



DECARBONIZATION

SHIP UNIVERSE

IMPACT



1. Energy Efficiency Training for Crew

Impact: Trains crew to optimize engine performance and fuel management, leading to fuel savings of 2%-5% annually.



2. Energy-Efficient Lighting and Equipment

Impact: Upgrading to LEDs and energy-efficient systems can reduce energy consumption, saving 1%-2% of overall fuel usage.



3. Hull Cleaning and Coating Optimization

Impact: Regular cleaning and advanced coatings reduce drag, improving fuel efficiency and cutting emissions by 5%-10%.



4. Slow Steaming

Impact: Reducing speed by just a few knots can lower fuel consumption by up to 30%, making it a highly impactful strategy.



5. Fuel Switching

Impact: Switching to lower-emission fuels like LNG or biofuels reduces CO₂ emissions by up to 70%, depending on the fuel type.



6. Route Planning and Weather Optimization

Impact: Optimizing routes and avoiding bad weather can save 5%-10% in fuel per voyage, improving overall efficiency.



7. Air Lubrication Systems

Impact: Creating an air cushion under the hull to reduce drag leads to fuel savings of 5%-10%, significantly cutting emissions.



8. Engine Maintenance and Tuning

Impact: 3% to 7% annually due to improved combustion and less fuel waste. Proportional to fuel savings, leading to a decrease in CO₂ emissions.



9. Engine and System Efficiency Upgrades

Impact: Upgrading engines and systems improves efficiency, saving 5%-15% in fuel and reducing carbon emissions.



10. Ballast Water Optimization

Impact: Adjusting ballast for better trim and reduced drag results in fuel savings of 1%-5%, contributing to lower emissions.



11. Waste Heat Recovery and Utilization

Impact: Capturing and reusing engine heat to power other systems can save 5%-15% in fuel, greatly reducing CO₂ emissions.



12. Onshore Power Supply (Cold Ironing)

Impact: Connecting to shore power instead of running auxiliary engines while docked eliminates auxiliary fuel use, reducing emissions to near zero.



13. Digital Twin Technology and Performance Monitoring

Impact: Real-time data and predictive analytics optimize performance and operations, saving 5%-15% in fuel and cutting emissions.



14. Energy-Efficient Propulsion Upgrades

Impact: Upgrading to high-efficiency propellers, rudders, and hybrid systems reduces fuel consumption by 5%-20%, significantly lowering emissions.



15. Renewable Energy Integration

Impact: Utilizing wind (e.g., rotor sails) and solar technologies to supplement propulsion and power onboard systems reduces engine workload, cutting fuel use by 5%-10%.