



CII Management: Unlocking Collaboration between Operators and Owners

Shipping companies are under pressure to reduce their carbon emissions and improve their Carbon Intensity Indicator (CII) scores. However, optimizing CII scores requires a holistic view of performance, which cannot be achieved without collaboration between owners and charterers.

Keeping information in silos leads to suboptimal CII

Penalties for a low CII grade apply to owners. However, without working closely with their charterers, an owner's ability to lower a vessel's emissions are limited to technical indicators such as engine efficiency and hull resistance.

In order to manage CII optimally, a holistic view of technical and operational performance is required. Operational decisions, such as the route taken, speed, and time spent at port, also play a crucial role in determining a vessel's CII. A comprehensive understanding of both technical and operational performance is necessary to optimize your fleet's CII grades, which is only possible if owners and charterers collaborate and share data openly. With [Nautilus Labs's Green Charter™](#), a new legal framework for collaborative charter parties that leverage data and machine learning as a source of truth between owners and charterers, the counterparties are empowered to make joint data-driven decisions for mutually beneficial outcomes for operational and technical KPIs.

Managing CII requires stakeholder collaboration and insights into emissions

Managing CII requires owners and charterers to share information, as neither party can ensure optimal vessel efficiency on their own:

- While the owner is legally liable for a vessel's CII score, they often lack visibility on how the ship is operated since the charterer is responsible for operating decisions that affect the emissions output.
- Additionally, charter parties might increasingly include clauses requiring the charterer to redeliver the vessel at the same CII grade, incentivizing them to cooperate closely with the owner for the vessel's technical management.

The two counterparties must work together to find a win-win outcome on commercial and environmental parameters.

Shared simulations and insights across technical and operational parameters drive optimal CII management between owners and operators

Nautilus's Digital Twins are digital representations of your physical ship, created by combining machine learning-based models with a ship's current state. They include detailed information about the ship's design, construction, and operational characteristics, as well as real-time data about its present condition and performance. Digital Twins can be used to simulate and analyze a ship's performance in various scenarios, such as different weather conditions or cargo loads. On the operational side, this allows operators to understand the impact of different operational variables, such as speed or route, on CII. On the technical side, Digital Twins highlight when a vessel's performance has degraded below the baseline, alerting owners and operators to the need for maintenance or cleaning.



With accurate simulated outcomes trusted by both parties, owners and charterers have a shared view of how technical (such as when to clean the vessel) and operational (such as sailing speed) decisions will affect the vessel's CII score and are empowered to make joint decisions that will benefit both sides.

Case Study on Hull Fouling Identification and Impact

In the case study below, Nautilus's Digital Twins identified hull fouling that was causing the vessel to require significantly more propulsive power than when the vessel was clean (see Figure 1).

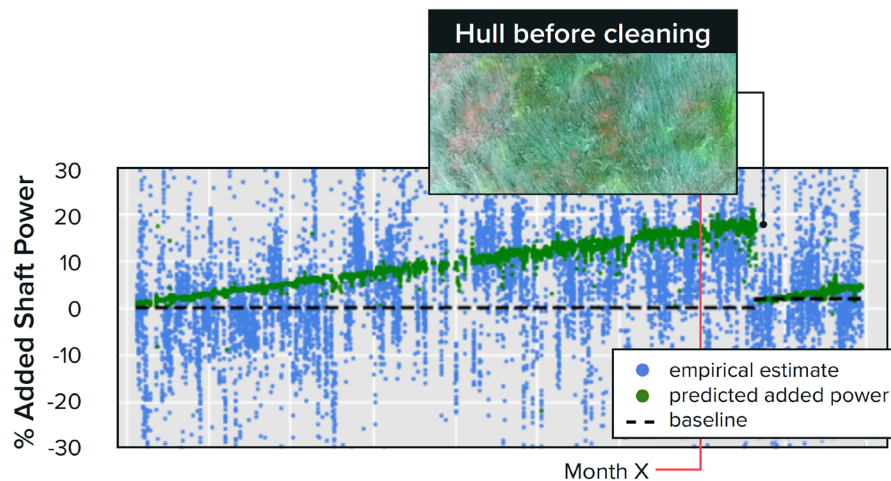


Figure 1: As of Month X, hull fouling was causing the vessel to require approximately 20% more propulsive power than the baseline

After cleaning the hull, the vessel's performance significantly improved, as shown in the drop in % Added Shaft Power after the cleaning, with a positive impact on CII. The Digital Twin also showed that while cleaning improved performance, the baseline of required shaft power was higher than the earlier baseline period due to natural performance degradation from wear and tear.

By sharing data on the vessel's technical performance, the owner and operator were able to leverage our simulations to see that it was time for a hull cleaning. If they had delayed the cleaning, the vessel would have continued performing suboptimally, resulting in a worsened CII grade for the owner, and much higher fuel expenditure for the charterer. Instead, because of their close partnership, the counterparties were able to use data as the foundation to collaboratively decide on the best course of action to preserve commercial and environmental bottom lines for both.

By harnessing the power of data for actionable insights into the real-time performance of your fleet, you can remove the guesswork from making operational and technical performance decisions.

If you would like to learn more about CII management or Green Charter™, please reach out to sales@nautiluslabs.com.