Your Damen guide to navigating IMO emission regulations

Introduction

Since the Paris Climate Agreement in 2015, there has been a strong uptake in renewable energy projects. Nevertheless, emissions have steadily continued to rise ever since. Legislators across industries and countries have put in place innovative regulation to bend the curve and limit global warming. Accounting for 2-3% of greenhouse gas (GHG) emissions globally, shipping is on the brink of a significant transformation. With new regulations coming into force, shipowners must navigate a complex landscape of decarbonisation requirements. Damen understands the challenges you face and is here to guide you through these uncharted waters.

The International Maritime Organization (IMO) adopted its initial GHG strategy in 2018, which was revised in 2023 with strengthened ambitions. It's ambition is to reduce GHG emissions of shipping by 40% in 2030 compared to 2008 levels, 70% in 2040 and to achieve net-zero emissions by 2050.

As part of these ambitions, the IMO aims to stimulate the uptake of zero and low GHG technologies represent at 5% but striving for 10% of energy used in 2030.

The IMO has introduced various regulations through its Ship Energy Efficiency Management Plans (SEEMP part I, II and III) to realise its GHG strategy:

- Part I was introduced in 2013, including the Energy Efficiency Design Index (EEDI)
- Part II was introduced in 2019, including the Data Collection System (DCS)
- Part III was introduced in 2023, including the Energy Efficiency Existing Ship Index (EEXI) and the Carbon Intensity Indicator (CII)

Let's have a look at an overview of these regulations and their implications for shipowners and operators.

EEDI (Energy Efficiency Design Index)

The EEDI is a ship design measure that promotes the use of more energy-efficient equipment and engines for **all new ships of 400 gross tonnage and above.** It requires a minimum energy efficiency level per capacity mile for different ship types and size segments. The EEDI has been in force since **January 1, 2013,** and **its reduction factors are tightened every five years** to stimulate innovation and technical development of newbuild ships.

EEXI (Energy Efficiency Existing Ship Index)

The EEXI is a framework for determining the energy efficiency of existing vessels over **400 gross tonnage**. It is adapted from the EEDI for newbuilds and requires shipowners to assess and measure their ships' CO_2 emissions by design against specific emission reduction factors for each vessel type. The EEXI came into effect on **January 1, 2023,** and is calculated at the first survey of each ship thereafter. When a ship is adjusted in such a way that the energy efficiency is affected, re-certification of the EEXI may be necessary or requested by shipowners.

IMO DCS (Data Collection System)

The IMO DCS requires ships of **5,000 gross tonnage and above** to collect and report data on their fuel oil consumption. This data is used to calculate the ship's operational carbon intensity and inform further measures to reduce GHG emissions.
The DCS is part of the Ship Energy Efficiency Management Plan (SEEMP) and has been in effect since **January 1, 2019.**

CII (Carbon Intensity Indicator)

The CII regulation, effective from **January 1, 2023**, mandates that ships calculate their annual operational CII, which links GHG emissions to the amount of cargo carried over distance travelled. **Ships of 5,000 gross tonnage and above** are rated from A to E based on their carbon intensity, with A being the best. Ships rated D for three consecutive years or E for one year must submit a corrective action plan.

$$CII = \frac{\text{Annual fuel consumption} * \text{CO}_2\text{ factor}}{\text{Annual distance travelled} * \text{Capacity DWT, GT, pax}} * \text{Correction factors}$$

These regulations have significant impact on shipowners, who must:

- **Monitor and report:** Implement systems to monitor and report fuel oil consumption and carbon emissions.
- **Improve energy efficiency:** Invest in energy-efficient technologies and practices to improve their ships' ratings.
- **Plan for compliance:** Develop and implement plans to ensure compliance with the EEXI and CII requirements.
- **Budget for costs:** Account for the costs associated with compliance, including potential penalties for non-compliance.

Non-compliance with these regulations can result in:

- **Financial penalties:** Fines for failing to meet required standards.
- **Operational restrictions:** Limitations on the operation of non-compliant ships.
- **Reputation damage:** Negative impact on the company reputation.
- **Personal liability:** Senior management could face personal liability claims if negligence in compliance leads to significant environmental damage.

Charting a course towards carbon neutrality

Shipowners can explore various decarbonisation strategies:

Innovative solutions These will include digital solutions to assess feasibility of renewable technologies and monitor emissions. Digital remote monitoring solutions, such as Damen Triton, will play a crucial role in success.

Operational adjustments Slow steaming and enhancing engine efficiency are immediate steps, though they offer limited savings and need guidance to be applied correctly, possibly guided by remote monitoring.

Hydrodynamic improvements Investing in propulsion enhancements, such as rudder appendices and wind rotors, or hull modifications like the Damen Air Cavity System (DACS), can yield significant efficiency gains.

Renewable strategies Achieving carbon neutrality by 2050 will require carbon capture technologies or a complete transition to renewable fuels.

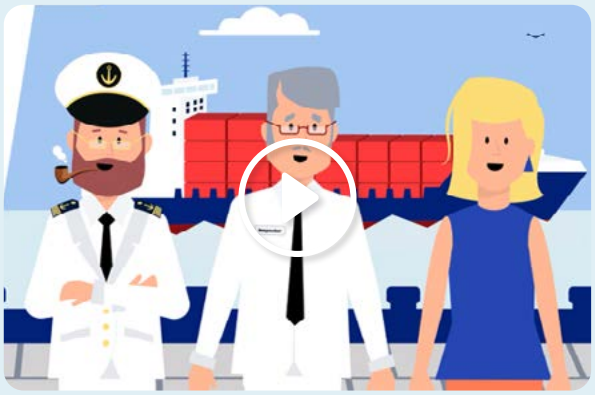
Damen Triton Emission Compliance

With close to 100 years of shipbuilding experience, Damen is well positioned to assist shipping companies in overcoming decarbonisation challenges. Our expertise in ship design, combined with EU emission and market data, allows us to offer tailored insights and solutions. In-house innovations like DACS, along with fuel analysis and vessel monitoring solutions, make Damen the ideal partner in setting a course towards a sustainable future. Damen Triton provides emission insights, improves sailing efficiency and harmonizes your energy saving technologies. Together, we can ensure a cleaner, greener, and more profitable future for the maritime industry.

Damen Emission Compliance solution includes:

- **Emission Insights Report:** Monitor vessel emissions over time and improve operational decision making based on emissions data.
- **Damen Triton Reporter:** Use Damen Triton Reporter to streamline and simplify emission data collection and verification for EU and IMO emission regulations.
- **Emission Data Verification Integration:** Use Damen Triton to collect emissions data, and simplify verification through our integration with your accredited verification company of choice.

Looking to monitor and reduce your emissions?
Get in touch with the Damen team for more information at sales.triton@damen.com



Damen Triton Reporter

Want to learn more? Watch the video.

MIS-5-076 v2 2502

DAMEN

Damen.com