Energy Efficiency — study guide

Fuel is a ship's largest controllable cost and a major source of emissions, so energy efficiency is now managed as a system. This guide covers the management framework, the ratings and the practical saving measures.[1][2]

Why it matters

The shipping industry is responsible for about **3% of greenhouse gas emissions**. Implementing a management system such as ISO 50001 brings cost reduction, organisational engagement and carbon reduction, and significant reputational benefits by showing stakeholders a genuine commitment to managing energy consumption.

The framework and key requirements

ISO 50001:2018 sets out an energy management framework built on establishing policies, processes, procedures and specific energy tasks that meet the organisation's energy objectives. Key requirements include conducting an initial diagnosis of energy consumption for all activities, establishing, implementing and maintaining an energy policy with a commitment to achieving energy performance, and identifying the main factors that influence energy consumption. Any energy reductions identified through an Energy Management System (EnMS) offer demonstrable savings on energy bills, reducing a business's overhead — sometimes substantially.

Indicators

An Energy Performance Indicator (EnPI) is used to compare energy performance after the implementation of action plans. The EEOI — **Energy Efficiency Operational Indicator** — is calculated from a formula relating fuel consumed to transport work.

Saving energy on board

Common energy-saving options are using alternative fuels, weather routing, slow steaming, and hull cleaning and propeller polishing. Staff awareness and incentives can be raised through training on Ship Energy Efficiency, poster campaigns and regular onboard meetings.

Vessel visits and ratings

When visiting vessels for compliance checks, confirm whether the crew are aware of the factors that affect energy efficiency and optimisation, whether they understand the energy-efficiency measures in the SEEMP (Ship Energy Efficiency Management Plan) and how they help, and whether they are aware of daily fuel optimisation. On carbon-intensity ratings, a vessel rated **E for 2021 must achieve rating D in 2022**.

Acronyms

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SEEMP is the Ship Energy Efficiency Management Plan and **EEOI** is the Energy Efficiency Operational Indicator; EEXI denotes the Energy Efficiency Existing Ship Index.

Key facts to remember

- Shipping ≈ 3% of GHG emissions.
- ISO 50001 benefits: cost, engagement, carbon, reputation. Framework: policies, processes, procedures, energy tasks.
- Key requirements: initial diagnosis; energy policy with commitment; identify influencing factors.
- EnPI compares performance after action plans; EEOI is the operational indicator formula.
- Saving options: alternative fuels, weather routing, slow steaming, hull cleaning/propeller polishing.
- Awareness: Ship Energy Efficiency training, posters, onboard meetings.
- E for 2021 → D in 2022. SEEMP and EEOI; EEXI = Energy Efficiency Existing Ship Index.

Sources

1. IMO MARPOL Annex VI — prevention of air pollution from ships (SEEMP, EEOI, EEXI and carbon-intensity ratings).
2. ISO 50001:2018 — Energy management systems — Requirements with guidance for use.