



招商局

CHINA MERCHANTS GROUP

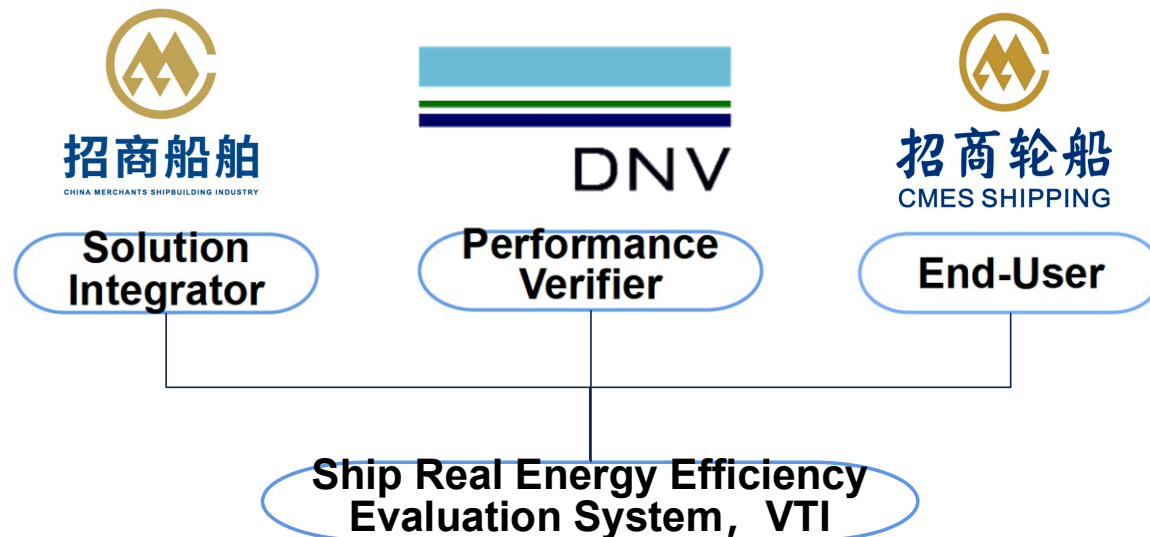
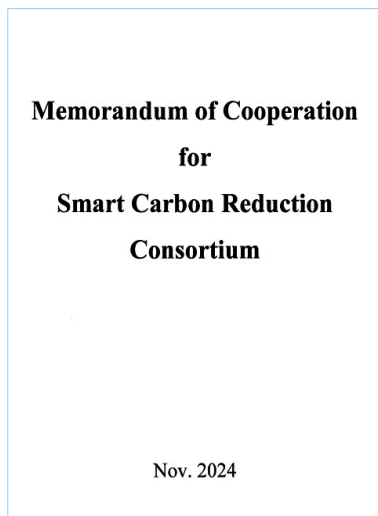
Since 1872

Quantifying performance of EETs by Vessel Technical Index

May 2026, Hong Kong



1、Backgrounds: Smart Carbon Reduction Consortium 招商局船舶工业集团有限公司 CHINA MERCHANTS SHIPBUILDING INDUSTRY GROUP CO., LTD.



Industry Collaboration on Energy Efficiency in China
CMI/DNV/CMES Joint Innovation Project on
VTI&WAPS

One of the initial projects of Smart Carbon Reduction Consortium, 2024

2、 Core Function: GHG Win-Win Platform

Management of the Credibility
of **Technology Investment**
and **Ship Maintenance**
Services

船东 Owner



设备商 OEM



租家 Charter



数据商 Data



船厂 Yard



VTI*

Enhance the impact of
equipment and services,
with **ongoing third-party**
certification

Renting **high-efficiency**
vessels to reduce fuel
consumption

Increase **business volume** and
promote **sensor and data**
acquisition technologies

A leading design industry with
innovative technology
applications

Win-win GHG
performance

Develop a
stakeholder-
aligned ship
operation **GHG**
performance
collaborative
management
platform.

Open / Credible
/ Dynamic

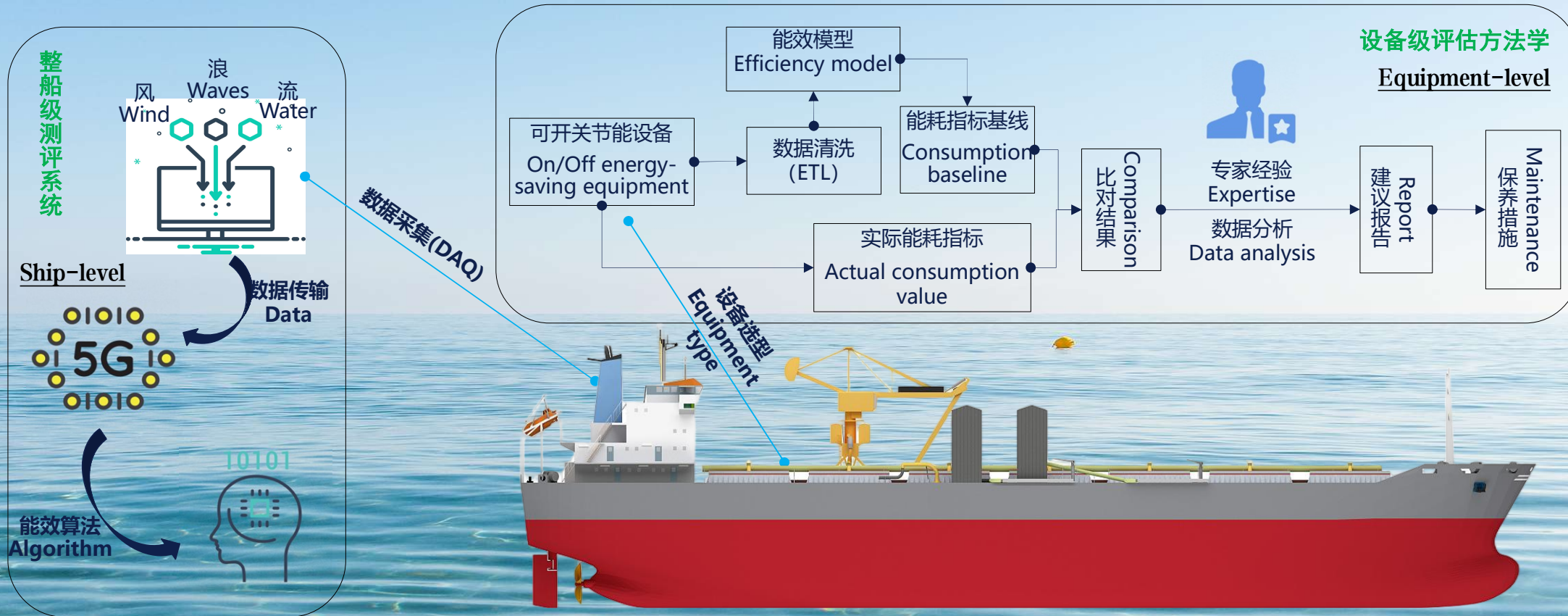
Build an
integrated,
transparent
energy efficiency
evaluation
system with **real-**
time dynamic
monitoring
mechanisms.

*Third-party-verified data and VTI, shared across teams, power relevant business scenarios.

2、Core Function: Dual Assessment at Ship and Equipment

兼具整船级和设备级真实能效评估，服务于投资决策评估、设计、建造、测试、交付及运营全业务流程场景。

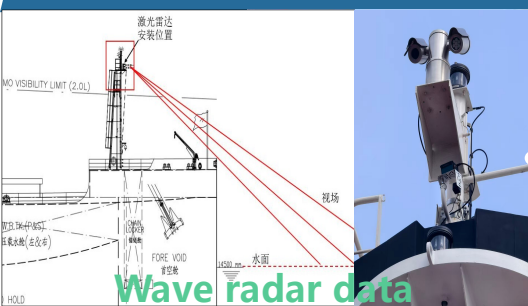
It conducts both ship-level and equipment-level real energy efficiency evaluations, and serves the entire business process scenarios including investment decision-making assessment, design, construction, testing, delivery, and operation.



3、 Plan: Based on 2 Applications of Actual Vessels



4、 Progress (I): 82k DWT bulker nails full-class certification!



Wave radar data acquisition



概览
设备信息
燃油管理
航行监控

VTI 1.01

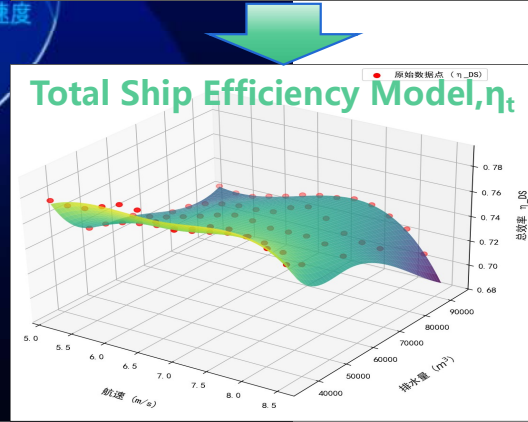
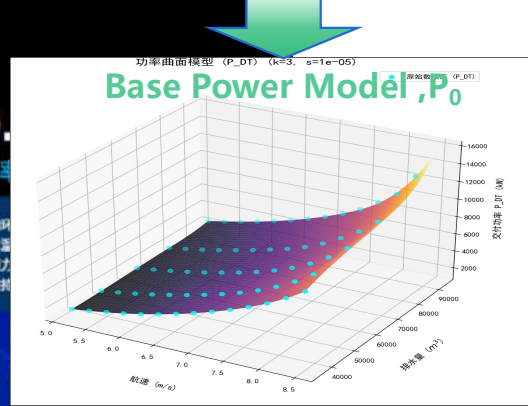
船舶真实能效参数

VTI Historical Curve

61886.8

船体排水量

Functional Verification Review By DNV



P_{env} 320
环境因素损耗功率

航行中的风浪、海水涌流、加航阻力功率以维持

V_w
对水速度

4、Progress (II): 7800PCTC Equipment Verification Underway

DNV
RECOMMENDED PRACTICE
DNV-RP-0686 Edition May 2025

Performance of wind assisted propulsion systems

WAPS: Guidelines and Standards Analysis

100%

DNV AS

WAPS Core Fuel Economy Calculation Strategy



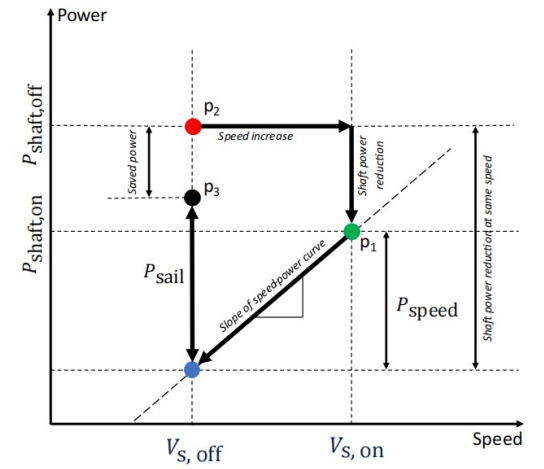
$$|V_{S, on} - V_{S, off}| \leq 1 \text{ kn}$$

Relative change in power after a switching instance:

$$x_i = \frac{P_{\text{shaft, on}, i} + P_{\text{speed}, i} + P_{\text{sail}, i}}{P_{\text{shaft, off}, i}} - 1$$

negative

power saving



Optimization of the Sail Control Strategy: 80%

Construction of the sail energy efficiency evaluation model: 50%

Control interface showing wind direction gauges (e.g., 123°, 123°, 123°), power meters (e.g., 6,840 m/s), and control buttons for various systems like '1#主机', '2#主机', '主电源', '起帆', '收帆', '抛锚', '解缆'.

Monitoring interface showing weather forecasts (e.g., 未来半天 25°C 多云转晴), power optimization suggestions (e.g., 航行优化建议, 能源优化建议), and energy efficiency charts (e.g., SFOC, 节能节能效果).

5、VTI-Driven App Promo: Solving Ships' Key Energy Efficiency Pain Points



招商局船舶工业集团有限公司
CHINA MERCHANTS SHIPBUILDING INDUSTRY GROUP CO., LTD.

价值导向、紧扣需求、易于推广 Value driven, Relevant, Scalable.

01

经验证的清污决策 Verified VTI for Cleaning Decisions

痛点 PROBLEM: 清污决策常基于不一致或延迟的数据, 难以精准判断最佳清洗时机
Cleaning decisions based on inconsistent or delayed data, difficult to accurately determine the optimal timing.

方案 SOLUTION: 提供每日更新、第三方验证的VTI值, 实现对船体的精准监控; 当VTI衰退时即触发最佳清洗时机, 赋能营运团队决策
Daily updated, third-party verified VTI values to enable precise monitoring of hull conditions; when VTI declines, the optimal cleaning timing is triggered.

02

经验证的动态油耗基准表 Verified & dynamic Fuel Tables

痛点 PROBLEM: 租船部门与客户缺乏一致、实时的船队性能全景视图, 难以准确预估航次的油耗、成本与排放
Lack a unified, real-time performance overview, difficult to estimate consumption, costs, and emissions.

方案 SOLUTION: 以标准化、质量受控的数据与VTI为基础, 构建一套持续更新且经第三方验证的动态油耗; 反映船舶在复杂营运环境中的真实性能表现
VTI Fuel Table: Standardized • Validated • Dynamic • Real-Performance under complex and variable operational conditions.

03

共享油耗, 赋能气导航 Sharing Fuel Tables with Weather Routers

痛点 PROBLEM: 航线决策基于笼统的或过时的船舶性能假设, 缺乏准确性和针对性, 导致油耗增加、航时拉长
Outdated vessel performance guesses = costlier, slower voyages + missed commercial goals.

方案 SOLUTION: 经验证的油耗基准表直联共享给气导服务商, 支撑气导算法以精准、实时的船舶性能数据驱动, 更优的航线规划
Verified fuel benchmarks shared with Weather Routers, powering algorithms with precise, real-time vessel performance data.

04

性能透明的航次报告 Performance Transparency Statement

痛点 PROBLEM: 缺乏对技术性能、天气影响与营运操作等因素的可靠分析, 难以厘清责任、准确归因、预测优化
Missing reliable tech & weather & operational analysis = unclear blame, causes, unoptimized results.

方案 SOLUTION: 航次报告可将总燃油消耗分解为技术衰减、天气影响与运营实际情况三大归因, 为租船部门提供实际结果与航前预估的客观对比基准
Voyage report: Fuel use split into tech wear, weather, operations → chartering gets objective actual vs. estimate benchmark.

05

租约创新: 风险共担, 收益共享 Risk/reward Sharing

痛点 PROBLEM: 监测失真、容差过宽、透明度不足, 租家面对性能不达标索赔无据; 船东投资技术能效回报无门
Flawed data + lax rules + no transparency → tenants get no compensation, shipowners see no returns.

方案 SOLUTION: 提供精确且经独立验证的评估依据; 对船东的评估将聚焦于真正可控的因素 (VTI), 并为租约奠定清晰、客观的性能基础
Precise, independent voyage evaluation criteria + VTI-focused shipowner assessments = clear, objective charter performance benchmarks.



招商船舶

CHINA MERCHANTS SHIPBUILDING INDUSTRY

THANKS

谢 谢

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