

ESPO Environmental Report 2024

EcoPorts in Sights 2024



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PREPARED FOR

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FOREWORD

*By ESPO Chair
Zeno D'Agostino*

It is my pleasure to present the 2024 edition of the ESPO Environmental Report which highlights a particularly positive outlook on the environmental performance of Europe's ports.

But even if almost all indicators show progress, Europe's ports are not resting on their laurels. They are facing enormous challenges, both in terms of investment and in terms of planning, to stay on course for reaching net-zero ambitions. For ports, this implies both becoming net-zero themselves and playing a role in helping their stakeholders and customers, as well as the surrounding economy and society to become net-zero.

The publication of this report comes at the time when the new European Parliament is settling in, and the new Commission is about to start its mandate. The priorities of Commission President von der Leyen, as well as the mission letters the different Commissioners-designates received upon designation are clear.

While ambitions remain high, a lot of emphasis is being put on implementation. In the past five years, several "fit for 55" legislative measures have been adopted that directly impact ports. Different indicators in this report, particularly those on the provision of onshore power and alternative fuels, can be helpful in monitoring this implementation. ESPO welcomes the Commission's increased focus on implementation and hopes the coming months will bring much-needed clarity. We also hope that the pragmatism and technology neutrality announced in that respect by Mrs von der Leyen will allow ports to prioritise investments where it makes most sense.

The flagship of this new Commission seems to be the Clean Industrial Deal, which aims at combining decarbonisation with industrialisation and competitiveness. Europe's ports can certainly play a role in attracting net zero industries and in reinforcing their supply chains. Competitiveness and safeguarding the level playing field are important priorities for Europe's ports. During the past years, ESPO has repeatedly voiced its concerns about the risk of carbon and business leakage linked to the extending scope of the EU ETS to maritime. We also hope that the Commission's monitoring exercise will be strengthened and continued in close cooperation with all relevant stakeholders, and lessons will be learned from this assessment.

The greening requirements set by the Green Deal will need to be met. While this year's Environmental Report once again highlights climate change as the top priority for ports, it also shows that other greening priorities remain firmly on the radar and agenda of Europe's ports. This is also demonstrated in our growing list of good green practices showcased on the ESPO website.

The ESPO Environmental Report can only be made with the support of our ports. I would like to thank all the ports that joined the EcoPorts network over the past year and congratulate those that achieved or renewed their PERS certification, the only port-specific environmental management standard.

I would like to extend my thanks to the verifiers, the academics who have made the report and the ESPO secretariat, particularly Anaëlle, the EcoPorts coordinator and Belén, for their daily efforts to strengthen the EcoPorts network.

INTRODUCTION

Welcome to the ESPO Environmental Report 2024. This annual publication, conducted by the European Sea Ports Organisation (ESPO), serves as a critical barometer of environmental performance and sustainability practices across Europe's seaports. The report synthesises data and insights derived from the **EcoPorts Self-Diagnosis Method (SDM)**, a comprehensive tool that enables ports to evaluate and benchmark their environmental management, policies, and initiatives. The SDM is designed to assist port authorities with a phased approach to achieve and maintain certification to the International Quality Standard of Environmental Management System (EMS), namely **EcoPorts Port Environmental Review System (PERS)** – the only standard dedicated to the port sector.

The maritime and port sector is pivotal to Europe's economic vitality, facilitating trade, tourism, and connectivity across the continent and beyond. This sector plays an increasingly important role in securing Europe's energy and ensuring Europe's progress towards the energy transition. However, it also bears a significant responsibility in mitigating environmental impacts and fostering sustainable development. In response to the increasing urgency of climate action, biodiversity conservation, and pollution prevention, European ports are adopting innovative strategies and technologies to enhance their environmental stewardship.

Aiming to increase the transparency and accountability of the European port sector and to further enhance the relationship of ports with their local communities, ESPO decided to publish an environmental report annually from 2016 onward.

This year's report draws on data from 83 European ports across 21 countries, all members of the EcoPorts Network (www.ecoport.com). The report reflects the collective efforts of European ports, capturing their progress, challenges, and aspirations in the journey toward greater environmental sustainability. It highlights key trends, best practices, and emerging issues that shape the environmental landscape of the port sector and maritime industry. By sharing these insights, the ESPO Environmental Report aims to inspire collaboration, innovation, and continuous improvement - between port authorities, policy-makers, and stakeholders. For ports outside Europe, access to the EcoPorts tool and standard is accessible via www.ecoslc.eu.

The overall profile of the sample of ports is detailed in the Annex of this report, including the number of ports by country, geographical characteristics, size, as well as the Trans-European Transport Network (TEN-T) status. The Annex also includes the list of participating ports certified with the **EcoPorts' Port Environmental Review System (PERS)**.

The structure of the report closely follows the pattern of recent years to facilitate the identification and comparison of trends, with the addition of a new section (section E). It comprises benchmark results for more than 60 indicators of environmental management, alongside results from previous years, enabling the identification of significant variations over time. The main categories comprising this report are:

- A. **Environmental management indicators:** this section presents an overview of the main environmental management practices adopted by European ports. It includes data on policies, responsibilities, and certifications that contribute to systematic environmental management. This section also includes the calculation of the Environmental Management Index (EMI), and indicators on environmental communication.
- B. **Environmental monitoring indicators:** this section focuses on the implementation of environmental monitoring programs in ports. These indicators track key metrics such as water quality, port waste, and energy efficiency, which are crucial for assessing the effectiveness of environmental measures, ensuring compliance with environmental legislation, and achieving objectives. Additionally, it includes indicators related to climate change to evaluate how ports are adapting to environmental challenges.

- C. **Top 10 environmental priorities:** this part presents a ranking of the most pressing environmental concerns for European ports, showing trends and shifts in priorities over time. This helps in understanding the main areas where ports are focusing their environmental efforts.
- D. **Services to shipping:** this section assesses the availability of green services for shipping, including onshore power supply (OPS) and liquefied natural gas (LNG) bunkering. It also reviews the ports' efforts to promote greener shipping practices through differentiated fees for environmentally friendly ships. The 2024 report introduces new details about the technical challenges that ports face in deploying OPS and explores ongoing projects related to infrastructure for other clean fuels, such as hydrogen, ammonia, biofuels, synthetic fuels, and methanol/methane.
- E. **Clean fuels for cars and trucks:** these indicators assess whether electric charging stations for cars and trucks, as well as hydrogen fuelling stations for trucks, are available in ports. It is a new 2024 inclusion which underscores the ports' efforts to support sustainable transportation by providing essential infrastructure for clean fuel options for both cars and trucks, contributing to overall reductions in emissions and environmental impact.
- F. **Annex: Sample of ports:** the Annex provides detailed information about the sample of ports that participated in the survey, offering context to the data presented in the report.

It is important to note that the actual sample of ports varies each year, as new ports join the EcoPorts Network, and the results are analysed and interpreted with this variability in mind. The environmental performance indicators included in this report also feed into **PortinSights**, ESPO's digital platform for European ports to collect, share, compare, and analyse their data. This platform encompasses throughput data, environmental data (EcoPorts), and port governance data, providing a comprehensive tool for data-driven decision-making and performance improvement (www.portinsights.eu).

Executive Summary

The ESPO Environmental Report 2024 underlines substantial advancements in environmental performance across European ports, reflecting a strong commitment to sustainability and environmental governance. This year, notable improvements have been observed in several key areas. The percentage of ports with an Environmental Policy, an inventory of relevant environmental legislation, and defined objectives for environmental improvement has reached an unprecedented 98%. Additionally, almost all (96%) ports now maintain inventories of Significant Environmental Aspects (SEA) and have established active environmental monitoring programs (95%), demonstrating a proactive approach to environmental management. The indicator on documentation of environmental responsibilities for key personnel has experienced a significant increase (93%), marking a 22% rise since 2013. The proportion of ports with certified Environmental Management Systems (EMS), such as ISO 14001, EMAS, or PERS, has also risen to 75%, reflecting a 21% increase over the past decade. The presence of environmental training programs for port employees has seen the most significant increase compared to last year, rising by 10%. However, it remains the only indicator that shows a decline since 2013, with a 7% decrease over this period. Regarding the communication of environmental policies, 89% of ports now make their policies available online, and 92% actively share these policies with relevant stakeholders.

The Environmental Management Index (EMI), which aggregates the environmental management indicators, has achieved its highest value to date, reaching 8.61 in 2024. Environmental monitoring remains robust, with most of the surveyed ports (95%) implementing programs, focusing primarily on energy efficiency (for 86% of the surveyed ports), port waste (84%), and water quality (82%).

Climate change adaptation has become notably important, with 64% of ports reporting climate-related operational challenges, up from 47% previously. Efforts to improve existing infrastructure resilience and integrate climate adaptation into new projects are also notable, with 73% and 86% of ports respectively engaging in these practices.

Regarding the sector's Top 10 priorities, the results for 2024 show some changes, mainly in the order of priorities. Indeed, in 2024, climate change continues to be the sector's top environmental priority, stressing its significant importance. Energy efficiency has moved from third to second position, surpassing air quality, which is now in third place. Noise remains in the fourth position. While there have been some shifts in the ranking of the other topics, no new issues have emerged this year. The priorities from fifth to tenth positions are: Port development (land-related), Ship waste, Garbage/Port waste, Water quality, Relationship with the local community, and Port development (water-related).

On another note, the provision of green services for shipping has expanded notably. Currently, 58% of the surveyed ports offer onshore power supply (OPS) at one or more berths, with 56% of the latter providing high voltage options. New insights into OPS implementation challenges reveal that insufficient grid infrastructure (45%) and inadequate grid capacity (40%) are the primary obstacles. LNG bunkering is available at 48% of the surveyed ports, with an additional 16% planning to introduce it within the next two years. In addition, hydrogen projects are underway at almost half of the surveyed ports (44%), highlighting its role as a key alternative clean fuel. Furthermore, another significant result indicates that 61% of the surveyed ports offer environmentally differentiated dues for ships that go beyond regulatory standards, incentivising sustainable practices in shipping. Among these ports, the air emissions reduction scheme is the most widely implemented incentive, available at 67% of the ports offering these differentiated dues.

In the 2024 ESPO Environmental Report, a new focus on clean fuels for cars and trucks at European ports highlights the sector's role in advancing cleaner transportation options. The report reveals that 85% of surveyed ports now offer electric vehicle charging stations, reflecting a strong commitment to reducing road transport emissions and supporting the transition to electric vehicles. This infrastructure is crucial for lowering urban air pollution and aligns with broader EU carbon reduction goals. Conversely, only 6% of surveyed ports provide hydrogen fuelling stations for trucks, indicating that hydrogen infrastructure is still emerging and faces challenges, such as high costs and technical complexities.

About ESPO

The European Sea Ports Organisation (ESPO) is the principal interface between European seaports and the European institutions and its policymakers. Established in 1993, ESPO represents the interests of port authorities, port associations, and port administrations from 22 EU Member States, including Norway, at the EU political level. Additionally, ESPO includes observer members from Albania, Iceland, Israel, Montenegro, Ukraine, and the United Kingdom.

Serving as the first port of call for European transport policymakers in Brussels, ESPO is a knowledge network that drives ports to perform better. In terms of environmental management, ESPO plays a crucial role in coordinating the collaborative efforts of the port sector to develop policies focused on monitoring, environmental protection, and sustainability.

About EcoPorts

EcoPorts is the leading environmental initiative within the European port sector. Launched in 1997 by a group of proactive ports in collaboration with academia, it has been fully integrated into the European Sea Ports Organisation (ESPO) since 2011. The EcoPorts Network fosters environmental awareness through knowledge sharing and collaboration among ports, promoting good practices and the continuous improvement of environmental management across Europe.

As the flagship initiative of the European port sector, EcoPorts was designed by ports for ports, focusing on voluntary self-regulation to demonstrate the sector's capability in managing its environmental responsibilities. The network increases awareness of environmental challenges, aids in regulatory compliance, and upholds high standards of environmental management among its 88 members from 26 countries (as of August 2024).

The publication of the environmental report is an important tool of the ESPO EcoPorts Network, together with the Self-Diagnosis Method (SDM) and the Port Environmental Review System (PERS).

The annual environmental report relies on consolidated data derived from the Self-Diagnosis Method (SDM). Serving as a concise checklist, the SDM allows port managers to conduct self-assessments of their port's environmental management program. These evaluations gauge the port's adherence to both sectoral and international standards, forming the foundation for the comprehensive environmental report. The EcoPorts Network also provides the option to get independent and confidential analysis and interpretation of the ports' responses to the SDM through the EcoPorts SDM comparison and SDM review.

PERS started as an EU research initiative connecting the ESPO Network, port professionals, academia, and the maritime industry. Developed by ports themselves, PERS has firmly established its reputation as the only port sector-specific international quality standard of environmental management system. PERS certification is voluntary and provides evidence of compliance that is independently audited by Lloyd's Register Quality Assurance (LRQA). Currently, over a third of EcoPorts members are PERS-certified ports.

A Environmental management indicators

The Environmental Management Indicators section of this report presents a comprehensive overview of the environmental management practices adopted by European ports over the past decade. This section highlights key performance indicators, showcasing the progress and areas for improvement in environmental management. Environmental management refers to the systematic approach taken by organisations to address and mitigate the impact of their activities on the environment. This involves planning, implementing, monitoring, and continuously improving practices that promote environmental sustainability and compliance with regulatory requirements.

Table 1 presents the **10 selected environmental management indicators** that have been consistently reported. They provide information about the management efforts influencing the environmental performance of the port. It includes the percentage of positive responses to these indicators compared to the baseline year of 2013, allowing for the analysis of the trends over time.

TABLE 1
Percentage of positive responses to the environmental management indicators

Indicators	2013 (%)	2019 (%)	2020 (%)	2021 (%)	2022 (%)	2023 (%)	2024 (%)	% CHANGE 13–24
A Existence of a certified Environmental Management System (EMS) – ISO, EMAS or PERS	54	71	65	75	75	69	75	+21
B Existence of an Environmental Policy	90	95	96	93	90	92	98	+8
C Environmental Policy makes reference to international and/or national port environmental policy guidelines	38	38	43	39	46	53	53	+15
D Existence of an inventory of relevant environmental legislation	90	96	91	88	90	93	98	+8
E Existence of an inventory of Significant Environmental Aspects (SEA)	84	89	92	92	90	92	96	+12
F Definition of objectives for environmental improvement	84	90	88	87	88	90	98	+14
G Existence of an environmental training program for port employees	66	53	55	56	49	49	59	-7
H Existence of an environmental monitoring program	79	82	81	86	90	92	95	+16
I Environmental responsibilities of key personnel are documented	71	85	85	82	88	89	93	+22
J Publication of a publicly available environmental report	62	65	69	68	74	76	82	+20

The ESPO Environmental Report 2024 reveals several significant trends and developments in the environmental management practices of European ports over the past decade. By analysing the 2024 results of the proposed 10 environmental management indicators, it is evident that there has been an increase in performance in all parameters compared to 2023, with some showing substantial increase.

Firstly, the **existence of an Environmental Policy** is a common practice in 98% of surveyed ports in 2024, a steady increase from 90% in 2013. This 8% increase indicates a near-universal adoption of formal environmental policies across ports, demonstrating a strong commitment to structured environmental governance across the sector. An Environmental Policy serves as a foundation for decision-making and provides a framework for setting environmental objectives and targets.

Similarly, the **existence of an inventory of relevant environmental legislation** is also adopted in 98% of ports in 2024, up from 93% in 2023 and from 90% in 2013. This 8% improvement underscores the ports' diligence in tracking and complying with applicable environmental laws, which is critical for maintaining regulatory compliance and mitigating environmental impacts.

The third indicator reaching 98% of positive responses in 2024 is the **definition of objectives for environmental improvement**. This represents a major 14% increase from 84% in 2013 and an 8% rise from the previous year. This all-time high indicates that nearly all ports are now setting clear and actionable environmental improvement goals, demonstrating a proactive approach to continuously strengthening their environmental performance.

In addition to setting broad environmental objectives, specific targets are also being defined and communicated. For instance, 79% of port authorities have set their own greenhouse gas (GHG) reduction targets, while 62% have established targets for reducing air emissions. Moreover, 39% of surveyed ports have set limits for the discharge of scrubber's liquid effluents based on local or national legislation, and 32% of ports have introduced low emissions zones or emission berth standards in the port area. Notably, half of the surveyed ports (47%) have set zero-emission targets for emissions related to port activities and operations.

Communication of these emissions' reduction objectives is also strong, with 81% of ports having communicated them. A majority of the ports have defined quantitative objectives (78%) and specific targets for these (87%). This comprehensive approach to setting, communicating, and quantifying environmental objectives reinforces the commitment of European ports to improving their environmental performance.

Moreover, the existence of an **inventory of Significant Environmental Aspects (SEA)** has risen to 96% in 2024 from 84% in 2013, marking a 12% increase and a 4% rise from 2023. This indicates that ports are increasingly effective in identifying and managing key environmental aspects, enabling them to implement targeted mitigation strategies. Identifying and documenting Significant Environmental Aspects (SEA) allows ports to assess the potential environmental impacts of the activities, products and services functioning in their port area. It helps to systematically evaluate the interactions between port activities and the environment, including air quality, water quality, noise levels, waste generation, energy consumption, and biodiversity. This assessment enables ports to prioritise their environmental management efforts and allocate resources effectively. Such an inventory is a major tool in terms of compliance and control.

In 95% of the surveyed ports in 2024 an **environmental monitoring program** exists. This represents a significant 16% rise since 2013, showing a strong commitment to systematic monitoring of environmental performance, which is essential for assessing the effectiveness of environmental measures and ensuring compliance with established objectives. By regularly monitoring key environmental indicators, ports can quickly identify deviations from expected conditions and take appropriate actions to address potential issues. Early detection of environmental impacts enables timely intervention and minimises the risk of significant harm to ecosystems or public health.

Environmental responsibilities of key personnel are documented in 93% of ports in 2024. A 22% increase since 2013, the largest observed, reflects significant progress in organisational clarity and accountability, ensuring that environmental duties are clearly defined and managed.

Ports with **publicly available environmental reports** have increased to 82% in 2024 from 62% in 2013, showing a 20% rise. This trend towards greater transparency allows stakeholders, including the public, local communities, regulatory agen-

cies, and environmental organisations, to evaluate and understand the ports' environmental performance, promoting accountability and public trust.

The **achievement of a certified Environmental Management System (EMS)** – ISO, EMAS or PERS – has increased at 75% in 2024, up from 54% in 2013. This increase reflects the sector's dedication to be transparent about environmental performances and to manage its environmental responsibilities on the basis of voluntary, self-regulation that has been independently audited against international quality standards.

In 2024, the indicator of having an **environmental policy making referring to to international and/or national guidelines** remained steady at 53%, unchanged from 2023 but showing a 15% increase since 2013. This consistency indicates ongoing alignment with broader regulatory frameworks, which is vital for maintaining high standards of environmental management.

Lastly, the **existence of an environmental training program for port employees** increased to 59% in 2024 from 49% in 2023, despite a 7% overall decrease since 2013. This recent increase shows a renewed focus on staff education and training, although more focus might be needed to achieve a comprehensive level of environmental awareness and competence among port staff. Another positive aspect may be that new employees are more aware and informed about environmental issues thanks to a growing emphasis on environmental topics in educational curricula.

In summary, the 2024 data reveals substantial progress in several key areas of environmental management among European ports, with significant improvements in the adoption of environmental policies, legislative inventories, and defined objectives. However, the data also highlights the need for ongoing efforts to enhance environmental training programs for employees to foster an environmentally conscious workforce.

The improved performance in key performance indicators has led to a remarkable rise in the **Environmental Management Index (EMI)** for European ports (see Figure 1). ESPO Green Guide 2021 aimed at achieving an EMI score of 8 by 2025, which was already reached in 2023. The EMI is a comprehensive metric that evaluates the overall environmental performance of a port by aggregating the ten environmental indicators presented in Table 1. Each indicator is weighted according to its significance for environmental management.

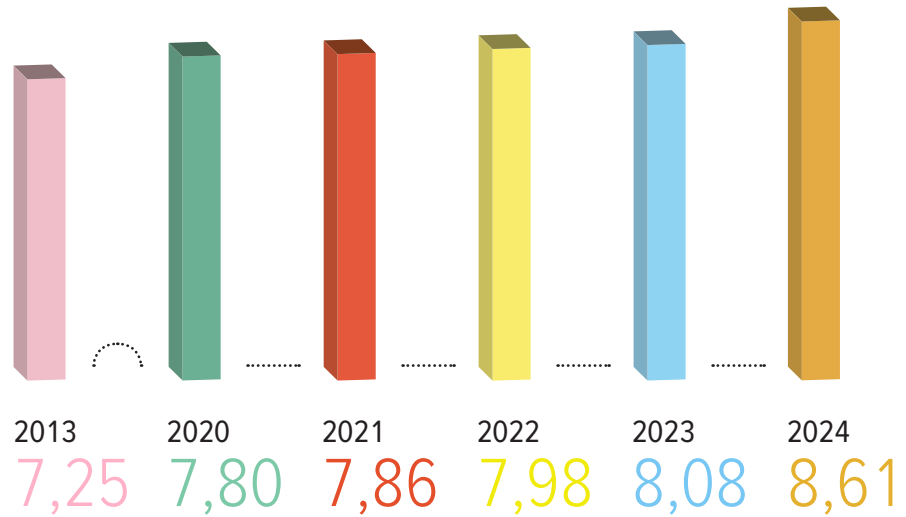
The EMI is calculated by multiplying the weight of each indicator with the percentage of positive responses. The final score is derived using the following formula:

$$\text{Environmental Management Index} = A*1,5 + B*1,25 + C*0,75 + D*1 + E*1 + F*1 + G*0,75 + H*1 + I*1 + J*0,75.$$

The numerical value of each letter represents the percentage of positive responses divided by 100. For instance, in the 2024 results (Table 1), A is 0,75.

The EMI reflects the aggregate score of the environmental performance of ports, taking into account the varying importance of different aspects of environmental management. Figure 1 illustrates the evolution of the EMI over the past decade.

FIGURE 1
Evolution of the Environmental Management Index over the years

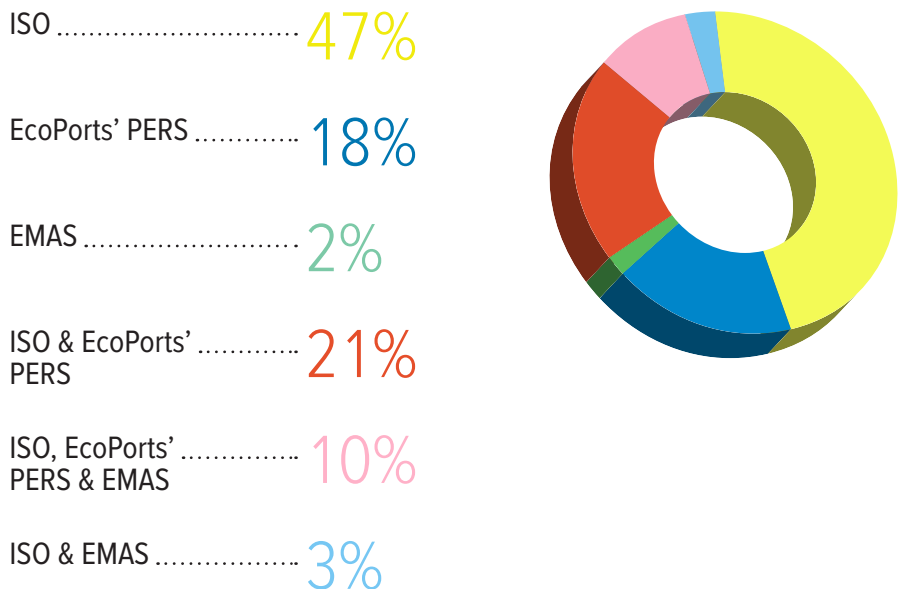


From the data, it is evident that the EMI has shown a steady increase over the years, reaching its highest value of 8,61 in 2024. This positive trend highlights the continuous improvement and commitment of European ports to improving their environmental management practices. The significant rise in the EMI from 8,08 in 2023 to 8,61 in 2024 is particularly noteworthy, reflecting the positive impact of increased rate of management indicators.

There are three main internationally recognised Environmental Management Systems (EMS) standards: the EcoPorts’ Port Environmental Review System (PERS), ISO 14001, and the Eco-Management and Audit Scheme (EMAS). Figure 2 shows the distribution among certified ports regarding the environmental standard they are certified with, or a combination of them.

In 2024, 75% of respondent ports have a certified EMS. Among these, nearly half have opted for ISO 14001 (47%), followed by the EcoPorts’ PERS (18%), making ISO and PERS the most popular standards in the sector. Additionally, some ports hold certifications in more than one standard, such as ports with both ISO and EcoPorts’ PERS (21%) or with the three certificates (10%).

FIGURE 2
Breakdown of the EMS certificates (2024)



As the only international, port sector-specific environmental management standard available, EcoPorts PERS is becoming increasingly recognised and adopted outside Europe. The international quality EMS standard of PERS is endorsed by several prominent organisations, including ESPO, the American Association

of Port Authorities (AAPA), the International Association of Ports and Harbors (IAPH), the World Bank (European Investment Bank, and European Bank for Reconstruction and Development), the United Nations Environment Programme (UNEP), the African Ports Association, the Arab Sea Ports Federation, the Taiwan Ports International Corporation (TIPC), and the InterAmerican Committee for Ports (Organisation of the American States).

Standards such as PERS are recognised components of a responsible approach, and such certification may also be a strong consideration in the approval of funding to assist port and terminal development. The growing adoption of these standards reflects the ports' commitment to high environmental performance and sustainable operations, which is crucial for mitigating risks and securing financial support for future projects.

Apart from the environmental management indicators presented so far, the ESPO Environmental Report also analyses environmental communication indicators. These indicators have been assessed to understand how ports communicate their environmental policies, being presented in Figure 3 and Figure 4.

FIGURE 3
Communication of environmental policy to relevant stakeholders

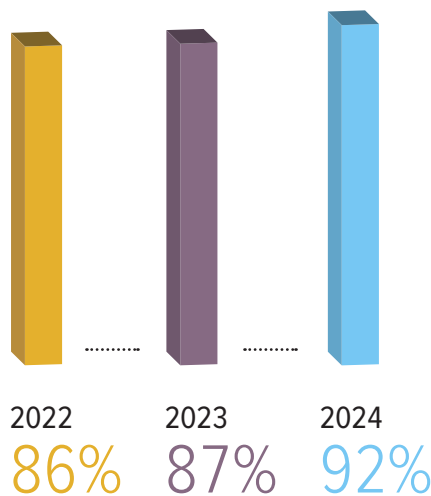
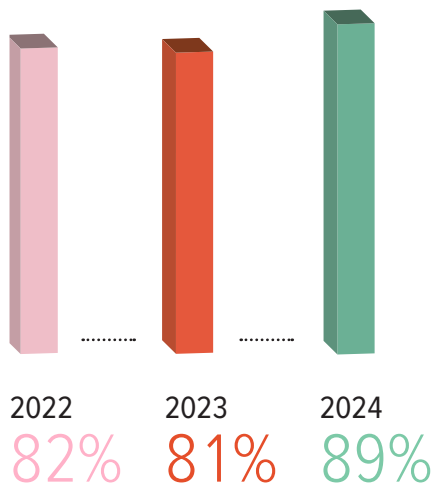


FIGURE 4
Availability of ports' environmental policy online



Most ports continue to prioritise transparency, with 92% of them communicating their environmental policy to relevant stakeholders and 89% making their policy public on their websites. These positive results suggest that ports are maintaining a high level of engagement with their local communities and other stakeholders.

Effective communication of environmental policies is crucial for engaging stakeholders in a port's environmental efforts. It provides an opportunity for stakeholders, including local communities, regulatory agencies, customers, suppliers, and environmental organisations, to offer feedback, ask questions, and contribute to the development and implementation of environmental initiatives. By engaging

stakeholders, ports ensure that their perspectives and concerns are considered, leading to more effective and inclusive environmental management practices.

The consistent communication of environmental policy to stakeholders, as shown by the 92% adherence rate in 2024, highlights the ports' commitment to transparency and stakeholder engagement. This approach not only builds trust with the community but also fosters collaborative efforts to address environmental challenges. Moreover, the increased availability of environmental policies online, which reached 89% in 2024, highlights the ports' dedication to making information accessible to a broader audience, further reinforcing their role as responsible and environmentally conscious entities.

B Environmental monitoring indicators

The section 'Environmental Monitoring Indicators' offers valuable insights into the extent to which ports are monitoring various environmental issues. Table 2 updates the percentages of positive responses based on the 2024 results, highlighting significant improvements across most indicators compared to 2013.

Monitoring environmental parameters enables ports to evaluate their environmental performance over time as it is challenging to manage what is not measured. By collecting and analysing data, ports can assess the effectiveness of their environmental management practices, track progress towards sustainability goals, and identify areas for improvement. Regular monitoring provides a basis for evidence-based decision-making and supports the development of targeted strategies for enhancing environmental performance.

TABLE 2
Percentage of positive responses to environmental monitoring indicators

Indicators	2013 (%)	2019 (%)	2020 (%)	2021 (%)	2022 (%)	2023 (%)	2024 (%)	% CHANGE 2013–2024
Energy efficiency	65	76	75	77	76	76	86	+21
Port waste	67	79	79	80	79	81	84	+17
Water quality	56	71	67	70	82	82	82	+26
Carbon footprint	48	49	52	59	63	65	77	+29
Sediment quality	56	54	59	60	71	73	75	+19
Water consumption	58	68	69	70	72	73	73	+15
Air quality	52	62	67	71	66	70	71	+19
Noise	52	57	54	64	64	64	66	+14
Marine ecosystems	35	40	46	46	52	53	55	+20
Soil quality	42	32	41	40	45	48	55	+13
Terrestrial habitats	38	37	41	40	45	43	47	+9

In 2024, **energy efficiency** monitoring experienced important growth compared to 2023 (from 76% to 86% of ports), becoming the most monitored indicator. This increase underscores the sector's intensified commitment to sustainable energy practices, which encompass the adoption of energy-efficient technologies, optimisation of energy use, and investment in renewable energy sources, such as wind and solar power.

Similarly, monitoring of **port waste**, which can include solid waste, hazardous materials, oily waste, and wastewater, has also shown considerable progress (+17% since 2013), with ports increasingly embracing thorough waste management practices. By tracking waste generation and disposal, ports are not only ensuring adherence to regulatory requirements but are also advancing broader sustainability objectives and enhancing their overall environmental performance.

Water quality monitoring remained robust and consistent, marking significant progress since 2013 (+26%). The steady, high levels of monitoring reflect the sector's ongoing dedication to ensuring the safety and health of aquatic environments. This continuous focus helps in effectively managing water resources, complying with environmental regulations, and safeguarding marine ecosystems from potential contaminants and pollutants.

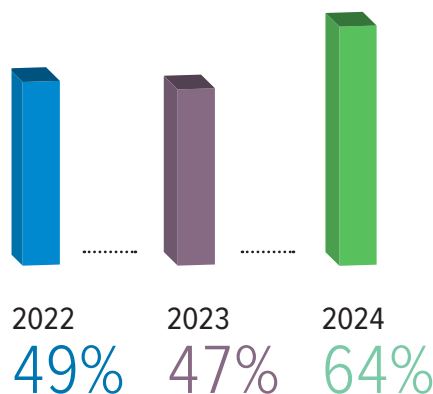
The most significant increase was observed in **carbon footprint** monitoring, which rose to 77% in 2024 from 48% in 2013, a substantial 29% increase. It is important to notice that this figure corresponds to the percentage of port authorities that calculate the carbon footprint from their activities. Alternatively, in 2024, 35% of ports monitor the carbon footprint accounting for both the port authority's and port stakeholders' emissions (including terminals, tenants, and contractors). When including the percentage of ports that monitor the emissions from port authority, port stakeholders, and third parties (including ships), the responses reach 37%.

It is also relevant to mention that **soil quality** monitoring has seen a substantial increase, rising by 7% from 2023 to 2024, bringing the total to 55% of surveyed ports. Similarly, **terrestrial habitats** monitoring, which focuses on the natural land-based environments around port areas, such as forests, wetlands, and other ecosystems, has grown by 4% over the past year, now standing at 47%. This increase is likely linked to recent port development projects that expand or modify land areas, prompting a greater need to monitor and mitigate the environmental impact on these critical habitats. As ports develop, there is a growing awareness of the importance of protecting local ecosystems, which may explain the heightened attention to terrestrial habitats.

Given the importance of climate change, ESPO decided to include in the annual report indicators to assess how ports are adapting to climate change challenges. These indicators focus on i) whether ports encounter operational challenges due to climate change, ii) whether ports take steps to enhance the resilience of existing infrastructure, and iii) whether climate change adaptation is integrated into new infrastructure development projects.

The first indicator examines if ports have faced climate-related operational challenges affecting efficiency, safety, or infrastructure. In 2024, the data reveals that a noteworthy 64% of surveyed ports have experienced operational challenges related to climate change, a significant increase from 49% in 2022 (Figure 5). This notable increase highlights the escalating impact of climate change on port operations, likely driven by the growing frequency and intensity of extreme weather events and rising sea levels, which are increasingly disrupting port activities and infrastructure.

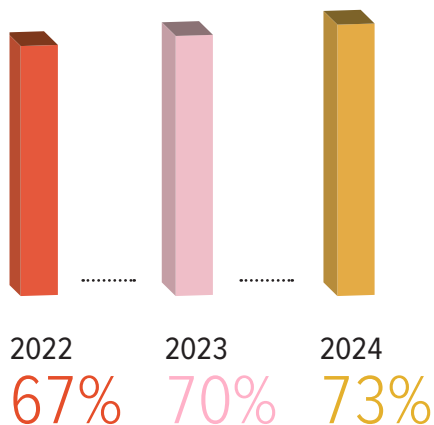
FIGURE 5
Share of ports experiencing operational challenges related to climate change



The second indicator assesses proactive measures taken by ports to adapt their infrastructure to climate impacts, such as sea-level rise or increased storm intensity. In this regard, 73% of ports are actively working to enhance the resilience of their existing infrastructure, up from 59% in 2018 and 67% in 2022 (Figure 6). This substantial increase demonstrates a significant rise in the proactive measures that ports are implementing to prepare for and address climate-related impacts.

FIGURE 6

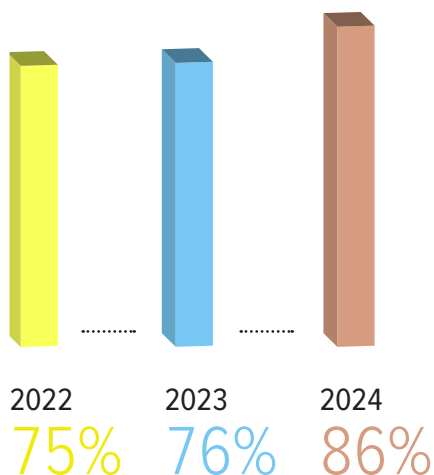
Share of ports adapting existing infrastructure to increase resilience



Finally, the third indicator examines how ports integrate climate adaptation considerations into new infrastructure projects. Currently, 86% of ports take climate adaptation into account when planning such projects (Figure 7).

FIGURE 7

Share of ports considering climate adaptation for new infrastructure



EXAMPLE

The **Port of Rotterdam** developed an adaptation strategy for each port area. For instance, in the Europoort, the adaptation strategy consists of three types of measures or a combination of those measures:

1. Preventive Measures
Reducing the risk of flooding with, for example, wave attenuation measures and by raising the Tuimelkade.
2. Spatial adaptation
Managing flood risks by adapting sites and assets to cope with floods. For example, vulnerable electricity substations can be made flood-resilient by dry-proofing the stations or building them on higher ground.
3. Crisis Management
Developing and implementing crisis management and emergency-response measures in good time. The focus here is on the drafting of emergency, recovery and crisis management plans. This makes it possible to control and monitor floods, and allow functions and processes to restart quickly. Because of the interdependence between the areas studied, this requires coordination with businesses in the Botlek and Maasvlakte areas.

C Top 10 Environmental priorities

This section updates the **Top 10 environmental priorities** of European port authorities, a ranking monitored since 1996. The Top 10 environmental priorities require ports to rank a diverse range of issues¹ that impact their operations and the surrounding environment. By prioritising these concerns, ports can focus on the most critical environmental challenges they face, ensuring targeted and effective management strategies that address operational impacts.

These priorities are pivotal for the port sector and other relevant stakeholders, as they reflect the key environmental concerns that ports themselves prioritise. Additionally, these priorities guide ESPO in its efforts to represent port interests and develop the capabilities of European ports.

The results in Table 3 illustrate the environmental priorities of European ports for 2024, alongside data from previous years. The table highlights trends over time by using the same colours for issues that have appeared consistently.

¹ The 37 proposed topics are Air quality, Antifouling paints, Biodiversity loss, Bunkering, Cargo Spillage (handling), Climate change (Energy efficiency, GHG emissions reduction & Adaptation), Conservation areas, Scrubber's discharges to water, Contaminated land, Dredging: disposal, Dredging: operations, Dust, Energy efficiency, Garbage/ Port waste (including waste disposal), Habitat/Ecosystem loss/Biodiversity (land), Habitat/Ecosystem loss/Biodiversity (water), Hazardous cargo (handling/storage), Industrial or urban effluent to water, Industrial emissions to air, Invasive species, Light pollution, Noise, Odours, Pollution from rivers, Port development (land related), Port development (water related), Rain water treatment, Relationship with local community, Sediment contamination (marine), Ship discharge (ballast), Ship discharge (oil waste), Ship discharge (sewage), Ship exhaust emissions, Ship waste, Soil contamination (land), Vehicle exhaust emissions (including cargo handling), and Water quality.

TABLE 3
Top 10
environmental
priorities of the
port sector over
the years

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

2020

2021

2022

2023

2024

Air quality	Air quality	Climate change	Climate change	Climate change
Climate change	Climate change	Air quality	Air quality	Energy efficiency
Energy efficiency	Energy efficiency	Energy efficiency	Energy efficiency	Air quality
Noise	Noise	Noise	Noise	Noise
Relationship with the local community	Relationship with the local community	Water quality	Water quality	Port development (land-related)
Ship waste	Water quality	Relationship with the local community	Ship waste	Ship waste
Water quality	Ship waste	Ship waste	Relationship with the local community	Garbage/ Port waste
Garbage/ Port waste	Dredging operations	Garbage/ Port waste	Port development (land-related)	Water quality
Dredging operations	Port development (land-related)	Port development (land-related)	Garbage/ Port waste	Relationship with the local community
Port development (land-related)	Garbage/ Port waste	Dredging operations	Port development (water-related)	Port development (water-related)

EXAMPLE

The **Port of Oslo** will feature a new terminal dedicated to carbon capture and storage (CCS), enabling support for customers throughout the supply chain. The facility will store CO₂ generated at Celsio's waste-to-energy plant in Klemetsrud before shipping it to the Northern Lights terminal in Øygarden on the west coast for export. The Celsio CCS project and the Northern Lights storage initiative are integral parts of Longship, the Norwegian government's carbon capture and storage (CCS) project. Longship also encompasses the capture of CO₂ emissions from Heidelberg Materials' cement plant in Brevik.

EXAMPLE

The **Port of Klaipėda** is well underway for the implementation of its green hydrogen production and refuelling stations project. All environmental impact assessment procedures for the planned activities are completed. Preparation of the hydrogen production facility is expected to start later this year. The Nemuno g. 40 site will be equipped with a hydrogen production base and a refuelling system for the vehicles. It is planned to produce around 500 kilograms of hydrogen per day here, and for the territory to be located 150 metres or more from the nearest residential area. Green hydrogen will be produced by electrolysis using a polymer electrolyte membrane (PEM) type electrolyser or equivalent. The hydrogen plant will be installed in a standard 40-foot sea container. The planned electricity demand for the hydrogen production equipment in the Klaipėda Port is 3 MW.

EXAMPLE

The **Port of Tenerife** provides onshore power supply (OPS) to the Armas Trasmediterránea ferry ships at night. The electricity powers refrigeration systems, lighting, and emergency equipment from 10 pm to 6 am, reducing noise and improving air quality. Additionally, the use of biofuels made from agricultural waste further lowers emissions and supports circular economy.

The Top 10 environmental priorities of European port authorities have evolved significantly from 1996 to 2024, reflecting shifts in both environmental challenges and the strategic focus of ports.

In recent years, **climate change** has emerged as the top priority, highlighting a growing awareness and response to global climate issues. Since 2022, climate change has consistently ranked first, underscoring the urgency ports place on mitigating and adapting to its impacts. This shift reflects broader global trends and regulatory pressures to reduce greenhouse gas emissions and enhance resilience against climate-induced events.

Energy efficiency has risen in priority with respect to the last year, reflecting the port sector's commitment to reducing energy consumption and improving operational sustainability. This priority aligns with global energy trends and the push for more sustainable, cost-effective operations. Ports are increasingly investing in energy-efficient technologies and renewable energy sources, a trend that supports broader climate goals.

Air quality has remained a consistent concern, ranking among the top priorities since 2009. This long-term focus indicates ongoing efforts to address air pollution from port activities, which include emissions from ships, cargo handling equipment, port operations, industrial activities and other related traffic. The sustained attention to air quality reflects both environmental regulations and community concerns about health impacts.

Noise pollution, including both ambient and underwater noise, has continually been a top concern for ports, reflecting its significant impact on local communities. In ports, ambient noise primarily arises from machinery, cranes, and trucks involved in cargo loading and unloading activities. Meanwhile, underwater noise primarily originates from auxiliary engines of vessels. The steady focus on noise in the rankings emphasizes ongoing efforts to mitigate acoustic pollution through better planning, technology upgrades, and operational adjustments. Ports recognise that managing noise is crucial for maintaining good relations with nearby residents and ensuring the health and well-being of the port personnel, nearby wildlife and the surrounding community.

Land-related port development has become increasingly prominent, reflecting the need for sustainable expansion and modernisation of port facilities. Land-related development focuses on the port development done onshore, such as expanding a port terminal or developing a new one, developing improved road and rail connectivity, creating logistics parks near the port area or constructing modern warehouses. This priority indicates a strategic focus on improving infrastructure to support growing trade volumes while ensuring minimal environmental impact. Investments in land development projects are crucial for maintaining operational efficiency and competitiveness in the global market. Spatial planning of the port also increases in complexity due to the integration of future energy plans, infrastructure, and requirements. Port development remains important since ports continue to develop, but more so, their increasingly important role in the supply, production and storage of new energies comes with an increasing need for space, as shown in the Royal Haskoning DHV report on the new energy landscape in European ports².

Managing ship waste has remained a consistent priority, indicating ongoing efforts to address waste generated by vessels. Ports are committed to improving waste handling facilities and ensuring compliance with environmental regulations to prevent marine pollution. Effective ship waste management is essential for protecting marine ecosystems and supporting sustainable port operations. The review of the Directive on port reception facilities, last revised in 2019 and applicable since 2021, prevents marine pollution from ships by ensuring that waste generated on ships is not thrown into the sea but returned to land and adequately managed.

The management of **garbage and port waste** continues to be a significant concern. Ports are increasingly adopting comprehensive waste management practices to handle the diverse types of waste generated. This priority highlights the importance of reducing waste, recycling, and ensuring proper disposal to meet

2 Royal Haskoning DHV report "The new energy landscape: Impact on and implications for European ports", June 2022, accessible at <https://www.espo.be/media/The%20New%20Energy%20landscape%20v20221018.pdf>

EXAMPLE

The **Port of Algeciras** started the intensive cleaning of the coastline, collecting every last piece of paper from the public port area, including the Natural Park of the Strait or the cliffs of Punta San García, in Algeciras. The objective is that these areas remain clean of waste, for which the Port Authority asks the commitment of visitors and users. In total, the action will clean 9 kilometres of the Port shores, along four different municipalities (La Linea, San Roque, Algeciras, Tarifa).

EXAMPLE

The **Port of Dublin** has placed along the Great South Wall (in Dublin) massive concrete blocks, moulded to replicate the shoreline of Ringaskiddy in Cork to increase biodiversity and support fish populations in Dublin Port. This initiative follows a study of 60 shorelines in Ireland and Wales to determine optimal topography for biodiversity promotion. Natural and rocky shorelines, with their numerous nooks and crannies, offer protection for aquatic organisms from tidal challenges, motivating the use of artificial structures to mimic these habitats. This enhancement helps increase biodiversity by providing better protection and food sources for marine life, thereby contributing to the overall health and quality of the port's water environment.

EXAMPLE

The **Port of Sevilla** has recovered a 275-meter-long stretch of the right bank of its Guadalquivir River, where the Doñana National Park's coastline is located. The area had been affected by erosion due to recent storms, high tides and flooding. The regeneration of the Doñana's beaches began in November 2021 and was achieved through the deposit of 62.000 m³ of sand extracted during maintenance dredging of the navigation channel.

ESPO AWARD 2024

The theme of the 16th edition of the **ESPO Award** is "Port Projects or Strategies in Circular Economy Benefiting the City and Surrounding Community" and will be handed out during a ceremony in Brussels in November 2024.

environmental standards and enhance sustainability. In accordance with the Waste Framework Directive 2018/851, its management adheres to the "waste hierarchy", which establishes a preferred sequence of actions for waste reduction and management. The hierarchy prioritises waste prevention, minimisation, reuse, recycling, energy recovery, and, as a last resort, landfill disposal. The ultimate objective is to establish a circular economy in society, wherein materials previously considered waste can be reused as new resources, thus avoiding a throwaway economy.

Water quality remains a vital environmental priority, reflecting the direct impact of port activities on marine and coastal ecosystems. Consistent focus on this issue indicates ongoing efforts to monitor and improve water quality, preventing pollution, and protecting aquatic life. Ports are investing in technologies and practices to minimise water contamination and ensure compliance with environmental regulations.

Maintaining a positive relationship with the local community is a longstanding priority for ports. This focus highlights the importance of social responsibility and the need to address community concerns related to port operations. Ports are actively engaging with local stakeholders, implementing measures to mitigate negative impacts, and fostering collaboration to ensure sustainable development. However, in the ranking of environmental priorities, this issue seems to be less prevailing. This could be because ports that have effectively managed community relations in the past may face fewer immediate or significant issues in this area. Consequently, compared to more pressing environmental concerns such as climate change, air quality, and noise, community relations might be perceived as less urgent, leading to its lower ranking in the prioritisation of environmental issues.

In order to incorporate this issue into the ports' agenda, ESPO published its Code of Practice on Societal Integration of Ports in 2010. In addition, the ESPO Award on Social Integration of Ports was established in 2009 to promote innovative projects of port authorities that improve social integration of ports, especially with the city or wider community in which they are located. ESPO acknowledges the importance of considering the dynamic interactions between ports and the cities they serve. ESPO emphasises the significance of fostering positive port-city relations, addressing shared challenges, and promoting collaborative approaches to sustainability, environmental protection, and social well-being.

Finally, **water-related port development** has recently re-emerged as a key priority, reflecting the strategic importance of expanding and upgrading waterfront infrastructure. Water related development focuses on the port development realised offshore, such as dredging and deepening navigational channels, gaining space on the water side, extending existing berths or constructing new ones, building breakwaters or seawalls. This focus is crucial for accommodating larger vessels, improving cargo handling efficiency, and supporting economic growth. Sustainable water development projects ensure that ports can meet future demands while minimising environmental impacts on marine ecosystems.

D Green services to shipping

Ports are not only areas where the emissions from various maritime and industrial activities come together. Ports can also act as facilitators of the greening of shipping and other port stakeholders, promoting ambitious policies for decarbonisation and leading by example. The provision of green services to shipping by ports promotes cleaner, more efficient shipping. These services help lower environmental impact, reduce greenhouse gases and pollutants, and support broader decarbonisation goals in the maritime sector.

The ESPO Environmental Reports track three major green services that ports offer: Onshore Power Supply (OPS), Liquefied Natural Gas (LNG) bunkering facilities, and Environmental Differentiated Port Fees.

- I **Onshore Power Supply (OPS)** offers a significant opportunity for reducing the environmental impact of maritime operations by allowing ships to connect to the electricity grid while at berth. This practice enables vessels to power down their auxiliary engines, leading to a reduction in exhaust emissions, particulate matter, noise pollution, and vibrations while at berth. The effectiveness of OPS in mitigating these pollutants is well-recognised, but to maximise its environmental benefits, the electricity used must primarily come from renewable sources such as solar and wind power. Emphasising the use of both solar and wind resources can significantly enhance the overall environmental impact of OPS. Although often relying on national grids, port authorities aim to prioritise where possible the consideration of solar, onshore, and offshore wind resources to meet the energy demands of OPS. While solar resources are important, it is crucial to give special attention to wind resources, as they offer significant potential for generating clean energy.

The latest data indicates that the adoption of OPS in ports has continued to grow (Figure 8). In 2024, 58% of surveyed ports provided OPS at one or more berths. This expansion reflects a broader trend towards integrating green technologies into port operations. Among these ports, 83% offer low voltage OPS, which is primarily used by inland, domestic, and auxiliary vessels, and would be sufficient for a substantial share of container vessels. High voltage OPS, which usually serves commercial seagoing vessels, is available at 56% of the ports at one or more berths. Almost all ports providing OPS utilise fixed installations (98%), with 17% also offering mobile installations.

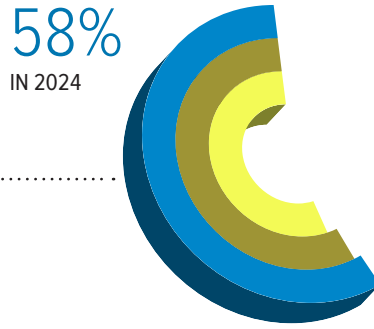
Looking forward, the commitment to OPS is further demonstrated by future planning. The proportion of ports intending to implement OPS within the next two years has risen significantly, from 48% in 2022 to 59% in 2024. This substantial increase indicates that nearly all ports are either already offering OPS or have plans to do so soon, reflecting a strong sector-wide commitment to enhancing environmental performance. OPS will only meet its environmental objective when used by ships calling at ports.

The increasing use and planning must be seen in the context of the recently adopted Alternative Fuels Infrastructure Regulation (AFIR). The progress shows that ports are working on it but the transition to widespread OPS deployment does not come without its challenges. The AFIR mandates that by 2030, OPS must be available for seagoing container and passenger ships over 5000 gross tonnes in TEN-T maritime ports. Despite the clear benefits, several obstacles need to be addressed. Ports face issues such as insufficient grid infrastructure, with 45% of ports reporting problems in this area. Frequency conversion issues, due to discrepancies between the OPS onboard vessels and the national grid, affect 28% of ports. Additionally, 40% of ports struggle with insufficient grid capacity. These challenges underscore the need for targeted efforts to optimise OPS deployment and achieve the anticipated environmental gains.

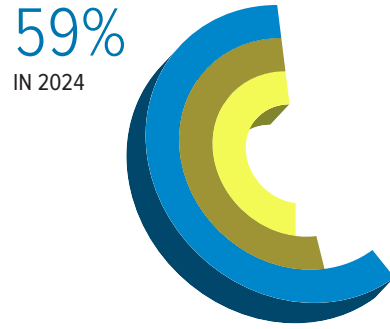
In summary, the expansion of OPS infrastructure and the growing commitment of ports to integrate this technology mark significant progress towards reducing maritime emissions. Nevertheless, overcoming infrastructure and grid capacity challenges will be essential to fully realise the potential of OPS in promoting cleaner, more sustainable shipping practices.

FIGURE 8
Positive responses to Onshore Power Supply (OPS) indicators

* The percentages of these indicators are calculated on the basis of the 48 ports offering OPS (58% of surveyed ports), not out of the total number of participating ports.

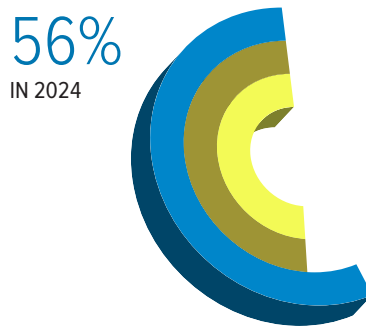


SUPPLY (OPS) AVAILABLE AT ONE OR MORE BERTHS?
55% 57% 58%
2022 2023 2024

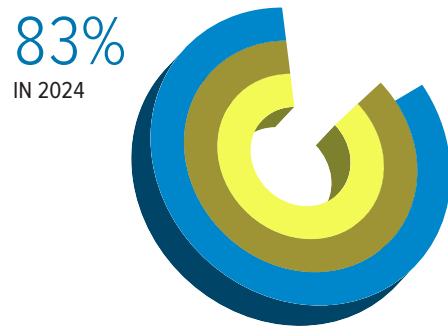


OFFER OPS DURING THE NEXT TWO YEARS?
48% 52% 59%
2022 2023 2024

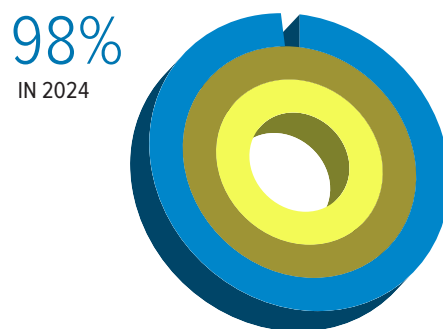
AMONG OPS-EQUIPPED PORTS



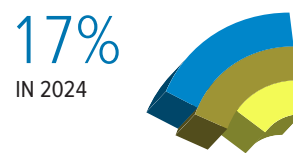
HIGH VOLTAGE*
49% 49% 56%
2022 2023 2024



LOW VOLTAGE*
86% 86% 83%
2022 2023 2024



BY FIXED INSTALLATION*
100% 100% 98%
2022 2023 2024



BY MOBILE INSTALLATION*
14% 18% 17%
2022 2023 2024

II The **provision of Liquefied Natural Gas (LNG) bunkering** in ports is crucial for advancing the decarbonisation of the shipping industry. The ESPO Report 2024 shows significant progress in this area, reflecting the broader trend towards integrating sustainable fuels in maritime operations (Figure 9). As of 2024, 48% of surveyed ports offer LNG bunkering. A steady growth is observed which aligns with the objectives of the recently adopted Alternative Fuels Infrastructure Regulation (AFIR), aimed at ensuring that, by 2025, an appropriate number of refuelling points for LNG are deployed at maritime ports connected to the TEN-T Core Network.

LNG is recognised as a cleaner alternative to traditional marine fuels, contributing to reduced GHG emissions and enhanced environmental sustainability. The increasing availability of LNG bunkering facilities in ports underscores the industry's commitment to building the necessary infrastructure to support this transition.

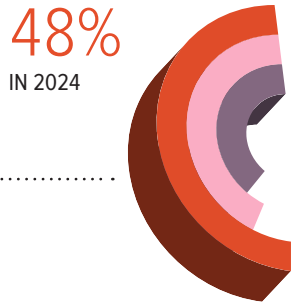
In terms of how LNG is bunkered, the vast majority of ports providing LNG bunkering services use trucks, with 88% of ports utilising this method in 2024, a figure that has remained relatively stable over recent years. However, there has been a noticeable increase in the provision of LNG bunkering by barge, rising to 50% in 2024. This method offers flexibility and efficiency, particularly for larger vessels. Conversely, the provision of LNG through non-mobile installations has increased to 18% in 2024, reflecting a renewed focus on permanent infrastructure.

Looking forward, 12% of ports are currently undertaking LNG bunkering infrastructure projects, and 16% of respondents plan to install LNG bunkering facilities within the next two years. Although this forward-looking approach demonstrates a strong commitment to expanding LNG infrastructure to meet future demand and support the maritime sector's transition to cleaner energy sources, these percentages have slightly decreased compared to last year.

The ESPO Report for 2024, for the first time, provides data on ports developing infrastructure for various clean fuels beyond LNG, reflecting ports' commitment to decarbonisation. Notably, 44% of ports are working on hydrogen projects, 26% on biofuels, 18% on synthetic fuels, 17% on ammonia, and 6% on methanol/methane. These efforts highlight a diversified approach to reducing emissions and supporting sustainable maritime operations, with some ports preparing for a multifuel future.

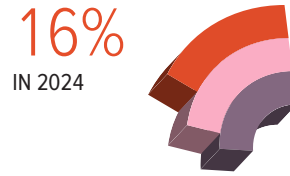
FIGURE 9
Positive responses to Liquefied Natural Gas (LNG) indicators

*The percentages of these indicators are calculated on the basis of the 40 ports offering LNG bunkering (48% of surveyed ports), not out of the total number of participating ports.



IS LIQUEFIED NATURAL GAS (LNG) BUNKERING AVAILABLE IN THE PORT TODAY?

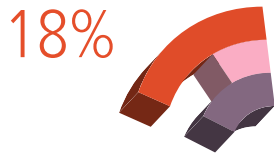
38% 42% 48%
2022 2023 2024



DO PLANS EXIST FOR THE DEVELOPMENT OF LNG BUNKERING FACILITIES DURING THE NEXT TWO YEARS?

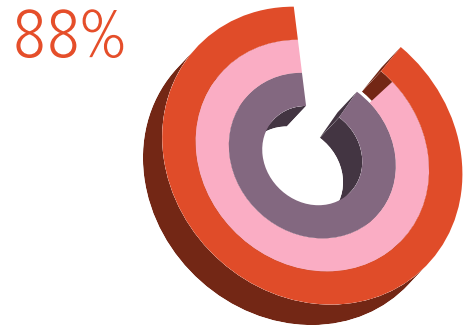
24% 21% 16%
2022 2023 2024

AMONG PORTS WITH LNG BUNKERING FACILITIES



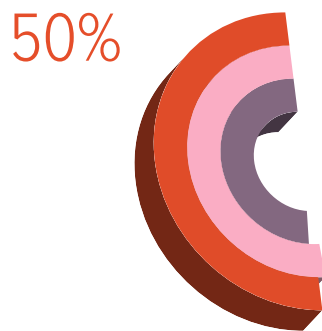
THROUGH A NON-MOBILE INSTALLATION*

17% 8% 18%
2022 2023 2024



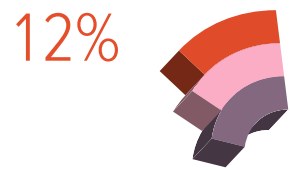
BY TRUCK*

89% 86% 88%
2022 2023 2024



BY BARGE*

49% 51% 50%
2022 2023 2024



ARE THERE CURRENTLY ONGOING LNG BUNKERING INFRASTRUCTURE PROJECTS IN THE PORT?

21% 15% 12%
2022 2023 2024

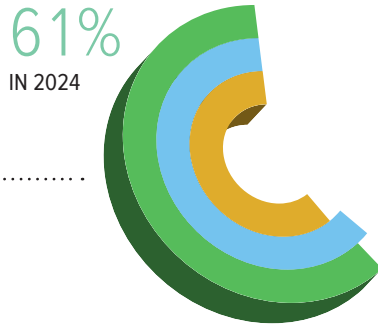
III The 2024 ESPO Report highlights the ongoing commitment of European ports to promote sustainable practices through **environmentally differentiated fees** for “green” ships that exceed regulatory standards. These schemes incentivise shipping companies to adopt environmentally friendly technologies and practices by offering reductions on port infrastructure charges. Depending on the scheme used, this approach aims to encourage the reduction of emissions, the use of cleaner fuels, energy-efficient technologies, and effective waste management.

According to the 2024 data (Figure 10), 51 ports, or 61% of the surveyed ports, offer environmentally differentiated fees. The most common incentives are for the reduction of air emissions (67%), and of GHG emissions (59%), and for vessels with environmental certification (57%). Additionally, 51% of ports reward vessels with waste management and segregation, while 29% offer incentives for noise reduction. Sustainable waste management in vessels follows the new legal framework of the port reception facilities Directive 2019/883 which obliges ports, since 2021, to apply a reduced fee to “green” ships that can demonstrate reduced quantities of waste and sustainable on-board waste management.

Positive trends indicate a growing willingness among ports to introduce environmentally differentiated dues, with 35% planning to do so in the next two years. This reflects an increasing recognition of the importance of environmental sustainability within the maritime industry, as ports strive to mitigate environmental impacts, improve air and water quality, and foster an eco-friendlier port sector. This approach is steadily gaining momentum, demonstrating the sector's commitment to decarbonisation and sustainable operations. It is important to note that the environmentally differentiated dues represent a financial commitment by the port, as they involve a reduction in a significant revenue source for the port authority.

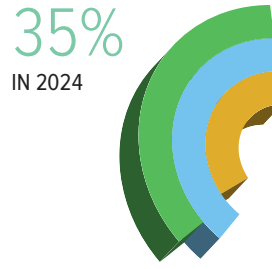
FIGURE 10
Share of ports providing differentiated dues to “Greener vessels”

*The percentage of the different initiatives are calculated on the basis of the 51 ports offering differentiated dues for “Greener Vessels” (61% of surveyed ports), not out of the total number of participating ports.



DOES THE PORT OFFER DIFFERENTIATED DUES FOR “GREENER” VESSELS?

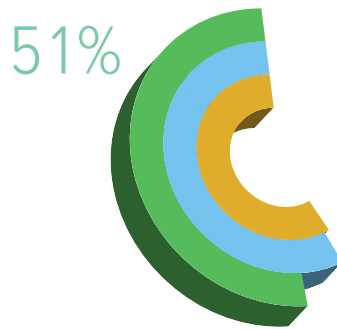
60% 63% 61%
2022 2023 2024



DOES THE PORT PLAN TO INTRODUCE ENVIRONMENTALLY DIFFERENTIATED PORT DUES DURING THE NEXT TWO YEARS?

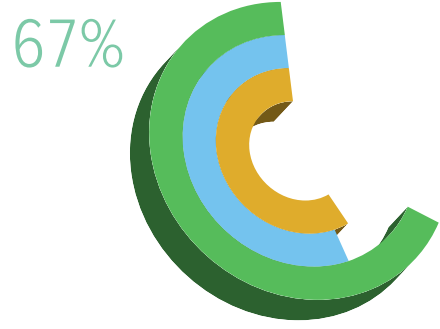
33% 38% 35%
2022 2023 2024

AMONG PORTS PROVIDING DIFFERENTIATED DUES, THESE ARE TAKEN INTO ACCOUNT



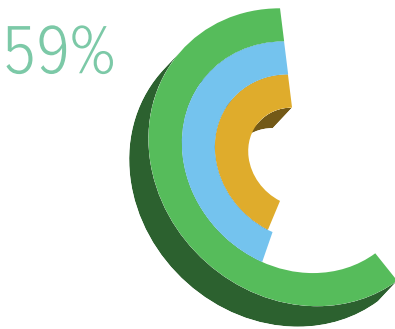
WASTE MANAGEMENT/ SEGREGATION*

58% 57% 51%
2022 2023 2024



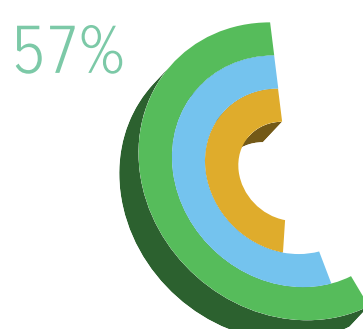
AIR EMISSIONS (NO_x, SO_x, PM) REDUCTION*

58% 55% 67%
2022 2023 2024



NOISE REDUCTION*

24% 23% 29%
2022 2023 2024



CERTIFICATION*

47% 54% 57%
2022 2023 2024

REDUCTION
42% 43% 59%
2022 2023 2024

E Clean fuels for cars and trucks

In the 2024 ESPO Environmental Report, a new section has been introduced to focus on the availability of clean fuels for cars and trucks at European ports. This addition highlights the increasing importance of ports in facilitating the transition to cleaner transport options, not only for maritime activities, but also for land-based vehicles. The data for 2024 provide insight into the current state of infrastructure supporting electric and hydrogen-powered vehicles at ports.

A significant majority of surveyed ports (85%) reported having electric charging stations for cars and/or trucks available on-site. This high percentage deepens the commitment of European ports to support the shift towards electric vehicles. The widespread availability of charging stations is crucial for reducing emissions from road transport, which remains a significant contributor to urban air pollution and greenhouse gas emissions. By providing the necessary infrastructure for electric vehicles, ports are not only facilitating greener transport options but also promoting the adoption of electric vehicles among port users, including employees, visitors, and logistics operators.

The availability of electric charging stations aligns with broader EU goals to reduce carbon emissions and enhance air quality. Ports serving as hubs for logistics and transportation can play a pivotal role in this transition by ensuring that electric vehicles have the necessary charging infrastructure. This move also supports the decarbonisation strategies of many port authorities, contributing to their overall environmental and sustainability goals.

The availability of hydrogen fuelling stations for trucks at ports is much lower, with only 6% of surveyed ports offering this facility. While hydrogen is considered a promising clean fuel for heavy-duty vehicles due to its high energy density and potential for zero emission, the infrastructure to support hydrogen fuelling is still in its initial stages and the current demand is limited. The low percentage reflects the current challenges associated with hydrogen infrastructure development, including high costs, technical complexities, and the need for substantial investment.

Conclusions

The ESPO Environmental Report 2024 reveals significant progress in environmental management across European ports, highlighting a significant commitment to sustainability and proactive governance. The data, collected from 83 ESPO members and observers through the EcoPorts' Self-Diagnosis Method (SDM), demonstrates marked improvements in various environmental indicators.

Almost all ports (98%) have established an Environmental Policy, reflecting the sector's dedication to structured environmental governance. Similarly, 98% of ports maintain an inventory of relevant environmental legislation, ensuring compliance and awareness of regulatory requirements. The same percentage of ports have also set clear objectives for environmental improvement, demonstrating a proactive approach to optimise their environmental performance. In addition to these high-performing areas, 96% of ports have identified and documented Significant Environmental Aspects (SEA), allowing for targeted management of key environmental issues. Environmental monitoring programs are actively implemented by 95% of ports, which is crucial for tracking and managing their environmental impacts. Furthermore, 93% of ports have documented environmental responsibilities for key personnel, ensuring accountability and clarity in environmental management roles. The availability of publicly accessible environmental reports is also significant, with 82% of ports publishing these documents, highlighting transparency and a commitment to stakeholder engagement. Certified Environmental Management Systems (EMS) are in place at 75% of ports, underscoring their commitment to standardised environmental management, with ISO 14001 and PERS being the most commonly implemented standards. Additionally, 59% of ports provide environmental training programs for their employees, emphasising efforts to build internal capacity and environmental awareness. Lastly, 53% of Environmental Policies in ports reference international and/or national port environmental policy guidelines. These indicators illustrate the comprehensive and proactive measures European ports are taking to manage and mitigate their environmental impacts, reinforcing their role as leaders in sustainable port operations.

Environmental monitoring remains robust, with 95% of ports implementing programs. The primary focuses are energy efficiency (86%), port waste (84%), and water quality (82%). Climate change adaptation has become significantly important, with 64% of ports reporting climate-related operational challenges, up from 47% previously. Efforts to improve existing infrastructure resilience and integrate climate adaptation into new projects are also notable, with 73% and 86% of ports respectively engaging in these practices.

Climate change continues to be the sector's top environmental priority. Energy efficiency has moved into the second position, surpassing air quality, which is now in third place. Noise remains in the fourth position. The increase to the 5th position of port development (land-related) indicates that infrastructure improvements are also a key part of the sector's strategy, potentially supporting sustainability and efficiency goals. Waste-related issues, including ship and port waste, continue to highlight the sector's commitment to managing and reducing environmental impacts across a range of operations and activities. Water quality remains a top priority, although it has shifted to a slightly lower position compared to previous years, along with the relationship with the local community. Finally, port development (water-related) closes the Top 10 environmental priorities list in the same position as last year.

A notable 58% of ports now provide Onshore Power Supply (OPS) at one or more berths, with 56% of them offering high voltage options. Despite this advancement, challenges such as insufficient grid infrastructure and inadequate grid capacity persist. LNG bunkering facilities are available at 48% of ports, with an additional 16% planning to introduce them within the next two years. Hydrogen projects are also gaining traction, with 44% of ports actively engaged in this area, highlighting hydrogen's potential as a key alternative clean fuel. Additionally, 61% of ports offer environmentally differentiated dues to incentivise sustainable practices in shipping, with air emissions reduction scheme, being the most implemented incentive, available at 67% of these ports. Overall, the advancements underscore a strong commitment to greener practices, although ongoing challenges and opportunities for improvement remain.

A new section in the 2024 Report focuses on the availability of clean fuels for cars and trucks at European ports. Notably, 85% of ports reported having electric charging stations for cars and trucks, supporting the transition to electric vehicles. However, only 6% of ports offer hydrogen fuelling stations for trucks, indicating the initial stages of hydrogen infrastructure development.

The global environmental management situation has improved significantly, as evidenced by the increase of the EMI index to 8.61. This positive trend reflects the continuous efforts of ports to enhance their environmental performance and adopt more sustainable practices.

Based on the reported responses to the SDM, it can be reasonably concluded that representative ports in the sector are consistently improving their environmental management practices. This indicates that ports are either maintaining or further enhancing their compliance with policies related to risk reduction, environmental protection, and sustainable development.

The findings of this review highlight the effectiveness of the EcoPorts methodology in helping port authorities translate ESPO environmental policies into practical actions. This effectiveness is further supported by the collection of diverse green practices available on the continuously updated database developed by ESPO. Interested parties can access these practices through www.espo.be/practices.

In addition to the ESPO Green Guide and other environmental management tools, the EcoPorts Network actively encourages and facilitates the implementation of best practices across the sector. The expanding network of EcoPorts demonstrates the competence of its members and promotes a collaborative approach to addressing shared challenges, including climate change, and to ensuring that cross-boundary aspects and priority issues are effectively tackled throughout the industry.

The positive trends of continuous improvement by the sector in terms of the uptake and application of the various components of a systematic EMS throughout the EcoPorts Network (including independent verification to an international EMS standard) demonstrate unequivocally, ESPO achievement in terms of its policy of compliance with environmental liabilities and regulations through voluntary, self-regulation, and demonstrable competence in working towards sustainability of activities and operations.

F Annex: Sample of ports

The sample of ports participating in this assessment comprises 83 European ports from 21 countries, which are ESPO members and observers. The sample includes ports from non-EU neighbouring countries applying EU legislation, such as Norway (as a member of the European Economic Area), the United Kingdom (as a former EU Member State with comparable legislation for the time being), and Albania (as an official candidate for accession to the EU and an ESPO observer member).

Table 4 provides a detailed list of countries represented in the sample, along with the number of participating ports from each country and their respective percentages. Spain has the highest percentage of participant ports at 16,9% (14 ports), followed by the United Kingdom at 12% (10 ports), Germany at 10,8% (9 ports), and the Netherlands at 9,6% (8 ports). Finland and Greece are also important contributors, with 7,2% (6 ports) and 6% (5 ports) of the sample, respectively. Other countries, including Denmark, Sweden, Ireland, and France, each contribute between 3,6% (3 ports) and 4,8% (4 ports) of the total sample. The remaining countries, including Portugal, Italy, Bulgaria, Poland, Lithuania, Latvia, Romania, Estonia, Malta, and Albania, each represent a smaller portion of the sample, with percentages ranging from 1,2% (1 port) to 2,4% (2 ports).

This diverse representation ensures a comprehensive overview of environmental practices and policies across a wide range of European ports, reflecting various geographic regions and operational contexts.

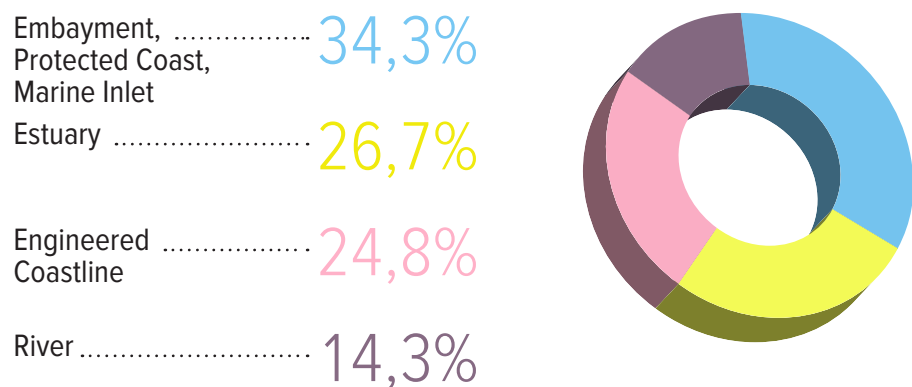
TABLE 4
List of countries represented in the sample and number of participating ports

Country	Number of ports	Percentage (%)
Spain	14	16,9
United Kingdom	10	12,0
Germany	9	10,8
Netherlands ³	8	9,6
Finland	6	7,2
Greece	5	6,0
Denmark	4	4,8
Sweden	4	4,8
Ireland	4	4,8
France	3	3,6
Norway	3	3,6
Portugal	2	2,4
Italy	2	2,4
Bulgaria	2	2,4
Poland	1	1,2
Lithuania	1	1,2
Latvia	1	1,2
Romania	1	1,2
Estonia	1	1,2
Malta	1	1,2
Albania	1	1,2

³ Ports in the Netherlands include North Sea Port, a cross-border port authority covering a 60-kilometer area in the Netherlands and Belgium.

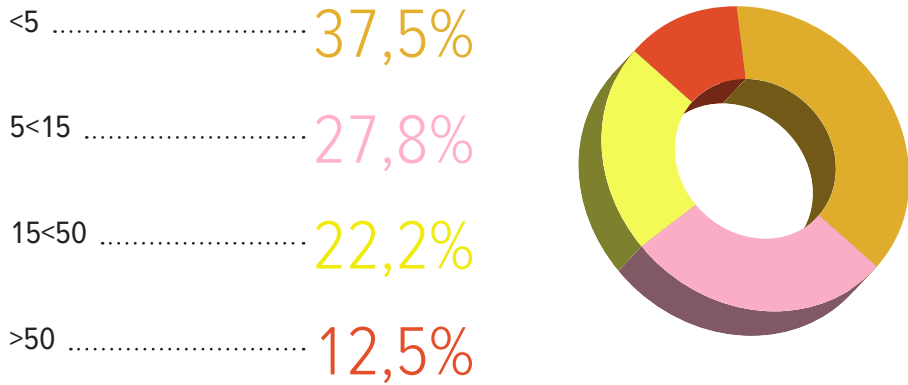
As illustrated in Figure 11, the geographical location of the participating ports showcases considerable diversity. The most common geographic settings among the contributing ports are embayment, protected coasts, and marine inlets, accounting for 34,3% of the sample. Ports situated in estuaries and along engineered coastlines follow closely, representing 26,7% and 24,8% of the sample, respectively. River ports make up 14,3% of the sample. This diverse geographical representation highlights the balanced nature of the EcoPorts database, ensuring that the responses and results reflect a broad spectrum of real-world maritime environments.

FIGURE 11
Geographical characteristics of the sample



Regarding the size of the participating ports, small ports, handling less than 5 million tonnes per year, constitute 37,5% of the overall sample. They are followed by medium-sized ports (5 to 15 million tonnes/year) at 27,8%, and large ports (15 to 50 million tonnes/year) with a share of 22,2%. Ports managing more than 50 million tonnes annually represent 12,5% of the sample. The significant involvement of small ports in the network is noteworthy, highlighting their diverse range of good practices and innovative environmental projects, often achieved through collaboration. While large ports frequently capture media attention, the vital role and contributions of smaller ports should not be underestimated.

FIGURE 12
Tonnage characteristics
of the sample
(million tonnes/year)



The TEN-T status of a port (Core, Comprehensive or non-TEN-T) often defines the scope of EU legislation that applies, making it relevant to assess the sample in that respect as well. As can be seen in Figure 13, the sample shows that 53% of the participating ports are part of the Core Network, and 29% of them are part of the Comprehensive Network.

FIGURE 13
Percentage of ports in
TEN-T Network out of
the sample

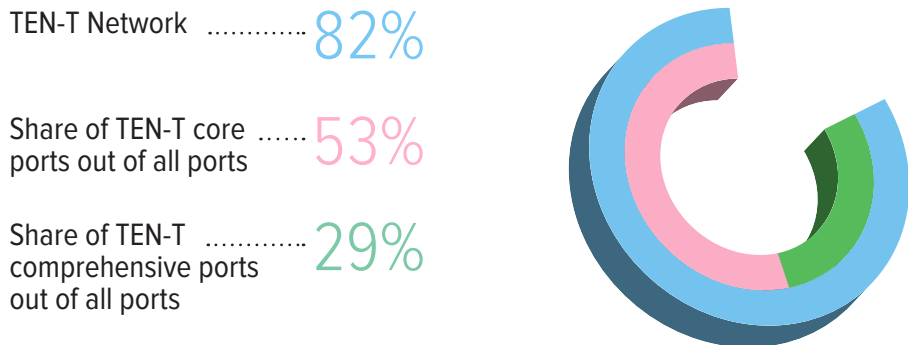


TABLE 5

List of 32 ESPO-member ports certified with EcoPorts PERS (as of August 2024)

Port	Country
Port of Pori	Finland
Port of Dunkirk	France
Ports of Bremen/Bremerhaven	Germany
Niedersachsen Ports	Germany
Port of Igoumenitsa	Greece
Port of Volos	Greece
Port of Cork	Ireland
Shannon Foynes Port	Ireland
Port of Waterford	Ireland
Port of Klaipeda	Lithuania
Groningen Seaports	Netherlands
Port of Den Helder	Netherlands
Port of Lauwersoog	Netherlands
North Sea Port	Netherlands/Belgium
Port of Rotterdam	Netherlands
Port of Oslo	Norway
Port of Algeciras	Spain
Port of Barcelona	Spain
Port of Castellón	Spain
Port of Ceuta	Spain
Port of Huelva	Spain
Port of Melilla	Spain
Port of Santa Cruz de Tenerife	Spain
Port of Santander	Spain
Port of Seville	Spain
Port of Valencia	Spain
Port of Vigo	Spain
Port of Dover	United Kingdom
Port of Peterhead	United Kingdom
Shoreham Port	United Kingdom

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