Ship Energy Efficiency Improvement Technologies and Measures

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Introduction

CO2 emissions from international maritime transport 2012–2050

Introduction—regulation development

- **2011**: Energy Efficiency Design Index (EEDI)
  - Ship Energy Efficiency Managements Plan (SEEMP)
- **2013**: technical co-operation and transfer
- **2016**: fuel oil consumption data collection
- **2018**: Initial strategy on reduction of GHG emissions from ships.
IMO remains committed to reducing GHG emissions from international shipping and, as a matter of urgency, aims to phase them out as soon as possible in this century.
Energy consumption and saving opportunities

What are the existing technologies?
Existing technologies

1. Hull

Bow optimisation

Hull coating
Existing technologies

2. Main Engine

- De-rating
- Waste heat recovery
- Common-rail
- Diesel-electric propulsion

Engine efficiency improvement with heat recovery = 54.9 / 49.3 = 11.4%
Existing technologies

3. Auxiliary Engine

Shaft generator

Electrical consumption

Shore power

Seaside terminal
Onshore to ship voltage adaption
Main substation
High voltage green power supply
Existing technologies

4. Propeller

Ducted propeller  Contra-rotating propeller  Post swirl devise  Pre swirl devise
Existing technologies

5. Voyage optimization

Ship speed reduction

Weather routing

Optimum trim

Autopilot
What are the new measures and technologies being developed?
Future technologies

Air lubrication
Wind power
Solar power

Lightweight construction
Hybrid ship
Summary of the technologies and measures

Small gains can be made everywhere rather than aiming to achieve one large gain. These collectively would make a big difference.
Thank you for your attention!
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