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Optimization Strategy For Biodiesel Use On The M.T FTM 24 Oil Tanker As An Alternative To Conventional Diesel Fuel

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Abstract

This study formulates an optimization strategy for the use of biodiesel-blended diesel (bio solar) on the M.T FTM 24 oil tanker as an alternative to conventional diesel fuel. The analysis integrates four dimensions: technical and engine operation, bunkering management and logistics, company policy and human-resource readiness, and strategic optimization based on internal and external factors. A descriptive qualitative case-study design was employed. Data were obtained through direct observation, semi-structured interviews with six informants representing shipboard and shore-based functions, document review, and literature analysis. The data were processed through reduction, data display, triangulation, SWOT analysis, and conclusion verification. The findings indicate that biodiesel can be used on M.T FTM 24, but its operational reliability depends on tighter control of tank cleanliness, water content, filtration, purifier operation, injectors, fuel-system temperature, and preventive maintenance. Bunkering remains vulnerable to supplier-quality variation and weak batch traceability, while a dedicated biodiesel checklist, complete Bunker Delivery Notes and Certificates of Analysis, and supplier evaluation are required. Organizational readiness is also incomplete because a specific SOP, clearly communicated RACI responsibilities, and dedicated competency-based training are not yet fully established. The study proposes a five-pillar optimization model—Quality, Engine, Bunkering, People & Governance, and Data & Review—supported by phased implementation and measurable key performance indicators. The

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principal implication is that biodiesel transition should be managed as an integrated maritime management system rather than as a simple fuel substitution.

Keywords: biodiesel, bio solar, oil tanker, bunkering, human-resource readiness, SWOT, operational optimization.

INTRODUCTION

Maritime transportation is a strategic component of global trade, energy distribution, and national logistics, but it is simultaneously under growing pressure to reduce greenhouse-gas emissions and improve energy efficiency. The International Maritime Organization (IMO, 2023) has strengthened the direction of maritime decarbonization through its revised greenhouse-gas strategy, while the 2024 lifecycle greenhouse-gas guidelines broaden the focus from exhaust emissions alone to the overall fuel pathway (IMO, 2024). These developments increase the operational relevance of lower-carbon and alternative marine fuels.

Indonesia has adopted an increasingly ambitious biodiesel policy. The national B40 mandate, effective from 1 January 2025, strengthens the practical availability and policy relevance of biodiesel-blended diesel for domestic energy users. Wirawan et al. (2024) emphasize that biodiesel implementation in Indonesia depends not only on policy commitment but also on quality, supply reliability, economics, infrastructure, and system readiness. For shipping companies, therefore, the question is not simply whether biodiesel is available, but whether a vessel can use it safely, reliably, and measurably under real operating conditions.

Recent marine-engine studies indicate that biodiesel can be technically feasible, although its effects are not uniform across blends and operating profiles. Wei et al. (2023) reported that biodiesel could be used in a low-speed marine engine without major changes to basic engine parameters, while combustion and emission characteristics still changed. Wu et al. (2023) found that lower biodiesel blends could maintain performance close to diesel and reduce soot, but the blend ratio, injection conditions, and nitrogen-oxide behavior remained important. Sagin et al. (2024a, 2024b) similarly stress that biofuel use must be assessed together with engine condition, blend concentration, operating load, maintenance, safety, and environmental objectives.

Fuel quality and storage conditions create an additional operational dimension. Biodiesel is more sensitive to water, oxidation, and microbial contamination than conventional diesel under some storage conditions. Komariah et al. (2022) documented

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microbial contamination in stored diesel-biodiesel blends, while Christensen and McCormick (2023) showed that water contamination can affect biodiesel storage stability. In a humid marine environment, these characteristics can manifest as sludge, increased filter loading, tank contamination, or injection-system problems if quality control and storage management are weak.

The transition is also organizational. Alternative-fuel adoption is a socio-technical change involving technology, supply chains, regulation, management practices, and people. Lee et al. (2024) show that alternative marine-fuel pathways are shaped by interacting technological, policy, market, and organizational factors. Dimitranov and Belev (2024) further argue that sustainable shipping requires corresponding development of education and training. Consistently, the IMO issued interim training guidance in 2025 for seafarers working with alternative fuels and new technologies (IMO, 2025). Thus, even when a fuel is relatively close to conventional diesel, organizational readiness, procedures, accountability, and competence remain decisive.

The M.T FTM 24 case is important because many prior studies emphasize laboratory testing, numerical simulation, emissions, or broad policy analysis, whereas vessel operators require an applied framework that connects fuel quality, machinery, bunkering, crew competence, documentation, and management decisions on a specific operating ship. M.T FTM 24 is an oil tanker powered by two Wärtsilä 6L20 main engines rated at 930 kW each. Treating biodiesel adoption merely as a product substitution would overlook the interdependence between the fuel, the vessel's technical system, shore-based supply, and the organization that operates the ship.

Research Objective

This study aims to formulate an operationally applicable strategy for optimizing biodiesel use on M.T FTM 24 by answering four questions: (1) what technical and engine-operational controls are required; (2) how should bunkering management, fuel quality, storage, and traceability be organized; (3) what policies, responsibilities, and human-resource competencies are necessary; and (4) what strategic priorities emerge from a qualitative SWOT analysis. The practical novelty is the integration of these four dimensions into a single five-pillar maritime management model.

RESEARCH METHOD

The study used a descriptive qualitative case-study design focused on M.T FTM 24. This approach was selected because the research sought to understand the actual

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operational context of biodiesel use rather than statistically test a hypothesis. The unit of analysis was the management system surrounding biodiesel use, including engine operation, the fuel system, bunkering and storage, shore-based logistics, company policy, and crew readiness.

Informants were selected purposively based on their direct involvement in vessel operation and fuel management. The completed interviews involved six functions: the Master, Chief Engineer, Engineer Officer, fuel-handling crew, company operational management, and logistics/bunkering personnel. The interview guide was semi-structured so that each discussion remained linked to the four research questions while allowing operational details and emerging issues to be explored.

Data were collected through four techniques. First, direct observation was used to examine the ship's operating environment, monitoring panels, deck piping, personnel activities, and fuel-handling context. Second, semi-structured interviews explored technical effects, fuel handling, supplier consistency, procedures, responsibilities, training, and reporting. Third, documentation was used to verify vessel particulars and available field evidence and to identify missing technical records such as fuel-consumption logs, Bunker Delivery Notes (BDN), Certificates of Analysis (CoA), filter and injector records, and training documentation. Fourth, a literature review connected the field evidence with recent research, policy, fuel standards, and maritime decarbonization guidance.

Qualitative data analysis followed the logic of data reduction, data display, and conclusion verification described by Miles, Huberman, and Saldaña (2020). Evidence was coded into four analytical themes: technical-engine operation, bunkering-logistics, policy-human resources, and strategic factors. Triangulation compared interviews, observation, documentation, and literature. A qualitative SWOT analysis then classified internal strengths and weaknesses and external opportunities and threats, and generated SO, WO, ST, and WT strategic directions. No artificial numerical weighting was used because the available evidence did not support a defensible quantitative SWOT score.

Table 1. Informants and Analytical Focus

Informant/Function	Primary analytical focus
Master	Safety, coordination, shipboard policy, procedure changes, and escalation.

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Informant/Function	Primary analytical focus
Chief Engineer	Engine compatibility, reliability, fuel consumption, maintenance, and technical decision-making.
Engineer Officer	Daily monitoring, filters, injectors, alarms, operating parameters, and records.
Fuel-handling crew	Fuel receipt, transfer, storage, tank cleanliness, and operational deviations.
Company management	Policy, targets, contracts, costs, evaluation, and governance.
Logistics/Bunkering	Supply availability, scheduling, volume, quality documents, and coordination.

RESULTS AND DISCUSSION

Technical and Engine-Operational Findings

The field evidence indicates that biodiesel use on M.T FTM 24 is technically feasible but requires a higher level of control than a simple “fuel-in/fuel-out” approach. Interviewees consistently highlighted sludge formation, faster contamination of tanks and filters, possible effects on injectors and fuel pumps, the importance of temperature management, water checks, tank draining, purifier operation, and preventive monitoring. These observations are consistent with recent literature showing that biodiesel performance is highly dependent on blend, load, fuel condition, and system cleanliness (Wei et al., 2023; Wu et al., 2023; Sagin et al., 2024a).

Three layers of compatibility should be distinguished. The first is fuel-to-engine compatibility with manufacturer recommendations and fuel specifications. The second is compatibility with the supply system, including pumps, seals, hoses, filters, injectors, and storage tanks. The third is operational compatibility: the crew’s ability to maintain stable engine parameters at different loads and to recognize abnormal trends. Because the study did not contain a complete set of original equipment manufacturer documents and controlled comparative engine logs, compatibility should be treated as a verification task rather than an assumption.

Fuel performance should also be evaluated with normalized indicators rather than daily volume alone. Recommended parameters include fuel consumption per hour and

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per unit load, engine load, rpm, exhaust-gas temperature by cylinder, cooling-water temperature, lubricating-oil pressure, alarms, smoke condition, filter differential pressure, and maintenance events. A before–transition–stabilization baseline is therefore preferable: establish a conventional-fuel reference period, trace each biodiesel batch during transition, and define a new normal range only after sufficient evidence has accumulated.

Water and storage conditions are particularly important. In a marine environment, water may enter through condensation, delivery contamination, leakage, or weak storage practices. The combined evidence from Komariah et al. (2022) and Christensen and McCormick (2023) supports systematic tank inspection, water control, drain records, storage-time monitoring, and batch-level correlation between fuel condition and technical events. This avoids incorrectly attributing every filter or combustion problem to biodiesel in general when the actual cause may be a specific batch, tank condition, transfer practice, or pre-existing deposit.

Bunkering Management, Logistics, and Traceability

Bunkering emerged as an end-to-end supply-chain process rather than a single refueling event. The main management issue was variation in supplier quality combined with the absence of a dedicated biodiesel checklist. Existing practices included procurement coordination, sounding, seal checks, sampling, and transfer monitoring, but the evidence base was not yet sufficiently integrated to trace each batch from supplier acceptance to engine performance.

An optimized process begins with demand forecasting based on voyage plans, historical consumption, tank capacity, location, lead time, and a defined safety margin. Supplier selection should use multiple criteria—fuel quality, on-time delivery, completeness of documents, consistency, complaint response, and total cost—rather than price per litre alone. Potential additional costs include cleaning, filter replacement, sampling, downtime, and maintenance. This system perspective is consistent with the broader Indonesian biodiesel implementation challenges identified by Wirawan et al. (2024).

Fuel acceptance should create a complete document trail containing supplier identity, fuel type, quantity, batch, date, location, and quality evidence. The study identified BDN and CoA completeness as a priority data gap. Batch identification should follow the fuel into the receiving tank, usage period, and engine records. This traceability is important because it enables root-cause analysis when technical deviations occur and

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supports periodic supplier scorecards. The 2024 IMO lifecycle approach further reinforces the strategic value of fuel provenance and documented traceability (IMO, 2024).

Storage and internal transfer should be governed by recorded controls. Tank condition, water drainage, stock rotation, cleaning, line identification, valve configuration, volume reconciliation, and communication between responsible personnel should be documented. The purpose of the study is not to replace vessel-specific technical procedures; rather, it emphasizes management controls ensuring that procedures exist, are authorized, understood, followed, and reviewed.

Policy and Human-Resource Readiness

The transition to biodiesel is a management-of-change process. Although the company direction supports biodiesel use, the study found that a specific written SOP, clearly communicated RACI responsibilities, dedicated practical training, and a mature rapid-reporting culture were not yet fully established. Reliance on individual experience may work temporarily, but it is difficult to standardize across crews and operating periods.

Effective policy should clarify why biodiesel is used, under what operating conditions it is accepted, who has technical and supply authority, what data must be recorded, what acceptance criteria apply, and how deviations are escalated. The RACI concept is useful because decisions on supplier selection, fuel receipt, quality acceptance, transfer, engine monitoring, incident reporting, supplier evaluation, and continuation or suspension of a batch involve both shipboard and shore-based roles.

Training should be competency-based and divided into awareness, operational, and supervisory levels. Awareness training provides common knowledge of fuel characteristics, risks, and reporting routes. Operational training is intended for personnel who receive, transfer, monitor, and maintain the fuel system. Supervisory training supports the Master, Chief Engineer, and managers in trend interpretation, risk-based decisions, and management review. This direction is consistent with Dimitranov and Belev (2024) and the IMO's 2025 interim training guidance.

Finally, a learning-oriented reporting culture is necessary. Filter blockage, sludge, unusual alarms, or quality deviations should be reported early and examined as system evidence rather than automatically framed as individual error. Such a culture links technical reliability to organizational learning and enables continuous improvement.

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SWOT Analysis and Strategic Priorities

The qualitative SWOT analysis shows that the strongest opportunities are the national B40 policy, maritime decarbonization pressure, the potential reduction of soot and incomplete-combustion emissions, and growing availability of digital monitoring tools. The principal internal strengths are the diesel-engine platform, an existing operational structure, and experienced shipboard personnel. The largest weaknesses are not only fuel properties but also incomplete baseline data, limited batch traceability, incomplete biodiesel-specific procedures, and insufficient evidence of dedicated training. Key threats include supplier-quality variation, water and microbial contamination, supply disruption, possible increases in consumption or NOx under some conditions, and uncertainty when manufacturer compatibility has not been fully verified.

Table 2. SWOT-Based Strategic Directions

Strategy	Strategic direction
SO	Use the diesel platform and B40 policy support to establish a data-based transition program linking consumption, reliability, and energy-efficiency monitoring.
WO	Use policy momentum and monitoring technology to close data and governance gaps through batch traceability, BDN/CoA control, engine baselines, supplier scorecards, SOPs, and training.
ST	Use operational experience and the vessel's organizational structure to manage supplier-quality variation through acceptance criteria, trend monitoring, and clear escalation decisions.
WT	Reduce exposure through phased implementation, compatibility verification, water and tank control, document audits, and temporary rejection/suspension of unacceptable batches.

Seven strategic programs were prioritized: (1) establish technical and operational baselines; (2) implement batch traceability from supplier to engine performance; (3) strengthen fuel-quality, water, and storage control; (4) formalize governance through policy, SOP, RACI, and escalation routes; (5) provide tiered competency training; (6) evaluate suppliers using quality, timeliness, documentation, response, and total cost; and (7) institutionalize periodic management review and continuous improvement. The

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first three were assessed as the most urgent because without baseline, traceability, and quality control, the operational effect of biodiesel cannot be interpreted reliably.

Five-Pillar Optimization Model

The core contribution of the study is a five-pillar model that treats biodiesel adoption as an integrated maritime management system. The model links fuel input quality, engine performance, bunkering processes, people and governance, and an evidence-based review cycle. This integration is the study's practical novelty compared with approaches that assess fuel only through laboratory or emission variables.

Table 3. Five-Pillar Optimization Model and Key Indicators

Pillar	Core components	Expected outcome / example KPI
1. Quality	CoA/BDN, batch ID, water control, storage condition, acceptance criteria.	Traceable fuel quality; 100% complete batch documentation; declining quality deviations.
2. Engine	Baseline, fuel consumption, load, EGT, filters, injectors, alarms, maintenance.	Comparable reliability and efficiency; no uncontrolled rise in alarms, downtime, or unscheduled maintenance.
3. Bunkering	Forecasting, supplier selection, receiving, sampling, storage, transfer, supplier review.	Safe and timely supply; improved BDN/CoA compliance and supplier performance.
4. People & Governance	Policy, SOP, RACI, competency training, communication, reporting, escalation.	Clear accountability; all relevant personnel meet internal competency standards.
5. Data & Review	Dashboard, incident review, supplier scorecard, management review, corrective actions.	Evidence-based decisions and continuous improvement; action items closed within target.

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Phased Implementation

Table 4. Recommended Implementation Stages

Stage	Main focus	Recommended actions
Short term (0–6 months)	Data foundation and governance	Complete baseline engine/fuel records; establish batch IDs and BDN/CoA control; define quality acceptance; issue policy, SOP, RACI, and escalation routes; close critical document gaps.
Medium term (6–18 months)	Integration and competence	Integrate fuel, engine, maintenance, and cost data; use supplier scorecards; conduct tiered training; audit tanks and storage control; review KPIs and corrective actions.
Long term (>18 months)	Optimization and organizational learning	Use multi-period data to optimize blend and operating conditions; integrate biodiesel with decarbonization and energy-efficiency goals; expand digital analytics and predictive maintenance; benchmark periods or vessels; conduct quantitative lifecycle and cost studies.

Managerial Implications and Limitations

The managerial implication is that shipping companies should avoid defining success only as achieving a target biodiesel blend. Success is better defined as using biodiesel in a manner that is measurable, safe, traceable, reliable, and economically explainable. The five-pillar model allows management to assign responsibilities and KPIs across technical, supply-chain, and human dimensions. For the Chief Engineer and engine team, the priority is baseline and condition monitoring; for logistics, traceability and supplier quality; for ship management, safety and cross-functional coordination; and for company management, governance, resource allocation, and periodic review.

The study has important limitations. Detailed quantitative records—including fuel consumption, engine-load histories, laboratory fuel-quality results, BDN/CoA files, filter and injector histories, and training records—were not complete enough for full numerical before-and-after analysis. The study is also limited to one oil tanker, so results should be transferred to other vessels cautiously because engine design, vessel age, route,

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supplier conditions, and management systems may differ. The five-pillar model is therefore best viewed as an adaptive implementation framework that requires vessel-specific validation.

CONCLUSION

The M.T FTM 24 case demonstrates that biodiesel-blended diesel can be used as an alternative to conventional diesel fuel, but optimization depends on system-level management. Technically, reliable use requires fuel-quality control, water management, tank cleanliness, filtration, purifier and injector monitoring, temperature control, and preventive maintenance. In bunkering and logistics, the decisive requirement is end-to-end batch traceability supported by verified suppliers, sampling, BDN/CoA documentation, storage records, and supplier evaluation. Organizationally, policy and human-resource readiness remain incomplete without a dedicated SOP, explicit RACI responsibilities, practical competency-based training, and an open reporting culture. The qualitative SWOT analysis therefore prioritizes baseline data, traceability, quality control, preventive engine monitoring, governance, training, supplier assessment, and periodic review. The proposed five-pillar model—Quality, Engine, Bunkering, People & Governance, and Data & Review—provides a practical framework for phased implementation. Future research should combine qualitative evidence with normalized fuel-consumption and engine data, laboratory fuel-quality results, total-cost analysis, lifecycle greenhouse-gas assessment, and comparisons across vessels to test the model quantitatively.

REFERENCES

Bayraktar, M., Pamik, M., Sökükcü, M., & Yuksel, O. (2023). A SWOT-AHP analysis on biodiesel as an alternative future marine fuel. Clean Technologies and Environmental Policy.

Chountalas, P., Founti, M., & Tsalavoutas, A. (2023). Evaluation of biofuel effect on performance and emissions of a 2-stroke marine diesel engine using on-board measurements. Energy.

Christensen, E. D., & McCormick, R. L. (2023). Water contamination impacts on biodiesel antioxidants and storage stability. Energy & Fuels, 37(7), 5179–5188. https://doi.org/10.1021/acs.energyfuels.2c03911

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Chua, J. Y., Wang, X. Q., & Yuen, K. F. (2023). Sustainable shipping management: Definitions, critical success factors, drivers and performance. Transport Policy, 141, 72–82.

Dimitranov, D., & Belev, B. (2024). Sustainable shipping requires sustainable education and training. Sustainability, 16(24), 11270. https://doi.org/10.3390/su162411270

International Maritime Organization. (2023). 2023 IMO strategy on reduction of GHG emissions from ships (Resolution MEPC.377(80)).

International Maritime Organization. (2024). 2024 guidelines on life cycle GHG intensity of marine fuels (Resolution MEPC.391(81)).

International Maritime Organization. (2025). Generic interim guidelines on training for seafarers on ships using alternative fuels and new technologies (STCW.7/Circ.25).

International Organization for Standardization. (2024). ISO 8217:2024 Petroleum products—Fuels (class F)—Specifications of marine fuels.

Komariah, L. N., Arita, S., Rendana, M., Ramayanti, C., Suriani, N. L., & Erisna, D. (2022). Microbial contamination of diesel-biodiesel blends in storage tank: An analysis of colony morphology. Heliyon, 8(4), e09264. https://doi.org/10.1016/j.heliyon.2022.e09264

Lee, J., Sim, M., Kim, Y., & Lee, C. (2024). Strategic pathways to alternative marine fuels: Empirical evidence from shipping practices in South Korea. Sustainability, 16(6), 2412. https://doi.org/10.3390/su16062412

Meilinda, R., Ningsih, P. A., Anggraini, D., & Pardi, H. (2024). Environmentally friendly maritime fuel alternative: A review. Indonesian Journal of Chemical Research, 9(1).

Miles, M. B., Huberman, A. M., & Saldaña, J. (2020). Qualitative data analysis: A methods sourcebook (4th ed.). SAGE Publications.

Sagin, S. V., Sagin, S. S., Fomin, O., Gaichenia, O., Zablotskyi, Y., Píštěk, V., & Kučera, P. (2024a). Use of biofuels in marine diesel engines for sustainable and safe maritime transport. Renewable Energy, 224, 120221. https://doi.org/10.1016/j.renene.2024.120221

Sagin, S., Kuropyatnyk, O., Matieiko, O., Razinkin, R., Stoliaryk, T., & Volkov, O. (2024b). Ensuring operational performance and environmental sustainability of marine diesel engines through the use of biodiesel fuel. Journal of Marine Science and Engineering, 12(8), 1440. https://doi.org/10.3390/jmse12081440

Sugiyono. (2020). Metode penelitian kualitatif. Alfabeta.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Wei, C., Jiang, G., Cui, L., Wu, G., & Zhong, S. (2023). Combustion analysis of low-speed marine engine fueled with biofuel. Journal of Marine Science and Application, 22(4), 861–869. https://doi.org/10.1007/s11804-023-00375-1

Wirawan, S. S., Solikhah, M. D., Setiapraja, H., & Sugiyono, A. (2024). Biodiesel implementation in Indonesia: Experiences and future perspectives. Renewable and Sustainable Energy Reviews, 189, 113911. https://doi.org/10.1016/j.rser.2023.113911

Wu, G., Li, J., Guo, H., Wang, X., & Jiang, G. (2023). Numerical method for predicting emissions from biodiesel blend fuels in diesel engines of inland waterway vessels. Journal of Marine Science and Engineering, 11(1), 86. https://doi.org/10.3390/jmse11010086

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