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SWOT Analysis of the Financial Model to Support Decarbonization of Shipping in Indonesia

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Abstract: *This study analyzes a financial model to support the decarbonization of shipping in Indonesia using a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis approach. The research identifies that Indonesia has strengths in the variety of financing sources, including a joint financing scheme (65% from banks, 30% from non-bank financial institutions, and 5% equity) and a supporting institutional structure. However, there are significant weaknesses, such as high financing costs with interest rates ranging from 7% to 12% per year and limited government support, as ships and shipyards are not considered critical infrastructure. Development opportunities are identified through financing innovations, such as green financing and the implementation of the Poseidon Principles, as well as potential international collaborations and capital market development. Key threats include global economic uncertainty, challenges in implementing decarbonization standards, and competition from countries with more attractive financing schemes. The study concludes that there is a need for supportive policy development, financing scheme innovations, and strengthened collaboration among stakeholders to create an effective financial model that supports the transition to more environmentally friendly shipping in Indonesia.*

INTRODUCTION

Global climate change is a complex challenge that The maritime industry is a crucial sector in Indonesia's economy. However, it faces various challenges, particularly in terms of financial support from the government and the public sector. The limited support has a significant impact on the competitiveness of Indonesia’s maritime industry, especially in efforts to decarbonize shipping. One of the key issues faced by Indonesia's maritime industry is the high interest rates on loans, which range from 7-12% per year (Gurning, 2024). These high rates burden industry players with substantial repayment and interest costs, making them less competitive. Moreover, the limited availability of financing and regulatory restrictions further hinder the growth of the maritime industry.

The maritime industry's transition towards decarbonization faces significant obstacles

stemming from limited service model availability and pricing constraints, creating a complex web of challenges that impede the adoption of sustainable technologies. The reliability issues associated with newer, environmentally friendly technologies often result in lower market valuations for vessels equipped with these systems, creating a negative feedback loop that discourages investment in sustainable solutions. This dynamic is particularly problematic for shipping companies attempting to balance environmental responsibilities with financial viability, as the reduced resale value of eco-friendly vessels impacts their ability to secure favorable financing terms or generate adequate returns on investment. The limited track record of new technologies in real-world maritime operations further compounds these challenges, making it difficult for companies to accurately assess the long-term financial implications of adopting sustainable solutions.

Government-controlled regulatory tariffs present another significant barrier to maritime decarbonization efforts, often creating artificial price ceilings that fail to reflect the true costs of implementing sustainable technologies. These regulated pricing structures frequently prevent shipping companies from passing through the additional costs associated with environmental upgrades to their customers, effectively forcing them to absorb these expenses and reducing their operational margins. The resulting financial strain makes it increasingly difficult for maritime companies to justify significant investments in decarbonization technologies, particularly when faced with competitive pressures from operators using traditional, less environmentally friendly but more cost-effective solutions. The misalignment between regulatory pricing frameworks and the actual costs of sustainable operations creates a significant impediment to the industry's broader environmental objectives.

The combined effect of these challenges creates a particularly difficult environment for maritime companies attempting to navigate the transition to sustainable operations. The financial constraints imposed by limited service models, poor reliability perceptions, and regulated tariffs effectively create a triple burden that disproportionately affects companies attempting to lead in environmental sustainability. This situation is especially challenging for smaller operators and companies in developing markets, who often lack the financial reserves necessary to absorb the additional costs associated with sustainable technologies while maintaining competitive pricing under regulatory constraints. The resolution of these challenges likely requires a coordinated approach involving regulatory reform, technological advancement, and innovative financing solutions that can help bridge the gap between environmental objectives and economic realities in the maritime sector.

Interestingly, ships and shipyards are not considered critical infrastructure by the Indonesian government (Gurning, 2024). The lack of public financing support for key components in this maritime industry further complicates efforts for the sector to invest in the technology and innovation required to reduce carbon emissions.

Indonesia's maritime industry is actively pursuing creative and innovative financial models to overcome the significant challenges in shipping decarbonization, with a particular focus on blended financing approaches that have proven successful in other maritime nations. This sophisticated financing strategy brings together multiple stakeholders, including cargo owners, maritime operators, banks, and non-bank financial institutions, in collaborative arrangements designed to create additional value and distribute risks effectively. The adoption of these innovative financing models represents a critical step in addressing the limitations of public support while enhancing the industry's competitiveness and accelerating the transition toward sustainable shipping practices.

The implementation of blended financing in Indonesia's maritime sector demonstrates a

nuanced understanding of the need to combine different funding sources and stakeholder capabilities. This approach not only helps overcome the traditional barriers to maritime financing but also creates new opportunities for value creation through strategic partnerships and risk-sharing arrangements. The collaboration between various stakeholders enables the development of more comprehensive financing solutions that can address both the immediate needs of maritime operators and the longer-term objectives of industry decarbonization.

The proposed SWOT analysis of financial models represents a strategic approach to evaluating and improving maritime financing mechanisms in Indonesia. By systematically examining the strengths, weaknesses, opportunities, and threats associated with existing and potential financial models, this research aims to provide valuable insights that can guide the industry's development toward more sustainable practices. The analysis will particularly focus on identifying innovative financing solutions that can support the maritime industry's decarbonization efforts while maintaining its economic viability and competitive position in the global market. This comprehensive evaluation will serve as a foundation for developing more effective financing strategies that can accelerate Indonesia's transition to environmentally-friendly shipping practices while addressing the industry's unique challenges and opportunities.

LITERATURE REVIEW

Maritime Financial Variations

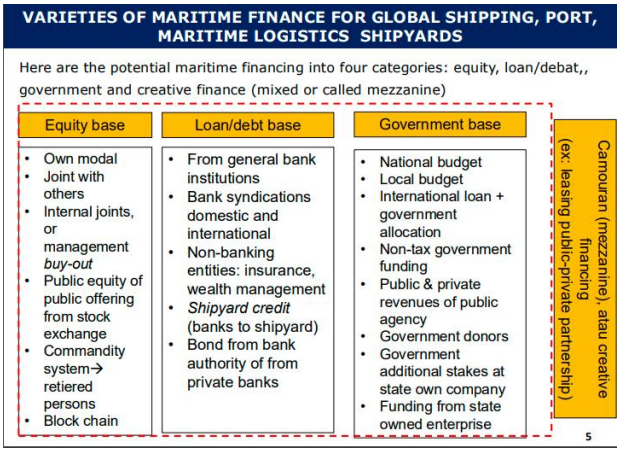


Figure 1. Maritime Financial Variations Scheme
Source: Gurning, R. O. S (2024)

The maritime industry's financing landscape represents a complex ecosystem of funding sources, each offering distinct advantages and serving specific needs within the shipping, port, and shipbuilding sectors. The equity base category stands as a fundamental pillar of maritime financing, encompassing diverse capital-raising mechanisms that provide companies with operational flexibility and strategic autonomy. Traditional equity structures have evolved significantly with technological advancements, particularly evident in the emergence of blockchain-enabled ownership platforms that facilitate fractional vessel ownership and enhance liquidity in maritime assets. This democratization of vessel ownership through technology has opened new avenues for capital formation, allowing smaller investors to participate in maritime ventures while providing shipping companies with more diverse funding sources. The evolution of equity financing in the maritime sector reflects the industry's adaptation to modern financial

technologies and changing investor preferences, with joint ventures and public offerings becoming increasingly sophisticated in their structure and implementation.

The loan/debt base category represents the most traditional and extensive source of maritime financing, characterized by its structured approach to funding and clear repayment mechanisms. Commercial banks, particularly those with specialized maritime divisions, play a pivotal role in providing vessel financing, working capital, and project funding for port development and shipyard operations. The participation of international bank syndicates in large-scale maritime projects demonstrates the global nature of shipping finance and the industry's ability to attract diverse funding sources. The involvement of non-banking entities, such as insurance companies and wealth management firms, has introduced additional flexibility in lending terms and conditions, often providing alternative financing solutions when traditional banking channels may be constrained. The bond market has emerged as a crucial component of maritime debt financing, offering shipping companies access to capital markets through various instruments, including green bonds and sustainability-linked bonds, which align with the industry's increasing focus on environmental sustainability.

Government foundation financing represents a critical support mechanism for the maritime industry, particularly in strategic sectors and during periods of market volatility. This category encompasses direct government funding through national budgets, development banks, and specialized maritime funds, as well as indirect support through guarantees, tax incentives, and subsidies. The role of government financing becomes particularly significant in supporting strategic maritime infrastructure development, domestic shipbuilding capabilities, and environmental sustainability initiatives. International governmental cooperation, manifested through bilateral and multilateral funding arrangements, plays a crucial role in supporting maritime projects with broader economic and social implications. The involvement of state-owned enterprises in maritime financing adds another dimension to government support, often bridging the gap between public policy objectives and commercial maritime operations.

The emergence of blended/creative financing represents the maritime industry's response to evolving funding needs and market conditions, combining elements from traditional financing categories in innovative ways. This approach often involves structured finance solutions that integrate equity, debt, and government support within sophisticated frameworks designed to optimize risk allocation and return profiles. Blended financing has proven particularly effective in supporting green maritime initiatives, where the combination of commercial funding with concessional finance and government support helps mitigate the risks associated with adopting new technologies and environmental solutions. The flexibility inherent in blended financing arrangements allows for the development of tailored funding solutions that address specific project requirements while accommodating the diverse needs of different stakeholders.

Looking forward, the evolution of maritime financing continues to be shaped by technological innovation, environmental considerations, and changing market dynamics. The integration of digital technologies in financing platforms, the growing emphasis on sustainable shipping practices, and the emergence of new funding models are transforming how maritime projects are financed. The success of future maritime ventures will increasingly depend on the ability to navigate this complex financing landscape, leveraging various funding sources in innovative ways while managing associated risks and compliance requirements. The continued development of creative financing solutions, particularly those supporting the industry's transition to sustainable practices, will play a crucial role in ensuring the maritime sector's long-term growth and adaptation to changing global requirements. The interplay between traditional financing mechanisms and emerging funding solutions will remain central to supporting the

maritime industry's evolution, particularly in addressing challenges related to decarbonization, technological advancement, and market volatility.

Common Financial Issues in the Maritime Industry

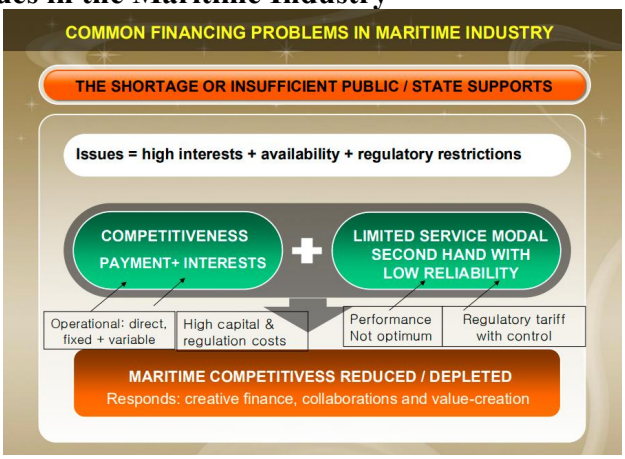


Figure 2. Common Financial Issues in the Maritime Industry
Source: Gurning, R. O. S (2024)

One of the main challenges faced by the maritime industry is the lack of adequate support from the public sector and government. Emerging issues include high interest rates on loans, limited availability of financing, and regulatory restrictions. These factors result in repayment burdens, interest costs, and various requirements that are less competitive for industry players.

In addition, another issue that arises is the limited availability of service models and the low selling prices due to poor reliability. Furthermore, government-controlled regulated tariffs also result in suboptimal financial conditions for maritime companies.

To address these issues, the industry needs to shift towards more creative financing schemes, such as blended financing, inter-company collaboration, and value creation efforts. This more innovative approach is expected to help overcome the reduction or depletion of maritime competitiveness caused by limited public and state support.

In Indonesia, the maritime industry faces relatively high loan interest rates, ranging from 7-12% per year. Additionally, land acquisition costs represent a private burden for the industry. Furthermore, government funding allocations for the maritime sector, particularly for port infrastructure, utilities, and port access, are also limited.

Interestingly, ships and shipyards are not considered basic infrastructure by the government. This results in a lack of public financing support for critical components of the maritime industry. However, to address this financing constraint, the chart suggests that various maritime nations have responded with creative approaches, such as blended financing, collaboration between cargo owners, maritime operators, banks, and non-bank institutions, as well as efforts to create added value.

Overall, the financing challenges faced by Indonesia's maritime industry include high loan interest rates, land acquisition costs, and a lack of public financing support. However, innovative approaches such as blended financing and collaboration among stakeholders offer hope for the industry to overcome these obstacles and enhance its competitiveness in the future. (Gurning, 2024)

Global Financial Models for Shipping

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Financing is a crucial element for ship owners and fleets seeking to expand, upgrade, or maintain their operations. Traditional sources of loans, such as banks and financial institutions, have long been a staple, but a variety of innovative financing solutions have emerged. These creative options offer greater flexibility, lower costs, and customized terms, helping ship owners navigate the complex financial waters. Here, we explore thirty creative financing solutions designed to drive growth in the maritime industry.

Creative financing solutions offer a range of benefits for shipowners and fleet operators. By leveraging these options, they can access a broader pool of capital, including private investors, equity funds, and peer-to-peer lending platforms. These solutions also provide more flexible financing structures, such as revenue-based loans or leasing agreements, allowing shipowners to align their payments with business cash flows. Furthermore, some creative financing solutions offer lower costs compared to traditional bank loans, with more competitive interest rates and reduced transaction fees.

These thirty creative financing solutions encompass a range of innovative approaches. They include crowdfunding platforms that allow ship owners to raise funds from a large pool of individual investors, as well as equity-based financing arrangements where investors provide capital in exchange for partial ownership of the ship. Other solutions involve the use of blockchain technology to facilitate secure and efficient financing transactions, as well as the implementation of shared economy models to enable the sharing of ownership and costs of ships. By exploring and adopting these creative financing solutions, the maritime industry can unlock new growth opportunities and ensure long-term sustainability. Shipuniverse (2024).

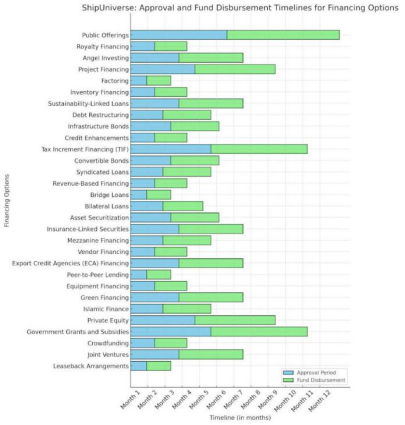


Figure 3. Approval and Funding Duration for Financing Options
Source: Shipuniverse (2024)

Table 1. Overview of Maritime Financing Options and Interest Rates

No	Financing Solutions	Description	Interest Rate Range
1	Leaseback Arrangements	The shipowner sells the boat to a financial entity and leases it back	4% - 8%
2	Joint Ventures	Some parties pool resources for the purchase and operation of ships	No interest rate involved
3	Crowdfunding	Capital is raised through small contributions from a large number of investors	Does not involve interest payments

4	Government Grants and Subsidies	Government grants and subsidies to support maritime activities	Interest-free
5	Private Equity	Investors invest capital directly in shipping companies	No interest rates, involving the sale of equity
6	Islamic Finance	Provide a structure that complies with Sharia law, prohibiting interest	No interest involved, yield 3% - 6%
7	Green Financing	Loans or investments for projects that improve environmental performance	2% - 6%
8	Equipment Financing	Financing to purchase new machines or upgrade existing equipment	4% - 10%
9	Peer-to-Peer Lending	Bringing together borrowers and lenders through online platforms	5% - 15%
10	Export Credit Agencies (ECA) Financing	Providing guarantees and insurance to lenders for import-export	2% - 5%
11	Vendor Financing	Ship or equipment suppliers offer loans or deferred payments	5% - 15%
12	Mezzanine Financing	Hybrid between debt financing and equity, higher risk	12% - 20%
13	Insurance-Linked Securities	Securitization of insurance risks, including those related to maritime operations	Yields vary
14	Asset Securitization	Collecting financial assets and selling them to special purpose entities	4% - 8%
15	Bilateral Loans	Direct loans from one lender to one borrower	3% - 10%
16	Bridge Loans	Short-term financing to cover immediate costs	8% - 15%
17	Revenue-Based Financing	Loans are paid in installments based on a percentage of monthly income	A fixed percentage of revenue
18	Syndicated Loans	Some lenders pool resources to provide large loans	3% - 7%
19	Convertible Bonds	Bonds that can be converted into a predetermined number of shares	2% - 6%
20	Tax Increment Financing (TIF)	Public financing methods for redevelopment and infrastructure projects	No traditional interest rates
21	Credit Enhancements	Use various tools or agreements to improve your credit profile	Does not have a direct impact on interest rates
22	Infrastructure Bonds	Long-term securities to fund maritime infrastructure projects	3% - 6%

23	Debt Restructuring	Modifying existing debt terms to achieve profitability	Depends on the negotiation
24	Sustainability-Linked Loans	Loans that drive borrowers' commitment to achieve ESG goals	2% - 5%
25	Inventory Financing	Using business inventory as collateral for loans	6% - 15%
26	Factoring	Selling invoices at a discount to third parties for cash	Fees 1% - 5% per month
27	Project Financing	Loan structure that relies on project cash flow for payment	5% - 15%
28	Angel Investing	Individuals who provide capital for business start-ups	No interest rates, involving equity
29	Royalty Financing	Investors receive a percentage of the company's revenue over a certain period	Royalty 2% - 6% of revenue
30	Public Offerings	The company sells shares to the public to raise funds	No interest rates, involving the sale of shares

The maritime industry faces challenges in securing adequate financing to support its growth and operations. Traditional lending sources, such as banks and financial institutions, are often either insufficiently flexible or too costly for shipowners and fleet operators. However, various creative financing solutions offer attractive alternatives.

These solutions include sale-and-leaseback arrangements, joint ventures, crowdfunding, government grants and subsidies, private equity, Islamic financing, green financing, equipment financing, peer-to-peer lending, ECA financing, vendor financing, mezzanine financing, insurance-linked securities, asset securitization, bilateral loans, bridge loans, revenue-based financing, syndicated loans, convertible bonds, tax increment financing, credit enhancement, infrastructure bonds, debt restructuring, sustainability-linked loans, inventory financing, factoring, project financing, angel investors, royalty financing, and public offerings.

Each financing solution comes with its own characteristics, requirements, and range of interest rates. Ship and fleet owners must carefully evaluate which option best aligns with their needs and strategic objectives. By understanding the nuances of each method and aligning them with the operational realities of their business, ship and fleet owners can ensure robust growth and sustainability in the competitive maritime industry. Shipuniverse (2024).

Shipping Financial Models in Multiple Countries

1. Shipping Finance Model in Korea

Korean commercial banks provide a variety of financing methods for the shipping industry, mainly through guarantee systems and direct loans. They provide guarantees in the form of Standby Letters of Credit (L/C) or direct guarantees to shipping companies. For loans, banks usually channel them through a Special Purpose Company (SPC) which is specially formed to own and operate ships, separating the risk from the parent company.

Japanese trading companies, such as Mitsubishi and Sumitomo Corporation, also play an important role in financing Korean shipping. They offer a more flexible financing scheme because they are not bound by OECD guidelines, with loan coverage of up to 100% and a term of

10-15 years. The JBIC (Japan Bank for International Cooperation) program also supports Korean shipowners through a two-stage mechanism, where JBIC provides a 50% loan through the Korea Development Bank (KDB).

Leasing financing is led by KDB Capital and Shinhan Capital, which focus on small and medium-sized shipping companies with loans denominated in Korean Won. There are two main structures: BBCHP (Bareboat Charter Hire Purchase) which allows for the transfer of ownership at the end of the term, and Simple BBC (Bareboat Charter) where ownership remains in the hands of the SPC with a shorter lease period.

The ship investment program was introduced after the Asian financial crisis, inspired by the Norwegian (K/S) and German (K/G) models. In this scheme, the Special Investment Company (SIC) acts as a liaison between investors and ship operations, in collaboration with the Ship Investment Management Company for investment management. The program has successfully completed 75 transactions since its inception in 2002.

The KDB Shipping Fund Program provides a comprehensive financing structure that involves the Operating Fund as the center for fund management. The program integrates the roles of Asset Management Company and Trustee in supervision, while SPC acts as an executor who receives loans from Senior and Junior Lenders. The system creates a structured financing flow from the construction to the operation of the vessel, including BBCHP's contract with Charterer and the relationship with COA Contractor. Hyun, Y.S. (2019)

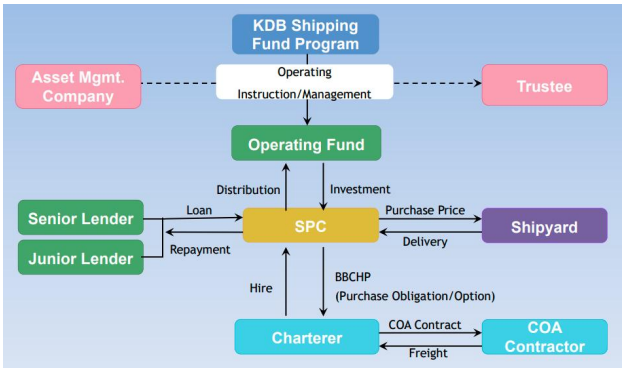


Figure 4. KDB financing scheme
Source: Hyun, Y.S. (2019)

The program is headed by the KDB Shipping Fund Program which oversees all operations through instruction and management. Under its structure, there is an Operating Fund that acts as a fund management center, with the Asset Management Company and Trustee coordinating with each other in asset management and supervision. This Operating Fund has distribution and investment relationships with Special Purpose Companies (SPC).

SPCs become the central point of various business transactions, where they receive loans from Senior Lenders and Junior Lenders with repayment obligations. SPC also has a business relationship with Shipyard through the Purchase Price and Delivery mechanism for ship building. This structure ensures an orderly flow of funds to finance the construction of ships.

On the operational side, SPC is connected to Charterer through a lease contract (hire) and BBCHP (Bareboat Charter Hire Purchase) which includes a purchase option. The charterer then establishes a relationship with the COA Contractor through a COA Contract (Contract of Affreightment), where there is an exchange of freight services. This system creates an integrated business chain between financing, construction, and operation of ships. (Hyun, Y.S. (2019))

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2. Shipping Finance Model in Malaysia

Sources of ship financing can be divided into several main categories: open market financing (through bank loans, charters, and capital markets), government sources, and regional financial institutions. Commercial bank loans are the norm with tenors between 5-7 years, although local funding tends to be scarce and expensive. Used ship financing is easier to obtain, and is usually secured by a combination of mortgages, agreements, guarantees, and assignments.

Leasing, although not widely used, is starting to gain popularity in corporate financing. The advantages include off-balance sheet treatment and reduced cost of capital, but have disadvantages such as long tenors, complex structures, and tax liabilities. Meanwhile, the capital market provides a platform to raise additional funds and raise the profile of companies, despite the high cost of listing and the risk of takeovers.

Government financing sources include the Shipping Financing Fund, maritime insurance assistance, operational subsidies, construction subsidies, scrap-and-build subsidies, tax breaks and depreciation, import duties and levies, and guarantees. Regional financial institutions such as the Islamic Development Bank (IDB), Asian Development Bank (ADB), and Japanese Bank for International Cooperation (JBIC) also play a role in financing the shipping sector.

From a bank's perspective, a strong cash flow and applicant's balance sheet are essential. Banks face challenges in controlling costs, diversifying revenue, and improving asset quality. Lending considerations include single customer limits, client/market/sovereignty due diligence, adjustment of debt services to cash flows, flag regulations, guarantees, types of registration, and industry developments. The risks involved include credit, market, time, sovereignty, security, residual value, legal, and operational risks.

Shipping companies expect banks to focus on customer relationships and service, providing long and flexible tenors, competitive interest rates, fast application processing, greater financing flexibility, having in-house shipping industry experts, and more diversified financing sources. They feel that bank support is still lacking and the requirements are too strict, especially for small shipping companies.

To bridge the gap between shipping companies and banks, understanding between the two parties is essential to encourage financing of the shipping sector. Banks need to evaluate shipping fairly, while shipping companies should try to present a strong case to qualify for financing. Loan needs must be in line with lending aspirations and find a balance in the shipping and financial markets. Dynamic shipping sector financing will create a multiplier effect for the economy. Khalid, N. (2005)

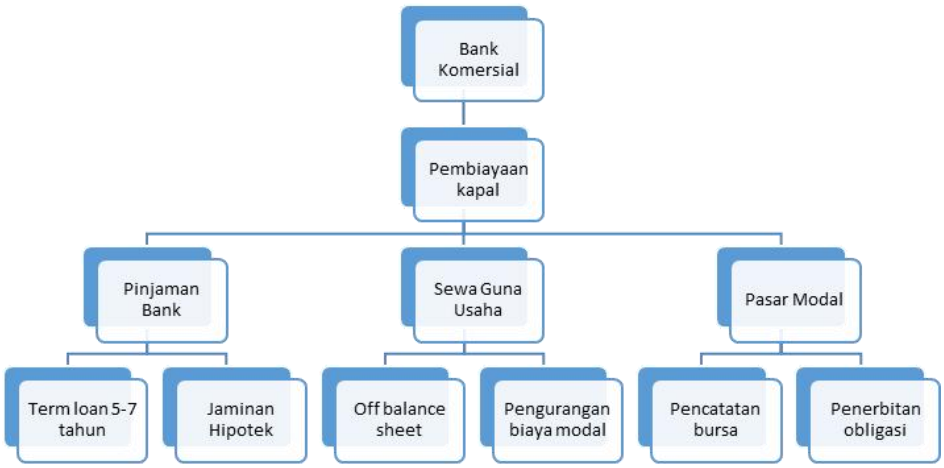


Figure 5. Shipping Financing Scheme in general in Malaysia
Source: Khalid, N (2005)

3. Shipping Financial Model in Indonesia

In the context of Indonesia's maritime industry, there are several significant challenges faced by this sector. Relatively high interest rates range from 7-12 percent per year, land acquisition costs are a burden on the private sector, and limited government financing allocations. In addition, the maritime sector (especially ships and shipyards) is not considered infrastructure, and government spending on public infrastructure such as ports, port access, and utilities (energy, electricity, water, gas) is still very limited.

As an empirical response from various maritime countries, the concept of Maritime Creative Financing was developed which involves collaboration between cargo owners, maritime operators, as well as banking and non-banking institutions. This model follows a progressive flow from a lower level of financial competitiveness, towards efficient and productive operations with responsibility for infrastructure costs, and finally unlocks and stimulates public or creative financing such as IPOs, mezzanines, and shipyard loans from domestic and international sources. All of this is done by considering the cost of basic infrastructure managed by the government through the State Budget, Regional Budget, and PNBP.

One of the shipping finance concepts that is trying to be applied is by joining financing to be one of the forces to support shipping in Indonesia. This ship financing scheme shows an integrated financing structure involving several main parties: banks that provide credit at 65%, Non-Bank Financial Institutions (LKBB) that provide leasing at 30%, and equity from shipping companies at 5%. This system is regulated through a Joint Financing & Security Agent Arrangement agreement between the Bank and LKBB, with lease and credit payments flowing from the shipping company to LKBB, then from LKBB to the Bank.

On the operational side, there is a contractual relationship between the shipping company and the Shipyard/Seller for the construction or purchase of ships, where LKBB performs a supervisory function. Meanwhile, Shippers/End Users make payments to shipping companies based on the Master Agreement Security Agent. The scheme uses bank mortgages as collateral for new ships, with interest rates that refer to PT PANN's provisions, creating a structured and

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secure financing system for the shipping industry. (Widiarto, L. & Gurning, S. (2019))

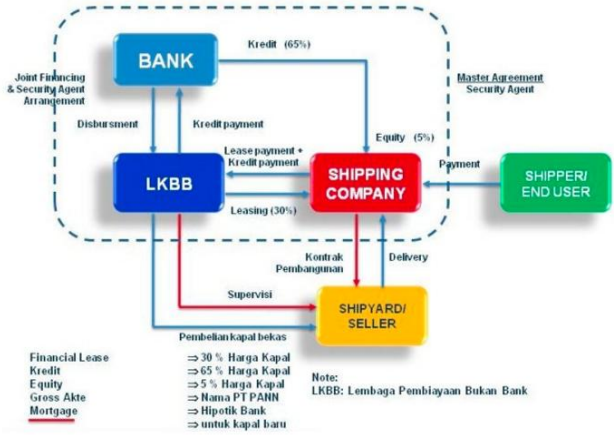


Figure 6. Shipping Financing Scheme in Indonesia
Source: Widiarto, L. & Gurning, S. (2019)

Shipping Decarbonization Financial Model
1. Poseidon Principles

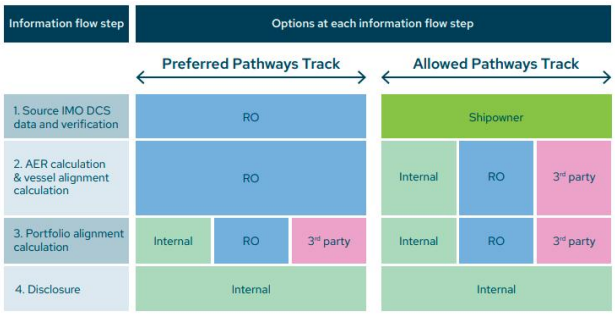


Figure 7. "Poseidon Principles" financing flow for Decarbonization

This figure shows the flow of maritime financing information divided into two main pathways: the Preferred Pathways Track and the Allowed Pathways Track. Each path has four main stages: 1) IMO DCS data source and verification, 2) AER calculation and ship alignment calculation, 3) Portfolio alignment calculation, and 4) Disclosure. At each stage, there are three implementing options: Internal (done by yourself), RO (Recognized Organization), and Third Party.

In the Primary Choice Path, the first and second stages are carried out by the RO, the third stage can be done internally, by the RO, or a third party, while the disclosure stage is carried out internally. As for the Permitted Lane, the ship owner has greater flexibility where almost all stages can be done either internally, by the RO, or by a third party, except for the disclosure stage which still has to be done internally. This structure provides a clear framework of who can carry out each stage in the maritime financing process.

2. Blue Premium Fund

The EU's Blue Premium Fund's main objective is to improve the competitiveness of alternative fuels and technologies by reducing Blue Premium, while supporting the achievement of 2030 and 2050 maritime decarbonization targets at IMO and EU levels. The fund is designed specifically for the maritime industry, in contrast to other global climate funds, and adopts best practices from various existing funding models. Its working system is based on a carbon levy that is still in the proposal stage at the IMO, with the aim of developing the maritime industry's R&D capacity and innovation in alternative technologies and fuels, as well as implementing an ESG-based carbon tax system in which companies with high ESG scores receive tax relief.

The Blue Premium Fund's innovative investment model, inspired by Israel's successful YOZMA program, represents a groundbreaking approach to maritime technology financing. By combining diverse funding sources from EU member states, philanthropic organizations, foundations, and shipping companies, the fund creates a robust investment platform that minimizes individual investor risk while maximizing potential returns. The co-investment model, which contributes 40% of total investment to qualified start-ups alongside partner investors, provides a unique risk-sharing mechanism that encourages innovation while protecting investor interests through its conditional return policy.

The fund's strategic support for academic research and innovation demonstrates its comprehensive approach to maritime sustainability. By providing financial assistance to universities, research centers, and individual researchers focused on decarbonization solutions, the fund helps bridge the gap between academic research and practical application. The integration of co-financing opportunities for Horizon Europe applications further strengthens the research ecosystem, ensuring that promising innovations receive the support needed to advance from concept to implementation.

The establishment of an independent evaluators committee to oversee R&D funding decisions ensures transparency and expertise in project selection. This oversight mechanism, combined with the fund's support for contributing companies' decarbonization initiatives, creates a self-reinforcing ecosystem that promotes both innovation and practical implementation. The comprehensive nature of this funding approach addresses multiple aspects of maritime sustainability, from early-stage research to commercial application, creating a sustainable pathway for industry transformation. (Şaşmaz, A. (2022))

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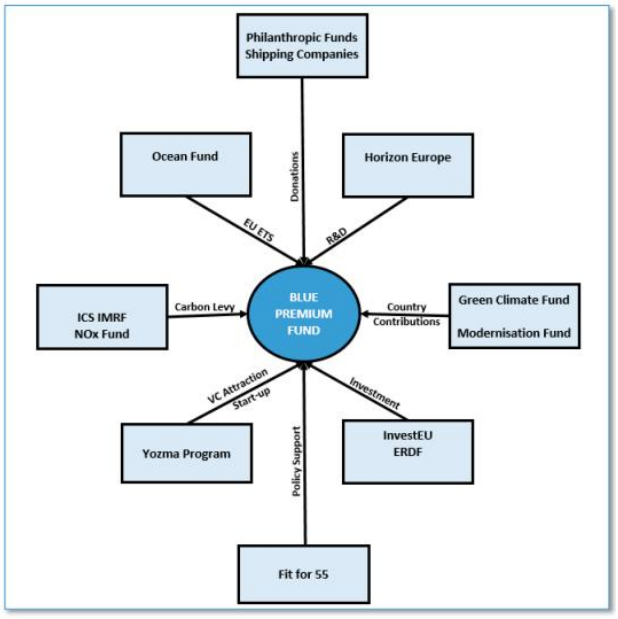


Figure 8. Blue Premium Fund Scheme
Source: Şaşmaz, A. (2022)

The Blue Premium Fund is the center of an integrated maritime funding ecosystem with various sources and supporting programs. The fund receives contributions from a variety of sources: philanthropic funds and shipping companies in the form of donations, the Ocean Fund through the EU ETS scheme, Horizon Europe for R&D funding, and the ICS IMRF NOx Fund through carbon levies. The fund is also supported by the state through the Green Climate Fund and the Modernisation Fund, and is integrated with investment programs such as the InvestEU ERDF. The Yozma program contributes to attracting venture capital and start-up investment, while the overall program is aligned with the Fit for 55 policy, which is the EU's climate policy package. This structure creates a comprehensive funding system that supports the decarbonization of the maritime sector through various financing channels and complementary programs. (Şaşmaz, A. (2022).

RESEARCH METHOD

This research uses a qualitative approach with descriptive analysis. The qualitative approach is employed to understand the complexities of financial models supporting the decarbonization of the shipping industry in Indonesia. This study is exploratory in nature, aiming to identify financial structures, stakeholder relationships, and regulatory challenges that cannot be captured through quantitative methods. The data in this study is secondary data sourced from government reports, financial institution publications, international maritime frameworks, and relevant case studies from academic journals. The data analysis technique uses a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis combined with a literature study review. Data is organized based on key themes such as financial mechanisms, regulatory challenges, and sustainability initiatives, while SWOT analysis is applied to systematically evaluate the strengths, weaknesses, opportunities, and threats associated with maritime financing models for decarbonization.

RESULTS AND DISCUSSION

Table 2. SWOT Analysis

Strengths	Weaknesses
1. Variety of Funding Sources: - Various financing options available (equity, loan/debt, government, mixed financing) - Skema join financing (bank 65%, LKBB 30%, equity 5%) - Access to regional financial institutions (ADB, IDB) **2. Supportive Institutional Structure** - National banks that understand the maritime sector - The existence of non-bank financial institutions - Support for SOEs in the maritime sector **3. Collaboration Potential** - Cooperation between cargo owners, maritime operators, and financial institutions - Development of creative financing schemes - Bank mortgage system as collateral	**1. High Financing Costs:** - High loan interest rates (7-12% per annum) - The burden of land acquisition becomes a private dependent. - High transaction fees **2. Limited Government Support** - Ships and shipyards are not considered basic infrastructure - Limited allocation of government financing - Lack of fiscal incentives for green investments **3. Regulatory Barriers** - Government-controlled regulatory rates - Complexity of requirements and procedures - Limited service model
Opportunities	**Threats**
1. Financing Innovation - Development of green financing - Implements Poseidon Principles - Adoption of the Blue Premium Fund scheme **2. International Cooperation** - Access to international financing - Collaboration with advanced maritime countries - Technology and knowledge transfer **3. Capital Market Development** - Issuance of green bonds - Development of maritime crowdfunding - Withdrawal of ESG investors	**1. Economic Risk** - Global market uncertainty - Volatility in fuel prices - Decline in demand for shipping services **2. Implementation Challenges** - Difficulty meeting decarbonization standards - Resistance to technological changes - The complexity of verification of emission reductions **3. Global Competition** - Competition with countries with more attractive financing schemes - Pressure of international environmental standards - Risk of declining competitiveness

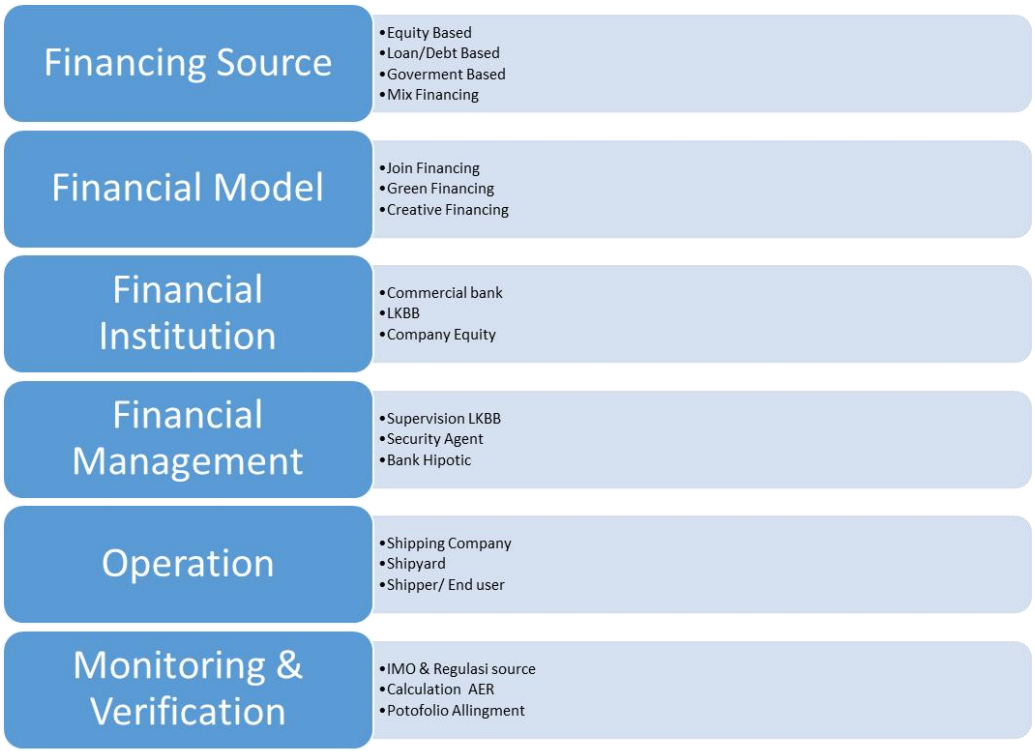


Figure 9. Decarbonization Shipping Financial Scheme

CONCLUSION

Based on the analysis that has been carried out on the financial model to support shipping decarbonization in Indonesia, it can be concluded that Indonesia has great potential in developing a financing system that supports shipping decarbonization efforts. This can be seen from the availability of various sources of financing, ranging from equity bases, loans/debts, government support, to mixed financing. The existence of a joint financing scheme involving banks (65%), LKBB (30%), and corporate equity (5%) shows that there is already a basic structure that can be further developed.

However, there are several significant challenges that need to be overcome, especially related to the high cost of financing with interest rates reaching 7-12% per year, as well as limited government support where ships and shipyards are not yet considered as basic infrastructure. Regulatory barriers and government-controlled tariffs also limit the financial flexibility of shipping companies in developing decarbonization initiatives.

On the other hand, there is a great opportunity to develop financing innovations through the adoption of models such as the Poseidon Principles and the Blue Premium Fund that have been successfully implemented in other countries. International cooperation and capital market development, including the issuance of green bonds and the withdrawal of ESG investors, can be a solution to overcome existing financing limitations. However, it is necessary to be aware of global economic risks, implementation challenges, and competitive pressure from countries that have more attractive financing schemes.

For this reason, strategic steps are needed that include the development of supportive policies, innovations in financing schemes, and strengthening collaboration between various stakeholders. Policy revisions to recognize ships and shipyards as basic infrastructure, the development of fiscal incentives for environmentally friendly investments, and the simplification

of maritime financing procedures are key in supporting the decarbonization of shipping in Indonesia. By optimizing its potential and systematically addressing challenges, Indonesia can develop an effective financial model to support the transition to greener shipping.

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