



THE ENVIRONMENTAL SHIP INDEX

Setting the
standard for
maritime
environmental
performance







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What is ESI?

The Environmental Ship Index (ESI) is a voluntary system designed and used by ports to incentivize ship owners to improve the environmental performance of their vessels.

Applicable to any vessel exceeding current IMO emission standards, ESI has become the established global standard for ports to incentivise the ongoing improvement of shipping's environmental performance. It has also been recognised by the IMO as the standard basis for port incentives for low- and zero-carbon ships.

The aim of ESI is to achieve a genuine reduction in emissions of NO_x, SO_x and particulates, as well as CO₂ in the longer term, by promoting behavioural change among ship owners/operators and ports.

Port incentive providers offer port due reductions and other benefits to eligible vessels, with ship owners paying a per-vessel subscription to join the index.

Used by more than 60 global ports, half of the world's container fleet and a multitude of vessel types, ESI has become the international benchmark by which ports incentivise ship owners to continuously improve the environmental performance of the fleets calling at their facilities.





How does ESI work?

ESI is an automated, maintainable and evolving environmental-scoring system for ships (Incentive Receivers) which can result in lower port dues/fees and other incentives for vessels calling at ports registered as an ESI Incentive Provider.

All indexed vessels begin from a baseline of performing beyond current IMO emission standards.

In its present configuration, ESI scores these vessels on their NO_x and SO_x emissions, rewarding reporting, and improvements over time, of energy efficiency (in terms of greenhouse gas emissions – GHGs). Vessels also receive bonuses for being equipped to use onshore power supply in ports (OPS).

Taking these factors into account, ESI analyses a ship's average performance over a six-month period and produces a score out of 100.

Via a separate module, ESI Noise also scores noise emissions of vessels, directly and proportionally, and gives a fixed bonus for a noise-reduction measurement report.

Participating ports and other incentive providers are free to set a qualifying level, in terms of points, and an incentive – most frequently a reduction in port dues – that a ship owner will receive if their vessel meets, or exceeds, that benchmark.

Forthcoming changes to ESI's formulation will further enhance the utility of the service.

The evolution of ESI will include a fully-integrated calculation of GHG emissions, rewards for zero-emissions techniques (such as batteries, fuel cells and wind sails), the addition of underwater noise, and a new at-berth module for the evaluation of the emissions performance of a given port call, starting with cruise vessels as a pilot case.

Up-to-date details of ESI formulae can be found on the ESI website at <https://environmentalshipindex.org/info>





ESI at a glance

The Environmental Ship Index (ESI)...

- is a system from **ports for ports**
- is the **established global benchmark**, recognised by the IMO, and used by half of the world's container fleet and more than 60 global ports
- identifies ships that perform better in **reducing air emissions** than required by IMO standards
- **rewards vessels** demonstrating improvements in emission performance and underwater noise
- enables ship owners (Incentive Receivers) to pay a per-vessel subscription to the index and **receive benefits** from Incentive Providers (usually ports)
- provides a **numerical representation** of the environmental performance of ships, regarding **air pollutants, CO₂ and noise**



Why use ESI?

The Environmental Ship Index (ESI) has been designed for optimal ease of use and effectiveness.

Once an Incentive Receiver (ship owner) or Incentive Provider (port or service provider) is enrolled within the scheme, there is no complex software to install and no expensive additional emission-monitoring technology to maintain.

The system is clear and simple and it is automatically calculated and maintained.

ESI is also flexible, allowing ports to choose the incentive – be it a reduction in port dues, preferential berthing options or something else – and the qualifying level that it wishes to set for vessels.

ESI can be instituted at any port of any size globally and can be applied to any type of sea-going merchant vessel. There are currently close to 7,000 vessels enrolled in the scheme.

To participate, Incentive Providers pay a variable contribution fee based on their total annual throughput, identified each year based on the ESI fee-calculation scheme.

However, from 2023, all Incentive Providers that are members of the IAPH may participate in the scheme free of charge.

Incentive Receivers pay a fee for ESI services, per six-month verification period, of €170 for vessels > 20.000 GT and €85 for vessels ≤ 20.000 GT.

ESI is subject to a robust onboard data-verification programme by its administrator, with 100 verifications conducted per quarter across the ESI fleet on a strategic, targeted basis to ensure that the scheme remains fair, accurate and effective.





ESI at a glance

ESI is

- **straightforward** and **simple** in approach and presentation
- applicable to **all types** of sea-going ships
- **automatically calculated** and maintained
- **flexible** for incentive providers – ports choose the incentive and qualifying level
- a scheme that **rewards excellence**
- subject to a **rigorous verification programme** to ensure ESI is fair and effective
- offered free of charge, as of 2023, to all Incentive Providers that are **IAPH members**





An established industry benchmark

Since its inception, ESI has become the established global standard for ports to incentivise the ongoing improvement of shipping's environmental performance.

In July 2023, a Memorandum of Understanding (MoU) for future cooperation, signed by the International Maritime Organization (IMO) and the IAPH, recognised ESI as an asset for future collaboration, promotion and joint programming, and listed ESI as the 'standard basis for port incentives for low- and zero-carbon ships'.

The MoU is in line with the IMO MEPC resolution 366 (79), which invites IMO Member States to encourage voluntary cooperation between the port and shipping sectors to contribute to reducing GHG emissions from ships.





A 2017 European Commission/COGEA study on ‘differentiated port infrastructure charges to promote environmentally friendly maritime transport activities and sustainable transportation’ concluded that:

The ESI is by far the most used initiative in environmental charging in the EU, with an increasing number of ports and ship owners adopting it. This is a competitive advantage which suggests that the uptake may further increase in the future, because both ports and ship owners are more likely to choose an index if it [is] recognised worldwide.

A separate study in the *International Journal of Transport Economics* came to a similar conclusion:

‘The success of the ESI has to be devoted to its simplicity, its comprehensibility, its transparency, and to its added potential to have the choice as a port authority to tailor the system to the particular market and to the environmental and governance situation of the port cluster.’

‘Environmentally Differentiated Port Pricing: The Case of the Hamburg-Le Havre Range,’
Geerts, M., Dooms, M. and Langenus, M. (2017)
International Journal of Transport Economics, Vol. XLIV No. 4

Finally, a 2023 EC report exploring ESI in depth in the context of cruise shipping, noted that:

‘The ESI at-berth module is a practice with an expected positive impact on environmental and social sustainability.’

Good Practices for Sustainable Cruise Tourism: Appendix 1, Fiches of good practices in sustainable cruise tourism published by the EC in collaboration with Deloitte Consulting and Ramboll Management Consulting.





The future of ESI

ESI was founded on the principle of encouraging ship owners to exceed the highest maritime environmental regulations of the moment. As the shipping industry strives to decarbonise, setting ever more ambitious targets on the way to net-zero in 2050, ESI is evolving to help owner-operators to exceed the latest standards.

The driver for this change is ESI 2.0, the most significant and far-reaching revision of ESI's formulae since the launch of the scheme.

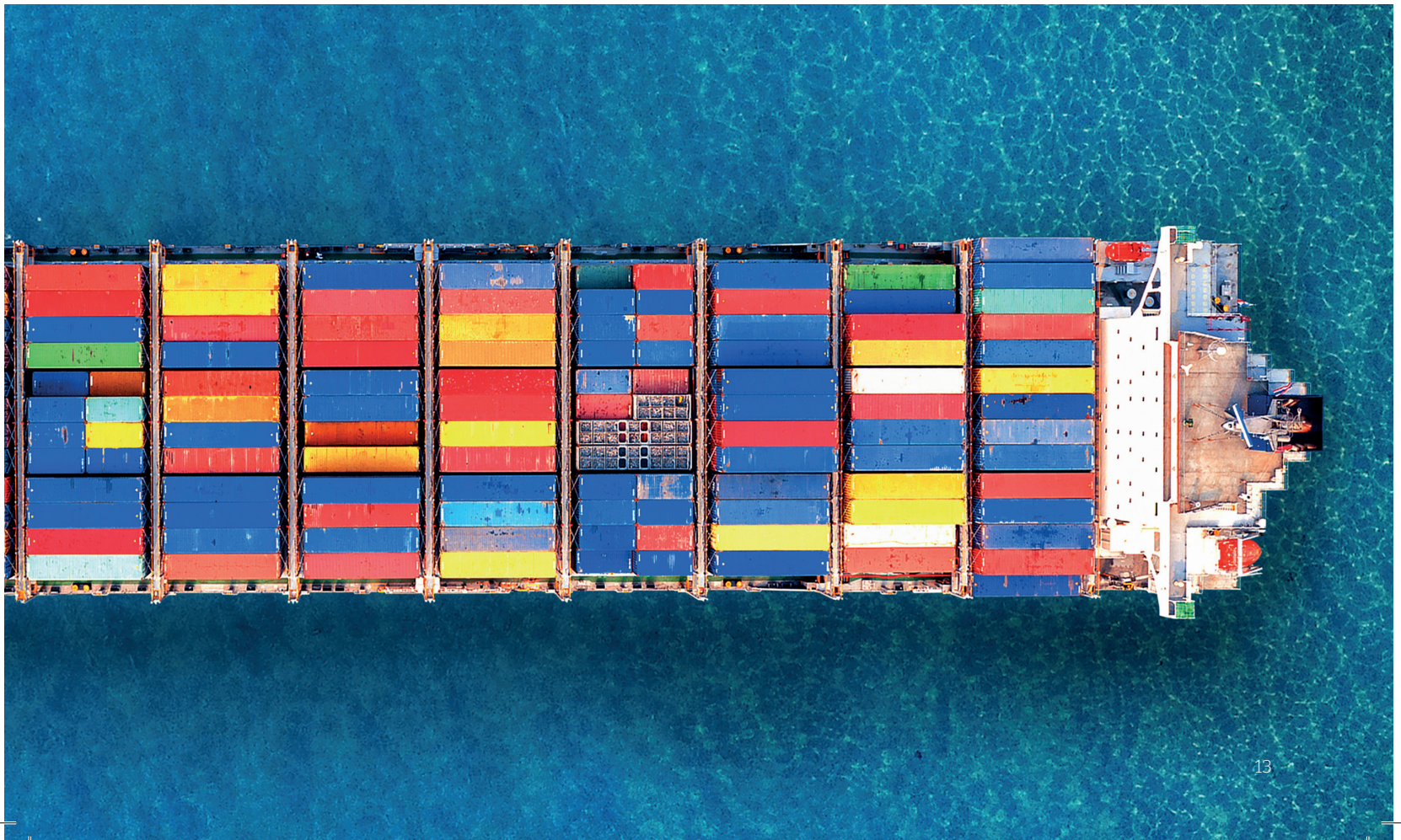
Through 2024 and beyond, ESI's modules is set to expand to take into account a range of potential emissions including GHGs, and a range of zero-emissions techniques, alongside further enhancement of the noise-emission functionality.

Not only that, but a new at-berth module, already entering its pilot phase in 2023-4 and focusing initially on cruise vessels, will allow participating ports to evaluate the emissions performance of a given port call.



ESI 2.0 at a glance

- A new fully-integrated calculation of greenhouse gas emissions performance
- The capacity to reward zero-emissions techniques beyond onshore power supply (eg. batteries, fuel cells, wind sails)
- The addition of underwater noise to the emissions module
- A new at-berth module for the evaluation of the emissions performance of a given port call, starting with cruise vessels as a pilot case.





Case Studies

MSC: Growing together with ESI

In a company the size of MSC, even small changes can make a big impact. It makes sense, therefore, that MSC – one of the largest container shipping companies in the world – is also one of the largest incentive receivers enrolled in ESI.

Like most major shipping companies, MSC has ambitious sustainability goals, but its multifaceted, employee-centred approach arguably sets it apart.

“We are going high-speed on decarbonisation programmes and other air-quality reduction efforts, not only in newbuildings but on existing ships,” explains Franklin S Karkada, Director – Fleet Performance at MSC Ship Management. The latter includes programmes of conversion to multifuel platforms, as well as modifications and retrofits of propellers and bulbous bows across many hundreds of vessels.

Although MSC has a Net Zero programme focused on 2050, the organisation’s stretch goal is to reach its environmental targets “well before regulations tell us to do it,” Franklin affirmed.

Participation in ESI is a longstanding element in MSC’s ‘full court press’ toward fully sustainable operations.

MSC has been an Incentive Receiver since ESI was in its infancy, more than a decade ago. At that time, the number of participating ports was modest and MSC’s enrolled fleet numbered fewer than 100.

“We have grown together,” observes Franklin, noting that in 2023 there were nearly 70 ports participating in ESI and more than 760 MSC vessels enrolled in the scheme.

Franklin believes that incentivising environmental performance is critical, but emphasises that “we are in the ESI program because we want to be part of the culture – the culture of saving the environment, the culture of reducing emissions.”

He adds that, even with all of MSC’s technological and organisational sophistication, enrolment wouldn’t be a success if he and his team were unable to win over the vessel crews. “They are the implementers of savings,” he reasons. “I can organise the retrofit of a lot of propellers and bulbous bows, but if the chief engineer and the captain don’t have the mindset to change, then nothing happens.”

Franklin’s team emphasises to MSC crews that “to save even 1% by changing your habits will make a very, very big difference to the environment – not only that, of course you will save money as well. This is a win-win situation.”



MSC is in it for the long haul, and Franklin hopes that other ports and vessel operators will make the journey. Pointing to the potential financial benefits of participating in ESI, he adds that “my wish is that more ports will join, and that will give everybody a benefit.”



Port Nelson: ESI helps to keep the noise down

Air-quality improvements and decarbonisation are frequently seen as the major reasons for ESI participation. Yet, for some global ports, the scheme's noise-mitigation mechanisms have proven equally potent.

Vessels that can deliver a measurement report based on the NEPTUNES methodology (which calculates noise coming from sea-going vessels at berth) receive a separate score within ESI, based on noise points.

Due to their relative remoteness from other major developed industrial centres, ports in New Zealand can sometimes face challenges around the age and performance of visiting tonnage. Noise has been an area of focus for New Zealand ports in recent years, with the country's ports ultimately adopting a common approach to the management of low-frequency vessel noise.

Matt McDonald, General Manager (Operations) at Port Nelson, says that ensuring noise reduction is critical to his port, and others throughout New Zealand. He explained that the NEPTUNES methodology underpinning the ESI noise score was an important way to address the issue.

“The rubber is hitting the road through the NEPTUNES methodology” says Matt, explaining that “ESI was used as the way to publicise the scores”.





In 2022, the country's ports agreed to adopt a common approach to the management of low-frequency vessel noise. A letter was sent to vessel operators and agents, co-signed by 13 New Zealand port CEOs, outlining the New Zealand Low Frequency Vessel Noise Specification, with a common approach based on the NEPTUNES Noise Label Score.

The noise code will come into force on June 1, 2024 and relates to container vessels in the first instance.

If requirements are not met (a certified NEPTUNES Noise Label Score or confirmation that a reactive silencer is fitted to one of ancillary engines used while at berth) then the vessel will be refused entry.

From Matt's perspective, ESI was helpful in setting an "international benchmark" for noise mitigation: Port Nelson could send an introductory email to a company's environmental team, with clear standards outlined.

"Reducing noise levels from vessels visiting the region is a priority for Port Nelson" affirms Hugh Morrison, Chief Executive of the port. "For low-frequency generator noise, Port Nelson has been working with shipping lines to ensure they have a noise mitigation plan for vessels that are noisier than usual."





Testimonials

Port of Yokohama

We think ESI is quite a fantastic system. Without ESI, it can be very difficult for Japanese ports to take the initiative and encourage the ships to implement measures that are good for the environment, such as decreasing speed or using shore power.

Just participating in ESI allows the Port of Yokohama to collaborate with other ports in the world and collectively encourage vessels to take environmentally sound measures. The cost is very reasonable – even more so, now that ESI contribution fees are waived for IAPH members.

Port Saint John

As part of our decarbonization plan, we use ESI as our guideline to determine which sea-going vessels calling at our port perform better in reducing air emissions than required by current regulations. Under our program, both cruise and cargo vessels that call our port and are registered with ESI with a score of 25 or higher are eligible for a berthage tariff rebate based on their score.

As Port Saint John continues our path to Net Zero, we believe this incentive is a step in the right direction to propel the greening of both the cruise and shipping industries. As more ports leverage the ESI tool, the value of membership and the collective impact on GHG reduction will continue to increase.







Testimonial:

Porto do Açu

Porto do Açu is the largest deep-water private port complex in Latin America, so our sustainability decisions have a significant impact. Our ESG performance reflects our purpose that is “Help the world to reduce the carbon footprint and accelerate the best of Brazil”.

ESI is an important tool towards the decarbonization and part of that strategy. Porto do Açu is an ESI Incentive Provider because membership helps the organisation to meet its key sustainability goals and decarbonization strategy.

ESI is simple, flexible and – most importantly for Porto do Açu – it rewards excellence in sustainable shipping. We hope to see increased uptake of ESI throughout Central and South America to further support maritime decarbonisation efforts.





Testimonial:

Port of Tokyo

The Port of Tokyo is located next to a large urban area, so we are always under high pressure to develop effective environmental measures, while responding to the complex demands of maritime transportation.

The Port of Tokyo was the first Japanese port to participate in ESI, joining in 2015. We were persuaded of ESI's reliability as an accreditation system because it was backed by respected global ports and by IAPH members.



Courtesy Port of Tokyo

We consider our participation in ESI to be both meaningful and effective in improving the atmospheric environment and promoting carbon neutrality. The Tokyo Metropolitan Government, in cooperation with the national government and other ports, will continue to promote ESI and a deeper understanding of its benefits.



Who manages ESI?

ESI was created, designed, and initially implemented by ports in 2011 in cooperation with the International Association of Ports and Harbors (IAPH).

The subsequent ESI Working Group established administrative and operating procedures to refine and continuously improve the index.

Since 2020, ESI has been fully integrated into IAPH with a governance structure, as a subsidiary body of the association.

About IAPH

Founded in 1955, the International Association of Ports and Harbors (IAPH) has developed into a global alliance of 180 port authorities as well as 148 port-related businesses. Comprising 84 different nationalities across the world's continents, member ports handle approximately one third of the world's sea-borne trade and well over 60% of the world's container traffic.

IAPH leads global port industry initiatives on decarbonization and energy transition, risk and resilience management, and accelerating digitalization in the maritime transport chain.

The IAPH's World Ports Sustainability Program has grown into the reference database of best practices of ports applying the UN Sustainable Development Goals and integrating them into their businesses. Learn more at www.iaphworldports.org





ESI governance

The ESI Board includes representatives from:

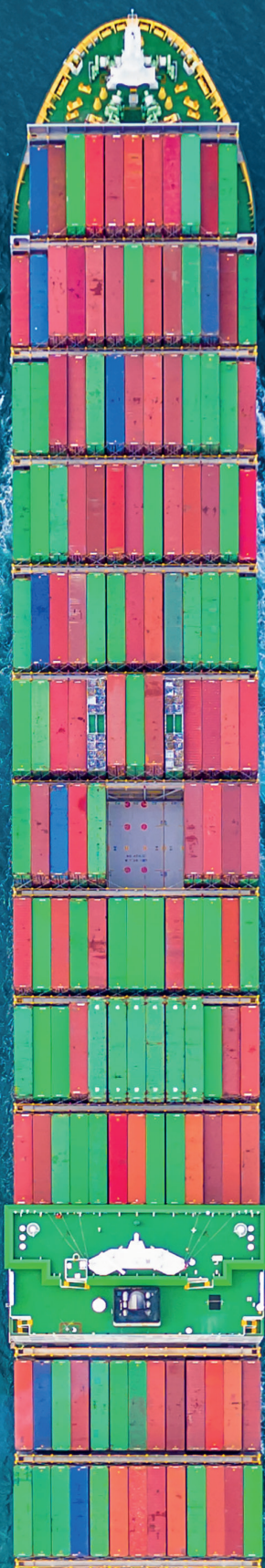
- Port of Antwerp-Bruges
- Green Award Foundation
- Port of Gothenburg
- Port of Hamburg
- Port of Los Angeles
- Port of Rotterdam

ESI's Advisory Group includes representatives from:

- Starcrest Consulting Group (Chair)
- Port of Amsterdam
- Port of Antwerp-Bruges
- Green Award Foundation
- Port of Hamburg
- Port of HAROPA – Le Havre
- Port of Long Beach
- Port of Los Angeles
- Port Authority of New York & New Jersey
- Port of Rotterdam
- Vancouver Fraser Port Authority

ESI is administered by Green Award Foundation, a non-profit organisation that offers a certification and port incentive program for shipping. Green Award certifies shipowners, owner operators, ship managers and vessels that go beyond industry standards in terms of safety, quality and environmental performance.





Contact

Contact IAPH

Antonis Michail, Technical Director
antonis.michail@iaphworldports.org

Visit: <https://environmentalshipindex.org>

Contact ESI Administration

ESI Administration
Westerkade 7B
3016CL Rotterdam
The Netherlands
Tel: +31 10 217 0208
Email: admin@environmentalshipindex.org

The ESI Administration is managed and operated
by Green Award Foundation, The Netherlands

Office hours: 09:00 – 17:30 CET

