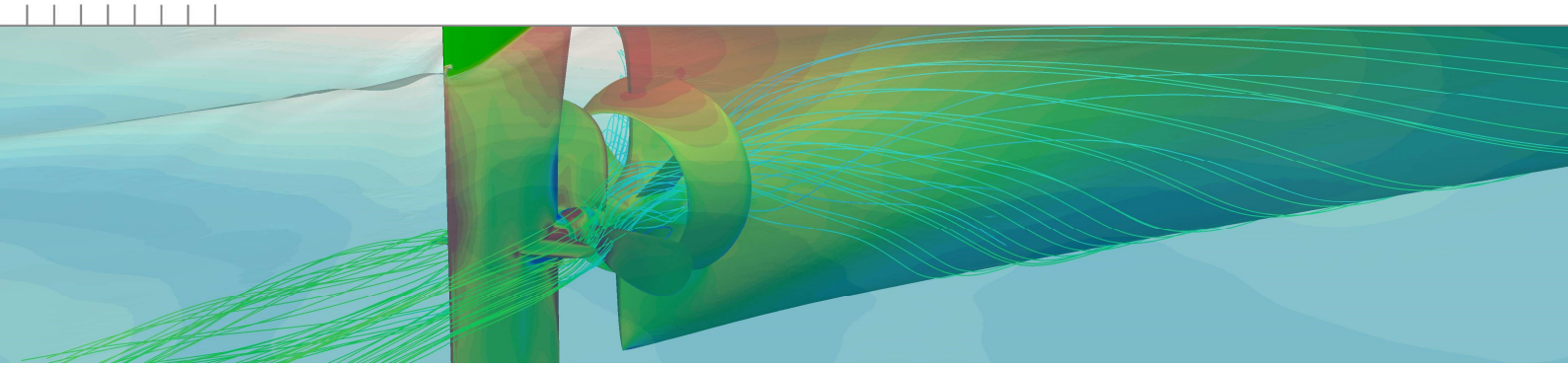
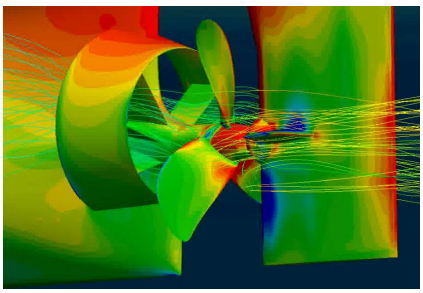


Energy savings quick-scan study

The energy efficiency index for ships (EEXI) requirements introduced in 2023 and more recently the carbon intensity indicator (CII) and EU emissions trading system (EU ETS), force a reduction of the carbon emissions of ships. The first question that typically arises concerns the potential of retrofit solutions: which retrofits can be done on a vessel and which power/fuel savings can be expected? MARIN proposes a cost-effective retrofit scan highlighting possible retrofit solutions.

Services to:

- Provide clarity on which retrofits can be done on a vessel to reduce CO2 emissions.
- Identify power saving measures as well as the impact on power/fuel savings.
- Support decision making for retrofit options.
- Provide first estimation before detailed optimisation study.

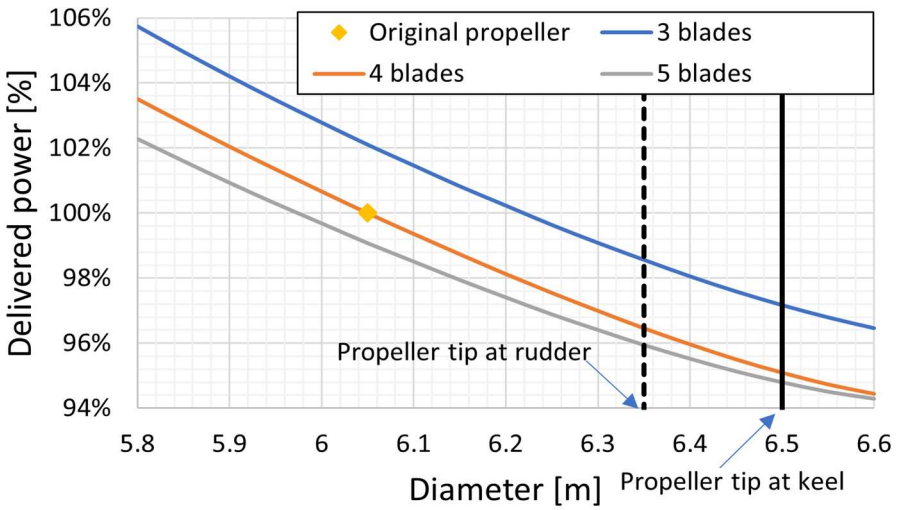


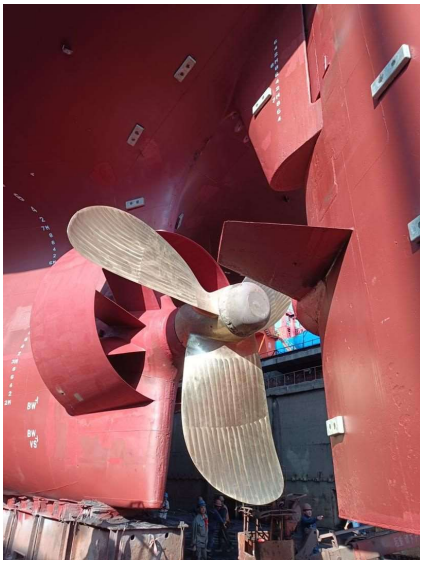
What is an energy savings quick-scan study?

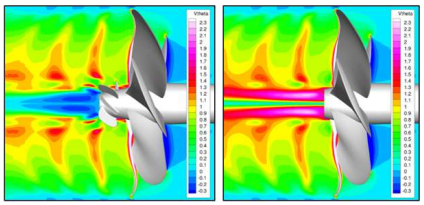
During an energy savings quick-scan study, MARIN uses its hydrodynamic expertise to provide a first analysis of the energy savings measures that could be applied to the vessel. This analysis is conducted in two to three days after which a document is provided highlighting the possible retrofit solutions for the vessel together with the estimated power/fuel savings.

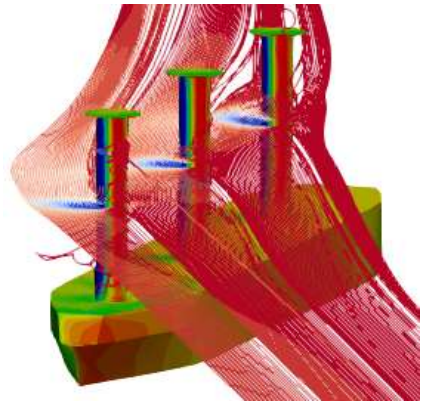
What is required for an energy savings quick-scan study?

MARIN conducts this quick-scan using a general arrangement of the vessel combined with the main particular of the propeller and a reference speed power, for example existing sea trial data. In general, such information is readily available by the ship owner.









Related products:

- Hull form optimization
- Propeller design
- ESD evaluation
- CII evaluation

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Typical retrofit options

During a retrofit scan, the existing propeller of the vessel is analysed and benchmarked against the latest Wageningen F-series or C/D-series propellers. Often the efficiency of the propeller can be improved with a modern propeller design. Also, the engine power limitations introduced on the vessel often means that 1 to 2% additional propeller efficiency gain can be achieved. Moreover, substantial power savings are possible by changing the propeller diameter and number of blades, while maintaining keel clearance and cavitation level.

Energy saving devices (ESD) can be an option when the required power must be reduced to maintain operational speed. Using the current stern configuration and the loading on the propeller a first estimation of the potential of an ESD can be made. This information could help in choosing several options, such as pre-swirl stators, ducts or post-swirl stators. A combination of ESDs may be considered as well.

Applying a wind propulsion device can be an alternative to lower fuel consumption, for example Flettner rotors or wing sails. Depending on the size of the installation, significant savings on fuel consumption and improvements of the CII can be obtained.

Modifying the bulb is another option if other measures are insufficient. This drastic measure can be especially beneficial when the bulb was designed for contract speed and draught. A bulb designed for the operational profile could dramatically reduce the fuel consumption of your vessel because bulbs for high speeds usually imply a penalty at lower speeds.