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Reviews of Shipbuilding Economies

Peer Review of the Korean Shipbuilding Industry

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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, Korea was subject to 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, in April 2022, the OECD shipbuilding committee agreed that peer reviews from 2024 onwards would focus on industry and market topics. In this context, Korea'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, Korea's official response to the Peer Review questionnaire, and stakeholder consultations conducted during the OECD's fact-finding mission to Korea in December 2024, as well as consultations with selected stakeholders and the Ministry of Trade, Industry and Resources (MOTIR) of Korea.

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

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

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Executive summary

Trends and overview of the Korean shipbuilding industry

In the early 2020s, global ship completions and orders moderately rebounded from the mid-2010s slump, yet they remained well below the 2008-2011 peak. This recovery was driven by the rebound in seaborne trade volumes and surging freight rates following logistics disruptions during the COVID-19 pandemic. Korea's share in global ship completions and orders has remained strong at around 20-30%, even during downturns, and rose counter-cyclically in the mid-2010s. In 2024, Korea consolidated its position as the world's second-largest shipbuilding nation, accounting for approximately 27% of global completions on a compensated gross tonnage (CGT) basis.

Addressing challenges through digital and green innovation

During the shipbuilding recession in the mid-2010s, the Korean government and shipbuilding sector worked together to focus on building high-value ships, such as LNG carriers, to overcome the recession. Currently, the public and private sectors are working together to develop alternative fuel vessels and smart ships, such as maritime autonomous surface ships (MASS), and the Korean shipbuilding industry is expanding overseas to further enhance its competitiveness.

Korean shipbuilders have increasingly specialised in high-value segments, such as LNG carriers and ultra-large container ships (ULCS), reflecting both shifts in global shipping demand and tightening environmental standards, in line with Korea's industrial policy priorities.

Korea remains highly competitive in high-value shipbuilding, underpinned by strong engineering capacity. However, the industry faces a severe workforce shortage, with employment declining by 44% between 2014 and 2024, and skilled workers accounting for only 28% of the workforce in 2023. To mitigate these labour constraints, major shipbuilders have recruited foreign workers, who now represent approximately 15% of total employment.

The Korean marine equipment industry comprises around 2 700 companies employing 73 000 people, supplying roughly 90% of domestic demand as of 2019, while shipbuilders remain reliant on imports for eco-technology components. In 2022, marine equipment exports reached USD 1.2 billion, primarily to Asia and North America, with China and the United States accounting for 57.7% and 29.3% respectively. Environmental retrofit activities are largely carried out in Korean shipyards.

Sustainability, labour, and government support

Korea is actively promoting ship decarbonisation as a pillar of its industrial strategy, supported by a KRW 9 trillion investment plan that includes funding for green ships. Complementary to the Ministry of Trade, Industry and Resources (MOTIR) (formerly MOTIE) and MOF programmes provide support for private-sector R&D, adoption of fuel-saving technologies, and construction or conversion of environmentally

friendly ships to comply with IMO regulations. Korean shipbuilders are at the forefront of orders for low-emission vessels, notably LNG and LPG-fuelled ships, although the share of Korea in global maritime-related patents has recently declined.

In parallel to promoting decarbonisation, the Korean shipbuilding industry is accelerating the integration of smart technologies—including artificial intelligence (AI), robotics, and augmented reality (AR)—to enhance productivity and workforce efficiency amid persistent labour shortages.

The shipbuilding industry remains a strategic pillar of the Korean economy, accounting for about 3% of total exports and manufacturing employment, with strong linkages to equipment manufacturing, steel, and ship finance. While traditionally export-oriented, the share of domestically owned vessels has increased from under 5% in the early 2000s to 15-25% in recent years. Despite a decline in sales revenues, Korean shipbuilders remain optimistic, buoyed by recovering global demand and strong orders for LNG carriers and eco-friendly ships.

The Korean shipbuilding industry remains a major global player, despite a gradual erosion of market share. The sector consolidated during the mid-2010s recession into three major groups: HD Hyundai, Samsung Heavy Industries (SHI), and Hanwha Ocean. During the downturn and restructuring phase, Korea faced a WTO dispute in 2018. These leading firms focus on high-value segments—including LNG carriers, ULCS, Floating Production Storage and Offloading (FPSO) units, and naval vessels—and account for over 90% of national completions. They are pursuing aggressive overseas expansion strategies, with more than 50% of their investments directed toward eco-friendly ship technologies.

The Korean government plays a central and strategic role in supporting the shipbuilding and maritime sectors through regulatory frameworks, technological innovation, and financial instruments. Ministries such as MOTIR and MOF spearhead policies promoting innovation, technology, and shipping competitiveness. Export credit agencies, KEXIM and K-Sure, facilitate export financing and mitigate market risks. The “K-Shipbuilding Strategy” and “Super Gap Vision 2040” outline long-term transformation goals, emphasising R&D in zero-emission vessels, autonomous ships, and smart shipbuilding systems. In 2025, government R&D support is set to increase by 40%, to KRW 260 billion, underscoring the strategic importance of innovation for future competitiveness.

Recent corporate developments illustrate Korea’s global expansion. Hanwha Ocean is expanding into the U.S. shipbuilding market and naval market through mergers and acquisitions in 2024. In 2025, SHI extended production to Viet Nam, and HD Hyundai strengthened its global presence, constructing LNG-fuelled ships under a collaboration with the U.S. shipbuilding and partnering with Saudi Aramco to complete the largest shipyard, but also signing an MoU with Indian shipyards for long-term co-operation. In addition, the Korean government is currently discussing further co-operation with the U.S. shipbuilding industry under the billion USD range package, bearing in mind the ‘Make America Shipbuilding Great Again’.

Competitiveness of the Korean shipbuilding industry

A detailed SWOT analysis of the Korean shipbuilding industry is presented in Chapter 5. The SWOT analysis shows that Korea maintains strong competitiveness in high-value-added vessels, supported by advanced R&D, efficient large-scale production, and a robust policy and ship-finance framework. However, chronic labour shortages and concentrated exposure to LNG, offshore and ultra-large container ships remain key structural weaknesses. Opportunities arise from increasing demand for alternative-fuel and digital vessels, while major threats include China’s rapid ascent, tightening global competition for skilled labour, market volatility and emerging geopolitical constraints. The analysis suggests that sustaining Korea’s competitive position will require strengthening the workforce base and accelerating innovation aligned with the fuel transition and digital transition.

1 Global perspectives: Overview of the world market

This chapter examines the status and strategic direction of Korea’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 Korea's standing as the world’s second-largest shipbuilding nation and how it maintains competitiveness in high-value-added segments despite structural cost challenges. Furthermore, the chapter evaluates the impact of government-led decarbonisation, 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 moderately in the early 2020s after the mid-2010s downturn but remained well below the 2008–2011 peak**. The recovery was supported by post-COVID demand, improved logistics conditions, and environmental regulations accelerating fleet renewal.
- **Korea's share of global ship completions and orders has consistently remained within the 20–30% range, even during market downturns**. Notably, Korea's share increased counter-cyclically in the mid-2010s, highlighting its resilience. The country retains a strong position in advanced vessel segments, particularly those requiring stringent regulatory compliance and specialised technical expertise.

Measured in compensated gross tonnage (CGT), Korea accounted for approximately 27% of global completions in 2024, maintaining its position as the world's second-largest shipbuilding nation after China. Despite challenges from the global financial crisis and the oil-price collapse, Korea has preserved substantial industrial capacity, reinforcing its status as one of the leading shipbuilding powers.

- **Korean shipbuilders have shifted production towards high-value segments such as LNG carriers and ultra-large container ships (ULCS)**, reflecting evolving global demand patterns and tightening environmental standards since the mid-2010s, in line with changes in Korea's industrial policy.
- **The Korean shipbuilding workforce has continued to decline, shrinking by about 44% between 2014 and 2024**. The share of skilled workers fell to 28% of total employment in 2023. To mitigate labour shortages and sustain output, major shipyards have increasingly hired foreign workers, who now represent roughly 15% of the workforce.
- **Korea remains highly competitive in high-value vessel construction**, underpinned by strong engineering capabilities, rigorous quality control, and reliable delivery performance. Korean shipyards are trusted partners for complex, compliance-driven orders where lifecycle performance and technical reliability outweigh cost considerations.

1.1.1. Orderbook

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

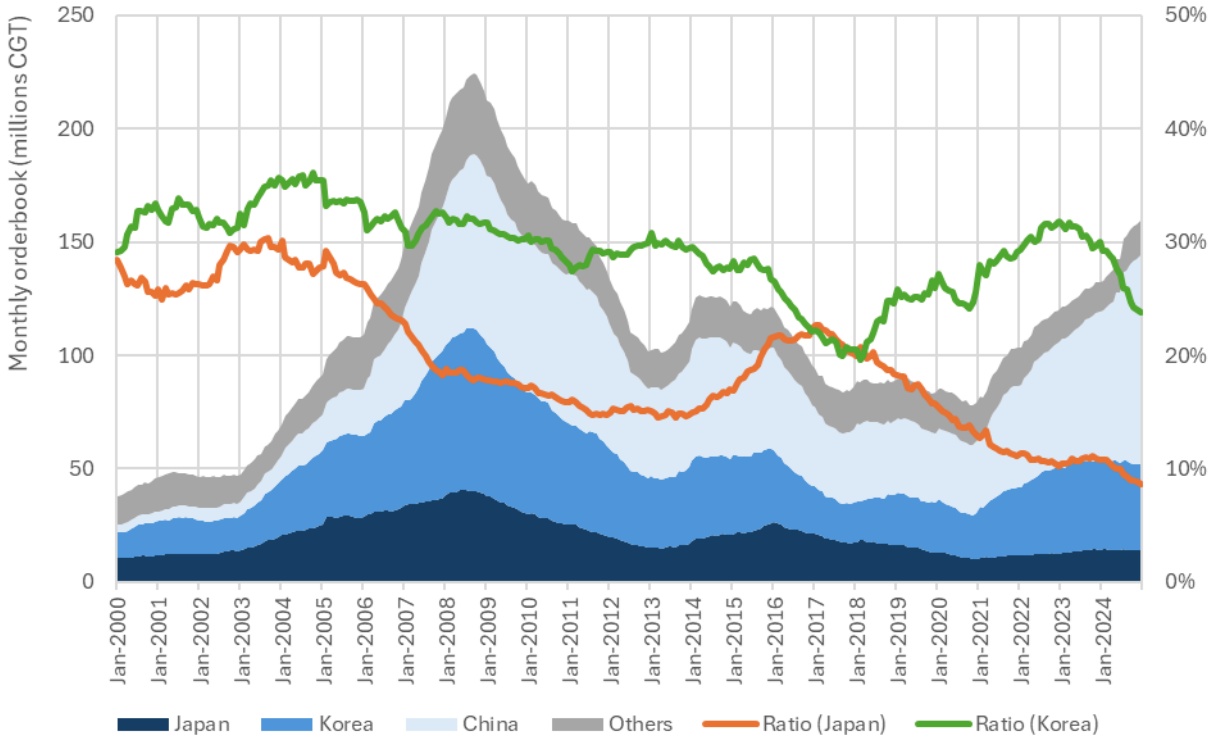
Figure 1.1 shows the evolution of the global shipbuilding orderbook, with reference to Korea's relative market share and strategic positioning. In the mid-2000s, the global orderbook reached an all-time high, driven by sustained global economic expansion, China's accelerated industrialisation, and increased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

The decrease in Korea's shipbuilding production from its peak in 2009 can be attributed to the impact of the 2008 Global Financial Crisis, reduced orders and increased competition from China led to small and medium sized shipbuilders going out of business. Since 2010, the number of shipyards producing ships has declined. The Korean shipbuilding sector was also impacted by the decline in oil prices in 2014, which

led to a reduction in orders for offshore vessels and LNG carriers from international oil companies, impacting liquidity in firms including Daewoo Shipbuilding and Samsung Heavy Industries.

In addition, after the COVID-19 pandemic, in response to the increasing demand for container ships and the disruption of logistics caused by the Red Sea conflict, Korea's orderbook has been gradually rising.

Figure 1.1. Global orderbook development



Source: Shipping Intelligence Network.

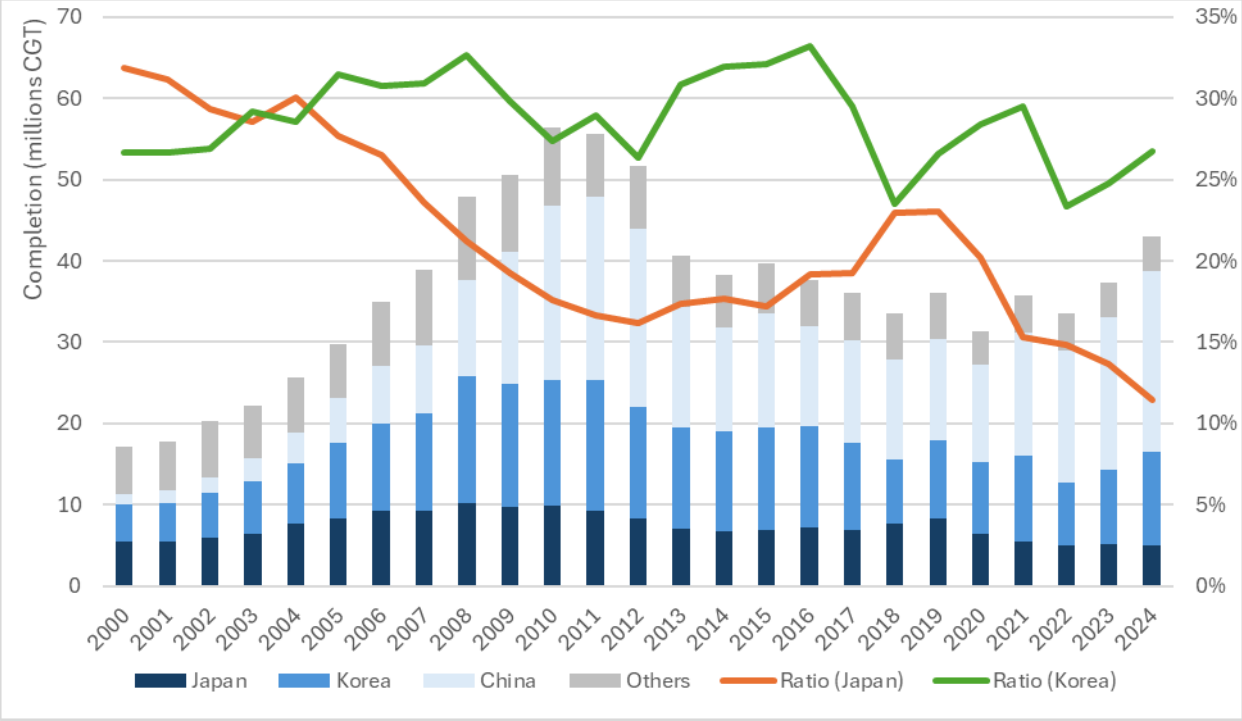
1.1.2. Completions

Figure 1.2 shows the global distribution of ship completions from 2000 to 2024, with a specific emphasis on Korea's CGT-based output and market share. During the early 2000s, Korea held a leading position in global ship completions, reaching a peak in 2011. Despite the subsequent decline in offshore-related demand following the global financial crisis and the collapse in oil prices, Korea consistently maintained a global market share of around 30% throughout the downturn.

Korea's strong completion performance is rooted in its strategic focus on high-value-added segments such as LNG carriers and ultra-large container ships (ULCS). This achievement is enabled by Korea's technological edge, including early investment in digitalisation and production automation.

Figure 1.2 also reveals a sharp decline in completions between 2016 and 2018, largely attributable to overinvestment in offshore facilities and a collapse in crude oil prices, as well as a downturn in the global economy and an oversupply of ships in the shipping market. These developments led to massive losses in companies like DSME and Samsung Heavy Industries—DSME alone reported losses of over KRW 5 trillion in 2015. This prompted large-scale restructuring, mergers, and workforce reductions across the industry.

Figure 1.2. Global completion volumes

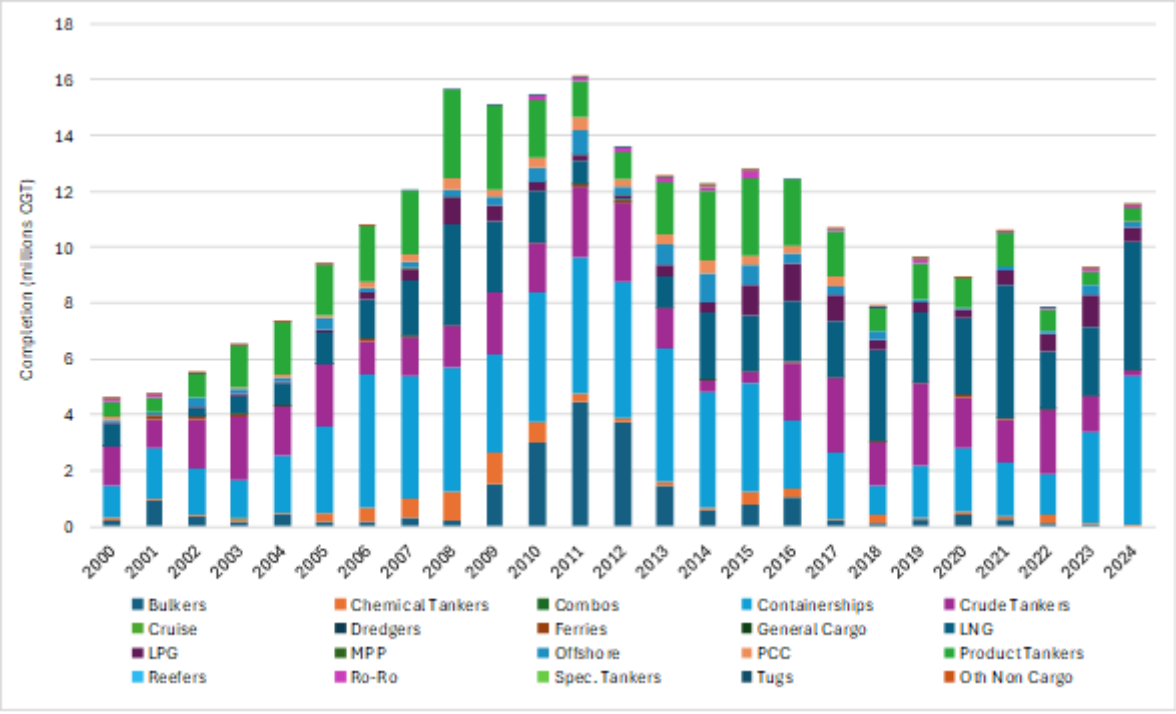


Source: Clarksons World Fleet Register.

Figure 1.3 illustrates the change in Korea's ship type composition between 2000 and 2024. In the early years, crude oil tankers and bulk carriers represented a major share of completions. However, from the mid-2010s onward, the focus shifted toward LNG carriers and container ships—especially ULCS—reflecting broader changes in global shipping demand and environmental requirements. This transition is a direct reflection of Korea's industrial policy shift toward high-value, technology-intensive ship types.

As China continues to dominate cost-competitive segments like bulk carriers, Korea is shifting its strategy toward technological leadership. Under this approach, Korean yards are focusing on fuel cell propulsion, autonomous navigation, and zero-carbon vessel designs. In line with tightening IMO regulations, Korea invested KRW 1 828.7 billion in R&D between 2019 and 2023 in three major shipbuilders, enabling shipbuilders to secure orders for ammonia-fuelled and methanol-ready vessels, and thereby strengthening their position in the premium green ship market.

Figure 1.3. Proportion of vessel type in Korea, 2000-2024



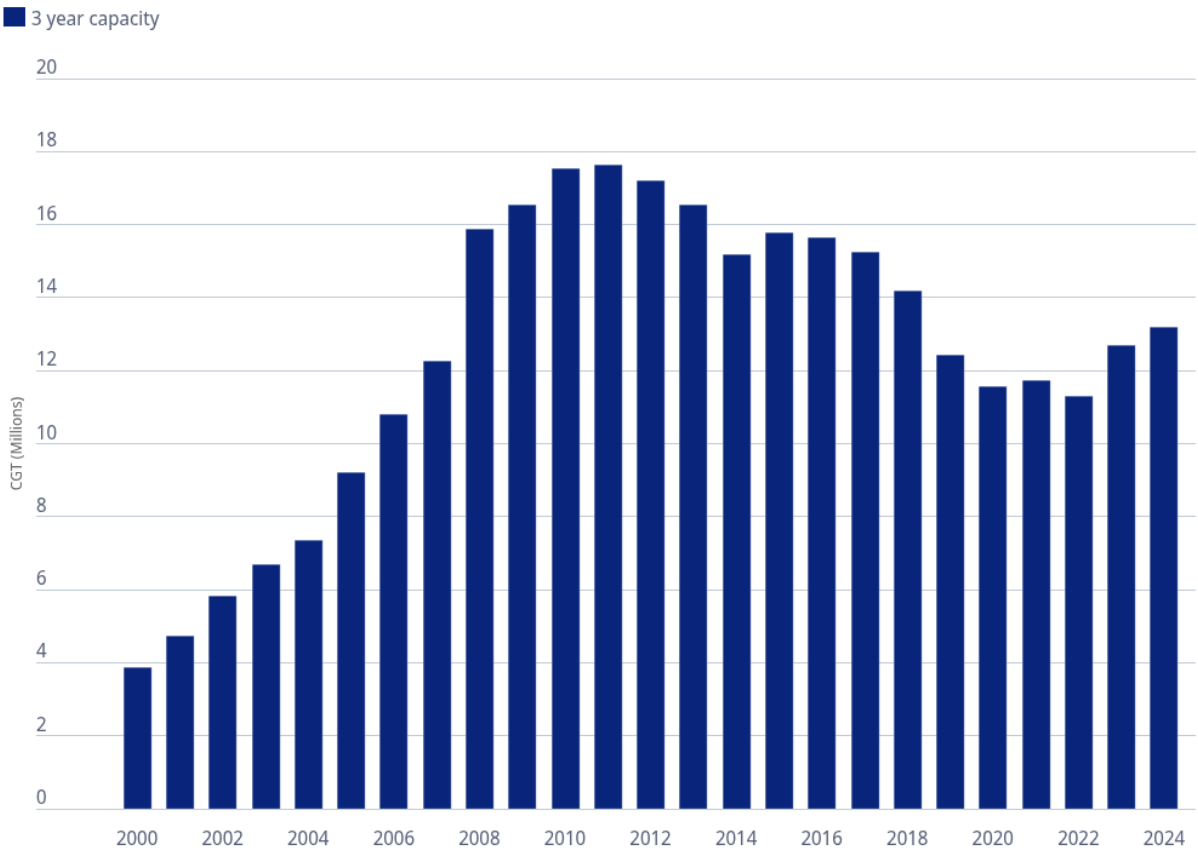
Source: Clarksons World Fleet Register.

1.1.3. Capacity

To calculate Korean shipbuilding capacity, the Shipbuilding Committee Secretariat's "maximum production" approach is used to calculate shipyard capacity (Daniel, Adachi and Lee, 2022[1]). 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.

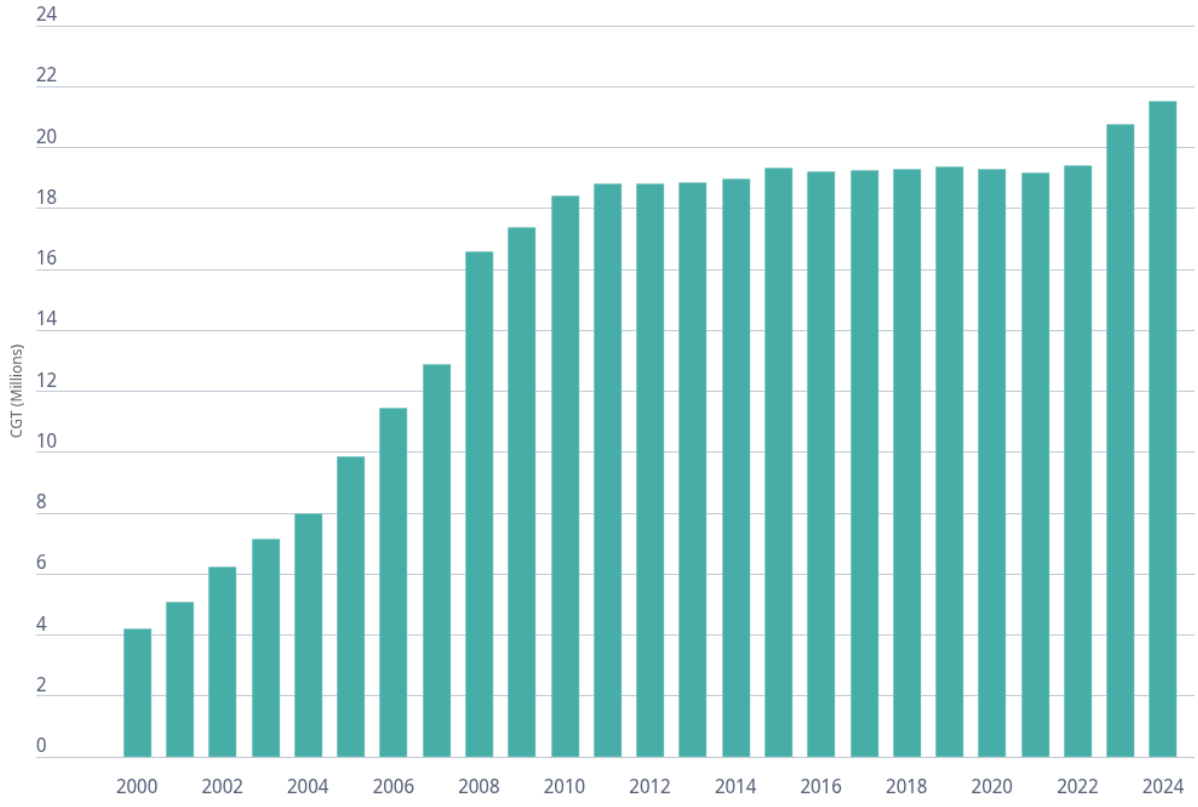
Figure 1.4 and Figure 1.5 illustrate Korean shipbuilding capacity from 2000 using a 3-year interval and a 15-year interval. For 2024, capacity was estimated at 13.2 million CGT with the 3-year interval and 21.5 million with the 15-year interval.

Figure 1.4. Korean shipyard capacity estimations (3-year interval)



Source: OECD estimation based on Clarkson Research Services Limited (September 2025), World Fleet Register, https://www.clarksons.net/wfr.

Figure 1.5. Korean shipyard capacity estimations (15-year interval)



Source: OECD estimation based on Clarkson Research Services Limited (September 2025), World Fleet Register, https://www.clarksons.net/wfr.

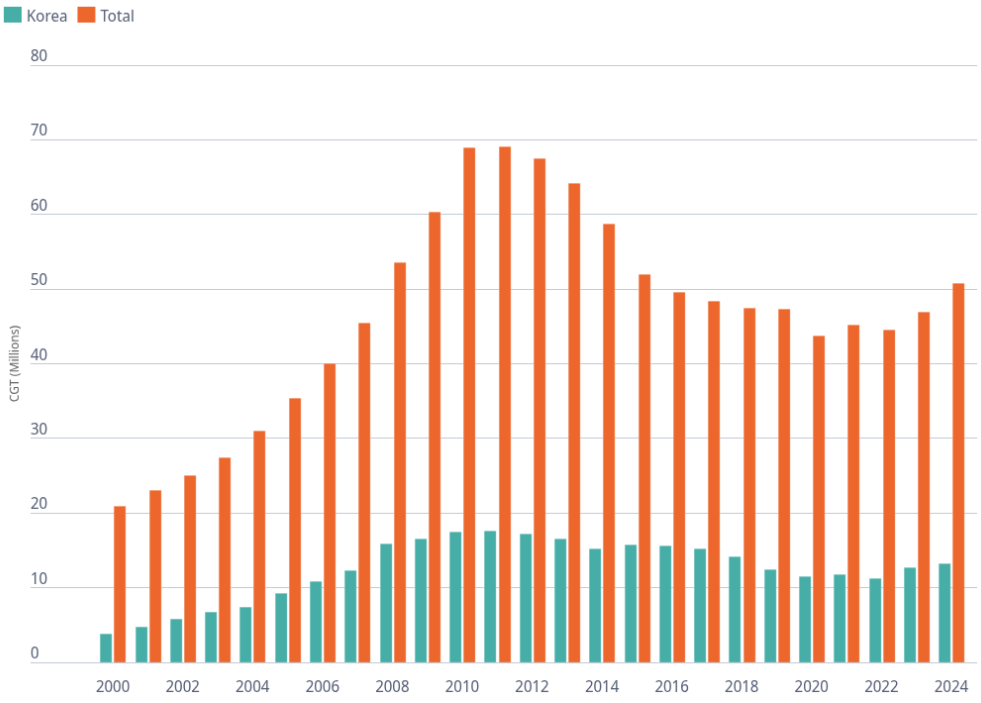
Korea has maintained high levels of capacity since 2000, strengthening its position as one of the major shipbuilding countries, alongside Japan and China. In 2000, capacity was 3.9 million CGT (3-year interval) and 4.2 million CGT (15-year interval), while it rose to 17.5 million CGT (+351%) and 18.4 million CGT (+336%) respectively by 2010.

Shipyard capacity was at its peak in 2011 at 17.6 million CGT using the 3-year interval, while it reached a peak in 2024 at 21.5 million CGT for estimates using the 15-year interval. Since then, using the 3-year interval, capacity decreased steadily until 2022 at 11.3 million CGT, the lowest point, then beginning to increase from 2023 onwards. The 15-year interval capacity estimates observed that the shipyard capacity had remained relatively stable, though it has risen again since 2023.

Korea's shipyard capacity has been relatively consistent since 2000, compared to the development of the total shipyard capacity, as demonstrated in Figure 1.6. In 2000, its share was 19% (3-year interval) and 14% (15-year interval), the lowest share between 2000 and 2024. Korea's share of global shipyard capacity peaked at 32% in 2017 using the 3-year interval and in 2008 at 25% using the 15-year interval. In 2024, its share was 26% (3-year interval) and 23% (15-year interval).

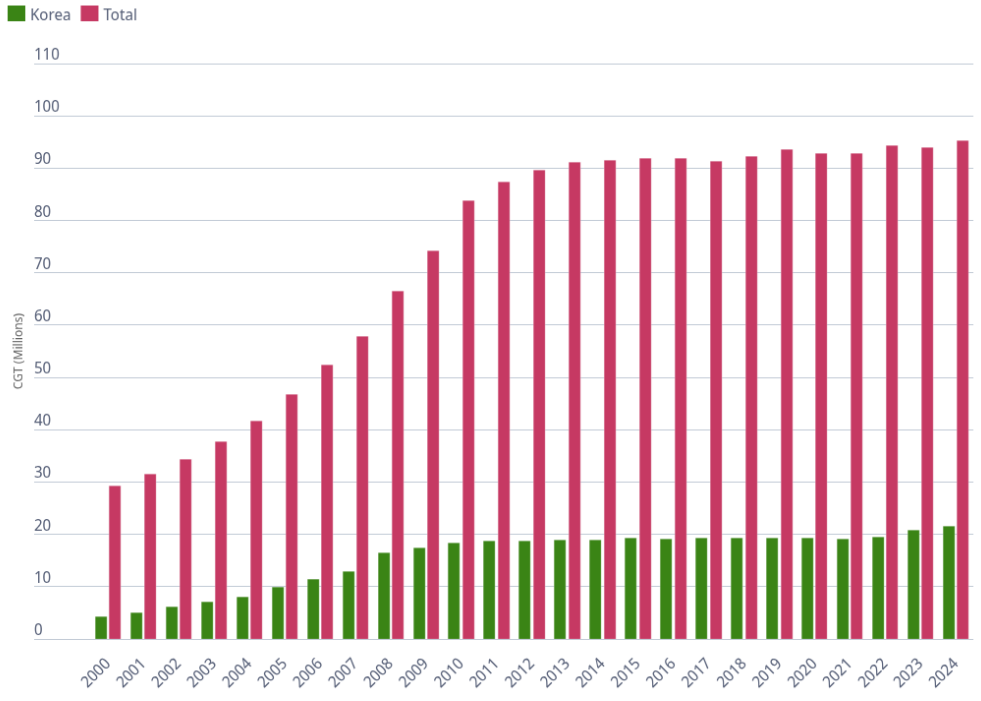
In fact, since 2016, HD Hyundai Group shut down three docks, Samsung Heavy Industries shut down one floating dock and one 3 000-ton floating crane, and Hanwha Ocean sold two floating docks (Korea, 2024[2]).

Figure 1.6. Korean shipyard capacity vs. total global shipyard capacity (3-year interval)



Source: OECD estimation based on Clarkson Research Services Limited (September 2025), World Fleet Register, https://www.clarksons.net/wfr.

Figure 1.7. Korean shipyard capacity vs. total global shipyard capacity (15-year interval)



Source: OECD estimation based on Clarkson Research Services Limited (September 2025), World Fleet Register, https://www.clarksons.net/wfr.

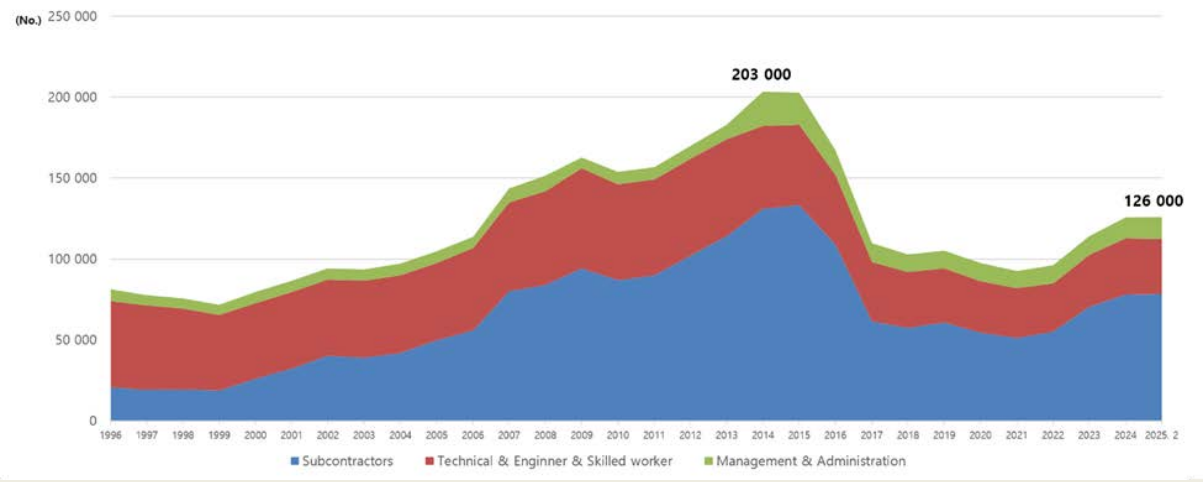
Box 1.1. Korean shipbuilding industry - workforce

KOSHIPA's data on the sector's workforce

The workforce in the sector peaked in 2014-2015 and decreased until 2021. Since 2021, it started to increase again since new orders on the eco-friendly ships were increasing. But most of the increase came from the sub-contractors, not from the engineers & skilled workers or management. Regarding the foreign workers, the share in the entire shipbuilding industry is 20%, most of whom are construction workers.

The number of people moving from the shipbuilding industry to other industries continues to increase. In order to improve the image of the shipbuilding industry, marketing efforts such as TV commercials are continuing, and the focus is on enhancing the image as a digital, green industry.

Figure 1.8. Workforce trends



Source: KOSHIPA.

1.1.4. Labour

Shipbuilding employment has changed from 162 747 employees in 2009 to a peak of 203 441 in 2014, to 125 636 in 2024, as shown in Table 1.1.

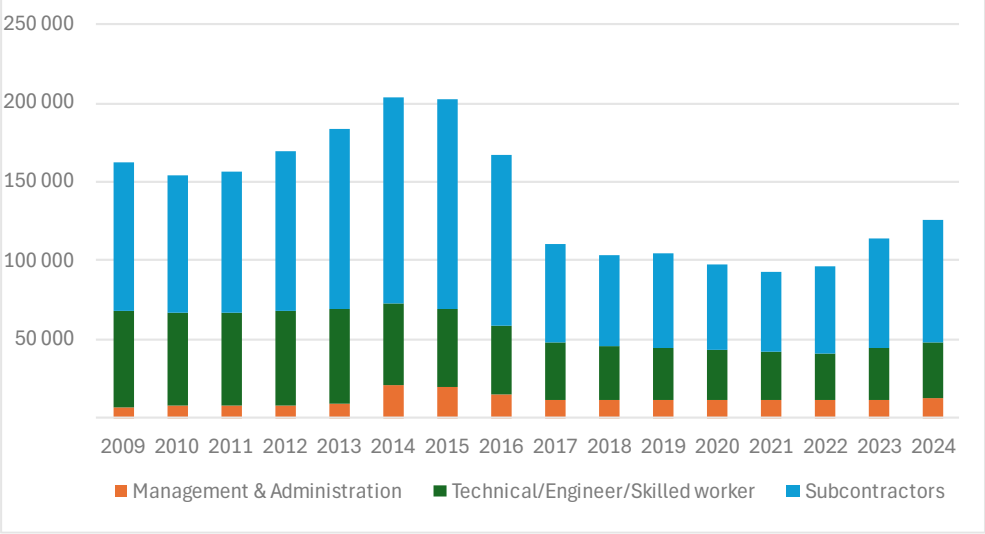
As shown in Figure 1.9, the majority of workers are subcontractors, consisting of 55-66% of total shipyard employees over 2009 and 2024. The use of subcontractors peaked in 2015, reaching 66%, and has declined to 62.2% in 2024, although with fluctuations. The next largest segment of workers is skilled workers, ranging from 28-39%, peaking at 38.7% in 2010. Skilled workers were 27.7% of total shipyard employees in 2024. Lastly, management and administration have remained relatively consistent, consisting of 4-12% of total shipyard employees in 2009-2024. During this period, management and administration have increased their share from 5% in 2013 and 10% in 2014, to 10% of total shipyard employees in 2024.

Table 1.1. Number of shipyard employees

Year	Number of shipyard employees	Subcontractors	Technical/Engineer/Skilled worker	Management & Administration
2009	162 747	94 325	61 688	6 734
2010	153 769	86 810	59 511	7 448
2011	156 850	90 008	59 250	7 592
2012	169 893	102 308	59 739	7 846
2013	183 022	114 167	59 881	8 974
2014	203 441	130 975	51 420	21 046
2015	202 689	133 346	49 623	19 720
2016	167 174	108 841	43 034	15 299
2017	109 901	61 465	36 569	11 867
2018	102 895	57 440	34 463	10 992
2019	105 118	60 870	33 321	10 927
2020	97 428	54 424	31 900	11 104
2021	92 687	51 153	30 661	10 873
2022	96 254	55 009	29 943	11 302
2023	114 244	70 377	32 023	11 844
2024	125 636	78 161	34 748	12 727

Source: Answers to the Peer Review Questionnaire from KOSHIPA.

Figure 1.9. Total size and composition of Korean shipbuilding employment



Source: Answer to the Peer Review Questionnaire from KOSHIPA.

The gender ratio in shipbuilding has remained relatively stable between 2017 and 2023. The percentage share of women employed in the sector increased from 7% in 2017-18 to 8% in 2019-23.

Moreover, Korea has launched the disclosure system on employment types and the proportion of women in managerial positions since 2014. The Korean government has made efforts to foster a work-life balance work environment through initiatives such as flexible work conditions and support for childbirth and childcare, and has taken various measures in collaboration with the shipbuilding industry, including recruitment support, awareness campaigns, and the publication of career guidance materials.

HD Hyundai Heavy Industries, which has maintained its certification as a family-friendly company certification by the Ministry of Gender Equality and Family, announced its commitment to increasing the proportion of female hires to 30% by 2030 in 2023. As a result, the number of female employees at HD Hyundai Heavy Industries increased by approximately 26%, from 865 in 2021 to 1,094 in 2023.

Table 1.2. Gender ratio

Year	Male	Female
2017	93%	7%
2018	93%	7%
2019	92%	8%
2020	92%	8%
2021	92%	8%
2022	92%	8%
2023	92%	8%

Note: Shipbuilding and Boat building Industry.
Source: Questionnaire: Commissioner of Statistics Korea.

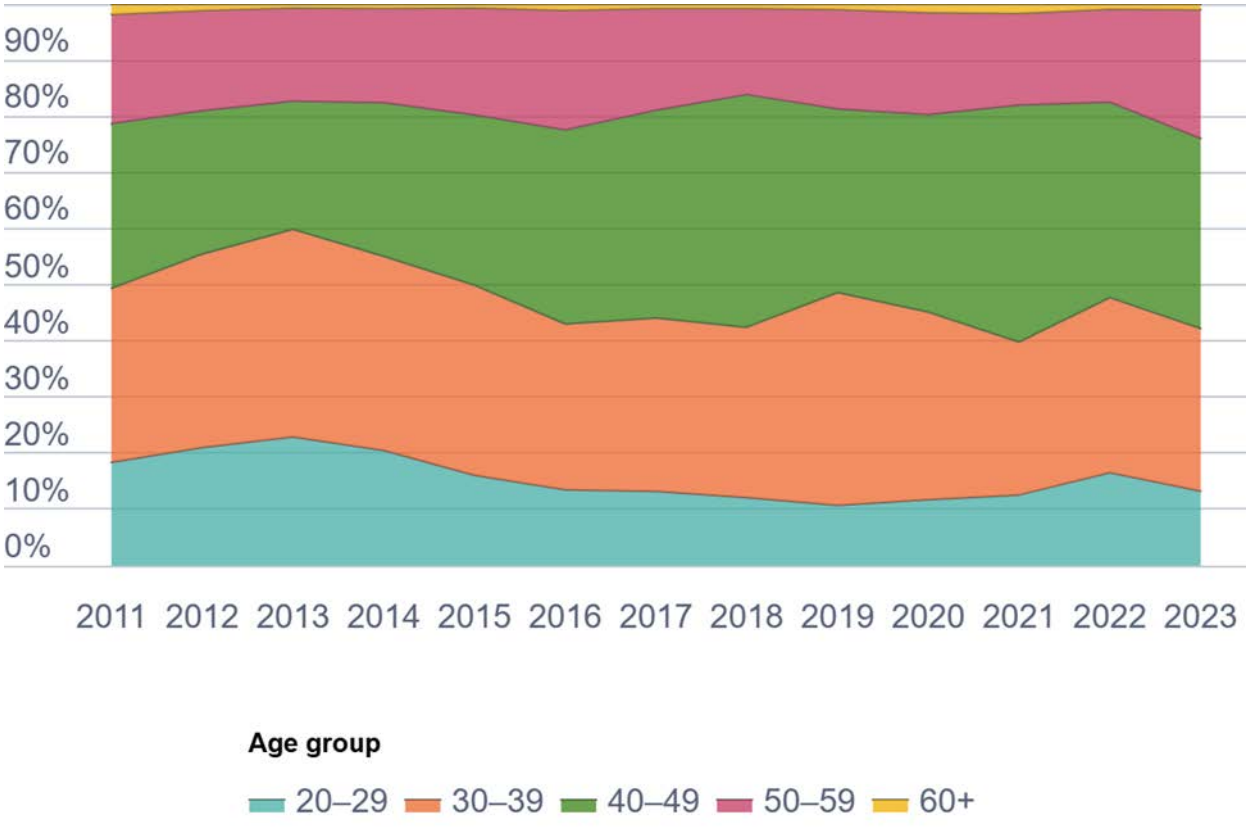
In 2023, the largest age segment for skilled workers was workers aged 40-49 years, consisting of 33.8% of the total skilled workforce employed, followed by 30-39 years, at 28.9%, as shown in Table 1.3. This was then followed by 50-59 years, at 22.9%, then 20-29 years, at 13.3% and lastly 1.0% for 60 years and older. The share of workers aged 20-29 peaked in 2013, at 22.9%, reaching a low point in 2019, at 10.8%, and since then has increased. Skilled workers aged 30-39 have been relatively consistent, peaking in 2013, at 36.7%, then declining, only to peak again in 2019, at 37.9%, then declining in 2021 to its lowest point, with 27.2%. This is likely due to the ageing out of the workforce to the next age segment (40-49 years), which saw an increase of 7% in 2021. The age segment 40-49 has been growing most consistently, increasing from 29.3% of the total share in 2011 to 41.4% in 2018, then declining until reaching a peak in 2021, with 42.2% of workers. Those aged 50-59 maintained a consistent share throughout, where it was 19.5% of the total workforce in 2011, peaking in 2016, with 21.3% then reaching a low of 15.3% in 2018. Figure 1.10 visually depicts the changing age structure of the workforce.

Table 1.3. Age structure

Year	Total	20～29	30～39	40～49	50～59	60～
2011	49 798	9 158	15 429	14 593	9 708	910
2012	71 802	14 819	42 598		14 385	
2013	69 308	15 882	25 609	15 824	11 528	465
2014	69 766	14 333	24 086	19 074	11 731	542
2015	67 064	10 793	22 695	20 349	12 755	474
2016	65 121	8 802	19 218	22 501	13 881	719
2017	63 436	8 408	19 566	23 472	11 498	491
2018	60 301	7 305	18 293	24 982	9 249	472
2019	59 621	6 412	22 575	19 497	10,569	568
2020	58 622	6 895	19 567	20 620	10 638	902
2021	58 225	7 344	15 838	24,572	9 512	959
2022	58 042	9 608	18 089	20 205	9 616	524
2023	58 527	7 779 (13%)	16 931 (29%)	19 804 (34%)	13 413 (23%)	600 (1%)

Note: Industry skills workforce numbers, not total workers. The methodology for 2012 industrial workforce survey differed from other years.
Source: Questionnaire KIAT (Korea Institute for Advancement of Technology).

Figure 1.10. Korea's age structure of shipbuilding workers



Note: Industry skills workforce numbers, not total workers.
Source: Questionnaire: KIAT (Korea Institute for Advancement of Technology).

1.1.5. Foreign workforce

In the Korean shipbuilding sector, the foreign workforce primarily consists of individuals from Viet Nam, the Philippines, Indonesia, and Sri Lanka. The foreign workers are granted E-7 or E-9 visas, which permit legal residence and employment in Korea for an initial period of three years, with the possibility of extension contingent upon compliance with the relevant regulatory requirements.

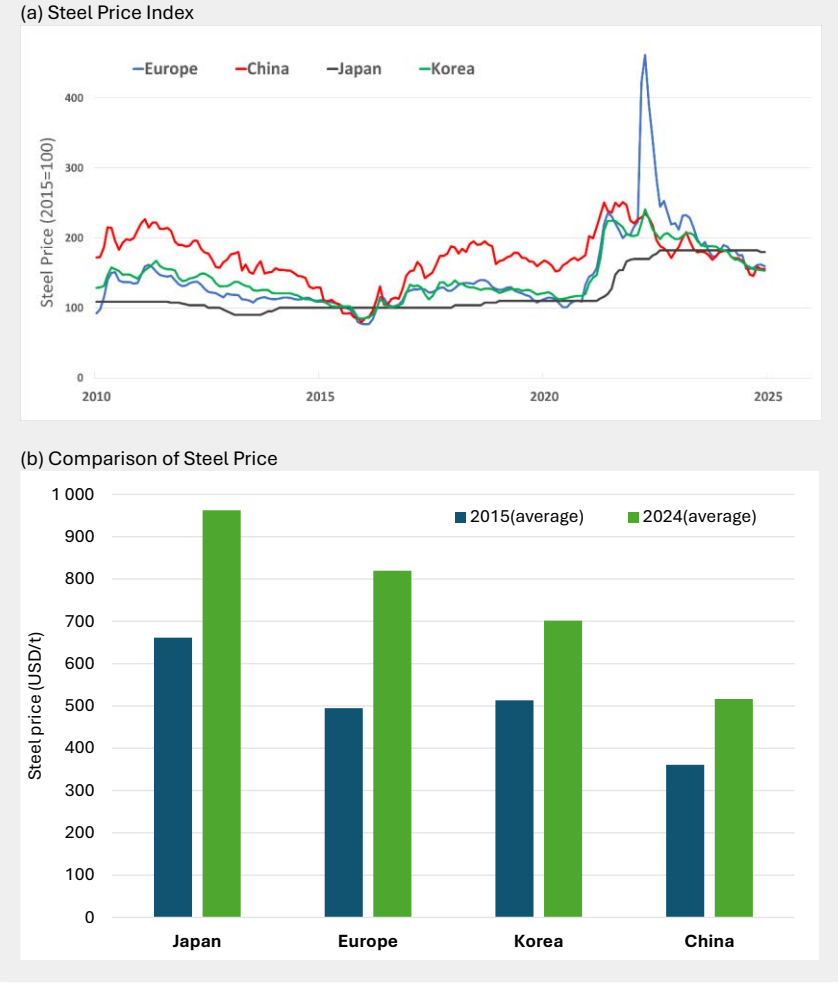
As of 2023, foreign workers account for approximately 15% of the workforce at the major shipyards in Korea. Korea expects the share of foreign workforce to remain relatively stable in the next few years, unless labour market conditions or policy change significantly.

1.1.6. Shipbuilding cost

According to Figure 1.11 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 they seem to bottom out. However, the price is still at a higher level compared to the one before the COVID-19 pandemic.

Comparing different economies (USD) both in 2015 (average) and December 2024, adjusted by exchange rate, steel prices have risen in every economy since 2015, but the steel price in Korea is 20% higher than in China and 48% lower than in Japan. Although overall price differences between regions remain elevated, over the last year the same price dynamics seem to have affected all regional prices.

Figure 1.11. Steel price

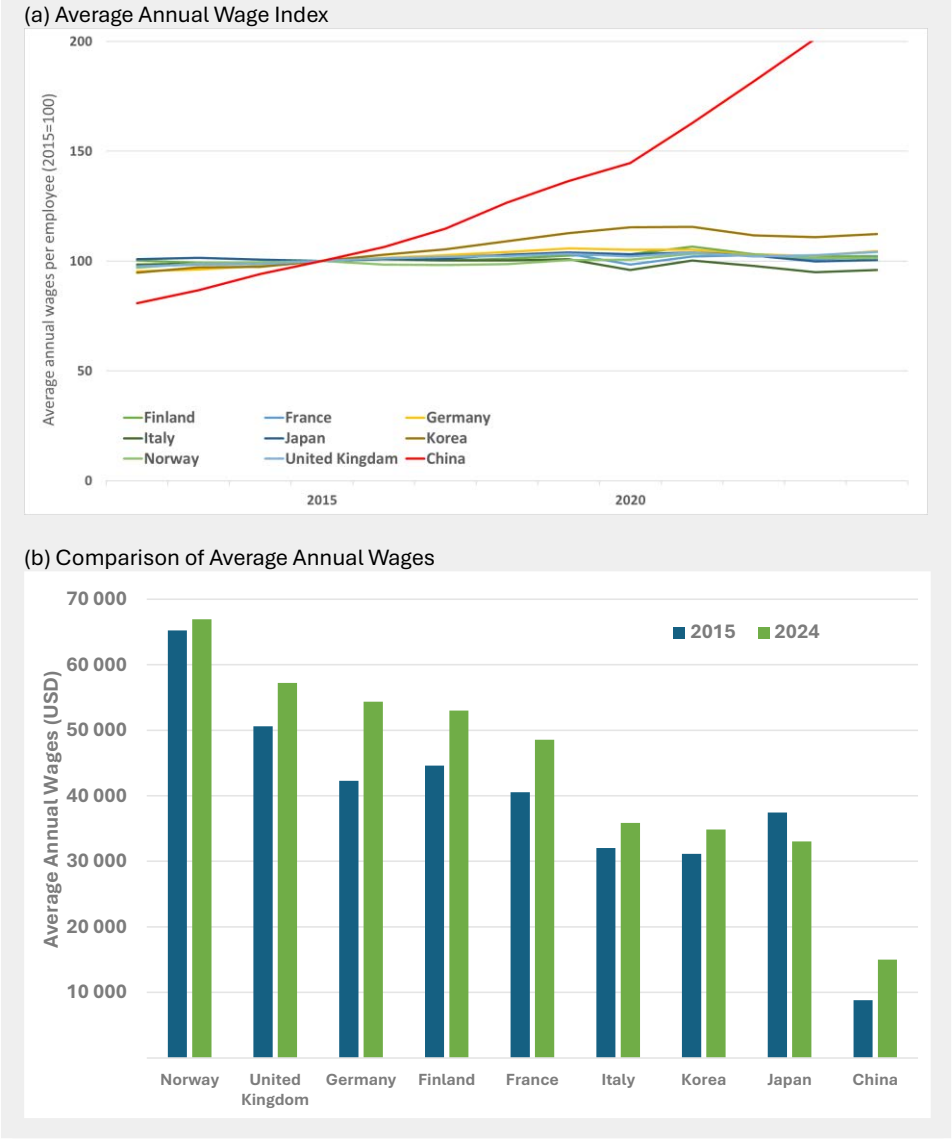


Note: a) Local currency basis; b) US dollars basis.
Source: OECD calculations based on Kallanish, Sangyo Press Co., Ltd, and Korean Steel Daily.

Figure 1.12 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 PPP, in all countries increased gradually by 2-4% and there were 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 Korea in 2024 were 5% higher than in Japan, 2.3 times higher than China.

Figure 1.12. Labour costs

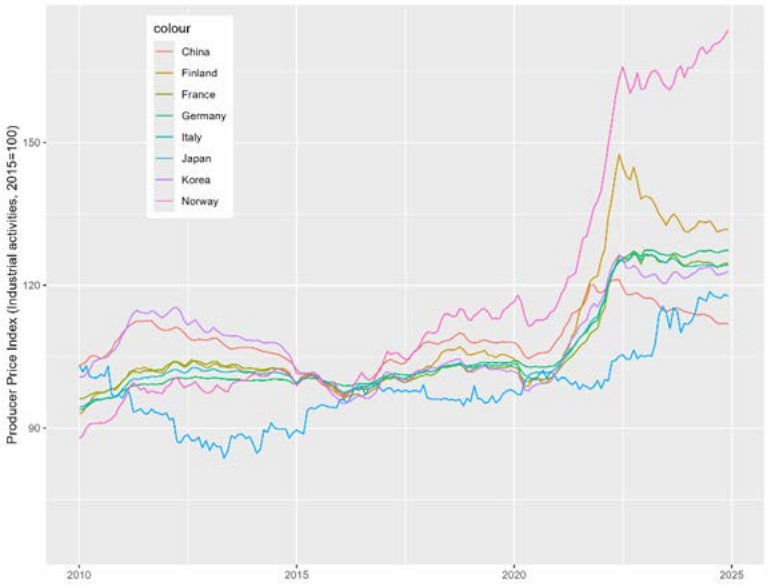


Note: a) US dollar basis and PPP converted; b) Average annual wages, US dollar basis, per employee in full-time equivalent unit in the total economy. China's data is shown only for manufacturing.
Source: OECD calculation based on (OECD, 2026[3]); (National Bureau of Statistics of China, 2026[4]); (Trading Economics, 2026[5]); (World Bank Group, 2026[6]).

Figure 1.13 shows the domestic producer price index (PPI) for industrial activities in various economies until December 2024. The Secretariat presents 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 these trends, the price rise has stabilised at a high level. Norway (174) is the largest, and China (112) is the lowest. Although Korea (123) ranks third lowest, the PPI has been increasing.

Figure 1.13. Producer Price Index



Note: The average for 2015 is set at 100.
Source: Publications from the governments; (Louis and China, 2022 (FRED) / 2023 (NBS)[7]), (Eurostat, 2025[8]), (Japan, 2025[9]), (Korea and Louis, 2022 (FRED) / 2023 (BOK)[10]), (Statistics, 2025[11]).

1.2. Other markets

Key Findings

- **As of 2019, the Korean marine equipment industry counted around 2 700 companies employing 73 000 people**. It is a key domestic supplier, producing roughly 90% of the marine equipment used by Korean shipyards, although shipbuilders continue to rely heavily on imports for eco-technology components.
- **The industry's exports are mainly directed to Asia and North America**, with China (57.7%) and the United States (29.2%) as the leading destinations. Total direct exports reached approximately USD 1.2 billion in 2022.
- **Ship repair activities in Korea are largely dominated by domestic firms, accounting for about 70% of the market in 2024**. Environmental retrofit operations—such as the installation of ballast water management systems and exhaust gas scrubbers—are primarily carried out in Korean shipyards, although the track record for energy-saving retrofits remains relatively limited.

1.2.1. Global supply chain (Marine equipment)

Korean shipbuilders rely significantly on imports for eco-technology related equipment, but source about 90 per cent of their marine equipment domestically. However, many of these suppliers are licensees of foreign companies.

According to the 2020 Report by the Ministry of Trade, Industry and Energy (MOTIE) (present: MOTIR), which includes a Statistical Survey of the Shipbuilding Equipment Industry, there are about

2 700 companies in the Korean marine equipment industry and about 73 000 employees as of 2019. As of 2022, there were 286 marine equipment manufacturers affiliated with the Korean Marine Equipment Association (KOMEA), concentrated in Busan and Gyeongnam province, which are adjacent to Korea's three big shipyards.

The total sales revenue of KOMEA's member companies was KRW 26 trillion in 2022, increased from KRW 18 trillion in 2020. Most of the increase came from the engine, electrical and electronic sectors. The employment increased from 30 886 people in 2020 to 33 135 people in 2022, with most of the increase coming from the electrical and electronic product category. Their total exports amounted to USD 1.1 billion in 2022, decreased slightly from USD 1.2 billion in 2020.

The largest export markets for Korean marine equipment manufacturers are Asia and North America; as of 2022, China (57.7%) and the U.S. (29.2%) accounted for 87% of Korea's total exports of marine equipment.

Table 1.4. Main products of Korean marine equipment industry in 2020 and 2022

Product Category	Year	Employment	Production (Billion KRW)	Direct export (Million USD)
1. Hull (Chemical products, welding material, casting and forging, etc.)	2020	3 068	1 652	151
	2022	3 219	2 330	108
2. Engine and machinery (Diesel engine, turbine, propeller, generator, etc.)	2020	4 508	1 642	203
	2022	4 541	3 490	365
3. Outfitting (Steering, navigation, mooring, cargo arrangement, safety and accommodation, etc.)	2020	14 681	6 899	321
	2022	14 189	7 551	309
4. Electrical and Electronic (Power arrangement, wiring, lighting, communication system, etc.)	2020	6 406	6 629	328
	2022	8 693	11 955	340
5. Others	2020	2 223	1 164	-
	2022	2 493	1 314	-
Total	2020	**30 886**	**17 986**	**1 203**
	2022	**33 135**	**26 641**	**1 122**

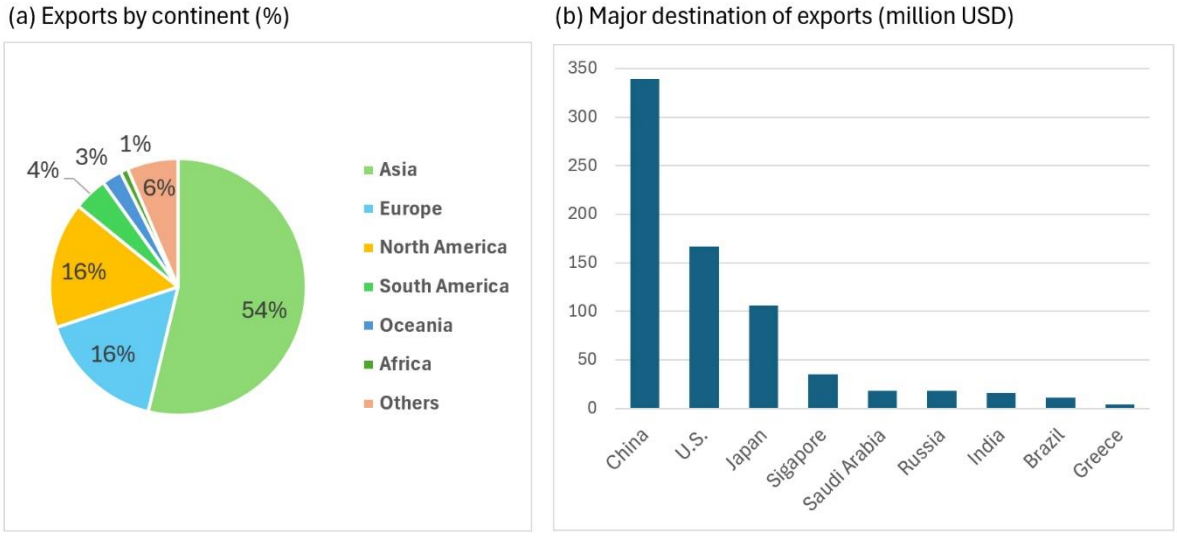
Note: These figures are based on the survey of member companies of the KOMEA.
Source: Korean Marine Equipment Association (KOMEA).

Table 1.5. Marine equipment sector by categories

	(KRW million for Sales & Profit)	2020	2021	2022	2023
Manufacturing	Sales	24 512 999	27 214 722	31 065 261	32 981 505
	Profit	985 801	957 437	1 526 582	1 857 791
	Employment	43 630	42 407	43 665	45 203
ICT	Sales	1 842 357	2 015 660	2 250 594	2 400 308
	Profit	107 845	125 196	112 990	95 079
	Employment	5 465	5 715	5 923	6 502
Technical Service	Sales	683 236	1 389 500	1 541 095	1 678 087
	Profit	49 877	87 152	92 364	92 065
	Employment	3 420	4 930	5 074	5 205
Outsourcing	Sales	662 919	1 694 999	1 983 067	2 117 076
	Profit	35 705	67 894	70 760	91 106
	Employment	1 975	4 405	5 669	4 283
Total	Sales	27 701 510	32 314 880	36 840 018	39 176 976
	Profit	1 179 227	1 237 679	1 802 696	2 136 040
	Employment	54 489	57 457	60 330	61 193

Note: These figures are based on the survey of member companies of the KOMEA.
Source: Questionnaire (KOMEA).

Figure 1.14. Exports of Korean marine equipment in 2022

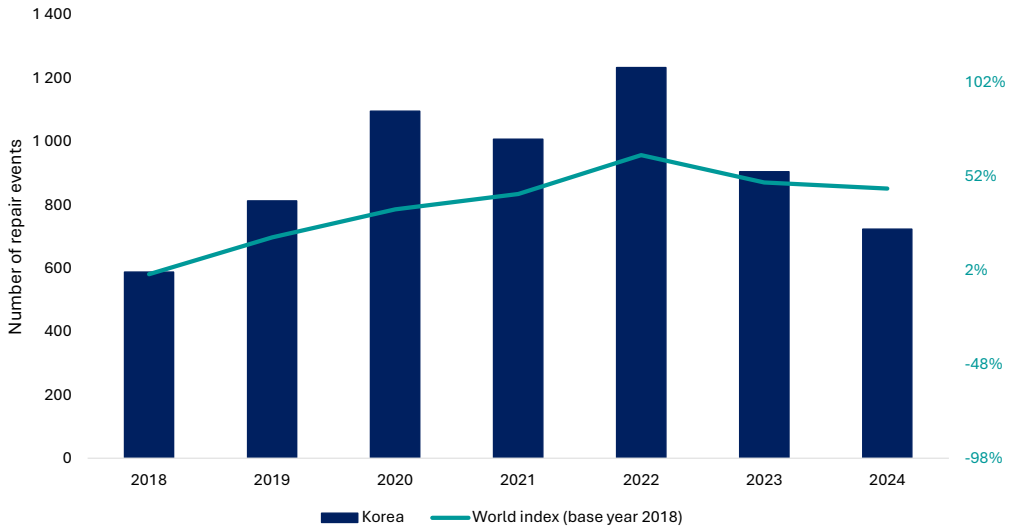


Note: These figures are based on the survey of member companies of the KOMEA.
Source: Korean Marine Equipment Association (KOMEA).

1.2.2. Conversion/Repair

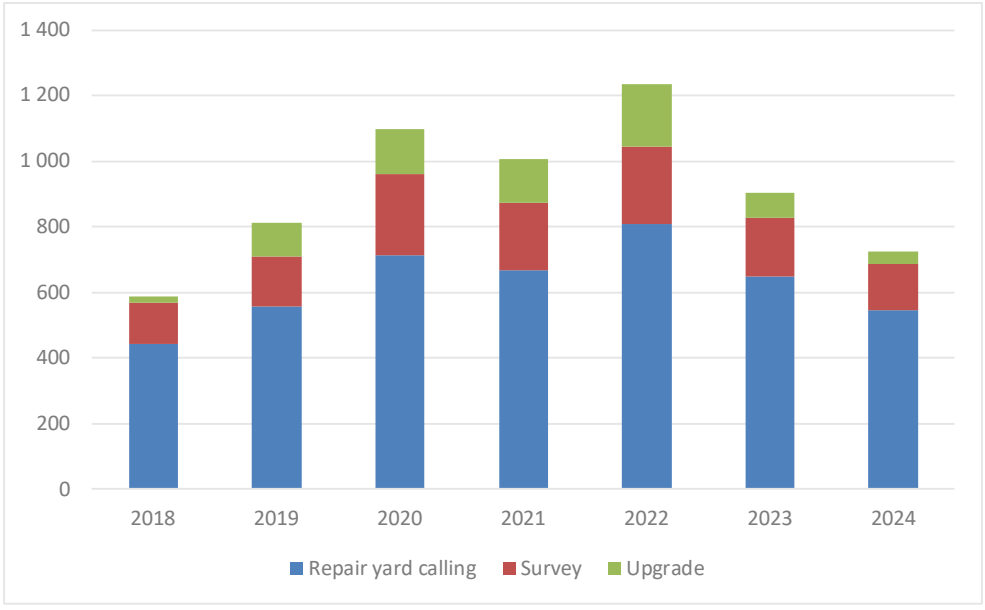
Korean yards experienced an increase in overall ship repair activity, measured in the number of repair events, from 2018 to 2020. This trend was interrupted by a decrease in 2021, before reaching a peak in 2022. From 2022 until 2024, there has been a decrease of 41.3% in the number of repairs. This drop could be due to increased repair activity during the COVID-19 period when operational demand was significantly disrupted. There could also be an element of front-loading of future maintenance during these years, which could contribute to explaining the low repair activity in 2024. Figure 1.15 illustrates the development in repair activities in Korea compared to the world trend.

Figure 1.15. Repair activities development in Korea compared to the world trend



Source: (Clarksons WFR, 2025[12]).

Figure 1.16. Repairs by activity types in Korea



Source: (Clarksons WFR, 2025[12]).

In the period from 2018 until 2024, 68.7% of the repair activity in Korean yards was commissioned by domestic companies. Japanese companies were the second largest contributor with 9.5% of the activity, followed by Russia (5%). In 2024, 72.7% of repair activities originated from domestic companies, 7.9% from Japanese companies, followed by China with 3.6%, and Russia fourth at 3%.

Upgrades represent an important component of the work carried out by repair yards, including retrofitting of Energy Saving Technologies (ESTs) and environmental upgrades. These upgrades are becoming increasingly relevant as environmental ambitions and regulations become more stringent. Fuel conversions are another related segment in this regard, though activity is still limited globally, with only

11 conversions registered in 2024 (Clarksons WFR, 2025[12]). There have not been performed any fuel conversions by South Korean shipyards. EST retrofit activities are examined in greater detail in the Market trend Section.

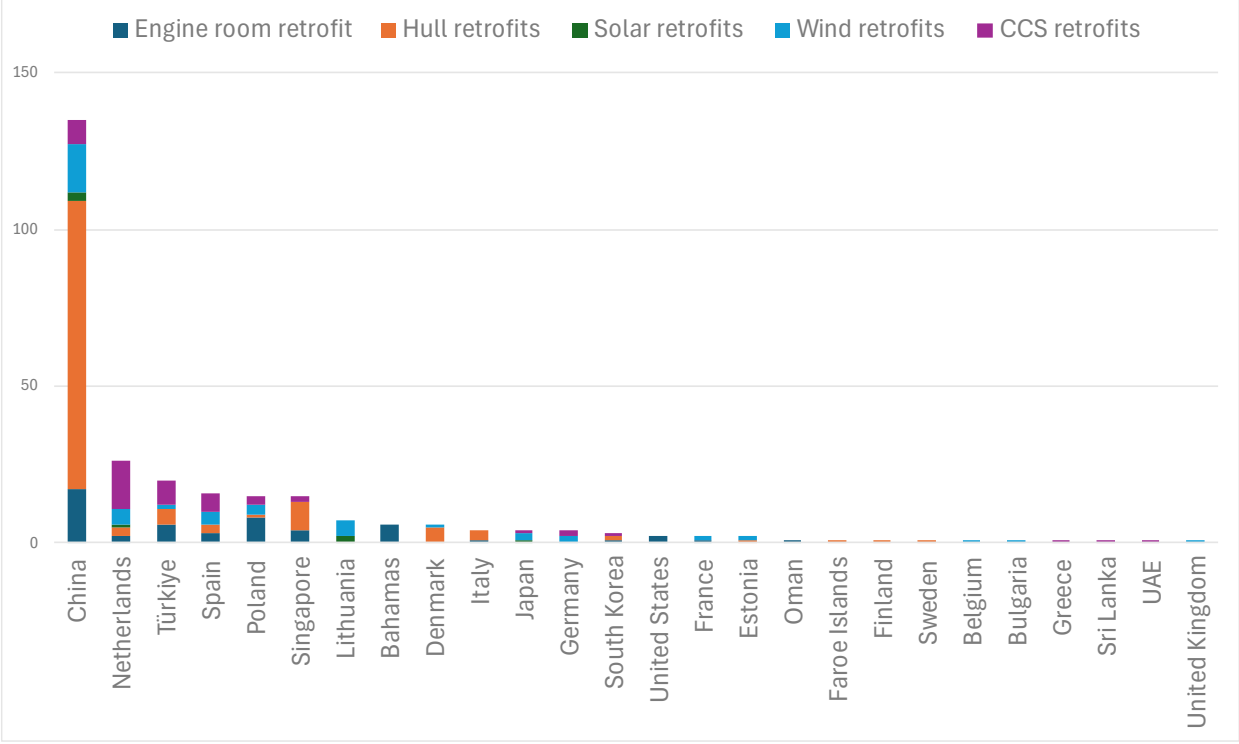
Figure 1.17 illustrates the repair activities broken down by activity types, showing the extent of upgrade activities as a share of total activities. Table 1.6 illustrates the range and volume of EST and environmental upgrades performed by Korean shipyards. Korean yards have extensive experience with retrofitting ballast water management systems and scrubbers.

Table 1.6. Overview of upgrades performed in Korea

Types of upgrades	2018	2019	2020	2021	2022	2023	2024
BWMS Retrofit	16	48	97	130	184	57	18
Propeller EST Retrofit	1			1		3	
Scrubber retrofit	2	52	40	3	5	16	16
Battery retrofit			1				
CCS retrofit							1
Hull EST retrofit	1						
High Voltage Shore Power Connection Retrofit			1				1
Engine room EST Retrofit							1
Sum	20	100	139	134	189	76	37

Source: (Clarksons WFR, 2025[12]).

Figure 1.17. Retrofits 2018 - August 2025



Note: Propeller retrofits are excluded. Data from 1.1.2018-21.08.2025.
Source: (Clarksons WFR, 2025[12]).

1.3. Market trends

Key Findings

- **Korea's substantial government-backed investment programmes are positioning ship decarbonisation as a central pillar of industrial policy, driving R&D, technology adoption, and the rollout of green vessels**. Korea has placed ship decarbonisation at the core of its industrial strategy, supported by a KRW 9 trillion investment package, of which KRW 258.6 billion is earmarked for green ship initiatives. Complementary MOTIR (formerly MOTIE) and MOF programmes provide support for private-sector R&D, the adoption of fuel-saving technologies, and the construction or conversion of environmentally friendly vessels in line with IMO regulations.
- **Enhanced transparency in ESG reporting**. Both major Korean shipbuilders and several shipping companies now publish ESG reports, while greenhouse gas emissions and energy consumption are monitored through the National Greenhouse Gas Management System, under the supervision of the Korean government.
- **R&D focused on advanced and low-carbon technologies**. Korea continues to prioritise innovation in areas such as autonomous vessels and alternative fuel technologies. While the overall volume of patents has been maintained, the number of low-carbon maritime patents has fluctuated, and the maritime sector's share of total patents has gradually declined.
- **Concentration in alternative-fuel vessel orders**. Orders and completions for alternative-fuel-capable ships are highly concentrated, representing about 62% of Korea's orderbook. Korea is a global leader in LNG-fuelled vessels, second only to China, and also holds a strong position in LPG-fuelled and other alternative-fuel ships, thereby supporting the decarbonisation of the global shipping fleet.
- **Labour shortages and skills gaps.** Korea's three major shipbuilders are advancing the integration of smart technologies—such as artificial intelligence (AI), robotics, and augmented reality (AR)—to enhance shipbuilding processes, boost productivity, and mitigate labour and skills shortages.

1.3.1. Innovation activity

Decarbonisation

Korea has been at the forefront of maritime decarbonisation, consistently leading innovation in eco-friendly vessel technologies. The nation marked significant milestones in sustainable shipbuilding with the launch of the world's first LNG-fuelled containership in September 2020, followed by the introduction of the first methanol-fuelled containership in September 2023 (KOSHIPA, 2024[13]). More recently, in October 2023, Korea unveiled the world's first ammonia-fuelled ship, an LPG carrier, further solidifying its commitment to clean energy in the maritime sector (KOSHIPA, 2024[13]). To stay ahead in the ever-increasing competition with China, Korean shipbuilders are striving to establish a strong position in emerging markets beyond LNG, such as ammonia and hydrogen. With no established global players in these segments yet, Korean companies are making substantial investments to position themselves as industry pioneers, securing an advantageous foothold in the evolving green shipping landscape.

At the company level, several shipbuilding and shipping companies have set net-zero emission targets by 2050. HMM aims to achieve carbon neutrality by early 2045, while other companies are in the process of reviewing their carbon neutrality goals in response to new IMO environmental regulations. Environmental, Social, Governance (ESG) reporting is currently at the discretion of shipping and shipbuilding companies. While a total of nine companies (including HMM, Pan Ocea, and Hyundai Glovis) are currently known to annually publish their ESG reports, this number is expected to increase in the near term (Korea, 2024[2]).

To further encourage shipyards to monitor their environmental impact and reduce carbon emissions to reach net-zero goals, Korea implements an Emissions Trading Scheme (ETS) program. These entities can emit GHGs up to the limit set by their allocated allowances and get benefits by selling any excess emission reductions on the market—which encourages them to meet their set goals while increasing profits. In the converse scenario, entities struggling to reach the set limit, can cut costs by purchasing emission permits at prices lower than the cost of direct reduction (Korea, 2024[2]). According to the National Greenhouse Gas Management System (NGMS), which is a framework for monitoring and reporting GHG emissions and energy consumption under the comprehensive oversight of the Ministry of Environment, the greenhouse gas emissions and energy consumption of nine ship and boat manufacturing companies, which are subject to allocation, amount to 2 013 476 tCO2-eq and 35 620 TJ, respectively (Korea, 2024[2]).

Other shipbuilding/yard-level workplace impact assessments are being carried out through internal and external environmental monitoring—including through in-house greenhouse gas management system or ICT-based remote control and monitoring systems to reduce emissions (Korea, 2024[2]) Increased visibility of greenhouse gas emission on vessels is already in place for some of the major Korean shipbuilders. In 2023, HD Hyundai Global Service had already unveiled the “Ocean Wise” solution at KORMARINE to monitor carbon dioxide emissions based on AI and data analysis (Mare in Korea News, 2023[14]). In fact, HD Hyundai Global Service has implemented the Ocean Wise platform, an AI-powered system designed to perform real-time analysis of CO_2 emissions generated during vessel operations (Korea, 2025[15]). Similarly, SYARD—a data-based company integrated and controllable monitoring system—is used by Samsung Heavy Industries to utilise big data using the Internet of Things (IoT) to enable efficient management of resources, including the optimisation of fuel consumption and reduction emissions (Jae-Fu, 2023[16]). Moreover, steel reduction systems are being implemented to predict steel plate usage, to reduce unnecessary steel plate consumption, and increase recycling rates, and Hyundai Samho Heavy Industries has adopted a predictive optimisation system aimed at minimising steel plate consumption and maximising material recyclability. To promote waste resource recovery, the range of recyclable waste items is expanded, and recycled materials are produced, notably including: (1) replacement of outdated chiller and heater units, (2) replacement of LED lights, or (3) replacement of old crane control system with inverter type control system (Korea, 2024[2]).

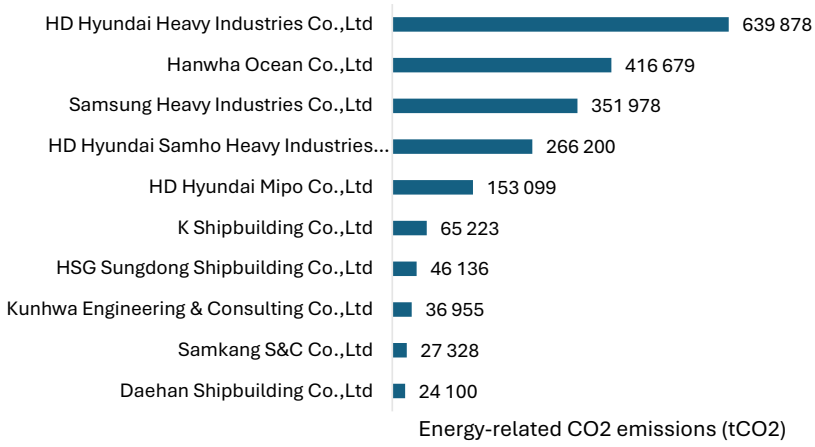
Among the top 10 shipbuilding companies by volume, five have established greenhouse gas (GHG) emissions reduction targets. In 2023, Hyundai Heavy Industries, together with HD Korea Shipbuilding & Offshore Engineering (HDKSOE), HD Hyundai Samho Heavy Industries, and HD Hyundai Mipo, released a joint “2050 Carbon Neutrality Implementation Roadmap” covering Scope 1 and 2 emissions (HD Hyundai Heavy Industries, 2023[17]). This roadmap sets out a phased approach to decarbonisation: a 28% reduction in GHG emissions by 2030, 60% by 2040, and full carbon neutrality by 2050, relative to 2018 levels. Key measures include improving energy efficiency through the replacement of ageing equipment, adoption of high-efficiency machinery, increased use of low- and zero-carbon fuels, integration of renewable energy, and deployment of carbon offset mechanisms.

Hanwha Ocean has also published its ESG targets for 2030, aiming for a 40% reduction in GHG emissions compared to 2018 levels, alongside a goal of achieving a 100% eco-friendly ship order backlog (Hanwha Ocean, 2023[18]). Similarly, Samsung Heavy Industries has developed a “2050 Net Zero Roadmap” for Scope 1 and 2 emissions, which includes plans to transition the Geoje Shipyard to renewable energy and

promote the development of hydrogen-fueled vessels and hydrogen carriers (Samsung Heavy Industries, 2024[19]).

Significant variation in energy-related CO_2 emissions exists across shipyards, largely driven by differences in production scale, as shown in Figure 1.18. Among the top 10 shipbuilders by volume, total CO_2 emissions range from 24,100 to 640,000 tonnes. HD Hyundai records the highest emissions at 639 878 tCO_2, reflecting its position as Korea's largest shipbuilder, followed by Hanwha Ocean and Samsung Heavy Industries.

Figure 1.18. Energy-related CO2 emissions (tCO2) by shipyard for 2023



Note: Data shared by Korea in the Shipbuilding Committee Peer Review Questionnaire (2024).

Table 1.7. Overview of selected programs supported by the Korean Environment Corporation (K-eco)

Projects	Aim	Support description
Smart Eco-Factory Support Program	Aims to support small and medium-sized manufacturing companies in Korea to transition to eco-friendly factories.	The program provides consulting and financial support, with national treasury subsidies covering up to 60% of the total project cost for small companies and 50% for midsize companies.
Win-Win Co-operation Support Program	Aims to facilitate private sector agreements for co-growth (win-win growth) between large companies and SMEs, while also striving to foster and promote a culture of co-growth (win-win growth).	The program dedicates a fund, provides services to protect SME technologies (consultation, on-site diagnosis), encourages a performance-sharing model, and publishes the win-win index.
Emission Reduction Facility Support Program for Target Management	Aims to designate and manage corporations that emit more than a specific amount of greenhouse gases (GHGs) to achieve medium-term targets, such as a 40% reduction in GHG emissions by 2030 compared to 2018 levels.	The program sets targets and establishes guidelines for target management, provides technical assistance for reporting entities to prepare GHG data reports and implementation plans. Lastly, it supports the operation and improvement of facility efficiency.

Note: List of projects based on Korea's answers to the Shipbuilding Peer Review Questionnaire (2024).
Source: (KECO, 2025[20]); (KOFCA, n.d.[21]); (KECO, n.d.[22]).

Table 1.8. Overview of selected projects supported by the Korea Energy Agency (KEA) and Korea SMEs and Startups Agency (KOSME)

Projects	Agency	Aim	Support description
Korea Energy Efficiency partnership (KEEP30)	KEA	Aims to enhance energy efficiency and promote carbon neutrality among 200 selected energy-intensive SMEs through the agreement of mid and long-term visions.	Once energy-intensive businesses have signed in agreement to energy efficient reform and a common long-term vision, they are provided with comprehensive support (from energy assessment and investment to management).
Energy Management System Infrastructure Establishment Support Program	KEA	Aims to support the establishment of a company-wide energy management system (EnMS) to enhance energy efficiency and reduce greenhouse gas emissions.	Support includes consulting support to small and medium-sized businesses. Additionally, the program promotes information sharing and provides long-term low-interest loans for the installment of energy-efficient facilities.
Carbon Reduction Support Program	KOSME	Aims to support the discovery of climate tech start-ups by activating emission certification and trading platforms and establishing a close business co- operation system between financial investment companies, KOTEC and KOSME.	Support includes the distribution of trading and brokering credits for SMEs and startups to invest in climate tech companies and provide preferential access to financing.

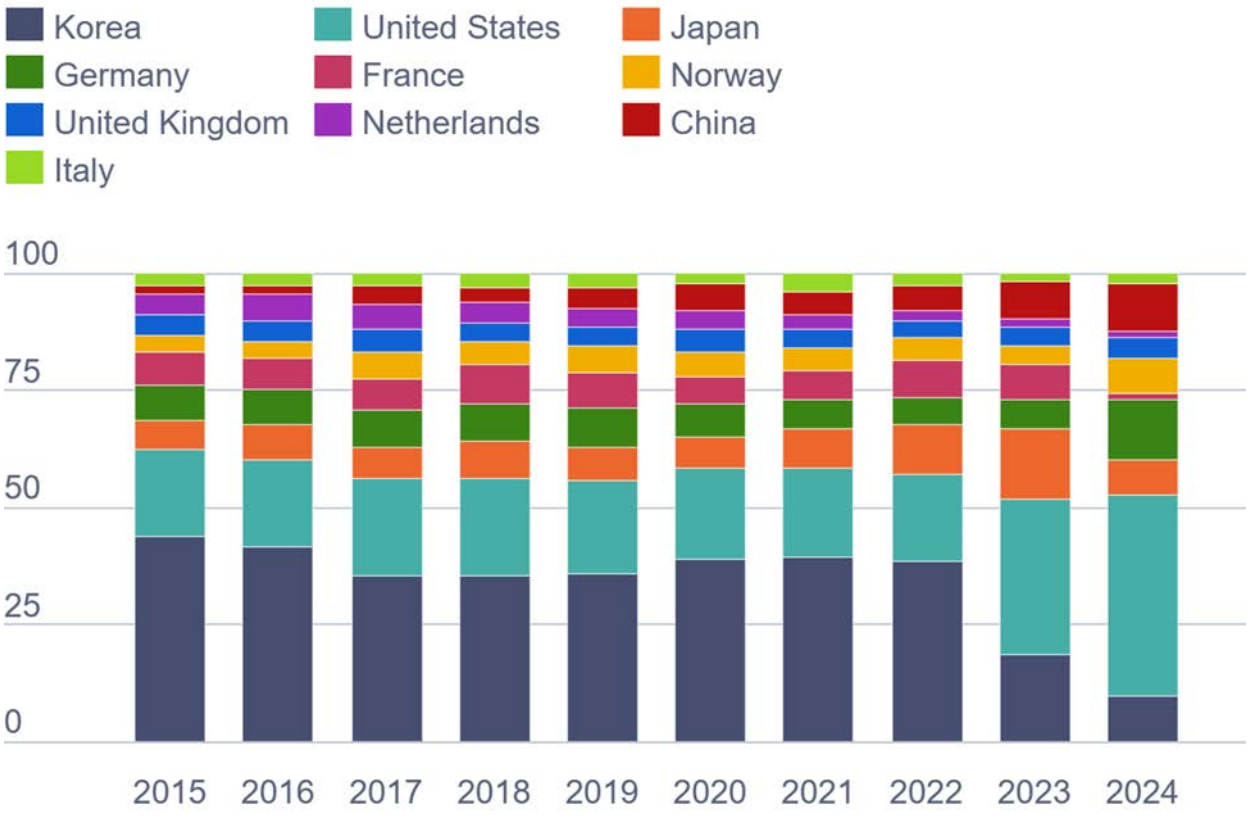
Note: List of projects based on Korea's answers to the Shipbuilding Peer Review Questionnaire (2024).
Source: (KEA, n.d.[23]), (Minjo Chun, 2023[24]).

Patenting Activity

Meeting international emissions targets and, ultimately, curbing climate change demands that the maritime sector moves decisively toward zero- and low-carbon 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[25]). 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 Korea 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 spending, which focuses more on inputs, patents capture the output of inventive efforts. Figure 1.19 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[26]). The countries selected represent the top ten most active in terms of patenting activity in this category and for this period. Figure 1.21 shows that Korea was the clear frontrunner, accounting for almost half of B63 patents in 2015 when compared to the other top 10 players of this time. The country successfully maintained a stable position with a slight drop in 2017 and a stronger dip after 2022. This decreasing share of patenting activity can notably indicate a shift from a higher volume towards fewer but more targeted filings towards the end of the decade.

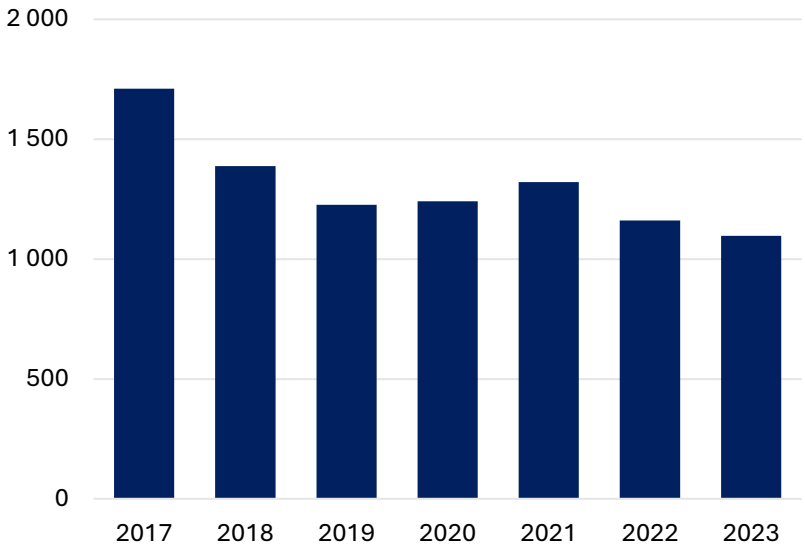
Figure 1.19. Patent share for ships and related equipment by country from 2015 until 2024



Source: (European Patent Office, 2024[26]).

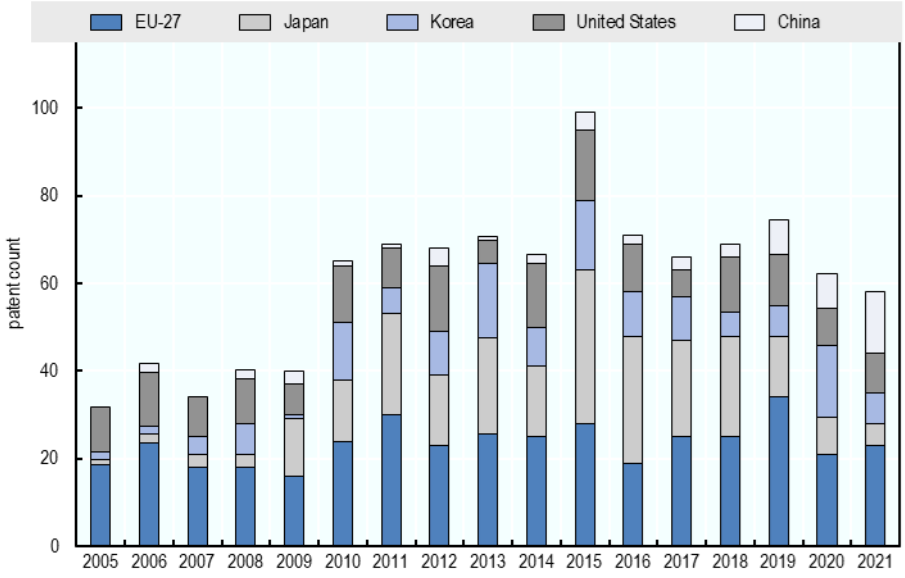
The Korean Intellectual Property Office (KIPO) provides data on registered patents related to ships and floating marine structures, as illustrated in Figure 1.20. Unlike the European Patent Office (EPO) data, which reports the share of global patent filings, KIPO focuses on the absolute number of patent registrations within Korea. While EPO data shows a sharp decline in Korea's share of global ship-related patents in 2023 and 2024, KIPO data suggests only a modest decrease in domestic filings. The decline in its share of patent activity can be attributed to two key factors: the prolonged stagnation of the global shipbuilding market and a strategic national pivot toward qualitative innovation. In particular, Korea has increasingly prioritised high-value, eco-friendly, and technologically advanced solutions over broad-based patenting activity. Despite the downward trend in volume, KIPO data confirms that innovation in the sector remains active, with continued domestic patent filings aligned with national innovation goals.

Figure 1.20. Yearly statistics on registered patents pertaining to ships, floating marine structures, and related outfitting components



Source: Korean Intellectual Property Office (KIPO), https://www.kipo.go.kr/en/MainApp (2024).

Figure 1.21. 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.

Low-carbon patents are identified via the Y02-tag, which the European Patent Offices defines as "Technologies or applications for mitigation or adaptation to climate change (European Patent Office, 2024[27]). 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[27]).

In Korea, innovation activity in low-carbon technologies is decreasing over time - as seen in Figure 1.21. In the early 2000s, Figure 1.21 shows that patenting activity remained modest in Korea until the 2010s, where the country's segment grew significantly and varied over time until contracting again in 2018. The EU and Japan on the other hand have consistently shown the most patent filings in this field over the studied period, but China shows a rapid increase in its patenting activity since 2019, surpassing other key innovating countries.

To provide a granular view of innovations in maritime technology, the patent codes can be further 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 1.9 explains their breakdown by sub-category.

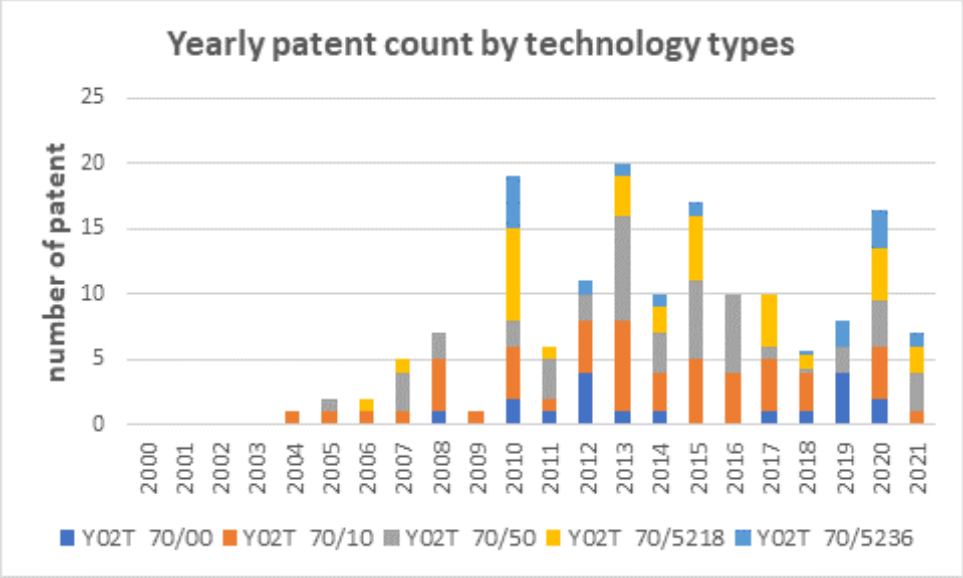
Table 1.9. List of patent codes

Patent code	Description
Y02T70/00	Maritime or waterways transport
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[27]).

Given this breakdown and as can be seen in Figure 1.22, following a handful of exploratory filings in 2004-2009, Korean low-carbon patenting activity surged in 2010 with roughly 19 patents spread across all five Y02T sub-classes; the bulk came from alternative fuels (70/5218) and energy-efficient hull design and construction (70/10), marking the country's first broad push into maritime decarbonisation. A brief dip in 2011 was followed by a second, and highest, peak of about 20 patents in 2013. This record year was driven mainly by hull-form optimisation (8 filings) and GHG-reducing propulsion systems (7 filings under 70/50), while smaller but visible contributions came from renewable or hybrid-power solutions (70/5236) and the generic 70/00 category. Subsequent waves appear shorter and more focused: in 2015, another spike is recorded (17 patents) led almost equally by propulsion, design and construction of watercraft hulls and alternative-fuel inventions, whereas 2017-2018 witness a temporary contraction to fewer than six filings per year. The portfolio rebounds in 2020 (16 patents) with a notably balanced mix of hull, propulsion, fuel and renewable/hybrid technologies. This can suggest a shift toward integrated, system-wide approaches. Overall, Korea's patenting alternates between hull design, propulsion upgrades and fuel substitution, with no single domain maintaining dominance for long, implying an adaptive strategy that follows successive technological opportunities rather than focusing on one niche.

Figure 1.22. Development of low-carbon patents, Korea



Source: (European Patent Office, 2024[27]).

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[25]). 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[25]). The chart underscores a decade of hyper-growth in LNG-capable shipbuilding, led overwhelmingly by Korean yards, with China emerging as a challenger and followed by Japan with a smaller share. For Japan, ship completions for LNG-capable ships remain limited, from zero in 2014 to almost 100 in 2023, as shown in Figure 1.23. Contrastingly, Korea dominates in terms of completions for these vessels, reaching approximately 500 in 2023, followed by China, which has produced around 200 vessels. The number of Korean vessels has significantly increased over time. In 2023, the country's share is around 60%, with about 500 vessels out of a total 850, while China's share is about 28%. From 2014 to 2023, Korea's share starts around 55-60%, with a slight decline as China's share grows. The main drivers for Korea's strong position can be attributed to its specialised yards and the rising demand for new-generation LNG carriers and dual-fuel container ships.

This strong share of completions for LNG-capable ships is the result of the Korean government and industry's strong support for LNG as a low-carbon option (Korea, 2024[2]). Methanol is also seen as a viable fuel to achieve a carbon-free sector, as are ammonia and hydrogen (Korea, 2024[2]). As part of its strategy to respond to the IMO's decarbonisation targets and to strengthen the competitiveness of its shipbuilding ecosystem, Korea is pursuing large-scale national initiatives such as the "Green Ship Technology Development Project for Carbon Neutrality (2023)" to commercialise ammonia and hydrogen as alternative marine fuels.

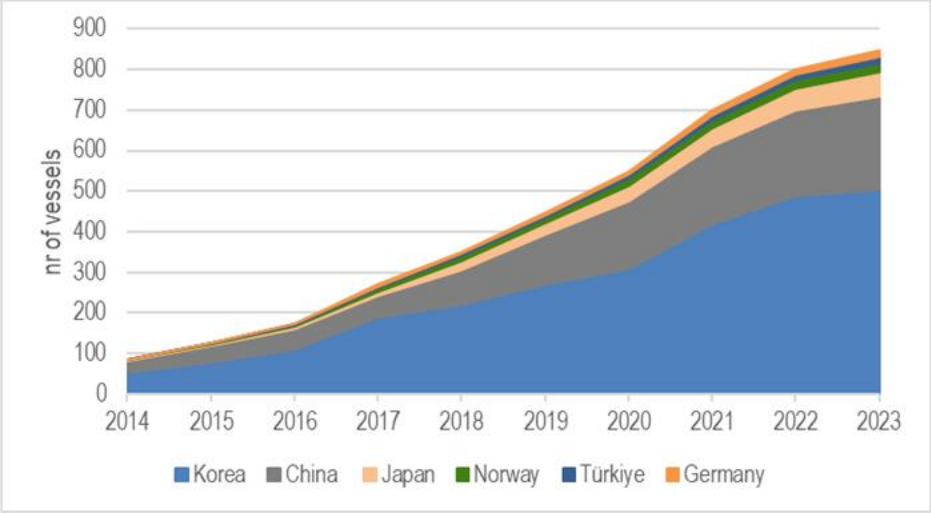
At port level, eco-friendly ship fuel supply is actively being carried out in certain domestic ports—notably at Busan Port, where LNG and methanol bunkering are in progress. As of 2024, Busan Port was the first port in the country capable of simultaneous bunkering and unloading operations for LNG-powered containerships (Ministry og Oceans and Fisheries, 2024[28]). Other ports such as Ulsan Port remain at the planning stage for ammonia bunkering (Korea, 2024[2]).

Against that background, Korea is also developing hydrogen fuel cell propulsion vessels, with the aim of commercialising dual-fuel engines capable of ammonia, hydrogen, and LNG by 2025.

In the field of liquefied hydrogen carriers, HD Korea Shipbuilding and Offshore Engineering (HD KSOE) has acquired Approval in Principle (AiP) from American Bureau of Shipping (ABS) for the design of a large-capacity liquefied hydrogen storage tank in 2025.

Regarding ammonia, a gas carrier vessel capable of ammonia transportation, 45,000 cubic meter class, and LPG carrier equipped with ammonia dual fueled engine is under construction at Hyundai Mipo Dockyard. HD KSOE has acquired AiP from Lloyd's Register (LR) and the Liberian International Ship & Corporate Registry (LISCR) for the design of an ammonia cargo handling and fuel supply system in 2024. HD KOSE is collaborating with Amogy Inc. to conduct an integrated demonstration of a ship propulsion system that converts ammonia into electric power via hydrogen fuel cells.

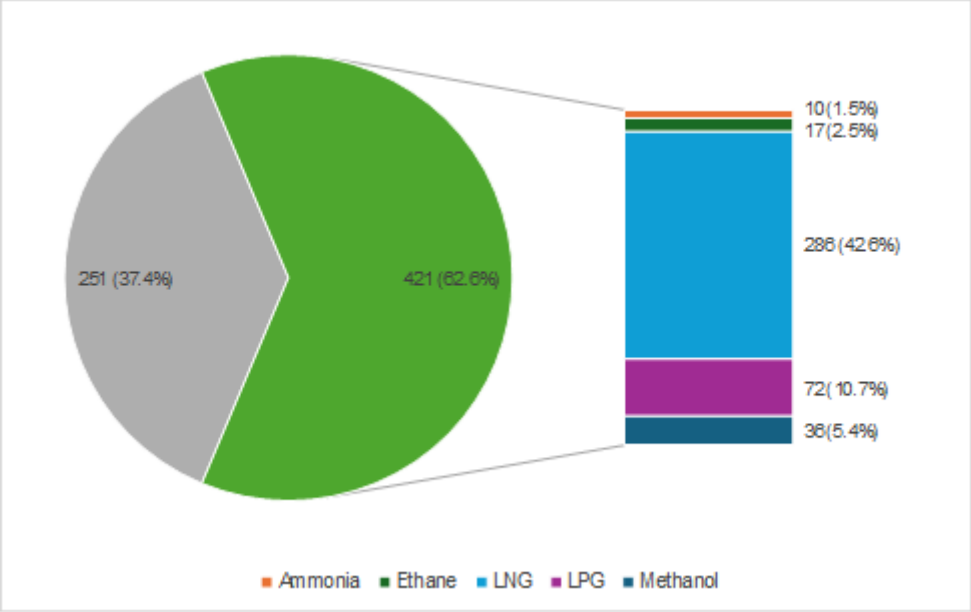
Figure 1.23. Cumulative LNG-capable ship completions per top builder country (2014-2023)



Source: (Clarksons WFR, 2025[12])

As shown in Figure 1.24, the current alternative fuel orderbook for Korean shipyards as of 25 July 2025 contains 421 vessels, corresponding to a proportion of 62.6% of the total orderbook for Korea (Clarksons WFR, 2025[12]), compared to 28.8% in the global orderbook (May 2025). The figure includes all vessels on order that are using alternative fuels as a basis fuel, excluding alternative fuel-ready vessels. A significant proportion of the conventionally fuelled vessels on order in Korea is alternative fuel ready (e.g. LNG, Ammonia, Methanol). LNG capable vessels represent the largest segment within the alternative fuel orderbook, significantly contributing to the size of the alternative fuel orderbook.

Figure 1.24. Orderbook Korea alternative fuel type breakdown



Note: Includes vessel larger than 1000 GT. As of 25 July 2025.
Source: (Clarksons WFR, 2025[12]).

As shown in Table 1.10, the current orderbook for methanol vessels is dominated by China, with 233 vessels, followed by Korea and Japan (36 and 32 vessels). For LPG capable vessels, Korea is leading the way in terms of orderbook, followed by China (55 vessels). The overall alternative fuel proportion of the current global orderbook is 27,65%, meaning 72,35% of the current orderbook is still conventional fuel. However, Korea stands out positively due to the large proportion of LNG vessels on order. A significant proportion of the conventional fuel vessels are alternative fuel-ready vessels.

Table 1.10. 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

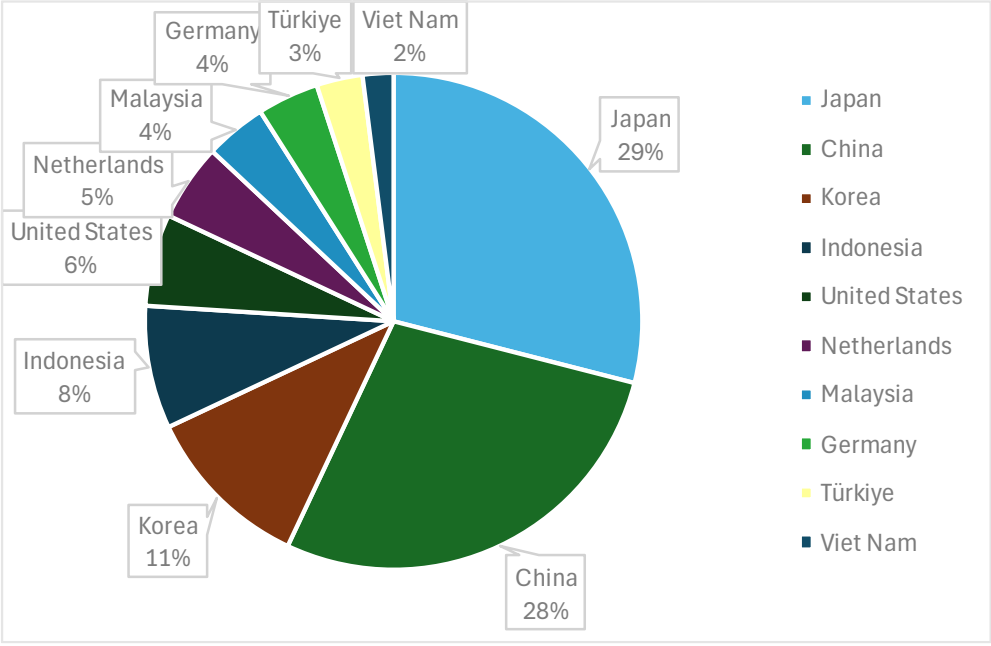
Note: Orderbook in number of ships as of 25 July 2025. Analysis with Vessels 1000 GT and above. Alternative fuel-ready vessels are part of the conventional fuel category. Hydrogen also includes hydrogen fuel cells.
Source: (Clarksons WFR, 2025[12]).

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. These technologies provide a solution to current challenges while minimising demand for scarce carbon neutral fuels while improving performance at sea. This section of the report gives an overview of their uptake in Korea newbuilding and retrofits.

Looking at the global fleet by builder countries in Table 1.11 Figure 1.25, Japan and China emerge as the main suppliers of ESTs to the whole global fleet, making up 29% and 28% respectively, according to OECD calculations (OECD, 2025[25]). Korea and Indonesia are also notable suppliers and represent 11% and 8% respectively. 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 whole global fleet.

Figure 1.25. ESTs in global fleet by builder country



Note: All vessels, including small ships.
Source: (OECD, 2025[25]).

As seen in Table 1.11 China accounts for the highest number of EST across nearly all technology types, with 1 519 (40.5%). Japan shows a notable uptake in rudder bulbs (18,5%) and propeller ducts (13,8%), and Korea leads in air lubrication systems (21,3%). CCS uptake is limited, with Korea and China being the only countries currently set to install these systems in new vessels. Solar and Wind ESTs are almost exclusively performed by China, and are generally still at low adoption levels based on the current orderbook.

While conventional ESTs like rudder bulbs and propeller fins are well equipped, the adoption of next-generation technologies remains in its early stages. Wind, solar and CCS are systems that are complex, space-demanding and capital-intensive, while propeller and rudder modifications tend to be lower-cost upgrades that do not impact the flexibility or use of the vessel.

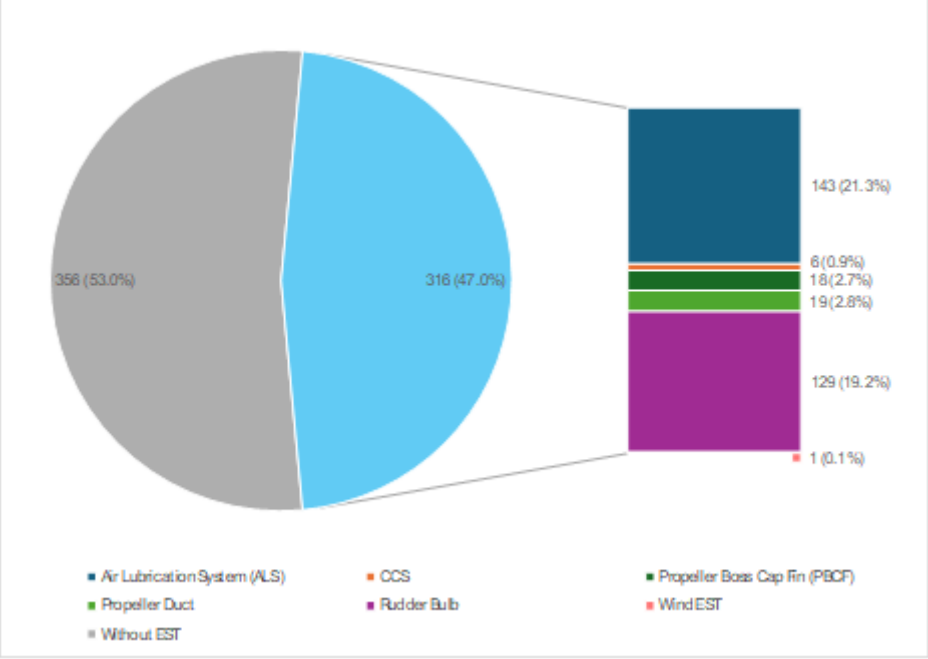
However, as shown in Figure 1.26, Korea leads in the share of EST upgrades on current orderbook, with 47% of its ship orderbook including fitment of an EST, driven by a high number of ALS (143 installations) and rudder bulbs (129 installations). Following are China (40,5%) and Japan (35,5%), in terms of EST share in the orderbook.

Table 1.11. EST upgrades on new ships orderbook by builder country

Countries	Air Lubrication System (ALS)	CCS	Propeller Boss Cap Fin (PBCF)	Propeller Duct	Rudder Bulb	Solar EST	Wind EST	EST Total	Total orderbook
China	155 (4,1%)	7 (0,2%)	420 (11,2%)	160 (4,3%)	664 (17,7%)	45 (1,2%)	68 (1,8%)	1 519 (40,5%)	3 748
France	2 (13,3%)	0	0	0	0	0	2 (13,3%)	4 (26,7%)	15
Germany	2 (11,1%)	0	0	0	1 (5,6%)	1 (5,6%)	0	4 (22.2%)	18
Indonesia	0	0	0	0	0	0	0	0	24
Japan	8 (1,2%)	0	17 (2,5%)	94 (13,8%)	126 (18,5%)	2 (0,3%)	3 (0,4%)	242 (35,5%)	682
Netherlands	0	0	0	0	0	0	1 (1,0%)	1 (1,0%)	96
Philippines	0	0	0	0	5 (8,2%)	1 (1,6%)	0	6 (9,8%)	61
Korea	143 (21,3%)	6 (0,9%)	18 (2,7%)	19 (2,8%)	129 (19,2%)	0	1 (0,2%)	316 (47,0%)	672
Viet Nam	0	0	2 (1,7%)	0	8	0	1 (0,9%)	11 (9,4%)	117
Grand Total	310 (5,7%)	13 (0,2%)	457 (8,4%)	273 (5,0%)	933 (17,2%)	49 (0,9%)	76 (1,4%)	2 103 (38,7%)	5 433

Note: Orderbook as of 28 July 2025. Analysis with Vessels 1 000 GT and above.
Source: (Clarksons WFR, 2025[12]).

Figure 1.26. Orderbook in Korea with EST breakdown



Note: Analysis with 1 000 GT and above vessels. As of 25 July 2025.
Source: (Clarksons WFR, 2025[12])

Digital technologies

Similarly to decarbonisation, Korea has been a global leader in maritime digitalisation, pioneering innovations that redefine modern shipping. In 2011, the country unveiled the world's first smart ship, developed by Hyundai Heavy Industries (HHI), marking a significant leap in ship automation and efficiency (KOSHIPA, 2024[13]). This was followed in June 2022 by the world's first fully automated ocean-crossing voyage, showcasing Korea's commitment to autonomous maritime technology. More recently, in August 2023, the industry introduced the world's first AI-based, machinery-automated bulk carrier powered by LNG, further advancing intelligent vessel operations (KOSHIPA, 2024[13]).

At the international level, the Korean government is building-up international partnerships to enhance its digital capabilities in the sector. In the context of ongoing trade negotiations between Korea and the United States, discussions surrounding the "July Package" have placed these talks at the forefront of Korea's international collaboration (Korea JoonAng Daily, 2025[29]) Following public-private consultations held by the Ministry of Economy and Finance's Office for New Growth Strategy in Ulsan, Korea—discussing the potential for increased collaboration on the development of autonomous ships this past February—further negotiations took place in April (Ministry of Economy and Finance, 2025[30]). This trade meeting allowed Korea to express its commitment to supporting the US in the revitalisation of its shipbuilding sector, which is set to strengthen Korea's position in the ongoing tariff negotiations.

At ship level, the Ministry of Trade, Industry and Energy has focused on developing automated processes, which have included the development of large projects to advance the country's shipbuilding industry, notably the development of autonomous ship technology and the development of eco-friendly ship full-cycle innovation technology. More recently, as of November 2024, the Ministry of Trade, Industry and Energy of Korea announced the launch of the SHIFT-Auto, an autonomous navigation demonstration vessel by Samsung Heavy Industries aimed to support the country's strategy in becoming a leading player on the global autonomous navigation market (Ministry of Trade, Industry and Energy, 2024[31]).

This initiative is part of Korea's regulatory sandbox and the upcoming Act on Promoting the Development and Commercialisation of Autonomous Ships. SHIFT-Auto will showcase technologies like collision-avoidance and remote control via low earth orbit satellite communications. Additionally, HD Hyundai Heavy Industries and Hanwha Ocean are also conducting autonomous vessel demonstrations. Similarly, the K-Shipbuilding Super Gap Vision 2040 project, announced by Korea's Ministry of Trade, Industry and Energy, aims to advance the country's shipbuilding industry digital capabilities through a comprehensive roadmap developed by experts from major shipyards, academia, and research institutions (Ministry of Trade, Industry and Energy, 2024[32]). This project involves a public-private investment of around USD 1.4 billion in 10 years and covers the three key aspects presented in Table 1.12.

Table 1.12. Key aspects of the K-Shipbuilding Super Gap Vision 2040 project

Eco-friendly Technologies	Digital Autonomation	Smart Technologies
Development of zero-carbon emission shipyard technologies, eco-friendly fuel propulsion, and offshore hydrogen and ammonia plant technologies.	Achieving 50% process automation by 2040, focusing on high-risk tasks like welding and vessel painting, and developing 24-hour automated ship block construction technology.	Commercialisation of fully autonomous vessels, including sensor, material, and integrated management systems, and safety technologies for emergencies and human-robot collaboration.

Source: (Ministry of Trade, Industry and Energy, 2024[32]).

In the shipyard facilities and systems, Hyundai Heavy Industries, Samsung Heavy Industries, and others are actively building smart yards based on digital twin technology, artificial intelligence (AI), and the Internet of Things (IoT). These companies are developing integrated process management systems that encompass all stages of shipbuilding, from design and production to inspection. Hanwha Ocean is

promoting the application of augmented reality (AR)–based design simulation, alongside the development of a digital twin–enabled system for real-time production monitoring. Samsung Heavy Industries is deploying the SYARD platform featuring real-time tracking of materials and personnel via IoT technologies.

Furthermore, in pursuit of achieving a 50% automation rate in production processes by 2040, robotics is being deployed in high-risk tasks such as welding and painting, and fully automated 24-hour block assembly systems are currently under development.

In the field of Smart Ship Technology, patent applications related to autonomous ship technology, AI-based route optimisation, and fuel efficiency monitoring systems have been steadily increasing. Notable systems in this field include Hyundai Heavy Industries' HiNAS (Hyundai Intelligent Navigation Assistant System) and Samsung Heavy Industries' SYARD platform of AI-based systems for fuel consumption prediction.

In the Carbon Neutral Technologies, Korea is underway to develop zero-carbon ship technologies through the integrated application of digital solutions to ammonia- and hydrogen-based propulsion systems, eco-friendly fuel supply infrastructure, and green offshore plant design, monitoring, and safety technologies.

In addition, Korea is going on developing the collaborative robot (cobot) systems aimed at enabling safe human-robot interaction and preventing collisions, in tandem with real-time, sensor-driven hazard detection technologies.

1.3.2. Challenges (labour, overcapacity etc.)

The analysis above has shed light some of the challenges faced by the Korean shipbuilding industry. Firstly, on a global scale, the ramping competition with China in terms of orderbooks is increasing. Related challenges identified by the government of Korea include the narrowing gap between the two countries' main ship types, high value-added and low-carbon ships, and intensifying pursuit by competitors such as securing technology from the EU and Japan. Korea's comparative global competitiveness is impacted due to higher labour costs and steel prices then its top competitor China. Digital transformation hurdles include manpower shortages and competitiveness of small and medium-sized shipbuilders and equipment industries.

Increased supply chain costs are associated to licensing agreements on major marine equipment items and the overall competitiveness of the sector. Items such as ship engines and LNG cargo containment systems can hence be produced based on licensing agreements, meaning that the company holding the technology is different from the company producing it (OECD, 2024[33]). Licensing can encourage shipbuilders to try to reduce royalties, for example by investing more in developing their own equipment rather than sourcing from other marine equipment companies, but it can also lead to legal disputes. For instance, the Korea Fair Trade Commission (KFTC) issued a corrective order and imposed an administrative fine on GTT for requiring Korean shipbuilders constructing LNG carriers to purchase additional engineering services as part of the licensing process for its LNG membrane containment technologies (Mayer, 2018[34]). Furthermore, the KFTC acted against GTT for including unfair contract terms that permitted it to cancel licensing agreements if a shipbuilder challenged the validity of its patent rights.

Additionally, Korea—like many other shipbuilding industries around the globe—is facing challenges in maintaining a stable workforce due to a declining young population, an ageing labour force, and reluctance toward physically demanding and dangerous (3D) jobs. In response, government entities like the Ministry of Trade, Industry, and Energy (MOTIE) (present: the Ministry of Trade, Industry and Resources (MOTIR) are working to ease the process of hiring foreign workers by simplifying visa issuance procedures and increasing quotas (Korea, 2024[2]).

At the international level, these challenges are driving collaboration. In March 2024, a Memorandum of Understanding (MoU) was signed between Thailand and Korea to tackle labour shortages in shipbuilding

(Jeong-Gu and Su-hyeon, 2024[35]). The MoU was signed between representatives from HD Korea Shipbuilding & Offshore Engineering, Hanwha Ocean, and Samsung Heavy Industries and Thailand's labour minister Phipat Ratchakitprakarn. The MoU notably includes sending an additional 3 000 Thai workers to Korea to contribute to filling the gap in the Korean labour force. Shipyards are also striving to enhance the welfare and working conditions of foreign employees through system improvements in the hopes of increasing the attractiveness of the industry. Locally, governments in regions such as Geoje, Ulsan, and Busan are organising job fairs to attract production workers. Building on these efforts, shipyard subcontractors and partners, along with shipbuilding associations, industry experts, and both central and local governments, have come together to establish the Shipbuilding Industry Win-Win Consultative Body (Korea, 2024[2]). This initiative aims to address disparities between original contractors and subcontractors, promote the expansion of the escrow payment system to prevent wage delays, and organise employment events to attract a diverse workforce for the sector, which includes youth and women (Ministry of Employment and Labor, 2022[36]). Moreover, efforts are being made to enhance vocational training opportunities, ensuring a more sustainable and skilled workforce for the industry.

During discussions on digitalisation progress, shipbuilding workers expressed concerns about potential job losses linked to the digital transformation of the sector. In response, government and industry implemented measures such as upskilling programmes and support for occupational transitions to mitigate these impacts.

Decarbonisation is further proving to be a challenge for the country's shipbuilding industry in relation to the IMO's regulation to reach net-zero targets by 2050. Although the various promotions of alternative-fuelled vessels are being conducted, the order book share for the conventional fuel ship in Korea accounts for approximately 40%. Moreover, other key bottlenecks for the industry are being pointed out by shipping companies, such as high ship prices, fuel costs and other cost issues, as well as the lack of an eco-friendly ship fuel supply chain, as difficulties in introducing eco-friendly ships (Korea, 2024[2]). To successfully digitalise and decarbonise the shipbuilding industry, reskilling and upskilling of the workforce will be necessary. The Shipbuilding Maritime Future Innovation Training Centre, established in 2024, has been actively operating across two locations, one in the metropolitan area and another in the southeast region. It offers specialised education focused on eco-friendly and smart technologies, catering to university students and professionals in the shipbuilding industry, including those involved in shipbuilding equipment manufacturing (Korea, 2024[2]).

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2 Structure and characteristics: Feature of Korean maritime industry

This chapter delineates the structural framework of the Korean 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 MOTIR, KEXIM, and K-Sure, focusing on export financing mechanisms and the implementation of the 'K-Shipbuilding Super Gap Vision 2040'. Key emphasis is placed on the government's role in co-ordinating R&D to ensure domestic self-sufficiency and technological autonomy.

2.1. Structure of the Industry

Key Findings

- **The shipbuilding industry remains a cornerstone of the Korean economy**, accounting for approximately 3% of total exports and manufacturing employment. It has strong linkages with upstream and downstream industries, including equipment manufacturing, the steel industry, and ship finance, and plays a crucial role in regional development, particularly in Busan, Ulsan, and Gyeongnam. In 2022, Korean shipbuilders delivered about 90% of newly built vessels ordered by domestic shipping companies. Despite declining sales revenues, shipbuilders remain optimistic amid the recovery in global demand, continuing to focus on high-value segments such as LNG carriers and eco-friendly vessels to support sustainable growth.
- **The Korean shipbuilding industry has traditionally been highly export-oriented, with domestic demand historically limited**. However, the share of vessels built in Korea and purchased by Korean owners has risen from less than 5% in the early 2000s to 15–25% in recent years. At the same time, Korea faces increasing challenges, including declining orders from major shipowning countries such as Greece and intensifying competition from rapidly expanding Chinese shipyards, which poses risks to maintaining an export-driven industrial model.

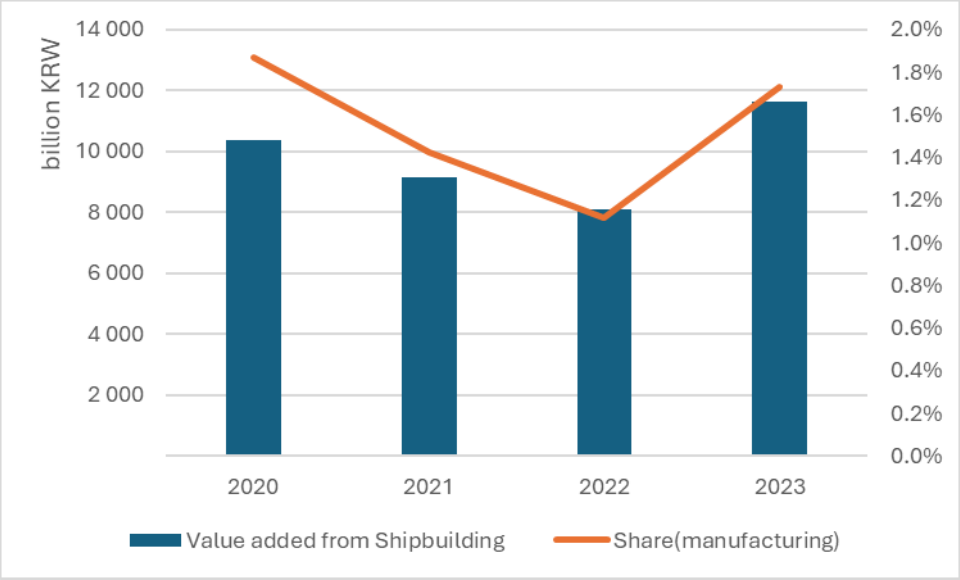
2.1.1. Economic impact

The shipbuilding industry plays a central role in the Korean economy, not only as a key national industry but also as a significant driver of regional development. Accounting for approximately 3% of the country's total exports and manufacturing employment, the sector generates wide-ranging economic ripple effects through strong linkages with both upstream and downstream industries. On the demand side, domestic shipbuilders supply around 90% of orders placed by Korea's shipping industry (as of 2022), while on the supply side, they absorb roughly 50% of the thick plate output from the national steel industry. Moreover, Korea's shipbuilding activities are concentrated in several major regional hubs — including Busan, Ulsan, Gyeongnam, Jeonnam, and Jeonbuk — where shipbuilding serves as a core component of local industrial ecosystems. These regions demonstrate high levels of dependence on shipbuilding, with the industry accounting for up to 41% of Gyeongnam's economic activity, followed by Ulsan (33.4%), Jeonnam (19.7%), and Busan (4%) (MOTIE, 2024).

Given the shipbuilding industry's central role in Korea's economy, the financial performance of the country's major shipbuilding firms offers insight into broader industry dynamics. As shown in Figure 2.2, the sales revenues of the 11 leading shipbuilding companies generally mirror the overall fluctuations of the Korean shipbuilding sector. From 2010 to 2021, sales revenues have declined steadily, reflecting a prolonged downturn in global newbuilding demand. This trend was shaped by multiple factors, including the lingering effects of the global financial crisis, a collapse in freight rates, and a sharp drop in oil prices. In particular, Korea's strong focus on offshore oil and gas plant construction — a segment more vulnerable to oil price volatility — contributed to heightened exposure. This vulnerability is reflected in the significant deterioration of operating income, which entered a deficit in 2013 and reached a record low in 2015. These dynamics are reflected in the sector's operating income, which turned negative in 2013 and reached a record low in 2015. While operating results have remained in deficit through 2023, the scale of losses has significantly decreased in recent years, with the industry approaching breakeven, gradual stabilisation in financial performance, and the industry swung to profit in 2024.

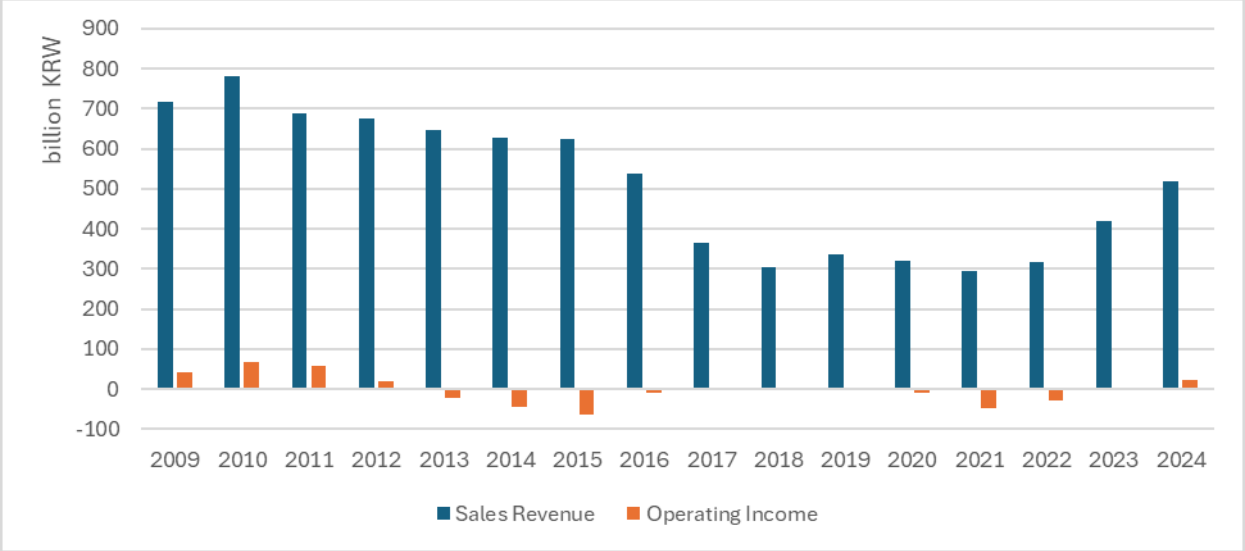
Looking ahead, the financial outlook for the Korean shipbuilding industry is expected to improve, supported by the ongoing recovery in global shipbuilding demand. In recent years, several major Korean shipbuilders have undergone restructuring and mergers aimed at enhancing financial stability and operational efficiency. The current orderbook provides further optimism, indicating a robust pipeline of deliveries over the next three to four years. In addition, Korean shipyards are increasingly focusing on high-value-added segments — such as LNG carriers and eco-friendly vessels — and are selectively securing contracts to prioritise profitability over volume, reflecting a strategic shift toward sustainable growth (KOSHIPA, 2024). Furthermore, the recent depreciation of the Korean won has improved export competitiveness, providing additional support to earnings in the near term.

Figure 2.1. Value added from the shipbuilding industry



Note: Share indicates the share of value added from shipbuilding industry to total value added from manufacturing industry of Korea.
Source: (KOSIS-KOrean Statistical Information Service, 2025[1]).

Figure 2.2. Sales revenue and operating income of 11 major shipbuilders

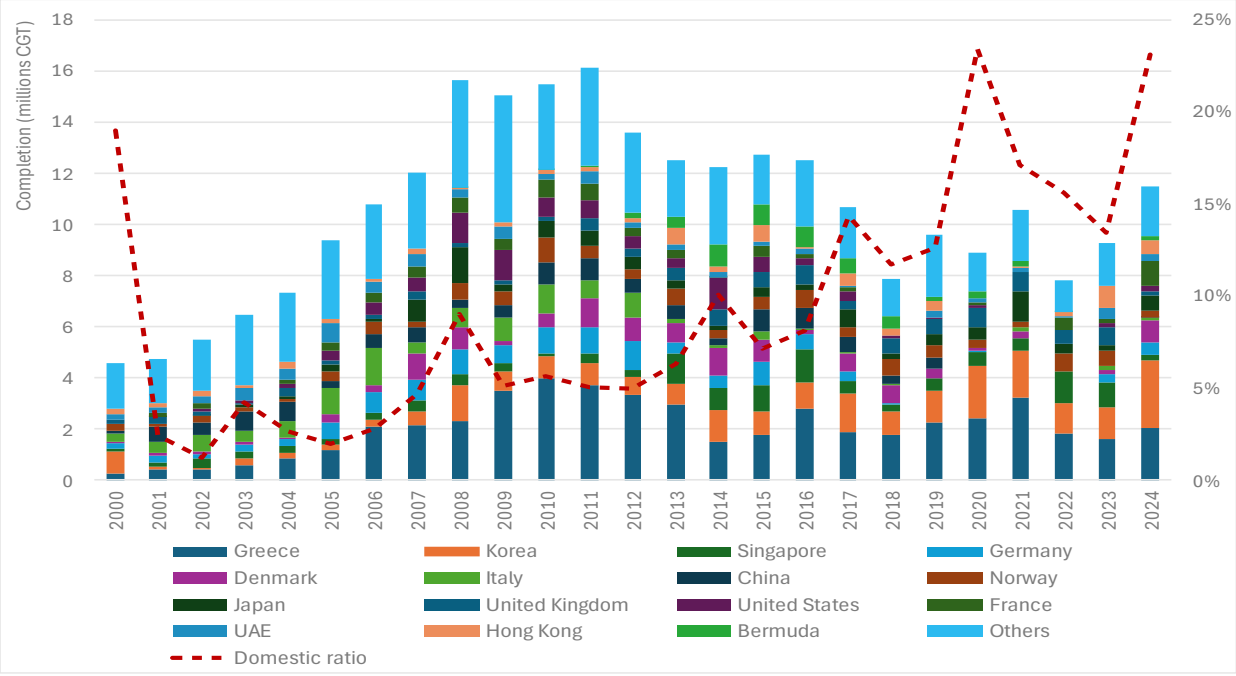


Source: Data compiled by MOTIR (former MOTIE) from disclosures from individual companies.

2.1.2. Export/Import

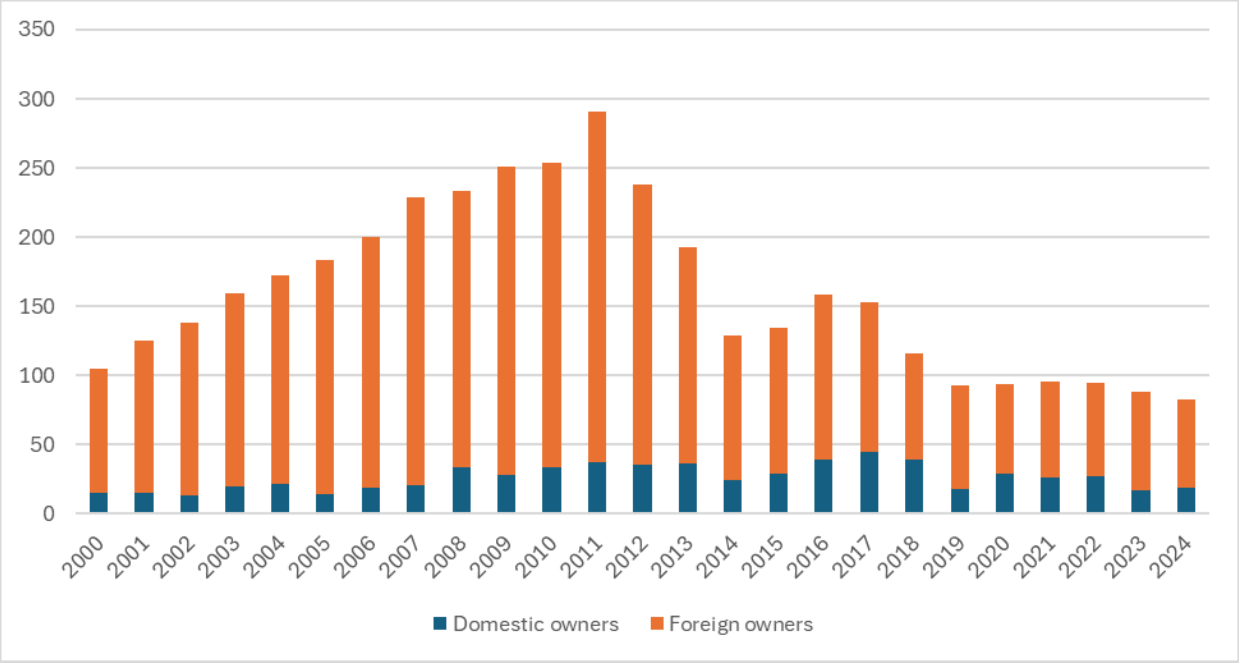
Compared to some peer economies, Korea's shipbuilding industry has historically been more export-oriented, with relatively limited domestic demand for newbuild vessels. While Korea is home to several prominent shipping companies, including HMM, the scale and global footprint of its domestic fleet owners are more modest than those in countries like Japan. As a result, the proportion of Korean-built ships ordered by domestic owners has remained relatively low. In the early 2000s, domestic ownership accounted for around 5% or less of total completions (in CGT terms). However, this share has shown a gradual upward trend in recent years, fluctuating between 15% and 25%, indicating some strengthening of domestic demand — though the sector remains predominantly export-driven.

Figure 2.3. Major owners of vessels built in Korea



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

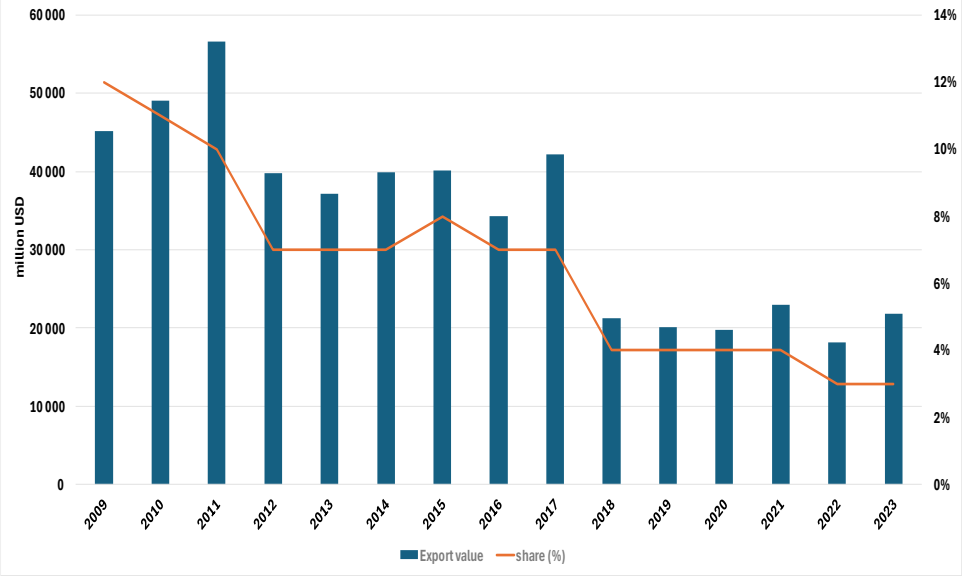
Figure 2.4. Development of owners of vessels built in Korea



Source: (Clarksons WFR, 2025[2])

The export value of ships and boats (classified under MTI code 746), as well as their share in Korea's total exports, has shown a declining trend in recent years. This development can be attributed to a combination of structural and demand-side factors. Traditional markets such as Greece — once major buyers of bulk carriers and tankers — have significantly reduced their order volumes, not due to a shift to alternative suppliers, but as a result of overall contraction in investment. Similarly, Italy, previously an important customer for Korea shipbuilders, has decreased its demand without increasing procurement from lower-cost producers such as China, indicating a broader reduction in market appetite. Germany, meanwhile, has redirected a portion of its orders to Chinese shipyards, particularly during the 2017–2023 period. Overall, these trends reflect both the global downcycle in ship demand and a more cautious, risk-averse approach by major buyers toward new vessel investments, presenting continued challenges for Korea's export-oriented shipbuilding sector.

Figure 2.5. Export value and share



Source: KITA (Korea International Trade Association(Code : MTI 746)).

2.2. Components of the Industry

Key Findings

- **Korea's shipbuilding industry continues to operate a significant number of globally competitive yards**, despite a gradual long-term decline in market share. Structural adjustments in commercial shipbuilding have consolidated the sector under three major groups: HD Hyundai, Samsung Heavy Industries (SHI), and Hanwha Ocean (part of the Hanwha Group). These firms continue to focus strategically on high-value segments, including LNG carriers, ultra-large container ships (ULCS), Floating Production Storage and Offloading units (FPSOs), and naval vessels. In addition, Hanwha Group and SHI are actively pursuing overseas expansion strategies.
- **In 2024, Korea ranked second globally in shipbuilding completions**. HD Hyundai, SHI, Hanwha Ocean, and Daehan Shipbuilding (formerly KHI–Hantsu SG PE) were all among the top 20 shipbuilders worldwide by CGT. The three largest groups—HD Hyundai, Hanwha Group, and SHI—accounted for more than 90% of national completions, with over half of their total investment directed toward the eco-friendly ship segment.
- Based on three-year interval capacity estimates, the top ten Korean shipbuilders controlled 99.7% of national capacity in 2024, with HD Hyundai alone representing 44.1%. HD Hyundai has led national capacity rankings since 2000. On a 15-year interval basis, the top ten firms accounted for 90.3% of total capacity, with HD Hyundai contributing 30.5%. This high concentration reflects the consolidation of the industry into large corporate groups during the downturn of the 2000s.
- **The Korean public sector plays a central role in supporting the maritime industry through regulatory oversight, technological co-ordination, and export finance**. The Shipbuilding and Offshore Plant Industry Division of MOTIR (formerly MOTIE) oversees policies for

shipbuilding and marine equipment, including standards for safety, recycling, and innovation, while the MOF supports eco-friendly technology development. Export financing is provided by KEXIM, offering buyer's credits and bank-to-bank loans, and K-Sure, which insures ship exports against political and commercial risks. These institutions aim to maintain the global competitiveness of Korean shipbuilders, including SMEs integrated within regional production networks.

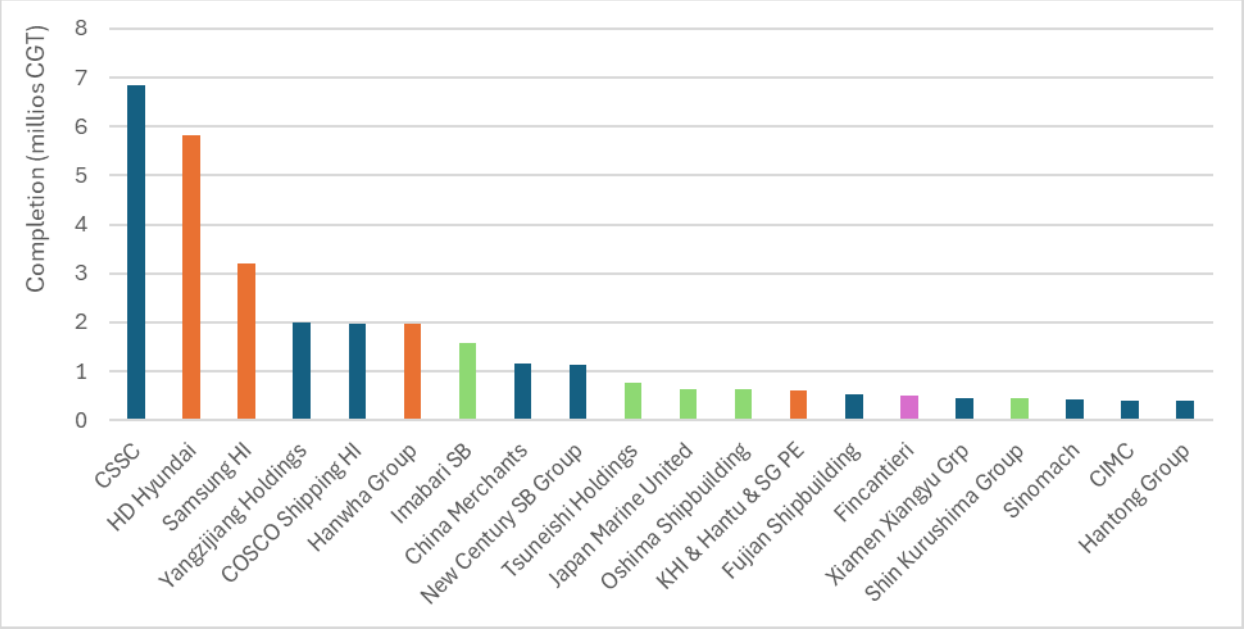
- **Industrial transformation is further supported through strategic initiatives such as the "K-Shipbuilding Strategy" and the "K-Shipbuilding Super Gap Vision 2040"**. The government is promoting zero-emission vessel development, digital design processes, and smart shipbuilding technologies. Under the K-Shipbuilding Strategy, in 2025 MOTIR (formerly MOTIE) will allocate KRW 260 billion to R&D in hydrogen and ammonia fuel systems, autonomous ship technologies, and smart shipbuilding systems—a 40% increase from 2024 levels—to strengthen the sector's long-term competitiveness.

2.2.1. Private sector

Shipbuilders

The domestic shipbuilding industry has invested KRW 1.2 trillion 2019-2023 over the past five years. The growth rate of R&D investment by the three major shipbuilding companies over the past five years is 11.0%, and the trend is expected to increase starting in 2022 when the market conditions begin to improve in earnest. The largest investment area for the three domestic shipbuilding companies is the eco-friendly ship sector, accounting for more than 50% of the total investment amount.

Figure 2.6. Top 20 in the world (2024)



Source: (Clarksons WFR, 2025[2])

South Korea's shipbuilding industry is led by a consolidated "Big Three" structure consisting of HD Hyundai, Hanwha Ocean, and Samsung Heavy Industries (SHI)—each with distinctive strategic strengths and technological capabilities.

According to Clarksons Research (Q4 2024), three Korean shipbuilders—HD Hyundai, Samsung Heavy Industries, and Hanwha Ocean—ranked within the global top 10 based on CGT completions. HD Hyundai Heavy Industries recorded approximately 5.82 million CGT, leading among Korean builders and specialising in LNG carriers, large container ships, and ammonia/methanol-fuelled vessels. Samsung Heavy Industries followed with around 3.21 million CGT, maintaining its strength in FLNG, FPSO, and high-value offshore units. Hanwha Ocean, formerly DSME, joined the top 10 following its acquisition by Hanwha Group in 2022, with a focus on LNG carriers and naval vessels. While Chinese shipyards such as CSSC, Yangzijiang, and COSCO ranked higher in total volume, Korean shipbuilders continued to hold strong positions. in high-technology segments. Their comparative advantage lies in engineering capacity, fuel-flexible propulsion systems, and compliance with IMO decarbonisation standards.

HD Hyundai stands as the largest shipbuilder in Korea, benefitting from economies of scale across its three major shipyards: Hyundai Heavy Industries (Ulsan), Hyundai Samho, and Hyundai Mipo. This vertically integrated structure enables the group to deliver a broad range of vessels, including ultra-large container ships, LNG and LPG carriers, and ammonia-fuelled ships. Hyundai Mipo specialises in medium-sized product tankers, while Samho focuses on large-scale LNG carriers and tankers. HD Hyundai's dominance is not only in volume but also in its capacity to adapt quickly to green fuel transitions and high-spec requirements. Furthermore, HD Hyundai signed a strategic collaboration with Tampa Ship, a United States shipyard, in June 2025, in order to further expand its business, in view of building medium-sized LNG dual-fuel container ships in the United States, with first deliveries targeted for 2028 (HD HYUNDAI, 2025[3]). In addition, in August 2025, HD Hyundai Heavy Industries announced that it will absorb its affiliate HD Hyundai Mipo through a merger in December, in order to not only maximize synergies through both quantitative and qualitative growth, strengthen competitiveness, and secure an advantage in the global market, but also enhance its defence capabilities and expand defence business further, as well as the integrated company will establish an overseas investment corporation in Singapore in December 2025, which will supervise overseas production base, including HD Hyundai Viet Nam Shipbuilding, HD Hyundai Heavy Industries Philippines and a new subsidiary in Viet Nam (Reuters, 2025[4]) (Yonhap News Agency, 2025[5]). In September 2025, HD Korea Shipbuilding & Offshore Engineering (HD KSOE), a HD Hyundai subsidiary, signed the MoU with Cochin Shipyard Limited (CSL), India, for long-term shipbuilding collaboration (Ministry of Ports, Shipping and Waterways, India, 2025[6]). Furthermore, HD Hyundai are working to complete the construction of the biggest shipyard in the Middle East in Saudi Arabia with Saudi's Aramco by the end of 2025 (The Korea Times, 2025[7]).

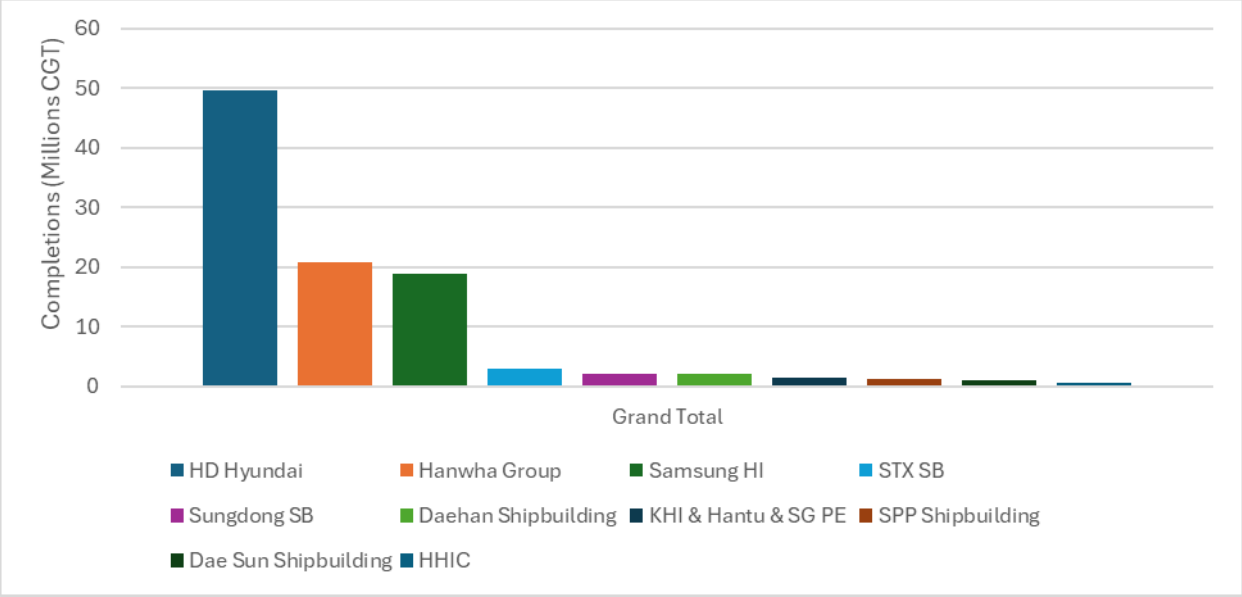
Hanwha Ocean, formerly Daewoo Shipbuilding & Marine Engineering (DSME), has solidified its position through technical legacy and recent investments. With a track record of building the world's first large-scale LNG and Arctic-class LNG carriers, Hanwha Ocean possesses proprietary technologies such as shaft generator motor systems, LNG reliquefication, and onboard CCS (carbon capture and storage). The company is actively investing in future-oriented capabilities, including the development of CO_2, ammonia, and hydrogen carriers through research facilities like the Sloshing Research Centre and Energy Systems Testing Lab. Furthermore, Hanwha Ocean acquired Philly Shipyard in the United States for USD 100 million in 2024, in order to further expand its business and enter the United States naval business.

Samsung Heavy Industries has carved out a strong niche in offshore platforms and high-spec LNG carriers. The company continues to secure major contracts for floating LNG (FLNG) units and is renowned for delivering vessels with advanced automation and propulsion systems. SHI's business model emphasises high unit-value over volume, reflecting a focus on complex engineering solutions rather than standard mass production. On overseas activity, in July 2025, SHI is extending its shipbuilding capacity into Viet Nam to

build tankers up to suezmax size at Vietnamese yards through a collaboration with PetroViet Nam (TradeWinds, 2025[8]).

Together, these three companies represent the technological and commercial foundation of Korea's global leadership in high-value shipbuilding, particularly in the eco-friendly and digital segments that are gaining prominence under global decarbonisation trends.

Figure 2.7. Top 10 Builder groups in Korea (2015-2024)

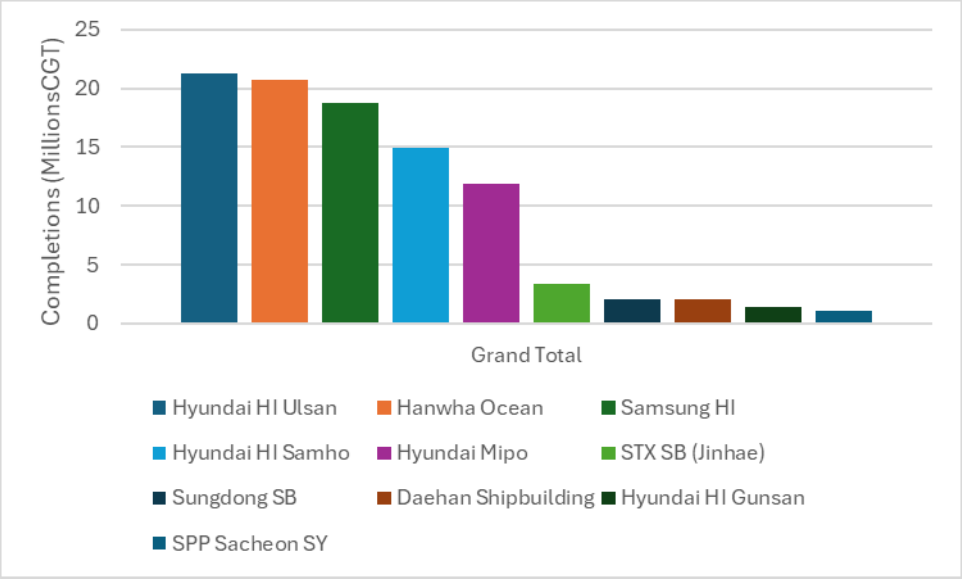


Note: Daewoo Shipbuilding & Marine Engineering (DSME) was acquired by Hanwha group in 2022.
Source: (Clarksons WFR, 2025[2]).

Figure 2.8 presents the cumulative completions (in million CGT) of Korea's top shipbuilding groups from 2015 to 2024. It highlights the scale-driven hierarchy of the industry: HD Hyundai leads decisively with approximately 49.7 million CGT, reflecting the combined output of its Ulsan, Samho, and Mipo shipyards. Hanwha Group and Samsung HI follow with 20.7 million CGT and 18.8 million CGT, respectively.

Mid-sized players such as STX SB(Jinhae), renamed K-shipbuilding in 2021, Sungdong, and Daehan Shipbuilding trail significantly, each below 3 million CGT. At the bottom tier, HHIC (Hanjin Heavy Industries and Construction), renamed HJSC (HJ Shipbuilding & Construction, SPP Shipbuilding) in 2021, and Dae Sun Shipbuilding each recorded around 1 million CGT, reflecting the lingering effects of past restructuring or limited market exposure. This group-level perspective emphasizes the industry's strong concentration at the top, with Korea's competitive capacity largely held within its top three shipbuilders.

Figure 2.8. Top 10 Builders in Korea (2015-2024)

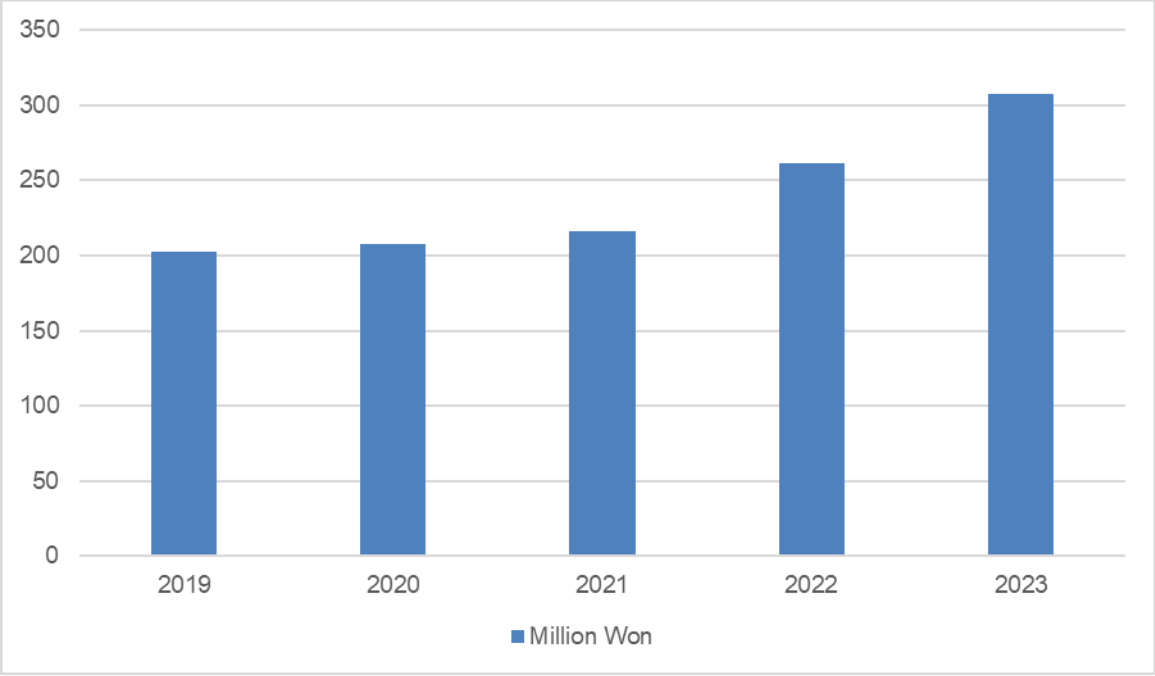


Note: SPP Sacheon went bankrupt in 2019. STX SB (Jinhae) changed its name to K-Shipbuilding in 2021.
Source: (Clarksons WFR, 2025[2])

Figure 2.8 disaggregates production data by individual yards rather than corporate groups, providing a clearer picture of operational distribution: Hyundai Heavy Industries (Ulsan) ranks first with over 20 million CGT, showcasing its unmatched production scale. Hanwha Ocean and Samsung HI follow closely. Hyundai Samho and Hyundai Mipo, both part of HD Hyundai, also appear in the top five, illustrating HD Hyundai's intra-group production diversity.

Yards such as STX SB (Jinhae), Sungdong, Daehan, Hyundai HI Gunsan, and SPP Sacheon comprise the second tier, each contributing under 5 million CGT. The financial crisis severely impacted small and mid-sized companies, causing significant financial difficulties that led SPP Sacheon to bankruptcy in 2019, and STX SB, following an overly aggressive expansion strategy and the subsequent downturn in the shipbuilding market, underwent restructuring procedures, to subsequently underwent transitions to K-Shipbuilding in 2021. These shipbuilders have historically focused on standard vessel types like bulk carriers and tankers, but are now transitioning toward smart yard upgrades and eco-friendly retrofitting in response to evolving regulatory and market pressures.

Figure 2.9. Investment by private sectors



Source: Answer to the Questionnaire Peer Review (2024).

Recession

After the 2008 financial crisis, relatively large shipyards entered workout programs, consignment management, or creditor management, while vulnerable small- and medium-sized shipyards were sold off or exited the market. Following this, only a few medium-sized shipyards, such as Daesun Shipbuilding, K Shipbuilding, HJ Shipbuilding & Construction, and Daehan Shipbuilding, survived restructuring, with most completing creditor management or being sold by 2021–2022. As for large shipyards, they conducted self-led restructuring after 2015, including workforce reductions and asset sales.

Against the background of a recession and restructuring measures, on 6 November 2018, Korea was requested consultation to the WTO by Japan concerning the following measures allegedly affecting trade in commercial vessels: (1) corporate restructuring measures to allegedly support Korean shipbuilders; (2) guarantees and other insurance for financing related to commercial vessel orders placed with Korean shipbuilders; (3) pre-shipment loans, measures part of the new shipbuilding program, and other financing for commercial vessel orders placed with Korean shipbuilders; (4) alleged eco-ship replacement subsidies; (5) other measures imposed by Korea to allegedly support commercial vessel purchases; and (6) amendments and other measures (WTO, 2018[9]).

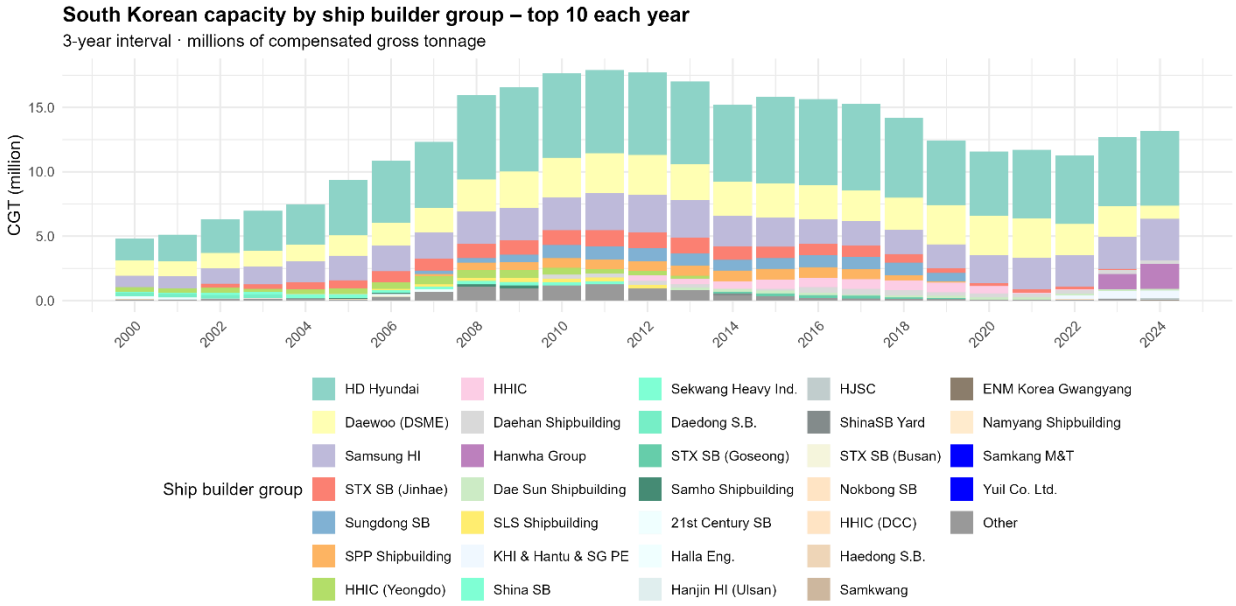
In addition, on 20 November 2018, the European Union also requested to join the consultations. On 21 November 2018, Chinese Taipei requested to join the consultations. Subsequently, Korea informed the DSB that it had accepted the European Union's request to join the consultations (WTO, 2020[10]).

Capacity (main yards)

The capacity of the main Korea shipbuilding groups from 2000 to 2024 is depicted using the 3-year interval calculation in Figure 2.10. On average, the ten largest groups accounted for 97.4% of total national capacity over this period. In 2000, they held 98.3%, with HD Hyundai at the top of the list at 35.1%. This share remained relatively the same until 2006, when it started to decline, reaching 92.9% in 2011. HD

Hyundai maintained 35.9% in 2006, as the largest group. Since then, the share has steadily increased, with the top ten holding 99.7%, the largest share ever held by the top ten groups, and HD Hyundai contributing 44.1%. HD Hyundai has remained the largest shipbuilding group between 2000 and 2024, where on average, it represented 41.5% of total Korean shipbuilding capacity.

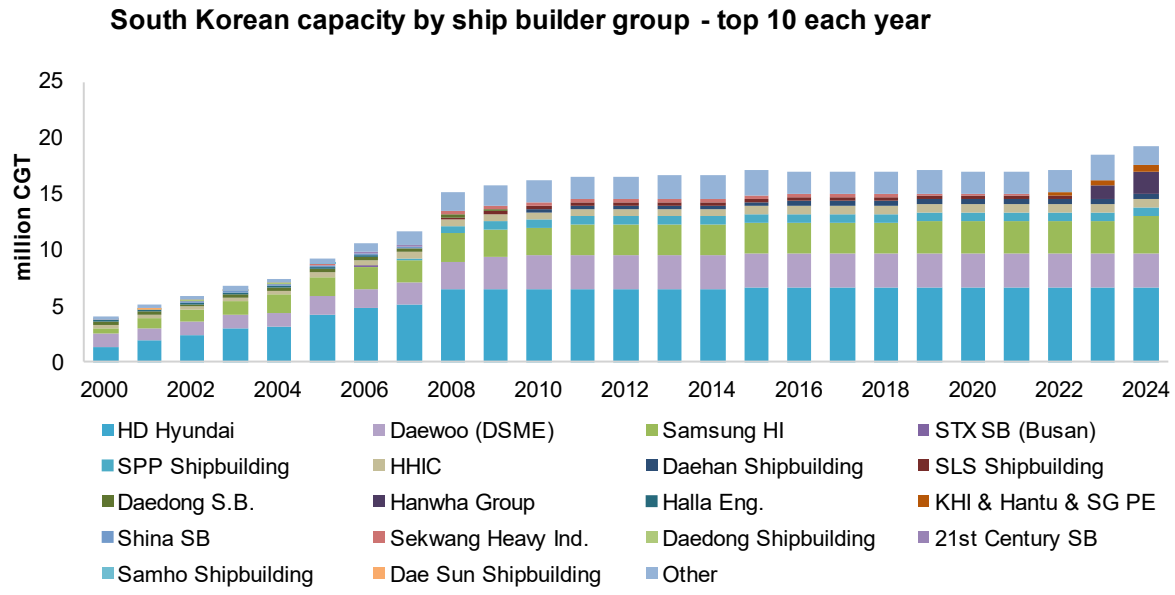
Figure 2.10. Estimations of capacity for top ten Korean shipbuilders, 3-year interval



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 top ten Korean shipbuilder groups are found in Figure 2.11. On average, between 2000 and 2024, the top ten shipbuilder groups made up 90.3% share of the total shipbuilding capacity. In 2000, the top ten groups by capacity had 94.3% share of total capacity, where HD Hyundai had the largest capacity, with 33.3% of the total share. The highest share during this period was in 2005, with 95.1% share of total capacity, where Hyundai HD had 42.4% of the total, the highest share. In 2024, the top ten yards had 90.3% of the total share of capacity, with HD Hyundai, with 30.5% share. HD Hyundai has remained the largest shipbuilding group between 2000 and 2024, where on average, it represented 35.3% of total Korean shipbuilding capacity. Overall, the shares of capacity by the top ten shipbuilding groups by capacity are lower using the 15-year interval.

Figure 2.11. Estimations of capacity for top ten Korean shipbuilders, 15-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/.

Box 2.1. Korea shipbuiding capacity

Korea government views

According to the government's views at the time of the 2024 interview, regarding shipbuilding capacity, after a period of restructuring, small and medium-sized shipbuilders were forced out after 2008, and DSME was also converted to a private company, Hanwha. The government assessed that it has reached an appropriate level of capacity. In addition, regarding the recent increase in orders, it stated that it is responding in the direction of increasing efficiency rather than increasing capacity.

Investment (R&D)

The domestic shipbuilding industry has invested KRW 1.8 trillion (2019-2023) over the past five years. The growth rate of R&D investment by the three major shipbuilding companies over the past five years is 11.0%, and the trend is expected to increase starting in 2022 when the market conditions begin to improve in earnest. The largest investment area for the three domestic shipbuilding companies is the eco-friendly ship sector, accounting for more than 50% of the total investment amount.

Industry associations

KOSHIPA (Korea Offshore & Shipbuilding Association): The association counts 8 members, including large & Medium shipbuilders (HD Hyundai Heavy Industries, Samsung Heavy Industries, Hanwha Ocean, HD Hyundai Samho, HD Hyundai Mipo, K-Shipbuilding, Daesun Shipbuilding, HJ Heavy Industries). KOSHIPA's mandate is to promote mutual friendship among members and to strengthen the market information system and promote mutual benefits through co-operation in the shipbuilding industry. It initiates various international co-operation. JECK (Japan, Europe, China, Korea) Top Executive Meeting

is an annual meeting of top executives from major shipbuilders in Japan, EU, China, and Korea. During the meeting, participants discuss global economic trend, regional shipbuilding markets, and various ship types in the market. ASEF (Active Shipbuilding Experts' Federation) is an international organisation comprising shipbuilding experts from leading shipbuilding nations. ASEF's mission is to foster co-operation among its members to address technical, regulatory, and environmental challenges in the shipbuilding industry. The organisation provides a platform for sharing expertise, discussing industry trends, and promoting best practices to enhance the global competitiveness and sustainability of shipbuilding. ISFEM (International Shipbuilding Forecasting Experts Meeting) is annual meetings involving working-level from major shipbuilding countries (Korea, China, Japan, and Europe) focus on long term of shipbuilding market forecasts and related topics.

KOMEA (Korea Marine Equipment Association): KOMEA is compromised with 318 members, including small and medium enterprises (SMEs) related to marine equipment. KOMEA is dedicated to promoting and develop the Rights and Interests of Small and Medium Enterprises Related to Marine Equipment. KOMEA also participates to JSMEA.

KOMERI (Korean Marine Equipment Research Institute)

2.2.2. Public sector

Government

MOTIR (the Ministry of Trade, Industry and Resources) (Former name: MOTIE (Ministry of Trade, Industry and Energy) Shipbuilding and Offshore plant Industry Division) The Ministry name changed in accordance with the amendment of the Government Organisation Act, effective 1 October 2025. The MOTIR is responsible for strengthening the security of national critical technologies, enhancing industrial competitiveness and preventing safety accidents at industrial sites. The MOTIR is formulating and implementing policies to foster business growth and export, while addressing regulatory issues and alleviating difficulties faced by enterprises.

MOF (Ministry of Oceans and Fisheries) The MOF bears the responsibility to ensure the safety of aquatic products, to prevent maritime accidents, to safeguard the marine environment, and to strengthen the nation’s competitiveness in eco-friendly technologies in response to the climate crisis. The MOF undertakes monitoring activities to protect aquatic resources and the marine ecosystem, while also leading efforts in research and development to establish environmentally sustainable and cutting-edge port logistics systems, as well as in the construction of port and logistics infrastructure.

MOJ (Ministry of Justice) The MOJ supports visa-related procedures to facilitate the recruitment of foreign workers.

MOEL (Ministry of Employment and Labor) The MOEL implements a range of policies aimed at regulating working hours and ensuring safe and equitable working conditions.

State Owned Enterprise (SOE)

The Export Credit Agency (ECA) is run as a state-owned enterprise.

K-SURE (Korea Trade Insurance Corporation) K-SURE carries the responsibility of supporting the enhancement of national competitiveness by facilitating international trade and foreign investment through comprehensive schemes, including trade insurance, overseas investment insurance, and credit guarantee programs. K-SURE contributes to the stability of international trade and foreign investment by administering a diversified portfolio of trade insurance instruments and managing dedicated trade insurance funds.

KEXIM (The Export-Import Bank of Korea) The KEXIM is mandated to provide uninterrupted credit support to ensure that enterprises encounter no financial constraints in executing their export operations. The KEXIM offers comprehensive policy financing to facilitate overseas investment and resource development, support official development assistance (ODA) initiatives in developing countries, and enhance the resilience and competitiveness of supply chains in key industries.

2.2.3. Support measures

Based on the questionnaire to Korea and web research by the Secretariat, this section provides the recent measures for shipbuilding sector in Korea (Annex A). This section introduces the overview of some measures.

Strategies/plans/roadmap

In 2024, Korea published the K-shipbuilding strategy and based on that developed the K-Shipbuilding Super Gap Vision 2040. This vision consists of the following important parts:

a. Eco-friendly: With the goal of completing a zero-carbon ship technology portfolio by 2040, they will develop eco-friendly fuel propulsion technologies such as hydrogen and ammonia, eco-friendly innovative equipment, and future fuel production plant technologies such as hydrogen and ammonia beyond crude oil and gas. In addition, to put focus on capabilities on securing core technologies such as liquefied hydrogen carrier cargo holds and large electric propulsion ships.
b. Digital: With the goal of achieving a 50% unmanned rate in the process by 2040, they will secure automation technologies for all processes, including design, production, and yard operation. Prioritise the development of welding and painting automation technologies and collaborative robot technologies that can replace high-risk and high-difficulty tasks. In the mid- to long-term, they plan to secure technologies based on an automated ship block factory that can operate 24 hours a day and promote the construction of a test bed.
c. Smart: With the goal of commercialising fully autonomous ships by 2040, Korea will secure technologies such as sensors, equipment, and integrated operation systems necessary for unmanned navigation. In addition, technologies that allow human-robots to assist crew members in their work and technologies to ensure safety in case of emergency situations are being developed in parallel.

Decarbonisation

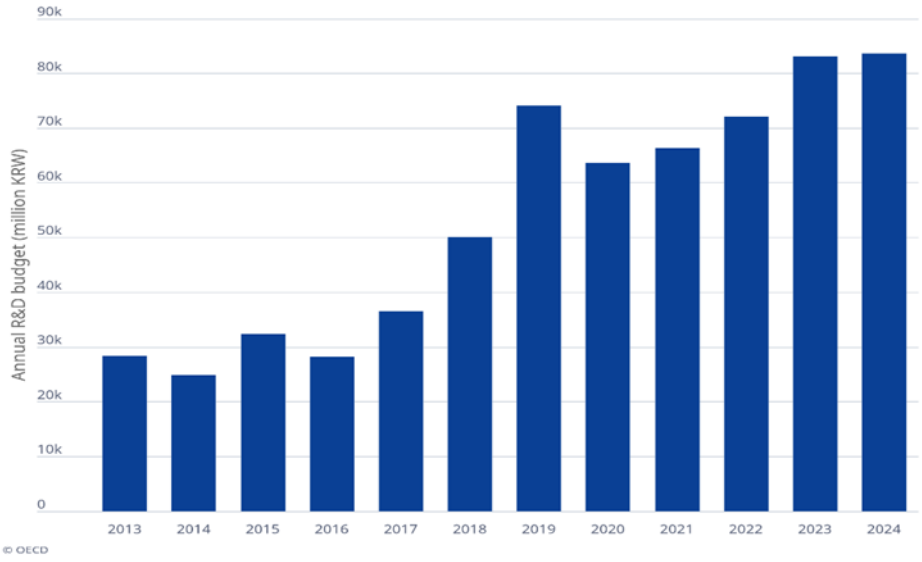
In response to the growing demand for a decarbonised shipbuilding sector, the Korean government is taking a variety of actions to promote this shift. The Act on Promotion of Development Distribution of Environmentally Friendly Ships, enacted in December 2018 by the Korean government, mandates the public sector to build environment-friendly ships and provides the private sector with incentives like tax reductions and subsidies for converting to such ships (Ministry of Oceans and Fisheries, 2025[11]). More recently, the Ministry of Oceans and Fisheries (MOF) announced the 2025 Implementation Plan for Environment-Friendly Ship Distribution in accordance with the 1st Master Plan for Environment-Friendly Ship Development and Distribution (2021-2030). This plan includes the building of 54 new environment friendly ships and the remodelling of an additional 27 ships for an investment of around KRW 222.3 billion this year (Ministry of Oceans and Fisheries, 2025[11]).

R&D

The Annual Research and Development (R&D) budget for shipbuilding and marine equipment has been increasing since 2013, as can be seen in Figure 2.12 While a dip can be observed in 2023, R&D has surpassed KRW 80 000 million in 2024. Over the five years from 2019 to 2023, the Korean government invested a total of KRW 904.8 billion in shipbuilding and marine technology development—representing an increase of 6.8% of R&D in the shipbuilding and maritime sector and an increase of 11% for government R&D during that same time period (Korea, 2024[12]).

Comparatively, Korea's order competitiveness for most ship types (excluding LNG carriers) are low and require the expansion of R&D investment. This will support the future product market such as the development of hydrogen and ammonia. While China's State-owned Company Group (CSSC) R&D budget was approximatively of KRW 585 billion in 2022, Korea's represented around half of this number when including 250 billion in shipbuilding R&D as well as 100 billion in government R&D for that same year (Korea, 2024[12]).

Figure 2.12. Annual R&D budget in shipbuilding and marine equipment over the last decade



Source: (Korea, 2024[12]).

To enhance productivity and manage energy more efficiently, several R&D initiatives focus on establishing smart yards and strengthening digital-based production capabilities. Efforts are also being made to digitalise processes within shipyards, such as production and logistics, while supporting the development of key technologies like robotic welding and digital twin technology for block assembly (Korea, 2024[12]).

Moreover, increasing global co-operation in the sphere of R&D is inciting Korea to develop its partnerships with other countries. To bolster domestic companies' competitiveness, the government is enhancing support through R&D development with research funding, tax breaks, and export assistance. In response to China's rapid expansion in market share in shipbuilding, Korea is adopting a collaborative approach, bringing together its top shipbuilders such as HD Hyundai Heavy Industries, Samsung Heavy Industries, and Hanwha Ocean (Marine public, 2025[13]). The aim is to combine efforts in key sectors such as sustainable technology, automated maritime transport, and skill development. Although Korea continues to lead in sophisticated shipbuilding—particularly in LNG carriers and environmentally friendly vessels—the push for innovation is accelerating (Marine public, 2025[13]). This collaboration would concern the entire construction ecosystem, from design to construction and equipment development and would require the

creation of a one-team co-operation system (Korea, 2024[12]). As of 2019, part of R&D coming from the Ministry of Trade, Industry and Energy started to focus on supporting the development of eco-friendly ship equipment, energy efficiency improvements and investments in automated processes (Korea, 2024[12]).

Labour

In the Korean shipbuilding industry, the supply and demand of production manpower has been disrupted due to the decrease in the young population, aging, and 3D avoidance. Accordingly, in order to facilitate the introduction of foreign workers at the government level such as the MOTIR (the Ministry of Trade, Industry and Resources) (formerly MOTIE (Ministry of Trade, Industry and Energy)), shipyards such as simplifying visa issuance procedures and expanding quotas are making efforts to improve the welfare and working environment of foreign workers through system improvement. In addition, local governments such as Geoje/Ulsan/Busan are holding job fairs to recruit production workers.

Shipyard subcontractors/partners, shipbuilding associations, experts, and central/local governments participated in the launch of the Shipbuilding Industry Win-Win Consultative Body to discuss practical measures to resolve the gap between the original contractor and subcontractors, expand the escrow payment system to prevent overdue wages, employment events to secure (youth and women) manpower, and expand vocational training.

The Korean government and private companies are making efforts to improve the work environment and work-life balance, while the improvements of gender ratio have been seen in some companies, the improvement of the gender ratio in the whole industry has not increased significantly, with 8% of women employed.

The Ministry of Justice is operating the Korea Immigration and Integration Program (KIIP) to provide opportunities for foreign workers to systematically cultivate basic skills essential for adaptation to the domestic market and independence. KIIP is divided into the fields of ‘Korean language and culture’ and ‘Understanding on Korean society.

The ‘Shipbuilding Maritime Future Innovation Training Center’ has been opened and operates since 2024. It operates as two centres in the metropolitan area and the southeast area, and provides eco-friendly/smartisation education for university students and workers in shipbuilding industry including shipbuilding equipment industry.

Others

According to the Congress, the Korea government is currently discussing further co-operation with the U.S. shipbuilding industry under the billion USD range package, bearing in mind the Make America Shipbuilding Great Again’’ (CONGRESS, 2025[14]) (KOREA.net, 2025[15]) (koreaherald, 2025[16]).

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3 Competitiveness

This chapter presents a SWOT analysis of the Korean shipbuilding industry and a comparative assessment with the Japanese 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 Korean shipbuilding industries.

3.1. Competitiveness of Korea shipbuilding industry

3.1.1. SWOT analysis

The competitiveness of the Korean shipbuilding sector is shaped by a mix of structural strengths, persistent challenges, and emerging opportunities.

Table 3.1 provides a SWOT analysis of the industry, summarising insights from the report's analysis on the wider maritime sector, the shipbuilding industry structure and key market trends.

3.1.2. Strengths

The Korean shipbuilding industry maintains a solid competitive position in high value-added vessel segments, including LNG carriers, ultra-large container ships, and very large crude carriers (VLCCs). Its advantages stem from strong R&D and design capabilities, supported by experience across a wide range of ship types, and from production efficiency achieved through large-scale facilities and systemized processes. As of 2024, Korea accounts for over 65% of global LNG carrier orders and has a clear technical edge over China and Japan in cryogenic cargo containment and high-efficiency propulsion systems. These factors contribute to the strong reputation of Korean shipyards among international shipowners.

Korea also benefits from a well-developed ship finance framework centred on the Export-Import Bank of Korea (KEXIM) and the Korea Trade Insurance Corporation (K-SURE). These institutions provide integrated financial, guarantee, and insurance support, improving access to project financing and reducing risk exposure, particularly for large-scale and long-term projects such as LNG carriers and offshore facilities.

The industry is further supported by an integrated cluster built around the three major shipbuilding groups—HD Hyundai, Samsung Heavy Industries, and Hanwha Ocean—which link shipyards, design firms, and research institutes. This structure enables process standardisation, supply chain stability, and efficient use of skilled labour and technology.

The Korean shipbuilding industry is promoting and strengthening the R&D activities through the benefits from strong government policies, 'K-Shipbuilding Strategy' and 'K-Shipbuilding Super Gap Vision 2040', and financial support, bearing in mind of the IMO GHG strategy. Specialising in high-value vessels such as LNG carriers and ultra-large container ships, the shipbuilding industry is developing alternative fuel vessels aligned with the IMO GHG Strategy. Productivity improvements through digitalisation and automation are ongoing, while a consistent though limited domestic demand for new ships is supported by an established domestic supply chain of maritime equipment and the steel industry, reinforcing global competitiveness.

3.1.3. Weaknesses

The main challenge is a chronic labour shortage of skilled workers and young talents, leading to reliance on foreign labour to a certain extent, although sustained efforts are being made to cultivate domestic technical talent and gradually expand the domestic workforce. The workforce declined by 44% between 2014 and 2024, and skilled workers accounted for only 28% of the workforce in 2023. To mitigate these labour constraints, major shipbuilders have recruited foreign workers, who now represent approximately 15% of total employment.

Overconcentration in specific areas like offshore, LNG carriers, and ultra-large container ships raises risks in terms of concentrated investment. This strategy strengthens the competitiveness in specific ship types, yet the industry is exposed to a downturn trend risk when the specific sectors face in a recession.

3.1.4. Opportunities

The growing demand for alternative fuel-capable vessels in accordance with the IMO Strategy and regulations creates new opportunities for shipbuilding and new market potential. The new financial incentive, such as sustainable transition funds, encourages shipowners to invest in alternative fuel vessels.

The Korean shipbuilding companies are expanding overseas through M&A and partnerships with overseas shipbuilding companies, which is expected to increase order opportunities and strengthen their competitiveness.

3.1.5. Threats

China's rapid rise has pushed its global orderbook share to around 69% in 2024, leaving Korea with only about 16%.

The significant threats include intense competition for skilled and foreign workers across industries and other countries, in addition to the rapid technological progresses in competing countries, in particular China. Moreover, there is a threat that the existing high-value and low-emission ship technologies would become obsolete.

The volatile shipping market, shifting demand, and a possible downturn in green activities could further threaten the continuous development of the shipbuilding industry. In addition, geopolitical risks—such as tightening procurement rules linked to national security and potential trade restrictions—pose additional uncertainties for Korea's export-oriented segment, potentially limiting market access even in areas of technological strength.

Box 3.1. Comparative Analysis of Korea and Japan in the Shipbuilding Industry

Common point

Firstly, both economies 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 economies.

Difference point

Firstly, Korea has a relatively low level of domestic ship and marine equipment demand, which is a big difference from Japan. Around 15-25% of ships built in Korea are delivered to Korean ship owners. The marine equipment for eco-technology components relies heavily on imports. Secondly, Korea tends to address trends such as decarbonisation and digitalisation at the level of shipyards, especially large ones, while Japan is implementing a consortium strategy involving various stakeholders such as shipping companies and shipbuilders.

Table 3.1. SWOT analysis of the Korea shipbuilding industry

Strengths	Weaknesses
• **Strong government policies and government financial support** for the shipbuilding industry and R&D • **Retention of the shipbuilding capacity** to maintain the global share • **Specialising in the high-value ship building** such as LNG carrier, ultra-large container ship and naval sector • **Developing alternative fuel vessels** in line with IMO Net-Zero framework • **Public-private partnership to support capital expenditures** for new technology development. (From 2019 to 2023, the Korean government invested 0.9 trillion KRW and the private companies invested 1.2 trillion KRW on R&D) • **Public-private partnership to support capital expenditures** for new technology development. (From 2019 to 2023, the Korean government invested 0.9 trillion KRW and the private companies invested 1.2 trillion KRW on R&D) • **Strengthening shipbuilding productivity** through the development of digitalisation and automation in the design and building process • Consistent **demand for domestic shipping** companies, albeit limited • **Establishment of the domestic supply chain** of maritime equipment and the steel industry for the shipbuilder.	• Chronic **shortage of skilled workers and young talent** • Reliance on **foreign workforce** (accounting for 15% in the major shipbuilders) • **Excessive investment and over-reliance** on specific areas, such as offshore, LNG carrier, and container sectors • **Reliance on imports** of a part of the energy-saving maritime equipment and maritime equipment • **Loss of resources** through internal competition with domestic builders on R&D and order activity through a lack of collaboration • **Overdependence on global demand (exports).**
Opportunities	**Threats**
1. **Demand for alternative fuel vessels** to comply with the IMO regulations **2.** **Growing R&D in hydrogen and ammonia fuel designs** **3.** **Extensive IP base** **4.** Expanding order opportunities and strengthening competitiveness though overseas expansion **5.** **Expanding overseas procurement of the naval** sector by foreign governments **6.** **Benefit of financial incentives** on capital investment and overseas expansion from foreign governments, and the **derivative of financing sources to shipowners**.	7. **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** 8. **Obsolescence of existing technology** on high-value ship and low emission ship such as LNG carrier 9. Rapid technological development in **competitive countries**, in particular China 10. **Deterioration and high volatility** in the shipping market and changes in market trends 11. **Slowdown in patent activity** post-2022 12. **Geopolitical risks /Tightening procurement regulations** on shipowners by the government, considering national security concerns.

Source: OECD authors' elaboration.

Annex A. Recent measures for the shipbuilding sector

Type	Categories	Name	Outline	Start year
Act	Industrial policy	Act on the Promotion of Development and Commercialisation of Autonomous Ships	The law is designed to provide the legal foundation for comprehensive policies related to autonomous ships.	2025
Act	Industrial policy	Act on Promotion of Development and Distribution of Environmentally Friendly Ships	The law enacted in 2018 and entered into force in 2020 is designed to mandate the public sector to build environment-friendly ships and provide the private sector with a legal basis to reduce acquisition taxes and provide subsidies when converting into environment-friendly ships.	2020
Act	Industrial policy	Special Act on the Corporate Revitalisation	The law is designed to contribute to the sound development of the national economy through improvement of corporate vitality and the competitiveness of industries, and the promotion of competition in markets by improving relevant procedures, regulation, etc., so that companies may promptly engage in voluntary corporate restructuring.	2016
Strategy	Industrial policy	K-Shipbuilding Super Gap Vision 2040	To set the roadmap with domestic shipbuilders and other stakeholders, with the aim of making Korea the leader in the industry's green, smart, and digital technologies.	2024
Strategy	Industrial policy	K-Shipbuilding Re-leap Strategy	(1) Train 8 000 shipbuilding workers by 2022, increase productivity by 30% by 2030 (compared to 2020) (2) Maintain global No. 1 by expanding market share in eco-friendly and autonomous ships (3) Eco-friendly ships (2021) 66% - ('30) 75%, autonomous ships (2021) 0% - ('30) 50% Building a healthy shipbuilding industry ecosystem (4) Small and medium-sized shipbuilders promote eco-friendly and digital transformation of shipbuilding equipment industry.	2021
Strategy	Industrial policy	2030 Greenship-K Promotion Strategy	This strategy explores advanced emission-free technologies which enable to phase out greenhouse gases (GHG) emission up to 70 percent by 2030 in such an arena as ship design, future fuel, renewable energy and equipments and so on.	2020
Support	Industrial policy	The Certified Environment-Friendly Vessel Supply Support Project	The building or conversion of environment-friendly ships by the MOF, local governments, and public institutions.	2025
Support	Industrial policy	Eco-Friendly Ship Fuel Infrastructure Fund	This Fund established by the Ministry of Oceans and Fisheries (MOF) and the Korea Ocean Business Corporation (KOBC) provides practical financial support for the construction of eco-friendly fuel storage facilities in ports in Korea and enable shipping companies to build	2025

			bunkering vessels dedicated to supplying these fuels. Specifically, it will invest KRW 600 billion of the KRW 1 trillion fund to build port storage facilities capable of supplying LNG, methanol, and ammonia by 2030, with the remaining KRW 400 billion to be invested in the construction of 4 LNG and ammonia bunkering vessels.	
Support	Industrial policy	Smart Eco-Factory Support Program (KECO)	A support program by the Korea Environment Corporation (KECO) to assist SMEs in establishing smart eco-factories with digital and environmental innovation. It provides financial assistance for automation, energy monitoring, and pollution control systems to reduce emissions and improve efficiency.	2021
Support	Industrial policy	Win-Win Co-operation Support Program	A joint program by MOTIR (formerly MOTIE) and large firms to support SMEs through technology transfer, ESG upgrades, and process innovation. It promotes mutual growth between large companies and suppliers, especially in green and smart shipbuilding.	Unknown
Support	Industrial policy	Emission Reduction Facility Support Program for Target Management	A KECO-managed program that supports facilities subject to Korea's GHG Target Management System. It subsidizes the installation of emission-reduction equipment to help meet mandated targets.	2017
Support	Industrial policy	Energy Efficiency Market Creation Industry Support Program (KEA)	Administered by the Korea Energy Agency (KEA), this program supports the deployment of high-efficiency energy products and services. It promotes ESCO-based projects and financial assistance for efficient equipment in the manufacturing sector.	Unknown
Support	Industrial policy	Energy Management System Infrastructure Establishment Support Program (KEA)	KEA's program that provides support for installing EMS (Energy Management Systems) in industrial sites. It helps factories monitor and optimize energy usage in real time, aiming to digitalize energy management and reduce operational costs.	Unknown
Support	Industrial policy	Carbon Reduction Support Program (KOSMES)	A financing program by the Korea SMEs and Startups Agency (KOSMES) that supports SMEs in adopting low-carbon equipment and technologies. It offers low-interest loans and grants to reduce GHG emissions and support the carbon neutrality transition.	Unknown
Support	Industrial policy	Environment-friendly ship support program	This program is jointly invested by Korea Ocean Business Corporation (KOBC) by Korea Ocean Business Corporation Act and Korea Development Bank (KDB) for environment-friendly ships (other than container ships) to be introduced by national shipping companies (including second-hands ships).	Unknown
Support	Industrial policy	Support to secure ships (Investment)	This program is to support domestic shipping companies securing new building and second-hand vessels by the KOBC proving investment program. Support to secure eco-friendly, high-efficiency vessels Provide a financial support through various finance programs depending on a deal structure	Unknown
Support	Industrial policy	Ship introduction guarantee	The Ship Introduction Guarantee Program is a guarantee initiative by which the KOBC provides debt guarantees to cover risk of default by shipping companies regarding funds borrowed from creditors (financial institutions, etc.) when a	Unknown

			domestic shipping company introduces new ship builds or second-hand Ships. Reinforcing credit of shipping companies, improving repayment possibility for financial institutions, and revitalising ship finance Overseas financial institutions (creditors) debt guarantee Guarantee ratio: 95%.	
Support	Industrial policy	BBC (bareboat) program	This program is a transaction type of leasing ships purchased and owned by the KOBC to shipping companies. • Minimize capital investment upon ship introduction: Securing high-priced ships by paying a small fee, such as the initial rental fee • Flexible leasing: Profit route expedited standby period • Minimisation: Securing necessary ships within a brief period without waiting for construction period (order → delivery) • Solution to resale value risk: Avoiding ship price fluctuation risk by returning ships at the end of a lease period.	Unknown
Support	Industrial policy	Ship S&LB	Ship S&LB(BBCHP) program is a transaction in which the KOBC purchases ships owned by domestic shipping companies and leases them back to the shipping companies through BBCHP (financial lease). Upon expiration of lease period, ownership of the ship is transferred to the shipping company. • Liquidity for shipping companies due to sale of ship • Since only the ownership of a ship is transferred, ship operations can continue unencumbered.	Unknown

Reviews of Shipbuilding Economies

Peer Review of the Korean Shipbuilding Industry

The OECD Shipbuilding Committee Peer review of the Korean shipbuilding industry provides a comprehensive analysis of its structure, market trends, and national strategies. The report highlights Korea's role as the world's second-largest shipbuilder and its strategic focus on high-value-added, eco-friendly vessels.

While identifying structural challenges like an ageing workforce and high production costs, the review emphasises growth opportunities through digitalization and the production of more energy-efficient ships, particularly via smart manufacturing. The report is structured into three parts: a global perspective on Korea's market standing, an analysis of the shipbuilding ecosystem, and a SWOT-based assessment of the industry's competitiveness.

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