



DECARBONIZATION BLUEPRINT 2025

Proactive Hull Performance for Maritime Excellence: Executive Guide

Leveraging Optima One for Compliance, Efficiency, and Profitability

THE CHALLENGE: Hull Fouling's Triple Threat

The maritime industry faces converging pressures that demand immediate action:



Regulatory Compliance at Risk

- CII ratings tightening annually: D rating for 3 years or E for 1 year mandates corrective action
- EEXI power limitations make clean hulls critical to maintain speed capabilities
- IMO 2023 GHG Strategy targets: 30% emissions reduction by 2030, 80% by 2040



Operational Performance Crisis

- Even mild slime (0.5mm) increases fuel consumption 5-10% and GHG emissions 20-25%
- Heavy fouling can spike fuel consumption up to 55% on container ships
- A 10% fuel penalty on a vessel burning 50 tonnes/day at \$600/tonne = \$3,000 lost daily



Traditional Cleaning Methods Fall Short

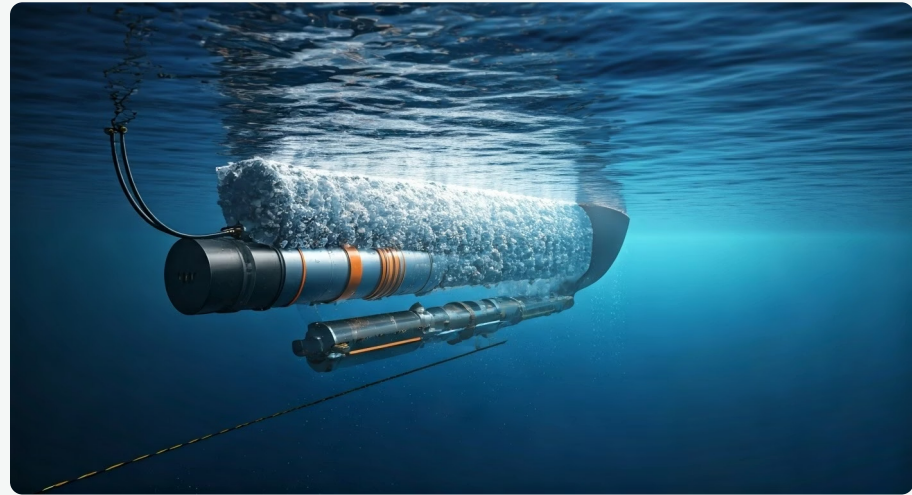
- Dry-docking: Infrequent (2.5-5 years), high downtime, expensive
- Divers: Increasingly restricted by ports, damages coatings, poor environmental profile
- Both: Reactive rather than proactive, leading to prolonged inefficiency periods

THE SOLUTION: Optima One Advanced Hull Cleaning

Optima One offers a revolutionary paradigm shift in hull maintenance:

Key Technology Advantages

- Closed-Loop Filtration System captures >95% of removed fouling and biocides
- Gentle Cleaning Technology preserves expensive hull coatings with optimized brushes and controlled pressure
- Zero Downtime Operation during cargo operations, port stays, or at anchorage
- High Cleaning Rate up to 1,000 m²/hour with consistent, thorough coverage



Business Impact Across Vessel Types

Vessel Type	Annual Fuel Savings	CO ₂ Reduction	ROI
Panamax Bulk Carrier	\$300,000	1,575 tonnes	187%
Ultra Large Container	\$1,080,000	5,670 tonnes	300%
Product Tanker	\$235,200	1,235 tonnes	224%

Assumptions: VLSFO \$600/tonne, 7-10% fouling penalty avoided, 3-6 cleanings annually

Practical Implementation Strategy



Assess & Pilot (2025)

- Select 2-3 vessels with highest fouling risk or poor CII ratings
- Establish baseline performance data (fuel, speed, emissions)
- Update Biofouling Management Plans to incorporate Optima One



Expand & Integrate (2026)

- Scale to 25-50% of fleet based on pilot results
- Integrate with Vessel Performance Monitoring (VPM) systems
- Target: All participating vessels achieve minimum 'C' CII rating



Optimize & Future-Proof (2027-2030)

- Implement data-driven cleaning schedules based on performance triggers
- Align with coating renewal cycles for maximum synergy
- Prepare for carbon pricing by documenting emissions reductions

GLOBAL COMPLIANCE: Regional Port Authority Playbook

Strategically deploy Optima One to navigate varying regulations worldwide:

Singapore

- Challenge: MPA strictly limits in-water cleaning; Port Master approval mandatory
- Optima One Advantage: Closed-loop filtration meets MPA's environmental standards
- Action Plan: Schedule cleaning during port stays; maintain detailed records for inspection

UAE/Fujairah

- Challenge: Federal Law No. 24 prohibits pollutant discharge
- Optima One Advantage: ROV cleaning with capture is already routine practice
- Action Plan: Utilize approved anchorages where cleaning infrastructure exists

EU Ports

- Challenge: EU ETS applies carbon pricing to shipping; Barcelona Convention regulations
- Optima One Advantage: Reduces emissions and prevents invasive species transfer
- Action Plan: Document fuel/emissions savings for carbon cost avoidance

Key Port Call Checklist

- Hull condition assessed prior to arrival
- Optima One cleaning scheduled with authorized provider if needed
- Necessary port permissions arranged via agent
- Biofouling Management Plan & Record Book updated

IMPLEMENTATION: Decision Support & ROI Calculator

When to Clean: Data-Driven Decision Logic

IF any of these conditions apply:

- VPM shows hull performance index <95% (fuel consumption up ~5%)
- Vessel scheduled for port/anchorage with Optima One availability
- Idle time exceeds 12 hours
- Trading in high-fouling regions (warm waters)
- CII rating at risk of dropping to D

THEN schedule Optima One cleaning



Quick ROI Self-Assessment

Calculate your vessel's potential savings:

1. Daily fuel consumption: ____ tonnes × \$____ /tonne = \$____ daily fuel cost
2. Estimated fouling penalty: ____ % × \$____ daily fuel cost = \$____/day excess cost
3. Annual excess: \$/day × ____ sailing days = \$ annual fuel penalty
4. Annual cleaning cost: \$____ per clean × ____ cleanings = \$____ annual cleaning cost
5. Net annual savings: \$____ annual fuel penalty - \$____ annual cleaning cost = \$____

Example: 60,000 DWT bulk carrier

- Burning 25 tonnes/day at \$600/tonne with 8% fouling penalty
- \$1,200/day excess fuel cost
- \$300,000 annual fuel penalty (250 sailing days)
- \$160,000 annual cleaning cost (4 cleanings)
- \$140,000 net annual savings
- Plus CII rating preservation, enhanced asset value, and carbon cost avoidance

Technical Specifications: Optima One at a Glance

- ROV Dimensions: 1.2m × 0.8m × 0.5m, 150 kg
- Cleaning Rate: Up to 1,000 m²/hour
- Filtration: Closed-loop, 50 microns, >95% capture
- Power Required: 440V AC, 15kW
- Deployment Options: Service model or owned unit
- Operating Conditions: Up to Sea State 3, Current 2 knots

Strategic Conclusion

Hull performance optimization with Optima One is not merely a compliance measure; it's a powerful lever for cost leadership and competitive resilience in the evolving maritime landscape.

