

EEDI versus Lifecycle CO2 emissions – Is it time for a more realistic policy?

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In this work the EEDI for the optimal solutions derived from the multi-objective optimisation of a tanker ship energy systems with objectives the NO_x, SO_x, CO₂ emissions as well as the Life Cycle Cost is estimated and presented. The results of the EEDI for each solution are compared with the lifetime CO₂ emissions. First it is estimated that the baseline configuration does not manage to comply with the EEDI Phase 3 that will be implemented on 2025, therefore new configurations are required for the future. In addition, it is inferred from the findings that the EEDI underestimates the effect of technologies for reducing the carbon emissions. It was identified from the analysis that the operating profile should not be overlooked in the future regulations. Considering only one design speed, like the EEDI is inaccurate and does not manage to capture the real carbon footprint of the configurations. As a result, it does not provide incentives for the ship-owners to adopt greener technologies, whereas the lifetime emissions is a more representative metric. Therefore, adopting the lifetime CO₂ emissions metric leads to the promotion of green solutions and decarbonisation of the shipping industry.

Keywords: EEDI; Carbon Lifetime Emissions; Multi-Objective Optimisation; Environmental Objectives; Ship Energy Systems

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