Reviews of Shipbuilding Economies

Peer Review of the Japanese Shipbuilding Industry 2026

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Foreword

In 2012, the OECD Shipbuilding Committee introduced a Peer Review process to examine government policies and support measures affecting the shipbuilding industry. This process involves in-depth reviews of the shipbuilding sectors of participating economies and provides a structured platform for sharing experiences, promoting transparency, and identifying practices that shape competitiveness in the global shipbuilding market. While primarily focused on Shipbuilding Committee members, the process also welcomes participation from non-member economies, either as observers or as subjects of review. The Peer Reviews combine policy analysis with detailed industry context and are enriched through active discussion and feedback among Committee participants.

In 2024 and 2025, Japan is subject to an ad hoc Peer Review, following earlier reviews of Japan (2012), Portugal (2013), Korea (2014), Germany (2015), Norway (2016), Finland (2017), the Netherlands (2019), Türkiye (2021), several EU member states including Croatia, Denmark, Italy, Poland, Romania (2023), the Philippines (2025) and the United Kingdon (2025).

The main goal of the peer review process was to identify government policies, practices, and measures affecting the shipbuilding sector. However, given the increased transparency **of** support measures **under** the new Inventory procedure, the members agreed at the April 2022 meeting that peer reviews from 2024 onwards would focus on industry and market topics. In this context, Japan's second peer review focuses on these industry and market dynamics, reflecting the rapidly evolving global landscape and policy environment.

This report is based on multiple sources, including publicly available data, statistical series accessible to the Secretariat, Japan's official response to the Peer Review questionnaire, and stakeholder consultations conducted during the OECD's fact-finding mission to Japan in December 2024, as well as consultations with selected stakeholders and the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) of Japan.

The report provides a timely and comprehensive assessment of the shipbuilding sector in Japan. It primarily covers shipbuilding and marine equipment manufacturing in Japan. The report is structured in three parts:

1. a global perspective to situate the Japanese shipbuilding industry within international market trends;
2. a detailed overview of the structure and characteristics of the Japanese maritime industry; and
3. an assessment of its competitiveness, including a SWOT analysis and a comparative analysis between Japan and Korea.

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The Secretariat extends its gratitude to Yasufumi Onishi, Kazushige Iwamoto, and all colleagues from the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) of Japan for their outstanding collaboration throughout the peer review process. Their support during the mission to Japan and constructive feedback during the drafting phase were instrumental to the success of the peer review process and report.

Executive summary

Trends and overview of the Japanese shipbuilding industry

In the early 2020s, global shipbuilding completions and orders rebounded moderately from the mid-2010s downturn, but levels remained well below the 2008–2011 peak. Japan's share of global completions and orders gradually declined to around 11% in 2024, maintaining its position as the third-largest shipbuilding nation after China and Korea. Despite this reduction, Japanese shipbuilders retain strong positions in high-value and technologically advanced vessels, including LNG-fuelled, methanol-ready, and hybrid-propulsion ships, supported by high engineering capacity and rigorous quality standards.

Addressing challenges through digital and green innovation

The Japanese government and shipbuilding sector are working together to strengthen the industry's competitiveness through technological innovation, digital transformation, and decarbonisation. Japan is promoting the development of next-generation and zero-emission vessels, while shipbuilders are enhancing productivity through automation and advanced design technologies. At the same time, the industry is seeking to secure skilled workforce, restructure supply chains, and improve operational efficiency to sustain its position to strengthen its position in the global shipbuilding industry.

Japan's shipbuilding sector continues to face structural cost disadvantages, notably higher labour, land, and energy costs compared with neighbouring competitors. The prolonged appreciation of the yen during the 2010s eroded export competitiveness; however, recent yen depreciation has partially offset these pressures. Japanese yards have responded by shifting toward smart manufacturing and automation, integrating modular construction and digital shipyard management systems to enhance productivity without expanding physical capacity.

Following the global financial crisis, Japan's orderbook and completions contracted sharply as trade slowed and ship finance tightened. The sector underwent extensive restructuring and consolidation, particularly among mid-sized yards, while leading builders—Imabari, Mitsubishi, and Tsuneishi—maintained output in bulkers, PCCs, and LNG carriers. Through the 2020s, Japanese shipbuilders further diversified into dual-fuel, methanol-capable, and energy-efficient designs, aligning with global decarbonisation trends and ESG-linked investment criteria.

The Japanese marine equipment industry remains a key pillar of industrial competitiveness, characterised by high domestic integration (≈92%), technological leadership, and export strength in diesel engines, outboard motors, propulsion control systems, and energy-saving devices. In 2024, total production value reached JPY 470 billion, with diesel engine output alone valued at JPY 264 billion. Japan's exports of outboard motors and reciprocating engines account for more than 80% of total marine equipment exports, primarily destined for the United States, Southeast Asia, and Europe.

Sustainability, labour, and government support

Japan is pursuing a comprehensive green transition strategy, anchored in the Green Growth Strategy toward Carbon Neutrality by 2050 and the Green Innovation Fund supporting research, development, and demonstration of next-generation vessels. Public programmes promote R&D on hydrogen- and ammonia-fuelled propulsion, fuel-conversion systems, and autonomous operations, ensuring Japan's continued leadership in clean maritime technologies.

Labour dynamics remain a structural concern. Total shipbuilding employment fell from over 90 000 in 2016 to 70 300 in 2023, with foreign workers now representing 5–10% of the workforce—primarily from the Philippines, Indonesia, and Viet Nam. While the share of skilled and design staff has increased, the inflow of younger workers has slowed, posing challenges for long-term labour sustainability.

Japanese repair yards maintain stable activity levels, primarily serving domestic clients. Between 2018 and 2024, over 96% of repairs were commissioned by Japanese owners. Although energy-saving retrofits remain limited, notable progress includes the world's first ammonia-propulsion conversion in 2023 by Keihin Dock Co., demonstrating Japan's capability in advanced retrofitting and alternative-fuel integration.

The shipbuilding industry continues to play a pivotal role in Japan's manufacturing base and export performance. The sector contributes to regional economies through dense industrial networks in Hiroshima, Ehime, and Nagasaki prefectures, closely linked with the marine equipment, steel, and logistics industries. Japan's long-term industrial vision emphasises digitalisation, decarbonisation, and global competitiveness, aiming to secure sustainable growth through innovation and international collaboration.

The Japanese government actively supports these goals through Ministry of Land, Infrastructure, Transport and Tourism (MLIT) policies focusing on technological innovation, ship finance facilitation via Japan Bank for International Cooperation (JBIC) and Nippon Export and Investment Insurance (NEXI), and collaborative frameworks between industry and academia. Strategic initiatives such as the Smart Ship Project, Zero Emission Ship Project, and Maritime DX Consortium highlight Japan's efforts to combine engineering excellence with green and digital transitions.

Competitiveness of the Japanese shipbuilding industry

The SWOT analysis for the Japanese shipbuilding industry is presented in Chapter 5, outlining Japan's strengths in engineering and technology, weaknesses in cost structure and labour pipeline, opportunities in alternative-fuel markets, and threats from global overcapacity and intensified regional competition. The analysis highlights Japan's strong technological base and stable industrial ecosystem but also underscores structural challenges such as high production costs and workforce constraints. It suggests that Japan's future competitiveness will depend on accelerating innovation and adapting to the global transition toward green and digital shipbuilding.

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1 Global perspectives: Overview of the world market

This chapter examines the status and strategic direction of Japan's maritime sector, focusing on three primary dimensions: market performance in shipbuilding, the resilience of the marine equipment industry, and emerging market trends driven by decarbonisation and digital transformation. It analyses Japan's standing as the world's third-largest shipbuilding nation and how it maintains competitiveness in high-value-added segments despite structural cost challenges. Furthermore, the chapter explores the strategic integration of the marine equipment industry and evaluates the impact of government-led green initiatives, such as the Green Innovation Fund, alongside the critical challenges of labour shortages and shifting innovation leadership in the global landscape.

1.1. Shipbuilding

Key Findings

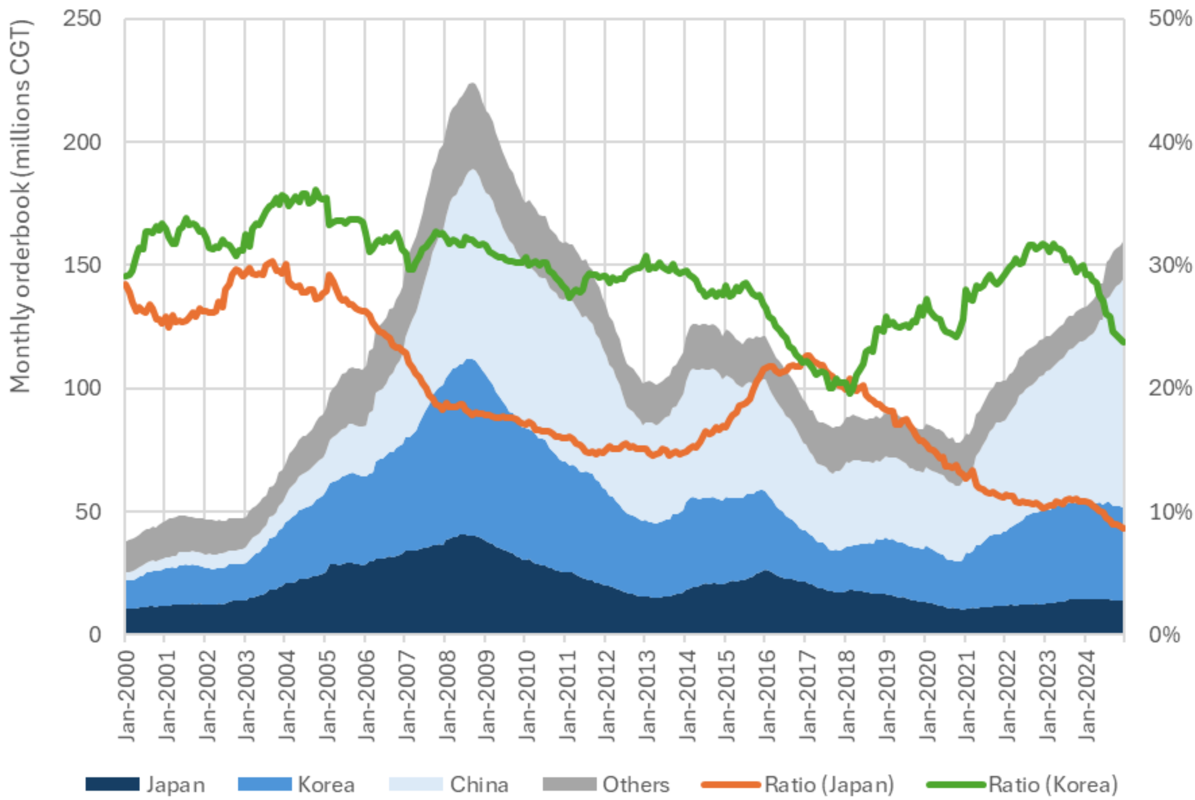
- **Global shipbuilding completions and orders rebounded modestly in the early 2020s after a mid-2010s trough but stayed well below the 2008–2011 peak**. The recovery was driven by post-COVID demand, logistics improvements, and environmental regulation which accelerates ship replacement.
- **Japan’s share in global ship completions and orders has gradually declined**, yet the country retains a significant position in advanced vessel segments, particularly those requiring high regulatory compliance or specialised technical capabilities.
- **In terms of compensated gross tons (CGT)-based completions, Japan accounted for approximately 11% of the global total in 2024**, maintaining its position as the third-largest shipbuilding nation after China and Korea. Although this share is below historical levels, Japanese shipbuilders maintain stable capacity utilisation due to sustained domestic demand and orders from quality-focused international shipowners.
- **Japan’s shipbuilders continue to face structural cost disadvantages, primarily due to higher labour expenses, land prices, and energy costs relative to China and Korea**. Additionally, the strong yen in earlier periods further undermined export price competitiveness, although recent depreciation of the Japanese Yen (JPY) has provided some relief.
- **Japan remains competitive in high-value-added vessels by offering strong engineering capacity, quality control, and delivery reliability**. Its shipyards are trusted for complex orders where compliance and lifecycle performance matter more than cost.

1.1.1. Orderbook

Japan remains one of the world’s three leading shipbuilding nations, alongside China and Korea. Its shipyards maintain a stable orderbook supported by sustained demand for technologically advanced and environmentally compliant vessels.

Figure 1.1 traces the evolution of the global shipbuilding orderbook, with reference to Japan’s relative market share and strategic positioning. In the mid-2000s, the global orderbook reached an all-time high, driven by sustained global economic expansion, China's accelerated industrialisation, and increased seaborne trade. During this period, Japan held a considerable share of the orderbook, supported by international demand for its high-quality bulk carriers and tankers.

Figure 1.1. Global orderbook development



Source: (Clarksons World Fleet Register, 2024[1]).

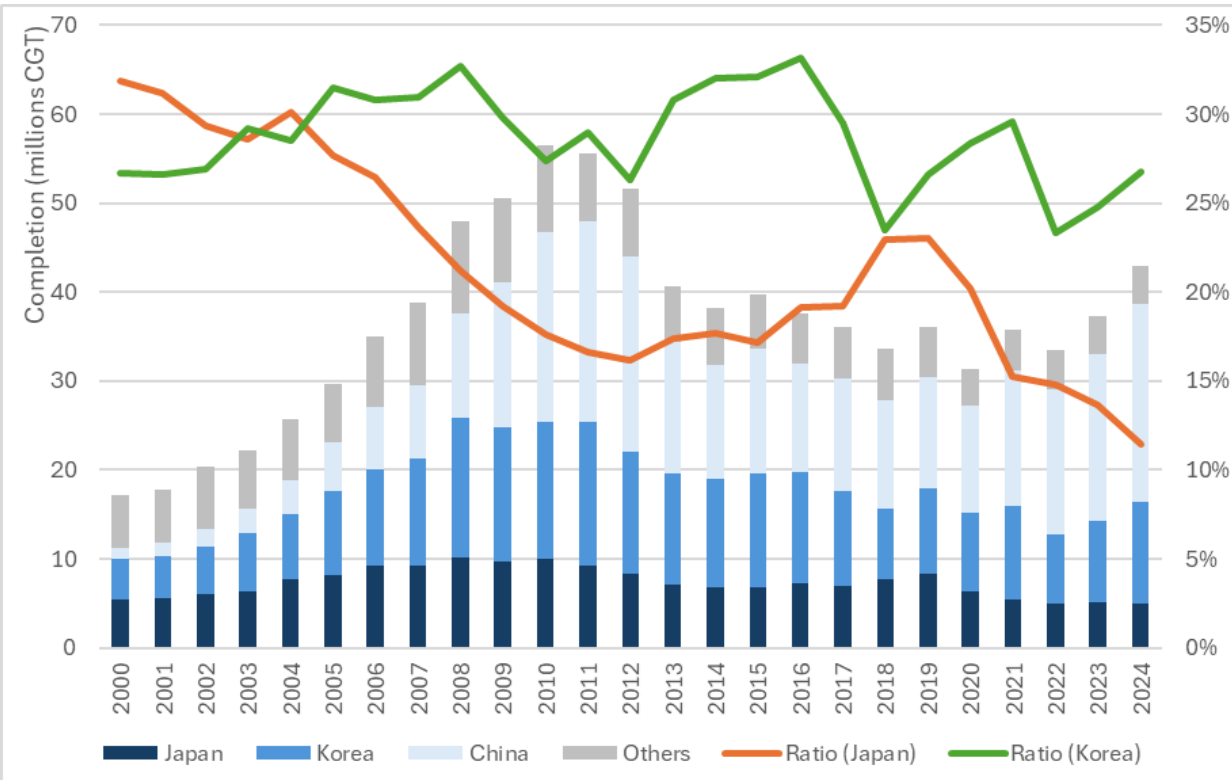
The 2008 global financial crisis marked a pivotal downturn for the shipbuilding industry. The collapse in global trade led to widespread cancellations and a sharp decline in new orders. Japan, like other major producers, experienced a significant contraction in order intake. Several mid-sized Japanese yards were forced to restructure, shift to ship repair, or pivot toward offshore and non-commercial sectors. This period also marked the beginning of the gradual erosion of Japan's global market share, as China leveraged cost advantages and rapid yard expansion to dominate the volume segment. Throughout the 2010s, the global orderbook remained largely stagnant. Japanese builders shifted focus toward high-specification and technologically advanced vessels, such as LNG carriers and energy-efficient ship designs.

In the early 2020s, the orderbook experienced a modest recovery following pandemic-related disruptions. Fiscal and trade stimulus—particularly from e-commerce-driven logistics—revived demand for new tonnage. Concurrently, environmental policy developments, such as the IMO GHG strategy and ESG-linked investment trends, accelerated orders for dual-fuel and alternative fuel-capable ships. Japan responded by reinforcing its position in high-value-added segments. Several yards secured contracts for methanol-ready vessels, and public funding—particularly through the Green Innovation Fund—supported R&D on hydrogen- and ammonia-fuelled designs. Although Japan's output remained below China and Korea, its technological strengths in clean propulsion and retrofit solutions ensured continued relevance in the evolving market landscape.

1.1.2. Completions

Figure 1.2 presents trends in global shipbuilding completions, measured in compensated gross tons (CGT). The figure also highlights Japan's relative industrial output and its strategic adaptations in response to evolving market conditions.

Figure 1.2. Global completion volumes



Source: (Clarksons Research, 2025[2]).

In the mid-2000s, global completions increased steadily, driven by a surge in new orders between 2003 and 2007 amid strong global economic growth and rising seaborne trade. Japan was the world's second-largest shipbuilder after South Korea, with completions peaking at approximately 10 million CGT during 2008–2010. Japanese shipyards, particularly Imabari, Mitsubishi, and Tsuneishi, operated at full capacity, supported by strong demand for bulk carriers and tankers from Greece, Germany, and Southeast Asia.

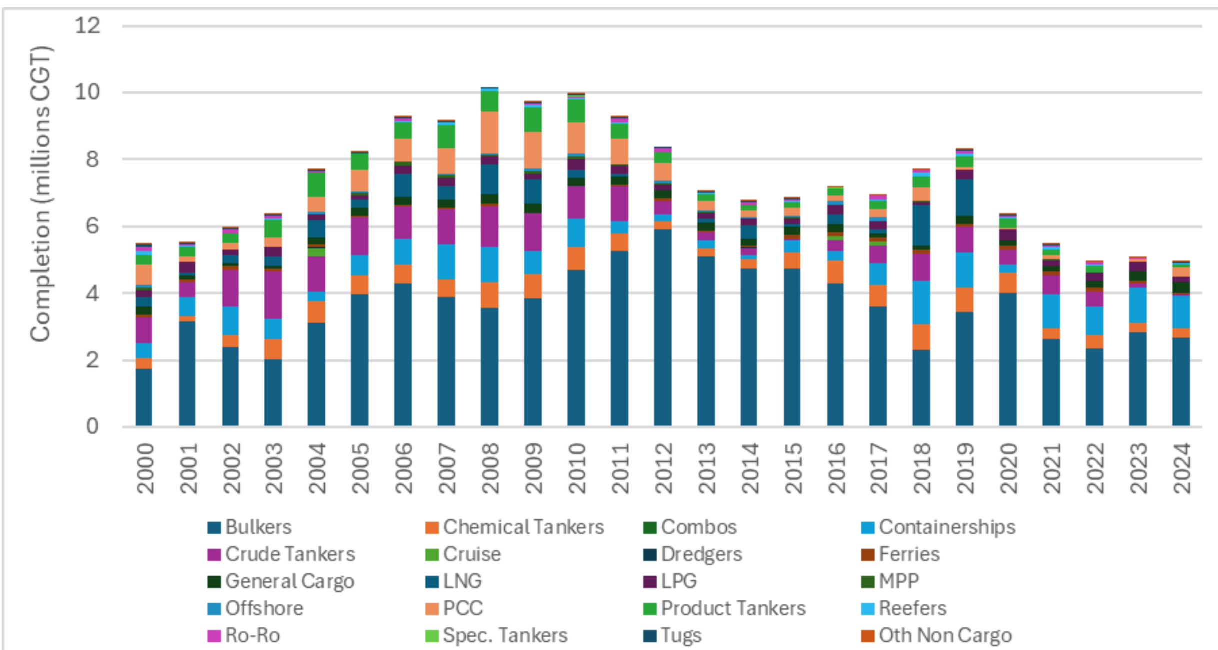
Following the 2008 financial crisis, completions began to deviate from prior trends due to a contraction in trade and restricted access to ship finance. Japan experienced a notable decline in export deliveries. By 2012, completions had declined to around 8.4 million CGT. Unlike China, which responded with domestic stimulus and subsidised credit, Japanese yards avoided price competition and focused on risk mitigation through output adjustments.

From 2013 to 2018, global completions declined further as pre-crisis backlogs were cleared, and new contracting activity remained limited. Oversupply in dry bulk and container ship segments exacerbated pressure on yard utilisation. In Japan, annual completions ranged between 6.8 and 7.2 million CGT, with several mid-sized yards undergoing consolidation or shifting toward offshore and repair markets. Concurrently, Japanese yards became increasingly dependent on domestic owners, as international orders migrated to producers in China and Korea.

By the late 2010s, the rate of decline slowed, and the global market began to stabilise. Regulatory developments—such as the Ballast Water Management Convention (2017) and the IMO's Energy Efficiency Design Index (EEDI)—generated demand for compliant new-buildings and retrofits. Japan, known for high technical standards and regulatory conformity, leveraged this trend to secure orders for higher-standard vessels. The industry also increased investment in automation, precision manufacturing, and energy-saving technologies.

In the early 2020s, global completions saw a modest rebound following COVID-19-related disruptions. A recovery in trade, particularly in container shipping and logistics, drove the fulfilment of deferred orders. According to Clarksons WFR, Japanese completions totalled approximately 5.5 million CGT in 2021 and 5.0 million CGT in 2022. While these volumes remained below historical peaks, the technological complexity of delivered vessels improved, including LNG-ready bulkers, methanol-capable feeders, and ships equipped with energy-saving technologies (EST).

Figure 1.3. Proportion of vessel type in Japan, 2005-2024



Source: (Clarksons World Fleet Register, 2024[1]).

Figure 1.3 shows how Japan's shipbuilding portfolio evolved from 2005 to 2024 in response to global trade, regulatory, and technological shifts. In the mid-2000s, over 60% of completions were bulk carriers and crude oil tankers, driven by China's industrial growth (Gourdon, 2019[3]).

Post-2008, Japan's orders declined sharply. In response, shipbuilders diversified into technologically advanced and environmentally compliant vessels, supported by government policy. During the 2010s, production shifted toward feeder containerships, PCCs, Ro-Ro ships, and LNG carriers, reflecting changes in logistics and demand for complex ship types.

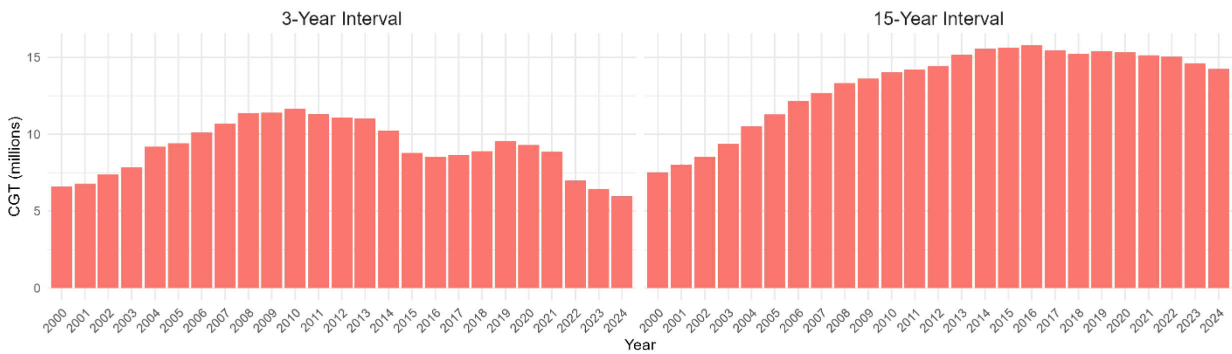
In the early 2020s, Japan prioritised next-generation ships—LNG-fuelled, methanol-ready, and hybrid-propulsion vessels. From 2020 to 2023, over 35% of completions featured alternative fuels or energy-saving tech. Japan retained a niche in high-tech, environmentally specialised vessels through ongoing investment in automation, modular propulsion, and compliance-driven design.

1.1.3. Capacity

To calculate Japanese shipbuilding capacity, the Shipbuilding Committee Secretariat's "maximum production" approach is used to calculate shipyard capacity (Daniel, 2022[4]). This approach uses data on observed deliveries of yards to calculate capacity, looking at the maximum production over the past 3 or 15 years. The 3-year interval follows closely latest developments in ship deliveries, while the 15-year approach assumed a slower adjustment of yard capacity. For this study, all vessel types are considered.

Figure 1.4 illustrates Japanese shipbuilding capacity from 2000 using a 3-year interval and 15-year interval. For 2024, capacity was estimated at 6.0 million CGT with the 3-year interval and 14.2 million with the 15-year interval.

Figure 1.4. Japanese shipyard capacity estimations



Source: OECD estimation based on Clarkson Research Services Limited (February 2025), World Fleet Register, https://www.clarksons.net/wfr; S&P Global (February 2025), Maritime IHS database, https://maritime.ihs.com/.

During the 2000s, Japan maintained high-capacity levels, driven by strong global demand and its position as one of the top shipbuilding nations alongside Korea and China. Capacity rose from 6.6 million CGT (3-year interval) and 7.5 million CGT (15-year interval) in 2000 to 11.7 million CGT (+77 %) and 14.0 million CGT (+86 %) respectively by 2010.

Throughout the 2010s, capacity contracted or was reorganised as several yards merged, downsized, or shifted away from commercial newbuilding. The process accelerated after the 2008 financial crisis, mirroring Japan's declining cost competitiveness relative to Korea and China and an increasing reliance on domestic orders (Gourdon, 2019[3]).

Under the 3-year interval, shipyard capacity was at its highest in 2010 at 11.7 million CGT while it reaches its peak at 15.8 million CGT in 2016 under the 15-year interval. Rising global competition posed a challenge to maintaining this peak capacity.

Rather than expanding yard space, Japanese builders have recently prioritised productivity gains through digitalisation and "smart factory" techniques—for example, greater automation and modular construction—to remain competitive without enlarging their physical footprint.

Figure 1.5. Japanese shipyard capacity compared to total global shipyard capacity

Source: OECD estimation based on Clarkson Research Services Limited (February 2025), World Fleet Register, https://www.clarksons.net/wfr; S&P Global (February 2025), Maritime IHS database, https://maritime.ihs.com/.

Historically, Japan's shipyard capacity contributed to a significant amount of total global shipyard capacity, as demonstrated in Figure 1.5. In 2000, its share was 28% (with capacity measured as the maximum production in the last 3 years) and 24% (15-year interval). Japan's share of global capacity peaked in 2004 at 28.3% under the 3-year interval while it peaked in 2000 under the 15-year interval. The 3-year interval estimation shows a trough in 2012 at 15.5%, Japanese shipyard capacity's share increased until 2020, where it declined to 11.5%. Under the 15-year interval, Japan's share similarly declined until 2012, then relatively plateaued at 14-15% until 2021, then declined to 13.1% in 2024.

1.1.4. Labour

Over the past 15 years, shipbuilding employment has varied from 84,510 employees in 2009 to a peak of 90,957 in 2016 to 70,300 in 2023, as demonstrated in Table 1.1. However, it has a relatively consistent ratio to Japan's total labour force, decreasing to 10% in 2023 from 13% in 2009.

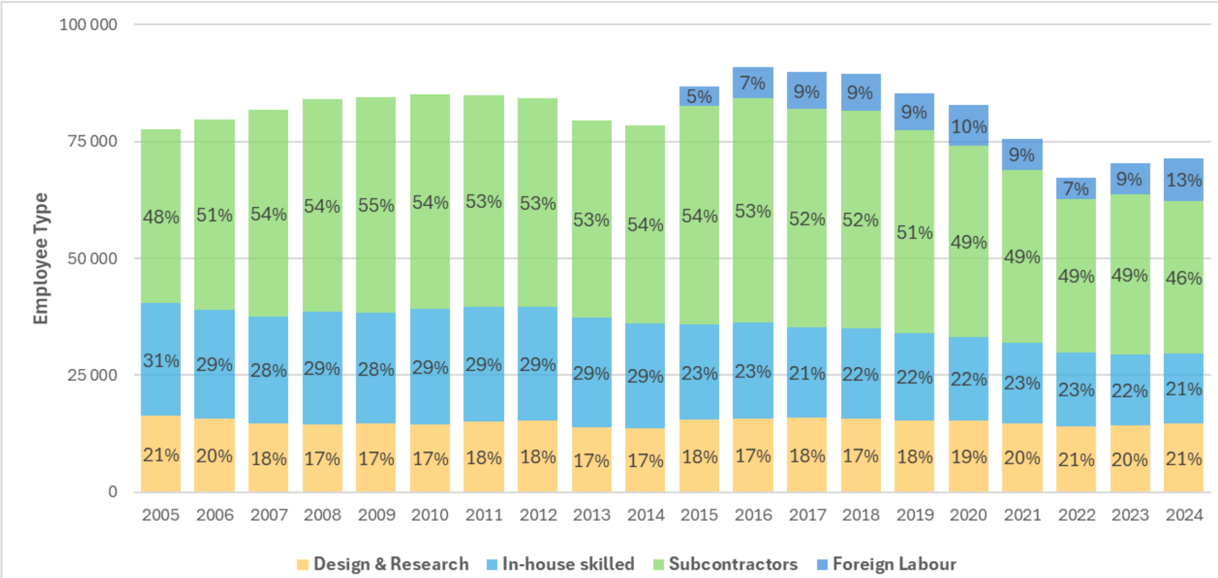
Table 1.1. Number of shipbuilding employees

Year	Number of shipyard employees	Ratio of Japan's total labor force	Design and Research	In-house technical/ engineer/skilled	Subcontractors	Foreign labor
2009	84 510	0.13%	14 601	23 762	46 147	
2010	85 045	0.13%	14 511	24 629	45 905	
2011	84 826	0.13%	15 106	24 592	45 128	
2012	84 173	0.13%	15 239	24 377	44 557	
2013	79 595	0.12%	13 869	23 468	42 258	
2014	78 561	0.12%	13 599	22 461	42 501	
2015	86 741	0.13%	15 508	20 286	46 787	4 160
2016	90 957	0.14%	15 795	20 486	48 050	6 626
2017	89 823	0.13%	15 930	19 255	46 790	7 848
2018	89 430	0.13%	15 648	19 422	46 513	7 848
2019	85 219	0.12%	15 380	18 652	43 424	7 753
2020	82 744	0.12%	15 340	17 907	40 833	8 664
2021	75 649	0.11%	14 790	17 194	36 959	6 708
2022	67 346	0.10%	14 136	15 765	32 826	4 619
2023	70 300	0.10%	14 193	15 321	34 231	6 555

Source: (Ministry of Land, Infrastructure, Transport and Tourism, 2024[5]; Statistics Bureau of Japan, 2024[6]).

As shown in Figure 1.6, design and research employees and in-house skilled workers consist of approximately 40-50% of total shipbuilding employees. The use of subcontractors has been relatively consistent at around 50% of the total, and since 2015, the use of foreign labour has been recorded, which ranges from 5 to 10% of total shipbuilding employment. The share of design and research employees as part of total shipbuilding employment has been increasing relatively consistently, from 17.3% in 2009 to 20.2% in 2023.

Figure 1.6. Total size and composition of Japanese shipbuilding employment



Source: (Ministry of Land, Infrastructure, Transport and Tourism, 2024[5]; Statistics Bureau of Japan, 2024[6]).

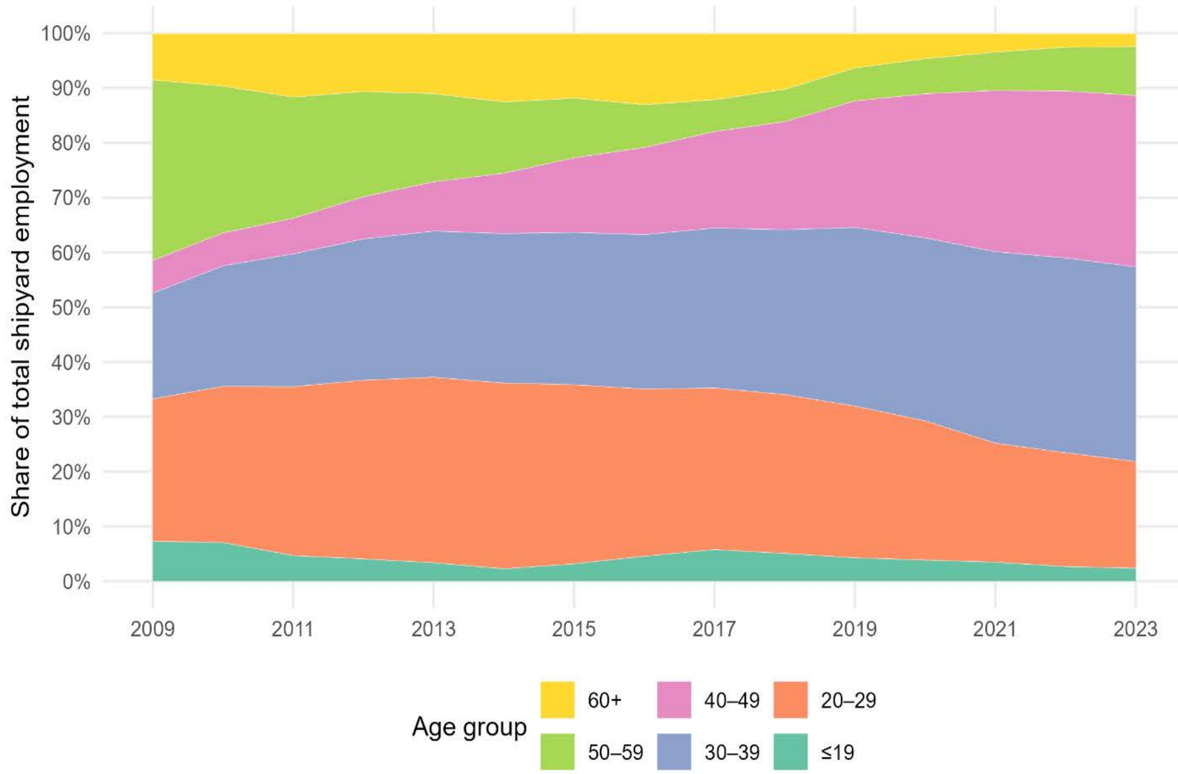
In 2023, the skilled Japanese shipbuilding workers are largely mid-career, with 66.8% of workers being aged 30-49 years, according to Table 1.2. and Figure 1.7. This has been steadily increasing since 2009, peaking in 2023. There is a significantly reduced number of >19 and 20-29 years olds employed in the sector when comparing 2009 (33.3% share) and 2023 (21.9% share), although peaking in 2013 with 37.3% share. The decreasing youth inflow into the industry could be an obstacle to ensuring a continued employment pipeline. The workforce was at its oldest in 2009, with 41.4% of workers over 50 years old, but this has been steadily decreasing, falling to 11.3% in 2023 meaning that currently the sector does not face dynamics of an ageing workforce. To ensure adequate replacement employment, there needs to be increased youth employment in the sector to sustain future retirements.

Table 1.2. Age structure

Year	～19	20～29	30～39	40～49	50～59	60～
2009	7.3%	26.0%	19.3%	6.0%	32.9%	8.5%
2010	7.1%	28.5%	22.0%	6.0%	26.8%	9.6%
2011	4.7%	30.8%	24.2%	6.5%	22.1%	11.6%
2012	4.1%	32.6%	25.8%	7.7%	19.2%	10.6%
2013	3.4%	33.9%	26.7%	9.0%	16.1%	11.0%
2014	2.3%	33.9%	27.3%	11.0%	13.0%	12.5%
2015	3.2%	32.7%	27.8%	13.6%	10.9%	11.8%
2016	4.6%	30.5%	28.2%	15.9%	7.8%	13.0%
2017	5.8%	29.5%	29.2%	17.6%	5.8%	12.1%
2018	5.1%	29.0%	30.1%	19.7%	5.9%	10.2%
2019	4.3%	27.7%	32.6%	23.1%	6.0%	6.3%
2020	3.9%	25.4%	33.4%	26.3%	6.4%	4.6%
2021	3.5%	21.7%	34.9%	29.4%	7.0%	3.4%
2022	2.7%	20.8%	35.6%	30.5%	8.0%	2.5%
2023	2.4%	19.5%	35.5%	31.3%	8.9%	2.4%

Note: The table shows the age structure of skilled workers (in-house workers).
Source: Survey by SAJ.

Figure 1.7. Japan's age structure of skilled shipbuilding workers



Note: The table shows the age structure of skilled workers (in-house workers).
Source: Survey by SAJ.

Japan has no annual foreign worker quota. The main nationalities employed in the sector are largely from the Philippines, who are 52% of total foreign workers in the sector in 2024, followed by Indonesia (18%), Viet Nam (17%), China (11%) and other nationalities (2%), as shown in Table 1.3. Between 2020 and 2024, the share of Chinese workers declined from 28% to 11%, with Viet Nam and Indonesia increasing their shares.

Table 1.3. Foreign workers ratio

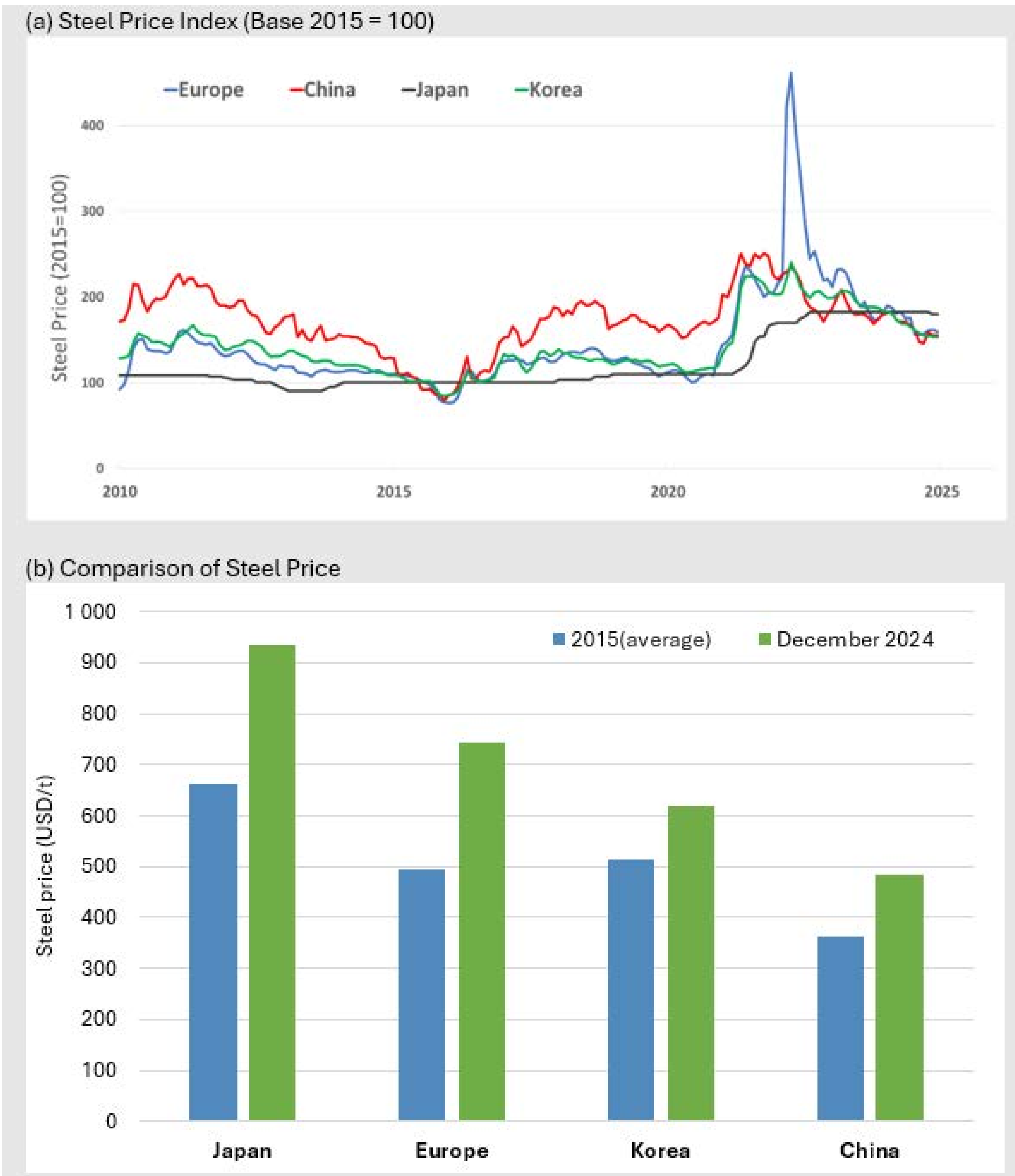
2020	**Philippines**	**China**	**Viet Nam**	**Indonesia**	**Others**
	42%	28%	18%	10%	2%
2021	**Philippines**	**China**	**Viet Nam**	**Indonesia**	**Others**
	44%	23%	21%	10%	2%
2022	**Philippines**	**China**	**Viet Nam**	**Indonesia**	**Others**
	51%	19%	19%	9%	2%
2023	**Philippines**	**Viet Nam**	**China**	**Indonesia**	**Others**
	54%	18%	13%	12%	2%
2024	**Philippines**	**Indonesia**	**Viet Nam**	**China**	**Others**
	52%	18%	17%	11%	2%

Note: There is no annual foreign worker quota.
Source: Japan's questionnaire answer.

1.1.5. Shipbuilding cost

According to Figure 1.8, in all economies, steel prices began to rise in Spring 2020 and soared in 2021-2022. Since then, the peak has passed, and steel prices have been declining in many economies. The steel prices kept falling though most of 2024 but seem to have bottomed out. However, the price is still at a higher level compared to the one before the Covid pandemic. Steel prices in Japan are higher than in other major shipbuilding economies.

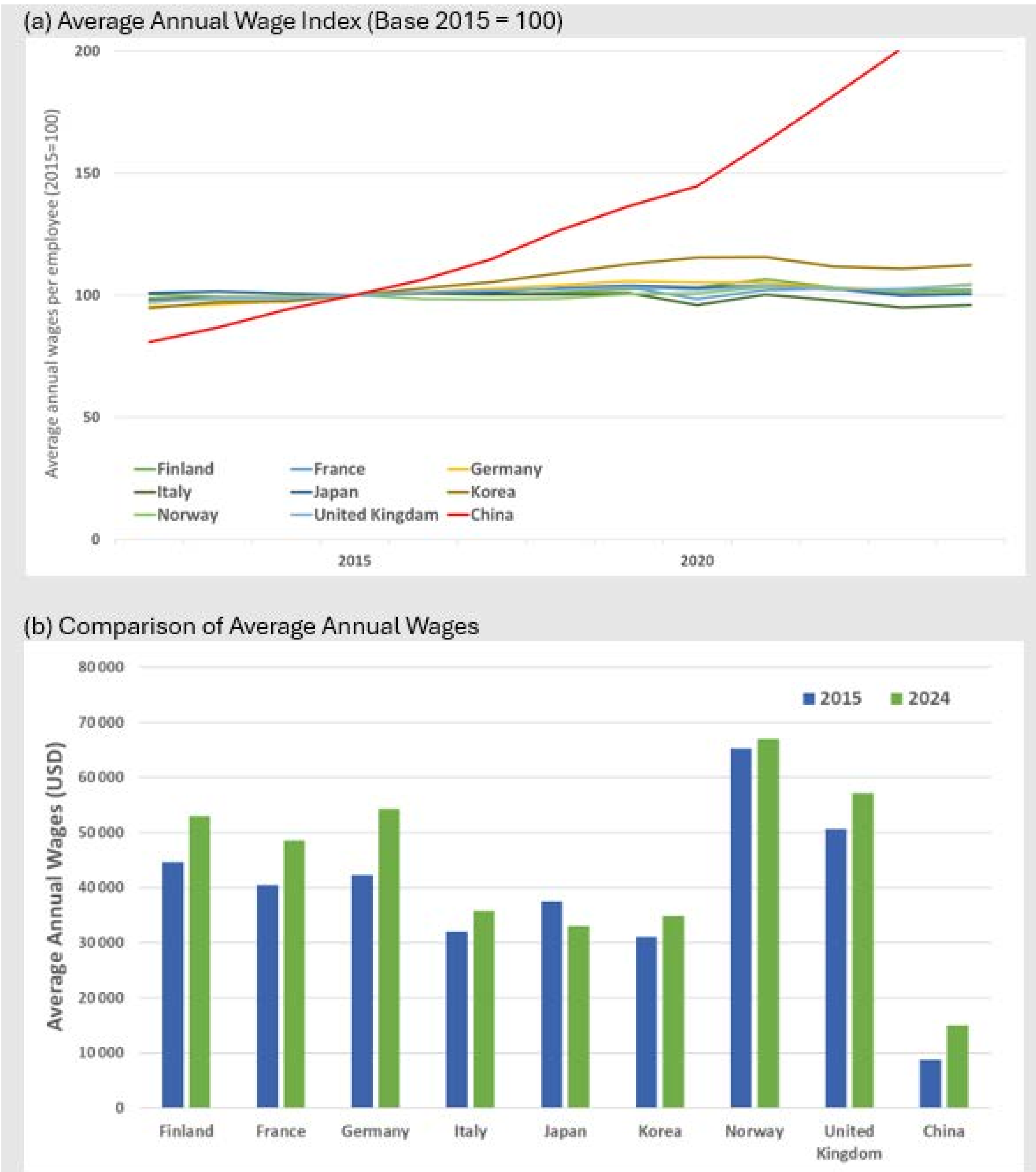
Figure 1.8. Steel price



Note: Panel a) Local currency basis. Panel b) US dollars basis.
Source: OECD calculations based on Kallanish, Sangyo Press Co., Ltd, and Korean Steel Daily.

Figure 1.9 shows the average annual wages converted to PPP and the average annual wages, US dollar basis, per employee in full-time equivalent unit in the total economy, compared to 2015. The average annual wages converted to PPP, in all countries increased gradually by 2-4% and it was no significant differences in wage increase rates between countries in terms of the PPP. The annual average wages of Japan in 2024 decreased compared to 2015, due to the yen depreciating by 25% during this period. The labour costs in Japan in 2024 were 5% lower than in Korea, 2.2 times higher than in China.

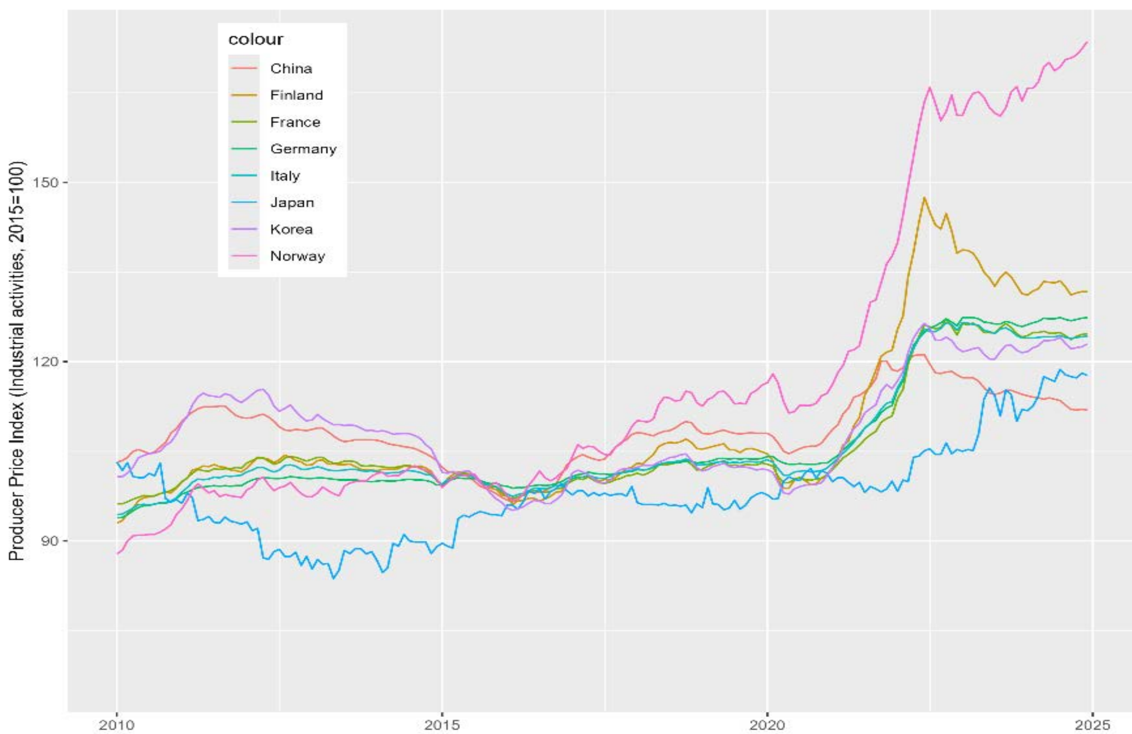
Figure 1.9. Labour costs



Note: Panel a) US dollar basis and PPP converted. 2015 = 100. Panel b) Average annual wages, US dollar basis, per employee in full-time equivalent unit in the total economy. China's data is shown only for manufacturing.
Source: OECD calculation based on (OECD, 2026[7]; National Bureau of Statistics of China, 2026[8]; Trading Economics, 2026[9]; World Bank Group, 2026[10]).

Figure 1.10 shows the domestic producer price index (PPI) for industrial activities in selected economies until December 2024. This index as a proxy for the price index for marine equipment due to the absence of more detailed cost information. The PPI has followed an upward trend since 2016 and has risen sharply since 2020 due to the pandemic and global inflation. Following its sharp rise, price has stabilised at a high level. Norway (174) experiences the highest PPI and China (112) the lowest. Although Japan (118) is the second lowest, its PPI has been increasing.

Figure 1.10. Producer Price Index



Source: Publications from the governments; (Louis and China, 2022 (FRED) / 2023 (NBS)[11]), (Eurostat, 2025[12]), (Japan, 2025[13]), (Korea and Louis, 2022 (FRED) / 2023 (BOK)[14]), (Statistics, 2025[15]).

1.2. Other market

Key Findings

- **Japan government has a strategically well positioned marine equipment industry**. Japan's marine equipment industry is indeed characterised by high self-sufficiency, strong export competitiveness, and advanced technical capabilities, particularly in diesel engines, outboard motors, propulsion controls, and energy-saving devices. The deep integration between shipyards and equipment suppliers enhances resilience and quality assurance, setting Japan apart from other shipbuilding nations.
- **The industry is a major player in the global supply chain, with outboard motors, reciprocating engines, and navigation-control systems comprising over 80% of exports**. Japan's high level of domestic integration (92% of marine equipment on Japanese-built vessels is domestically manufactured) provides strategic security and shields the industry from external supply chain shocks.
- **The government's alignment of public funding with industrial transformation supports leading exporters and maintains stable repair activity levels, despite global trends**. However, ship conversion activities remain limited, with only one notable ammonia propulsion conversion performed in 2023.

1.2.1. Global supply chain (Marine equipment)

The Japanese government has adopted a comprehensive and forward-looking approach to sustainability and innovation. Under the "Green Growth Strategy Through Achieving Carbon Neutrality in 2050," the government invests in 14 strategic sectors, including shipbuilding and marine equipment.

Japan's marine equipment industry plays a pivotal role in the global maritime supply chain. It is characterised by an exceptionally high level of domestic self-sufficiency, strong export competitiveness, and technical leadership in core systems such as diesel engines, outboard motors, propulsion controls, and energy-saving devices. Unlike many competing shipbuilding nations, Japan's industrial ecosystem features deep integration between shipyards and equipment suppliers, allowing for both resilience and quality assurance.

Japan's five major marine equipment product categories are: diesel engines, outboard motors, pumps, electrical equipment, and cargo-handling systems. In 2020, Japanese firms produced 8 723 diesel engines worth JPY 204 billion, and 277 230 outboard motors valued at JPY 105 billion, confirming the sector's scale and productivity. These numbers significantly increased by 2022, when Japan produced 420 627 outboard motors (JPY 177 billion) and 10 705 diesel engines (JPY 208 billion), contributing to a total marine equipment production value of JPY 442 billion. According to MLIT, production and value of outboard motors declined in 2024. Nevertheless, Japanese firms produced 11 441 diesel engines worth JPY 264 billion in 2024, continuing the steady growth observed since 2020. In addition, supported by increases in pumps, electrical equipment, and other categories, the total production value rose from JPY 369 billion in 2020 to JPY 470 billion in 2024 (Table 1.4).

Table 1.4. Main products of Japanese marine equipment industry in 2020, 2022 and 2024

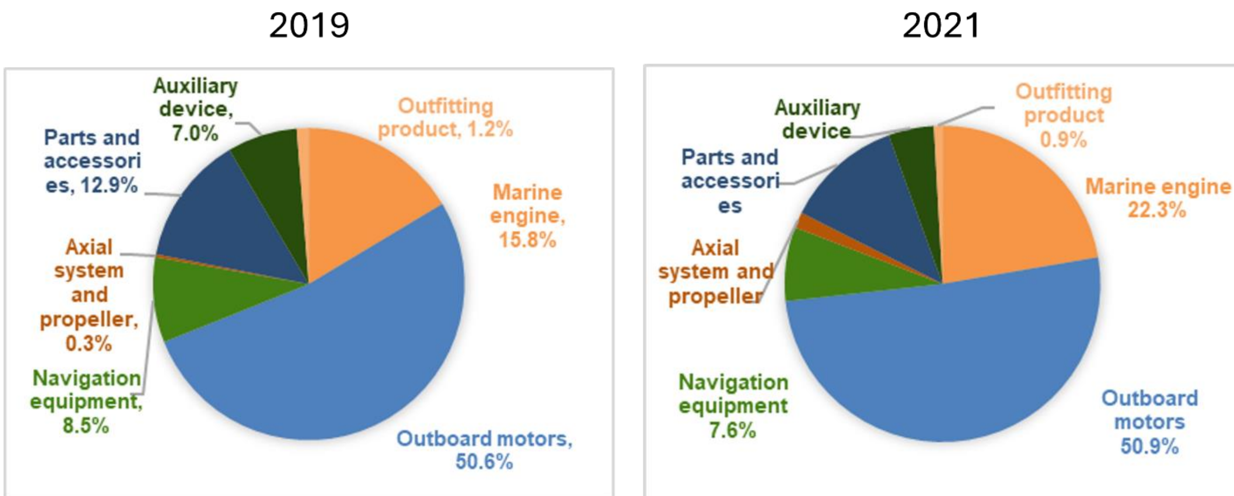
Product	2020 Amount (Quantity), JPY	2024 Amount (Quantity), JPY
1. Diesel Engines	204 billion (8,723)	264 billion (11,441)
- less than 1 000 PS	28 billion (6,575)	38 billion (9,144)
- 1 000 PS more/less than 10 000 PS	74 billion (1,905)	80 billion (2,058)
- 10 000 or more	102 billion (243)	146 billion (239)
2. Outboard motors	105 billion (277,230)	124 billion (264,087)
3. Pumps	26 billion (29,019)	42 billion (35,546)
4. Electrical equipment	21 billion (31,958)	22 billion (26,266)
5. Cargo handling machines	13 billion (669)	18 billion (458)
Total	369 billion	470 billion

Source: OECD Analysis of the marine equipment industry and its challenges (2023), MLIT.

Japan’s export structure, shown in Figure 1.11, reflects the shift toward high-value-added product dominance. Outboard motors, reciprocating engines, and navigation-control systems collectively account for over 80% of Japan’s marine equipment exports. Between 2019 and 2020, Japan exported JPY 370 billion (USD 3.7 billion) in outboard motors alone—nearly double the combined value of similar exports from the EU, US, and China—underscoring Japan’s dominance in this segment. Key markets include the United States, Southeast Asia (Philippines, Indonesia, Viet Nam), and Europe, reflecting the breadth of Japan’s global reach.

Japan’s most unique structural strength, however, lies in its domestic integration and supply chain independence. In 2022, approximately 92% of the marine equipment installed on Japanese-built vessels was domestically manufactured, up from 87% in 2019. This level of self-sufficiency far exceeds that of South Korea (which imports ~25% of marine components) and China, which runs a trade deficit in high-value components such as diesel engines, smart bridge systems, and propeller units.

Figure 1.11. Export Portfolio of Japan's Marine Equipment Industry by Product Category

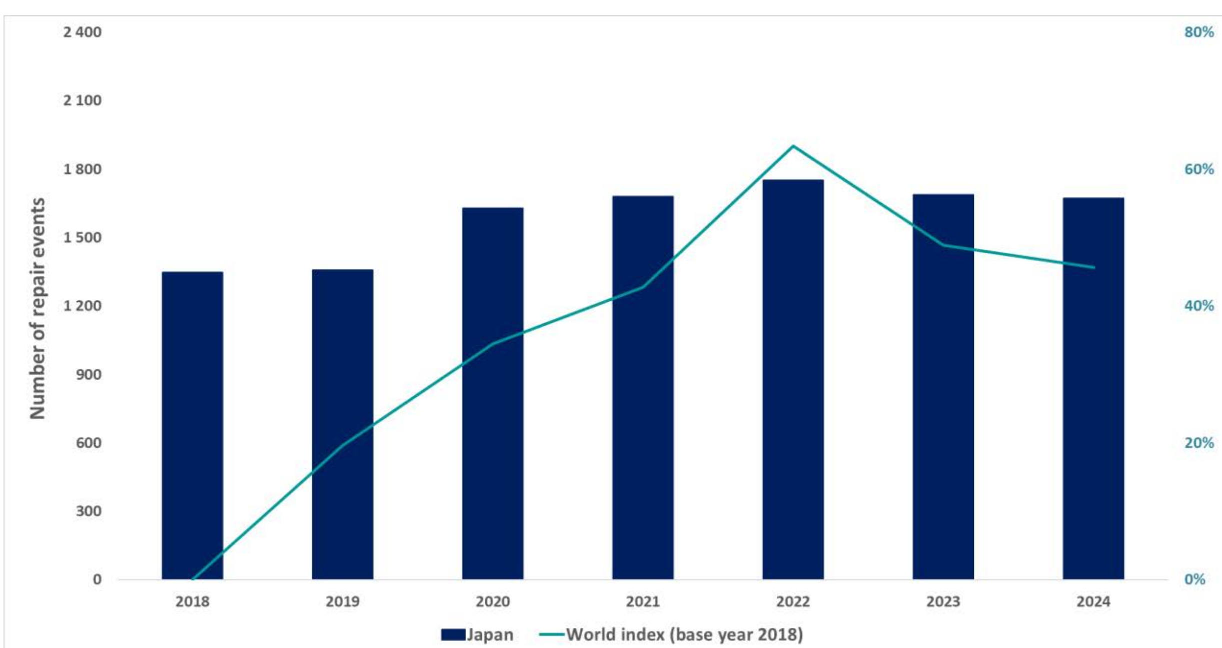


Source: MLIT.

1.2.2. Conversion & repair

Since 2020, Japanese yards have maintained a stable level of repair activity, following a 20% increase compared to the two previous years. Figure 1.12 shows the development of the number of repairs in Japan compared to the world trend. The figure illustrates that the global repair activity has increased more than the repair activity in Japan since 2018. However, while the global trend has been downward sloping since 2022, repair activity in Japan has remained stable.

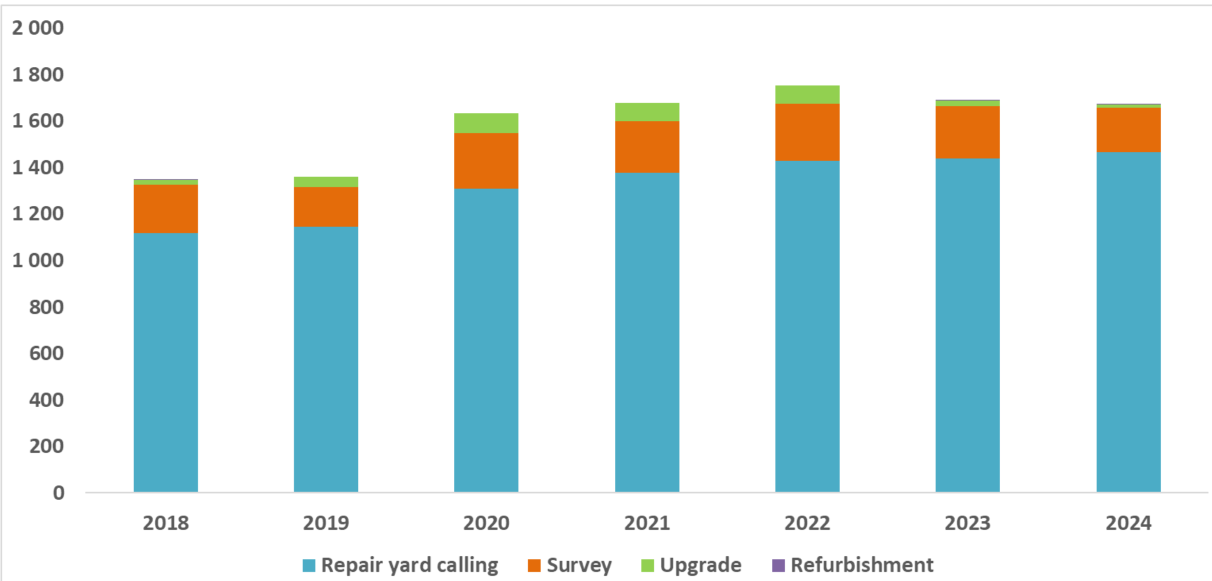
Figure 1.12. Number of repairs in Japan compared to world trend



Source: (WFR, 2025[16]).

Figure 1.13 illustrates the broad categories of activities that are included in these numbers. Most of the activities are repair yard calls and surveys. Upgrade activities in relation to improved vessel performance or efficiency, accounted for around 4-5% of the repair yard activities in 2020-2022, while in 2023 and 2024 it these only accounted for respectively 1.3% and 0.8% of the activity. This decline may be explained by the impact of the COVID-19 pandemic, where many vessels went into layup, which might have prompted ship-owners to carry out upgrades during the period of reduced operational demand. Table 1.5 illustrates the range and volume of environmental and EST upgrading capabilities of Japanese yards.

Figure 1.13. Repair events divided by activity types



Source: (WFR, 2025[16]).

Table 1.5. Types of upgrades performed by Japanese yards

Types of upgrades	2018	2019	2020	2021	2022	2023	2024
BWMS Retrofit	17	29	65	71	70	20	9
Propeller EST Retrofit	2	3	4	3	7		4
Wind EST retrofit					1		1
Ammonia fuel conversion						1	
Other Engine/Power equipment retrofit				1		2	
Scrubber retrofit	2	9	17	3	1		
All other CRSL Equipment retrofit					1		
Battery retrofit				1			
CCS retrofit				1			

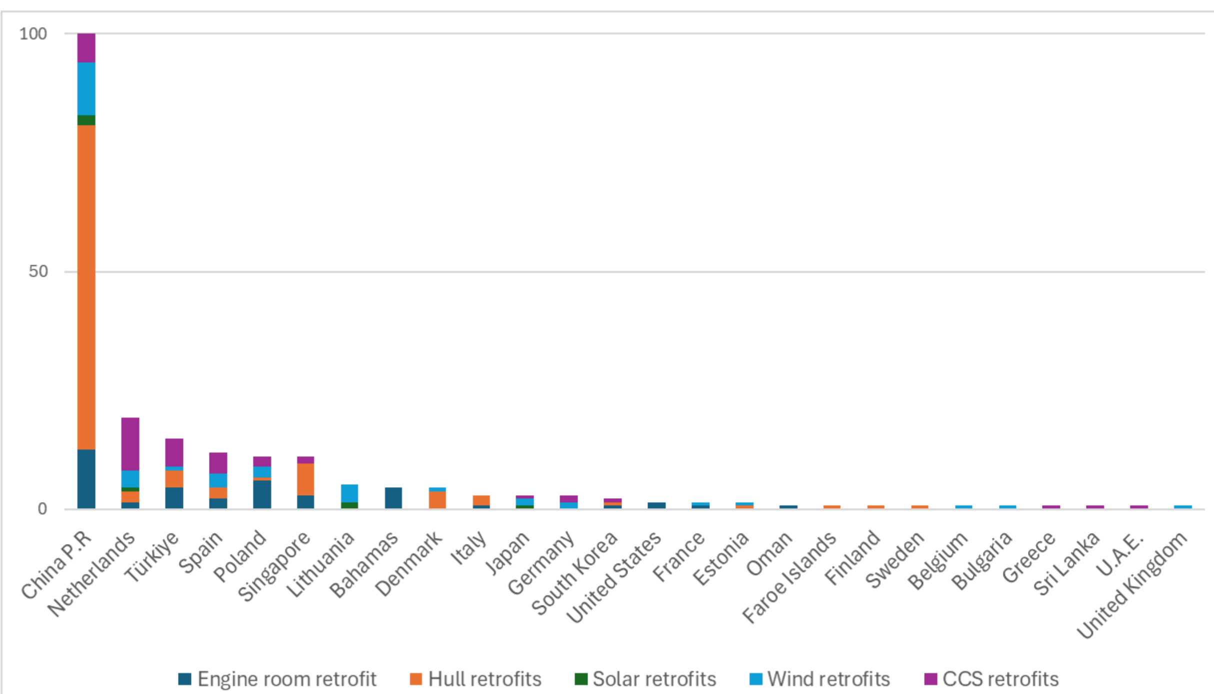
Types of upgrades	2018	2019	2020	2021	2022	2023	2024
Main propulsor retrofit				1			
Solar EST retrofit		1					
Sum	**21**	**42**	**86**	**81**	**80**	**23**	**14**

Source: (WFR, 2025[16]).

Japanese repair yards are largely servicing domestic companies. Of all the repairs in the period 2018 to the end of 2024, 96,4% of the repair missions came from domestic companies, with no significant change in this proportion when isolating just 2024. In 2024, the four most active yard groups regarding repairs were Sanwa Dock, Shin Kurushima Group, Mukaishima Dockyard and Tsuneishi Holdings, the four of which managed 49% of the total repairs in 2024 (WFR, 2025[16]). All of them are in the Hiroshima or Ehime prefectures of Japan, on the North and South shores of the Seto inland sea

Fuel-conversions are becoming an increasingly relevant subdivision in the shipbuilding industry as new environmental requirements and measures are being enacted in accordance with rising emission reduction targets. However, activity on this field is still sparse. Clarksons registered 11 fuel conversions worldwide in 2024, none of which were performed in Japan (WFR, 2025[16]). Notably, there was one pioneer fuel conversion performed in 2023 by Keihin Dock Co. Ltd, who converted an LNG-fuelled tugboat into ammonia propulsion (NYK Group, 2023[17]).

Figure 1.14. EST retrofits (2018 - 21.08.2025)



Note: Propeller retrofits are excluded. Data from 1.1.2018-21.08.2025.
Source: (WFR, 2025[16]).

Figure 1.14 shows that Japan has played only a marginal role in global EST retrofit activity between 2018 and mid-2025. While China and several European countries registered multiple projects—particularly in hull, engine room and CCS retrofits—Japan accounted for only a few cases, placing it among the lower contributors worldwide. Since 2018, Japan has expedited one CCS retrofit, one solar retrofit, and two wind retrofits. This limited engagement reflects the domestic orientation of Japan's repair yards, which primarily serve local owners, and the industry's continued focus on newbuilding rather than large-scale retrofit markets. The data underlines that, despite Japan's technological strength in shipbuilding and equipment, its contribution to EST retrofits remains modest, with no projects recorded in emerging areas such as propeller retrofits.

1.3. Market trends

Key Findings

- **Japan's shipbuilding decarbonisation is supported by significant government funding and policy measures.** Japan has put ship decarbonisation at the heart of its industrial strategy, notably through the Green Innovation Fund with JPY 35 billion reserved for next-generation ships. Complementary MLIT schemes are subsidising private R&D and fuel-saving equipment to meet IMO regulations.
- **At corporate-level, net-zero commitments are gaining traction**. The top three major shipping groups (Kawasaki Kisen Kaisha ("K" Line), Mitsui O.S.K. Lines (MOL) and Nippon Yusen Kaisha (NYK)), have set 2050 net-zero targets, catalysing demand for low and zero-carbon vessels and equipment.
- **While transparency for ESG reporting is improving, large disparities remain within yard-level emissions.** Major shipping players now publish ESG reports but the disclosure remains far from universal. Energy-related CO_2 from the ten largest builders spans two orders of magnitude (≈5 000–250 000 tCO_2 in 2021).
- **Japan's innovation leadership is shrinking.** Japan and the EU historically filed the most low-carbon maritime patents, yet Japan's output has slid since its 2011-2018 peak. Activity is still concentrated in hull-design efficiency (Y02T70/10), while China's filings have surged since 2019, overtaking other leaders.
- **Orderbook and completions of alternative fuel capable vessels remain highly concentrated among the top three shipbuilders**. Japan comes in 3rd after China and Korea.
- **Labour shortages and skills gaps.** Ageing demographics and limited specialised training constrain capacity. The Shipbuilding Skills Development Centre (six sites) and new university-industry programmes (University of Tokyo-NYK-Mitsubishi "Maritime Digital Engineering" course) aim to upskill the workforce.

Japan's annual expenditure on R&D in the shipbuilding and maritime industries over the past ten years has remained stable with an average annual R&D expenditure of USD 174 million —as can be seen in. We note that the highest expenditure was made in 2023 with expenses surpassing USD 200 million. Between 2014 and 2024, a total of USD 1.74 billion was allocated to R&D. In terms of purchasing power parity, a budget amounting to USD 322 million has been allocated for the Green Innovation Fund over the 10-year period from fiscal 2021 onwards (Institute for International Monetary Affairs, 2022[18]).

Figure 1.15. Japan's internal research expenses of companies in shipbuilding and maritime equipment in millions USD

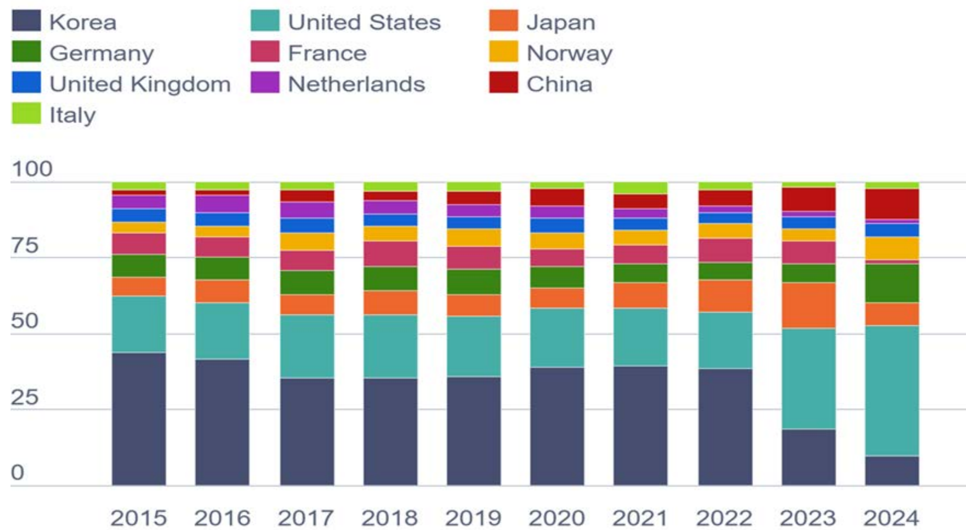
Source: Statistics of Japan (https://www.e-stat.go.jp/stat-search/files?page=1&toukei=00200543&tstat=000001032090).

1.3.1. Patenting activity

Meeting international emissions targets and, ultimately, curbing climate change demands that the maritime sector move decisively toward zero- and low-carbon emission propulsion. Continuous innovation will be crucial to drive down costs, solve outstanding technical challenges and scale new technologies fast enough to align global shipping and shipbuilding with a net-zero pathway (OECD, 2025[19]). This transition also creates major openings for shipyards and marine-technology suppliers to design and deliver the next generation of low-/zero-carbon vessels. The following section examines how Japan is responding, tracing key low-carbon innovation trends through its recent maritime patent activity.

Patents can offer a reliable "signal" of technological innovation. Each patent application discloses a novel technical solution, that is timestamped and assigned to an internationally harmonised classification code. Hence, counting patents can allow us to know where and how quickly innovation is advancing in a certain sector. Unlike R&D spendings which focus more on inputs, patents capture the output of inventive efforts. Figure 1.16 provides an overview of global patenting activity in the shipbuilding sector by counting inventions belonging to the international patenting category (IPC) B63 "ships and other waterborne vessels and related equipment" (European Patent Office, 2024[20]). The countries selected represent the top ten most active in terms of patenting activity in this category and for this period. We observe that Japan holds a mid-table position, contributing to a stable share of patenting activity over the decade with a slight increase in filings in 2023.

Figure 1.16. Patent share for ships and related equipment by country from 2015 until 2024

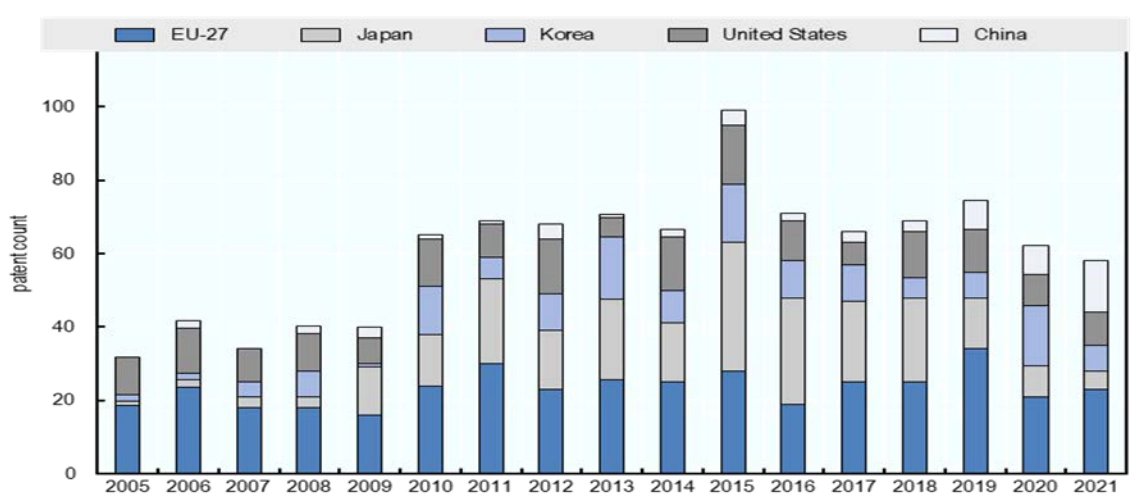


Source: (European Patent Office, 2024[20]).

We can further narrow our focus on low-carbon patents, identified via the Y02-tag, which the European Patent Offices defines as “Technologies or applications for mitigation or adaptation to climate change”. Specific Y02 patent codes (Y02T70/00) pertaining to “Climate change mitigation technologies related to transportation: maritime or waterways transport” are used to extract relevant patents (European Patent Office, 2024[21]).

In Japan, we observe that innovation activity in low-carbon technologies is decreasing over time—demonstrated in Figure 1.17. In the early 2000s, Japan presents a modest segment which grows rapidly towards the end of the decade sitting on top of a similar sized EU block. Despite the growing pressure to decarbonise the maritime sector, the yearly share of low-carbon patenting activity in maritime technologies patents in Japan peaked between 2011 and 2018 but rapidly declined thereafter. The EU and Japan have consistently shown the most patent filings in this field over this studied period, but China shows a rapid increase in its patenting activity since 2019, surpassing other key innovating countries.

Figure 1.17. Development of low-carbon patents, global



Note: Timeframe 2005–2021 Y02 low-carbon patents including Y02T70/10 (hulls), Y02T70/50 (propulsion), Y02T70/5218 (fuels), and Y02T70/5236 (renewable/hybrid systems).
Source: EU patent office.

To provide a granular view of innovations in maritime technology, the patent codes can further be classified into subcategories that group them based on their focus, thereby permitting a more detailed study of trends and patterns within the low-carbon maritime technology landscape. Table 1.6 explains their breakdown by sub-category.

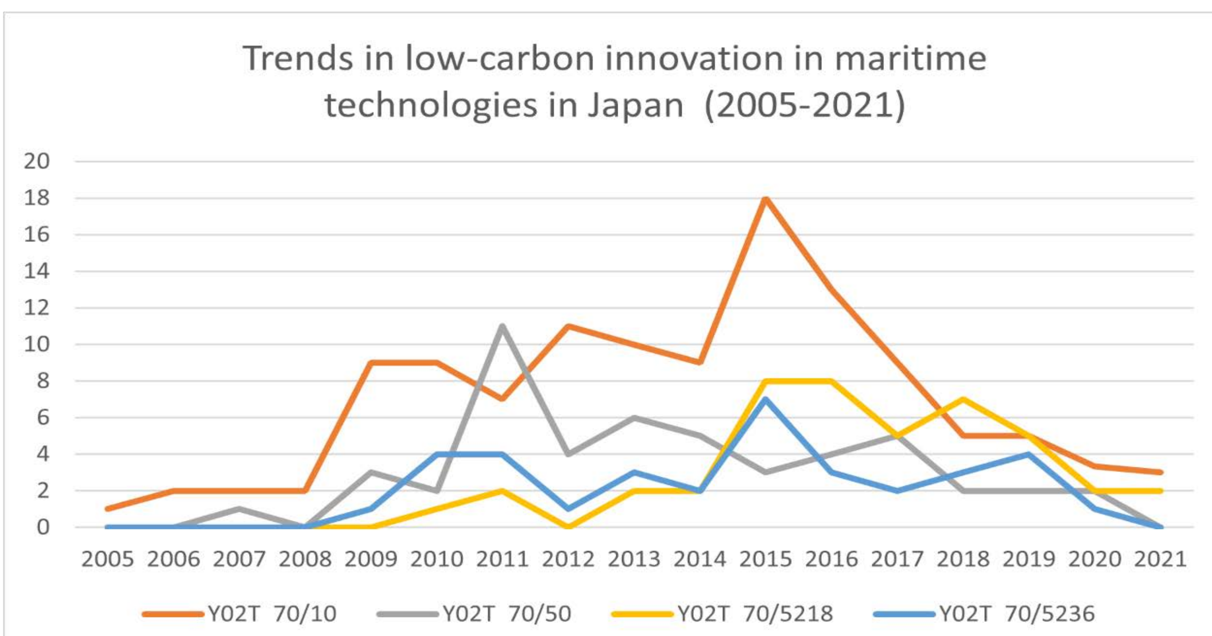
Table 1.6. List of patent codes

Patent code	Description
Y02T70/10	Measures concerning the design or construction of watercraft hulls
Y02T70/50	Measures to reduce greenhouse gas emissions related to the propulsion system
Y02T70/5218	Less carbon-intensive fuels, e.g. natural gas, biofuels
Y02T70/5236	Renewable or hybrid-electric solutions

Source: (European Patent Office, 2024[21]).

In Japan, low-carbon innovation is notably concentrated in the design or construction of watercraft hulls (patent code: 70/10) with a rapid increase and peak in the number of these patents in 2015 and 2016. In Figure 1.18, we observe that in addition to demonstrating the fasted climb, this subcategory presents the highest single-year output with a total of 18 patents in 2015. Measures related to the reduction of greenhouse gas in propulsion systems (70/50) show a sharp but short-lived spike from 2010-2012 which then fades. Alternative fuels (70/5218) and hybrid/renewable solutions pickup between 2012 and 2015 but remain low in comparison to the other categories, both show a decline after 2019.

Figure 1.18. Development of low-carbon patents, Japan



Source: EU patents office.

1.3.2. Decarbonisation

In response to the growing demand for a decarbonised shipbuilding sector, the Japanese government is taking a variety of actions to promote this shift. The Green Innovation Fund for Next-generation Ship Development aims to achieve carbon neutrality by 2050 by continuously supporting companies and organisations committed to ambitious 2030 targets (METI, 2023[22]). Established under the FY2020 Tertiary Supplementary Budget and is managed by the New Energy and Industrial Technology Development Organisation (NEDO).

The programme supports projects that are highly innovative and go beyond basic R&D to encompass demonstration, with participation encouraged from SMEs, venture companies, universities, and research institutions. To maximise outcomes, company managers must commit to the projects, submit long-term business strategies, and implement systems to enhance commitment. Projects with inadequate progress may be cancelled, and incentive measures are in place for achieving targets. Some of the other projects organised by the Green Innovation Fund include cost reductions for offshore wind power generation, fuel ammonia supply chain establishment and the development of next-generation batteries and motors.

Table 1.7. Overview of the Next-Generation Ship Development Project

Project	Category	Overview
Next-generation Ship Development	Field of Industry Structure Transformation	Development of engines, fuel tanks, and fuel supply systems sing hydrogen and ammonia to operate in ships. With a budget of up to 35 million yen, the project period ranges for a maximum of 10 years from FY2021 to FY 2030 and is led by the Hydrogen and Ammonia Department.

Source: (NEDO, 2023[23]).

Additionally, MLIT provides support to create an environment where the technology can be fully leveraged, based on the outcome of the development of fuel-saving technologies and works (MLIT, n.d.[24]). Concrete actions include: (1) supporting private-sector R&D aimed at cutting CO_2 emissions from ships and applying shipbuilding know-how to offshore resource development; and (2) leading discussions at the IMO on environmental regulation, so that technological progress, dissemination of new technologies, and creation of international rules advance in tandem.

In the private sector, Japanese shipbuilding and shipping companies are actively investing in decarbonisation, driven by corporate net-zero targets and market demand for greener vessels. In 2021, the Japan Shipowners' Association—comprising major shipping companies such as Kawasaki Kisen Kaisha (K Line), Mitsui O.S.K. Lines (MOL), and Nippon Yusen Kaisha (NYK)—adopted and announced the "Challenge of 2050 Net-Zero." Accordingly, shipbuilders have been focusing on energy-saving technologies, real-sea performance, and alternative fuel readiness.

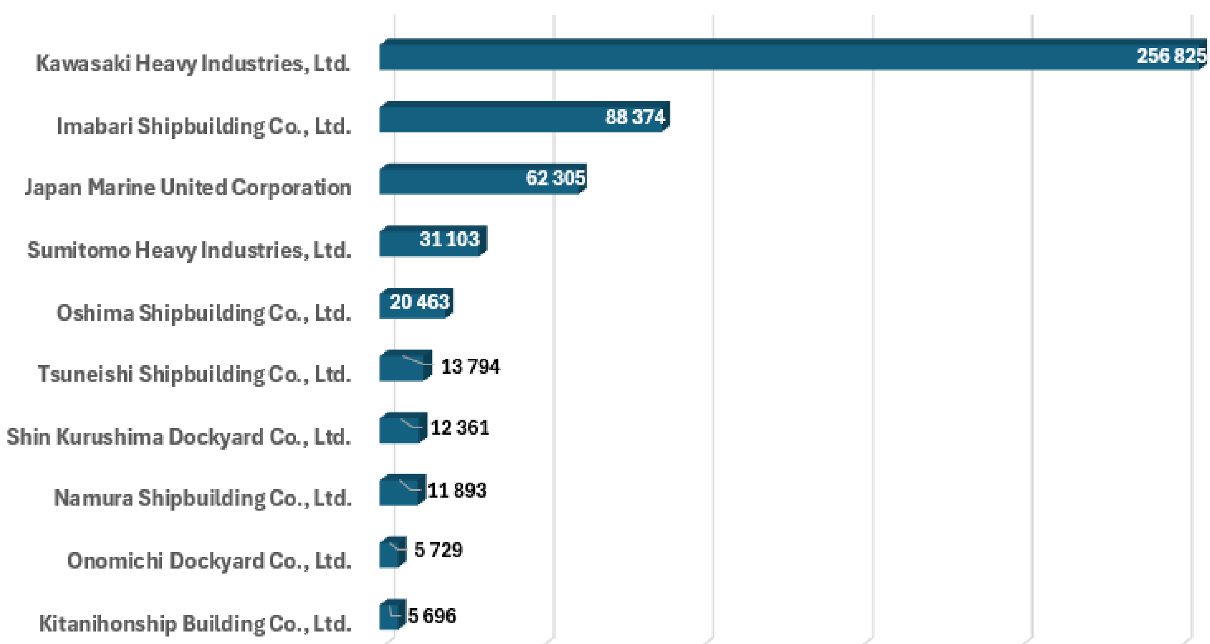
Innovation is particularly evident in patent activity related to hull design and propulsion systems. Although Japan's low-carbon maritime patenting has declined since 2019, the country remains a global leader in energy-saving technology deployment, accounting for nearly 30% of such installations in the world fleet. Private investment also supports the development of alternative-fuel-capable ships, including LNG and methanol vessels, with Japan ranking third globally in methanol vessel orderbooks.

In addition, many Japanese shipbuilding and shipping companies have acquired numerous Approvals in Principle (AiP) —preliminary certifications granted by class societies (organisations that set and verify technical standards for ship safety and design) for the technical feasibility of new designs— on decarbonisation technologies.

- In June 2024, Tsuneishi Shipbuilding, Ueno Transtech, and Yanmar Power Technology obtained an AiP from ClassNK for the design concept of a hydrogen-fueled tanker.
- In March 2025, Mitsui O.S.K. Lines, Namura Shipbuilding, and Mitsubishi Shipbuilding obtained an AiP from ClassNK for the design concept of an ammonia-fueled ammonia carrier.
- In April 2025, Mitsubishi Shipbuilding obtained an AiP from ClassNK for the design concept of an onboard carbon capture and storage system (OCCS).
- In June 2025, Mitsui O.S.K. Lines and Mitsubishi Shipbuilding obtained an AiP from ClassNK for the design concept of an LCO_2/methanol multi-cargo carrier.

However, as shown in Figure 1.19, the environmental performance of shipbuilding-related companies varies significantly. An analysis of energy-related CO_2 emissions among the top 10 shipbuilding companies by production volume shows a wide range—from 5 000 to 250 000 tCO_2—when assessed on a company-wide basis.

Figure 1.19. Energy-related CO2 emissions (tCO2) by shipbuilding-related company for 2021



Note: Data shared by Japan in the Shipbuilding Committee Peer Review Questionnaire (2024).
Source: (Ministry of the Environment, 2021[25]).

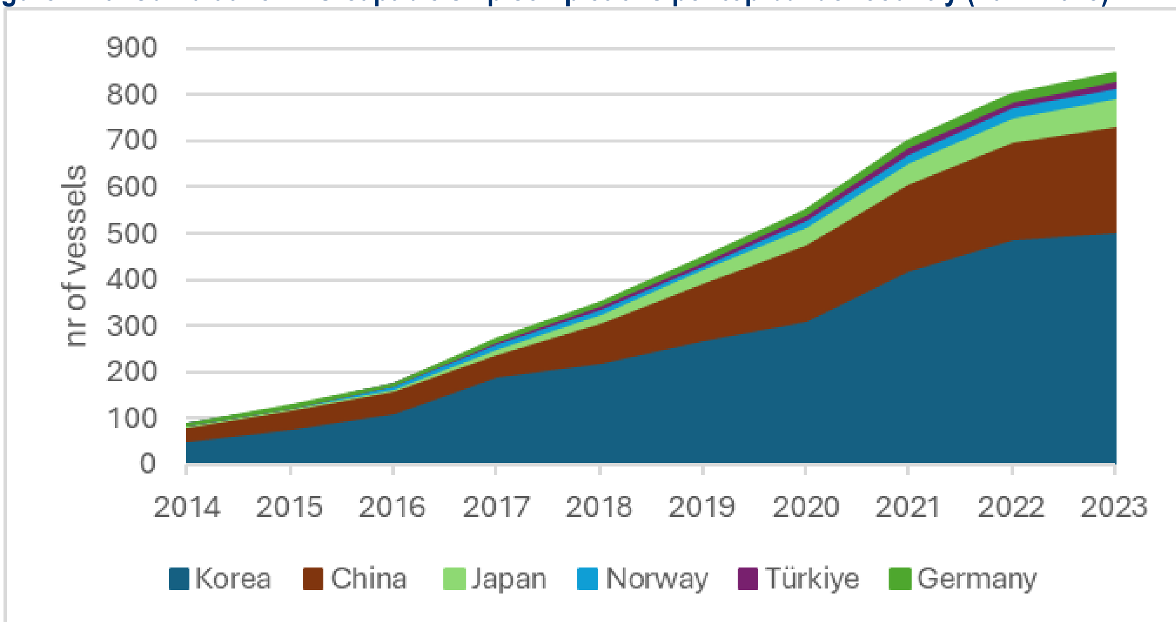
1.3.3. Alternative fuel trends

Establishing robust supply chains for carbon-neutral fuels—from production to storage and bunkering at ports—is essential for decarbonising shipping (OECD, 2025[19]). A great diversity of new technologies is being developed notably for alternative fuel engines, such as the development of ammonia and hydrogen fuel engines in Japan (Statistics Bureau of Japan, 2024[6]). However, building the necessary infrastructure, ensuring safe fuel handling, and securing the required investment remain critical bottlenecks.

LNG and biofuels are the most widely used alternative fuels in shipping, with vessels capable of running on these fuels having experienced a significant uptake in the global fleet (OECD, 2025[19]). The chart underscores a decade of hyper-growth in LNG-capable shipbuilding, led overwhelmingly by Korean yards, with China emerging as a potent challenger and followed by Japan with a smaller share. For Japan, ship completions for LNG-capable ships remain limited with zero in 2014 and 100 in 2023 as shown in

Figure 1.20. By contrast, Korea has a strong position in terms of completions for these vessels—almost reaching 500 in 2023, followed by China which has around 200 vessels (Figure 1.20).

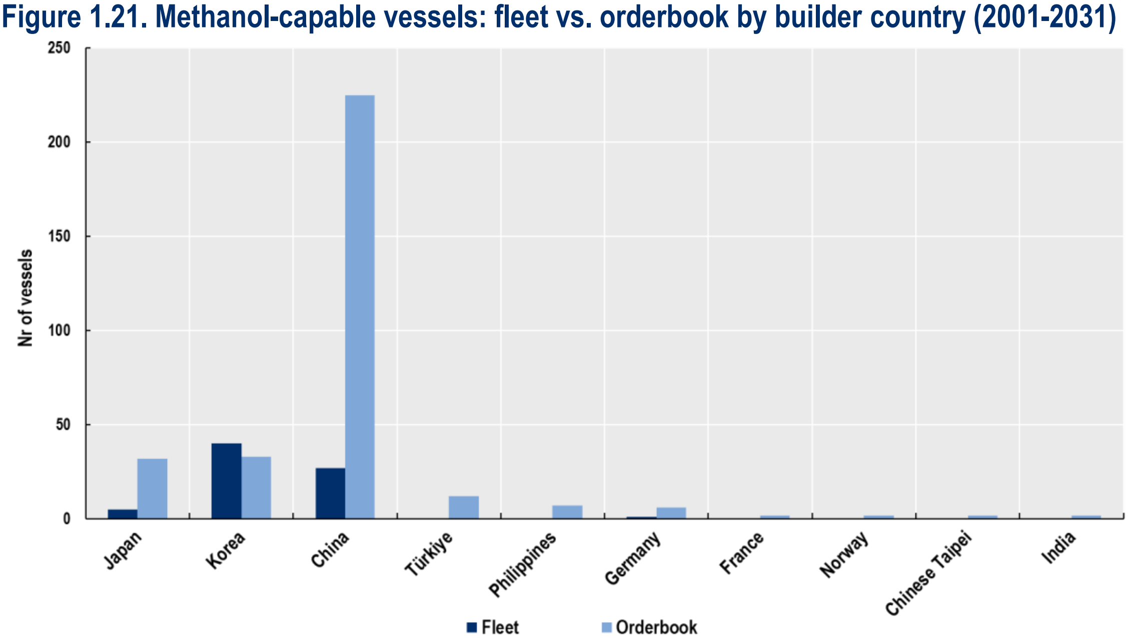
Figure 1.20. Cumulative LNG-capable ship completions per top builder country (2014-2023)



Source: WFR.

Moreover, the existing methanol tonnage in Japan's fleet incentivises increased production capacity for carbon-neutral methanol. Japan ranks third in terms of its orderbook for methanol-capable vessels after China and Korea. In terms of fleet as seen in Figure 1.21, Japan remains in the same position, this time led by Korea first and China second. Orderbook and completions of these vessels remain highly concentrated among the top three shipbuilders.

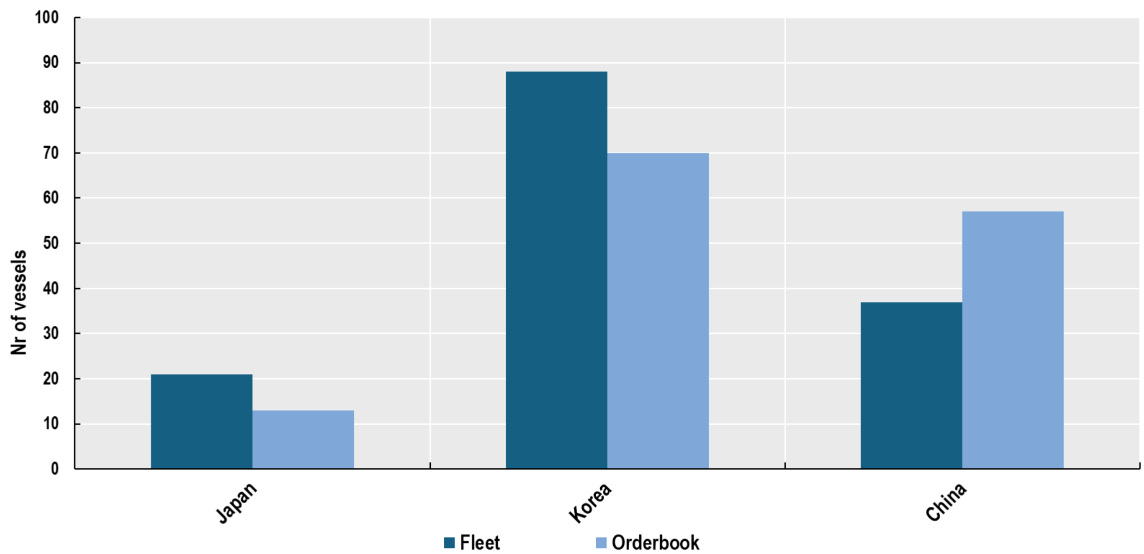
Figure 1.21. Methanol-capable vessels: fleet vs. orderbook by builder country (2001-2031)



Source: (OECD, 2025[19]).

LPG-capable vessels show a similar story with Korea leading the way both in terms of orderbook and fleet capabilities—with 88 vessels and 70 orders between 2015 and 2029. China stands at 37 LPG-capable vessels and 57 in its orderbook while Japan has 13 vessels in its orderbook and 21 in its fleet for that same period (Figure 1.22).

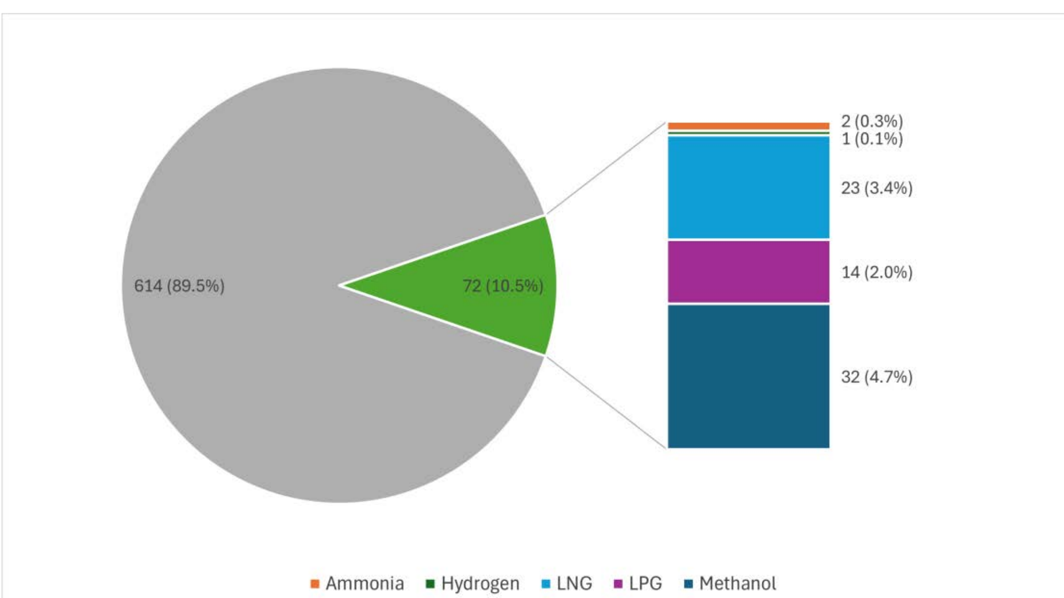
Figure 1.22. LPG-capable vessels: fleet vs. orderbook by builder country (2015-2029)



Source: (OECD, 2025[19]).

As shown in Figure 1.23, the current alternative-fuel orderbook for Japanese shipyards as of 25 July 2025 contains 72 vessels, corresponding to 10.5% of Japan's total orderbook, while 614 vessels (89.5%) are still conventional fuel.

Figure 1.23. Orderbook Japan alternative fuel type breakdown



Note: Includes vessel larger than 1000 GT. As of 25 July 2025.
Source: (Clarksons Research, 2025[2]).

As shown in Table 1.8, Japan's alternative-fuel orderbook is distributed as follows: Methanol 32 vessels, LNG 23, LPG 14, Ammonia 2, and Hydrogen 1. Within specific fuel types, Japan's methanol count follows China and Korea, while for LPG-capable vessels Japan has 14, compared with Korea and China.

Table 1.8. Orderbook comparison: fuel types

	China	France	Germany	Japan	Netherlands	Philippines	Korea	Türkiye	Viet Nam
Conventional fuel	2 754	6	6	614	95	55	251	68	111
Alternative fuel	996	9	13	72	3	7	421	18	8
Ammonia	30			2			10		
Biofuel	10				2				
Biofuel, Methanol	2								
Ethane	48						17		
Hydrogen				1				2	6
LNG	618	7	10	23			286	7	2
LPG	55			14			72		
Methanol	233	2	3	32	1	7	36	9	
Total	3 750	15	19	686	98	62	672	86	119

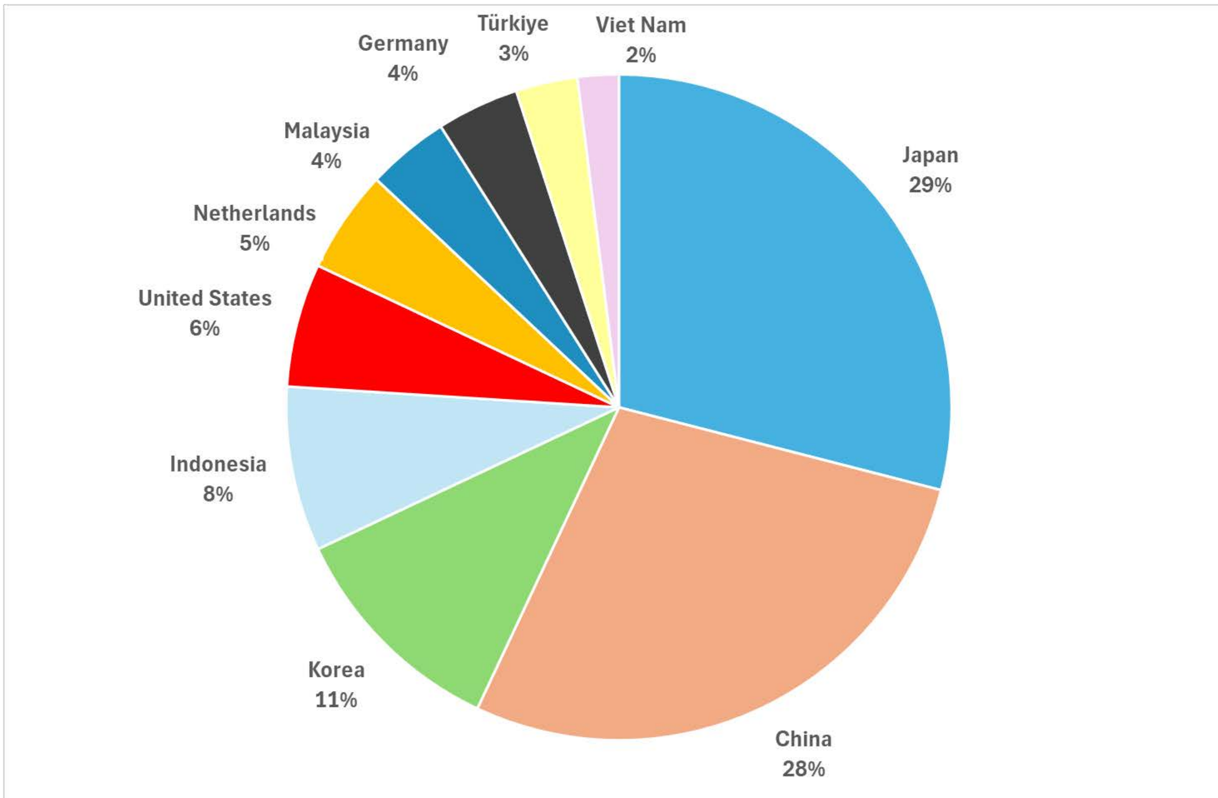
Note: Orderbook in number of ships as of 25 July 2025. Analysis with Vessels 1000 GT and above. Alternative fuel-ready vessels are part of the conventional fuel category. Hydrogen also includes hydrogen fuel cells.
Source: (Clarksons Research, 2025[2]).

1.3.4. Energy Saving Technologies

In accordance with their target to reach net-zero emissions of greenhouse gas by 2050, shipbuilding companies also rely on energy-saving technologies (ESTs), including new digital solutions, to offer a cost-effective pathway to reducing emissions. They notably include the development of technologies such as the adoption of air lubrication or wind propulsion systems in Japan (Statistics Bureau of Japan, 2024[6]). These technologies provide a solution to current challenges while minimising demand for scarce carbon neutral fuels and improving performance at sea. This section of the report gives an overview of their uptake in Japanese newbuilding and retrofits.

Looking to builder countries in Figure 1.24, Japan and China emerge as the main suppliers of ESTs to the global fleet, making up 29% and 28% respectively (OECD, 2025[19]). Korea and Indonesia are also notable suppliers. The market for equipment suppliers is diverse, with numerous countries from different regions of the world (Asia, Europe and North America) providing around or below 5% of ESTs within the global fleet.

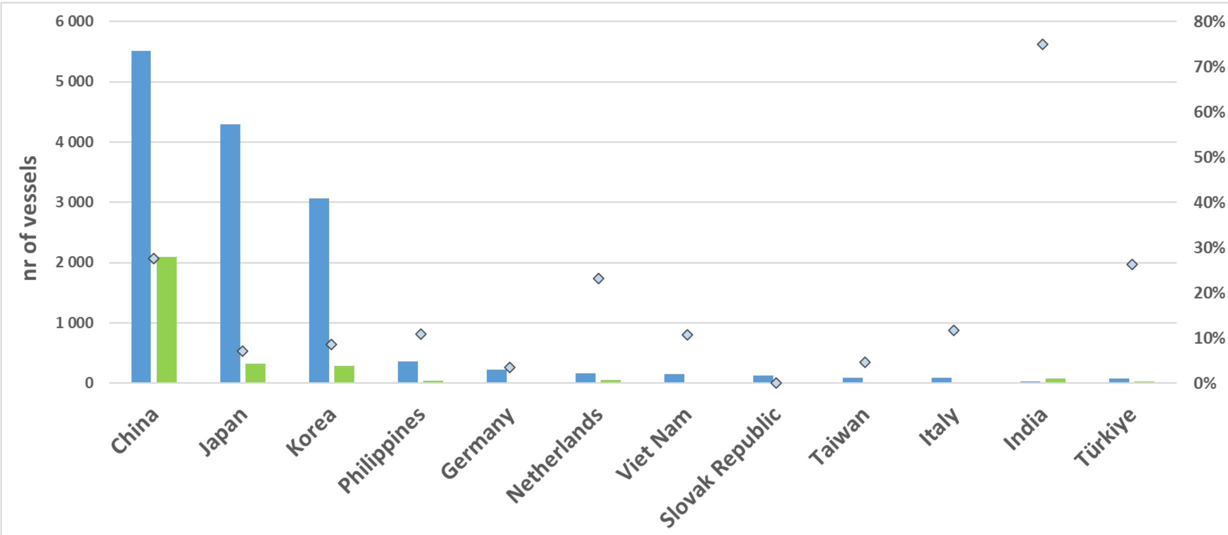
Figure 1.24. ESTs in global fleet by builder country (2025)



Source: WFR.

As seen in Figure 1.25, the latest data from WFR highlights the significant growth of China in the EST market. Japan holds a major position in the global shipbuilding market with 4 292 EST-equipped vessels in its current fleet, yet it remains in second place behind China (5 510 vessels), followed by Korea (3 069 vessels). In terms of the orderbook, Japan's EST volume is limited to 324 vessels; while this is at a similar level to Korea (288 vessels), it shows a substantial gap compared to China, which leads the market with 2 091 vessels.

Figure 1.25. ESTs: Fleet vs. orderbook by builder country (2026)



Source: WFR.

2 Structure and characteristics: Feature of Japanese maritime industry

This chapter delineates the structural framework of the Japanese shipbuilding industry, specifically the increasing concentration of domestic ownership and the shifting export volumes. It details the composition of the sector, analysing the consolidation trends among major shipbuilders and their transition toward alternative-fuel technologies. Additionally, the chapter evaluates the institutional support provided by MLIT, JBIC, and NEXI, focusing on export financing mechanisms and the implementation of the "Green Growth Strategy." Key emphasis is placed on the government's role in co-ordinating R&D through the Green Innovation Fund to ensure domestic self-sufficiency and technological autonomy.

2.1. Structure of the Industry

Key Findings

- **Japan is a major maritime trading nation, with maritime transport accounting for 99.6% of its international logistics**. In 2023, Japanese shipowners held 10.6% of the global fleet in deadweight tonnage (DWT), and domestic shipyards delivered 15.4% of newly built vessels in gross tonnage (GT). The maritime sector benefits from a robust industrial base, including shipbuilding, equipment manufacturing, and a supportive ship financing environment. Despite stable sales revenues, the financial performance of major Japanese shipbuilders has faced challenges, with operating profits remaining weak until signs of recovery emerged in 2023. Structural and cyclical issues, such as a downturn in global ship demand and a strong yen, have impacted profitability.
- **The reliance on domestic shipyards has increased, with Japanese entities owning nearly 70% of Japanese-built vessels by 2024, up from 10-20% before 2006**. This shift is partly due to reduced foreign demand, particularly from China and Greece. The role of domestic shipowners has grown, with foreign ownership of Japanese-built ships declining from 76% in the early 2000s to 20-30% recently. Japan's ship export volumes and values have also decreased, with export volumes dropping from 17.6 million GT in 2010 to 9.1 million GT in 2023. The decline has been most notable for bulk carriers and tankers, while containership exports have shown moderate growth.

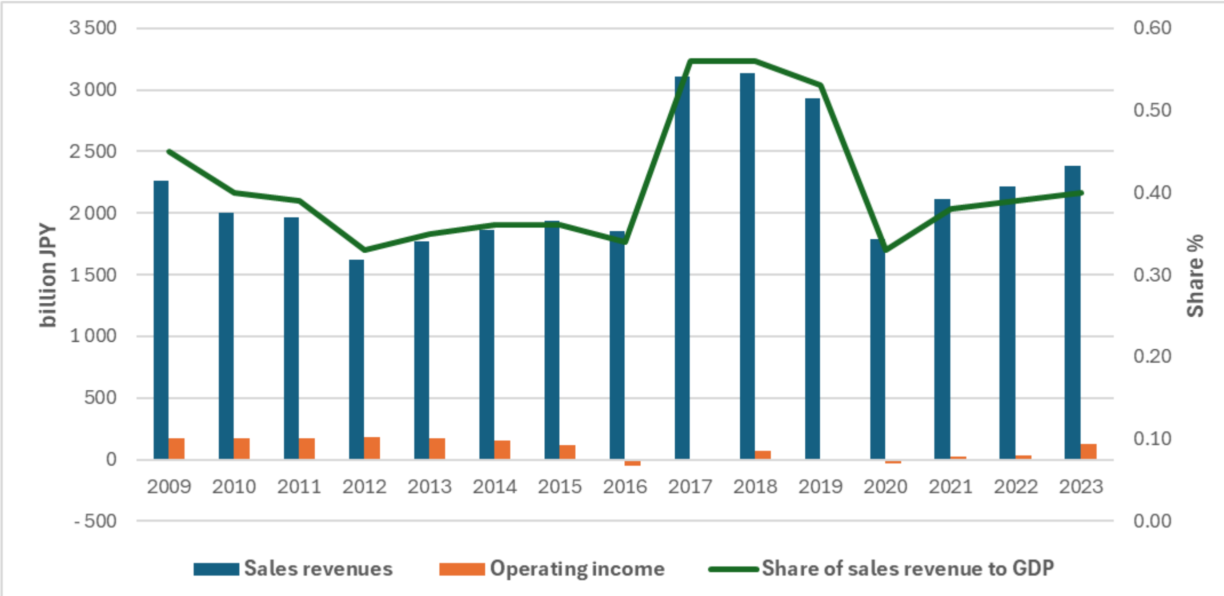
2.1.1. Economic significance of maritime industry

Japan is one of the world’s largest maritime trading nations, with maritime transport accounting for 99.6% of its international logistics (MLIT, 2025[26]). In 2023, Japanese shipowners held 10.6% of the global fleet in deadweight tonnage (DWT), and domestic shipyards delivered 15.4% of newly built vessels in gross tonnage (GT) (UNCTAD, 2025[27]). The maritime sector benefits from a strong industrial base, including shipbuilding, equipment manufacturing, and a ship financing environment supported by private financial institutions. This integrated ecosystem underpins Japan’s competitiveness in the global maritime industry.

Reflecting this macroeconomic significance, the financial performance of major Japanese shipbuilders offers further insights. As shown in Figure 2.1, the sales revenues of 11 firms affiliated with the Shipbuilders’ Association of Japan (SAJ) point to the sector’s stable contribution to GDP, peaking between 2017 and 2019. However, despite steady sales, operating income has remained weak. Following a record low in 2016, profitability showed limited improvement in subsequent years, with clearer signs of recovery only emerging in 2023.

This gap between revenue and profit highlights structural and cyclical issues. A downturn in global ship demand in 2016—driven by falling oil prices and freight rates—reduced orders for key ship types. While deliveries continued, fewer new contracts affected earnings. At the same time, a strong yen reduced the value of dollar-denominated contracts and weakened the price competitiveness of Japanese shipyards against regional rivals.

Figure 2.1. Revenue and contribution to GDP by 11 major Japanese shipbuilders, 2009-2023



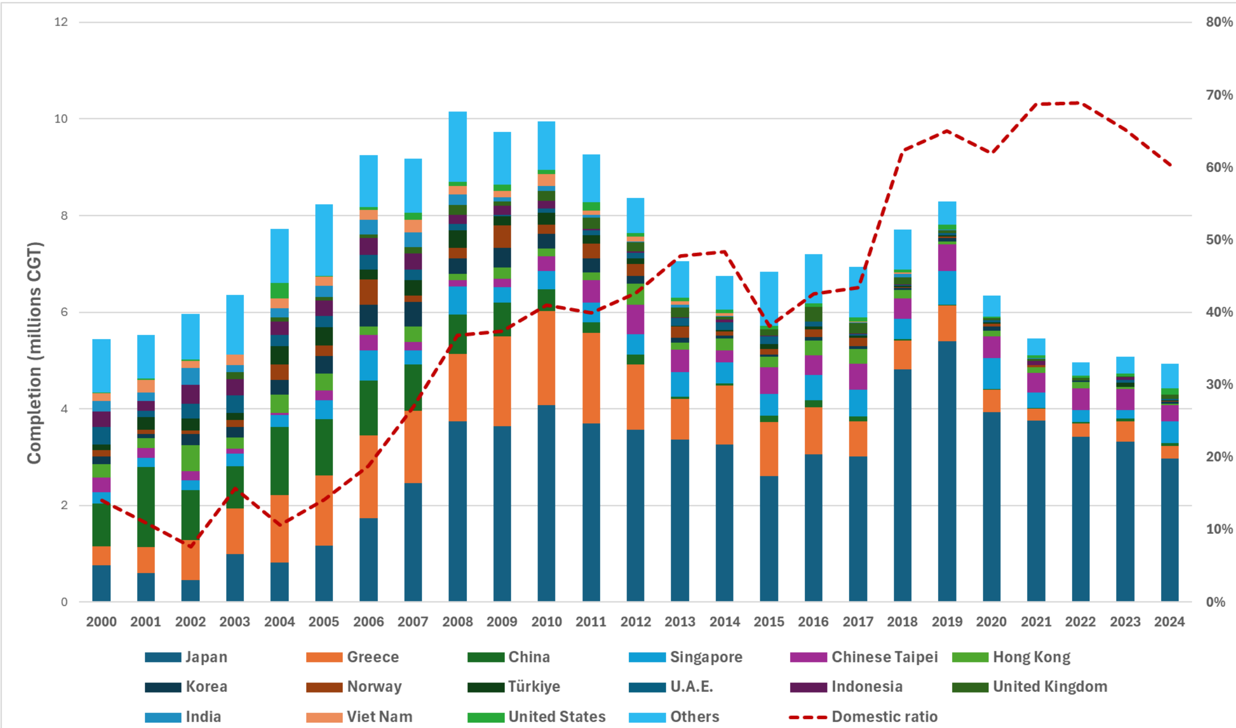
Note: Japan's fiscal year is from 1 April to 31 March. Sales and operating profit are compiled by the Maritime Bureau of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) based on financial statements on company websites and official gazettes. GDP used in the figure is Nominal GDP of "Annual GDP Actual Amount" on the Cabinet Office website.
Source : https://www.esri.cao.go.jp/jp/sna/menu.html.

Looking ahead, the financial outlook for the Japanese shipbuilding industry appears to be improving. According to the SAJ, newbuilding activity in 2023 and 2024 is expected to remain stable, but profitability is projected to increase significantly, supported by the historically weak yen. All seven mid- and large-sized shipbuilding companies reported profits in 2023, and the current order book levels are considered sufficient. However, as in Korea, the industry's key challenge now lies in how to strategically invest in future capacity, innovation, and competitiveness.

2.1.2. Export and import

The reliance on domestic shipyards is seen in the ownership of Japanese-built vessels. Prior to 2006, only 10–20% of these ships were owned by Japanese entities, but the share rose to 40–50% between 2008 and 2014 and has recently approached 70% (Figure 2.2). The increase is partly due to a fall in foreign demand, particularly from Greece and China. China's shift toward local procurement and rapid shipbuilding development significantly reduced its orders from Japan, while emerging economies like Viet Nam and India also scaled back orders.

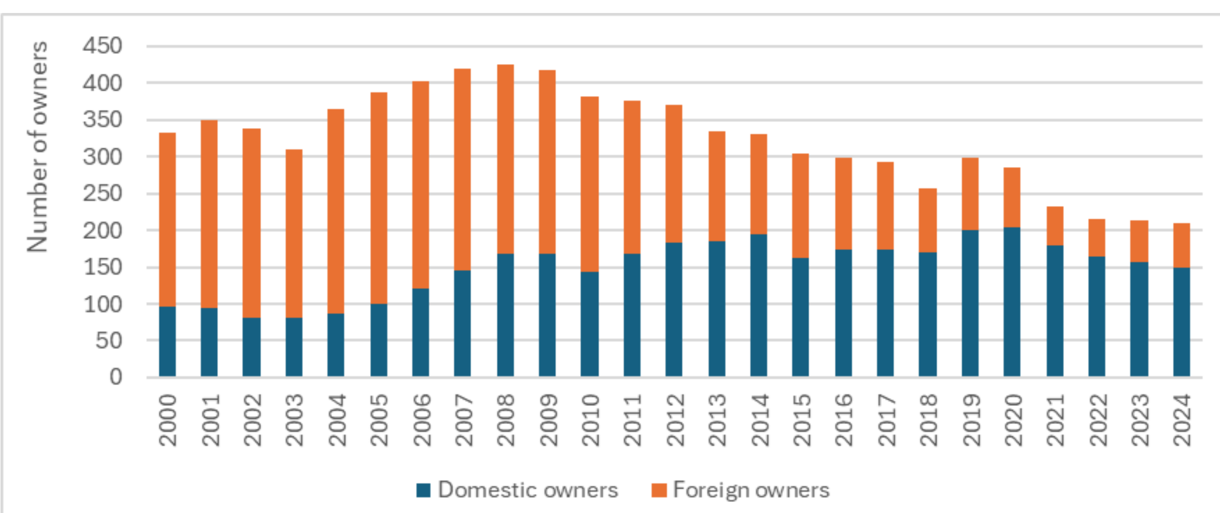
Figure 2.2. Major owners of vessels built in Japan



Source: WFR.

As shown in Figure 2.3, in the early 2000s, foreign owners accounted for up to 76% of ships built in Japan. In recent years, this figure has declined to 20–30%, highlighting the growing role of domestic shipowners in sustaining Japan's shipbuilding sector.

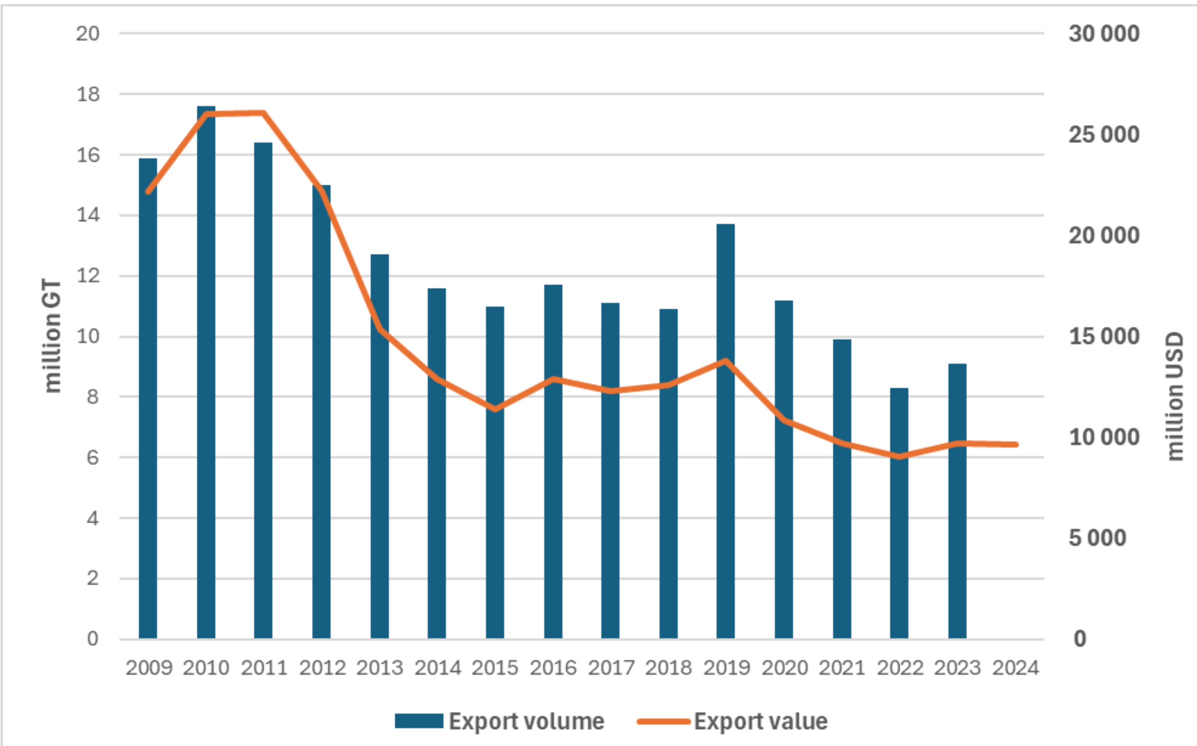
Figure 2.3. Development of owners of vessels built in Japan



Source: WFR.

This shift toward domestic demand can also be observed in Japan's ship export volumes and values. According to the Japan Ship Exporters' Association (JSEA, Figure 2.3), the export volume declined from 17.6 million GT in 2010 to 9.1 million GT in 2023 — a decrease of approximately 48.3%. Export values followed a similar trend. By vessel type, the decline has been most notable for bulk carriers and tankers, with export volumes measured in CGT falling by 63% and 87%, respectively, compared to 2010 levels. In contrast, exports of containerships recorded moderate growth, reaching 110% of their 2010 level (Clarkson).

Figure 2.4. Export volume and value of vessels



Note: Export volume is based on new export ship contract, which is 500 GT and above. Export value is based on all ships, boats, and floating structures under HS code 2002's 89 code.
Source: "Figures for New Export Ship Orders" issued by Japan Ship Exporters' Association (JSEA), https://www.jsea.or.jp/en/results/.

2.2. Components of the Industry

Key Findings

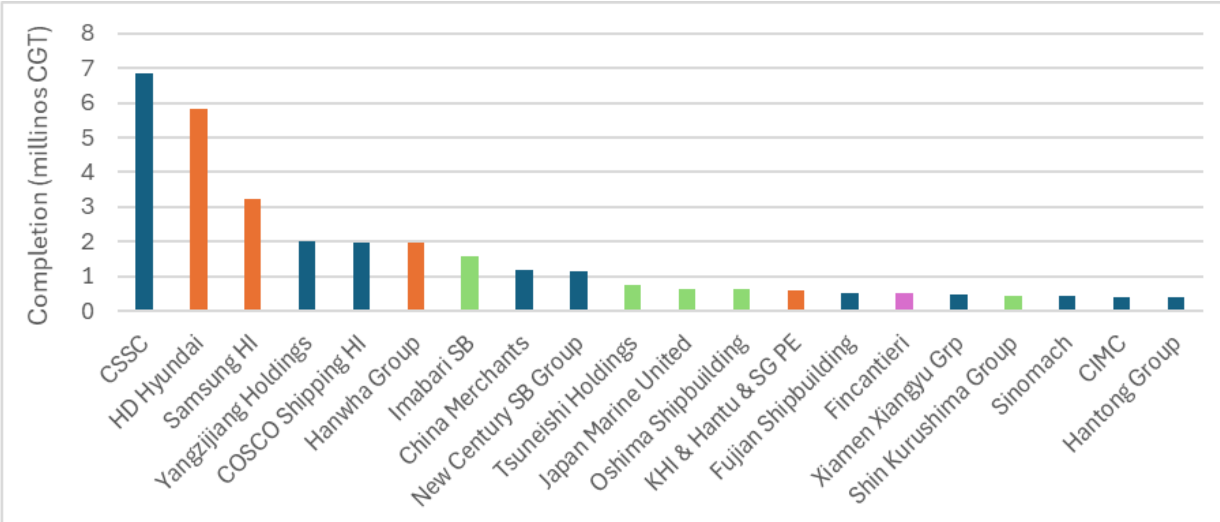
- **Japan's shipbuilding industry continues to operate a significant number of globally competitive yards**, despite a long-term decline in global market share. Structural adjustments are underway, including consolidation of commercial shipbuilding activities under large groups such as Imabari Shipbuilding, and strategic moves toward high-value segments such as offshore energy platforms and marine equipment. In 2024, Japan ranked third globally by number of shipbuilders in the top 20 CGT producers, with six firms represented, including Imabari, Tsuneishi, JMU, Oshima, and Shin Kurushima. These yards reflect a diversified and competitive structure distinct from Korea, where three firms account for over 90% of national output. The Japanese shipbuilding sector, however, experienced some consolidation recently which would lead to a higher level of concentration of the sector. More than 35% of Japanese completions featured alternative fuel compatibility or energy-saving technologies.
- **Measured by 3-year interval CGT capacity, the top 10 Japanese shipbuilders held 83.7% of national capacity in 2024, with Imabari contributing 25.3%.** Imabari has led capacity rankings since 2002. Under a 15-year interval estimate, the top 10 firms accounted for 68.1% of total capacity in 2024, with Imabari holding 16.7%. This reflects a gradual consolidation trend while maintaining a relatively dispersed industrial base compared to regional peers.
- **Japan's public sector plays a central role in supporting the maritime industry through regulatory oversight, technological co-ordination, and export finance.** The Maritime Bureau of MLIT oversees policy for shipbuilding and marine machinery and supports standards for safety, scrapping, and innovation. Export financing is led by JBIC, which offers buyer's credits and bank-to-bank loans, and by NEXI, which insures ship exports against political and commercial risk. These institutions aim to sustain the global competitiveness of Japanese yards, particularly SMEs integrated into regional production networks.
- **Support for industrial transformation is provided through strategies such as the "Green Growth Strategy" and the 2024 MLIT roadmap for next-generation shipbuilding.** The government promotes zero-emission vessel development, digital design processes, and modular production methods. As of 2023, the Green Innovation Fund supports R&D in hydrogen and ammonia fuel technologies, LNG-related engineering, and smart equipment systems. In addition, domestic self-sufficiency in equipment production—reported at 92% in 2022—is prioritised to reduce external supply shocks and align with strategic autonomy goals.

2.2.1. Private sector

Shipbuilder

Although Japan's global market share in shipbuilding has declined in recent years, the country continues to host a significant number of competitive shipyards, supported by a long-standing industrial tradition. In response to intensified global competition and evolving market demands, Japanese shipbuilders are undergoing structural adjustments. These changes include a concentration of merchant vessel production among leading shipbuilding groups—most notably Imabari Shipbuilding—to enhance operational efficiency, as well as a strategic pivot toward higher-value segments of the maritime supply chain, such as offshore renewable energy platforms and marine engine manufacturing, to improve profitability.

Figure 2.5. Top 20 Shipbuilder group globally (2024)



Source: WFR.

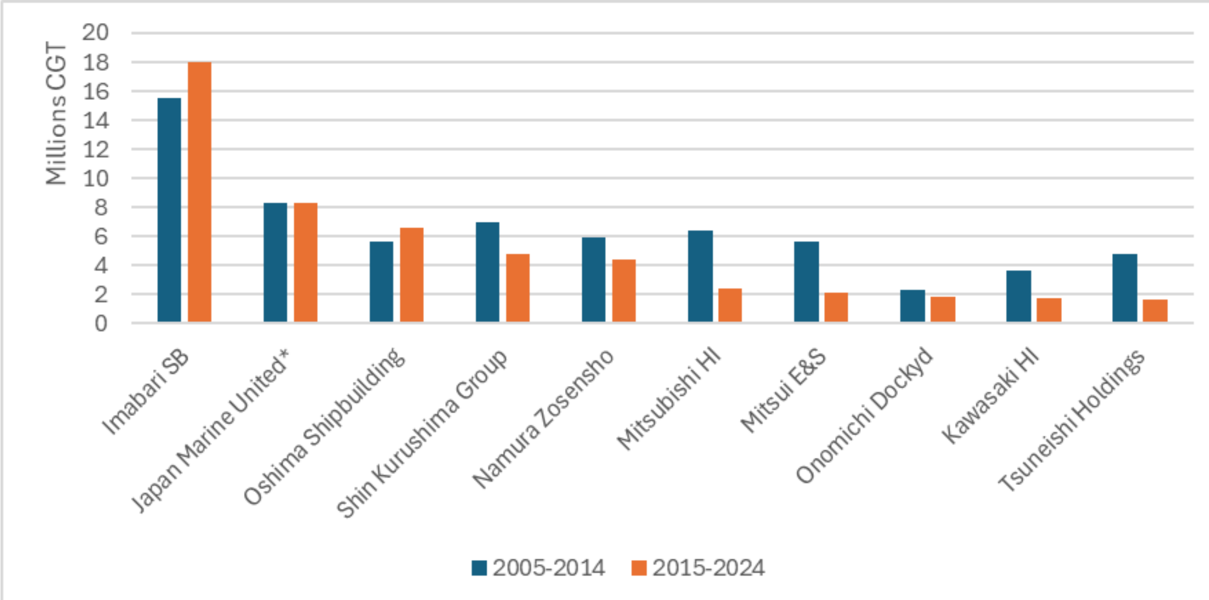
Figure 2.5 presents the top 20 global shipbuilders by CGT completions in 2024. Japan has five shipyards included in this global ranking: Imabari Shipbuilding, Tsuneishi Shipbuilding, Japan Marine United (JMU), Oshima Shipbuilding, and Shin Kurushima Dockyard. This representation indicates that Japan's shipbuilding industry remains globally competitive across a diverse range of firms. This places Japan second globally in terms of the number of companies represented in the top 20, following China and ahead of Korea. The presence of multiple firms confirms that Japan's industrial competitiveness is not reliant on a single entity, but on a group of specialised and productive shipyards.

Imabari Shipbuilding leads among Japanese firms with 1.6 million CGT, reflecting its broad capacity and product portfolio. Tsuneishi Shipbuilding follows with 0.8 million CGT, specialising in Panamax bulkers and midsize containerships. JMU recorded 0.6 million CGT, maintaining a strong position in multipurpose commercial vessels. Oshima Shipbuilding and Shin Kurushima Dockyard each completed around 0.4–0.6 million CGT, mostly in Handymax bulkers and Ro-Ro vessels respectively.

Compared to Korea, where three firms dominate over 90% of national CGT, Japan's shipbuilding structure in 2024 reflects broader diversity. This structural characteristic provides resilience, as production capacity is distributed among several competitive firms. However, a gradual process of consolidation is underway, with production of merchant vessels increasingly concentrated among major shipbuilding groups.

In terms of technological output, more than 35% of Japan's ship completions featured either alternative fuel compatibility or energy-saving technologies. These ships are often aligned with Japan's regulatory goals and supported by strategic government programs such as the Green Innovation Fund.

Figure 2.6. Top 10 Builder groups in Japan (2005-2014, 2015-2024)



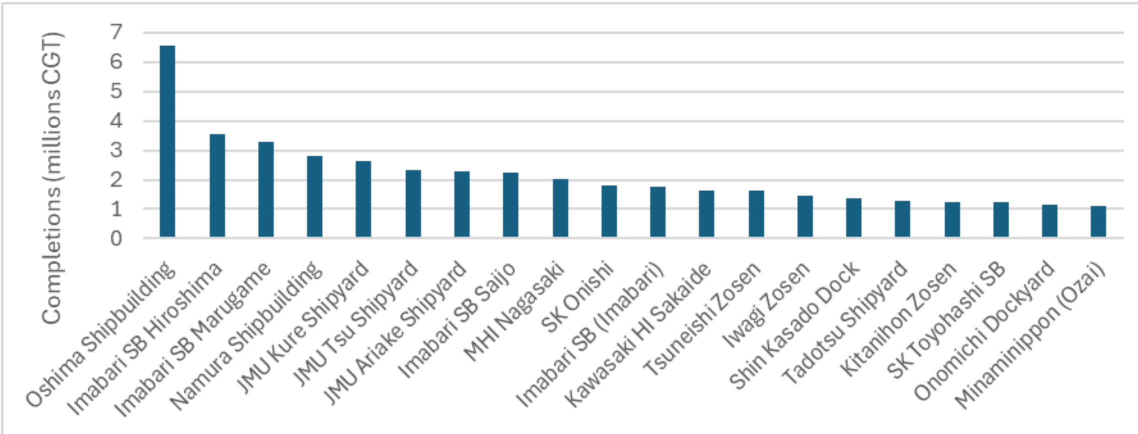
Note: Top 10 shipbuilders' groups were selected based on the completion from 2015-2024 period. *Universal Shipbuilding Corporation and IHI Marine United Inc. united and became Japan Marine United in 2013.
Source: WFR.

Figure 2.6 compares cumulative CGT completions from 2005-2014 and 2015-2024 for Japan's top 10 shipbuilding groups. The data reveals growing market concentration. Only Imabari and Oshima increased their completions in the recent decade, while others declined. Imabari led with around 18 million CGT—about 35% of completions among the top 10, up from 24% previously. The top five builders now account for over 66% of completions, compared to 55% in the earlier period, highlighting industry consolidation.

This trend toward concentration has been driven by major restructuring efforts. Imabari Shipbuilding played a leading role, acquiring Koyo Dockyard (2014), Tadotsu Shipbuilding (2015), and Minaminippon Shipbuilding (2018). In 2021, it partnered with Japan Marine United (JMU) to form Nihon Shipyard, consolidating merchant shipbuilding operations and acquiring a 30% stake in JMU. In 2025. Imabari Shipbuilding agreed to acquire a controlling 60% stake in Japan Marine United (JMU) (Financial Times, 2025[28]). This transaction aims to strengthen Japan's position against Chinese and South Korean competitors. This agreement follows earlier collaboration between the two companies, including the establishment of Nihon Shipyard in 2021 for commercial vessel design. This latest move reflects a strategic effort to secure economies of scale and technological leadership in response to regional competition.

At the same time, other major players such as Sumitomo Heavy Industries and Mitsui E&S have exited merchant shipbuilding, shifting toward offshore wind infrastructure, marine engines, and engineering services—signalling a broader repositioning across the industry. According to MLIT shipbuilding statistics (2023), mid-tier Japanese shipyards such as Oshima Shipbuilding and Shin Kurushima Dockyard specialise in Handymax bulk carriers and short-sea Ro-Ro or PCTC vessels, respectively. Furthermore, the resilience of Japan's mid-tier shipbuilders is supported by long-term relationships with domestic owners and continued demand for smaller, regulation-compliant vessels under environmental mandates. UNCTAD (2024) notes that Japan maintains a diversified production base with a higher share of domestic-oriented and technologically specialised yards compared to Korea or China.

Figure 2.7. Top 20 shipyards in Japan (2015-2024)



Source: WFR.

Figure 2.7 ranks Japan's top 20 individual shipyards by cumulative CGT completions over the period 2015 to 2024. This yard-level view supplements the group-based aggregation shown in Figure 2.6 and reveals the internal structure of Japan's production base in more granular detail.

The top-ranking yard is Oshima, with nearly 6.5 million CGT over the decade. The next three are Imabari's Marugame, Imabari's Hiroshima, and Namura Shipbuilding, each completing between 3.5–4.5 million CGT. These figures confirm the presence of high-capacity yards outside the JMU and Imabari main yards, with notable contributions from specialised bulk carrier producers.

Multiple Imabari-affiliated yards appear in the top 15, including Imabari Saijo and Iwagi Zosen, demonstrating the geographic and operational breadth of Imabari's network.

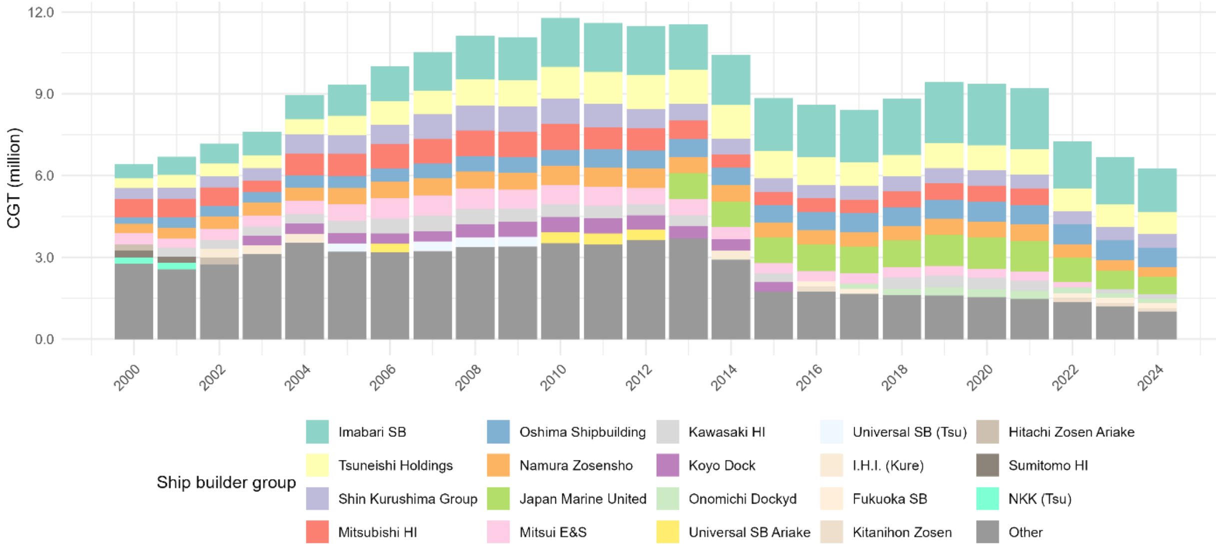
JMU yards (e.g. JMU Kure, JMU Ariake, JMU Tsu) and MHI Nagasaki, Tsuneishi, Shin Kurushima, and Sakaide yards also figure prominently, supporting the view that Japan's mid-sized builders play a persistent and material role in national production, particularly in Handymax bulkers, PCTCs, ferries, and coastal Ro-Ro vessels.

The diversity of yards in the top 20 reinforces the notion of Japan's relatively decentralised industrial structure. Japan's shipbuilding output remains more geographically distributed and less oligopolistic than Korea's, despite Imabari's network scale.

Capacity of main shipbuilding groups

The capacity of the main Japanese shipbuilding groups for 2000 to 2024 are depicted using the 3-year interval calculation in Figure 2.8. On average, the ten largest groups accounted for 72.4% of total national capacity over this period. In 2000 they held 56.8%, with Mitsubishi HI at the top of the list at 10.7%. That year marked the lowest concentration of capacity among the top ten. The share then climbed, reaching a peak of 83.9% in 2021, when Imabari SB alone represented 24.5%. In 2024, the top ten still held 83.7%, Imabari SB contributing 25.3%. Mitsubishi HI was the largest group in 2000–01, but from 2002 onward Imabari SB has led in capacity.

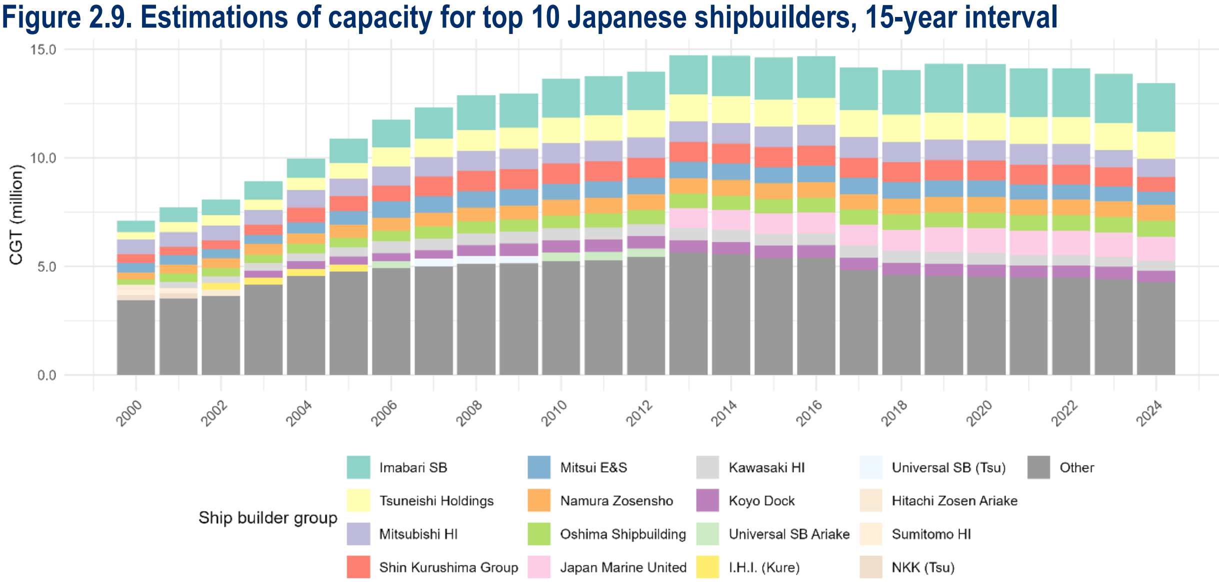
Figure 2.8. Estimations of capacity for top 10 Japanese shipbuilders, 3-year interval



Source: OECD estimation based on Clarkson Research Services Limited (February 2025), World Fleet Register, https://www.clarksons.net/wfr; S&P Global (February 2025), Maritime IHS database, https://maritime.ihs.com/.

The estimations of capacity using the 15-year interval for the leading ten Japanese shipbuilder groups are found in Figure 2.9. On average, between 2000 and 2024, the top ten shipbuilder groups made up 61.6% share of total shipbuilding capacity. In 2000, the top ten groups by capacity had a 51.4% share of total capacity, where Mitsubishi HI had the largest capacity, with 9.6% of the total share. The highest share during this period was in 2020, with 68.5% share of total capacity, where Imabari SB had the highest share with 15.7% of the total. The lowest share held by this group was in 2000. In 2024, the leading 10 yards by capacity had 68.1% of the total share of capacity, with Imabari SB leading, with 16.7% share. Between 2000 and 2001, Mitsubishi HI was the largest shipbuilder by capacity but since 2002, Imabari SB has maintained the most capacity. Overall, concentration ratios are lower under the 15-year window than under the three-year window.

Figure 2.9. Estimations of capacity for top 10 Japanese shipbuilders, 15-year interval



Source: OECD estimation based on Clarkson Research Services Limited (February 2025), World Fleet Register, S&P Global (February 2025), Maritime IHS database, https://maritime.ihs.com/.

Industry associations

Japan's shipbuilding sector is supported by a structured network of industry associations that play distinct roles in representing and promoting the interests of various segments of the industry. These organisations contribute to the policy dialogue, technical advancement, and international co-operation that underpin the competitiveness and resilience of Japan's maritime cluster.

The Shipbuilders' Association of Japan (SAJ): SAJ represents the interests of large and medium-sized shipbuilders and is the principal voice of Japan's merchant shipbuilding sector. As of August 2024, the association counts 17 shipbuilding companies and one additional organisation among its members. SAJ's mandate is to promote the sound and sustainable development of the shipbuilding industry, with a view to supporting both domestic and international economic growth and public welfare. Its core functions span business management support, technical research and development, international co-operation, and data collection and analysis. SAJ plays an active role in global shipbuilding forums. It is a founding member of the *JECK* forum (formerly *JECKU*), which brings together shipbuilding associations and major yards from Japan, Europe, China, and Korea. Although the United States withdrew from the forum in 2023, JECK continues to operate as a high-level dialogue platform. The 2024 Top Executive Meeting is scheduled to take place in Korea. SAJ is also a core member of the *Active Shipbuilding Experts' Federation (ASEF)*, established in 2015, which promotes co-operation among shipbuilding countries on issues of maritime safety and environmental regulation. ASEF attained consultative status at the IMO in 2017 and currently includes members from Japan, Korea, China, and several ASEAN and South Asian economies.

The Cooperative Association of Japan Shipbuilders (CAJS): CAJS represents small and medium-sized shipbuilders, comprising 50 regular corporate members and 38 supporting organisations as of August 2024. While regular members include smaller yards, supporting members consist of larger shipbuilders and marine equipment manufacturers, creating a collaborative platform across the supply chain. CAJS is dedicated to strengthening the technical and business capacities of smaller shipyards. Its activities aim to enhance competitiveness and ensure the sustainability of this segment, which remains crucial for Japan's regional industrial base and domestic vessel demand. CAJS does not currently participate in international forums such as JECK or ASEF, reflecting its primarily domestic focus.

Japan Ship Machinery and Equipment Association (JSMEA): JSMEA is the key association representing Japan's ship machinery and equipment manufacturers. As of August 2024, it includes 256 regular corporate members and 75 supporting organisations. Member firms are involved in the production, repair, and sales of a wide range of components including propulsion engines, pumps, compressors, heat exchangers, deck machinery, navigational aids, and various onboard systems. The association's objective is to foster technological advancement and promote the development of the ship equipment sector in support of both domestic and global maritime industries. JSMEA does not currently engage in international industry co-operation forums.

Together, these associations reflect the layered structure of Japan's shipbuilding ecosystem—from large, internationally active builders to specialised equipment suppliers and small- and medium-sized regional yards. Their differentiated mandates and membership bases allow them to address a broad range of sectoral challenges and policy priorities.

2.2.2. Public sector

Government

MLIT (Ministry of Land, Infrastructure, Transport and Tourism) Maritime Bureau and related maritime affairs in Japan fall under the jurisdiction of the Maritime Bureau, which operates within the MLIT. The Bureau oversees a broad portfolio, including the development, regulation, and co-ordination of the shipbuilding and ship machinery industries. Within its internal structure, the Shipbuilding and Ship Machinery Division is specifically responsible for the promotion of vessel manufacturing, repair, and scrapping, as well as the development of technical standards for safety and environmental protection. The Bureau also supports technological advancement in shipbuilding and marine engine production, while contributing to international regulatory alignment and the broader sustainability goals of Japan's maritime sector.

Export credit Agencies

The Japan Bank for International Cooperation (JBIC) plays a pivotal role in supporting Japan's shipbuilding industry through export financing mechanisms. Primarily, JBIC offers Buyer's Credit (B/C) and Bank-to-Bank Loans (B/L) to foreign importers and financial institutions, facilitating the procurement of Japanese-built vessels and related services. These financial instruments are designed to bolster the international competitiveness of Japanese shipbuilders, many of which are integral to regional economies and involve numerous small and medium-sized enterprises (SMEs). By providing such support, JBIC not only aids to maintaining the vitality of Japan's maritime sector but also ensures the continued global presence of its shipbuilding industry.

Nippon Export and Investment Insurance (NEXI) provides trade and investment insurance to support Japanese companies involved in international transactions, including shipbuilding exports. In the shipbuilding sector, NEXI offers insurance coverage for export credit risks, such as non-payment by foreign buyers due to political or commercial reasons. This includes insurance for buyer's credit loans extended by Japanese banks and supplier's credit arrangements for shipbuilders. By mitigating financial risks for both exporters and financial institutions, NEXI plays a key role in facilitating the export of Japanese-built vessels, particularly in competitive international markets where long-term financing is essential.

2.2.3. Support measures and policies

Based on the questionnaire to Japan and web research by the Secretariat, this provides the recent measures for shipbuilding sector in Japan.

Acts

Japan's shipbuilding policy framework is anchored in several legislative acts designed to strengthen competitiveness, secure supply chains, and facilitate decarbonisation. The Economic Security Promotion Law (2022) integrates industrial measures to ensure a stable supply of critical materials, designate ship components as strategic goods, and encourage domestic production to reduce reliance on foreign suppliers. Complementing this, the Act on Strengthening Maritime Industries (2021) aims to enhance competitiveness in both shipbuilding and shipping. More recently, the GX Promotion Act (2023) has provided the legal basis for Japan's transition toward a carbon-neutral economy, explicitly supporting the decarbonisation of shipping through the deployment of zero-emission vessels and related technologies.

Strategies

Strategic planning plays a pivotal role in Japan's maritime policy. The Realisation of Transformation in the Shipbuilding and Marine Equipment Industries strategy (2024) outlines long-term objectives for the shipbuilding and maritime sectors, including a roadmap for technological development and industrial restructuring by 2030. In the area of decarbonisation, the GX Promotion Strategy (2023) creates financial incentives for the adoption of alternative fuel technologies such as ammonia, hydrogen, and LNG. These strategies are intended to align industrial competitiveness with Japan's broader climate commitments while encouraging collaboration between shipyards, equipment makers, and academia.

Roadmaps

Japan also relies on detailed roadmaps to guide technological and industrial transformation. The Roadmap to Zero Emissions from International Shipping (2020) brings together government, industry, and academia to address the technological, regulatory, and market challenges of decarbonisation. This initiative not only promotes the development of new energy-saving and low-emission solutions but also seeks to influence international standards and regulatory frameworks, thereby reinforcing Japan's role as a thought leader in shaping the global maritime decarbonisation agenda.

Support measures

Decarbonisation is supported through multiple instruments, including the Green Innovation Fund (2021) and GX Transition Bonds (2022 On the other hand, in the private sector, in terms of supporting ESG management from the perspective of investor relations, the Zero-Emission Accelerating Ship Finance scheme was jointly developed by ClassNK and DBJ.

3 Competitiveness

This chapter presents a SWOT analysis of the Japanese shipbuilding industry and a comparative assessment with the South Korean maritime sector. It outlines the strengths and weaknesses of the industry, focusing on marine equipment self-sufficiency, workforce demographics, and cost competitiveness. The chapter also identifies external opportunities and threats, including emerging alternative fuel markets and shifting global market shares. Finally, it compares the structural differences between the Japanese and South Korean shipbuilding industries.

3.1. Feature of the shipbuilding industry in Japan (SWOT analysis)

3.1.1. Strengths

The Japanese shipbuilding industry benefits from a deeply integrated industrial ecosystem, supported by robust domestic demand, world-class marine equipment manufacturers, and a long-standing tradition of maritime engineering.

Japan has an exceptionally high level of self-sufficiency in marine equipment: in 2022, 92% of equipment installed on Japanese-built ships was produced domestically, up from 87% in 2019. This contrasts with Korea (≈25% imports) and China (persistent trade deficit in high-value machinery). This capability ensures a stable and resilient supply chain, particularly in times of global logistics volatility.

The Green Innovation Fund promotes for next-generation ship development. Projects cover hydrogen and ammonia engines, fuel supply systems, and hull designs optimised for alternative fuels. Public-private research consortia involving NYK, MOL, Kawasaki Heavy Industries, and academia enable strong co-ordination and decentralised innovation.

Japan maintains relatively stable domestic demand: in 2023, nearly 70% of all ships built in Japan were delivered to domestic owners such as NYK, K Line, and MOL. These shipping companies value Japanese yards for quality assurance, after-service capabilities, and integrated logistics. Stable domestic demand provides a reliable revenue stream that supports long-term investment planning.

3.1.2. Weaknesses

The most pressing weakness is the rapid aging and shrinking workforce. Employment declined from 85 000 in 2009 to 70 000 in 2023. The share of skilled workers under 30 fell from 26% in 2009 to 19.5% in 2023, while workers aged 40–49 rose to over 31%. This demographic imbalance is worsened by the limited attractiveness of the sector to younger generations and the absence of a national-level vocational training program dedicated to shipbuilding.

Cost competitiveness is a structural weakness. Although unit labour costs declined slightly from 2000–2008, they remain significantly higher than in Korea and China. In 2021, Japanese shipbuilders earned USD 713 per DWT delivered, compared to Korea’s USD 978 and the global average of USD 877. The average vessel value per GT also lags competitors, as Japan focuses more on mid-range bulk carriers and general cargo ships rather than ultra-high-value segments such as cruise ships or FPSOs.

3.1.3. Opportunities

Japan is well-positioned to capitalise on the structural shift toward green and digital shipbuilding. First, it holds the world’s third-largest orderbook for methanol-capable vessels and is increasingly active in developing hydrogen- and ammonia-fuelled ships, supported by the Green Innovation Fund (2021–2030). This vertically integrated innovation strategy—from fuel tank and engine design to emissions control systems—provides Japan with a competitive edge in alternative fuel technologies.

The domestic rollout of bunkering infrastructure strengthens Japan’s role in the regional energy transition. LNG bunkering hubs have already been established in Kitakyushu and Mikawa Bay, while an ammonia bunkering station is under construction at Tokyo Wan, positioning Japan as a future bunkering leader in Northeast Asia.

Japan’s extensive intellectual property portfolio in low-carbon maritime technologies, particularly in hull design and propulsion efficiency, offers strong potential for licensing and joint development agreements with emerging shipyards in Southeast Asia—aligning both commercial and geopolitical interests.

3.1.4. Threats

The Japanese shipbuilding industry faces intensifying external pressures that threaten its long-term competitiveness. First, China's rapid rise has pushed its global orderbook share to around 69% in 2024, leaving Japan with only about 11%. Korea also maintains clear dominance in LNG, LPG, and advanced offshore vessels, further squeezing Japan's position in high-value markets.

Export demand for Japanese-built ships has eroded significantly. Foreign ownership declined from 76% in the early 2000s to just 20–30% in 2023, reducing Japan's exposure to international projects and weakening its global market presence.

Volatile exchange rates and persistently high raw material costs (e.g. steel plates during 2022–2024) compress profit margins despite stable domestic demand.

Innovation risks are mounting. Japan's low-carbon maritime patent filings have slowed markedly since 2019, while China has overtaken in this field, threatening Japan's historical technological leadership. Finally, geopolitical risks—such as tightening procurement rules linked to national security and potential trade restrictions—pose additional uncertainties for Japan's export-oriented segment, potentially limiting market access even in areas of technological strength.

The competitiveness of the Japanese shipbuilding industry is shaped by a combination of structural strengths, persistent weaknesses, and evolving opportunities and threats. Table 3.1 presents a SWOT analysis that summarises the report's assessment of Japan's shipbuilding sector, its industrial ecosystem, and its position in the global market.

Table 3.1. SWOT analysis of the Japan shipbuilding industry

Strength	Weakness
High self-sufficiency in marine equipment (92% of equipment on Japanese-built vessels produced domestically in 2022).	**Rapidly aging and shrinking workforce**: employment fell from 85 000 (2009) to 70 000 (2023). Share of workers <30 declined to 19.5%.
Global leadership in marine power systems: 2022 production of 674 522 outboard motors (JPY 231 billion) and 19 522 diesel engines (JPY 226 billion).	**High reliance on foreign workers.**
	Cost competitiveness: in 2021, Japanese builders earned USD 713 per DWT delivered, below Korea (USD 978) and the global average (USD 877).
Strong role in Energy Saving Technologies (ESTs): 29% of global EST-equipped fleet in 2023, ahead of Korea and comparable to China.	**Average vessel value per GT lags competitors**, reflecting focus on mid-range bulkers and general cargo rather than ultra-high-value ships.
Governmental support through the Green Innovation Fund.	
Collaborative R&D consortia involving shipbuilders, equipment makers, and academia.	**Uneven digitalisation**: large builders piloting smart factories, but smaller yards lag in digital twins, MBSE, real-time tracking.
Stable domestic demand: ~70% of ships built in Japan delivered to Japanese owners in 2023.	**Limited global market share**: orderbook share fell to ~11% in 2024, down from ~15% in 2019.
Strong reputation for quality, after-service, and compliance in high-value vessels.	

Opportunities	Threats
Third-largest orderbook for **methanol-capable vessels.**	**China's rapid ascent**: ~69% of global orderbook in 2024, dominating volume and increasingly advanced segments / **Korea's dominance in LNG, LPG, and offshore vessels.**
Growing R&D in hydrogen and ammonia fuel designs.	**Declining export demand**: foreign-owned share of Japanese-built ships dropped from 76% (2000s) to 20–30% (2023).
Domestic rollout of LNG bunkering hubs (Kitakyushu, Mikawa Bay) and **ammonia fueling.**	**Exchange rate volatility**: weak yen boosts competitiveness short-term but complicates long-term pricing/contracts.
Extensive IP base: global leader in low-carbon maritime patents. Potential for licensing/export of green tech.	**High and volatile raw material costs** (e.g. steel plates) compress margins.
Promotion of maritime digital engineering programs.	**Slowdown in patent activity** post-2019.
Moderate growth in containership exports.	**Geopolitical risks** / **tightening procurement/security regulations** may restrict exports.

Source: OECD authors' elaboration.

3.2. Comparative analysis of Japan and Korea in the shipbuilding industry

The common point between Korea and Japan is, firstly, that they are increasing their investment in future maritime technologies. Secondly, the lack of workforce and the rise in raw material prices appear to be weaknesses for both countries.

On the other hand, the main difference between the two countries is, firstly, that Japan has a high level of domestic ship and marine equipment demand, which is a big difference with Korea. Around 70% of ships built in Japan are delivered to Japanese owners. Approximatively 90% of the marine equipment installed on Japanese-built vessels was domestically manufactured. Second, while Korea tends to address with trends such as decarbonisation and digitalisation at the level of shipyards, especially large ones, Japan, thanks to its long-term use of cluster strategies, is using a consortium strategy involving various stakeholders such as shipping companies and shipbuilders.

Annex A. Recent measures for shipbuilding sector

Type/Categories	Name	Outline	Start year
Act	Law on promoting security through the implementation of integrated economic policies	The law is designed to strengthen economic security by integrating various economic measures: 1) ensuring a stable supply of important materials, (2) ensuring a stable provision of core infrastructure services, (3) supporting the development of advanced important technologies, and (4) keeping patent applications confidential. Designates ship components as critical materials. Encourages domestic production to reduce reliance on foreign suppliers.	2022
Act	Act on Strengthening Maritime Industries	This act aims to strengthen competitiveness in the shipbuilding and shipping industries, promote work style reform for seafarers, and improve productivity in domestic shipping. Aimed to build 18 million gross tonnes of ships in 2025.	2021
Strategy/Industrial policy	Realisation of transformation in the shipbuilding and marine equipment	(1) 2030 Shipbuilding Industry goals ; (2) 2030 Maritime Industry goals ; (3) Roadmap for transformation of the shipbuilding industry.	2024
Act	Act on Promoting a Smooth Transition to a Carbon-Free Growth Economic Structure	The GX Promotion Act (2023) aims to facilitate a transition toward a green economy, with a specific focus on decarbonising industries like shipping. The law supports the development and deployment of low-carbon technologies, including zero-emission ships. Establishes a framework for achieving carbon neutrality by 2050. Supports decarbonisation efforts across the maritime sector through regulatory measures.	2023
Strategy/Decarbonisation	Decarbonised Growth Economic Structure Transition Promotion Strategy	GX Transition Strategy, provides financial incentives for the adoption of green technologies like ammonia, hydrogen, and LNG fuels for shipping.	2023
Roadmap/Decarbonisation	Roadmap to Zero Emission from International Shipping/ Shipping Zero GHG Emission Project	launched the "International Shipping GHG Zero Emissions" project, a collaboration between Japan's industry, academia, and government. This project will comprehensively examine the technological development issues necessary to further enhance Japan's competitive advantage, international standards and incentive systems that consider the impact on the market, while identifying future global trends in the fields of energy conservation and decarbonisation, and will compile a division of roles and work plans for stakeholders to strategically promote these issues.	2020
Support/Decarbonisation	GX Economic Transition Bonds	The government will issue GX transitional economic bonds. In addition, these investment promotion measures will be implemented in conjunction with regulatory and institutional measures so that they will effectively lead to the creation of new markets and demand. Previous support using this measure includes promotion of construction of zero-emission ships.	2022
Support/Decarbonisation	Zero-Emission Accelerating Ship Finance	ClassNK will assess ships based on a comprehensive scoring model that has been jointly developed with DBJ based on ‘decarbonisation, environmentally friendly performance and innovativeness’. DBJ will provide investment and financing for the ships that are in line with the guidelines.	2022
Support/Decarbonisation	Green Innovation Fund	This grant is provided to shipbuilding and ship machinery companies which carry out research and development of innovative technologies contributing to the goal of realising zero-emission ships by 2050.	2021
Project/Decarbonisation	Development of Next-Generation Ships	Develop hydrogen-fuelled ships and ammonia-fuelled ships (development of engines, fuel tanks, and fuel supply systems) and conduct on-board demonstrations to fully popularise zero-emission ships by 2050.	2021

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Reviews of Shipbuilding Economies

Peer Review of the Japanese Shipbuilding Industry 2026

The OECD Shipbuilding Committee Peer Review of the Japanese shipbuilding industry provides a comprehensive analysis of its structure, market trends, and national strategies. The report highlights Japan's role as the world's third-largest shipbuilder and its strategic focus on high-value-added, eco-friendly vessels. While identifying structural challenges like an aging workforce and high production costs, the review emphasizes growth opportunities through Digital Transformation (DX) and Green Transformation (GX), particularly in zero-emission vessel development and smart manufacturing. The report is structured into three parts: a global perspective on Japan's market standing, an analysis of the integrated shipbuilding and marine equipment ecosystem, and a SWOT-based assessment of the industry's competitiveness.

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