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Exploring Untapped Demand in Malaysia's Shipbuilding and Ship Repair Industry

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ABSTRACT

The global SBSR industry is projected to grow by over 195 billion U.S. dollars in size by 2030 whereby East Asia remains the dominant region in shipbuilding, with China, Japan, and South Korea leading the sector, while Malaysia ranks 16th in ship built by Million Gross Tonnage globally. According to the Container Port Performance Index (CPPI) 202, the Port of Tanjung Pelepas, Malaysia rose by 12 places to take the sixth position among the top 25 ports globally. By exploring the technological trends in SBSR, nine (9) key areas of innovations that led to sustainability in shipbuilding are highlighted too. Although Malaysia's SBSR industry recorded an increasing number of Malaysian flag registration vessels by 19.3% in 2023 compared to 2022, however, the locally built new vessels showed a decreasing trend from 38 units to 18 units built (2020 – 2023). Finally, potential market opportunities within Malaysia's SBSR sector have been identified and addressed to tackle the declining trend of newly built vessels in the Malaysian SBSR sector.

1. Introduction

Several key aspects of the Shipbuilding and Ship Repair (SBSR) industry are addressed in terms of economic, and global trends. It discusses the analysis of global trade trends impacting the global SBSR industry and the economic and geopolitical factors that shape international markets. By exploring the technological trends in SBSR, the innovations in driving efficiency and sustainability are highlighted too. In addition, this paper provides an overview of the current state of Malaysia's SBSR industry detailing its performance, infrastructure, and challenges. Finally, it identifies potential market opportunities within Malaysia's SBSR sector, focusing on untapped demand and growth areas to enhance Malaysia's position in the global market.

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2. Global Trade Trend Shaping International Markets

In 2020, the global shipbuilding market was valued at $142.52 billion and is expected to increase by a compound annual growth rate (CAGR) of around 3.2 per cent between 2020 and 2030. Looking ahead, the market is forecasted to grow steadily, with projections estimating it will reach a market size of nearly 152 billion U.S. dollars in 2022 and is projected to increase to over 195 billion U.S. dollars in size in 2030 [1].

Despite challenges in the shipbuilding market, major markets are actively striving to steer growth. In Korea, the government is implementing various initiatives to bolster the shipbuilding industry, which is seeing increased orders for companies within the nation. In recent years, there has been a notable shift in the shipbuilding industry towards adopting 3D printing technologies, also known as additive manufacturing. This trend mirrors broader trends in manufacturing and engineering, where industries are embracing cutting-edge technologies to enhance their capabilities. Companies in the shipbuilding sector are collaborating with other stakeholders to integrate advanced manufacturing technologies like 3D printing into their operations.

Moreover, East Asia remains the dominant region in shipbuilding, with China, Japan, and South Korea leading the sector. In 2022, China secured more than half of all global shipbuilding orders, solidifying its position as a powerhouse in the industry. In contrast, Southeast Asia, particularly Bangladesh, India, and Pakistan, plays a significant role in ship scrapping activities, accounting for nearly 90% of global ship scrapping.

At present, the Asia-Pacific region dominates the global shipbuilding industry, led by countries such as China, South Korea, and Japan. This leadership is bolstered by distinct advantages such as lower labour costs, strong governmental support, and well-established connections between industries upstream and downstream. Given the high capital requirements of shipbuilding, political stability and substantial government backing are crucial for sustained operations in this sector. Key participants in the global shipbuilding market include BAE Systems PLC, Damen Shipyards Group, Fincantieri Group, General Dynamics Corporation, Huntington Ingalls Industries, Korea Shipbuilding & Offshore Engineering, Mitsubishi Heavy Industries, Oshima Shipbuilding Co. Ltd, Samsung Heavy Industries, and Sumitomo Heavy Industries [1].

Figure 1 shows in 2022, China, South Korea, and Japan emerged as the leading shipbuilding nations. China alone completed ship constructions amounting to approximately 36.7 million gross tonnage, with CSSC (China State Shipbuilding Corporation) spearheading the shipbuilding efforts. This is followed by South Korea achieving 23.7 million gross tonnage and Japan nearly approaching 15.6 million gross tonnage [2].

Together, the shipbuilding activities of these three countries accounted for about 85% of the global total. China, South Korea, and Japan maintained their dominance in the maritime ship supply market, holding a 94% market share in 2022. While shipbuilding in China increased by 15.5% and in South Korea by 8.3% over the past year, it declined by 16.4% in Japan. In June 2022, South Korea placed orders for 70% of the alternative fuel-capable ships, while China accounted for 26%, Europe for 58%, and Japan for 17%. South Korea held a majority share of 64% in gas carriers and 42% in oil tankers, while Japan accounted for 45% of chemical tankers. Cargo vessels remain the preferred choice for trading activities.

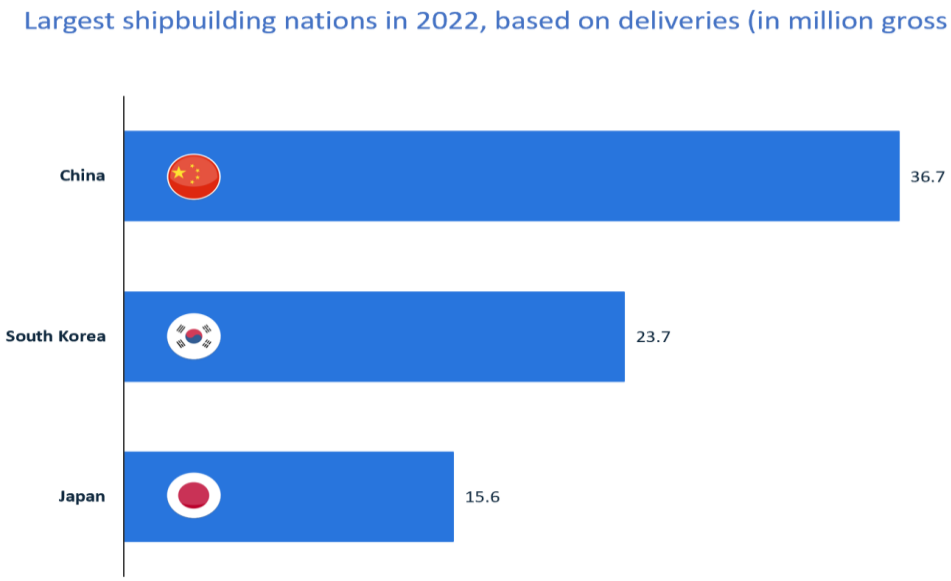


Fig. 1. Ranking of shipbuilding nations in 2023 [2]

In the second quarter of 2023, the most connected economies, as measured by the Liner Shipping Connectivity Index (LSCI), were in Asia. China led the ranking, followed by South Korea, Singapore, and Malaysia. These countries experienced a year-on-year increase in connectivity of between 3% and 5%, reaching record highs in their index values.

Asian countries also continue to excel in cargo handling performance. According to the Container Port Performance Index (CPPI), produced by the World Bank and S&P Global Market Intelligence, 18 of the top 25 ports globally are in Asia, with 11 located in Eastern Asia and four in Western Asia [3]. The Port of Tanjung Pelepas, Malaysia rose by 12 places to take the sixth position in the CPPI 2022 as shown in Figure 2.

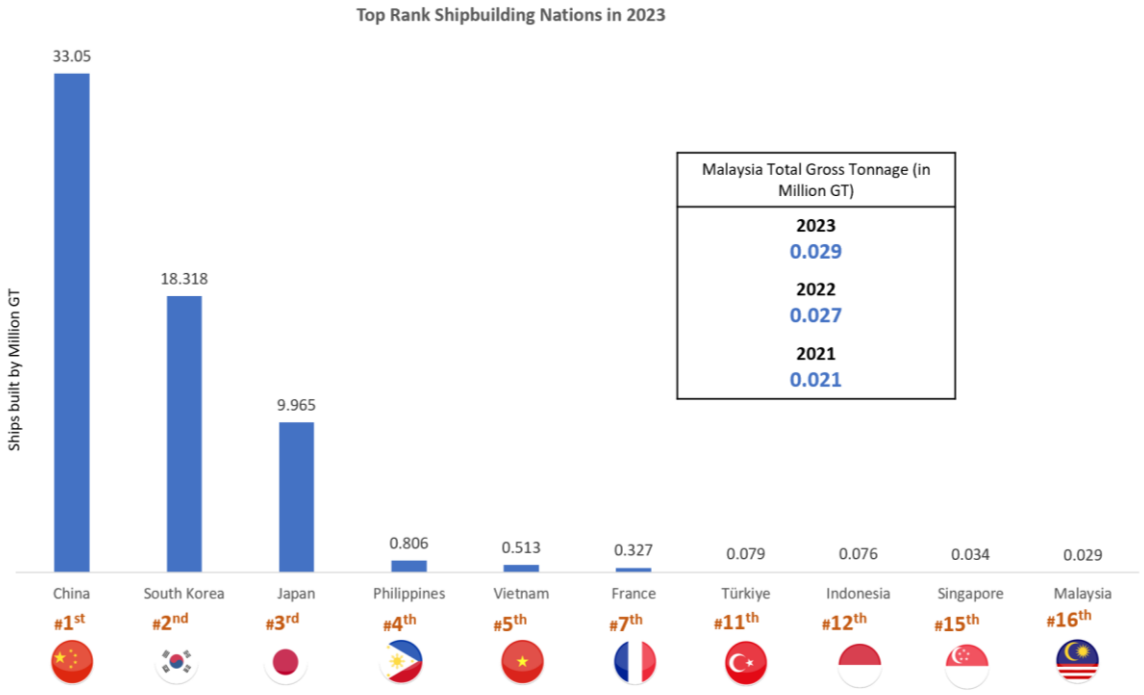


Fig. 2. Ranking of shipbuilding nation in 2023 [2]

Global shipbuilding capacity has indeed been on a decline since 2013 but is expected to rebound starting in 2023, reaching approximately 44 million Compensated Gross Tons (CGT) by 2026 as shown in Figure 3. The majority of the world's shipbuilding capacity is concentrated in Asia. In 2020, shipyards in China, South Korea, and Japan collectively produced about 86 per cent of all ships. This dominance is attributed to their advanced infrastructure, technological capabilities, and substantial investments in the shipbuilding sector.

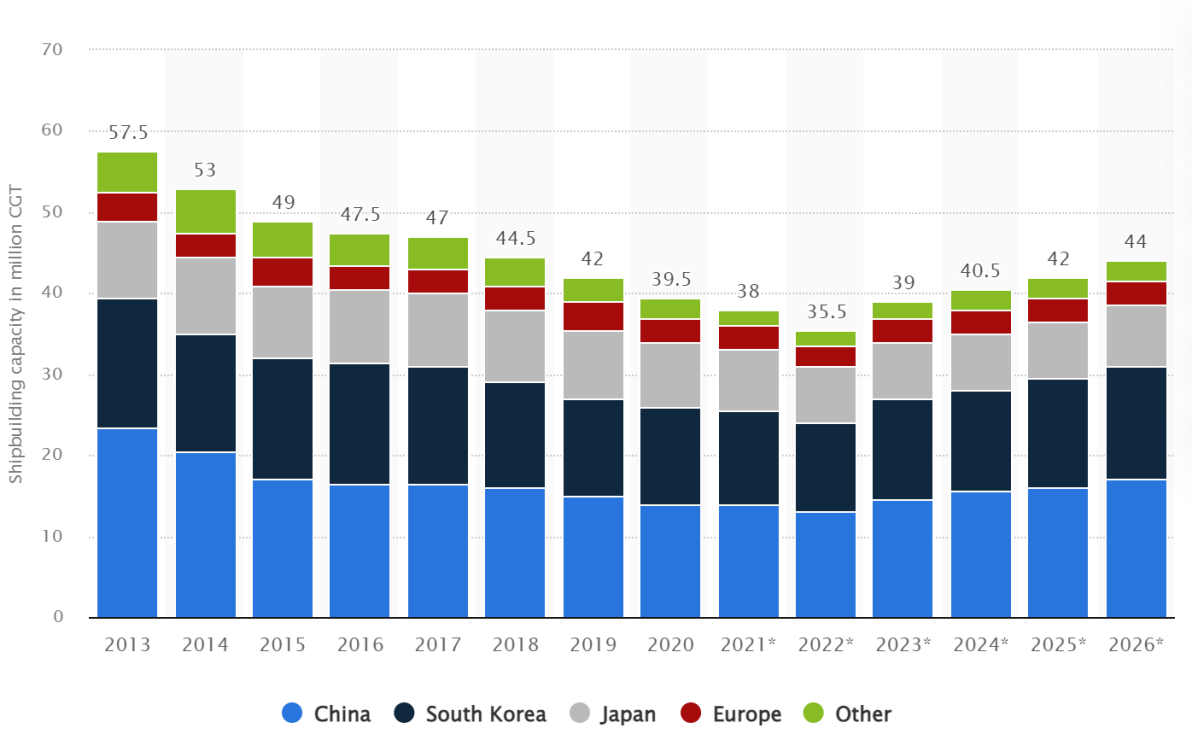


Fig. 3. Global shipbuilding capacity forecast for 2021 through 2026, by country (in million CGT) [3]

Referring to global new delivery vessels in 2021 (Figure 4), bulk carriers made up 35 per cent of the shipbuilding industry's total output, totalling nearly 60.8 million gross tons. Oil tankers accounted for 22 percent of production with about 13.6 million gross tons delivered. Bulk carriers are the largest segment in terms of tonnage, with around 13,000 in the world merchant fleet as of January 2022. The global shipbuilding industry completed bulk carriers with a combined gross tonnage exceeding 21 million in 2021, making them the largest category of vessels delivered by gross tonnage.

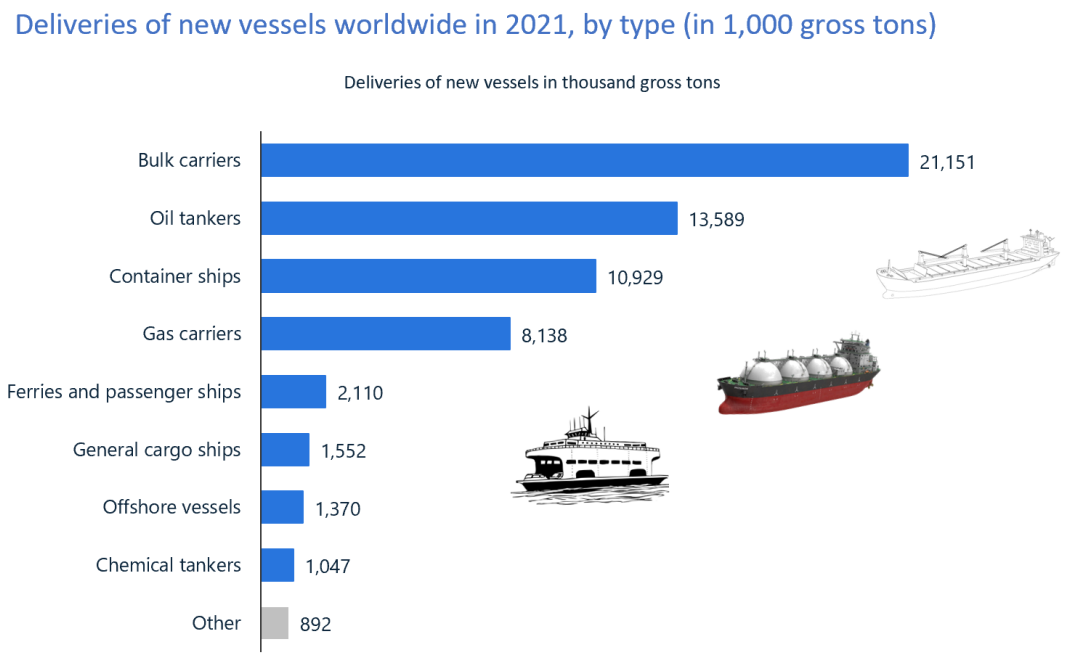


Fig. 4. Deliveries of new vessels worldwide in 2021[3]

Figure 5 below lists the current trend in shipbuilding innovations in 2024. There are nine (9) key areas of innovation involved such as advanced robotics, immersive technology, green ship, additive manufacturing, cybersecurity, artificial intelligence, advanced materials, design optimization and IoT. At the current moment, 1617 startups and emerging companies have participated in the shipbuilding innovations as reported by StartUs [4].

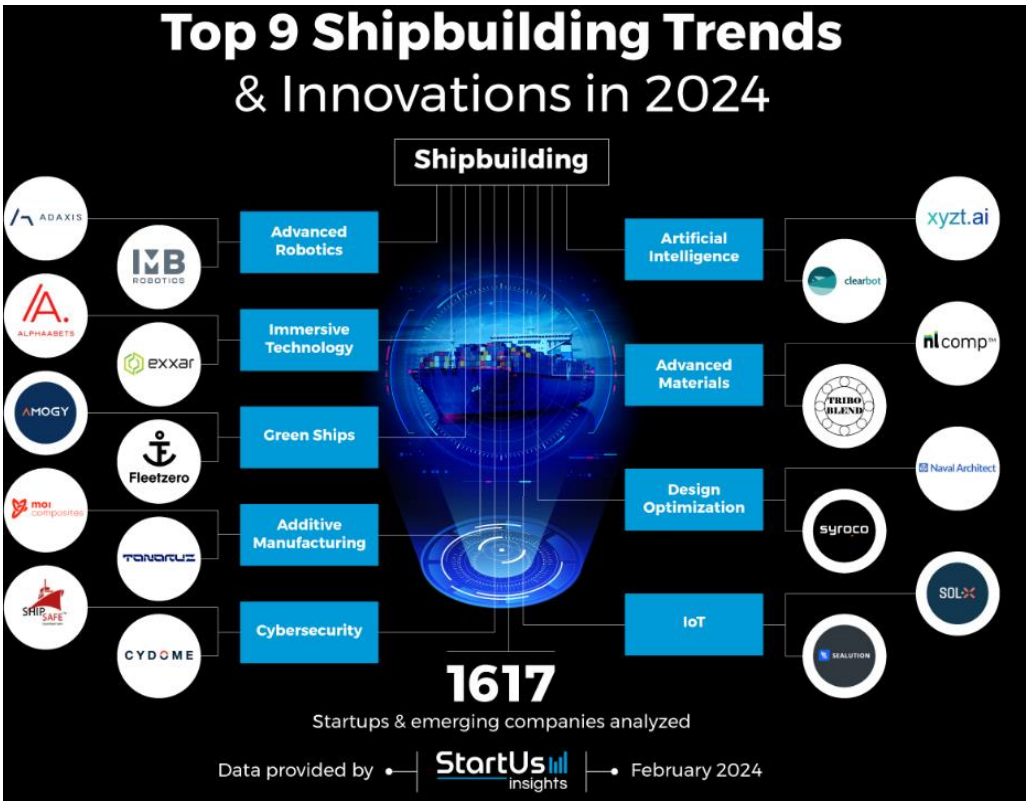


Fig 5. Innovations in shipbuilding in 2024

In 2024, the shipbuilding industry is witnessing significant trends driven by sustainability and technological advancements. A strong focus on eco-friendly practices is evident, with shipbuilders increasingly using biofuels and recyclable materials. For example, Aker Solutions is exploring bio-based coatings that minimize environmental impact. Additionally, the integration of automation and artificial intelligence, such as Wärtsilä's AI algorithms for optimizing fuel consumption, is enhancing operational efficiency. Digital twin technology is also making waves, with companies like Kongsberg creating virtual replicas of vessels to monitor performance and predict maintenance needs, ultimately leading to improved design and reduced downtime.

Moreover, modular construction is transforming production processes, as seen with Fincantieri's approach to building cruise ships, which shortens build times and lowers labour costs. The shift toward hybrid and electric propulsion is exemplified by Color Line's new electric ferries, significantly cutting emissions. Smart shipping solutions utilizing IoT devices, such as those implemented by Maersk for real-time container tracking, further enhance fleet management. Advanced materials like carbon fibre are being adopted to improve vessel performance, while cybersecurity measures from DNV GL ensure the protection of maritime systems. Lastly, innovative technologies like ABB's exhaust gas cleaning systems help vessels comply with stringent regulations, reflecting the industry's commitment to sustainability and efficiency. These trends illustrate a shift toward innovation, efficiency, and sustainability in the shipbuilding industry.

3. Malaysia SBSR Industry Activities

Current Malaysia SBSR industry activities are supply chain is divided into three (3) major groups that are ship owner & operator group, production & construction group and support group. Maritime authorities will regulate and implement the law and regulation on these major groups. The details on the major group and its activities supply chain as depicted in Figure 6.

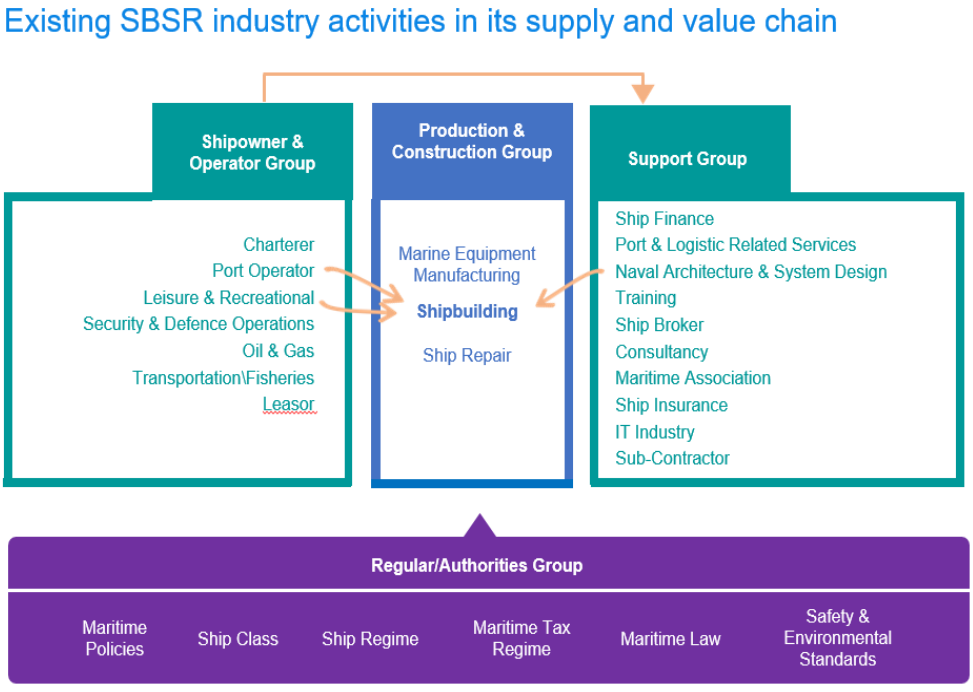


Fig. 6. Malaysia SBSR industry activities and its supply chain

At this moment, there are more than 100 shipyards in Peninsular and East Malaysia. The industry players include the shipbuilder, maintenance, repair and operation (MRO), marine part distributor and manufacturer, design house and support services. Based on the economic data from the Companies Commission of Malaysia (SSM) and MIGHT's Database [5] for the year 2021-2023 on 103 companies in Malaysia, the total revenue from shipbuilding, ship repair and ship conversion & others has been in increasing trend from RM 2.135 Billion to RM 2.777 Billion. The ship repair sector also showed promising inclining trends with revenue increases from RM 1.113 Billion to RM 1.666 Billion. This indicates that many sectors related to shipyard activities are still recovering in the post-Covid-19 pandemic.

In regards to ship import and ship export in 2023, Malaysia experienced a significant 32.3% decrease in ship imports, dropping to RM307.56 million from RM454.39 million in 2022. Among the primary items imported are rafts, tanks, coffer dams, landing stages, buoys, and beacons. Singapore, China, Mexico, and the Republic of Korea stand out as the leading source countries for these imports. Malaysia experienced a remarkable 31.5% increase in ship exports, reaching RM939.03 million, up from RM713.74 million in 2022. The primary exports mainly consist of tugs and pusher craft, with Indonesia, Singapore, Australia, and the United Arab Emirates (UAE) being the leading destinations for these exports. Figure 7 below shows the details revenue of ship import export from 2016 – 2023 [5].

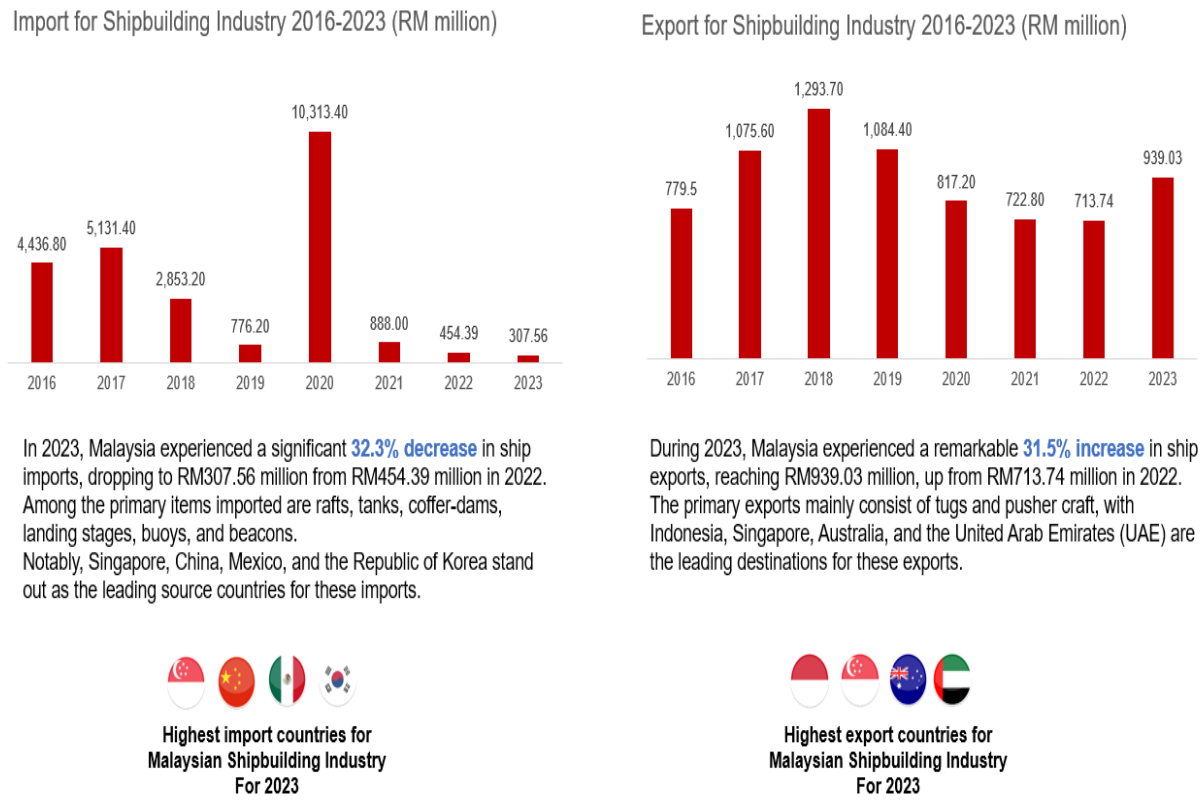
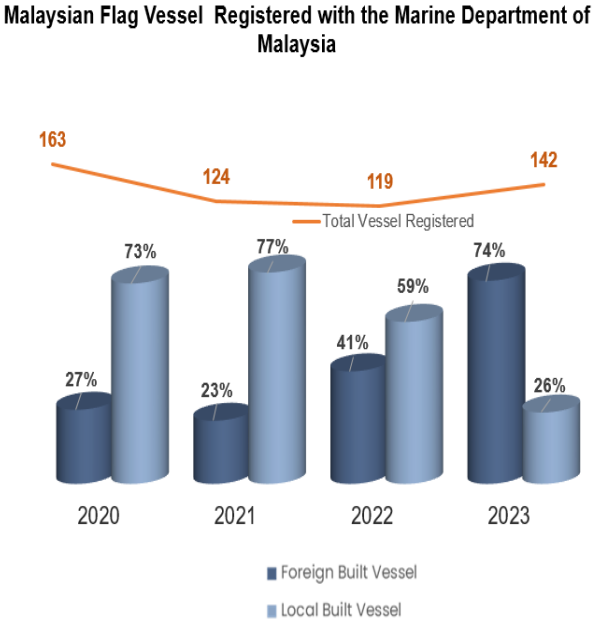


Fig. 7. Revenue from ship import export from 2016 – 2023

Statistic from the Marine Department of Malaysia [6] shows that Malaysian flag-registered vessels have an increasing trend with 142 registered vessels in 2023 after hitting a bottom number which is 119 vessels in the year 2022 as depicted in Figure 8. However, the foreign-built vessels showed an increasing trend since 2022 from 41% to 74%, while in the year 2023, the foreign-built vessels outpaced the locally-built vessels. Although the Malaysian registered flag vessels showed an

inclining trend, the local newly built vessels have declined from 2020 to 2023 from 38 newly built vessels to only 18 vessels (based on year of built and registered). The type of locally newly built vessel consists of the tanker, bulker, speciality ship, passenger ship, offshore, government vessel, near coastal ship and others. New vessels built in Sarawak have recorded a consistent trend from 2020 to 2023, this means Sarawak has become a potential hub in shipbuilding in East Malaysia.



Vessel Type Breakdown

Year of Registered with Marine Department	2020	2021	2022	2023
Type of Vessel	Year of Built (new)			
	2018-2020	2019-2021	2020-2022	2021-2023
Tanker	-	3	2	1
Bulker	-	-	-	-
Specialty Ship	5	4	1	4
Passenger	12	4	1	-
Offshore	1	4	3	8
Government Vessel	3	-	6	-
Near Coastal	12	13	8	4
Others	5	-	-	1
Total Local New Built Vessel	38	28	21	18
Built in Sarawak	68%	86%	89%	89%

Fig. 8. Malaysian flag registered vessels [6]

4. Potential Market and Opportunities for New Building Various Ship Types

In this section, opportunities for new shipbuilding in Malaysia have greatly emerged from the electric vehicle (EV) sector, trade and commodities sector and offshore support sector. Several key trends in global trade that might benefit the Malaysian market & players, include the rise in electric vehicle (EV) transportation using containers has generated significant logistical challenges in transporting vehicles and their components. In response to trade tensions between the USA and China, many companies are diversifying their supply chains, with Southeast Asia—particularly Malaysia—emerging as a key beneficiary. Additionally, the International Maritime Organization (IMO) has introduced green shipping requirements aimed at enhancing energy efficiency for new ships, including regulations to control global sulfur fuel content and reduce sulfur oxide emissions. Meanwhile, the Indonesian government is increasing its coal and nickel production targets in anticipation of high demand from major export partners like India and China, as well as the growing global need for refined nickel for EV batteries.

Opportunities for Malaysian Ship owners/Shipyards

- Container ships offer a quick solution thanks to their availability and the established global container shipping network.
- They can transport electric vehicles (EVs) efficiently, utilizing specialized containers that ensure safe transit.

- Many Malaysian companies, especially in manufacturing, electronics, and logistics, have reaped benefits from this trend.
- As more businesses opt to route their supply chains through Southeast Asia, shipping activities are increasing, resulting in higher demand for new ships and bolstering the shipbuilding sector.
- Governments and port authorities may provide incentives like tax breaks, subsidies, or preferential port access for vessels that adhere to specific environmental standards.
- These incentives motivate shipowners and operators to invest in new technologies that minimise environmental impacts, such as electric or hybrid propulsion systems.
- The booming nickel and coal mining in Indonesia is driving increased tugboat demand from Malaysia.
- Some players in Sibu are already exporting tugboats to Indonesia.

On the other hand, trade and commodities economic activities are creating significant opportunities for maritime industry stakeholders in Malaysia. In 2023, Malaysia exported 24.49 million tonnes of palm oil and palm-based products, generating RM94.95 billion, with expectations to increase export revenue to RM110 billion in 2024. The demand for offshore support vessels (OSVs) is projected to require 148 vessels for operations and 249 for drilling support in 2024, including supply vessels (PSVs), workboats, barges, and anchor handling tug supply (AHTS) vessels. Additionally, Malaysia imports coal briquettes valued at approximately $5.20 billion, primarily from Indonesia, Australia, Russia, South Africa, and China, utilizing bulk carriers for transportation. To enhance efficiency, Malaysia is also adopting a Malaysia Maritime Single Window (MMSW) system aimed at reducing administrative burdens and facilitating smoother cargo movements.

Opportunities for Malaysia's Shipping and Shipbuilding Industry:

- Currently, the majority of the tankers transporting palm oil and palm-based products are not Malaysian-flagged vessels, presenting an opportunity for local ownership and construction.
- The Safina Project II will create opportunities for the local construction of Offshore Support Vessels (OSVs), helping to reduce the average age of these vessels in Malaysia.
- Shaping Malaysia's niche area as the shipbuilders that have successfully exported OSV type of vessel globally.
- The bulk carrier sector, which has been overlooked, offers significant potential, supporting industries such as manufacturing, agriculture, and mining through the import and export of essential raw materials.
- The MMSW system at Port Klang will enhance port operations by streamlining coordination and communication, attracting more container ships, and improving overall efficiency. This seamless integration will not only reduce delays and ensure timely maintenance but also create new opportunities for local shipyards to attract container vessels for repairs and services, further minimising downtime and boosting operational reliability.

5. Conclusions

By advancing technological trends, promoting sustainability, and fostering collaborative ecosystems, the shipbuilding sector is adapting to modern challenges. However, Malaysia needs larger and more advanced shipyards, especially in Peninsular Malaysia, Sabah, and Sarawak, to meet the growing demand for bigger vessels and unlock regional opportunities.

The rapid expansion of EVs, semiconductors, and electronics industries—alongside thriving palm oil, mining, agriculture, and upstream petroleum sectors—provides significant growth potential for the shipbuilding and ship repair (SBSR) industry. By enhancing shipyard infrastructure across both Peninsular Malaysia and East Malaysia, the country can strengthen its position as a maritime hub, attract more international shipping activities, and drive sustainable growth. These efforts will also ensure that Sabah and Sarawak can benefit from increased regional trade and maritime activity, creating a more balanced economic development across the nation.

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