ShipUniverse | 2025

Future-Ready Ship Efficiency

→ 7 KEY STRATEGIES TO REDUCE ENVIRONMENTAL IMPACT FOR SHIPS

Slow Steaming

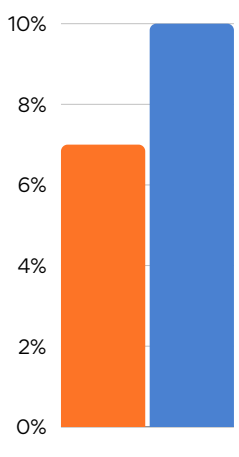
- **Fuel Reduction:** 20-30% reduction in fuel consumption for a speed reduction of 10-20%.
- **Emission Reduction:** CO_2 emissions are reduced proportionally with fuel savings since fuel burned = CO_2 emitted. For every 10% reduction in speed, ships can see a 10-20% reduction in CO_2 emissions.
- **Optimal Speed Range:** Reducing speed from 20 knots to 18 knots (10% reduction) can cut fuel use by 20% or more.

Bio Fuel Adoption

- **CO_2 Reduction:** Up to 80% lower CO_2 emissions compared to traditional marine fuel (depending on the type of biofuel).
- **NOx & SOx Reduction:** Significant reductions in Nitrogen Oxides (NOx) and Sulfur Oxides (SOx) since biofuels naturally contain less sulfur.
- **Regulatory Compliance & Decarbonization Goals:** Using biofuels helps shipowners meet IMO 2020 sulfur limits and prepares them for future IMO decarbonization targets (2030 & 2050).

CO_2 Reduction Status : 80%

Advanced Hull Coatings



- **Fuel Savings:** Reduces fuel consumption by 5% to 10% by minimizing friction between the hull and water, resulting in lower operational costs.
- **Emission Reduction:** Directly reduces CO_2 emissions by 5% to 10%, supporting compliance with IMO decarbonization targets and improving CII scores.
- **Biofouling Prevention:** Prevents buildup of marine organisms (like barnacles and algae), reducing drag and maintaining ship speed without requiring extra fuel.

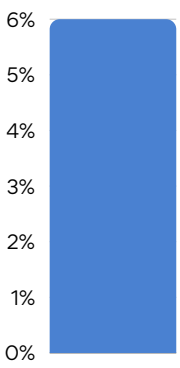
Renewable Energy

- **Fuel Reduction:** Wind-assisted propulsion can reduce fuel consumption by 5% to 20%, while solar panels reduce reliance on diesel generators for onboard power.
- **Emission Reduction:** By using wind and solar energy, ships can lower CO_2 emissions by up to 20%, supporting IMO decarbonization targets and improving CII scores.
- **Energy Diversification:** Integrating multiple energy sources.

Wind Propulsion 20%

Propeller Design

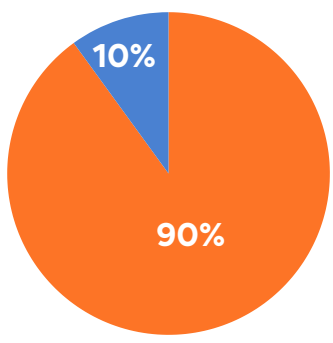
- **Fuel Savings:** New propeller designs (like Mewis Ducts, Kappel Propellers, and Pre-Swirl Stators) deliver 3-6% reductions in fuel consumption, resulting in significant cost savings across a fleet.
- **Emission Reduction:** By reducing fuel usage, ships can lower CO_2 emissions by 3-6%, directly supporting IMO decarbonization goals and improving CII scores.



- **Payback Period:** Retrofits for emission-reducing propellers typically have a payback period of 1-2 years, making them a cost-effective option for fleet-wide upgrades.

AI & Voyage Optimization

- **Fuel & Emission Reduction:** Real-time route and speed adjustments powered by AI can reduce fuel consumption by 5-10%, leading to lower operating costs and a corresponding reduction in CO_2 emissions.
- **Predictive Efficiency:** AI uses weather, port congestion, and sea current data to predict optimal routes and speeds, minimizing delays, improving port arrival times, and enhancing overall fleet efficiency.



Ballast Water Treatment

- **Invasive Species Prevention:** Prevents the spread of over 4,000 invasive marine species globally, protecting local marine ecosystems and supporting biodiversity conservation.
- **Regulatory Compliance:** Required for all ships under the IMO Ballast Water Management Convention, with a compliance deadline of 2024. Non-compliance can result in fines of $10,000 to $100,000 per violation and port detentions.

Looking Ahead

🌍 **Protect Marine Ecosystems:** Stop invasive species and reduce SOx, NOx, and CO_2 emissions.
⚡ **Boost Fuel Efficiency:** Cut fuel use by up to 30% with hull coatings, slow steaming, and propeller upgrades.
🚀 **Future-Ready Fleets:** Stay ahead of IMO 2030/2050 with biofuels, hybrid energy, and AI route optimization.