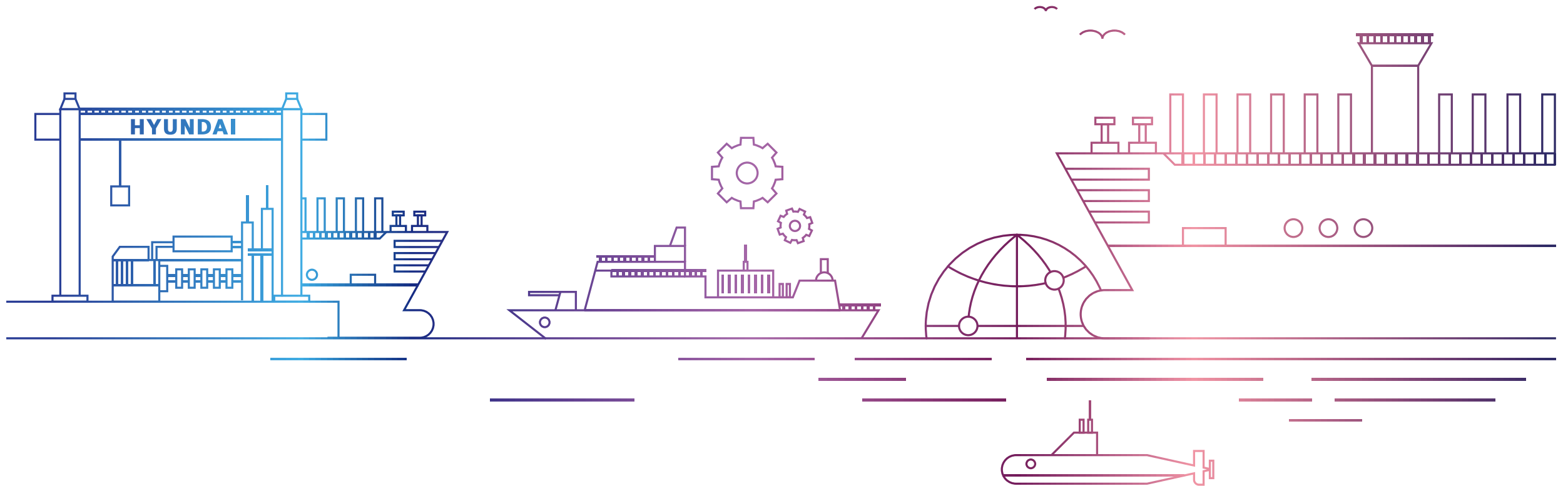


KSOE

INTEGRATED REPORT

2021



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About This Report

Report Overview

This integrated report of KSOE and its shipbuilding subsidiaries details our financial performance as well as progress we have made in ESG (Environment, Social, and Governance) management. The report provides an account of the competitiveness, future plans and directions of KSOE and its subsidiaries on the section named, ‘Sustainable Value Story’ (page 26~29). Going forward, we will disclose our business data in a transparent manner by annually updating our integrated report, based on which we will reach out to more various stakeholders to communicate with them.

Reporting Standards and Frameworks

This report is in accordance with the Core Option of Global Reporting Initiative (GRI). In order to address the key issues that relate to KSOE and its shipbuilding subsidiaries, we comply with the disclosure recommendations of Task Force on Climate-Related Financial Disclosure (TCFD) and Sustainability Accounting Standards board (SASB) Standards. We follow the IR Framework presented by IIRC (International Integrated Reporting Council).

Reporting Period

This report details our business operations from January 1 through December 2021. Some of the data extend to the period from 2019 through the first half of 2022.

Reporting Scope

This report covers KSOE and its shipbuilding subsidiaries (HHI, HMD, HSHI). We comply with Korean International Financial Reporting Standards (K-IFRS) for financial performance.

Reporting Assurance

KSOE and its shipbuilding subsidiaries conducted the third party’s independent assurance (overall sustainability management, GHG emissions, and energy consumption are separately verified) from an external institution to secure the credibility and improve the quality of the report. Please refer to page 156 of this report for the assurance result.

Organizations Helping the Production of Report

KSOE | Business Ethics Team, Compliance Team, Corporate Planning Team, CSR Planning Team, HR Management Team, IR Team, Management Support Team, Property Planning Team, Public Relations Team, Safety and Health Team, Tax & Administration Team, Technology Management Dep’t

HHI | Coexisting Cooperation Team, Compensation & Benefits Team, Environment Management Team, Finance Team, Health Management Team, HRD Planning Team, Human Resources Planning Team, Human Resources Support Team, IP Management Team, Legal/Security Support Team, Management Planning Team, Procurement Planning Dep’t, Quality Planning Dep’t, Resources Reuse & Recycle Team, Safety Culture Team, Safety Planning Team, Shipbuilding Technology Planning Dep’t, Social Contribution Team, Technology Planning Dep’t, Utility Planning Team

HMD | Accounting Dep’t, Coexisting Cooperation Dep’t, Co-Prosperity Dep’t, Cost Management Dep’t, Digital Transformation & ICT Dep’t, Environment & Health Dep’t, Facility Maintenance Dep’t, General Affairs Dep’t, Human Resources Support Dep’t, Legal Affairs Team, Materials Procurement Dep’t, Naval Architecture & Design Administration Dep’t, Project & Production Planning Dep’t, Public Relations Team, Quality Management Dep’t, Safety Dep’t, Technology Planning Team

HSHI | Accounting Team, Design Collaboration & Planning Dep’t, Design Project Manager Team, Environment & Health Dep’t, Fatal Accident Prevention Team, General Affairs Team, Hull QM Dep’t, Human Resources Development Team, Human Resources Team, Industrial Relations Team, Information Technology Dep’t, Maintenance Dep’t, Materials Procurement Dep’t, Project & Production Planning Dep’t, Safety Dep’t, System QM Dep’t

Inquiries about the Report

Please contact KSOE ESG Strategy Team for any inquiries or comments about the 2021 KSOE Integrated Report.

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KSOE ESG Strategy Team

T. 82-2-746-7139 E. sustainability@ksoe.co.kr

Interactive Guide

Please download the electronic version of the 2021 KSOE Integrated Report from KSOE homepage (<http://www.ksoe.co.kr>). It is an interactive PDF format for the better convenience of users.

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CEO Message

Taking the lead in green and digital shipbuilding technologies, we will usher in a better future for the next 50 years.

Sam H. Ka /
Vice Chairman & CEO



Ki-sun Chung /
President & CEO



Dear esteemed stakeholders,

The year 2022 is especially meaningful since it marks the 50th anniversary of Hyundai Heavy Industries (HHI) Group. Korea Shipbuilding & Offshore Engineering (KSOE) has never relented in innovating and challenging ourselves to date in Korea, the barren land for shipbuilding business 50 years ago. Our persistent efforts have eventually positioned us as the world's No. 1 shipbuilding and offshore engineering company. This remarkable progress is attributed to our stakeholders who have shown unwavering support and interest in us over the years. Taking this opportunity, we would like to extend our sincere gratitude to all of you.

The world is now going through worse storms than ever before, with prolonged COVID-19 pandemic, intensifying instability in global geopolitical landscape and deepening climate crisis. Amid the uncertainty, however, we accomplished the outstanding feat of winning 219 new building orders on the strength of our superior technological prowess and the employees' tireless efforts, exceeding our annual target for 2021. Never sliding into complacency, we endeavor to redefine our roles to protect the ocean, which promises to be the source of our future growth and the home to future generations. Our commitment focuses on creating future values, guided by key drivers of change and innovation in the marine mobility market. To this end, we have established the following strategies:

First, we will drive the paradigm shift toward going greener through digital transformation.

KSOE has built the largest number of ships in the world over the past 50 years. Our expertise in shipbuilding enables us to have the upper hand in this industry. We are now making massive investment in nurturing R&D and engineering talents and striving to advance the technologies for the commercialization of low-carbon and zero-carbon ships including LNG-, methanol- and ammonia-fueled ships, and electric-propulsion ships. All industries are currently required to strengthen their digital capabilities to proactively respond to the rapidly-evolving future. In line with the irreversible trend, we will become a 'first mover' that leads the way in the era of digital transformation by preempting the smart ship market such as an autonomous navigation ship, in close cooperation with our affiliates.

Secondly, we will take the initiative in establishing a hydrogen value chain.

To meet the growing challenge of climate change, the international community has adopted stringent regulations to achieve carbon neutrality, requiring corporations around the globe to actively take measures to reach net zero emissions. Against this backdrop, carbon neutrality is an integral element in the strategy of a company to move toward 'sustainability' from 'growth'. We believe the core value for the future lies in 'hydrogen'. We will do what we can do best - the establishment

of offshore green hydrogen production plants and the development of hydrogen carriers and hydrogen fuel cell propulsion ships, thereby maximizing the efficiency in terms of hydrogen production and transportation that underpins the hydrogen value chain. Our technologies in this field will become our competitiveness that will enable us to combat the climate crisis and lead the eco-friendly marine mobility market.

Thirdly, we will step up our ESG management.

This year again, one of our primary focuses will be on the reinforcement of ESG management as the issue that stands firmly in the spotlight for the whole industry. Staying true to our ESG vision, 'Future from the Ocean', we are directing all our efforts toward advancing our ESG ambitions. The ESG Management Council will play a key role in building feasible ESG management principles while the Board of Directors will lead the drive toward increased management transparency. Moreover, being mindful of our social corporate roles and responsibilities, we will be at the forefront of various ESG management activities so that our employees, suppliers, and local communities can join hands to create a sustainable ecosystem.

We would appreciate your continued interest, support, and patronage, on our journey toward a 'FutureBuilder' beyond a 'Shipbuilder'. Thank you very much.

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KSOE, R&D Control Tower in the Shipbuilding and Offshore Engineering Industry

KSOE, a shipbuilder and intermediate holding company of HHI Group, is a professional technology-centered shipbuilding and offshore engineering company that boasts top-notch R&D and engineering capabilities. As an intermediate holding company, we play a pivotal role in setting out directions and strategies for the growth of the Group. KSOE's Advanced Research Center spearheads the development of innovative technologies that drive future growth, thereby contributing to promoting the Group's sustainability.

Company Profile (as of December 2021, on a consolidated basis)

Company Name	Korea Shipbuilding & Offshore Engineering (KSOE)
Head Office Address	75, Yulgok-ro, Jongno-gu, Seoul, Republic of Korea
Date of Establishment	December 28, 1973
CEO	Sam H. Ka, Ki-sun Chung
Number of employees (on a separate basis)	649
Revenue	KRW 15.493 trillion
Operating profit (Loss)	KRW 1.384 trillion
Net profit (Loss)	KRW 1.141 trillion

Mission

Hyundai Spirit

The founder Chung Ju-yung believed that there is nothing impossible when we take on the challenge with indomitable spirit and unwavering driving force, underpinned by infinite potential. This is the philosophy of the founder that drives us, the very spirit in which HHI Group has its root.

Creative Wisdom Wisdom in pursuit of novelty to meet the needs of customers and our society	Strong Determination Attitude to take bold adventures with a strong sense of ownership	Unwavering Drive Power to achieve goals with a strong mind and iron will
---	--	--

Management Vision

Respected corporation with advanced technologies and high-quality products	Trusted corporation with fair and transparent management	Admired corporation with social contribution
--	--	--

Management Philosophy

With the aim of fulfilling our corporate responsibilities, we have established our management philosophy that must be shared and upheld by all of our employees.

Enhancing corporate value through sustainable growth	Upholding fair and transparent business practices	Pursuing safe and environmentally friendly business practices	Promoting strong labor-management relations built on mutual respect and trust	Demonstrating our commitment to global corporate citizenship
--	---	---	---	--

Business Policy

Slogan: New 50 Years, New Challenge

KSOE 1. Nurturing great talents 2. Leading future technologies 3. Embedding ESG management	HHI, HMD, HSHI 1. Putting safety first 2. Securing unrivaled technologies 3. Harmony and Coexistence 4. Establishing ESG management
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Investment Areas **Subsidiary Businesses**



Large-scale LNG DF container

Shipbuilding Business

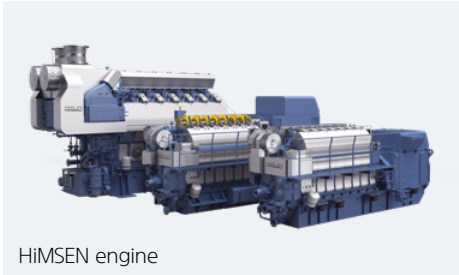
We have 50 years of experience in constructing a wide range of ships that boast the best quality ranging from merchant ships to high-value gas carriers such as LNG carriers to offshore vessels including drillships to cutting-edge naval warships.



FPSO

Offshore & Industrial Plant Business

We construct a variety of offshore power plants worldwide. When it comes to the construction of onshore plant facilities, the scope of our service covers the whole process: engineering, procurement, construction, installation, and commissioning.



HiMSEN engine

Engine & Machinery Business

Equipped with all the equipment required for the whole stage ranging from material production to advanced material processing, assembly, and commissioning, we provide eco-friendly engines for vessels, fuel supply systems, exhaust gas recirculation devices, land-based engine power plants and others. With the development of eco-friendly products, such as HiMSEN Engine¹, an integral part of the eco-friendly shipbuilding market, we are at the forefront of combating global warming and protecting the marine ecosystem.

1. HiMSEN Engine: HHI Group's representative medium speed engines that function based on the concept of Hi-touch (high sensitivity), which is designed from the perspective of users



Floating solar power generation system

Solar Energy Business

We manufacture the world's best-in-class solar cells and modules. Our constant investments in R&D activities and the expansion of cutting-edge production facilities in this field are the key drivers of it. In addition, we provide a comprehensive photovoltaic solution tailored to the environment where a solar power generating product or system is installed. The scope of the solution spans the whole stage ranging from the design of installation project to construction and maintenance.

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Future Technology Business



Ammonia-fueled container vessel

Future Vessels with Eco-friendly Fuels

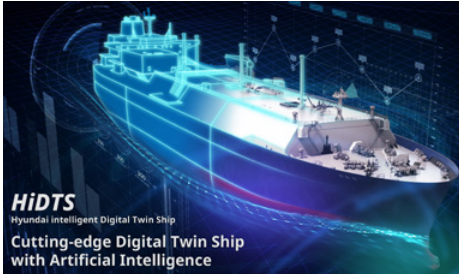
In response to more stringent global regulations on the marine environment, we are working on the development of engines for eco-friendly fuels such as ammonia, methanol or LPG, and an exhaust gas cleaning system. With these eco-friendly facilities, efforts are being made to commercialize futuristic vessels such as ‘ammonia-fueled vessels’.



LNG carrier

Next generation Gas Carrier & Gas-fueled Ship

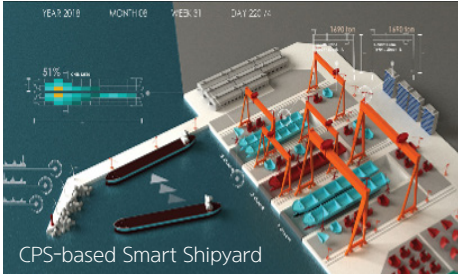
On the strength of our superb technology in the world, we are developing vessels for the next generation of gas carriers and gas-fueled ships. Besides, with the aim of responding to the era of carbon neutrality, we have led the commercialization of environment-friendly, zero-carbon vessels such as CO₂ carriers, ammonia-fueled or hydrogen-fueled vessels.



Digital Twin & Intelligent Ship, Virtual Test Operation

One of our primary focuses is on the development of intelligent autonomous ships which optimally operate the management of energy and assets by itself. To this end, we are capitalizing on an AI- and simulation-based digital twin¹ model to replicate our world’s best shipbuilding technology. On top of that, we utilize virtual commissioning, which enables us to assess and predict the safety of vessel in the virtual world, thereby refining the quality of vessel.

1. Digital Twin refers to the technology that can identify and solve potential problems by simulating various scenarios in virtual space, based on real-life operation of machines and equipment.



CPS²-based Smart Shipyard

For the purpose of transitioning to the state-of-the-art futuristic shipyard, we have spurred the transformation by establishing a smart shipyard based on Artificial Intelligence (AI), fifth generation (5G), and robotic technologies. The conversion to the smart one will allow us to replicate production information on the shop floor in the digital twin yard, which will lead to the optimization of procedure management. In addition, the effort to invent intelligent robots, new methods, and new raw materials will be made so that we can improve customer satisfaction.

2. Cyber Physical System

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Performance in 2021

In 2021, KSOE made remarkable achievements of receiving 219 shipbuilding orders, including naval and special ships, and 3 offshore plant orders mainly due to the increase in the global cargo volume. In addition, we have succeeded in advancing eco-friendly and digital transformation technologies drawing attention in the shipping industry, such as cyber commissioning or eco-friendly fuel supply system.

Shipbuilding Orders

Unit: USD 100 million

Classification	Ship Type	2019		2020		2021	
		No. of ships	Amount	No. of ships	Amount	No. of ships	Amount
Shipbuilding	LNGC	24		21		29	
	LPGC	19		16		49	
	Container ship	22	123.9	5	97.9	72	201.5
	Tanker	73		70		53	
	Others	8		3		13	
Naval & Special Ship		1	6.2	1	3.8	3	10.4
Offshore engineering	Manufacturing equipment	-	0.5	-	2.6	3	17.9
	Plant	-	1.7	-	0.5	-	0.3
Engine & Machinery		-	14.2	-	9.0	-	20.7
Total		147	146.5	116	113.8	222	250.8

※ Combined no. of orders received by HHI, HMD, HSHI
(based on the consolidation of shipbuilding subsidiaries)

Major Achievements



1. Developing World's First 'Cyber Commissioning' Technology

In January 2021, we obtained an AIP (Approval in Principle) from Lloyd's Register for the solution we developed for the first time in the world, 'Virtual commissioning service for LNG carrier'. This solution replicates the same environment as the actual commissioning situation in the virtual world, using a digital platform called Hyundai Intelligent Digital Twin Ship (HiDTS). The simulation for virtual commissioning of ships utilizing the HiDTS allows the users to verify the function of core equipment, such as dual fuel engine, fuel supply system, or power control system, as well as to predict problems that can occur in extreme conditions. It has other advantages including shorter commissioning time and cost savings of up to 30%.



2. Announcing the Roadmap for Hydrogen Dream 2030

In March 2021, HHI Group declared its ambition to lead the eco-friendly market for the future as a shipbuilding, offshore engineering and energy company, along with the Group's vision for hydrogen business.. In line with the strategies driven by the Group, KSOE is committed to the development of offshore plants and green hydrogen technologies utilizing our water electrolysis for hydrogen production. To this end, we have established the 'roadmap for Hydrogen Dream 2030' and put them into action step by step. For the stable supply of hydrogen, our main effort is assigned to developing specialized hydrogen carriers and propulsion ships that operate by hydrogen fuel cells and supply system.



3. Obtaining AIP for the Basic Design of Our Eco-friendly Ammonia Fuel Supply System

KSOE and HHI Group acquired an AIP from Korean Register (KR) for the basic design of its eco-friendly ammonia fuel supply system for the first time in the industry in September 2021. The ammonia fuel supply system is designed to remove nitrogen oxides from exhaust fumes by utilizing ammonia boil-off gas which naturally occurs in the course of navigation. The residual boil-off gas can be used as fuels for engine, elevating the efficiency and eco-friendliness of the system. Another advantage of this equipment is the application of the gas treatment system with double leakage prevention that completely blocks even a tiny leakage of ammonia of potent toxicity. The system not only meets the tightened regulations on the marine environment but raises the level of safety to the maximum level.

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Outlooks and Plans for 2022

Market Outlook

As we saw the surge in orders received mainly due to the increase in the marine cargo volume in 2021, our shipyard’s available deadlines for sales have been almost exhausted. Accordingly, the number of new orders is projected to decline in 2022 compared to the previous year. However, the demand for LNG dual-fueled ships is forecasted to increase in a gradual manner in order to replace outdated ships or comply with environmental regulations, which will underpin the stability in terms of orders. In addition, the market expects the global energy issue to give rise to the growing demand for high value-added vessels, such as LNG carriers. Meanwhile, soaring oil prices will propel the demand for offshore plants upward.

Key Plans

Transition to a Holding-Operating Company

In an effort to accelerate our transition to a holding-operating company and bring the business into full swing, we plan to launch a new business division in the second half of 2022. The new business division will take charge of developing, manufacturing, and selling the systems for next generation energy sources, such as LNG, ammonia, or hydrogen, and eco-friendly carbon emissions-reducing solutions. On top of that, the effort will be made to promote co-prosperity with domestic OEMs and Open Innovation strategies.

Secure Source Technologies for Hydrogen Economy Value Chain

As part of the roadmap for Hydrogen Dream 2030 established in 2021, KSOE obtained an AIP from ABS (American Bureau of Shipping) for the basic design of its 100MW-capacity platform for green hydrogen production. Based on this achievement, we will spur the R&D activities on the further development of water electrolysis-related technologies. Furthermore, we will complete the demonstration test of hydrogen dual-fuel engines and the basic designs of CHS¹ for hydrogen carriers and CCS² to acquire AIPs respectively.

- 1. CHS: Cargo Handling System
- 2. CCS: Cargo Containment System

Expand the Scope of Our Eco-friendly R&D Network

With the purpose of promoting global R&D collaboration, KSOE strives to play a leading role in developing eco-friendly and digital technologies for the future. To this end, we founded an R&D Center in Dusseldorf, Germany, in order to expand the scope of the R&D network, and have established partnerships with global research institutes. Going forward, our endeavors will be made to cooperate with a variety of companies including Germany, Britain, Norway, and other major countries in Europe, thereby securing technologies, such as hydrogen fuel cell, ammonia, or electricity propulsion, which are required to construct the next generation ships.

Nurture Future Talents in the Shipbuilding and Offshore Engineering Sectors

In order to cultivate future core talents in the shipbuilding and offshore engineering sectors, we have officially opened ‘Smart Ocean Mobility’ course, a combined master’s and doctorate program at the graduate school of Seoul National University. Through the operation of this course, we plan to persistently nurture talents in this field as part of the effort to create synergy through the educational-industrial cooperation while combining AI and Big Data technologies with the shipbuilding and offshore engineering sectors.

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Financial Highlights and Distribution to Stakeholders

In 2021, KSOE hit the three-year high in sales, delivering KRW 15.49 trillion in total revenue on a consolidated basis, which was attributed to the reinforced competitiveness in the eco-friendly shipbuilding business. Based on the achievements, we have distributed our financial performance and value to a variety of stakeholders.

Value Distribution to Stakeholders Unit: KRW 100 million

Classification		2019	2020	2021
Partner Company	Cost for raw material procurement (major raw material purchases, including intercompany transactions)	84,917	95,259	105,708
Employee	Personnel expenditure	17,717	16,195	20,580
Shareholder and Investor	Interest expense	1,657	2,089	1,777
	Dividend	-	-	-
Government	Corporate tax (profit)	(1,231)	2,662	(4,910)
	Tax and public imposts	177	83	72
Local Community	Donation	70	88	105

※ On a consolidated basis

Financial Highlights (consolidated basis)

Classification		Unit	2019	2020	2021
Total Revenue	Total		151,826	149,037	154,934
	Shipbuilding		125,637	124,687	132,402
	Offshore & Industrial Plant		13,762	10,766	6,205
	Engine & Machinery		5,389	7,086	7,398
	Green Energy		4,461	3,944	5,922
	Others	KRW 100 million	2,575	2,554	3,007
Operating Profit (Loss)			2,902	744	(13,848)
Net Profit (Loss)			2,131	(8,352)	(11,412)
Total Assets			250,554	252,442	272,931
Total Liabilities			121,291	128,230	148,793
Total Equity				124,212	124,138
Debt Ratio			93.8	103.2	119.9
Net Debt-to-Equity Ratio ¹		%	19.3	14.9	- ²
Operating Margin			1.9	0.5	-8.9
Return on Assets			0.9	-3.3	-4.2

1. (debts-deposits) / total equity

2. Not expressed since debts are less than deposits

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Global Network

Overseas Branches and Subsidiaries

KSOE and its shipbuilding subsidiaries have provided a wide range of products and services, such as ships, offshore plants, and engine & machinery. We communicate with stakeholders around the globe, capitalizing on our far-reaching global network that spans key overseas areas.

- KSOE
- HHI
- HMD

Consolidated subsidiaries

Company Name	Date of Establishment	Location	Key Business	Total Assets in 2021
Hyundai Heavy Industries (HHI) Co., Ltd.	Jun. 3, 2019	1000, Bangeojinsunhwando-ro, Dong-gu, Ulsan, Republic of Korea	Shipbuilding	15,078,769
Hyundai Samho Heavy Industries (HSHI) Co., Ltd.	Nov. 4, 1998	93, Daebul-ro, Samho-eup, Yeongam-gun, Jeollanam-do, Republic of Korea	Shipbuilding	4,980,090
Hyundai Mipo Dockyard (HMD) Co., Ltd.	Apr. 28, 1975	100, Bangeojinsunhwando-ro, Dong-gu, Ulsan, Republic of Korea	Shipbuilding	3,857,973
KOMAS Corporation	Jul. 15, 2008	400, Bangeojinsunhwando-ro, Dong-gu, Ulsan, Republic of Korea	Shipping	26,650
Hyundai E&T	Dec. 3, 2004	42, Munhyeon 6-gil, Dong-gu, Ulsan, Republic of Korea	Other engineering services	20,046
HHI Sports	Feb. 22, 2008	507, Bongsu-ro, Dong-gu, Ulsan, Republic of Korea	K-league football club operation	9,296
Hyundai Heavy Industries Mos Co., Ltd.	Jul. 25, 2016	1000, Bangeojinsunhwando-ro, Dong-gu, Ulsan, Republic of Korea	Business facilities management services	38,505
Hyundai Energy Solutions Co., Ltd.	Dec. 21, 2016	First Tower 4th floor, 55, Bundang-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea	Manufacture of diodes, transistors and other similar semiconductor devices	605,028
Hyundai Engine LLC (Formerly, Warsilla Hyundai Engine LLC)	Jul. 05, 2007	173, Jayumyeok-ro, Samho-eup, Yeongam-gun, Jeollanam-do, Republic of Korea	Manufacture of internal combustion engines	29,795
Hyundai Infra Solution	May. 02, 2021	93, Daebul-ro, Samho-eup, Yeongam-gun, Jeollanam-do, Republic of Korea	Loading and unloading equipment, manufacturing	137,793



Company Name	Date of Establishment	Location	Key Business	Total Assets in 2021
Hyundai-Vietnam Shipbuilding Co., Ltd.	Sep. 30, 1996	01 My Giang, Ninh Phuoc, Ninh Hoa, Khanh Hoa, Vietnam	Shipbuilding	426,120
Hyundai Transformers and Engineering India PVT, Ltd.	Nov. 11, 2011	Shivalik Yash, B-401, Ring Road & Ankur Road Crossing, Naranpura, Ahmedabad-380015, Gujarat	Manufacture and sale of transformers	-
Hyundai Heavy Industries Miraflores Power Plant Inc.	Sep. 14, 2012	Omega Building 2nd floor, Samuel Lewis Avenue and 53rd Street, Panama	Other manufacturing	-
HHI Mauritius Limited	Sep. 19, 2002	10th Floor, Raffles Tower, 19 Cybercity, Ebene, Mauritius	Other manufacturing	-
Hyundai West Africa Limited	Nov. 5, 2012	Plot B, Block12 E, Admiralty Way Lekki, Lagos, Nigeria	Manufacture of other transport equipment	6
Hyundai Arabia Company L.L.C	Nov. 10, 2012	2nd Floor, Al-Noor Bldg. No.2, Prince Sultan bin Abdullaziz Road, Al-Jawhrah District, P.O.Box 32140, Al Khobar 31952, KSA	Construction of industrial plants	14,727
Hyundai Samho Heavy Industries Panama, Inc.	Jan. 20, 2011	Galindo Arias y Lopez Scotia Plaza, No 18 Avenida Federico Boyd y Calle 51, PISO9, 10 y 11, Panama	Construction - Industrial Equipment, construction	1,574
Hyundai Energy Solutions America, Inc.	Apr. 19, 2019	4692 MacArthur Court, 11th fl, Newport Beach, CA 92660	Sale of photovoltaic (PV) modules	2,987
Hyundai Heavy Industries Technology Center India Private Limited	Nov. 26, 2019	Plot No.A-2, MIDC Chakan Phase-II, Village-Khalumbre, Taluka-Khed Pune 410501	R&D	3,415
Hyundai Heavy Industries Free Zone Enterprise	Jan. 16, 2020	Dangote Industries Free Zone, Lekki Coastal Road Ibeju Lekki Lagos, Nigeria	Construction of industrial plants	669

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Hyundai Heavy Industries (HHI)

CEO Message

Han Young-seuk /
Vice Chairman & CEO



Lee Sang-kyun /
President & CEO

Dear stakeholders,

The year 2022 marks the 50th anniversary of the time when HHI took root in Ulsan Shipyard. At the same time, 2022 is the first year for another giant leap for the next 50 years. To embark on our journey toward a better future, we have established our management policies as follows:

First, we will put ‘safety first’.

We are keenly aware that the safety of workers is of utmost value that never can be replaced. In an effort to uphold this value, we will adopt a three-level system for risk management comprised of supervisors, safety keepers, and safety agents, thereby preventing the occurrence of tragic accidents on the shop floor. Furthermore, multifaceted efforts will be made to reach zero critical accidents through feasible measures. These include establishing a risk evaluation system based on DT technology and applying an accident prediction system to the field using big data.

Second, we will spur our effort to sharpen ‘unrivaled technology’.

HHI has established a response system for diverse green fuels, including methanol, ammonia, and hydrogen, to combat deteriorating climate change, living up to our stature, the first mover in the eco-friendly and digital shipbuilding sector that leads future vessel technologies. A variety of environmental value-added technologies have been developed and applied in shipbuilding. Furthermore, we are actively being engaged in the hydrogen value chain establishment driven by the HHI Group to secure the source technology regarding water electrolysis equipment for offshore wind farm in addition to hydrogen carriers. Our efforts will be redoubled to secure the source technology of SMR (Small Module Reactor), a promising future energy source, so that we will set ourselves apart from competitors with outstanding technology prowess and achieving sustainable growth.

Third, we will create an ESG-oriented management culture.

We firmly believe that ESG management decides the survival of a company. HHI presents a united front on ESG management in line with the vision of the Group, ‘Future From the Ocean’. Committed to reinforce our ESG management, we will actively promote an ESG culture in the company that creates sustainable values. In addition, we will spare no effort to reinforce ESG capacity support for our partner companies while expanding our social contribution for the marginalized, thereby achieving co-prosperity.

With our ESG management policy, HHI will make continuous efforts and innovation to present better future values for our stakeholders. We would appreciate your interest and support on our journey toward sustainable growth. Thank you very much.

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Hyundai Heavy Industries (HHI)

HHI, First Mover in the Eco-friendly Ship Industry

HHI boasts outstanding shipbuilding technology prowess earned through the extensive experiences of building ships the most in the world since its inception 50 years ago. On the strength of it, we have grown as the world's best comprehensive heavy industry company with operations in the sectors of offshore plant, and engine and machinery. We have solidified our stature as a global leading company, raking 1st in the shipbuilding, and also two-stroke engine sectors. HHI also plans to sharpen our competitiveness in our key businesses while keeping one eye on tomorrow to secure the future technologies required for eco-friendly shipbuilding, thereby reinventing ourselves as the first mover in this field.

▽ 180,000 m³ LNG carrier built and delivered by HHI in 2020 to a client company



Business Overview

(1) Shipbuilding & Offshore Engineering

Shipbuilding

Our shipbuilding business has accumulated experience and technical know-how, diverse product lines, and reliable trading records with leading shipping companies globally for the last 50 years. Based on these multiple factors, we take the lead in the shipbuilding industry in the world. We build a variety of the highest quality ships: general ships, high value-added gas carriers (including LNG carriers, LPG carriers, and LNG-FSRU¹), offshore ships (drillships and semi-submersible drilling rigs).

1. FSRU: Floating Storage Re-gasification Unit

Offshore Installation

In the area of offshore installations, we use a 10,000-ton offshore crane, two super-sized 1,600-ton goliath cranes, and a million-ton construction dock to design, build, and test-operate offshore constructions. The types of oil production and storage facilities include fixed platforms, semi-submersibles, and floating production system.

Plant Production and Installation

In terms of plant production and installation, we manufacture large-scale equipment required for petrochemical process. In the plant sector where highly complicated and high quality capabilities are required in the production process, HHI promptly responds to customers' demands based on our ample project history and top-notch in-house engineering capabilities, equipped with large-scale machinery and facilities. Through these efforts, we have performed significant projects in and outside Korea, such as building the second launch pad of Nuri, a space rocket, and participating in the International Thermonuclear Experimental Reactor (ITER) project.

(2) Naval and Special Ships

HHI's Naval & Special Ship Business Unit designs and builds cutting edge naval ships and value-added ships with special purposes. In 1975, we developed the first indigenous Korean frigate, the Ulsan-class frigate, followed by delivering the first Korean-made Aegis destroyer, ROKS Sejong the Great in 2008, playing a role of a pioneer in the self-reliance of naval shipbuilding. Going forward, we will not only design and build ships but also support repairs and maintenance as a 'global top class naval solution partner'.

(3) Engine & Machinery

The Engine & Machinery Division is the largest engine manufacturer with state-of-the-art equipment in advanced material processing, assembly, and commissioning. Since we began to supply two-stroke engines in 1979, the engines surpassed a cumulative production of 192.16 million BHP as of 2021, which has set a world record. Currently, we are the 'unbudgeable No. 1' in the engine sector that accounts for about 35% of two-stroke engines globally.

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Hyundai Heavy Industries (HHI)

Performance in 2021

In 2021, HHI received 74 ship orders and 3 offshore plant orders in favor of the vibrant global trade market trend. We also succeeded in the initial public offering (IPO) in September 2021, beginning our journey toward investing in future eco-friendly businesses.

Shipbuilding Orders

Unit: USD 100 million

Classification	Ship Type	2019		2020		2021	
		No. of ships	Amount	No. of ships	Amount	No. of ships	Amount
Shipbuilding	LNGC	13		9		18	
	LPGC	8		4		15	
	Container ship	11	55.1	-	37.2	27	98.1
	Tanker	10		19		10	
	Others	-		-		1	
Naval & Special Ship		1	6.2	1	3.8	3	10.4
Offshore engineering	Manufacturing equipment	-	0.5	-	2.6	3	17.9
Plant		-	1.7	-	0.5	-	0.3
Engine & Machinery		-	14.2	-	9.0	-	20.7
Total		43	77.7	33	53.1	77	147.4

※ Shipbuilding: Performance of Shipbuilding Digital Business included

Major Achievements



1. Successful IPO for Investment in Eco-friendly Future Businesses

In September 2021, HHI completed the initial public offering (IPO) process and was listed on the stock market, which drew the keen attention of the public. During the IPO process, HHI declared its vision to become “the first mover to eco-friendly ships” and secure “unrivalled competitiveness through preemptive investment”. Aiming to fulfill these visions, we decided to invest KRW 760 billion out of KRW 1.08 trillion of IPO funds in the research and development of next generation ships and eco-friendly technologies. On the foundation of a successful IPO, HHI has laid the foundation for a leap forward in the fast-approaching next generation eco-friendly ship market.

현대중공업(주) Hyundai Heavy Industries Co., Ltd.		ESG Assessment	
현대중공업(주) Hyundai Heavy Industries Co., Ltd.		녹색채권 인증평가 Green Bond Assessment	
ESG 인증평가팀 팀장 권성철 02.2014.6211 ksksc@nicerating.com ESG 인증평가팀 선임연구원 권원혁 02.2014.6237 jirhyuk_kwon@nicerating.com			
ESG 인증등급(본평가)	인증대상 채권	ESG 녹색채권 인증평가일 : 2021.02.19.	
Green 1 (그린 1)	회사/단기	발행예정액(억원)	발행예정일
	제 4-1 회/2 년 제 4-2 회/3 년	600 2,400	2021.03.05. 2021.03.05. 2024.03.05.

2. Highest Grade of Green Bonds Obtained for the First Time in the Shipbuilding Industry

HHI received ‘Green 1’ grade from NICE Investors Service’s Green Bond Evaluation in February 2021, which was the first case in the shipbuilding industry. The highest grade was attributed to HHI’s genuine efforts to reduce hazardous material and build green ships. Obtaining the Green 1 grade strengthened the company’s stance on eco-friendliness and resulted in the successful issuance of Green Bonds worth KRW 300 billion, which doubled the volume of bond issues in the original plan.



3. Winning contracts to build the World’s First Methanol-powered Large Vessels

In August 2021, HHI won an order of 8 methanol-powered container ships worth KRW 1.6 trillion from Maersk, a Danish company, which is the world’s largest shipping firm. It is the first large vessel in the world to be equipped with ‘methanol-powered engine’ that reduces CO₂ emissions by 94% compared to general fuels. Maersk expects to replace some of the old containerships with the new methanol-powered ships while mitigating about 1 million tons of CO₂ emissions yearly.

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Hyundai Heavy Industries (HHI)

Business Goals and Plans

Management Goals

In 2022, HHI's shipbuilding business, including naval and special ship constructions, aims to win orders worth USD 8.34 billion this year, which is slightly lower than the previous year, as we already secured the stable amount of orders in 2021. The overall order target for this year, including Offshore & Industrial Plant and Engine & Machinery business, is USD 11.35 billion in total. Accordingly, HHI is expected to achieve total revenue (stand-alone basis) of KRW 10.17 trillion for 2022, which is a 23 percent increase compared to the target of the previous year, KRW 8.3 trillion.

Key Plans

1. Reoperation of Gunsan Shipyard

HHI signed a 'Cooperation Agreement for Reactivating Gunsan Shipyard' with Ministry of Trade, Industry and Energy, Ministry of Employment and Labor, and the local governments. As the global shipbuilding industry is in recovery, we decided to reopen Gunsan Shipyard, whose operation had been suspended due to the global financial crisis and long-term recession in the shipbuilding industry. For the restart of the shipyard, we plan to invest about KRW 100 billion into the facilities. Based on the investments, Gunsan Shipyard is scheduled to produce 100,000 tons of ship blocks every year, starting from January 2023. Depending on the shipbuilding market conditions, the shipyard may also produce high value-added blocks for LNGC and LPGC.

2. First Shipyard to be designated as Leading Root Industrial Complex

HHI's 'Ulsan (Bangeojin) Shipbuilding & Offshore Specialized Complex' was recently selected as the '2022 Leading Root Industrial Complex' by Ministry of Trade, Industry and Energy. On the foundation of this project, we have established a 'Root Academy', a dedicated building for Root companies in the production field. In collaboration with the government, local governments, and Root companies, the place will be equipped with state-of-the-art training areas where workers can learn welding and painting technologies using virtual reality (VR). Other facilities include recruiting booths and various amenities for the partner companies. HHI expects the Root Academy to serve as a platform to raise sales, create jobs, and reduce occupational accidents while improving the working and welfare environment for workers in the shipbuilding industry.

Financial Highlights (consolidated basis)

Classification	Unit	2019 ¹	2020	2021
Total Revenue	Total	54,567	83,120	83,113
	Shipbuilding	38,204	58,771	63,206
	Offshore & Industrial Plant	8,080	8,967	4,264
	Engine & Machinery	7,832	14,728	14,917
	Others	450	654	724
Operating Profit (Loss)		1,295	325	(8,003)
Net Profit (Loss)		(889)	(4,314)	(8,142)
Total Assets		138,695	137,997	150,787
Total Liabilities		82,466	84,389	94,846
Total Equity		56,229	53,608	55,940
Debt Ratio		146.7	157.4	169.55
Net Debt-to-Equity Ratio ¹		48.4	50.0	21.1
Operating Margin		2.4	0.4	-9.6
Return on Assets		-0.6	-3.1	-5.4

1. FY2019 is the first reporting period after HHI was established anew through the split-off from KSOE on June 1, 2019.

Value Distribution to Stakeholders

Classification	Indicator	Unit	2019	2020	2021
Partner company	Cost for raw material procurement (major raw material purchases, including intercompany transactions)		31,656	47,206	50,895
Employee	Personnel expenditure		5,683	8,436	11,803
Shareholder and investor	Interest expense	KRW 100 million	802	1,556	1,256
	Dividend		-	-	-
Government	Corporate tax (profit)		(146)	(1,086)	(2,972)
	Tax and public imposts		(8)	33	22
Local Community	Donation		2	31	25

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Hyundai Mipo Dockyard

CEO Message

Dear stakeholders,

I would like to extend my sincere gratitude for your interest and trust in us, taking this opportunity to publish KSOE Integrated Report 2021. Aiming to live up to all of your interest and support, we will take the lead in fulfilling ESG values, upholding the honor of being an unrivaled No.1 in the global market of mid-sized commercial vessels.

We will push forward ESG-oriented management.

HMD reinforces our ESG management under the Group's ESG management vision, 'Future From the Ocean'. We will garner all our capabilities in eco-friendly shipbuilding that saves the ocean, thereby actively promoting carbon neutrality, one of the key tasks to resolve the climate crisis. On top of the environmental efforts, we will also fulfill our social responsibilities and roles as a company, carrying out social contribution activities in association with local communities. In addition, HMD will strive to grow as a leading company for ESG management by actively communicating with the stakeholders and conducting ethical management.



Shin Hyeon-dae /
President & CEO

We will establish a seamless safety net by reinforcing the safety management system that covers every corner of our shipyard.

Nothing is more significant than the safety of our employees at our manufacturing sites. Therefore, we will tighten the safety management system in the field, complying with basic principles to fundamentally improve risk factors. In line with our management policy, 'Safety First', we will establish a seamless safety net so that we can achieve our goals of 'zero fatal accidents for six consecutive years' and 'accident rate below 0.12%'.

We will make a harmonious and coexisting corporate culture that serves as a platform to leap forward.

In times of crisis caused by the long-term depression in the shipbuilding industry, the trust and harmony between labor and management have become a solid cornerstone for a better future. Going forward, we will continue to listen to the opinions of our employees through various systems and programs, thereby creating a harmonious and coexisting corporate culture.

Together with all of our employees, we strive with our heart and soul to contribute to the well-being of the national economy and local communities, and ultimately to the prosperity of humankind. We look forward to your unwavering support and advice. Thank you very much.

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Hyundai Mipo Dockyard

HMD, Global No. 1 shipbuilder of Small- and Mid-sized Ships

HMD is ranked No. 1 in the worldwide market share of small- to mid-sized ships, featuring “masterpiece” shipbuilding capabilities applying strict quality and safety standards. In particular, the number of ship orders soared in 2021 owing to the recovery of shipbuilding and offshore market conditions, recording a total of 100 ship orders worth USD 47.89 billion. Based on the numerous shipbuilding experiences and technical know-how, we will further develop eco-friendly shipbuilding technologies, including ammonia-fueled VLCC, liquefied CO₂ carriers, and liquefied LH₂ carriers, thereby leading the next-generation eco-friendly shipbuilding market.

Business Overview

(1) Product & Chemical Tanker (PC Tanker)

HMD builds product & chemical tankers (PC tankers) that transport various oil products, bio-oil, and liquid chemicals. Our PC tankers have a series of separate cargo tanks coated with specialized coatings and are connected to complicated piping, allowing the vessel to safely load and transport various types of hazardous cargo.

(2) Containership

HMD’s small- to mid-sized containerships boast diverse eco-friendly technologies, including improved hull forms, electronically controlled engines as well as outstanding fuel efficiency. On top of that, our containerships are equipped with environmentally friendly equipment enabling the use of LNG and low-sulfur fuel and non-discharge of ballast water. These features gain tremendous attention from shipping companies that should meet stricter environmental regulations.

(3) Gas Carrier

We have put our focus on developing ammonia-fueled vessels, liquefied hydrogen carriers, and liquefied CO₂ carriers on the basis of our shipbuilding experiences and technologies encompassing diverse gas carriers capable of transporting LNG, LPG, LEG, and many more. By making these efforts, we have continuously advanced our eco-friendly technologies.

▽ The container carrier built by HMD and delivered to MITSUI, a Japanese firm, in February 2019



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Hyundai Mipo Dockyard

Performance in 2021

HMD received a total of 100 shipbuilding orders, including 39 orders for small- to medium-sized containerships, upon the recovery of the global ship market in 2021. On top of that, we accelerate the next-generation shipbuilding, including ICT-converged electric-fueled passenger ships. At the same time, we push forward the successful building of various ships installed with dual-fuel engines, enabling the use of eco-friendly fuels such as LNG and methanol.

Shipbuilding Orders

Unit: USD 100 million

Classification	Ship Type	2019		2020		2021	
		No. of ships	Amount	No. of ships	Amount	No. of ships	Amount
Shipbuilding	LNGC	2		-		1	
	LPGC	7		12		18	
	Container ship	11	27.1	1	23.2	39	47.9
	Tanker	40		40		32	
	Others	6		3		10	
	Total	66		56		100	

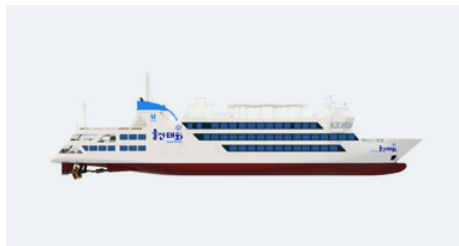
※ Performance of Hyundai Vietnam Shipbuilding included

Major Achievements



1. Reopening the Incheon-Jeju Route

HMD's 27,000-ton roll-on/roll-off passenger ship (RO-PAX) named "Beyond Trust" started sailing in December 2021, becoming the first ship to open up the Incheon-Jeju route that had been suspended for about 7 years since the 'Sewol Ferry' disaster. Ordered in 2019, the ship has the size of 170 meters in length, 26 meters in width, and 28 meters in height with the maximum speed of 23.2 knots (approximately 43km/h). Its low-weight and low-centered design maximize sailing stability to prioritize passenger safety. Furthermore, the ship effectively complies with regulations on pollutants by applying sulfur oxide reduction devices and HMD's optimal fuel injection technology for nitrogen oxide reduction.



2. Spurring Smart Electric Propulsion Shipbuilding

HMD has started building smart electric propulsion ships converged with ICT in full scale. It is an 'eco-friendly smart ship' applied with four key ICT convergence for the first time in Korea. The technologies include "DC Grid-based electric propulsion system" for maximized fuel efficiency; "Intelligent integrated control system" for functions as collision prevention, berthing guidance support, and optimal route recommendation; and "Remote control smart solution" for ship monitoring and operation. With an aim to successfully build smart electric propulsion ships, HMD will spur the commercialization of electric-powered ships in the domestic shipbuilding market by developing our own electric propulsion system, reducing reliance on import.



3. Delivering Korea's first LNG-fueled RO-RO Ships

HMD delivered a 20,000-ton LNG-fueled roll-on/roll-off (RO-RO) ship, 'FAUSTINE' in October 2021, raising the competitive edge in the eco-friendly ship market. 'FAUSTINE' is the first LNG-fueled RO-RO ship built in Korea. It is equipped with LNG dual fuel engine that can utilize both LNG and diesel as a fuel. The engine emits almost zero sulfur oxide during the operation, which enables it to sail in Emission Control Areas (ECAs). It also minimizes sailing costs and emissions by applying a shaft generator that generates and supplies electricity based on the rotatory power of the main engine. In addition, we have installed 4 Thruster units supporting side propulsion in FAUSTINE for easy movement within small ports.

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Hyundai Mipo Dockyard

Business Goals and Plans

Business Goals

In 2022, HMD set the target of receiving orders worth USD 3.6 billion, which is slightly lower than the previous year’s performance, following the selective order strategy. The sales target (stand-alone basis) for 2022 is set at KRW 3.6 trillion, up 26% from the previous year (KRW 2.85 trillion).

Key Plans

1. Earning the Reputation of ‘World’s Top Eco-friendly and High-end Shipyard’

As our RO-RO passenger ship was selected as the ‘world-class product’, we currently have a total of 15 world-class products, including Medium Range Product Carriers (MR PC), mid-sized feeder ships, and methanol and LNG dual fuel propulsion ships. Aiming at successfully building the ‘smart electric-powered passenger ship’ where ICT convergence is reflected, we plan to apply a low-weight and low-center design for safe sailing as well as various safety equipment, including Marine Evacuation System (MES) in preparation for flooding or fire, as well as Global Positioning System (GPS). Also, we will develop and adopt diverse eco-friendly devices such as LNG dual fuel propulsion engines and scrubbers to reduce harmful emissions, including CO₂, nitrogen, and sulfur oxides, thereby actively meeting the demands of shipping companies and complying with the environmental regulations in and outside Korea.

2. Obtaining the Energy Management System Certification (ISO 50001)

HMD will acquire the energy management system certification (ISO 50001) as part of our efforts to minimize energy risks from recent energy price hikes, and reduce carbon emissions, thereby raising our eco-friendly corporate image.

3. Acquiring the Anti-bribery Management Systems Certification (ISO 37001)

By operating compliance and anti-corruption programs, we plan to obtain the anti-corruption management systems certification (ISO 37001). Under the certification, we will inspect our compliance with fair trade standards, laws, and regulations and regularly communicate the results to the BOD. Through these endeavors, we will realize transparent and fair management.

Financial Highlights (consolidated basis)¹

Classification	Unit	Unit	2020	2021
Total Revenue			29,941	27,920
Operating Profit (Loss)			926	367
Net Profit (Loss)	KRW 100 million		612	(123)
Total Assets			33,806	35,990
Total Liabilities			10,267	12,315
Total Equity			23,540	23,675
Debt Ratio			43.6	52.0
Net Debt-to-Equity Ratio ²	%		-	-
Operating Margin			3.1	1.3
Return on Assets			1.8	-0.3

1. Subsidiaries included: Hyundai E&T and Hyundai Vietnam Shipbuilding
2. (debts-deposits) / total equity
3. The data is blank since the numerator is a negative quantity.

Value Distribution to Stakeholders

Classification	Indicator	Unit	2019	2020	2021
Partner company	Cost for raw material procurement (major raw material purchases, including intercompany transactions)		19,390	17,709	20,491
Employee	Personnel expenditure		3,323	3,113	3,690
Shareholder and investor	Interest expense	KRW 100 million	96	71	35
	Dividend		140	-	-
Government	Corporate tax (profit)		244	(79)	(497)
	Tax and public imposts		5	4	2
Local Community	Donation		19	29	29

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Hyundai Samho Heavy Industries

CEO Message

Distinguished stakeholders,

Since its establishment in 1999, Hyundai Samho Heavy Industries (HSHI) has gone through numerous difficulties, including the financial crisis. However, all our employees have risen to the challenge in unity to overcome all of the difficulties. These efforts have paid off, placing us at No.4 shipbuilder in the world. Currently, we are faced with the climate crisis, the most daunting conundrum of humanity. Against this backdrop, we have set out the management principles as below and are committed to tuning them into practice, aiming to create a sustainable future by promoting eco-friendly management that can save the Earth and humanity.

First, we will firmly establish the ESG management system.

HSHI newly formed a dedicated body to ESG in 2021 to enhance our ESG management. The organization has carried out a variety of activities based on ESG management, including social contribution activities for shared development with communities, MOUs for carbon neutrality as a climate action strategy, and technical support for co-prosperity with partner companies.



Kim Hyung-kwan /

Vice President & CEO

Second, we will put safety first.

Every effort will be made to build a safety system that lives up to our reputation as a global company. Investment in safety is a source to fulfill our responsibility and secure sustainability for the future. We will make strenuous efforts to tighten safety, using all capable means of systems, facilities, and smart technologies.

Third, we will sharpen our unparalleled technologies.

We will raise the competitive edge by internalizing our outstanding and eco-friendly ship technologies within the Group. Going forward, we will further solidify our leading status in the emerging green shipbuilding area, which encompasses not only LNG and LPG propulsion technologies but also the new leading power for the future, including methanol, ammonia, and hydrogen propulsion technologies.

Dear stakeholders, we are all companions on a same boat. We are firmly determined to go toward our common goal, new value creation and growth. We would appreciate your continued support on our journey toward a better future. Thank you very much.

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Hyundai Samho Heavy Industries

HSHI, Boasting the World's First Successful Demonstration of Eco-Friendly Shipyards

HSHI successfully built and delivered LNG-powered large oil tankers, LNG-fueled ultra-large container ships, and bulk carriers for the first time in the world. We also built oil tankers certified with underwater noise notation, becoming the first to apply eco-friendly technologies in the industry. We have successfully demonstrated a series of eco-friendly ships, raising our corporate value as the top company in the eco-friendly large-vessel sector, beyond the 4th shipbuilding firm in the world.

Business Overview

(1) Shipbuilding Business

The shipbuilding Business has taken the lead in the eco-friendly shipbuilding market by building various types of LNG-fueled vessels, including container ships and bulk carriers, starting from building an LNG-fueled crude oil carrier for the first time. As the demand for LNG carriers around the world is rising, we have established a continuous building system that enables us to complete eight LNG carriers yearly to deliver high-quality vessels in a timely manner.

(2) Offshore Business

HSHI has initiated manufacturing facilities for developing offshore oil wells based on our long-standing experience in the shipbuilding field. We successfully built FPSO¹ in collaboration with HHI, constructed FPU² in 2015, and then built a semi-submersible rig in 2018.

- 1. FPSO: Floating Production Storage and Offloading
- 2. FPU: Floating Production Unit

▽ The 174K LNG-fueled vessel built by HSHI and delivered to H-Line Shipping in December 2021



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Hyundai Samho Heavy Industries

Performance in 2021

In 2021, HSHI achieved 45 orders in total, taking the lead in the eco-friendly shipbuilding industry for large vessels. In particular, we successfully delivered the world-largest scale LPG-fueled ships, guiding the realization of eco-friendly vessels that can respond to various environmental regulations.

Shipbuilding Orders		Unit: USD 100 million					
Classification	Ship Type	2019		2020		2021	
		No. of ships	Amount	No. of ships	Amount	No. of ships	Amount
Shipbuilding	LNGC	9		12		10	
	LPGC	4		-		16	
	Container ship	-	41.7	4	37.5	6	55.5
	Tanker	23		11		11	
	Others	2		-		2	
	Total	38		27		45	

※ Performance of Hyundai Infra Solutions included

Major Achievements



1. Delivering the Largest LPG-fueled Vessel in the World

In July 2021, HSHI built and delivered the world's largest LPG-fueled ship, 'Bellavista Explorer'. Ordered by China's Bank of Communications Finance Leasing, the vessel is the largest LPG propulsion ship in the world with an LPG tank capacity of 90,000 m³, boasting its immense size of 229.98 meters in length, 36.6 meters in width, and 23.6 meters in height. 'Bellavista Explorer' is equipped with a dual-fuel propulsion engine that can selectively utilize LPG and diesel fuels depending on the sailing speed and environment. It is also capable of reducing sulfur oxide and micro-dust by 90%, NOx by 50%, and GHGs by 20%, which makes it easier to respond to various environmental regulations.



2. Delivering Industry's First Oil Tanker Certified with Underwater Noise Notation

In March 2021, HSHI successfully built and delivered a 115,000-ton product carrier, which obtained Silent E-Notation for the first time in the industry. Underwater noise is mainly generated by ocean-sailing ships and spreads into the water. It is considered as one of the sources of marine pollution, together with exhaust gases and contaminated water. The underwater radiated noise certification, which confirms low noise for ships, had been only applied to special purpose ships such as passenger ships before. Therefore it was the first time in the industry to obtain the certification as an oil carrier, classified as a general ship.

3. Foundation of Hyundai Infra Solutions

Hyundai Infra Solutions was newly founded in May 2021 as a spin-off of the industrial facility sector in HSHI. The company owns outstanding infrastructure, including a number of cranes and equipment such as moving shelters, 600-ton crawler cranes, and 250-ton gantry cranes in a site of about 16,500 square meters. Making use of these excellent infrastructures, the company carries out industrial facility business, such as cranes in the port, goliath cranes in the yard, facilities for bulk freight, and offshore plants. Hyundai Infra Solutions contributes to local economy vitalization based on customer satisfaction and stable production activities by developing smart solutions for eco-friendly, automated and unmanned cranes.



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Hyundai Samho Heavy Industries

Business Goals and Plans

Business Goals

HSHI set an order target for 2022 at USD 4.5 billion, which is slightly lower than the previous year’s performance, following the selective order strategy. Accordingly, the sales target for this year (consolidated basis) is KRW 4.49 trillion, six percent higher than the previous year (KRW 4.24 trillion).

Key Plans

1. Establishing Automation Innovation Center and Sharpening Technical Competitive Edge

With an aim to support fieldwork and conduct research closely related to production, HSHI established the ‘Automation Innovation Center’, an in-house research center. This center is dedicated to introducing and demonstrating automation technologies and newly commercialized technologies. It will take the role of integrating organizations related to production technologies that are scattered within the company, aiming to swiftly apply the mechanization and automation technologies to the field. It will fundamentally resolve the personnel supply issues while creating a link to adopt manufacturing technologies newly developed by the KSOE’s Advanced Research Center. The center will serve as a platform to continuously strengthen technological competitiveness and support production in the field.

2. Building Membrane LNG DF

HSHI successfully built and delivered the world’s first Type-B LNG DF container ship in 2020. Taking another step, we are putting great efforts to build membrane LNG DF container ships as well. Through the successful construction of membrane LNG DF container ships, we aim to have a technical competitive advantage in the market by building all types of LNG DF tanks.

3. Raising Competitiveness in Eco-friendly Ships Based on Unrivalled Technologies

HSHI, the hub shipyard for green ships, became the first in the world to deliver LNG-fueled container ships, crude oil carriers, and bulk carriers using eco-friendly technologies such as Hi-ARS and Hi-ALS for the first time. In 2022, we plan to further sharpen our competitive edge in winning orders by successfully applying Engine Mounted Generator (EMG) for the first time, which is an unparalleled eco-friendly technology.

Financial Highlights (consolidated basis)¹

Classification	Unit	2019	2020	2021
Total Revenue		34,883	39,180	42,410
Operating Profit (Loss)		52	156	(3,359)
Net Profit (Loss)	KRW 100 million	115	(591)	(2,341)
Total Assets		43,145	45,815	50,565
Total Liabilities		23,821	26,881	33,880
Total Equity		19,325	18,933	16,684
Debt Ratio		123.3	142.0	203.1
Net Debt-to-Equity Ratio ²	%	37.8	38.9	48.6
Operating Margin		0.1	0.4	-7.9
Return on Assets		0.3	-1.3	-4.6

1. Subsidiary included: Hyundai Infra Solutions 2. (debts-deposits) / total equity

Value Distribution to Stakeholders

Classification	Indicator	Unit	2019	2020	2021
Partner company	Cost for raw material procurement (major raw material purchases, including intercompany transactions)		21,909	25,756	28,119
Employee	Personnel expenditure		3,039	2,793	3,211
Shareholder and investor	Interest expense	KRW 100 million	213	378	392
	Dividend		52	52	52
Government	Corporate tax (profit)		70	(218)	(748)
	Tax and public imposts		24	19	20
Local Community	Donation		14	16	20

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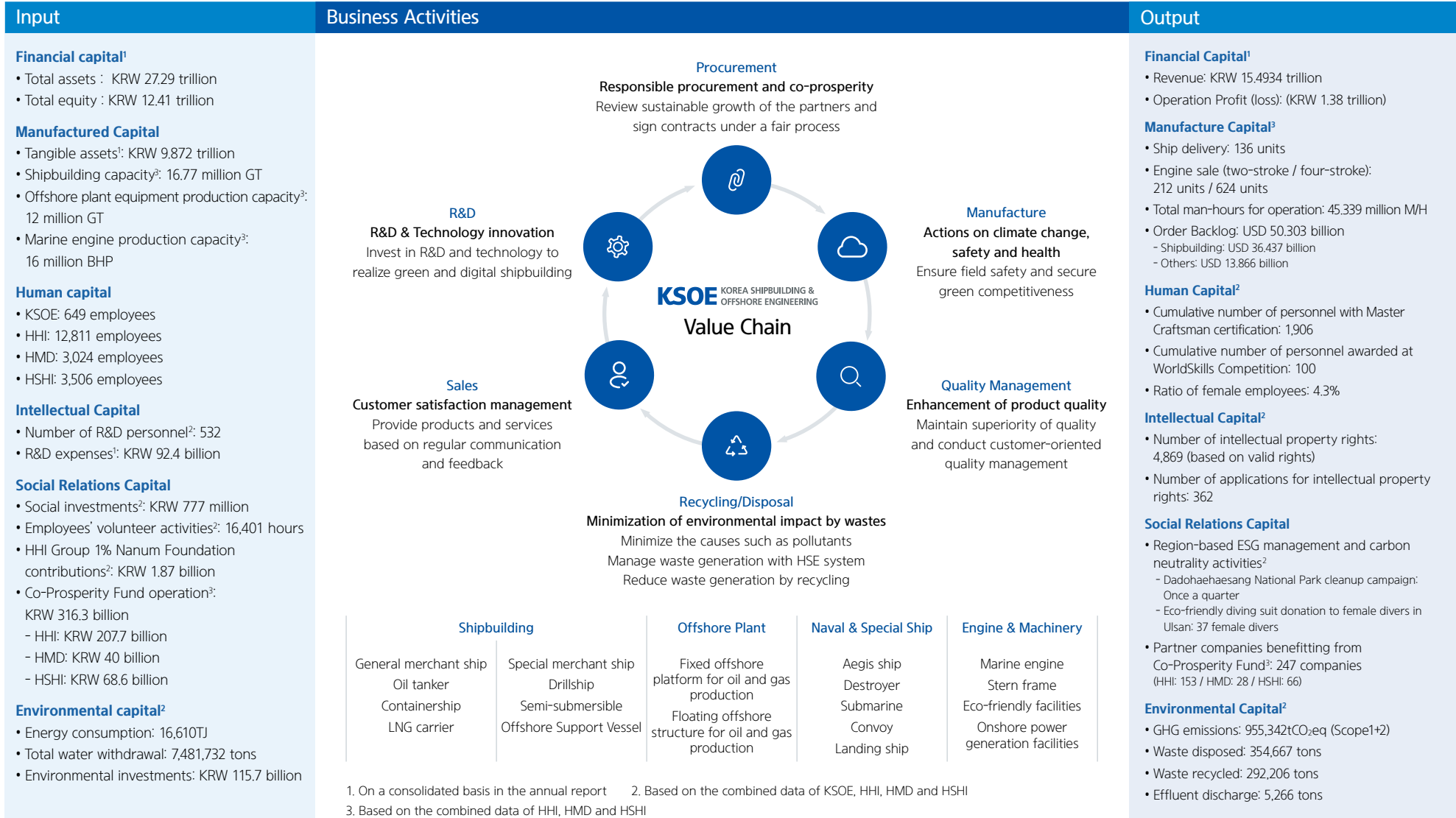
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Value Creation and Distribution

KSOE and its subsidiaries make economic, environmental, and social progress by inputting six types of capital. As shown in the description below, we intend to create values for the stakeholders and contribute to the sustainable growth of our society throughout the entire value chain ranging from R&D to sales.

(as of the end of December 2021, some activities in early 2022 included)



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33	#2. Eco-friendly Vessel, Weighing Anchor for Carbon Neutrality
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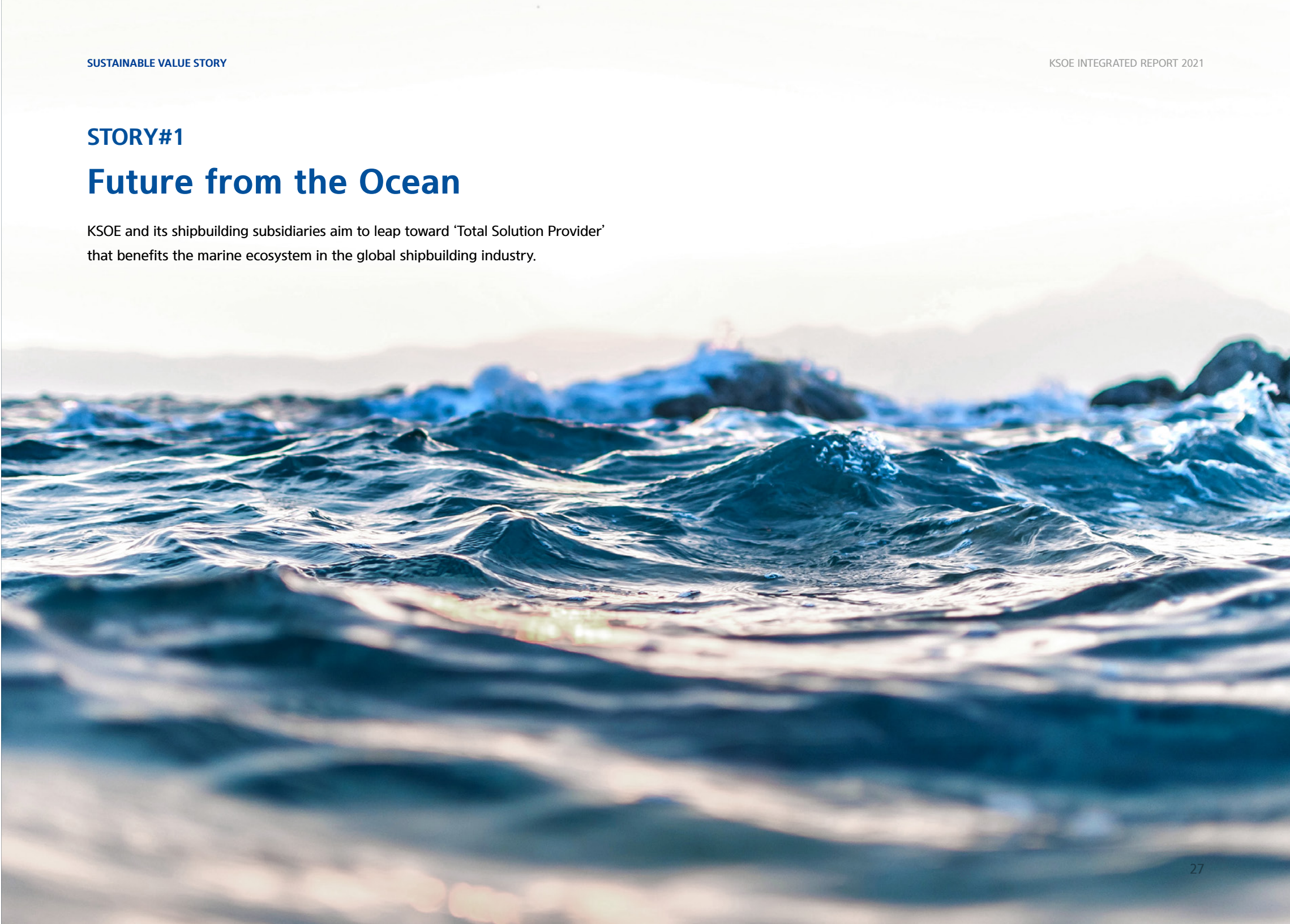
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STORY#1

Future from the Ocean

KSOE and its shipbuilding subsidiaries aim to leap toward ‘Total Solution Provider’ that benefits the marine ecosystem in the global shipbuilding industry.



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STORY#01

World's Best Shipbuilder Marking the 50th Anniversary of its Birth



For the past 50 years, KSOE and its shipbuilding subsidiaries have grown into the world's leading companies in shipbuilding and offshore engineering, creating great values out of what was previously a barren land in Korea. On our 50 years of journey toward a shipbuilding powerhouse, we have contributed to developing the shipbuilding business into a core industry of Korean economy. Furthermore, we have played a contributing role in raising export and employment and developing national and regional economies through the creation of industrial ecosystem, as well as giving vitality to the world trade with high-quality marine mobility.

In recent years, however, we have begun to face rapid changes in our business environment due to the unprecedented threat called 'Climate Crisis'. In response, the global community has declared GHG emissions mitigation on a large scale and the shipbuilding industry cannot be an exception. We have to reduce hazardous substances generated from vessels and join forces to make oceans clean. As we have contributed to the prosperity of humankind by developing the industry and economy over the past 50 years, our new focus is to make clean environment for future generations in response to the impending threats of climate change. As a shipbuilding and offshore engineering company, the clean ocean should be our starting point and at the same time, the final destination.

In terms of sustainability, the preservation of marine ecosystem will be a key objective in our business operations. KSOE and its shipbuilding businesses will realize our vision, 'Toward Eco-Ocean with Green Wave', through our top-notch shipbuilding technologies and persistent innovation that we obtained for the last half-century.

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Changing Trends and Outlook for Marine Regulations in the Global Shipbuilding Industry



We are seeing a growing demand to combat climate change and protect marine ecosystems from the global community, and more stringent regulations from international organizations, such as International Maritime Organization (IMO) or European Union (EU).

With the aim of preventing marine contamination, IMO has tightened the regulations on sulfur oxides emissions. Coming into effect on January 1, 2020, the regulations require to decrease the content of sulfur oxides in marine fuels from 3.5% to 0.5% or less. IMO also announced its target of mitigating GHG emissions in the shipping industry by 50% from the 2008 level by 2050 in line with the global GHG emissions reduction target. In order to accomplish this goal, the relevant regulations are expected to get more stringent in the years to come, such as Energy Efficiency Design Index (EEDI)¹, Energy Efficiency Existing Ship Index (EEXI)², and Carbon Intensity Indicator (CII)³.

Through the EEDI regulation, IMO makes it mandatory to show indicators for lines improvement, enhancement in the performance of ship's engines, fuel transition, and efficiency improvement from the design stage. This movement aims to cut down GHG emission from ships constructed after 2013. As part of the efforts for GHG reduction, EEXI and CII rating systems have been adopted. The CII is an indicator that rates ships on a scale of A to E based on their carbon intensity. If a vessel receives D ratings for three consecutive years or an E rating at least once, the shipping lines should establish and implement plans for improvement.

1. Energy Efficiency Design Index (EEDI): Index estimating CO₂ emissions per ton-mile of goods transported

2. Energy Efficiency Existing Ship Index (EEXI): Regulation that expands the application scope of EEDI to ships built before 2013

3. Carbon Intensity Indicator (CII): Indicator measuring a vessel's carbon intensity in navigation

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Changing Trends and Outlook for Marine Regulations in the Global Shipbuilding Industry

In addition to IMO, EU is working on the the revision of EU Emissions Trading System for the inclusion of the maritime sector in the carbon trading scheme. 'FuelEU Maritime', the regulations on GHG intensity management in the maritime sector, is also going through the procedure for the passage. All these trends are a clear demonstration of the global community's iron will to combat climate change, and the shipping industry is also redoubling its efforts to usher in the era of green ships.

Key Environmental Regulations

Category		Item		Timeline								
				2015	2020	2022	2023	2024	2025	2030	2040	2050
IMO	GHG emissions reduction target	Carbon intensity		Phase1 (Reduce by 10% from 2015)	Reduce by 40% compared to the 2008 level (by 2030)						Reduce by 70% compared to the 2008 level (by 2050)	
		Total GHG emissions			Reduce by 50% compared to the 2008 level (by 2050)							
	GHG emissions regulations	Energy efficiency	EEDI (New Vessels)		Phase2 (Reduce by 20% from 2020)				Phase3 ¹ (Reduce by 30% from 2025)		Phase 4 and above (Reduction rate and timing to be determined)	
			EEXI (Existing Vessels)				Take effect in 2023 (the same level as EEDI), applied once					
		Carbon intensity						CII Rating (from 2023)				
EU	GHG emissions regulations	Total GHG emissions			Reduce by 55% compared to the 1990 level (by 2030)						Net-Zero GHG emissions	
	GHG emissions regulations	EU ETS (European Union Emissions Trading System)						Shipping industry to be subject to the EU ETS (from 2024)				
		Regulations on GHG intensity of fuels							FuelEU Maritime to come into effect (from 2025)			

1. Reduction rate and timing depend on ship type/size, and partial ship types are to be early introduced before 2025

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Changing Trends and Outlook for Marine Regulations in the Global Shipbuilding Industry



Opportunity Arising from the Changing Environmental Regulations in the Maritime Sector

More stringent marine regulations are causing the growing demand for green, high value-added ships that are capable of reducing GHGs. Accordingly, new orders are projected to rise, owing to the demand to replace old ships with newly built green ships with the latest technology.

We regard this change in the industry as ‘an opportunity for growth’. The growing demand for high-value added ships featuring green technologies may lead to sales increase. We have made all-out efforts to secure distinguished and unrivalled technologies, which enables us to meet the diverse demands of shipping companies and solidify our position in the market.

Increase in demands for green ships



Opportunity Factor for Sales Increase

Shipping Companies (Client)

Increased Need for Green Vessel Construction

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New 50 Years, New Challenge



Marking the 50th anniversary, KSOE and its shipbuilding subsidiaries have made sincere efforts and deliberation to become a company that benefits the oceans, the source of our honorable success. With the aim of making the oceans clean, we have made investments to find feasible and substantial solutions while focusing on the development of green and digital technologies to lead the market. Going forward as a ‘Total Solution Provider’, we will become the best option to customers across the world.

“ Toward Eco-Ocean with Green Wave ”

KSOE and its shipbuilding subsidiaries have embarked on voyage on our main stage, the ocean, toward the next sustainable and green 50 years with eco-friendly technologies for the clean ocean.

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STORY#2

Eco-friendly Vessel, Weighing Anchor for Carbon Neutrality

Our strategies lie in various low-carbon and zero-carbon shipbuilding technologies to respond to climate change.



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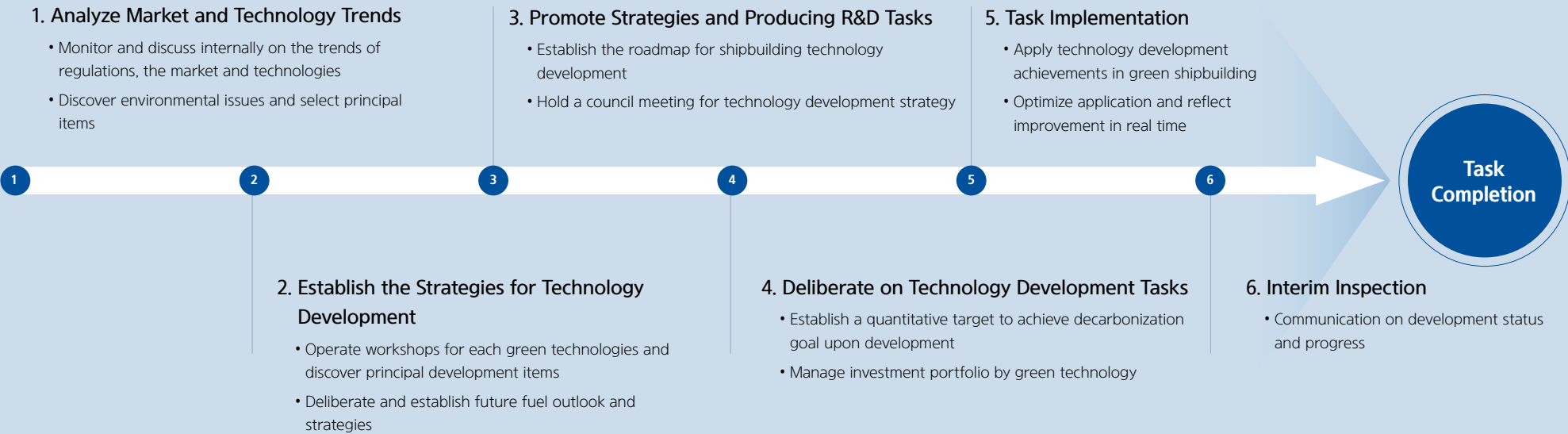
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STORY#02

‘Total Solution Provider’, Leading the Green Shipbuilding Market

Committed to our sustainability, KSOE and its shipbuilding subsidiaries are striving to develop a wide range of unparalleled future technologies. The efforts are being redoubled to build LNG DF vessel, the most commercialized eco-friendly ship, as well as green fuel-powered ships such as hydrogen fuel cell or ammonia propulsion ship. Our ultimate goal is to become ‘Total Solution Provider’ to meet diverse needs of the market. In order to reach the goal, our focus will be on the diversification of green vessel portfolio. As the first step, we mapped out the process for green technology development along with specific plans so that we can sharpen our green shipbuilding technology prowess.

Green Technology Development Process



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LNG Dual-Fuel Ships (LNG DF)

Methane Slip Reduction Technology Development Status

Technology items

- Next generation LNG engine with improved fuel efficiency and methane slip reduction to be jointly developed with an engine maker WinGD, signed in October 2021 (HHI)
- LNG DF engine ‘ME-GA’ successfully developed with MAN-ES of Germany in 2021, reducing methane slip by 30 to 50 percent (HHI)
- Methane oxidation catalyst system based on engine catalytic emission control in development since 2021 (KSOE, HHI)



For the cleaner ocean, we are developing vessels that operate by low-carbon or zero-carbon fuels such as ammonia, methanol, and hydrogen, using single-type or hybrid propulsion. However, practical limits and unsolved challenges remain in the process of converting fossil fuels to zero-carbon fuels. We are shaping the step-by-step changes, putting LNG DF vessel as our stepping stone toward zero-carbon ship as a company equipped with the world-class technology.

LNG falls under fossil fuels but has the effect of reducing sulfur oxides by 99%, nitrogen oxides by 90%, and CO₂ by 30% compared to bunker-C oil, a traditional ship fuel. Considering the limited time to develop technologies and port infrastructure, LNG DF is the best option that swiftly responds to the tightened marine regulations.

LNG DF emits less pollutants such as nitrogen oxides or sulfur oxides, but it has an issue of ‘methane slip’, unburned methane that is not fully combusted in ship’s engine. It is known to accelerate global warming by more than 20 times than CO₂ (based on GWP¹ 100). To cope with this issue, we will further spur the development of methane slip reduction technologies, thereby delivering green values and raising our competitiveness in the market.

1. GWP: Global Warming Potential

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Ammonia-Fueled Ship

Ammonia-fueled ship is one of the key green vessels that will replace the existing ships and usher in the era of 'zero carbon emissions'. Owing to the tighter regulations on shipping companies, orders for ammonia-fueled ships are expected to increase. Against this backdrop, KSOE and its shipbuilding subsidiaries are putting efforts to build ammonia-fueled ships that satisfy the future market and customer needs.

We are developing 'HiMSEN DF engine' as the key instrument for ammonia propulsion. In September 2021, we obtained AIP from KR (Korean Register) for ammonia fuel supply system that is capable of removing nitrogen oxides using ammonia boil-off gas and safely treating high-density ammonia. Furthermore, the development of ammonia carrier powered by ammonia is in progress as the demand for ammonia as a hydrogen carrier is expected to increase. In September 2021, HHI acquired AIP for 91K ammonia carrier from BV (Bureau Veritas), a French classification society. In addition, we have established the two-layered gas leak prevention system that prevents the leakage of ammonia, thereby ensuring risk removal and ocean safety.



Hydrogen Ship

Hydrogen will be our future growth engine. HHI Group will grow into the most competitive company in the hydrogen market where global spotlight is focused on. As a shipbuilding and offshore engineering company, we are committed to the development of next generation hydrogen vessel that transports hydrogen produced within the hydrogen value chain.

A liquid hydrogen carrier will be of great importance due to its efficiency. When hydrogen energy is transported in its liquid state, the ship can be propelled by using hydrogen boil-off gas. Accordingly, we are considering hydrogen propulsion ships or hybrid electric propulsion ships fueled by hydrogen fuel cell as the next generation hydrogen carrier.

KSOE and its shipbuilding subsidiaries aim to commercialize the hydrogen propulsion technologies firstly in small-sized ships and target to receive an order for world's first large-sized liquid hydrogen carrier in 2029 with the advancement of fuel supply systems and hydrogen tank.



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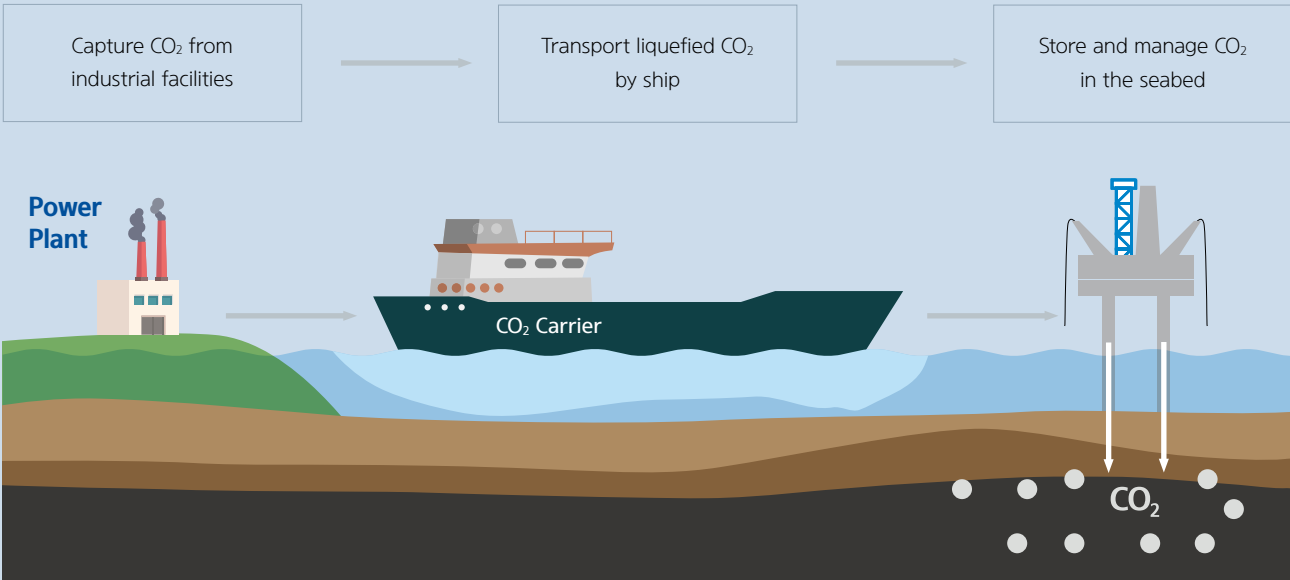
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CO₂ Carrier



The global carbon reduction target for net-zero by 2050 is approximately 7.6 billion tons. To achieve this goal, CCUS (Carbon Capture, Utilization & Storage) is one of the high-profile technologies. More tightened environmental regulations are likely to accelerate the growth of the CCUS market.

The value chain of CCUS consists of several sectors: capturing CO₂ from power plants, transporting it by ships or pipelines, injecting it through offshore platforms or floating structures for underground storage, and managing the storage such as the monitoring of the leakage of the injected gases. KSOE and its shipbuilding subsidiaries will contribute to creating new values by developing mass transport technologies for CO₂, taking advantage of the CCUS market on the rise.

Capitalizing on our technology, we are now working with Hyundai Glovis to develop the world's largest CO₂ carrier. Through the joint development agreement, we plan to invent the world's largest liquid CO₂ carrier by the second half of 2022, and then inspect the safety and suitability of the design in accordance with the international standards required by IMO. In addition, we are challenging on the advancement of Cargo Containment System (CCS) and Cargo Handling System (CHS) that preserve cargo in a stable manner by maintaining tank pressure based on our experience of building the world's first liquid CO₂ carriers with a capacity of 40,000 m³ in September 2021. By doing so, we will introduce the safe means of transportation that benefits the environment and further spur our sustainable management.

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Electric Propulsion Ship



An electric propulsion ship is a next generation future vessel that boasts higher energy efficiency compared to the existing liquefied fuels. KSOE and its shipbuilding subsidiaries are working on the development of DC¹-grid-based electricity propulsion system which will be mounted on the first electric-fueled and ICT-convergence whale-watching ship in Ulsan city. In November 2021, we succeeded in demonstrating this system, securing the package design and control technology that consists of variable speed engine and generator, power converter (AFE²), and DC grid, which are integral to the system’s efficiency and safety. Furthermore, we have completed the development of automatic voltage regulator that controls the output voltage from the generator, as well as a signal control technology between current converters. These technologies will be applied to a ship in construction by HMD, which is planned to be delivered to the Ulsan Metropolitan City in the second half of 2022. The ship will open a new chapter of green electric propulsion in domestic and foreign ship markets.

On top of that, KSOE and its shipbuilding subsidiaries prioritized safety by developing ESS³ Solution for the next generation vessels utilizing a ‘vanadium ion battery’ that has no risk of fire or explosion. The vanadium ion battery uses an electrolyte solution, which is mainly composed of water. Therefore, it does not have fire or explosion risks and produces little heat despite external shocks. Its energy output also has higher energy efficiency than the conventional lithium-ion battery by more than twice, and its lifespan is longer by more than four times. We plan to develop and demonstrate the ESS solution for ships based on vanadium ion batteries by the first half of next year to obtain AIP, in collaboration with ‘Standard Energy’, a producer and supplier of vanadium ion batteries, to get the classification approval.

1. DC: Direct Current 2. AFE: Active Front End 3. ESS: Energy Storage System

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Green Technology Development Roadmap

We have established a concrete technology development roadmap in accordance with the green technology development process. Accordingly, we put all our efforts into setting and implementing empirical R&D goals for eco-friendly propulsion technologies based on carbon-free fuel (ammonia and hydrogen) and low-carbon fuel (LNG, methanol, and biofuel) and GHG mitigation technologies through higher efficiency of vessels or post-treatment of exhaust gas.

Roadmap of Green Technology Development

Short-term : '22~'24 Mid-term : '25~'27 Long-term : '28~'30

Category	Technology items	Major Goals and Directions	Roadmap	
Future Ship Propulsion	Ammonia propulsion	<ul style="list-style-type: none">Secure the competitive edge for ammonia propulsion ships to respond to CO₂ Zero regulationDifferentiation of ammonia propulsion ships	Short-term <ul style="list-style-type: none">Develop the ammonia four-stroke engineDevelop the ammonia fuel supply / cargo-handling system	Mid-term <ul style="list-style-type: none">Develop large-sized ammonia enginesAdvance the ammonia fuel supply / cargo-handling system
	Hydrogen carriers	<ul style="list-style-type: none">Build hydrogen carriers by developing differentiated technologiesEnter into new business in the hydrogen economy by developing key hydrogen technologies	Short-termMid-term <ul style="list-style-type: none">Receive orders for liquefied hydrogen carriersDevelop large-scale liquefied hydrogen storage tanks	Long-term <ul style="list-style-type: none">Receive orders for large-scale liquefied hydrogen carriers
	Fuel cell propulsion	<ul style="list-style-type: none">Pre-occupy the power generation/propulsion systems for next generation ships in the marketMaintain the unrival technological gap in the green ship market	Short-term <ul style="list-style-type: none">Develop fuel cell propulsion system for small and medium-sized ships	Long-term <ul style="list-style-type: none">Develop fuel cell propulsion system for large ships
	Electric propulsion	<ul style="list-style-type: none">Lead the ship propulsion solution market by developing the next generation eco-friendly/high-efficiency electric propulsion system of our own	Short-termMid-term <ul style="list-style-type: none">Commercialize hybrid electric propulsion system (in the order of 4, 15, 30MW)	Long-term <ul style="list-style-type: none">Commercialize 50MW hybrid electric propulsion system
Green Technology	Reduction of marine GHG	<ul style="list-style-type: none">Commercialize new construction and remodel business through developing our own model for environmental facilities for shipsSharpen competitiveness of green solution technology	Short-term <ul style="list-style-type: none">Develop and demonstrate our own CO₂ capture, process, and storage system model for shipsDevelop and demonstrate methane slip reduction deviceDemonstrate and commercialize our own propulsion system assisted by wind power	

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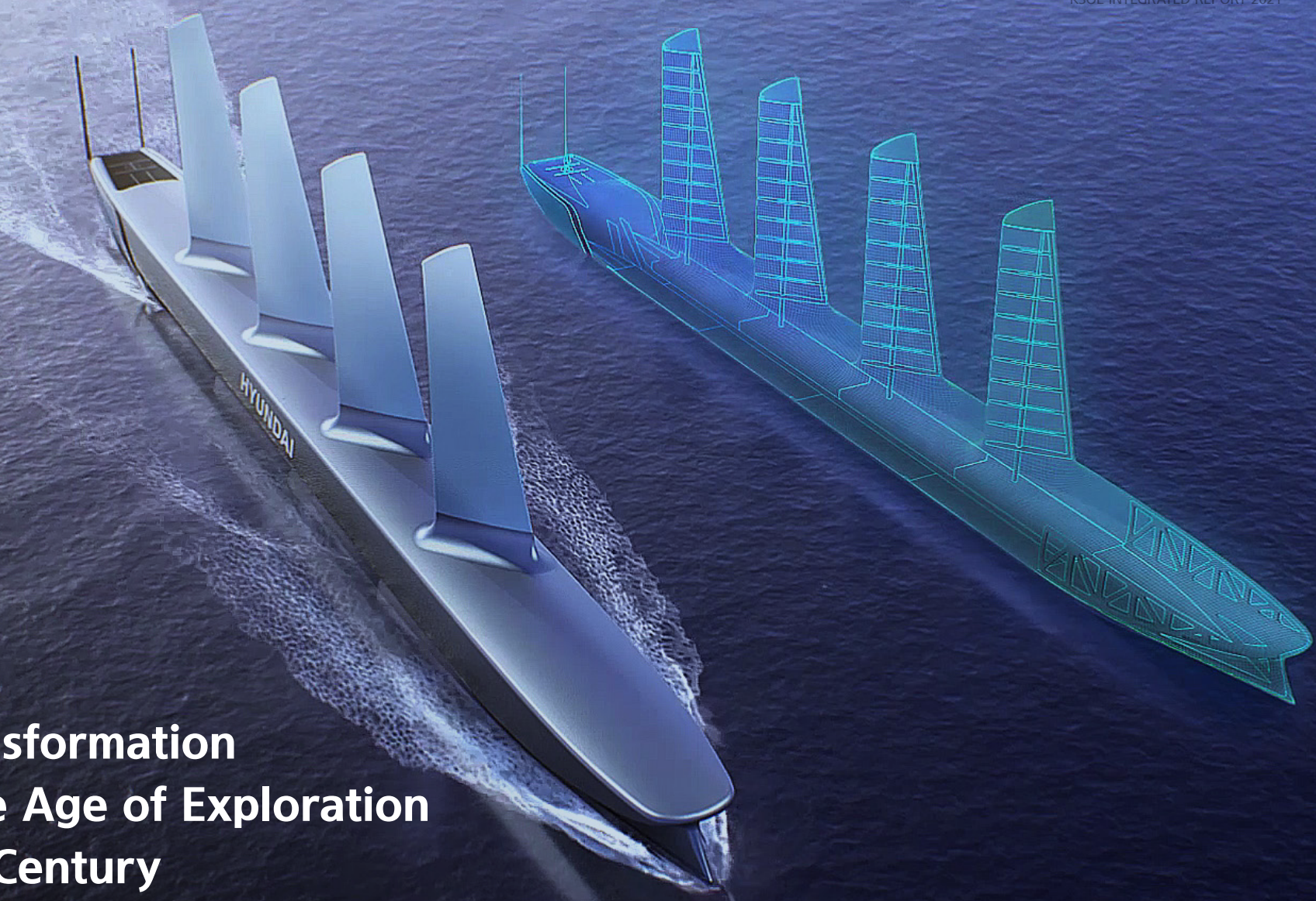
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STORY#3

Digital Transformation Leading the Age of Exploration in the 21st Century

KSOE and its shipbuilding subsidiaries will be the leader in the digital transformation of the worldwide shipbuilding and offshore industry through the commercialization of intelligent navigation technology and the establishment of a smart shipyard.



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STORY#03

Leading the digital transformation in the shipbuilding and offshore industry on the foundation of building 'smart shipyard' and developing 'smart ship solutions'.

The digital transformation of the shipbuilding and offshore industry refers to embedding autonomous and intelligent functions to ships and manufacturing processes. The autonomous and intelligent vessels and yards are equipped with monitoring systems that predict the signs of problems, thereby improving the stability and fuel efficiency of the ships. With an aim to raise the efficiency and safety of shipbuilding, we are converging our top-notch shipbuilding technology in the world with ICT capabilities. We have set out and implemented a detailed roadmap to build a smart shipyard in the order of 'Visible Shipyard', 'Connected, Predictable, and Optimized Factory', and 'Intelligent Autonomous Shipyard'. We are also spurring on the development of 'smart ships applied with an intelligent navigation system', moving up the commercialization of smart ships. Through these endeavors, we will take the lead in the era of digital ships and establish ourselves as a high-quality shipyard in the near future.



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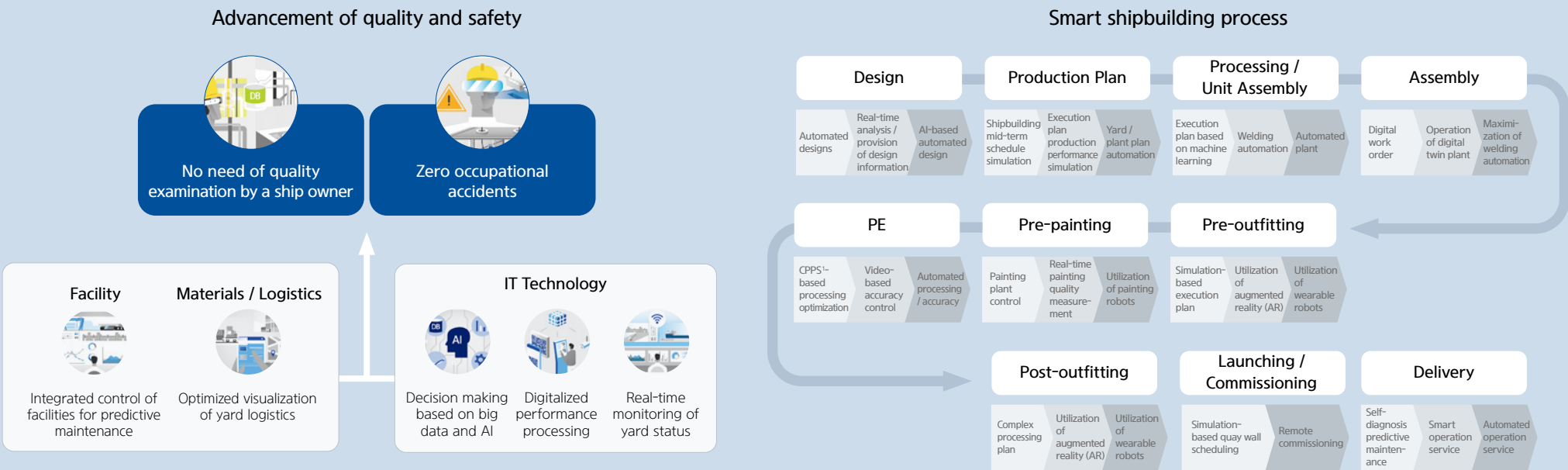
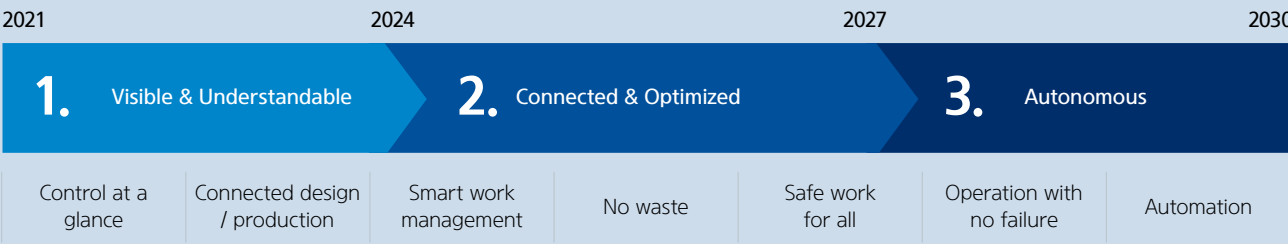
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Smart Shipyard

2030 Smart Shipyard Future of Shipyard

In order to preoccupy the future market and achieve sustainable growth, we expedite the building of ‘smart shipyard’. It refers to a digital shipyard innovated with the fourth industrial revolution technology from the conventional shipyard. At the smart shipyard, we can detect issues in advance, capitalizing on automation and intelligence in the heavy and grand nature of the shipyard environment, thereby elevating the efficiency and stability of production management.

KSOE and its shipbuilding subsidiaries are jointly pushing forward the ‘Future of Shipyard (FOS)’, a project to build an unrivaled smart shipyard by 2030. Currently, we are at the stage of building a yard monitoring system, integrated data platform, automation of production performance, and IoT-based factory/process monitoring system. Going forward, we will achieve a practical transformation into a smart shipyard through a step-by-step process to advance the yard layout.



1. CPPS: Cyber Physical Production System

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Ship with Autonomous Navigation Technology

With the influence of advanced ICT technology and innovated logistics, the digital ship market is witnessing the trend of smart ships upgrading to autonomous navigation ships. Autonomous navigation technology is one of the next generation solutions that can dramatically improve various problems such as the discharged pollutants during operation or lowered efficiency based on routes and external environments. Against this backdrop, HHI Group takes the lead in the autonomous navigation sector as the ‘First Mover’ of the industry. In particular, KSOE and its shipbuilding subsidiaries are applying this technology for the first time in the world.

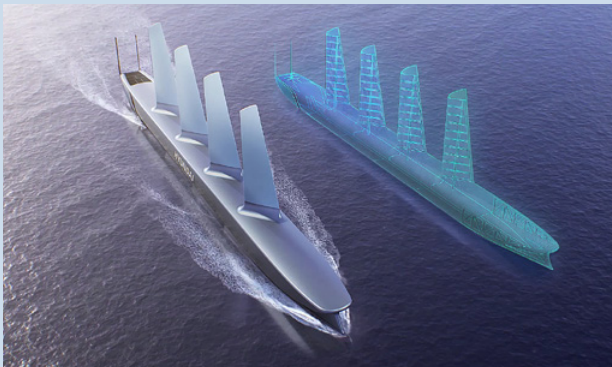
At the demonstration event in Pohang City, we successfully operated a small cruise ship in a fully autonomous mode for the first time in Korea. There was no human intervention in the entire process from the departure to navigation, return voyage and berthing. The ship was installed with Hyundai Intelligent Navigation Assistant System (HiNAS), which navigates the nearby routes based on the augmented reality. Likewise, Hyundai Intelligence Berthing Assistance System (HiBAS) was installed to assist berthing of the ship. Followed by the successful demonstration, HHI Group took another leap by succeeding in autonomous navigation of a large vessel across the ocean for the first time in the industry. The historic event took place in June 2022 as ‘Prism Courage’, SK shipping’s LNG carrier with the size of 180,000 cubic meters (m³) built by HHI, sailed across the Pacific Ocean using autonomous navigation. It took only 5 months to achieve the feat of transoceanic voyage since the ambitious plan was announced last January at CES 2022 in Las Vegas that we would cross the ocean with autonomous navigation within this year. Going forward, we will take the lead in commercializing autonomous intelligent vessels, which are at the center of the shipbuilding industry’s attention.



Digital Twin

Currently, the competition for digital transformation has accelerated in the global industries. Under the circumstances, KSOE and its shipbuilding subsidiaries strive to secure market competitiveness by building a ‘digital twin’ platform for both ships and shipyards. Digital twin refers to the technology that re-creates an object in virtual space, whose physical properties and three dimensional shape are identical to the actual object. Digital twin technology enables the integrated monitoring of real-time events in yards and ships, as well as the prediction and analysis of variable situations by simulating the navigation with the conditions of real-world environment.

Avikus, a subsidiary of HHI Group in charge of autonomous navigation technology, successfully demonstrated the commissioning of an autonomously navigated passenger ship in a virtual space with digital twin technology together with KSOE. The commissioning in the virtual space allows the simulation in extreme conditions that cannot be experienced in the real world. The commissioning period at sea can also be shortened, leading to the reduction of costs by up to 30%. The virtual commissioning demonstration was all the more meaningful as it enabled us to check not only autonomous navigation but the stability of the sailing, which was previously limited to marine engine checks.



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DT Technology Development Roadmap

With an aim to raise the efficiency and safety of shipbuilding, we converge the top-notch shipbuilding technology in the world with ICT capabilities. We have set out and implemented a detailed roadmap to build a smart shipyard, such as 'Visible Shipyard', 'Connected, Predictable, and Optimized Factory', and 'Connected, Predictable, and Optimized Factory'. On top of that, we put spurs to the development of 'smart ships applied with an intelligent navigation system', moving up the commercialization of smart ships. Through these endeavors, we will take the lead in the digital ship era and establish ourselves as a high-quality shipyard in the near future.

Roadmap of DT Technology Development

Short-term : '22~'24 Mid-term : '25~'27 Long-term : '28~'30

Classification	Unrival Technologies	Major Goals and Directions	Roadmap	
Smart Yard	Digital twin yard	<ul style="list-style-type: none">Build the digital twin yard based on production performance and simulationMaximize productivity through the optimal operation of resources based on simulation and AI	Short-term <ul style="list-style-type: none">Develop simulation-based integrated yard operation system	Mid-term <ul style="list-style-type: none">Develop integrated AI-based autonomous yard operation system
	Intelligent automation	<ul style="list-style-type: none">Establish the tip-topmost shipyard by developing and actively applying intelligent production automation system	Short-term <ul style="list-style-type: none">Weld automation based on the intelligent robot / carriage	Mid-term <ul style="list-style-type: none">Painting automation based on the intelligent robot
Smart Ship	Autonomous navigation	<ul style="list-style-type: none">Lead the autonomous navigation ship market and related technology by commercializing the autonomous navigation ship solutions	Short-term <ul style="list-style-type: none">Demonstrate autonomous navigation of whale watching shipsCommercialize autonomous navigation solutions (minimum number of crews / remote control)	Long-term <ul style="list-style-type: none">Commercialize fully autonomous vessels (zero crew / remote control)
	Digital twin ship	<ul style="list-style-type: none">Secure engineering competitive edge through virtual digitalization of ships and promote new businesses such as life-cycle digital twin management solutions for ships	Short-term <ul style="list-style-type: none">Commercialize LNGC virtual commissioning solutions	Mid-term <ul style="list-style-type: none">Commercialize life-cycle digital twin ships

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STORY#4

Navigating toward ‘FutureBuilder’ beyond No.1 Shipbuilding and Offshore Engineering Company in the World

KSOE and its shipbuilding subsidiaries will become a ‘FutureBuilder’ contributing to the growth of humanity and the world, beyond being a ‘Shipbuilder’ manufacturing green and digital ships. We will further set spurs to the offshore hydrogen infrastructure, taking the lead in the transition into green energy.



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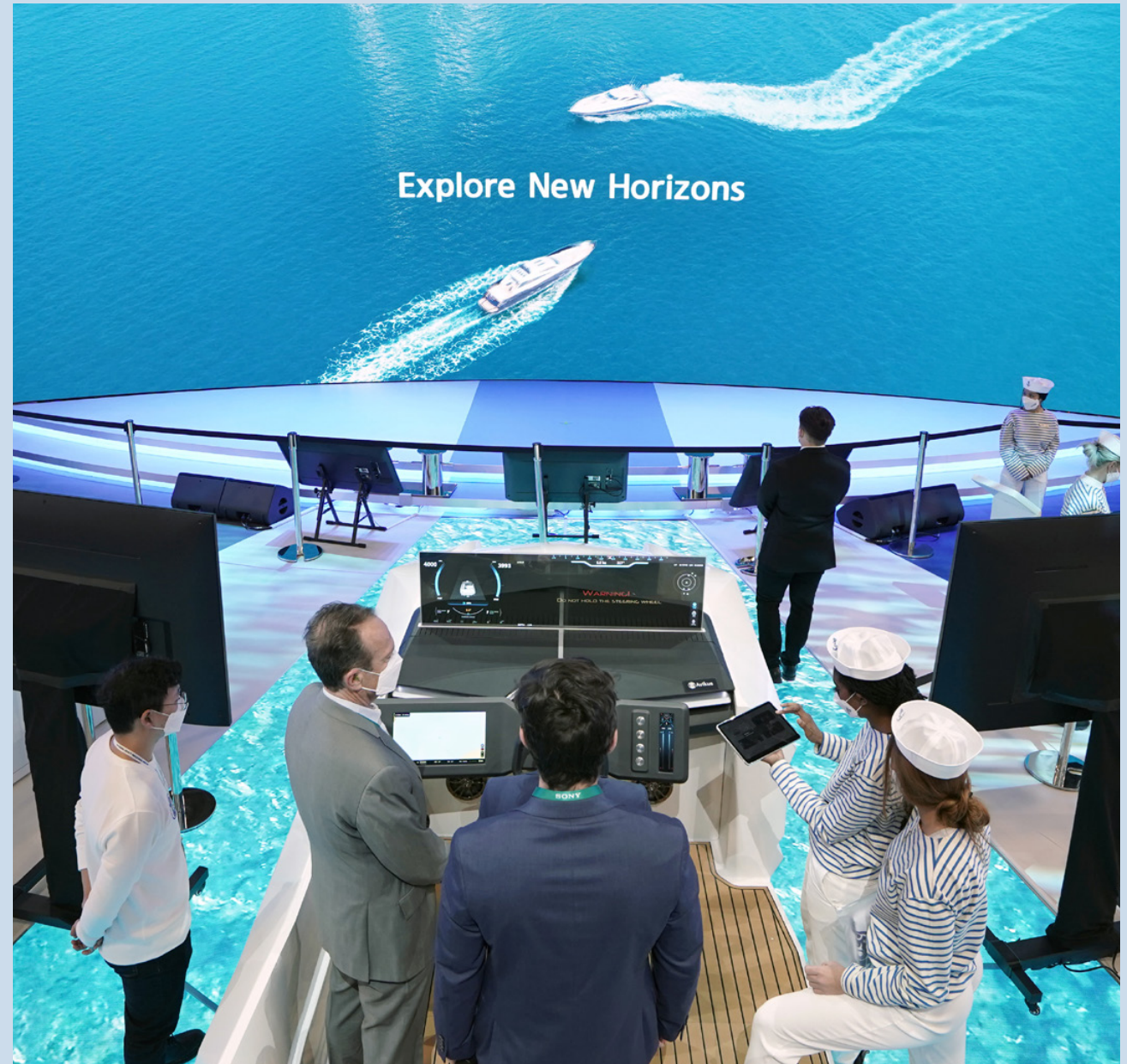
STORY#04

We're a FutureBuilder

KSOE and its shipbuilding subsidiaries will usher in the new era as a 'FutureBuilder', conveying new values to humanity on the foundation of 'green' and 'digital' innovation we have demonstrated earlier.

Participation in 'CES 2022' as the First Step

The first step we took as a 'FutureBuilder' was participating in 'CES 2022' to showcase our technological competitiveness in the shipbuilding and offshore sector to the world. At the venue where all the top-tier technologies gather, we unveiled our future competitive edge in the maritime mobility field, including autonomous navigation technology, liquefied hydrogen carriers, and propulsion system technology, and intelligent robotics and solution technology with HHI Group affiliates.



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Sustainable Future with Green Offshore Platform

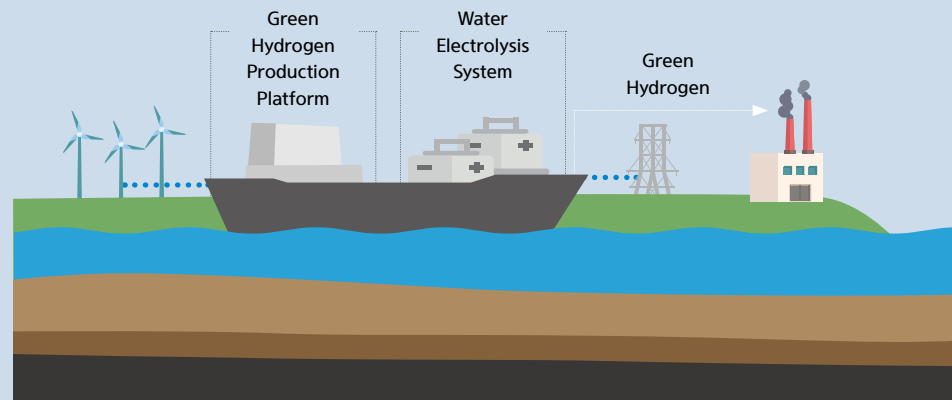
HHI Group declared group-wide 'hydrogen value chain' in 2021, establishing the 'Hydrogen Dream 2030' roadmap. The hydrogen value chain refers to the production of hydrogen from the ocean followed by its transportation by ship, realizing the 'Hydrogen Dream' as a business chain. Amid the paradigm shift toward a hydrogen society, we take the lead in establishing the hydrogen value chain as a shipbuilding and offshore engineering company.

The hydrogen value chain starts from the 'sea'. HHI Group will build the hydrogen value chain encompassing the entire areas including the green hydrogen production on the ocean, and land transportation, and utilization on fuel cells by garnering all our capabilities at the group level. KSOE and its shipbuilding subsidiaries will take a critical role in hydrogen production and transport on the basis of the world's best shipbuilding and offshore plant technologies.

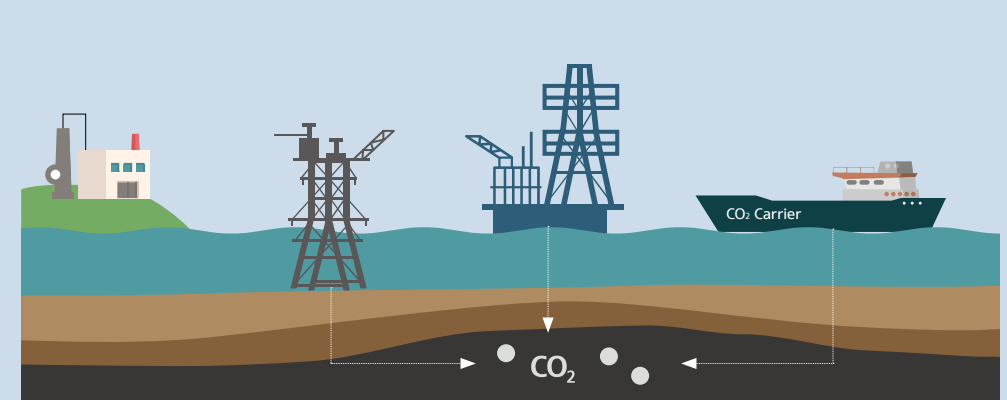
We aim to develop our own 1MW water electrolysis system, followed by securing core technologies and demonstrating the technologies by 2026. Then the following objective is to carry out the business of the water electrolysis and the green hydrogen production platform starting from 2027. In addition, we are in the process of developing the basic design of a berthing-type hydrogen production platform model to connect it with renewable energy sources and efficiently use the utilities available on land. We are also designing the storage and conversion system to seamlessly supply the produced green hydrogen to the customers while developing liquefied hydrogen carriers that can transport hydrogen worldwide.

We also make all-out efforts to develop a 'CCS platform', one of the key infrastructures of blue hydrogen. According to International Energy Agency (IEA), Carbon Capture and Storage (CCS) technology is essential to realize carbon neutrality and more than 20 CCS projects are expected to be launched annually by 2060. The function of a CCS platform is to store captured CO₂ below the ocean floor by liquefying it with high pressure. Together with HHI, KSOE acquired Approval in Principle (AIP) in August 2021 for the offshore platform technology that liquefies CO₂ captured on land and stores it under the sea by injection through carriers or pipelines. On top of that, we are designing a CO₂ storage platform for the waste gas field in the East Sea with an annual capacity of 0.4 million tons, which is scheduled to be operated as a national project from 2025. Through these endeavors, we provide to the market not only the 'maritime mobility solution' for transporting captured carbon but also the 'offshore platform solution' for its storage based on our top-notch prowess, thereby creating another environmental value.

Green Offshore Platform (Hydrogen Production)



Green Offshore Platform (Carbon Capture and Storage, CCS)



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HHI Group’s 2030 Hydrogen Dream

In the vortex of transition from a carbon economy to a hydrogen economy, we will further solidify our position as ‘the world’s top shipbuilding and offshore engineering company’. HHI Group was able to establish the group-wide ‘Hydrogen Dream 2030 Roadmap’ on the foundation of outstanding capabilities and technological prowess of each affiliate which are sufficient to build its own hydrogen value chain. As a shipbuilding subsidiary of HHI Group, we will lead the hydrogen market by developing offshore green hydrogen infrastructure and hydrogen carriers based on the best shipbuilding and offshore technologies. Aiming to make a ‘clean ocean’ led by our commitment toward the hydrogen era, we will garner all our capabilities in technological innovation.

HHI Group’s Hydrogen Economy Value Chain

Shipbuilding & Offshore Engineering Area			Group
 Offshore Power Generation	 Hydrogen Production Infrastructure	 Hydrogen Transport	 Hydrogen Utilization (fueling station, construction equipment, etc.)
 Offshore New Renewable Energy Generation <ul style="list-style-type: none">• Build an infrastructure for green hydrogen production from water electrolysis using renewables such as wind power	 Offshore Green Hydrogen Production <ul style="list-style-type: none">• Develop a source technology for highly efficient water electrolysis system jointly with a domestic research center• Converge offshore plants with water electrolysis technology and develop offshore green hydrogen production plant	 Hydrogen Transport <ul style="list-style-type: none">• Obtain AIP for the basic design of liquefied hydrogen carriers• Promote the development of international standards for hydrogen ships• Develop the liquefied hydrogen cargo technology• Demonstrate the hydrogen carriers	 Hydrogen Utilization <ul style="list-style-type: none">• Secure 180 hydrogen fueling stations• Demonstrate the hydrogen construction equipment (excavator, forklift, etc.)

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FutureBuilder

We're a FutureBuilder

“ For the humanity to enjoy continued growth and progress, we need to have a radical change on how we work, use resources, power industries, and manage the impact of all that we do on this planet. Our answer is to lead that change to our own transformation. For the next 50 years, we will become the world’s foremost ‘FutureBuilder’ with a new vision for a different kind of growth that is more sustainable, more intelligent, and more inclusive. ”

Quoted from the comment of Chung Ki-sun
CEO of HD HYUNDAI and KSOE, at CES 2022

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ESG Vision System

KSOE and its shipbuilding subsidiaries put ESG management front and center when running our core businesses including eco-friendly shipbuilding, offshore engineering, and engine and machinery. To this end, we have set up our ESG slogan as ‘Toward Eco-Ocean with Green Wave’, and produced detailed action plans, implementing them step by step.

ESG Vision House

ESG Slogan

Toward Eco-Ocean with Green Wave



Green
Environment



Sustainable
Society



Responsible
Governance

Key Tasks

Environmental Management

Strengthen our environmental management system
Spur R&D to secure unrivaled eco-friendly technologies

Social Responsibility

Reinforce human rights management
Promote social value creation

Ethical Management

Advance ethical management

Environmental Performance

Strengthen environmental impact management
Step up environmental communication

Responsible Management

Facilitate Health and safety management activities
Responsible supply chain management
Reinforcement of Employee Rights Protection

Governance

Protect the rights of shareholders
Expand the scope of data disclosure
Advance operation of the BOD

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Group ESG Governance System

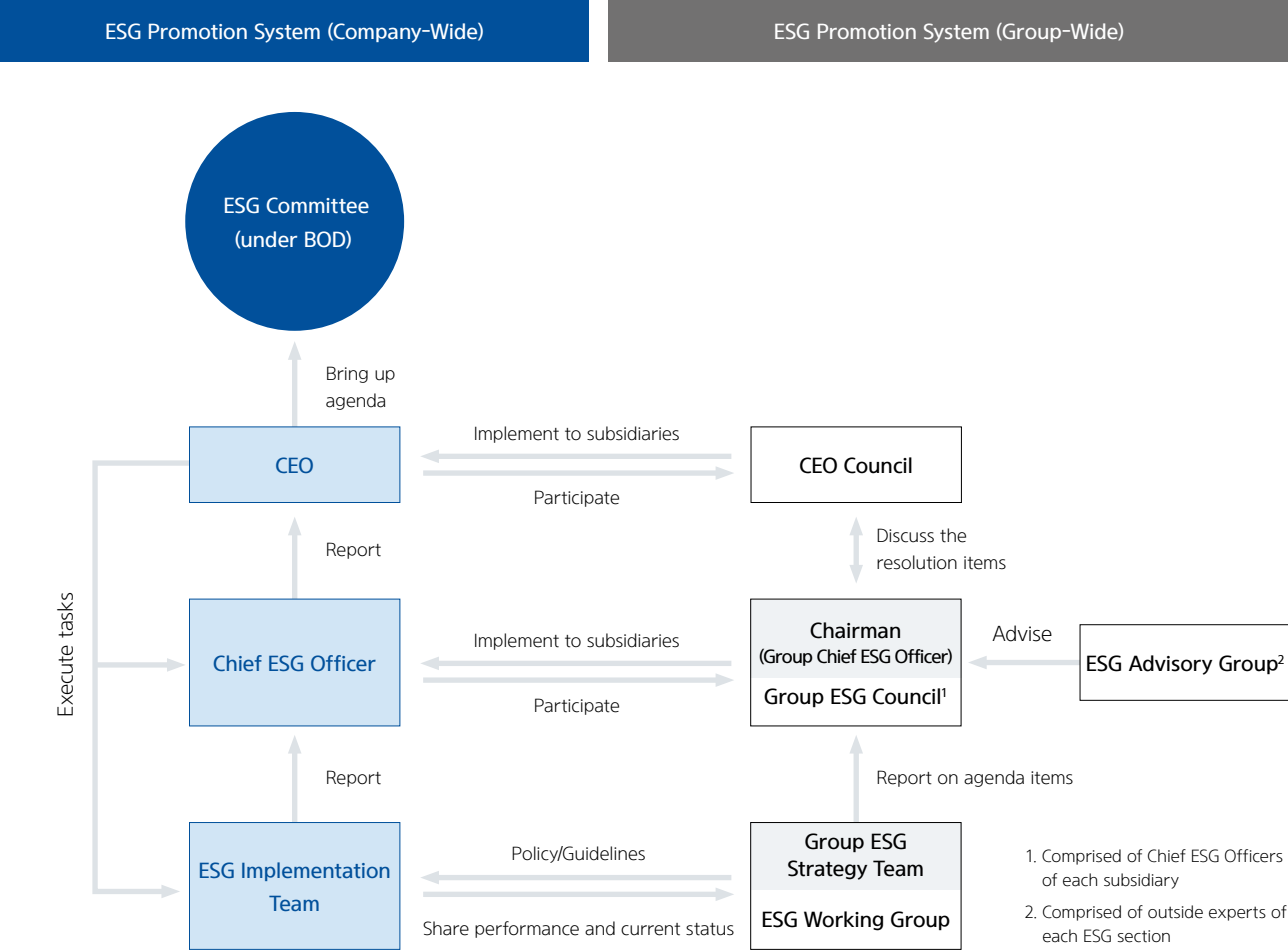
HHI Group has formed a Group-level ESG governance system, which includes the Group ESG Council that consists of Chief ESG Officers of each subsidiary, ESG Working Group that administers the group’s ESG business affairs; and ESG Advisory Group comprised of outside experts. KSOE and its shipbuilding subsidiaries have their own ESG implementation teams, as well as ESG Committee under the BOD.

ESG Issue Sharing and Decision-making System

With an aim to discuss comprehensive ESG policies and effectively talk about ESG key agenda items, HHI Group operates a group-level ESG decision-making system. KSOE and its shipbuilding subsidiaries develop appropriate policies and countermeasures while promptly identifying ESG issues through the ESG decision-making system.

Report on Agenda	Report ESG agenda items and key issues for the Group
Deliberate on Agenda	Discuss ESG agenda and counterplans for the issues
Seek Consultation	Seek advice from outside experts on the ESG agenda items and other matters
CEO Council	Discuss policy decisions and review the implementation plan for subsidiaries
Execute Tasks	Manage implementation of tasks for ESG teams in the subsidiaries and achievements of ESG departments for subsidiaries

ESG Governance



1. Comprised of Chief ESG Officers of each subsidiary
2. Comprised of outside experts of each ESG section

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ESG Governance System Operation

ESG governance system operation indicates KSOE and its shipbuilding subsidiaries established the system not only for the maintenance of itself but for significant action.

Operational Direction of ESG Committee

Purpose of the Committee	Authority
Decide on the company's ESG strategy direction, plans, and implementation	Deliberation and resolution on the following items 1. Implementation of the company's ESG strategic direction plans 2. Deliberation on the items related to the company's social responsibility 3. Items required for the company's ESG capacity-building and internalization 4. Items in relation to sustainable management submitted by other committees

Performance of ESG Committee by Each Company

Classification	Date of Meeting	Agenda Items	Vote Result
KSOE	Apr. 28, 2021	(Motion) Appointment of ESG Committee Chair (Report) Plans for ESG task promotion	Approved -
	Oct. 28, 2021	(Report) Plans for ESG vision establishment and major plans for the 4th quarter	-
HHI	Apr. 22, 2021	(Motion) Appointment of ESG Committee Chair (Report) Plans for ESG promotion	Approved -
	Dec. 06, 2021	(Report) Plans for ESG operation in 2022	-
HMD	Apr. 27, 2021	(Motion) Appointment of ESG Committee Chair (Report) Plans for ESG task promotion	Approved -
	Jul. 20, 2021	(Report) ESG performance of the first half of 2021 and plans for the second half of the year	-
	Oct. 27, 2021	(Report) ESG performance of the third quarter and future plans	-
HSHI	Apr. 27, 2021	(Motion) Appointment of ESG Committee Chair (Report) Plans for ESG promotion	Approved -
	Dec. 09, 2021	(Report) Plans for ESG promotion in 2022	-

Group ESG Council Operation

Committee Meeting	Date of Meeting	Major Discussion Items	Attendance
2021 the 1st ESG Working Group	Jun. 03, 2021	• Ways to reinforce environmental organizations • Implementation plans for climate change initiatives • Key activities and promotion plans related to ESG management for supply chain • Human resources and organizations for enhancing ESG management	14
2021 the 1st Group ESG Council	Jul. 08, 2021	• ESG status of each subsidiary and major plans for the second half of the year • Listening to opinions on Group's ESG vision • Plans to reinforce environmental organizations to respond to climate change • Ways to enhance ESG management for supply chain	13
2021 the 2nd ESG Working Group	Dec. 02, 2021	• Response plans for the revised standards and guidelines (GRI Standards, KCGS Standards, etc.) • Plans for the integrated report for 2022 • Informing and hearing opinions on the scheduled ESG tasks for each subsidiary in 2022	18
2022 the 1st Group ESG Council	Mar. 18, 2022	• Sharing best practices regarding ESG management internalization • Introducing the major execution plans of each subsidiary in 2022 • Sharing the major execution plans of the Group in 2022 - Establishing the response strategies against climate change - Reinforcing human rights management - Setting KPIs for ESG	16
2022 the 1st ESG Working Group	Apr. 20, 2022	• Status of promoting human rights management and listening to opinions • Sharing the progress and hearing opinions on ESG management promotion for supply chain and listening to opinions • Enhancing the external ESG communication and sharing the regarding activities • Plans to strengthen the disclosure of non-financial information at the group level	21

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Stakeholder Engagement

Stakeholder	Key Issue and Area of Concern	Key Communication Channel	Main Activity
 Customer	<ul style="list-style-type: none">Sharpening product and technology competitivenessDeveloping green and high value-added productsEnhancing product quality and safetyRaising quality satisfaction	<ul style="list-style-type: none">Fair· exhibition · forumOverseas branchesSales meeting and visit to clientsCustomer satisfaction survey	<ul style="list-style-type: none">Participating in fairs, exhibitions, and technology forumsVisiting customer companies and pitching technologiesAdvancement of customer satisfaction managementReinforcement of initial equipment / technology risk management
 Shareholder & Investor	<ul style="list-style-type: none">Elevating shareholder valueAchieving stable business performanceManaging business opportunities and risksTransparent governance	<ul style="list-style-type: none">Shareholders’ meetingCompany presentationDisclosure and release on the websiteInvestor presentation and conference call	<ul style="list-style-type: none">Quarterly earnings presentation and IR materials releaseIR activities for analysts and institutional investorsKey data disclosure regarding the BOD’s decisions or orders wonCorporate governance report publication
 Employee	<ul style="list-style-type: none">Fair evaluation and compensationEnhancing benefitsEmployee capacity buildingVitalizing labor-management relations and communicationSharing the company management situationOperation of safe workplace	<ul style="list-style-type: none">Labor-Management CouncilGrievance handling and reporting systemIntranet and in-house newsletterIn-house CATV broadcastingMeeting with the managementManagement status briefing	<ul style="list-style-type: none">Labor-Management Council quarterly heldCEO meetingCompany magazine and webzineOperation of the communication channels through intranetCreation and operation of the Human Rights Management CommitteeOperation of talent development programs
 Partner Company	<ul style="list-style-type: none">Promoting co-prosperity activitiesReinforcement of fair tradeSupport for capacity building of partner companiesSharing market information and vitalizing communication	<ul style="list-style-type: none">Meetings with partner companiesRegularly listening to VOCsOnsite interview with partner companiesOperation of the Co-Prosperity CouncilUnfair trade counseling counter for partner companies	<ul style="list-style-type: none">Operation of HIPRO, the integrated procurement systemAssisting with online and offline education and training connecting to jobsFinancial support for partner companiesTechnical protection supportQuality evaluation and technical guidance for suppliers
 Government / National Assembly	<ul style="list-style-type: none">Law revision issuesSafety and labor issuesGovernment event participation and supportSupport for industry and corporate informationRegional economic pending issues	<ul style="list-style-type: none">Visiting the National Assembly and government ministriesNational auditEngagement in economic group activitiesPolicy meetingLocal government council	<ul style="list-style-type: none">Frequent meetings with relevant standing committees and institutionsParticipation in regular national audits and nonscheduled hearingsParticipation in major seminars and forums of economic groupsEngaging with local councils and communicating with civic groupsProvision of external organization surveys and requested data
 Local Community	<ul style="list-style-type: none">Vitalizing local communitiesIncreasing business attraction and recruitment in the regionProtecting and improving the environment of local communitiesSocial contribution activities centering around communityCommunication with the local community	<ul style="list-style-type: none">Local government councilVisiting local public institutionsMeetings with local community voluntary groupsLocal community events	<ul style="list-style-type: none">Employee participation-type social contribution such as volunteer activitiesFormulation and participation in community councilsOperation of local community talent nurturing programsInvestment support for community growthSupport and engagement in local community events
 Press & Media	<ul style="list-style-type: none">Business performance and industry issuesKey issues across the companyCompany’s main business direction	<ul style="list-style-type: none">Press releaseHomepage media centerPress meeting	<ul style="list-style-type: none">Timely provision of press releasesSupport for reporters with their workHolding reporter meetings

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Double Materiality Assessment

KSOE and its shipbuilding subsidiaries annually conduct materiality assessments to reflect the opinions of domestic and overseas key stakeholders and to identify main topics for sustainable management. The materiality assessment used in KSOE Integrated Report 2021 is in accordance with the global guidelines and frameworks, such as GRI, SASB, and TCFD, as well as ESG indicators included in domestic and overseas initiatives. Based on the media research and perception survey on the investor and industry groups, we have assembled a pool of issues consisting of 17 topics. In particular, we carried out the double materiality assessment, which incorporates the concept of double materiality into the Materiality guidelines in GRI Standards. Double materiality is a process for topic identification that reviews business impacts on the corporate value and finance from an external perspective as well as environmental and social influence. This assessment leads to a better understanding of our stakeholders’ requirements, followed by relevant application on our Integrated Report and ESG management.

Double Materiality Assessment Process

STEP 1. Identify ESG issues and form a pool of issues	STEP 2. Identify the scope and affected period of the impact	STEP 3. Conduct double materialiy assessment	STEP 4. Assign priorities to the issues
<p>To manage internal and external issues regarding sustainable management, KSOE and its shipbuilding subsidiaries analyzed the requirements for external information disclosure and rating indicators, and assembled a pool of issues to set up our future management policy.</p> <p>On the basis of GRI (Global Reporting Initiative), the global standards for sustainability reporting, we unpacked domestic and overseas standards for sustainable management, removed overlapping topics, and then selected 17 material topics.</p> <p>Analysis of sustainable management standards and ESG rating indicators</p> <p>GRI, ISO 26000, TCFD, SASB, UN SDGs, KRX, MSCI, Sustainabilitys, DJSI, ISS, CDP, KCGS, etc.</p> <p>Analysis of the issue pool of KSOE and its shipbuilding subsidiaries</p> <ul style="list-style-type: none">• Data analysis (internal materials, Annual Report, business strategy system, investment reports, etc.)• ESG TF interviews (ESG-related key issues and status, ESG risks, etc.)	<p>We broke down 17 selected issues by the scope and affected period of the impact</p> <p>Scope</p> <ul style="list-style-type: none">• Direct impact: Business operations having a direct impact• Induced impact: Business operations inducing other organizations (suppliers, customers, etc.) to conduct related activities• Chain impact: Impact made by business relationship, not by direct business operations <p>Affected period</p> <ul style="list-style-type: none">• Identification of the period in which each topic is substantially affected by business operations	<p>To conduct the double materiality assessment, we took two-pronged approach: Financial Materiality (Outside-In) and Impact Materiality (Inside-Out). We surveyed external investor groups and in-house experts to review Financial Materiality. Another survey was taken on ESG experts and in-house Working Group to review Impact Materiality.</p> <p>Financial Materiality (Outside-In) Analysis (X-axis)</p> <p>In order to analyze the impact of external factors on corporate value and finance, we reviewed financial impact, regulations and policies, industrial trend, reputation, economic opportunities, and other relevant data.</p> <ul style="list-style-type: none">• Survey period: March 30, 2022 ~ April 06, 2022• Subject: Internal and external financial groups (financial/investment institutions affiliated with the company, in-house finance administrators, etc.)• Questionnaire: Financial materiality for each topic (financial impact, regulations and policies, industrial trend, reputation, economic opportunities) <p>Impact Materiality (Inside-Out) Analysis (Y-axis)</p> <p>In order to analyze the impact of the company’s business activities on the environment and society, we reviewed the impact’s chance of occurrence, magnitude, and resilience.</p> <ul style="list-style-type: none">• Survey period: March 24, 2022 ~ March 30, 2022• Subject: ESG Working Group and ESG expert groups of KSOE and its shipbuilding subsidiaries• Questionnaire: Impact materiality for each topic (occurrence, magnitude, resilience, etc.)	<p>We assigned priorities by incorporating our environmental and social materiality with the opinions of internal and external stakeholders. Third-party assurance was conducted for reliability.</p> <p>Prioritization</p> <p>We have set order of priority for 17 topics based on comprehensive evaluation of Financial and Impact Materiality.</p> <p>Third-party Assurance</p> <p>The reporting content was verified by a third-party agency (LRQA Korea) to secure reliability and transparency.</p>

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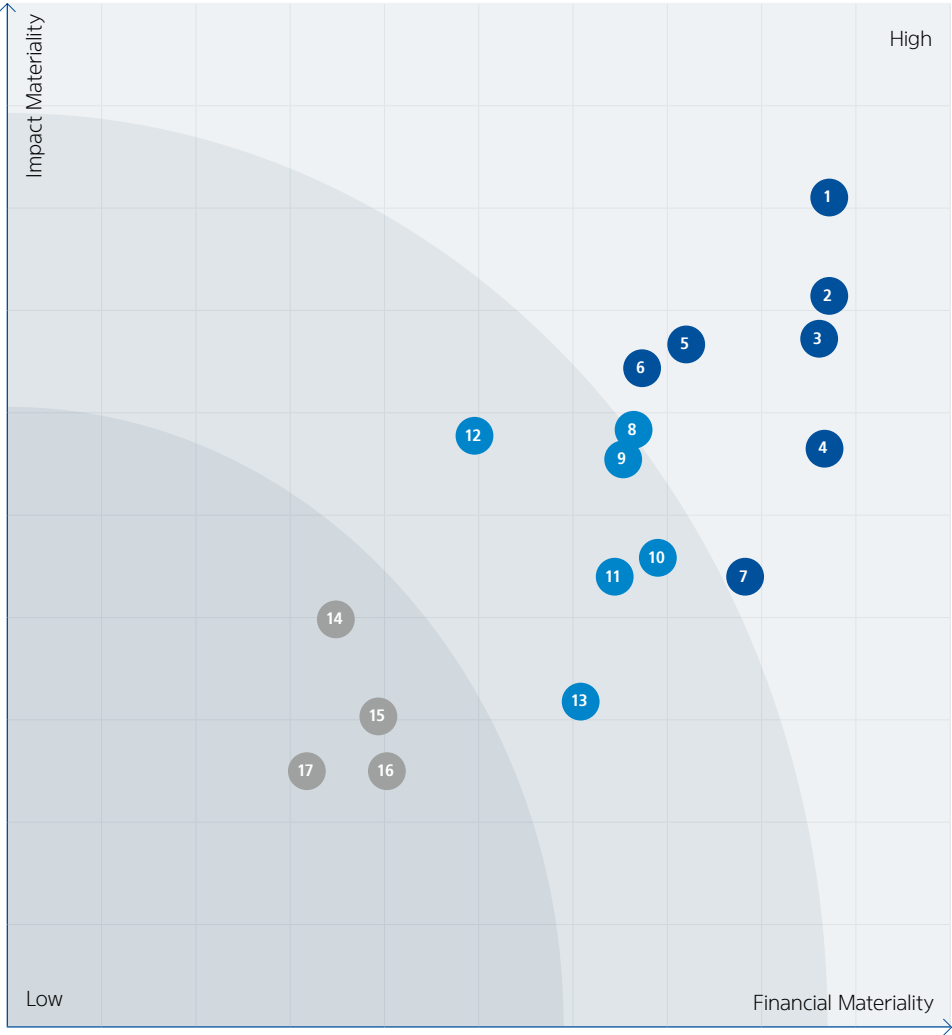
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Double Materiality Assessment

Double Materiality Assessment Matrix



Result Application

The issues of 'Occupational safety and health', 'Development of green digital technology', and 'Clean technology' were selected as crucial topics for the sustainable management of KSOE and its shipbuilding subsidiaries in 2021. The rank was followed by the issues of 'Establishment of a hydrogen value chain', 'Expansion of ESG management', and 'Response to climate change'. Through the assessment, we confirmed the stakeholders' expectation and social demand on climate change response and reinforced ESG management as well as workplace safety and sustainable business technologies.

17 topics in the table below were used to build strategies for ESG management promotion along with the analysis on ESG risks and opportunities. Detailed activities of KSOE and its shipbuilding subsidiaries in relation to 17 sustainability management topics can be found in the sections of 'Sustainable Value Story', 'Focus Area', and 'Fact Book'.

Results of Double Materiality Assessment

Rank	Topic	Impact Identification			Timing of Impact		Financial Materiality	Impact Materiality	Report Page
		Direct	Inducing	Linked	Current	Potential			
1	Occupational safety and health	●	●		●		4.13	4.03	66-69, 114-121
2	Development of green digital technology	●	●		●	●	4.13	3.84	41-44
3	Clean technology	●			●		4.10	3.78	34-39
4	Establishment of a hydrogen value chain	●	●		●	●	4.13	3.58	36
5	Expansion of ESG management	●			●		3.85	3.77	52-53
6	Response to climate change	●	●	●	●	●	3.75	3.73	58-65
7	Governance	●			●		3.95	3.37	125-133
8	Integrated risk management	●			●		3.73	3.60	60-62, 139
9	Supply chain management		●		●		3.73	3.58	75-79, 122
10	Client satisfaction	●			●		3.78	3.4	82
11	Ethics and integrity	●			●		3.70	3.37	134-138
12	Employment and labor relations	●			●		3.43	3.62	72-74, 102-107
13	Human rights management	●	●		●		3.63	3.15	70-71, 112-113
14	Pollutants and waste	●			●	●	3.15	3.30	96-101
15	Local communities		●	●		●	3.23	3.13	25, 84-86, 123
16	Resource circulation and recycling	●			●		3.25	3.03	100
17	Water management	●			●		3.08	3.03	96-97

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FOCUS ISSUE Climate Change Response

Demand for Carbon Neutrality from the International Community

Climate change is no longer a looming threat but an urgent issue confronting all mankind. There is a growing demand for carbon neutrality from the global community and large financial institutions. Moreover, global investors and major pension funds has declared the suspension of investment in corporations that do not actively respond to climate change. Carbon neutrality is not just about GHG emissions mitigation. It means a state of net-zero GHG emissions achieved by absorbing the same amount of GHG emitted in the course of business activities. KSOE and its shipbuilding affiliates are keenly aware that the rapid transition to carbon neutrality, the integral key to tackle climate change, will decide the sustainable survival of companies. Going forward, we will establish our strategies and risk management policies to combat climate change, and put them into action, thereby joining the global efforts to reach net-zero.



Turning Climate ‘Crisis’ into ‘Opportunity’

In the face of the growing demand for carbon neutrality and more stringent regulations on GHG emissions, KSOE and its shipbuilding subsidiaries have embarked on our journey toward net-zero, regarding the environmental change as an opportunity. Taking advantage of our outstanding shipbuilding and offshore engineering technologies as well as 50 years of experience in this field, we have been working on the development of low-carbon and zero-carbon fuel propulsion ships, and R&D activities to commercialize vessels with high energy efficiency. All-out efforts are being made to reduce GHGs emitted not only from our products but also manufacturing facilities. Furthermore, we always strive to improve energy efficiency of the equipment and facilities on the shop floor, and boost the use of new and renewable energy sources. The transition of our manufacturing sites to a smart shipyard by 2030 through FOS (Future of Shipyard) project is part of the effort along with establishment of green and low-carbon shipyard. In addition, we are working with our key suppliers and partner companies including steel or paint industries, as well as our own clients, to cut down on GHG emissions from the entire shipbuilding life cycle.

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Governance for Climate Change Response

Roles of Board of Directors

KSOE and its shipbuilding subsidiaries operate the ESG Committee under the supervision of the BOD. The ESG Committee assumes the roles of formulating mid- to long-term strategies for climate change response and managing relevant activities. The chief ESG officer monitors the company’s climate change response and reviews the performance status, reporting the results to the BOD.

ESG Committee Establishment and Its Climate Change Response Roles

Committee	Composition		Authority
ESG Committee	Internal director	Ka Sam-hyun	Deliberate and resolve followings: ① Establishment and implementation of climate change response strategies
	Outside director	Choe Hyuk (Chair) Lim Suk-sig Jo Young-hee	② Company’s environmental responsibility-related matters ③ Assistance required for climate change response capacity building and internalization ④ Climate change response-related matters that need deliberation delegated from other committees

ESG Committee’s Activities for Climate Change Response

Committee	Date of Convocation	Agenda Item
ESG Committee	April 28, 2021	• Report on ESG management execution plan - ESG management roadmap for the establishment of climate change response disclosure system
	October 28, 2021	• Report on key business plans for the 4th quarter - Formulation of strategies and plans to combat climate change

Roles of the Management and Working Group

The roles of the management have grown in importance to build strategies for climate change response and manage the implementation. KSOE and its shipbuilding subsidiaries manage climate change response activities by setting roles of the management and working group.

We established the Group ESG Council comprised of Chief ESG Officers of each subsidiary, which is responsible for strategy establishment and performance monitoring.

We also have ESG Working Group under the Group ESG Council. The ESG Working Group assumes the roles of executing strategies and discussing detailed implementation plans. It also makes discussions on the formulation and promotion of ESG management strategies to produce agenda items to be reported to the Group ESG Council.

The climate change response issues discussed at the Council are reported to Chief ESG Officers, CEOs and the ESG Committees of each subsidiary in accordance with the procedure along with its implementation status and results.

Group ESG Council’s Activities for Climate Change Response

Name	Date of Convocation	Key Agenda Items Discussed	Number of Attendees
1st ESG Working Group meeting in 2021	June 03, 2021	• Measures to ramp up the roles and duties of the environmental organization • Action plans for climate change-related initiative	14
1st Group ESG Council meeting in 2021	July 08, 2021	• Plans for the reinforcement of the environmental organization to combat climate change	13
2nd ESG Working Group meeting in 2021	December 02, 2021	• Share the tasks delivered by the Group ESG Council and making discussions	18
1st Group ESG Council meeting in 2022	March 18, 2022	• Share the best practices of ESG management internalization • Share and discuss the plan for the climate change response establishment - Come up with climate change response strategies - Make discussions on needs and directions to set up ESG KPIs	16
1st ESG Working Group meeting in 2022	April 20, 2022	• Strengthen external communication in regard to ESG issues • Plans to step up our response to non-financial data disclosure	21

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Climate Risk and Opportunity Analysis

Climate change may pose a threat to a company, incurring a great deal of social and economic costs. The absence of proactive response may lead to irreversible asset losses. Accordingly, KSOE and its shipbuilding subsidiaries classified transition risks according to their impact level and affected period¹, and identified threats and opportunities, thereby establishing the preemptive response strategies. On the basis of the systematic strategies, we will turn the climate crisis into opportunity.

1. Short-term (within 5 years), mid-term (between 5 to 10 years), long-term (after 10 years)

Transition Risk

Risk Area		Threats	Opportunities	Financial Impact	Affected Period
Regulation	Increase in carbon tax and carbon pricing	• Increase in procurement costs of energy, materials and GHG emissions credits	• Transition to green and high-efficiency equipment in order to reduce operational costs and improve production efficiency	High	Short-, mid-, and long-term
	More stringent regulations on GHG emissions	• Increase in technology and product development costs due to the tightened global regulations (IMO, EU, etc.), and changing customers' demand	• Rising number of orders for green, high value-added vessel with high efficiency owing to the growing demand to replace outdated ships	Medium	Short-term
Market	Energy source change	• Sales decrease in fossil fuel carriers • Decline orders for offshore plants	• New energy source (hydrogen, CO ₂ , etc.) • New business portfolio expansion	High	Mid- and long-term
	Rapidly changing demand for shipbuilding	• Increase costs of low-carbon and zero-carbon vessel development	• Increase orders for low-carbon and zero-carbon vessels	High	Short- and mid-term
	Pressure for green production	• Grow demand for the mitigation of GHGs emitted in the course of production, and rising demand for the use of eco-friendly raw materials	• Rising demand for new and eco-friendly manufacturing technologies	High	Short-term
Technology	Growing demand for technology advancement	• Increase investment amount required to sharpen technologies	• Increase sales due to the transition to high-efficiency vessels and low-emission ships	Medium	Short-term
	Growing need for next generation technology development	• Increase development costs • Decrease market share due to the delay in new technology development	• Enter the low-carbon market and proactively securing market share • Expand the scope of new business portfolio	High	Short- and mid-term
Reputation	Changing stakeholders' demand	• Rising costs in responding to global initiatives and complying with the policies of investment institutions	• Sharpen competitiveness of winning orders by gaining an eco-friendly reputation	Medium	Short- and mid-term

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Physical Risk Identification

The rising frequency of extreme weather events, such as scorching heat, floods, and forest fires, comes with the growing concerns over physical risks leading to companies’ material losses. We have a high risk of directly sustaining damage done by weather and climate disasters, such as typhoon, tsunami, and flooding, owing to the location of our business sites adjacent to the ocean. The first damage would be productivity decrease, which could be followed by the second damage, project delay. In response, KSOE identified potential negative impacts that the climate disasters may have on our business sites in Ulsan based on the findings of the research¹ conducted by Ulsan Research Institute (URI).

The risk evaluation shows that the Ulsan region has the highest risk of river overflow and flooding, and facility damage caused by typhoons and heavy rains. If the climate disasters incur the loss of life and property, it may have a direct impact on the reputation or finance of a company. Accordingly, KSOE and its shipbuilding subsidiaries plan for preemptive risk management in response to the changing business environment and to reduce risk possibility.

1. Quoted from Research on climate disaster risk reduction through risk evaluation (URI, 2021-04); some of the factors adjusted to the shipbuilding industry

No.	Type of disaster	Affected area	Review of vulnerability	Possible event occurrence	Damage	Risk evaluation results
1	Typhoon - heavy rainfall	Stream	River flood	Overflow	Human and property damage	Extremely high
2	Typhoon - heavy rainfall	Business site	Poor drainage	Flooding	Human and property damage	High
3	Typhoon - strong wind	Business site	Facility loss	Damage to ship	Property damage, project delay	High
4	Typhoon - strong wind	Business site	Facility loss	Damage to structure	Property damage, project delay	Medium
5	Typhoon - tsunami	Coast	Low-lying ground	Flooding	Human and property damage	Low
6	Sea level rise	Coast	Lack of response facilities	Erosion, loss	Property damage	Medium
7	Heavy snowfall, cold wave	Road transportation	Vehicle traffic	Accident	Human damage	Low



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Climate Change Risk Response Strategy

In response to the risks posed by climate change, KSOE and its shipbuilding subsidiaries have established and implemented three strategies: Green Product.

Green Product

In an effort to mitigate GHGs emitted from the operation of ships, KSOE and its shipbuilding subsidiaries are concentrating all our R&D capabilities on the development of Green Product, such as low-carbon and zero-carbon ships.

In preparation for the era of zero-carbon vessels, we are making all-out efforts to develop technologies that advance LNG DF vessels and reduce methane slip, based on which we will comply with the marine environmental regulations and drive the step-by-step transformation into the next generation vessels that fit into an eco-friendly era. We are also putting spurs to the development of HiMSEN DF engine and fuel supply system for ammonia-fueled shipbuilding. We are also accelerating the development of Green Product with a focus on liquid hydrogen carrier, CO₂ carrier as a major marine mobility in the CCUS market, and electric propulsion ships as the next generation green ship with high fuel efficiency.

In addition, our emphasis will be also on the development of a variety of green supplementary technologies in an effort to preserve the marine ecosystem and combat climate change.

Green Shipyard

KSOE and its shipbuilding subsidiaries aim to build an unrivaled smart shipyard by 2030 through FOS (Future of Shipyard) project. The very purpose of the project is to combine technologies, including ICT, Big Data, or AI to innovate our competitiveness in production automation, smart production management, new technologies and construction methods. The application of FOS system also enables monitoring of the whole procedure and discovering potential issues in advance, which prevents risk factors that could occur if the process were only operated by manpower.

FOS Project in Three Phases

Phase 1 2023	‘Visible & Understandable’ <ul style="list-style-type: none">• Complete the establishment of the digital twin platform, ‘Twin FOS’• Enable to remove inefficiencies such as manual work and overlapped work as well as idle hours by checking the progress in real-time
Phase 2 2026	‘Connected & Optimized’ <ul style="list-style-type: none">• Derive optimal operating conditions by analyzing numerous data collected during shipbuilding• The annual reduction effect for production cost is expected to be about KRW 70 billion with far fewer accidents by detecting risk factors in advance• Strengthen the cooperation with the global big data company ‘Palantir’ to achieve our goal
Phase 3 2030	‘Autonomous’ <ul style="list-style-type: none">• Establish the goal for 30% increase in productivity, 30% reduction in construction time, and zero waste through optimized automation in all processes from design to delivery

1. A virtual shipyard where the users can see the information, such as the status of shipbuilding and GHG emissions, at a glance when clicking on a ship on the digital map and monitor power equipment such as cranes and forklifts

Green Partnership

KSOE and its shipbuilding subsidiaries actively take part in domestic and foreign initiatives on climate change to promote carbon neutrality through Green Partnership. We have published Integrated Reports since 2014 to disclose annual GHG emissions, reduction activities, and achievements. From 2022, we will release more detailed carbon emission information, starting with our participation in the Carbon Disclosure Project (CDP). Furthermore, we will set out an implementation roadmap for achieving carbon neutrality by 2050 while publishing climate change reports based on the TCFD recommendation standards in the second half of 2022 by calculating the financial impact of climate change risks and opportunities. We will continue to disclose the entire process and results of our climate action in a transparent manner and keep in close communication with our stakeholders.

In line with the Paris Agreement’s goal to limit global warming, KSOE and its shipbuilding subsidiaries joined and signed a joint announcement for 2050 Carbon Neutrality Declaration of the shipbuilding industry in April 2021, hosted by Korea Offshore & Shipbuilding Association. The joint declaration suggests a reinforced cooperative system among the industry, the government, universities research institutes, as well as mutual assistance within the shipbuilding industry. Recognizing the fact that the climate change action is a task for the entire value chain of shipbuilding, we are all the more reinforcing the cooperation with our supply chains in and outside Korea to develop low-carbon steel, eco-friendly paints, and green fuels for ships.

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Eco-friendly Shipbuilding Process for Carbon Neutrality

As part of responding to climate change, KSOE and its shipbuilding subsidiaries strive to make an environmentally friendly shipbuilding process. To this end, we have unstintingly invested in technology development and infrastructure, such as large-scale facilities, to reduce GHG emissions and environmental pollution. We have established an infrastructure that incorporates eco-friendly technologies into all processes, from product design to delivery. Based on such a process, we prevent the emissions of air pollutants, such as GHG, volatile organic compounds (VOCs), and fine dust, while saving energy consumption by raising the efficiency of production facilities.

Major Green Technologies for Each Shipbuilding Process

- More Installation of dust collection equipment at welding sites
- Improvement of recycling rate through advanced LUG management
- Application of high-performance / high- efficiency welding techniques

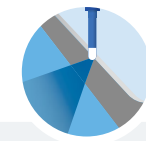
- Minimization of VOCs¹ emissions by installing RTO²
- Establishment of automation process for pretreatment paint
- Application of steel cutting simulation technique

1. Volatile Organic Compounds
2. Regenerative Thermal Oxidizer

② Assembly



③ Pre-painting



- Development and application of eco-friendly paint (under development)
- Advancement of dry film thickness and work process management
- Introduction of a clean room (air shower booth) for painting
- Establishment of an integrated control system for painting

Common

- Minimization of power consumption through the use of LED lighting
- Establishment of an integrated control system for air compression facilities
- Operation of internal navigation (under development)
- Optimization of heavy equipment³ fuel consumption through virtual simulation technique

3. Transporter, crane, etc.

① Steel pretreatment and cutting



④ Dock work

- Utilization of a simulator to predict hull deflection
- Advancement of cable management system
- Expanded application of the dust collection system inside a ship
- Application of robot blasting equipment
- Advancement of paint work and paint management techniques



⑥ Commissioning

- Use of onshore high-voltage / low-voltage power facilities for commissioning at berth
- Minimization of sulfur oxides emissions by applying exhaust gas cleaning devices
- Improvement of efficiency through optimization of boiler air-fuel ratio



⑤ Inspection

- Change of the pressure test method (hydraulic → pneumatic) to minimize the generation of waste water
- Virtual demonstration tests of containers for CNTR ship
- Replacement of radiographic testing (RT) with PAUT⁴ through development and application of it

4. Phased Array Ultrasonic Testing

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Sharpening Climate Change Response Capabilities

Climate Change Risk Management Process

For the systematic management of climate change risks derived from various sources, we have set up a risk management process and reinforced our responsive actions. The risks and opportunity factors identified by region, business site, and organization will go through our own response and impact assessment, followed by continued monitoring at the group level.

Risk Management Process

	Climate Change Risk Assessment				Climate Change Risk Response	
Stage	Phase I	Phase II	Phase III	Phase IV	Phase V	Phase VI
	Risk Identification	Response Capability Evaluation	Risk Impact Assessment	Opportunity Identification	Risk Management	Risk Acceptance (optional)
Definition	<ul style="list-style-type: none">Identify issues regarding the climate change by business site, region, and organizationExplain the impact of climate change on each business site, region, and organizationExplain risk factors regarding climate change	<ul style="list-style-type: none">Evaluate our climate change response and risk response capabilitiesRequire the consideration for all stakeholders that can be affected by climate change	<ul style="list-style-type: none">Conduct qualitative impact assessment based on the climate change risk and response capability evaluationThe risk impact increases with the rising size and possibility of a negative impactClassify the level into high, moderate, and low	<ul style="list-style-type: none">Find out the opportunities for achieving strategies and goalsOpportunities can exist regardless of the climate change risk impact assessment results.	<ul style="list-style-type: none">Select management options according to the risk impact assessment resultsHigh & Moderate: Require continuous monitoring and climate change risk response strategy, and integrated plansLow: Require the monitoring or potential risks although there is no need to integrate it into the strategy and plans.	<ul style="list-style-type: none">In case there is a higher negative impact of risks when responding to climate changeIn case when the used costs exceed the benefits
Key Question	<ul style="list-style-type: none">What are the climate change risks that we face?What affects us based on the anticipation of future climate change?	<ul style="list-style-type: none">Did we secure the human resources to cope with climate change risks?Is the financial support available to respond to climate change?	<ul style="list-style-type: none">What is the possibility of seeing the occurrence of the risks?How much do we expect for the financial impact?What is the relationship between risks and the business strategy?	<ul style="list-style-type: none">What are the opportunities coming from resolving the climate risks?Is there any opportunity factor derived from institutional or regulation changes?What are the benefits of seeking the opportunity factors?	<ul style="list-style-type: none">How much can we reduce the climate risk or potential impact?How much does it cost for investment and operation?Can we flexibly respond to future environmental changes?	
Executing Organization	<p>Organization responsible for ESG</p> <ul style="list-style-type: none">Major risks are discussed with ESG Working Group and submitted to Group ESG CouncilReporting to the highest person in charge of ESG				<p>The highest person in charge of ESG (discussing with Group ESG Group, ESG Advisory Group, reporting to CEO)</p> <p>▷ CEO (submitting to ESG Committee as an agenda item)</p> <p>▷ ESG Committee (reviewing and approving agenda items, managing non-financial risks in an integrated way)</p>	

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Integrated Risk Management for Climate Change

KSOE and its shipbuilding subsidiaries identify climate change risks and report them to the ESG Committee. The ESG Committee takes the lead in managing and responding to non-financial risks including the topics of climate change, safety, health, ethics, compliance, and supply chain. Besides, we have formed an advisory group composed of external experts in each field so that we can comprehensively manage risks in a more professional and objective manner.

Climate Change Risk Management Indicators

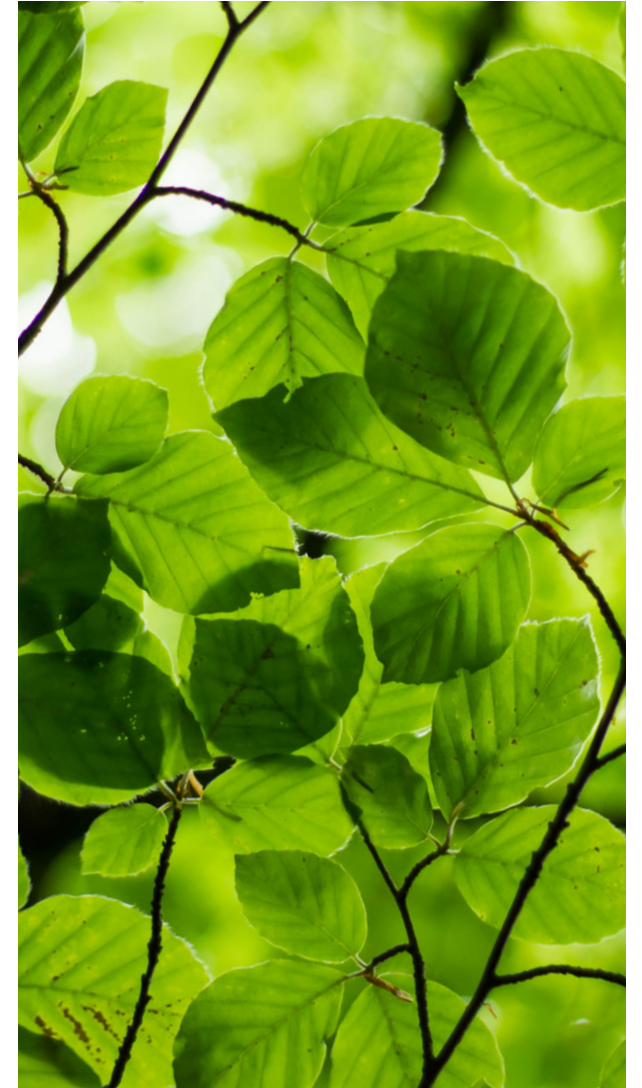
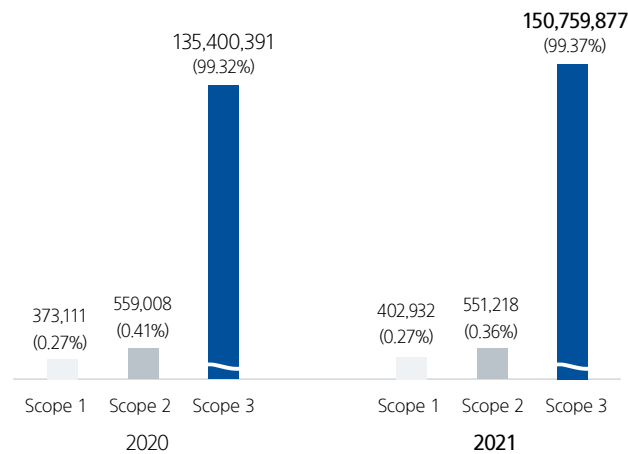
We select and manage threats and opportunities derived from climate change, capitalizing on indicators such as GHG and waste emissions as well as energy usage and renewable energy consumption. As for the air pollutants, we manage them more strictly than the legal standards, monitoring them on the basis of emitted amounts. We also apply our management standards that are 50% more stringent than the legal limits for water pollutants, preparing improvement measures followed by monitoring and evaluation. KSOE and its shipbuilding subsidiaries disclose not only Scope 1 and 2, the direct and indirect GHG emissions from business sites, but also Scope 3, which is the indirect emissions generated from the whole business process from raw material procurement to final consumer usage.

2050 Carbon Neutrality Goal

We establish the goal to cope with the climate change crisis, closely monitoring the environmental regulations, market, technology, and industry trends in and outside Korea. In line with the strengthening GHG reduction standards and growing demands for green ships with low-carbon or carbon-free engines, we established our 2050 carbon neutrality goal in April 2021. Currently, we are in the process of drawing up the implementation of a roadmap to accomplish 2050 carbon neutrality, and we plan to announce intermediate targets and implementation measures for 2030 as well.

GHG emissions

(Unit: tCO₂eq)



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Health & Safety Management

Background

Workplace accidents happen anytime and anywhere on the shop floor. Accordingly, it requires proactive prevention. Given the nature that the shipbuilding business involves a large number of employees, “safety” is the number one priority at all times. KSOE and its shipbuilding subsidiaries make every effort to create a safe work environment by rooting out work accidents under our management policy, ‘Safety First’. In order to achieve ‘Zero Serious Incidents’, the top management including the CEO and the heads of business units, Chief Safety Officers, and safety experts as external professionals join the efforts to inspect the whole system for safety management and rectify the issues. When it comes to the operation of occupational safety and health system, we enhance viability of the existing systems in the field based on operability performance. Making it our priority to improve safety management system, KSOE and its shipbuilding subsidiaries continue to figure out detailed ways to better prevent the occurrence of accidents. We will make all-out efforts to become a safe workplace for everyone.

Target

2022 Safety Target

KSOE

- ‘Maintain ZERO serious workplace accidents and civil disasters’**
- Tighten risk assessment system for research and experiment
 - Establish a safety education system and upgrade our safety culture standard

HHI

- ‘Achieve Zero serious accidents and accident rate of 0.195% or less’**
- Intensively manage the elements of serious accidents and settle the activities to fundamentally resolve the problems for safety improvement
 - Strengthen the system for risk evaluation based on the set of work standards
 - Reinforce experienced-based and practice-oriented educational content as well as safety training
 - Advance the accident prevention system with DT technology

HMD

- ‘Attain ZERO fatal accidents in 6 consecutive years’**
- Achieve an accident rate of less than 0.12%
 - Full-scale response to the Serious Accidents Punishment Act
 - Strengthen the power of execution to enhance on-site safety
 - Develop and operate the smart HSE management system

HSI

- ‘Safety and health above everything’**
- Achieve an accident rate of less than 0.165%
 - Maintain ZERO fatal accidents through preemptive safety management
 - Manage external risks (Serious Accidents Punishment Act, COVID-19, and others)



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Health & Safety Management

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The six fatal accidents that occurred in 2021 and the early 2022 (5 in HHI, 1 in HSHI) rested heavily on us. Although KSOE and its shipbuilding subsidiaries put elbow grease into becoming a safe workplace under the Safety First management policy, we were not completely free from accidental occurrences. In order to prevent the recurrence of the accidents, we make every effort to come up with ‘Comprehensive Safety Management Improvement Measures’, taking our safety management system up a notch, and making our safety management system more efficient. It is not an exaggeration to say that ‘safety’ decides the success of our business. KSOE and its shipbuilding subsidiaries are desperate to advance our Safety First management policy. By putting this policy into action, we will spare no pains to figure out improvement plans so that we can reach Zero accidents at our business sites.

Activities

Safety Organization Restructuring

KSOE and its shipbuilding subsidiaries restructured safety organizations and assigned employees dedicated to safety affairs. Safety specialized organizations ramp up their monitoring activities on the shop floor to establish more relevant policies and strategies, thereby becoming safe workplaces.

Company	Action Plans
HHI	<ul style="list-style-type: none">• Created the ‘Safety Management Committee’ that serves as the control tower taking on the roles of inspecting its safety system and formulating improvement plans• Launched the ‘Safety & Production Deliberation Committee’ in charge of responding to the threats to its production safety• Reorganized ‘Integrated Safety Management Office’ by incorporating a company-wide management office for safety policy and safety departments of each business unit
HMD	<ul style="list-style-type: none">• Put the organizations in charge of safety and health directly under the CEO• Made an exclusive department for safety instead of the existing integrated department of safety, health, and environment• Built a new company-wide sub-organization for safety planning within Safety Department
HSHI	<ul style="list-style-type: none">• Divided the existing Safety and Health Department into Safety Department and Environment & Health Department to strengthen respective power• Reinforced safety monitoring function and created the Fatal Accident Prevention Team with an aim of sharpening its ability for the prevention

Analysis of the Root Causes for a Series of Fatal Accidents

In an effort to take more stringent and comprehensive safety measures, we analyzed the root causes of the occurrence of serious accidents on the shop floor. The results show that the problem lies in the lack of executive ability in the field, not in the management system, the set of standards, or the way of working. Accordingly, we will implement the comprehensive safety measures that our employees can sense and follow in the field rather than simply pursuing ‘safety first’ policy in principle.

Reinforcing Executive Ability to Deliver Field Safety

KSOE and its shipbuilding subsidiaries strive to eradicate the occurrence of serious accidents through the establishment of safety system equipped with the reinforced power of execution in the field. As part of the effort, HHI has launched the ‘Safety Management Committee’ and examined the status of safety management system on a quarterly basis. Based on the results, the plans for improvements are made. HMD has appointed a C-Level leader for its safety organization to bolster its executive ability for safety management, thereby reinforcing its safety management organization. HSHI has created an exclusive Fire Detection Team to strengthen its control over fire detection while dividing its on-site safety management organization into Production Safety Team, Crisis Response Team, and other divisions so that its employees can take measures better step-by-step. In addition, the beneficiary scope of safety reward is expanded to suppliers and contractors to boost their executive ability as well.

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Health & Safety Management

Activities

Launching a TF for Improving the Safety Level of Three Facilities to the Highest Level

As part of the effort to strengthen on-site safety at its Head Office in Ulsan, HHI has launched the ‘Task Force team (TF) for improving three safety facilities’. The three safety facilities are footholds, lightings, and ventilators that are used the most in the shipyard and highly linked to the occurrence of workplace accidents. HHI divides the TF into three phases to scrutinize the facility problems and put improvement plans into practice.

Continued Increase of Budget for Safety Management

With an objective of maintaining and improving the safety level of the work site, we have secured more than 2% of our sales revenue as the safety investment budget. We also additionally secured an emergency budget for safety facility investment so that immediate actions can be taken in the safety area in need of investment. Main production facilities are managed under strict supervision with designated safety grades. In terms of old production facilities or machinery, we stably operate them through systematic diagnosis and investment. In case we detect any severe risks due to the change of production process or methods or emergency work, we hold the Safety & Production Deliberation Committee meeting to facilitate swift decision-making by the executives, thereby minimizing the risks on the field.

Reinforcement of Safety Management for Employees

For the purpose of preventing serious accidents that occur in the workplace, we step up the safety management of dangerous tasks. We have established a triple-layered safety management system that is protected by three positions

in charge; supervisors, safety keepers, and agents. We also support hiring safety managers for our partner companies to improve their safety management. Regarding facilities, we have built a smart control system converged with surveillance cameras and AI technology. We also equip the workplace with top-quality scaffolding, lighting, and ventilation system, never sparing our investments in ‘safety first’ management.

Creating a Safety First Culture Joined by All

We strive to make a safety culture where our employees actually feel safe in the field, rather than simply putting forward the ‘safety first’ management principle. As part of spreading the culture, we regularly hold in-house contests for risk management and conduct safety-related programs such as Hi-Safe. We intend to raise safety awareness for individuals and induce the fundamental improvement of unsafe behaviors. In addition to emphasizing on workers’ safety awareness, we have set a reward system based on the safety management performance of operators. KSOE and its shipbuilding subsidiaries reward excellent teams and partner companies for remarkable feats such as zero accidents and violation of rules, or good practice of work standard compliance. Furthermore, our reward system extends to partner companies with excellent safety performance, spreading safety awareness throughout the company. Employees who have contributed to accident prevention are recognized and rewarded as Safety Contributors. With regard to recent enforcement of the Serious Accidents Punishment Act, we have drawn up separate standards so that supervisors and on-site partner companies can faithfully carry out safety and health tasks, implementing systematic safety management.

Coexisting and Cooperative Safety Culture

We make every effort to ensure the safety of the employees of the partner companies as well as our employees. Through nurturing technology research assistants in the safety area, we help internal and external partners keep safety managers while selecting excellent partner companies in safety and rewarding safety managers of partner companies. In addition, we assist them with safety management technologies, funding for hiring safety managers, and experiential and practical safety training. By establishing a comprehensive safety management system with no boundary between head office and partners, KSOE and its shipbuilding subsidiaries will internalize our ‘safety first’ management principle at all corners of our workplaces.

Publication of HSE Report

To help all our employees and stakeholders understand company-wide activities in the safety area, HHI annually publishes the Health, Safety, Environment (HSE) Report containing safety information. Through this, we share the value of safety-first management and spread a safety culture. HMD and HSHI also plan to publish and release the report. As we advance, we will continue to actively communicate with stakeholders while sharing our safety vision, business plan, operational plan, and performances in a transparent manner by publishing HSE Report.



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Health & Safety Management

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Tightening of Infectious Disease Response System

Due to the COVID-19 pandemic, there is growing interest in health and hygiene in workplaces. Against this backdrop, we have set response and prevention manuals for infectious diseases and strictly manage them so that the pandemic diseases like COVID-19 will not spread within our business sites. The manual stipulates the composition of the general situation office, response measures by stage, and the role of each department in case of infectious disease crisis alert by Ministry of Health and Welfare.

Strengthening of Hazardous Chemicals Management

KSOE and its shipbuilding subsidiaries operate a hazard assessment process to verify the safety of chemicals before they are brought into the business sites. The assessment is conducted through the chemical substance management system. At the procurement stage, we are provided with the Material Safety Data Sheet (MSDS) by the supplier to check the information on the substance. To review the MSDS, we check whether the material contains inappropriate, harmful, or legally regulated substances. After a thorough review, we selectively purchase only the products that have passed strict standards.

Employee Health Check-up and Follow-up Management

We provide regular health check-ups every year for the health of our employees. Depending on the job, we offer special check-ups while assisting with detailed and comprehensive check-ups for long-serving employees. According to the health check-up results, we offer special medical consultation, medication, and health education for those highly likely to cause brain cardiovascular diseases such as high blood pressure, dyslipidemia, and diabetes.



Classification		Special Check-up		Comprehensive Check-up	Others
		General Check-up	First Half of the Year	Second Half of the Year	
Subject		Office worker, etc.	Production group, special group, etc.		Age of 40 and above, etc.
Check-up Cycle		Once a year	Once a year		Every 2 years
No. of people receiving health check-ups	KSOE	164	31	-	149
	HHI	3,966	8,600	3,294	4,957
	HMD	435	1,109	577	1,325
	HSHI	3,207	2,714	432	1,332

Overseas check-ups, employment check-ups, in-depth tests, etc.

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Human Rights Management

Background

As human rights issue in business operations is on the rise across the world, the demand for human rights management is also raising attention. Such human rights issues are recognized as serious matters to companies and the public alike, which directly affect business affairs. Against this backdrop, KSOE and its shipbuilding subsidiaries are making multifaceted efforts to protect the human rights of all our stakeholders engaging in our business operations.

Target

In order to advance human rights management at the company level, KSOE and its shipbuilding subsidiaries have established their own Human Rights Management Committees, and conducted human rights education. Furthermore, we plan to publish Human Rights Management Report that contains candid and detailed results as human rights impact assessment so as to ensure transparency in our human rights management.



Our Goals for Human Rights Management

Classification	Phase 1	Phase 2	Phase 3	Performance in 2021	Plans for 2022
Establishment of governance structure	Form a working-level group for human rights management	Designate the person in charge of human rights management	Launch the Human Rights Management Committee Utilize the working-level group for human rights management affair	-	Phase 3
Declaration of human rights management	Draw up the declaration of human rights management	Make a public declaration of human rights management	Formulate detailed guidelines on human rights management	Internal regulations	Phase 3
Disclosure of human rights-related data	Disclose the results of human rights due diligence	Release Integrated Report	Publish Human Rights Management Report (Korean and English)	Phase 2	Phase 3
Human rights education	Include human rights issues during the education sessions on workplace sexual harassment	Conduct human rights education on all employees	Provide professional trainings for employees in high human rights risk sector	Phase 1	Phases 2 and 3
Dissemination of human rights management	Make efforts to spread human rights management to the stakeholders in business relations	Endeavor to disseminate human rights management to subsidiaries and partner companies	Strive to embed human rights management into every stage of our global supply chain	Phase 1	Phase 1
Identification and evaluation of human rights-related risks (Human rights impact assessment)	Conduct human rights impact assessment (using the checklist formulated by National Human Rights Commission of Korea)	Establish the company's own checklist tailored to the nature of our business	Arrange effective methods of due diligence to identify human rights impact comprehensively	-	Phase 1
	Conduct human rights impact assessment under the direction of due diligence manager and business department managers	Reflect shareholders' opinion in the assessment process and analyze the cause for negative impacts	Identify grievance and difficulties of the employees and shareholders, and conduct in-depth analysis with human rights experts	-	Phase 1

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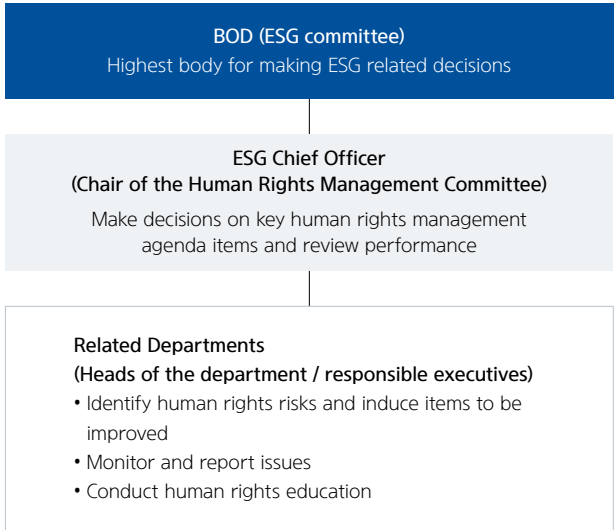
Human Rights Management

Activities

Human Rights Management Committee

In 2022, KSOE and its shipbuilding subsidiaries launched the human rights management committee respectively to promote systematic human rights management. Each committee consists of one Chief ESG Officer and about 10 other members including the executives of relevant departments. The key issues on human rights management are reported and approved by the ESG committee under the board of directors. In addition, we have a guiding principle that approves the appointment of human rights specialist as an advisory member in times of need.

Governance



Guiding Principles for Human Rights Management

For the practical protection and improvement of human rights for all employees and stakeholders, KSOE and its shipbuilding subsidiaries have established Guiding Principles for Human Rights Management and strictly observed them in business activities. The Guiding Principles specify the establishment and implementation of human rights management in terms of governance, administration, committee operation, human rights impact assessment, and remedial procedures. Through this, we will realize advanced human rights management that ensures life with dignity and decent working conditions for all stakeholders.

Human Rights Impact Assessment and Human Rights Management Report

KSOE and its shipbuilding subsidiaries plan to regularly conduct human rights impact assessment based on the guidelines from the National Human Rights Commission of Korea. Through the assessment, we will manage the improvement methods as mid- to long-term tasks, starting from the second half of 2022. In addition, we consider taking stakeholder surveys and in-depth interviews to discover specific human rights risks that may occur at each workplace and the vulnerable groups related to human rights. From the second half of 2022, we plan to publish Human Rights Management Report every year to transparently disclose the company's key policies, human rights impact assessment results, areas improved, and other related matters to our stakeholders.

Company-wide Human Rights Education

Every year, we conduct legally obligatory education on such topics as the recognition of the disabled, workplace abuse, and sexual harassment to all members of the company. The corporate policies concerning human rights are also continuously shared with employees to help raise the awareness of human rights management.

- Human rights management education: the concept and importance of human rights management
- Preventive education for workplace sexual harassment: the concept of sexual harassment, related regulations, coping methods, etc.
- Awareness program on the disabled in the workplace: raising awareness on people with disabilities, etc.
- Business ethics training: harassment prevention, ethics violation reporting, grievance handling, etc.
- Industrial security education: personal data protection, etc.

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Labor-Management Relations

Background

Coexisting labor-management culture is an overarching driving force of corporate growth. KSOE and its shipbuilding subsidiaries are cognizant that our future competitiveness lies in all our employees. Based on this firm belief, we have built a mutually beneficial labor-management relationship underpinned by mutual respect and trust. In particular, our focus is on the establishment of an advanced labor-management culture through genuine communication.

Target

- KSOE**

Build a coexisting labor-management culture and pursue shared growth based on trust and respect
- HHI**

Establish a trust between labor and management through active communication and seek coexisting cooperation underpinned by collaboration
- HMD**

Uphold and further develop the coexisting labor-management culture through active communication and corporate culture refinement
- HSHI**

Facilitate communication and maintain trust to settle a mutually beneficial labor-management culture



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Collective Bargaining and Labor-Management Council

KSOE and its shipbuilding subsidiaries annually conduct salary negotiations between labor and management and also communicate other issues regarding labor and management relations through collective bargaining every other year. In accordance with the 「Article 4 of the Act on the Promotion of Employee’s Participation and Cooperation」, the Labor and Management Council is operated at KSOE and its shipbuilding subsidiaries. On a quarterly basis, the representatives of each company and the representatives of the labor unions or employees have a meeting to discuss ways of improving production efficiency, handling the grievances of employees, and enhancing the working environment.

KSOE 4 labor-management council meetings convened 10 agenda items discussed discussions completed on 10 agenda items	HHI 4 labor-management council meetings convened 49 agenda items discussed discussions completed on 37 agenda items
HMD 4 labor-management council meetings convened 11 agenda items discussed discussions completed on 11 agenda items	HSHI 4 labor-management council meetings convened 22 agenda items discussed discussions completed on 16 agenda items

Training on Labor-Management Relations

KSOE and its shipbuilding subsidiaries provide a variety of training courses for labor-management relations to raise our employees’ awareness on labor-management relations and effective mutual communication. In addition to internal training on labor-management relations, we also encourage our employees to participate in relevant educational programs offered by external organizations. Through these efforts, we are developing labor-management relations into mutually beneficial ones.

Major Labor-Management Relations Training Courses

- Course for entry-level
- Training for leaders
- Course for team leaders and class leaders
- Training for organizational vitalization
- Training by position level
- Training for substantial management practice

Management Status Briefing

KSOE and its shipbuilding subsidiaries held Management Status Briefings for employees and the labor unions on a regular basis. The briefing aims to share the overall management status including performance, goals, directions, or pending issues with employees. This helps our employees keep up to date with the company status and be motivated to accomplish the business goals.

Communication with the Management

In an effort to build mutually beneficial labor-management relations through seamless communication, KSOE and its shipbuilding subsidiaries convene regular meetings with the management. For example, CEOs are attentive to the voices of young workers in their twenties or thirties, sparing no effort to meet new hires and build mutual understanding. Also, the management shares company policies and management status by holding meetings with team leaders, listening to their suggestions and difficulties. Through this, the company forms a consensus on corporate policies while improving the work environment by resolving issues in the field.

Mentoring Program

KSOE and its shipbuilding subsidiaries have a mentoring program to help employees improve their work competency, adapt to corporate organizations, and maintain work-life balance. One senior employee is matched as a mentor to one junior employee, teaching practical job skills to the junior and hearing out grievances. Their close relationship and communication provide a great foundation for an autonomous collaboration culture.

Thank You Card and Collaboration Point System

With an aim to create a cooperative culture among employees, KSOE and its shipbuilding subsidiaries operate Collaboration Point system. Leaders can also use Thank You Card system to encourage excellent employees, which is also calculated as points. The reward system based on the calculation of points serves as a platform to create a collaborative culture in the company and encourage outstanding employees.

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Labor-Management Relations

Activities

Counseling Service

We operate 'Mind Garden', a corporate counseling center, to promote the health and happiness of our employees. Professional counselors in Mind Garden provide counseling services at all times, helping the employees with issues as stress from work or home, interpersonal relationships, marital conflicts, and children issues.

Corporate Newsletters in Each Company

We publish a variety of newsletters, including HHI Magazine, HHI News, HMD News, The Yard, and Magazine H, to deliver major company news to our employees. The newsletters take a central role in sharing information while serving as channels for communication.

HHI Family Magazine



HHI The Yard



Major Activities of Subsidiaries

HHI

Aiming to form a consensus on the management situation and invigorate the morale of employees, HHI holds a company-wide 'Trust Building Workshop' chaired by the head of each division. Through the meeting, we gather grievances of our employees and resolve them, thereby raising work satisfaction and creating a mutually beneficial organizational culture.

HMD

At HMD, the CEO personally explains the management status to the front-line production managers (team leaders, class leaders, and group leaders), and holds meetings to communicate on the topics of on-site difficulties and suggestions with the executives and department heads. Also, we regularly send useful information on organizational culture, leadership, and communication skills through mobile phones to the managers, including the leaders in technology and office work areas, in order to encourage competency building and close communication with each other in the company. Besides, we run a united hometown community, an association of hometown communities of regions that facilitates communication within the organization and strengthens unity.

HSHI

HSHI has formed our own production group council. Comprised of production leaders, the council carries out volunteer activities for the region such as briquette delivering, assisting farm work, and sponsoring social welfare facilities together with the company, which contributes to making an advanced labor-management culture.

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Supply Chain Management

Background

Supply chain management is growing in importance as the supply chain-related sustainability issues, such as human rights, the environment or safety, are having a bigger impact on the reputation of a company and its business operations. KSOE and its shipbuilding subsidiaries are keenly aware of the gravity of our suppliers’ ESG risk management. Accordingly, we have strengthened our supplier management system. As part of this, we have lent support to our suppliers based on their needs and promoted communication with them, thereby establishing a favorable partnership with them. In addition, the scope of our assistance encompasses diverse sectors such as finance, education, consulting services or the operation of system for technology protection. Through these efforts, we aim to sharpen their competitiveness and go hand in hand with partner companies to achieve sustainable growth.

Activities

Supply Management Control System

Vision

Fair, Just and Legitimate Performance

Objective

Encourage the growth and development of partner companies
and thereby sharpen their competitiveness

Key Policy

Continuously Improving Systems

- Promote the engagement of small and medium sized enterprises
- Establish an institutional support system

Establishment of Fair Trade Practices

- Adopt and comply with four subcontracting practices set forth by Fair Trade Commission
- Establish reasonable trade practices
- Improve communication with partner companies

Enhance Competitiveness of Partners

- Increase sales of partner companies
- Support education, recruitment, technology development and finance

Supporting Organizations

Group Co-Prosperity Committee

Ensure consistency in terms of planning, executing and discussing company-wide policies for the co-prosperity

Co-Prosperity Council

Take charge of coming up with plans and measures for the co-prosperity with first- and second-tier suppliers

Co-Prosperity Support Organization

Put co-prosperity-related policies and strategies into action, evaluating the implementation and providing feedback

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Supply Chain Management

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Philosophy for Supply Chain Management

For the sake of transparency and fairness in transactions, KSOE and its shipbuilding subsidiaries have adopted the four subcontracting practices. We also operate Hyundai Integrated Procurement System (HiPRO) to do business in accordance with the legitimate procedure. Using the standard subcontract agreement for the shipbuilding industry promotes the rights and interests of our partner companies.

Classification / Details

Compliance with fair trade-related laws

- Adopt and comply with four subcontracting practices (Details uploaded on HiPRO website)
- Establish and operate the procedure for dispute mediation and resolution (Operated on HHI Group Business Ethics website)
- Operate Hyundai Integrated Procurement System (HiPRO)
- Use the standard subcontract agreement for the shipbuilding industry

Operation of the G-HiPRO

In an effort to promote transparency and fairness in the procurement contract process, KSOE and its shipbuilding subsidiaries operate the HiPRO (Hyundai Integrated Procurement System). The electronic bidding system of HiPRO makes it more efficient to select suppliers across the entire contracting process that ranges from contracting to delivery, issuance of transaction statement, and the actual payment. Furthermore, diverse efforts are being made to evaluate suppliers' sustainability in terms of their management. These

include regular credit assessment, annual quality evaluation, delivery and cooperation evaluation and inspection on their ESG management. In addition, we award outstanding partner companies with official commendations or financial incentives.

Supply Chain Management Process

Registration of Partner Companies

Partner companies are selected through the process of their self-diagnosis and the evaluation of their quality, management, and financial status by KSOE and its shipbuilding subsidiaries. The details regarding the required criteria and procedures are available on the HiPRO website (hipro.hhi.co.kr)

Rating Partner Companies

KSOE and its shipbuilding subsidiaries evaluate our partner companies as part of the effort to attain sustainable growth of our supply system. We reward high-rated partner companies and provide assistance for the low-rated companies, thereby helping them sharpen their competitiveness.

Follow-up Management

KSOE and its shipbuilding subsidiaries are making every effort to manage our supply chain in a more responsible manner. To this end, we identify ESG risks through the partner companies management process and lend support required according to the results.

Registration of Partner Companies

Application for registration / Self-diagnosis / Eligibility review / Management & Financial evaluation / Quality evaluation / Deliberation on the registration / Notification of quality evaluation results / Result acceptance



Evaluation of Partner Companies

- Target: Partner companies selected according to standards by company
- Evaluation items and scores: Quality, delivery, cooperation, safety management, green management (depending on companies)
- Evaluation period: Every November to December
- Evaluation grades: S/A/B/C/D (HHI, HMD), A/B/C/D/E (HSHI)



Follow-up Management

Rewards for Outstanding Partner Companies

- HHI: 40 companies annually selected:
Quality (30 companies) / Innovation (7 companies) / Contribution (3 companies)
- HMD: 11 companies annually selected:
Quality (8 companies) / Innovation (2 companies) / Contribution (1 company)
- HSHI: 18 companies annually selected:
Quality (15 companies) / Innovation (2 companies) / Contribution (1 company)
- Areas of support: Awarding plaques for the companies, special treatment for Co-Prosperity Fund, etc.
- HSHI has adopted an additional evaluating and rewarding system to promote co-prosperity with the local partner companies. The evaluation system is designed for around 50 suppliers of blocks, steel outfitting parts, or pipes, in the vicinity. Companies with good performance are rewarded based on the ratings from the evaluation.

Support for Partner Companies with Low Evaluation Grade

- Companies with C-grade or lower in the evaluation
- Request instructions from the Quality Management Department
- Report to the Disciplinary Deliberation Committee if the low grades continue for two consecutive years

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Reinforcement of ESG in the Supply Chain

ESG Management System

With the purpose of inspecting the supply chain-related issues and risks that can affect the shipbuilding and offshore engineering businesses, KSOE and its shipbuilding subsidiaries have established an ESG management system model and conducted implementation step by step. At the current stage, we are establishing a program that can analyze the ESG status of the partner companies so that we may support them based on the results. We expect this program to help partner companies to clearly grasp what ESG risks they have and resolve them. Going forward, KSOE and its shipbuilding subsidiaries will build an ESG risk evaluation system so that we can make our supply chain more sustainable by constantly monitoring the ESG risks of the partner companies.

Development of Tailored ESG Indicators and Establishment of ESG Self-analysis Tools for Partner Companies

KSOE and its shipbuilding subsidiaries have developed ESG indicators tailored to partner companies considering

their industry types and company sizes. We plan to establish system and procedures so that our partner companies may conduct self-diagnose on their ESG status and peer levels using the indicators. This will lead to the voluntary monitoring and improvement of ESG risks of our partner companies. In addition, we can efficiently support the companies according to their needs, thereby raising the ESG level of our supply chain.

ESG Consulting for Partner Companies

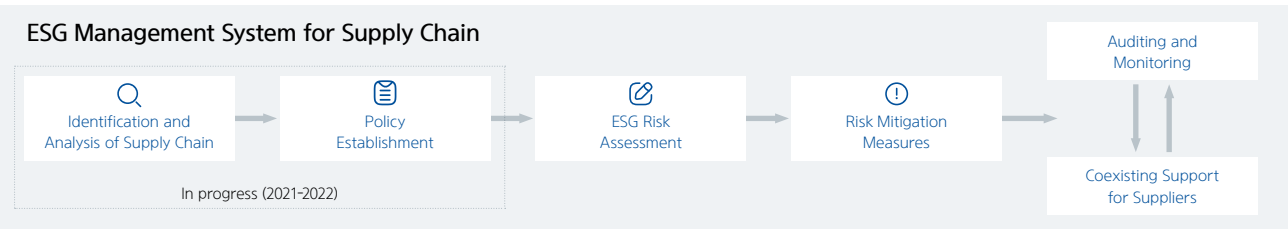
KSOE and its shipbuilding subsidiaries plan to provide consulting support for our key partner companies to improve ESG by establishing alliances and cooperation with specialized agencies located at the regional hubs. Through this, our key partners can be efficiently supported in terms of their needs, and we can strengthen ESG competitiveness together. We will not simply help them but make a system for their ESG capabilities so that they can elevate ESG on their own in the future. As part of the effort, we will formulate an ESG management manual for partner companies.

Code of Conduct for Partner Companies

KSOE and its shipbuilding subsidiaries have established the code of conduct for partner companies and mandated their compliance with the standard agreement so that all our partners can abide by the laws and ethics while safeguarding our employees and stakeholders. The code of conduct recommends the head office's standards and responsibilities equally to the subcontractors, thereby contributing to enhancing the sustainability of the whole corporate ecosystem. If necessary, we can inspect or audit the compliance with the code of conduct via independent institutions and may recommend improving certain areas in order to create a sustainable supply chain.

Summary of Code of Conduct for Partner Companies

- Human Rights Management: Prohibit discrimination in hiring and harassment / Guarantee the freedom of association / Prohibit child labor / Ensure voluntary employment / Manage work hours / Provide wages and welfare benefits, etc.
- Safety · Health: Establish safety & health management system / Respond to emergency situations / Manage industrial disasters and Control diseases / Diagnose safety / Comply with safety principles for the management of machinery, equipment, and facilities / Manage health / Provide safety & health education
- Environment: Build environmental management system / Manage air pollutants / Manage water resources and water pollutants / Manage chemicals / Control energy usage and GHG emissions / Manage waste / Manage noise and vibration, etc.
- Ethical Management: Secure transparency in trade relationship / Create a fair trade environment / Disclose information / Protect data / Safeguard identity and Prohibit retaliation, etc.
- Management Control: Voluntary and independent decision making and improvement / Communication with stakeholders / Responsible management of supply chain, etc.



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Supply Chain Management

Activities

Co-Prosperity with Partner Companies

We pursue co-prosperity with our partner companies. Promoting mutual growth, we have operated a variety of programs, including financial assistance, education and technology protection support as well as rewards and management support, as well as practicing contract signing and fulfillment with fairness.

Key Areas of Management Support

Classification	Details
Grade evaluation	• Annually select and reward outstanding partner companies in the areas of quality, innovation, and contribution
Operation of joint delivery center	• Operate joint delivery centers to reduce logistics costs for partners and streamlining the delivery process (HHI, HMD)
Registration of new products	• Introduce the new product registration system (linked to procurement) for encouraging partner companies to develop new products (HHI)
Support with ESG management internalization for partner companies	• Conduct ESG management pilot evaluation of partner companies in 2021 (HHI) • Plan to provide ESG management consulting for key partner companies by making alliances and cooperation with specialized organizations located in regional hubs.

Rewards and Management Support

KSOE and its shipbuilding subsidiaries evaluate the grades of suppliers and give rewards, aiming to form a consensus on the need to raise quality and technology levels. We also support activities to improve the management of our partner companies, such as operating joint delivery centers, registering new products, and internalizing ESG management within the companies.

Performance data of Education Support and Technology Protection Systems

Classification		HHI	HMD	HSHI
Education Support	Online training (Hi-eCampus)	532 people (23 companies)	37 people (1 company)	-
	Offline training (Hyundai Technical Education Institute)	471 people (138 companies)	347 people (102 companies)	107 people (373 companies)
	Training linked to recruitment	683 people (35 companies, 102 people hired)	136 people (67 companies, 134 people hired)	95 people (25 companies, 56 people hired)
Technology Protection System (Deposit of Technical Data in Third-Party Database)	No. of partner companies	2	6	12
	No. of protected technical materials	3	7	16

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Supply Chain Management

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Financial Assistance

We have expanded the financial assistance, including Co-Prosperity Fund and Loans secured by future bonds, for the sake of the stable business activities of our partner companies. Co-Prosperity Fund was jointly created with financial institutions to assist the loan interests of partner companies as a support measure for loan interest reduction or exemption. Loans secured by future bonds refer to the support for issuing a reference or assisting with loans. We issue references or give loans for operational funds in cooperation with financial institutions.

Assistance in Operational Funds



Cash payout

- Pay 100% in cash for materials twice a month, allowing small and medium sized enterprises and businesses to be protected to secure liquidity of funds



Early payment

- Pay for materials in advance earlier than the original payment date before holidays (New Year's Day, Chuseok, and summer holidays)



2nd and 3rd tier subcontractors

- Allow partner companies to use the self-diagnosis system for their management through the operation of the payment monitoring system
- Grant permission to utilize Co-Prosperity Fund for second-tier suppliers

Co-Prosperity Fund

The shipbuilding subsidiaries operate the Co-Prosperity Fund to support the stable management of partner companies. In 2021, the performance of it recorded KRW 207.7 billion for HHI, KRW 40 billion for HMD, KRW 68.6 billion for HSHI, demonstrating the active financial support for partner companies.

Management Performance of Co-Prosperity Fund (in 2021)



Cash payout rate for 2nd-tier suppliers (from 2019 to 2021)

We strive to raise the cash payout rate for second-tier suppliers through the payment monitoring system for suppliers.

Classification	2019	2020	2021
HHI	68%	71%	79%
HMD	66%	70%	72%
HSHI	59%	72%	58%

Early payment (in 2021)

Classification	No. of Target Partner Companies	Amount of Early Payment
HHI	1,131 companies	KRW 227.1 billion
HMD	630 companies	KRW 61.1 billion
HSHI	1,970 companies	KRW 174.7 billion



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Quality Management

Background

Under the basic principle that the quality of products and services decides consumer satisfaction, We comply with the safety and quality principles at every process ranging from sales to after-sales service. Furthermore, KSOE and its shipbuilding subsidiaries acquired and have maintained ISO 9001 Certificate, the international standard for a quality management system established and executed by ISO (International Organization for Standardization). Based on this set of the standards, we manage the quality of all our products and services, thereby sharpening our competitiveness and delivering reliable products. KSOE and its shipbuilding subsidiaries have mapped out quality policies respectively to raise and solidify outstanding service quality through multifaceted efforts such as inventing unrivaled eco-friendly technologies, enhancing value chain capability and quality stabilization, and minimizing quality failure cost.



Quality Policy

KSOE

Develop unrivaled future technologies at appropriate times,
scaling up technological support for subsidiaries
Commercialize technologies and products as a new growth
engine
Reinforce activities to prevent initial product failure

HHI

Establish eco-friendly technology and achieve zero failure cost
Enhance value chain capability and quality stabilization
Advance quality control and self-regulated quality system

HMD

Secure unparalleled construction technology for high value-
added ships
Minimize the quality failure cost through DT based quality control
Enhance support activities for partner companies for co-
prosperity

HSHI

Provide products and services that prioritize customer
satisfaction through proactive quality management
Enhance competitiveness by improving eco-friendly ship work
processes and advancing technology
Establish superior quality workplace through voluntary
participation of employees and sub-contractors for improvement



16,000 TEU-class Containership selected as
Significant Ship of 2021 (HHI)



27,000-ton car ferry selected as a
World Class Product of Korea (HMD)



World's First LNG DF Bulk carrier selected as
Significant Ship of 2021 (HSHI)

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Quality Management

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KSOE and its shipbuilding subsidiaries have established the principles in regard of product and service provision, based on which, we are committed to leading technologies and delivering customer-oriented quality management to ensure customer satisfaction and reliability. In an effort to raise the safety of products and services we provide, the principles of product and service provision are applied to the whole process ranging from design and development to manufacturing, construction, and after-sales service. The principles consist of basic rules regarding our responsibilities and duties for customer safety, and quality. The details are as follows.



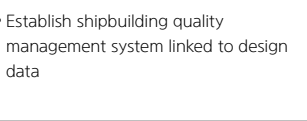
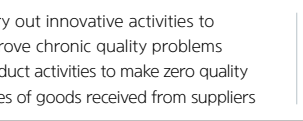
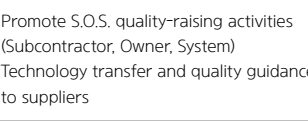
Accountability and Responsibility of Customer Safety

1. We shall consistently meet our stakeholders' expectations for our community and society to keep safe and sustainable by developing and providing safe high-quality products and services.
2. We shall actively engage in workplace safety to protect our colleagues and to prevent potential accidents.
3. We shall conduct pre-delivery verification and validation to guarantee safety in use.

Basic Quality Assurance Principle

1. All products shall satisfy all applicable statutory and regulatory requirements and customers' needs and specifications.
2. Design and development activities shall be clearly documented to ensure contractual and regulatory compliances.
3. All materials and equipment shall be consistent with design and development requirements.
4. Product manufacturing and installation shall be carried out in accordance with the work standards and procedures established to protect worker's safety.
5. Market monitoring such as a customer satisfaction survey and/or after-sales case study analysis shall be constantly conducted to address customers' needs when necessary.

Key Achievements and Plans

Subsidiaries	HHI	HMD	HSHI
Key Achievements	<ul style="list-style-type: none">• More delegation of owner's inspection and extend quality assurance• Boosted the cooperative system to create synergy in terms of quality enhancement (regular quality workshop, etc.)• Renewed the quality assurance program certificate of Korea Electric Power Industry Code for manufacturing of Nuclear components• Stabilized the process of mechanical completion for naval and special ships• Won the 2022 Global Excellence Award in Quality Management awarded by Korea society for Quality Management (CEO Han Young-seuk) 	<ul style="list-style-type: none">• More delegation of owner's inspection• Establishment of real-time quality information sharing digital signage system• Development and operation of quality sharing system (Q-Master) for customer management• Extended remote inspection• Development of welding technology for productivity efficiency 	<ul style="list-style-type: none">• More delegation of owner's inspection• Extended remote Factory Acceptance Test (FAT) implementation• Made DT-based inspection method efficient• Managed big data-based inspection results and quality issues• Developed Q-WiN, a platform to share quality information• Conducted quality academy 
Action Plans	<ul style="list-style-type: none">• Launch and expand the application of Hi-TRUST, a Group's integrated system for Delegation of owner inspection• Integrated quality management of shipbuilding subsidiaries 	<ul style="list-style-type: none">• Establish shipbuilding quality management system linked to design data• Carry out innovative activities to improve chronic quality problems• Conduct activities to make zero quality issues of goods received from suppliers 	<ul style="list-style-type: none">• Advanced quality data analytics - partnering with the global big data enterprise 'Palantier'• Manage by unifying the quality inspection tasks by region• Reinforce initial equipment / technology risk management 

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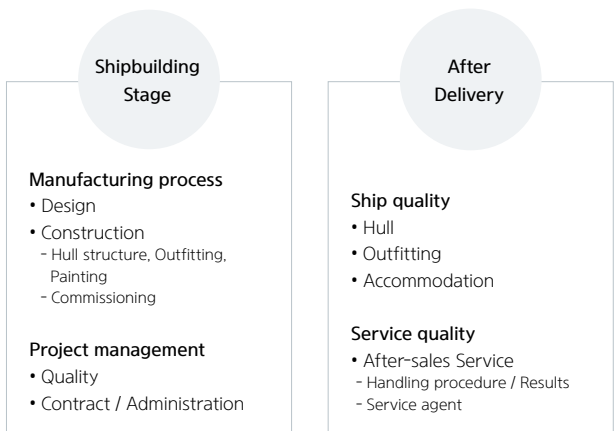
Quality Management

Activities

Building Platform for Managing Client Satisfaction Level

KSOE and its shipbuilding subsidiaries conduct customer satisfaction surveys by classifying survey areas by each stage of the shipbuilding process and implement stricter and more meticulous quality control by deriving improvement plans for the shipbuilding and delivery process. In addition, we conduct in-depth face-to-face interviews with customers (ship owners' on-site office, customer company visits, etc.) so that we can understand their requirements and improve them, providing optimized and tailored quality management. In 2022, we will build a platform for customer satisfaction management that can analyze real-time online surveys and response data, thereby elevating the satisfaction level of our customers.

Customer Satisfaction Survey Area



Quality Stabilization of Partner Companies

Quality Surveillance and Technical Guidance for Partner Companies

KSOE and its shipbuilding subsidiaries provide a wide range of support to raise the quality competitiveness of partner companies, which relatively lack talent and technical infrastructure. Quality surveillance is conducted regularly in partner companies, and technical guidance has expanded. With these general support programs, we have shared our know-how and technology without compensation. Also, we support partner companies to internalize their quality management system and share quality issues and best practices consistently to strengthen fellowship. KSOE and its shipbuilding subsidiaries keep considering that the quality competitiveness of partner companies decides our competence and paying close attention to building the quality management competence of partner companies.

Quality Control Activities

- Support technical guidance and automated manufacturing facility technologies (Technical advice, meeting, and system establishment, etc.)
- Provide training by inviting equipment makers and manuals tailored to each partner company
- Provide quality improvement recommendation based on quality database
- Promote self-regulated quality activities by fostering self-reliance of partner companies
- Participate in government support projects such as factory automation and offering technical support (I-HI)
- Dispatch quality instructors¹ (I-HI)
- Produce and provide quality training cards dedicated for foreign workers (I-HI)

1. Sharing experience and technology in regard to overall quality with partner companies free of charge

Quality Control Process



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Quality Management

Activities

Minimization of Quality failure cost

KSOE and its shipbuilding subsidiaries introduced the Quality failure cost¹ system for the first time in the industry. Since the system was first implemented in HHI in 2016, it was expanded to all shipbuilding subsidiaries, including HMD and HSHI, in 2019. Currently, the system is classified into critical items, such as production, design, and A/S, followed by analysis by item. Based on the results, we prepare improvement plans, reducing Quality failure cost. Targeting and controlling the quality failure cost system, we will continue to deliver high-quality vessels to our clients.

1. Quality failure cost: costs incurred by quality-related issues before and after delivery of products and services to the customer

Establishment of Self-regulated quality system

The shipbuilding subsidiaries have reached a stable quality level and built a quality system through decades of accumulated shipbuilding experience, which served as a foundation of customer trust. We aim to apply the inspection delegation policy more widely based on mutual trust. In addition to strengthening quality control in all areas, from ship design to construction and post-delivery, we will expand the delegation of customer inspection by providing transparent quality information such as upgrading remote inspection methods and transmitting real-time data. In particular, we will launch the Hi-TRUST service for group companies’ entrusted inspection, expand the homogeneity of quality among shipbuilding subsidiaries, implement policies and activities, and raise the fundamental quality level to increase the scope of the quality self-assurance.

Quality Training

We have continuously provided internal and external training for all employees with an aim to improve work quality. Notably, since the COVID-19 pandemic, we have expanded the non-face-to-face training area to upgrade our quality levels.

Area	Key Education Areas
Quality	<ul style="list-style-type: none"> Quality cost analysis / utilization Root cause analysis technique for quality issues Quality management of partner companies ISO 9001 internal / certification auditor course
DT / IT	<ul style="list-style-type: none"> AI introductory/beginner/intermediate/advanced course Big data analysis and programming course (R, Python, etc.) Smart Factory construction process
Design / PM	<ul style="list-style-type: none"> International standards and regulatory policies on ships and engine Failure diagnosis and cyber security of smart ships Risk management and management competency improvement

Quality control Synergy with Shipbuilding Subsidiaries

Quality Exchange Meeting

Shipbuilding subsidiaries jointly conduct ‘Quality Exchange Meeting’ every half year, joined by quality executives and department heads from each entity. The meeting reviews the direction of the group’s quality management, shares current issues and best practices, and identifies common items, seeking to create synergies in quality management. At the meeting in the first half of 2022, they covered items such as the advancement of the quality failure cost management, quality management measures for internal and external partner companies, and measures to improve basic quality and customer satisfaction management.



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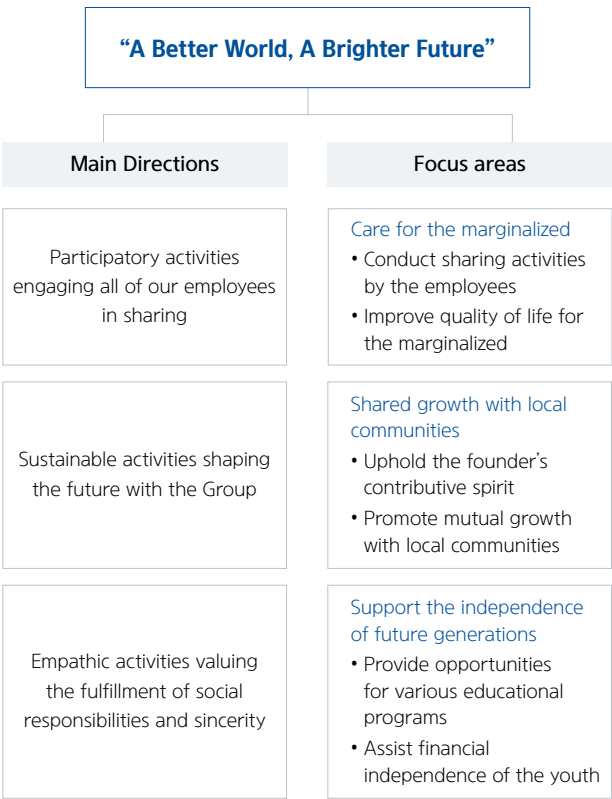
Social Contribution & Community

Background

Contributing to the development of the country and local communities is our management philosophy. Staying true to this, KSOE and its subsidiaries carry out a wide range of CSR activities to become a company that earns love and respect from people. Our contribution activities are linked to the themes of participation, sustainability, and empathy, which target to help the marginalized and promote local communities. Furthermore, we see these social contribution activities from the perspective of ‘shared growth’, not just as one-time support or charity activities. Especially, we regard young people as the future competitiveness that will drive the society. Therefore, we focus on assisting the growth of the youth by actively utilizing our infrastructure, expertise, and experience.

Activities

Social Contribution and Community Operational System



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Social Contribution & Community

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1% Salary Donation Campaign

In 2011 Hyundai Oilbank, an affiliate of HHI group, launched a foundation where the employees donate one percent of their salary. It was the first case of a major firm in Korea establishing a large-scale donation by the employees. Since then, the donation campaign has expanded to the whole group, culminating in the creation of ‘HHI Group 1% Nanum Foundation’ in 2020. Following the good custom, KSOE and its shipbuilding subsidiaries actively participated in the campaign and raised a total of KRW 3.9 billion in 2021, which was spent to conduct various sharing activities. Our activities mainly target to help the underprivileged, which include ‘Heating Fuel Sharing’ for the neighbors suffering from cold, ‘1% Meal Sharing’ project that provides free lunch to senior welfare centers, and ‘Dream Sketch’ to support children in institutional care. In addition, we also conduct projects from ‘Donor Proposals’ to appreciate feedback and ideas from our employees, which facilitates the social contribution and adds meaning to the donors.

Donations in 2021



Employees
KRW 1.1682 billion



Company
KRW 700 million

1. Based on the combined value of KSOE, HHI, HMD, and HSHI

Performance Area

Activity	Details		Performance in 2021	Participants
Care for the Marginalized	Rice giving	• Donation of rice to social welfare centers to help neighbors in need	• KRW 88.63 million spent • A total of 1,326 bags of rice donated to 21 social welfare centers in Ulsan	HHI
	Kimchi sharing	• Kimchi-making for neighbors in need	• KRW 48.42 million spent • Kimchi delivered to the underprivileged (2,000 packs, 5kg each)	HHI, HMD
Shared Growth with Local Communities	Blood donation campaign	• Contributed to the stabilization of the blood supply during the pandemic	• 1,969 employees engaged	KSOE, HHI, HMD, HSHI
	Support for the vulnerable in Seongnam	• Provided free breakfast for the poorly-fed children in Seongnam • Donated laptops to local children's centers • Improved the residential environment for senior citizens living alone	• KRW 80.30 million spent • Free breakfast given to 20 poorly-fed children • 60 laptops donated to 52 local children's centers • 20 houses of senior citizens living alone refurbished	KSOE
Support the Independence of Future Generations	‘Hope ON’ support for heating costs in winter for low-income families	• Supported the purchase of heating mattress pads and winter blankets for children from low-income families in Ulsan area	• KRW 20 million • 60 low-income households with children	HMD
	Financial support for children without parents	• Sponsored children without parents to lead stable lives and focus on their studies	• 23 households	HSHI

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Activities Linked up to the Shipbuilding Industry

Participation in ‘Dream Sketch’ Project

‘Dream Sketch’ is a support project to promote emotional stability and independence of children in orphanages, including aged-out children. Aged-out children refer to young adults who are discharged from childcare facilities as they come of age, even if they are not ready for independence. Unlike ordinary youth, they are faced with the problem of making a living without family care and financial support at an early age. KSOE and its shipbuilding subsidiaries deeply sympathize with the difficulties of the aged-out children discharged from the institution. Therefore, we assist their economic independence by teaching vocational skills to them, the best gift we can offer. By providing skill training and job opportunities, we aim to lessen financial pressure on the aged-out children. They can learn professional skills at our Technical Education Institutes and receive job offers from our partner companies. Even after employment, our support continues for at least two years, including the provision of accommodation, mentoring programs, and career development allowance (KRW 300,000 per month). Through ‘Dream Sketch’, we will continue to help aged-out children with practical support so that they can grow up into healthy members of society.

Shipbuilding Subsidiaries’ Technical Education Institutes and Technical Trainee Program

Technical Education Institutes in each subsidiary implements diverse social contribution activities utilizing our world-best shipbuilding technologies. ‘Technical Trainee’ is the most prominent program that contributes to creating jobs in local communities. The program aims to nurture professionals in heavy industries and provide trainings and job opportunities to technical trainees recruited from each technical education institute. The shipbuilding subsidiaries not only provide free education and training allowance for the trainees but assist them to find a job as production technicians in our affiliates or partner companies. Notably, in 2021, we doubled the number of applicants for Technical Trainees to nurture shipbuilding talents, as the shipbuilding industry showed signs of significant recovery. A total of 110 trainees were selected in four areas, including welding, piping, clamping, and painting. They received training both in theory and in practice as well as industrial safety education at each Technical Education Institute.



Support for People of Merit to the Country from Afghanistan

In August 2021, KSOE and its shipbuilding subsidiaries, along with HHI Group affiliates, decided to support people of merit to the country coming from Afghanistan. For their smooth adaptation to Korean life, we provided funds for settlement, Korean language courses, and job arrangements for their economic independence. In particular, 29 Afghans with excellent skills have accepted job offers from 12 partner companies of HHI, and they started working in Engine and Machinery Division since February 2022. After receiving job training at each company, they are currently working in the areas such as piping and painting. We will continuously assist the stable and prompt settlement of people from Afghanistan alongside the Korean government, fulfilling our corporate social responsibilities.

Supporting activities for People of Merit to the Country from Afghanistan

- Raised funds for initial settlement and employment training for women jointly with Ulsan City
: Settlement support funds, Korean language education for women (April to December), Care service, Employment education for women
- Multicultural Family Support Center
: Arrangements for step-by-step re-employment
- Ulsan Metropolitan Office of Education
: Assigned teachers dedicated for Afghans, supporting additional Korean language classes
- Ulsan Metropolitan City Donggu Office
: Conducted individual interviews at the multicultural center, assisted housing services such as window shade installation, and placed residing staff from the center at HHI Joong-ang apartment (for one year, starting from April)

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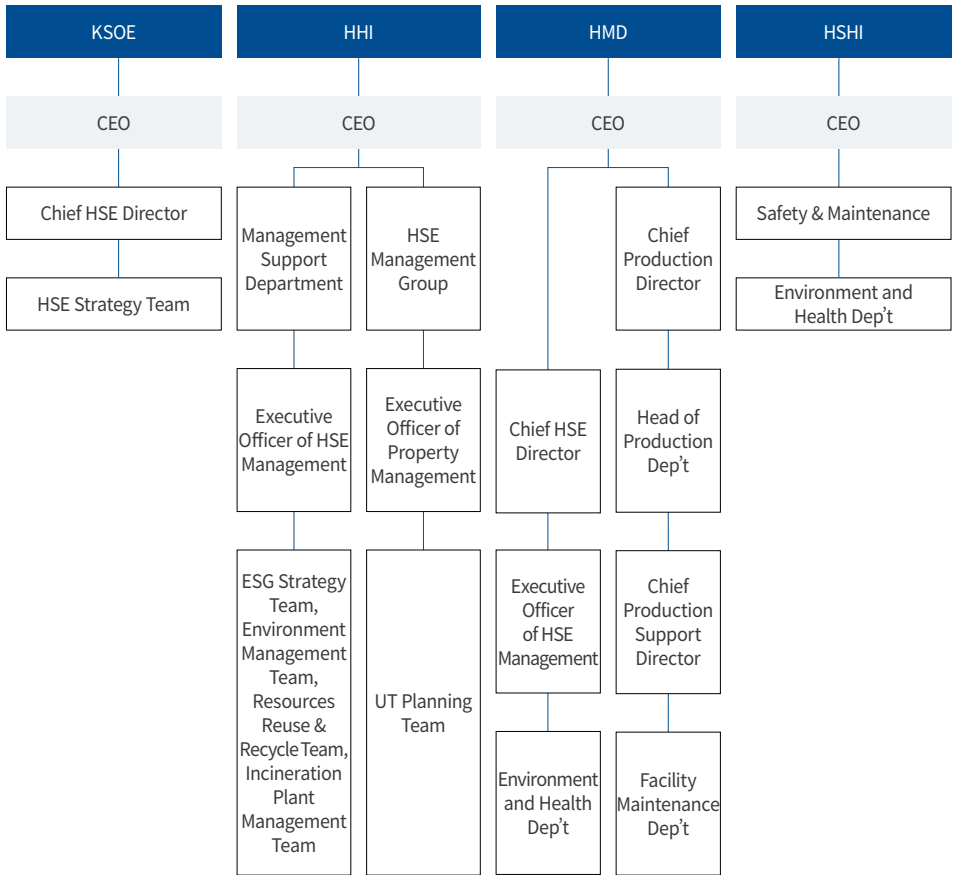
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Environmental Management Governance

KSOE and its shipbuilding subsidiaries put in place the organizations in charge of environmental management affairs. The organizations responsible for environmental management respond to climate change, manage energy and GHG emissions, and conduct various activities to minimize our business sites' impact on the environment.



Declaration of Environmental Management

KSOE and its shipbuilding subsidiaries announced their vision for low-carbon and green management through the declaration.

HHI Group's employees will deliver on our 'seven commitments' to create a clean and bright future and a dream of tomorrow to the next generation.

Seven Commitments of Environmental Management

🏠 HHI Group's ESG Website | <https://esg.hhigroup.kr/en/em>

1. We will achieve carbon neutrality to address climate change.
2. We will drive eco-friendly technologies for ships forward to low carbon green growth.
3. We will comply with domestic and international environmental laws and regulations.
4. We will strengthen our key pillars of environmental management based on ISO 14001.
5. We will take the lead in efficient use of resources through saving and recycling.
6. We will minimize pollutants in the production process.
7. We will make transparent disclosure of environmental information and establish good corporate culture for environmental management.

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① Environmental Investments

Category	Unit	KSOE			HHI ¹			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Environmental investments	KRW 100M	0	0.4	0	492	345	967	139	38	19	180	160	171

1. Changes made in calculation method and criteria may lead to discrepancies with the previous report.

② Environmental Trainings

Category			Unit	HHI			HMD			HSHI		
				2019	2020	2021	2019	2020	2021	2019	2020	2021
Employee	Participants	Persons	6,960	7,418	9,532	13	2,744	2,633	3,721	3,678	3,534	
	Total training hours	Hours	13,920	14,836	19,064	108	5,560	5,332	7,442	7,356	7,068	
	Training hours per employee	Hours	2	2	2	8	2	2	2	2	2	
	Ratio of employees participated in trainings	%	50.2	55.3	74.4	100	100	100	100	100	100	
	Environmental accident response drill	Cases	6	6	5	1	2	2	1	1	1	
Partner Company	Participants	Persons	7,800	7,963	12,263	5	3,740	3,622	7,933	5,631	7,852	
	Total training hours	Hours	15,600	15,926	24,526	5	7,900	7,244	7,933	5,631	7,852	

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③ Environmental Management Certification Coverage

Category	Unit	HHI			HMD ¹			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021
ISO 14001 (Environmental Management Systems)	%	100	100	100	100	100	100	100	100	100
ISO 50001 (Energy Management Systems)	%	100	100	100	-	-	-	100	100	100

1. Going through the procedure to obtain the Energy Management System (ISO 50001) certification

④ Environmental Engagement Program

We are working with local organizations to reduce environmental pollution in local communities through diverse preventive and cleanup activities.

- **HHI** has created a national response team, ‘HHI Dolphin’, to take measures in the event of a marine pollution accident and participate in the local environment autonomous patrol unit in the eastern and northern parts of Ulsan. Furthermore, it carries out voluntary work to clean up the stream.

- **HMD** has joined the local environment autonomous patrol unit in the eastern and northern parts of Ulsan. Each department manages respective energy targets and the company operates in-house buses to reduce energy consumption.
- **HSHI** is carrying out river cleanup activities in the vicinity of its business sites. It also signed business agreements on carbon neutrality activities with the Wolchulsan National Park and Dadohaehaesang National Park of Korea National Park Service.

⑤ Environmental Violations

Category	Unit	KSOE			HHI			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Violations of legal obligations	Cases	0	0	0	0	1 ¹	2	0	0	0	0	0	0
Environmental liability insurance	Applied	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

1. Changes made in calculation criteria may lead to discrepancies with the previous report.

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Climate Change Response

Target

KSOE and its shipbuilding subsidiaries have set up the targets of mitigating GHG emissions to deliver sustainable management. We comply with IPCC¹ and domestic guidelines to measure our GHG emissions and effectively reduce emissions. The detailed strategies and targets regarding climate action are available on pages 58 to 65. Each company’s target for GHG emissions is as follows.

- **HHI:** 584,596 tCO₂eq or below (less than 90% of carbon credits owned²)
- **HMD:** 175,000 tCO₂eq or below
- **HSHI:** 266,106 tCO₂eq or below

1. IPCC: Intergovernmental Panel on Climate Change

2. Carbon credits owned are subject to change due to additional allocation or allocation withdrawal.

Performance Data

GHG Emissions

KSOE and its shipbuilding subsidiaries have constantly monitored and managed our emissions for reduction. At the company level, the GHG emissions reduction policy has been established, and each subsidiary is making all-out efforts to ameliorate their facilities.

- **HHI** has established the HHI Greenhouse Gas Management System (HGMS) to manage its emissions. It also set up its target of reducing its emissions by 15% from the level of 2015 in 2021 and exceeded this target through fuel transition and equipment replacement. The sales of its surplus carbon credits generated around KRW 1.29 billion in revenue.
- **HMD** sold 10,000 ton of the surplus carbon credits and generated KRW 200 million. In addition, various efforts are being made such as the establishment of real-time monitoring system for GHG emissions-releasing facilities and the switch to low-carbon and high-efficiency equipment.
- **HSHI** mitigated GHG emissions by around 19,000 tons against the expected emissions in 2021 through the improved commissioning procedure including the shortened commissioning. The responsible energy management system optimizes the air compressors’ pressure standards, operating hours of painting equipment, and temperature and humidity of LNG carriers’ cargo tank.

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Climate Change Response

① Scope 1, 2^{1, 2}

Category	Unit	KSOE ³			HHI			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Total emissions (Scope1+2) ⁴	tCO ₂ eq	7,650	6,965	7,520	509,785	523,360	536,705	155,870	148,357	155,882	240,688	253,440	255,235
- Direct emissions (Scope1)	tCO ₂ eq	3,706	3,138	3,199	209,538 ⁵	218,914	243,443	50,036	48,091 ⁵	50,696	103,022 ⁵	101,652 ⁶	105,690
- Indirect emissions (Scope2)	tCO ₂ eq	3,944	3,827	4,321	300,247	304,446	293,262	105,834 ⁵	100,266 ⁵	105,186	137,666	151,788 ⁶	149,545
Intensity (Scope1+2)	tCO ₂ eq/ KRW billion	0.50	0.47	0.49	93.42	62.96	64.58	52.06	53.14	53.99	69.01	64.70	60.20
- Intensity change rate (Scope1+2)	%	- ⁷	-7.25	3.86	- ⁷	-32.60	2.56	-14.46	2.07	1.61	-12.88	-6.23	-6.96
Total reduction (Scope1+2)	tCO ₂ eq	-	-	-	1,666.5	22,190	35,532	-	-	-	3,419	26,437	19,136
- Direct reduction (Scope1)	tCO ₂ eq	-	-	-	1,240.5	15,284	32,151	-	-	-	-	17,397	13,015
- Indirect reduction (Scope2)	tCO ₂ eq	-	-	-	426	6,906	3,380	-	-	-	3,419	9,040	6,121

1. Calculated based on the guidelines on emissions reporting and verification of the Emissions Trading Scheme

2. Data coverage

- KSOE and HHI: All business sites
- HMD: The Head Office (Main Plant), Onsan Plant, Yongyeon Plant, Seoul Office, Future Hall, Literature Hall, Technical Education Institute, and Bangeojin Sports Park
- HSHI: the Head Office and Daebul 1 Plant

3. Not subject to the Emissions Trading Scheme, the emission factor specified in the guidelines on emissions reporting and verification of the Emissions Trading Scheme applied for the calculation since 2021

4. This total amount of Scope 1 and 2 emissions rounded off may be different from the figure specified in GHG Assurance Statement

5. Changes made in rounding decimals may lead to discrepancies with the previous report.

6. Changes made due to data errors may lead to discrepancies with the previous report.

7. Applicable numbers don't exist: the company was spun off/newly established in 2019.

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② Scope 3¹

Category		Unit	KSOE		HHI		HMD		HSHI	
			2020	2021	2020	2021	2020	2021	2020	2021
Total scope 3 emissions		tCO ₂ eq	14,868	15,338	40,930,026	53,282,604	66,044,605	64,799,803	28,410,893	32,662,131
Upstream	Purchased goods and services	tCO ₂ eq	0	0	2,139,001	2,155,703	788,095	887,624	1,770,478	1,726,616
	Capital goods ²	tCO ₂ eq	0	0	24,574	23,106	15,613	12,305	11,077	13,683
	Fuel-and Energy-related not included in Scope 1 or 2	tCO ₂ eq	573	553	30,474	31,793	9,390	10,352	14,211	14,255
	Upstream transportation and distribution ³	tCO ₂ eq	0	0	37,405	38,570	1,141	1,416	2,069	1,848
	Waste generated in operations	tCO ₂ eq	44	49	5,628	6,658	19,934	20,357	40,839	39,830
	Business travel	tCO ₂ eq	109	75	95	65	95	65	52	53
	Employees commuting	tCO ₂ eq	1	1	15	15	10	10	3	3
	Use of ships sold ⁴	tCO ₂ eq	0	0	38,689,326	51,022,580	65,209,103	63,866,452	26,568,387	30,861,662
Downstream	End-of-life treatment of ships sold ⁵	tCO ₂ eq	0	0	3,506	4,114	1,225	1,225	3,777	4,181
	Investments	tCO ₂ eq	14,141	14,660	0	0	0	0	0	0

1. 2020 ~ 2021: A total of ten categories are subject to Scope 3 emissions calculation, such as raw material procurement, transportation, use and transportation of products and services, and end-of-life treatment.
2. Based on the investments in key facilities within the year specified in the annual report
3. Limited to the transportation contracts directly signed by the company
4. Based on delivered vessels within the year
5. Based on the presumption that delivered vessels are fully recycled

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③ Energy consumption¹

KSOE and its shipbuilding subsidiaries have formulated a set of energy management standards for the efficient use of energy and operated the systematic energy management system.

Category		Unit	KSOE			HHI			HMD			HSHI		
			2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Total energy consumption ²		TJ	154	140	153	8,803.65	8,993.62	9,192.60	2,847	2,690	2,865	4,059	4,348	4,399
Direct energy (non-renewable energy)		TJ	73	61	63	2,620	2,724	3,063	668 ³	626 ³	667	1,225	1,223 ³	1,274
Indirect energy	Non-renewable energy	TJ	81	79	90	6,182	6,268	6,128	2,179	2,064	2,198	2,834	3,125 ³	3,125
	Renewable energy	TJ	0	0	0	1.65	1.62	1.60	0	0	0	0	0	0
Intensity		TJ/ KRW billion	0.01	0.01	0.01	1.61	1.08	1.11	0.95	0.96	0.99	1.16	1.11	1.04
Intensity change rate		%	- ⁴	-7.39	-5.13	- ⁴	-32.93	2.22	-16.18	1.32	2.99	-15.50	-4.61	-6.53

1. Data coverage
- KSOE and HHI: All business sites
- HMD: The Head Office (Main Plant), Onsan Plant, Mohwa Plant, Yongyeon Plant, Seoul Office, Future Hall, Literature Hall, Technical Education Institute, and Bangeojin Sports Park
- HSHI: The Head Office and Daebul 1 Plant

2. This total amount of direct and indirect emissions rounded off may be different from the figure specified in the GHG Assurance Statement.

3. Changes made in rounding decimals may lead to discrepancies with the previous report.

4. Applicable numbers don't exist: the company was spun off/newly established in 2019.

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④ Energy Savings

KSOE and its shipbuilding subsidiaries have carried out many activities for energy use reduction such as equipment replacement or management system establishment.

Category	Reduction
HHI	· Total energy reduction: 503.8TJ - Improvement in the ship commissioning process (preshipment of materials, reducing cable use, etc.) (412.2TJ) - Replacement with LED lighting fixture (30.7TJ) - Energy source transition for ship commissioning (oil → land power) (4.7TJ) - Other energy reduction activities (56.2TJ)
HMD	· Total energy reduction: 59TJ - Introduction of energy-saving devices for compressed air systems (28TJ) - Advancement of the air conditioning system in the painting shop (31TJ)
HSHI	· Total energy reduction: 290TJ - Shortening and improvement of commissioning procedure (162TJ) - Establishment of responsible energy management system and control system (128TJ)

⑤ Energy Generation and Sales

Category		Unit	HHI		
			2019	2020	2021
Non-renewable energy generation	Total generation	MWh	0	0	0
	- Electricity	MWh	0	0	0
Renewable energy generation	Total generation	MWh	2,446.539	1,668.754	1,841.079
	- Solar	MWh	171.875	168.750	166.667
	- Wind	MWh	2,274.664	1,500.004	1,674.412
	- Hydropower	MWh	0	0	0
	- Others (biomass, etc.)	MWh	0	0	0
Energy sales	Total Sales ¹	MWh	2,274.664	1,500.004	1,674.412
	- Electricity	MWh	2,274.664	1,500.004	1,674.412
	- Heat	MWh	0	0	0
	- Others	MWh	0	0	0

1. Sales from wind power generation

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Minimization of Water Consumption and Environmental Impact

Strategy

KSOE and its shipbuilding subsidiaries are making every effort to minimize the impact that our business operations have on the environment. To this end, we have drawn up a set of standards more stringent than the legal requirements for each category, based on which we manage our pollutant emissions.

Target

Category	HHI	HMD	HSHI
Water	· Reduce water use per business unit, factory, and department through an automated energy source collection and analysis system	· Reduce the consumption by 119,233 tons by implementing energy management system and managing water consumption by plant/department	· Reuse 205,000 tons of reclaimed water reducing KRW 127 million in water usage
Air pollutants	· Reduce particulate matters by 40% from the 2014 level · Discharge 90% of NOx from the NOx level held in Total Emission Control Shop (Main Plant)	· Manage the emission of NOx to be within 10 tons	· Reduce the emission of NOx by 30% from the allowable emissions
Water pollutants	· Manage effluent discharge to be within the 2022 discharge estimation by improving water reuse rate · Reduce effluent discharge by more than 1% from the previous year starting from 2023	· Manage effluent to be within 50% of allowable concentration for effluent discharge - Targets in 2022: BOD ≤ 60mg/L, TOC ≤37.5mg/L, SS ≤60mg/L	· Emission target: BOD below 6ppm and SS below 6ppm - Set our internal control standards for water pollutants at 30% of the legal requirements
Waste	· Manage waste to be within a target granted by Ministry of Environment in relation to 2022 Resource Circulation Control System - Targets in 2022: Circular utilization rate ≥ 26.58% Final treatment rate <31.29%	Targets in 2022: · Circular utilization rate ≥ 16.24 % · Final treatment rate < 30.69%	Targets in 2022: · Circular utilization rate: 59.55% · Final treatment rate: 19.96%
Chemicals	· Achieve Zero chemical accidents in hazardous chemical handling facilities by engaging in the ‘VALFS Plus Campaign’, a chemical accident prevention campaign hosted by Ministry of Environment · Limit chemical emissions to the estimated range for 2022; reduce the emissions by at least 1% than the previous year, starting from 2023	· Chemical emission control target in 2022: Less than 1,147tons/year (air discharge) (Calculation formula: 2021 performance X change rate of the number of annual constructions)	· Reduce chemical emissions by 5% from the 2021 level

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Minimization of Water Consumption and Environmental Impact

Performance Data

① Water¹

In an effort to mitigate our water consumption, KSOE and its shipbuilding subsidiaries measured and analyzed our water use to take countermeasures at the company level.

- **HHI** reduced its water use through the investments in the installation of water saving devices within in-house.
- **HMD** inspects water consumption of the Head Office and outside plants three times a month to analyze. For water leakage minimization, it removed hot water bathtubs in the shower room and replaced old pipelines.
- **HSHI** reused 201,889 tons of reclaimed water, saving KRW 120 million.

Category	Unit	KSOE ¹		HHI			HMD			HSHI		
		2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Water withdrawals	ton	31,963	29,487	3,615,425	3,172,639	3,145,145	1,205,127	1,016,309	1,249,565	3,086,567	2,702,422	3,057,535
- Water provided by the third parties (service water, industrial water, residential water, etc.)	ton	31,963	29,487	3,615,425	3,172,639	3,145,145	1,205,127	1,016,309	1,249,565	3,086,567	2,702,422	3,057,535
- Underground water	ton	0	0	0	0	0	0	0	0	0	0	0
- Surface water	ton	0	0	0	0	0	0	0	0	0	0	0
- Seawater	ton	0	0	0	0	0	0	0	0	0	0	0
Water intensity	ton/ KRW billion	2.14	1.90	662.53	381.69	378.43	402.50	364.01	432.79	884.91	689.92	721.12
Water reused	ton	0	0	- ²	- ²	- ²	- ²	- ²	- ²	230,034	174,603	261,026
Ratio of water reused	%	0	0	- ²	- ²	- ²	- ²	- ²	- ²	7.5	6.5	8.5

1. Data coverage

- KSOE: Ulsan Research Building

- HHI: The Head Office (Main Plant), Offshore 2 Plant, Naengcheon Piping Plant, Naengcheon Piping Painting Plant, Munsan Joint PIPE Yard, and Training Center

- HMD: The Head Office (Main Plant), Onsan Plant, Mohwa Plant, and Yongyeon Plant

- HSHI: The Head Office and Daebul 1 Plant

2. Non-managed indicator

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Minimization of Water Consumption and Environmental Impact

② Air pollutants¹

We put in place our own set of criteria for air pollutant management, based on which we have managed our emissions through the management system.

- HHI manages air pollutant emissions using its in-house integrated HSE management system (Hi-SEs) while regularly measuring air pollutants by equipment, installing, and managing the optimal prevention facilities. It has annually implemented its reduction plan following the voluntary agreement with Nakdong River Basin Environmental Office in 2018. As a result, it exceeded our mitigation target reducing our emissions by 27% compared to the level of 2014 in 2021.

- HMD manages its NOx emissions to be under 10.9 tons per year, and its emissions were 8.17 tons in 2021.
- HSHI mitigated its NOx emissions by 50% from the allowable emissions.

Category			KSOE		HHI			HMD			HSHI		
			2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
NOx	Emissions	ton	0	0.061	0.590 ²	0.442	22.474 ³	13.088	9.834	8.172	17.030	16.410	12.337
	Intensity	ton/KRW billion	0	0.00000394	0.00011	0.00005	0.00270	0.00437	0.00352	0.00283	0.00488	0.00419	0.00291
SOx	Emissions	ton	0	0	0	0	0.616 ³	- ⁴	- ⁴	0.137	0	0	0
	Intensity	ton/KRW billion	0	0	0	0	0.00007	- ⁴	- ⁴	0.00005	0	0	0
Dust	Emissions	ton	0	0.069	53.000	39.000	31.820	16.400	7.200	7.100	15.477	14.245	15.716
	Intensity	ton/KRW billion	0	0.00000445	0.010	0.005	0.004	0.005	0.003	0.002	0.004	0.004	0.004

1. Data coverage

- KSOE: Ulsan Research Building
- HHI: The Head Office (Main Plant)
- HMD: The Head Office (Main Plant)
- HSHI: The Head Office

2. Changes made due to data update may lead to discrepancies with the previous report. (Updates: data verified by the Ministry of Environment)

3. Emissions increased due to the growing number of subjects for mandatory air pollutant measurement and additional emission-related facilities such as absorption chiller heater in compliance with the revised Clean Air Conservation Act.

4. Non-managed indicator

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Minimization of Water Consumption and Environmental Impact

③ Water pollutants¹

KSOE and its shipbuilding subsidiaries strictly manage our emission of water contaminants in accordance with our own set of criteria.

- HHI manages water contaminant emission through integrated HSE management system (Hi-SEs). It also measures the emissions by facility on a regular basis and manage the sources of pollutants. In 2021, it also inspected all its effluent emission facilities, and managed the pollutant emission concentration to be within 70% of its allowable emission standards, thereby making ‘zero cases of exceeding the standards’.

- HMD analyzes and manages effluent water quality on a periodic basis through a third-party expert company. In 2021, it achieved BOD 2.2mg/L, COD 9.5mg/L, and SS 3mg/L (Regulatory Standard for Discharge: BOD 120mg/L, COD 130mg/L, SS 120mg/L), with a target to manage them below 50% of the regulatory standard.
- HSHI discharged BOD 2.13ppm and SS 17.6ppm.

Category			KSOE		HHI			HMD			HSHI		
			2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Effluents	Discharge	ton	21.54 ²	18.28	5,854	20,403	3,400	1,180	1,028	1,007	709 ³	1,096 ³	841
	Emissions	kg	0	0	19.0	74.6	17.1	6.5	10.5	9.6	2.8	4.9	2.8
Chemical Oxygen Demand (COD)	Intensity	kg/KRW billion	0	0	0.0035	0.0090	0.0021	0.0022	0.0038	0.0033	0.0008	0.0013	0.0006
	Emissions	kg	0	0	12.6	49.3	5.9	3.3	4.0	2.2	1.6	4.4	1.8
Biochemical Oxygen Demand (BOD)	Intensity	kg/KRW billion	0	0	0.0023	0.0059	0.0007	0.0011	0.0014	0.0008	0.0005	0.0011	0.0004
	Emissions	kg	0	0	7.5	19.7	6.0	22.4	4.1	3.0	0.9	1.1	1.5
Suspended Solid (SS)	Intensity	kg/KRW billion	0	0	0.0014	0.0024	0.0007	0.0075	0.0015	0.0010	0.0003	0.0003	0.0004

1. Data coverage
- KSOE: Ulsan Research Building; Calculated as zero since all effluent is consigned to external services.
- HHI: the Head Office (Main Plant)
- HMD: the Head Office (Main Plant)
- HSHI: the Head Office

2. Changes made due to data errors may lead to discrepancies with the previous report.

3. Changes made in calculation criteria may lead to discrepancies with the previous report.

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Minimization of Water Consumption and Environmental Impact

④ Waste¹

The wastes generated at the business site are classified as general and designated wastes under the Waste Control Act and are legitimately treated by a specialized third-party company. The wastes going out from the site are managed through Allbaro system (an online waste disposal verification system operated by Ministry of Environment) to manage the waste collection and transfer process in real-time, securing transparency, reliability, and adequacy of the waste treatment. Each shipbuilding subsidiary of KSOE continuously makes efforts to reduce, recycle, and reuse waste.

- In 2021, **HHI** successfully achieved 48.4% in waste circular utilization ratio with a target of 28.07% or higher while achieving 12.95% in waste terminal treatment ratio with a target of 24.97%.
- In 2021, **HMD** successfully achieved 55.73% in waste circular utilization ratio with a target of 18.5% or higher while achieving 11.03% in waste terminal treatment ratio with a target of 21.99%.
- In 2021, **HSHI** successfully achieved 72.36% in waste circular utilization ratio with a target of 48.28% or higher while achieving 12.64% in waste terminal treatment ratio with a target of 21.87%.

Category		Unit	KSOE		HHI			HMD			HSHI		
			2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Total waste disposed		ton	212	229	233,211	219,646	249,327	33,434	30,915	29,785	78,454	76,900	75,326
General	Landfilled ²	ton	0	0	169	44	308	714	621	445	6,335	6,509	7,399
	Incinerated with energy recovery	Internal treatment	ton	0	0	29,054 ³	31,784 ³	27,767	0	0	0	0	0
		External treatment	ton	20	26	28 ³	0	0	9,817	9,089	9,183	0	0
	Incinerated without energy recovery ²	ton	0	0	0	0	0	1,167	1,103	1,127	10,223	10,698	10,296
	Recycled ²	ton	182	195	165,946	139,671	137,694	18,604	14,517	14,184	58,308	55,673	53,633
Designated	Landfilled ²	ton	0	0	1,624 ³	1,447 ³	1,440	19	0	0	1	0	0
	Incinerated with energy recovery	Internal treatment	ton	0	0	0	0	0	0	0	0	0	0
		External treatment	ton	8	6	1,968 ³	2,210 ³	2,053	0	0	0	0	0
	Incinerated without energy recovery ²	ton	0	0	0	0	0	573	547	710	1,338	1,607	1,699
	Recycled ²	ton	2	2	4,657	4,607	4,021	1,384	1,185	1,339	2,249	2,413	2,299
Construction	Neutralized ²	ton	0	0	0	0	2	0	0	0	0	0	0
	Recycled ²	ton	0	0	29,765	39,883	76,042	1,156	3,853	2,797	0	0	0
Intensity		ton/ KRW billion	0.01	0.01	42.74	26.43	30.00	11.17	11.07	10.32	22.49	19.63	17.77
Intensity rate of change		%	- ⁴	3.91	- ⁴	-38.17	13.53	-7.66	-0.84	-6.83	-15.05	-12.72	-9.51

1. Data coverage: (KSOE) Ulsan Research Building / (HHI) The Head Office (Main Plant), Offshore Plant, Naengcheon Plant, Naengcheon Piping Plant, Naengcheon 3 Piping Plant, Hyundai Incineration Equipment, Munsan Yard, and Gunsan Shipyard / (HMD) The Head Office (Main Plant), Onsan Plant, Mohwa Plant, and Yongyeon Plant / (HSHI) The Head Office and Daebul 1 Plant

2. All treated off-site

3. Changes made in calculation method and criteria may lead to discrepancies with the previous report.

4. Applicable numbers don't exist: the company was spun off/newly established in 2019

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Minimization of Water Consumption and Environmental Impact

⑤ Chemical substances

HiPRO and our own management system are utilized to assess the harzards and risks chemical substances. In the case of hazardous chemicals, we handle them after gaining an approval or use alternative substances, and we plan to gradually reduce the amount of disposal.

- HHI has carried out ‘VALFS (Valve, Flange, Switch) Safety Campaign’ for preventing chemical accidents. In 2021, it conducted self-check more than once a week and received a periodic check from external institutions for hazardous chemical treatment facilities. As a result, it achieved 100% pass rate in inspections.
- HMD does not treat any hazardous chemicals. In 2021, the chemicals emitted to air amounted to 972 tons, reducing 6.1% compared with the previous year (1,035 tons).
- HSHI emitted 1,481 tons of chemicals, reducing 3.7% compared to 1,538 tons in 2020.

Special Section

#Conservation of Biodiversity

The shipbuilding subsidiaries of KSOE are at the forefront of marine ecosystem protection. Notably, in an effort to avoid disturbance of ecosystems due to ballast water, we have developed a Ballast Water Treatment System (BWTS) and received type approval for the system, ultimately complying with the standards of International Maritime Organization (IMO). In addition, we have developed graphene material that helps minimize ship vibration, reducing underwater noise to the marine ecosystem.

HHI conducts in-house marine pollution accident response drills and operates ‘HHI Dolphin’, a voluntary response team on marine pollution accidents, to prevent marine pollution accidents and minimize the impact of possible pollution. Moreover, HHI carries out various environmental protection activities such as One Company One River Revitalization campaign and Voluntary Environmental Patrol to protect the regional ecosystem.

HMD also undertakes the One Company One River campaign on a quarterly basis to not only improve river quality and sceneries, but also seek mutually beneficial cooperation with local communities. In addition, HMD leads a range of regional ecosystem preservation activities such as removing species disturbing the ecosystem.

HSHI has built and delivered an oil tanker equipped with the world’s first SILENT-E notation, underwater radiation noise level. Considering ongoing concerns over ship propeller noise affecting dolphin communication due to overlapped frequencies, it is meaningful to successfully develop and apply the technology into a vessel to go one step forward to ensure marine ecosystem preservation.

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Strategy

KSOE and its shipbuilding subsidiaries deliver a future-oriented personnel policy as a step toward the Group’s vision ‘FutureBuilder’, creating new values for the employees, companies, and the whole of humanity.

As the ‘First Mover’ in the eco-friendly, smart shipbuilding sector, we have constantly secured R&D manpower, developed technologies and created a corporate culture underpinned by trust and autonomy where our employees can grow through their work, thereby elevating the value of our employees’ life and the companies.

Performance Data

① Labor-Management Relations

KSOE and its shipbuilding subsidiaries ensure their employees of their voluntary joining of the labor union and pay close attention to the voice of our employees by regularly holding labor-management meetings. We make sure that the content of collective agreement is applied to all our employees on an equal basis.

Category	Unit	KSOE			HHI			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Union membership rate	%	34.6	8.2	4.0	97.9	96.3	96.5	100	100	100	86.6 ¹	87.9 ¹	88.1
Number of strikes	Cases	0	0	0	33	8	14	2	0	0	4	5	8
Strike force	Persons	0	0	0	43,401	5,860	8,149	205	0	0	394	799	1,079
Number of labor-management council meetings convened	Times	3	3	3	4	4	4	4	4	4	2	4	4
Ratio of employees covered by collective agreements	%	100	100	100	100	100	100	100	100	100	100	100	100

1. Changes made in data errors may lead to discrepancies with the previous report.

② Minimum notice period for a change in business

The collective agreement stipulates the minimum notice period for a significant change in management to the labor union.

- **HHI:** Notifying at least 40 days prior to the occurrence of spinning off the whole or part of business, transferring, or merging
- **HMD:** Consulting with the union at least 60 days prior to merger, absorption, or spin-off
- **HSHI:** Notifying the labor union of personnel unavoidable layoffs caused by restructuring, business conversion, spin-off, transfer, or merger at least three months in advance

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③ Workforce

Category			KSOE			HHI			HMD			HSHI		
			2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Total number of employees		Persons	652	655	649	13,863	13,423	12,811	3,094	3,066	3,024	3,681	3,636	3,506
Age groups	Under 30	Persons (%)	113 (17.3)	114 (17.4)	102 (15.7)	1,109 (8.0)	1,020 (7.6)	910 (7.1)	198 (6.4)	204 (6.7)	216 (7.1)	96 (2.6)	123 (3.4)	140 (4.0)
	30 - 49	Persons (%)	490 (75.2)	516 (78.8)	514 (79.2)	9,011 (65.0)	8,792 (65.5)	8,442 (65.9)	2,173 (70.2)	2,118 (69.1)	2,020 (66.8)	2,323 (63.1)	2,126 (58.5)	1,928 (55.0)
	50 or above	Persons (%)	49 (7.5)	25 (3.8)	33 (5.1)	3,743 (27.0)	3,611 (26.9)	3,459 (27.0)	723 (23.4)	744 (24.3)	788 (26.1)	1,262 (34.3)	1,387 (38.2)	1,438 (41.0)
Employment type	Regular	Persons (%)	590 (90.5)	624 (95.3)	625 (96.3)	13,461 (97.1)	13,153 (98.0)	12,550 (98.0)	3,029 (97.9)	2,996 (97.7)	2,974 (98.4)	3,523 (95.7)	3,495 (96.1)	3,423 (97.6)
	Non-regular	Persons (%)	62 (9.5)	31 (4.7)	24 (3.7)	402 (2.9)	270 (2.0)	261 (2.0)	65 (2.1)	70 (2.3)	50 (1.6)	158 (4.3)	141 (3.9)	83 (2.4)
Senior official	Senior officials ¹	Persons	34	40	43	72	68	73	21	20	20	21	24	18
	C-suite executives ²	Persons	11	13	14	29	30	33	7	7	7	4	6	6

1. Associate Executive Directors or higher ranks
2. Head of department or higher ranks

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④ Workforce Breakdown

Category			KSOE			HHI			HMD			HSHI		
			2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Gender	Women in total workforce	Persons (%)	123 (18.9)	129 (19.7)	133 (20.5)	632 (4.6)	591 (4.4)	567 (4.4)	86 (2.9)	91 (3.0)	84 (2.8)	80 (2.2)	83 (2.3)	74 (2.1)
	Women in managerial positions	Persons (%)	5 (7.7)	5 (7.0)	5 (6.7)	3 (1.4)	4 (2.2)	3 (1.4)	8 (1.1)	11 (1.4)	14 (1.7)	0	0	0
	Women in top management	Persons (%)	0	0	0	0	0	0	0	0	0	0	0	0
	Women in revenue-generating departments	Persons (%)	110 (19.2)	113 (18.7)	128 (20.4)	9 (5.5)	15 (8.2)	16 (9.2)	0	0	0	0	0	0
	New female hires	Persons (%)	30 (23.4)	12 (18.2)	23 (35.9)	157 (31.8)	53 (26.4)	107 (44.8)	16 (15.4)	14 (23.7)	20 (19.2)	27 (73.0)	18 (56.3)	23 (23.2)
	Women in STEM*-related departments (*Science, Technology, Engineering, and Mathematics)	Persons (%)	50 (13.2)	47 (11.8)	48 (12.7)	282 (2.0)	270 (2.0)	261 (2.0)	45 (1.7)	50 (1.8)	50 (1.9)	14 (3.7)	17 (4.3)	18 (4.7)
People with disability	Total number	Persons (%)	2 (0.31)	2 (0.31)	1 (0.15)	306 (2.2)	285 (2.2)	256 (2.0)	72 (2.3)	61 (2.0)	55 (1.8)	120 (3.3)	114 (3.2)	107 (3.2)
The national merits	Total number	Persons (%)	7 (1.0)	6 (0.9)	5 (0.8)	663 (4.5)	653 (4.8)	627 (4.9)	121 (3.9)	123 (4.0)	120 (4.0)	86 (2.4)	81 (2.2)	80 (2.2)
Nationality	Total number	Persons (%)	4 (0.61)	4 (0.61)	4 (0.62)	4 (0.03)	3 (0.02)	4 (0.03)	0	0	0	0	0	1 (0.03)
	- US	Persons (%)	1 (0.15)	1 (0.15)	1 (0.15)	0	0	0	0	0	0	0	0	0
	- UK	Persons (%)	1 (0.15)	1 (0.15)	1 (0.15)	0	0	0	0	0	0	0	0	0
	- Australia	Persons (%)	1 (0.15)	1 (0.15)	1 (0.15)	0	0	0	0	0	0	0	0	0
	- Canada	Persons (%)	1 (0.15)	1 (0.15)	1 (0.15)	0	0	0	0	0	0	0	0	0
	- India	Persons (%)	0	0	0	3 (0.02)	3 (0.02)	4 (0.03)	0	0	0	0	0	1 (0.03)
	- Greece	Persons (%)	0	0	0	1 (0.01)	0	0	0	0	0	0	0	0

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⑤ Recruitment and Retention

Category			KSOE			HHI			HMD			HSHI		
			2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Recruitment	Total number of new hires	Persons	128	66	64	494	201	239	104	59	104	37	32	99
	- Entry-level employee	Persons	99	50	52	353	183	211	88	57	69	35	31	54
	- Experienced employee	Persons	29	16	12	141	18	28	16	2	35	2	1	45
	Average hiring cost	KRW 1,000	1,155	927	1,097	537	1,037	1,043	713	928	908	2,261	1,702	901
Turnover	Total turnover	Persons (%)	33 (5.1)	42 (6.4)	66 (10.2)	983 (7.1)	848 (6.3)	870 (6.8)	116 (3.7)	124 (4.0)	42 (1.4)	32 (0.9)	40 (1.1)	81 (2.3)
	Voluntary turnover	Persons (%)	26 (4.0)	35 (5.3)	55 (8.5)	221 (1.6)	136 (1.0)	176 (1.4)	28 (0.9)	36 (1.2)	32 (1.1)	30 (0.8)	33 (0.9)	64 (1.8)
Retention	Average years of service	Years	6.3	5.9	6.0	17.1	17.5	17.7	16.4	17.6	17.9	18.1	18.9	19.5
	- Male	Years	6.6	5.9	6.0	17.4 ²	17.7 ²	17.8	17.1	17.9	18.2	18.2	19.2	19.7
	- Female	Years	5.2	5.9	5.8	12.7 ²	13.7 ²	14.5	6.8	7.1	7.8	7.6	7.5	7.7
	Retirement support system ¹	Operation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

1. Retirement planning program, retirement pension and personal pension plans
2. Changes made in calculation criteria may lead to discrepancies with the previous report.

⑥ Performance Evaluation

We have upgraded our data-based personnel evaluation and expanded its coverage to ensure fairness and employees' acceptability. Furthermore, we put in place diverse reward systems to become a work environment where our employees are motivated and have a sense of achievement.

Category		Unit	KSOE			HHI			HMD			HSHI		
			2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Ratio of employees receiving regular performance appraisal		%	77.9	83.8	85.7	90.5	91.6	91.6	93.8	95.2	94.2	91.7	90.4	89.9
Employee subject to capacity building-type evaluation system ¹		%	15.2	16.3	17.3	2.3	2.1	2.4	32.3	6.2	7.3	24.9	25.9	26.8

1. Operating MBO (Management by Objectives) for division heads / team leaders or above, and conducting 360 degree diagnosis of leadership once a year to use the results as materials to make decisions on position assignment

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⑦ Remuneration

Category			KSOE			HHI			HMD			HSHI		
			2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Employee	Average salary	KRW 1,000	67,269	63,457	63,631	75,912	67,912	70,562	79,490	69,497	75,775	77,498	75,554	79,098
	- Male	KRW 1,000	72,904	67,474	67,767	77,330 ¹	68,757 ¹	71,522	80,510	70,346	76,659	78,626 ¹	76,615 ¹	80,635
	- Female	KRW 1,000	43,513	47,077	47,585	49,182 ¹	49,567 ¹	50,325	43,795	41,737	44,853	32,703 ¹	35,027 ¹	30,451
Manager	- Male	KRW 1,000	80,772	76,063	77,709	90,292	82,882	83,473	89,708	79,796	84,857	86,830	81,927	89,395
	- Female	KRW 1,000	74,001	66,452	67,089	65,937	65,425	66,346	63,335	59,574	58,446	61,243	61,733	58,032
Non-manager	- Male	KRW 1,000	43,333	48,897	44,595	66,386	59,056	61,717	75,722	69,474	74,062	76,279	75,053	77,976
	- Female	KRW 1,000	36,471	41,017	41,502	42,987	44,917	46,046	41,791	39,689	43,093	27,143	29,618	25,280

1. Changes made in calculation criteria may lead to discrepancies with the previous report.

⑧ Welfare

Residential life support	Family life support	Leisure life support	Medical support	Retired life design support	Advancement of a work culture	Others
· Interest support for housing purchases · Residential support for employees living alone	· Support in the family events · Encouraging childbirth and childcare leaves · Daycare centers at work · Children's education support	· Operation of leisure facilities · Provision of leaves and paid leaves · Operation of self-development leaves · Leave support for workers with long-term service	· Medical expenses support · Family health check-up support	· Education on designing the retired life · Operation of retirement pension system · Individual pension support	· PC-Off system · Smart work system · Flexible work system (flexible/selective working system, etc.) · Operation of an organization dedicated to grievance handling	· Operation of a welfare mall · Provision of psychological and legal counseling

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Human Resource Management

⑧ Welfare

Category			KSOE			HHI			HMD			HSHI		
			2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Welfare	Welfare benefits	KRW 1,000	63,640,000	55,499,000	59,633,000	21,422,000	37,254,000	38,789,000	7,319,000	6,525,000	8,740,000	7,391,000	4,744,000	6,432,000
	Ratio of welfare benefits to revenues	%	0.42	0.37	0.38	0.39	0.45	0.47	0.24	0.23	0.30	0.21	0.12	0.15
Work-life balance	Ratio of participation in flexible working hours ⁴	%	48.47	65.95	81.05	6.29	25.01	28.77	0	5.06	12.67	15.51	15.59	15.69
Childcare leave	Number of subjects	Persons	238	213	290	4,590	4,057	4,112	908	835	786	1,117	986	1,046
	- Male on leave	Persons	2	7	5	107	244	227	21	46	46	65	47	49
	- Female on leave	Persons	6	9	7	17	20	23	8	8	7	4	2	6
Return to work after childcare leave	- Male	Persons (%)	2 (-) ²	4 (100)	5 (71)	258 (100)	243 (100)	223 (91)	14 (64)	27 (100)	33 (72)	68 (87)	52 (80)	40 (85)
	- Female	Persons (%)	4 (-) ²	7 (100)	8 (89)	39 (100)	21 (100)	22 (100)	3 (50)	5 (63)	3 (38)	4 (75)	3 (75)	4 (100)
Serve for over 12 months after returning from childcare leave	- Male	Persons (%)	1 (-) ²	0 (0)	3 (75)	108 (86)	231 (90)	205 (84)	13 (100)	14 (100)	28 (104) ¹	62 (87)	64 (94)	48 (92)
	- Female	Persons (%)	5 (-) ²	4 (100)	5 (71)	13 (57)	23 (59)	8 (38)	3 (100)	3 (100)	5 (100)	2 (100)	2 (67)	2 (67)
Maternity leave	- Male	Persons	7 ³	34 ³	24	446 ³	405 ³	351	81	58	31	70	54	41
	- Female	Persons	7 ³	7	6	26	25	24	6	2	5	4	2	4

1. Double counts may be included due to transfer between group affiliates.
2. Applicable numbers don't exist; the company was spun off/newly established in 2019.
3. Changes made due to data errors may lead to discrepancies with the previous report.
4. Calculation standards: (KSOE) Ratio of employees using selective work system, (HHI) Ratio of employees using at least one of selective work system, flexible commute hour system, working from home system, (HMD) Ratio of employees using working from home system, (HSHI) Ratio of employees using flexible commute hour system

Next Plan

HMD has conducted an employee satisfaction survey in 2021 and plans to create a corporate culture that sets a high value on the opinions of the employees. KSOE, HHI, and HSHI will also conduct satisfaction survey on employees by the end of 2022 to create a highly satisfactory work environment.

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Human Resource Development

Strategy

We operate various talent development programs to enhance the leadership and sharpen the job competency of our executives and employees. Equal opportunities are given to non-regular employees as well as regular employees, while providing various educational welfare benefits equally for all employees.

Education Curriculum for Office Workers																				
Job Title	Nurturing Leaders			Nurturing Hybrid Talents	Education by Rank	DT Training			Job Training		Global Training		Others							
Executive	HLC V (Leader course)	Leadership coaching			Education for new executives	DT leadership special lecture									Legally mandatory education					
Senior Manager	HLC IV	Leadership improvement course	New head of the department	Cross training on machine electricity				DT planner, agent course	DT development expert course				Consortium training	Cyber training		Training for candidates going overseas sites	Short-term study abroad for degrees	Work-study system	Retired life design	
	HLC III		New representative senior manager																	Capacity building training
	HLC II																			
Manager	HLC I																			
Associate Manager				Hybrid course for new employees	Training for employees at the second year of work	DT beginner														
					Mentoring for new employees															
New Hire															Orientation for new / experienced employees					

* HLC : HHI group Leader Course

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Education Curriculum for Production Workers															
Job Title		Leader Training		Technology Capacity Building		Technology Transfer		Other Technical Training		Self-Common Training					
Production Head			New Department Head	Basic capacity building	Job capacity building	Core Skill Transfer Program	General Skill Transfer Program	Certification training	Safety-related training	Collective professional training	Field autonomous job training	Organization facilitation training	Outstanding employee training	Legally mandatory training	Retired life design training
Production Deputy Head															
Production Manager		HTLC II (Manager)	New Manager												
Production Asst. Manager															
4th Class Engineer		HTLC I (Production Team Leader)	New Production Team Leader												
5th Class Engineer		HHI Meister University													
New Hire	After joining the company							Orientation for new hires							
	Before joining the company							Nurturing technical trainees							

* HTLC : HHI group Technical Leader Course

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Human Resource Development

Performance Data

① Training Programs

In 2021, KSOE and its shipbuilding subsidiaries strived to provide adequate educational opportunities for all employees based on diversity and inclusiveness. Despite the limitations on the training due to the Covid-19 pandemic in 2021, we swiftly improved relevant systems to conduct the training without difficulty in a non-face-to-face environment.

HHI Group Leader Course (HLC)	<div>Training target</div> Office workers
	<div>Training content</div> Curriculum in 1 to 5 levels, including organizational management capability required as a leader
	<div>Educational Effect</div> Systematically nurture leaders with business insights making them to respond flexibly in a rapidly changing business environment
HHI Group Technical Leader Course (HTLC)	<div>Training target</div> Production workers
	<div>Training content</div> Curriculum in 1 to 2 levels, including organizational management capability required as a leader
	<div>Educational Effect</div> Cultivation of basic knowledge and management innovative mindset required as a production manager
Nurturing of Convergence Talents	<div>Training target</div> New hires of science/engineering and humanities/business majors
	<div>Training content</div> Providing management and economic education to new employees in science/engineering fields, and basic engineering education to new employees in humanities/business background
	<div>Educational Effect</div> Raise the understanding of various job groups and foster consilience-type talents
DT Talent Development (DT mindset, beginner, DT planner and agent, DT advanced development expert, etc.)	<div>Training target</div> All employees
	<div>Training content</div> Providing advanced technical training for innovating work methods based on DT technology and improving work productivity
	<div>Educational Effect</div> Improve DT competency through re-education of all employees, encompassing DT mindset to advanced technology in line with the digital transformation era. Identify opportunities such as changes in working methods and entry into new businesses
Nurturing of Job Experts	<div>Training target</div> All employees
	<div>Training content</div> Sharpening specialized job capabilities, including design, sales, production management, and administrative support
	<div>Educational Effect</div> Nurture and secure employees with core technologies and raise efficiency of work
Training Course for Outstanding Employees	<div>Training target</div> Employees with work experience for more than 5 years or equivalent experience (senior managers or below)
	<div>Training content</div> Supporting a master's and doctoral degree course at leading domestic and foreign universities or short-term study abroad with concurrent work, 60% of the total admission fee and tuition (required to acquire a degree), exemption of full-time work for up to twice a week
	<div>Educational Effect</div> Nurture outstanding skilled human resources

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Human Resource Development

② Training Performance

Category		Unit	KSOE			HHI			HMD			HSHI		
			2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Training hours per employee		Hours	28	20	49	28	16	56	30	20	17	27	35	40
Training costs per employee		KRW 1,000	276	207	300	166	149	354	282	88	80	354	160	159
Ratio of employees completing the training		%	-	89.5	100	-	53.8	99.4	-	96.1	99.4	-	45.9	73.8
Employment Type	Regular employee	Hours	-	-	48.9	-	-	23.4	-	-	17.2	-	-	-
	Non-regular employee (contract workers, part-time workers)	Hours	-	-	12.4	-	-	18.7	-	-	7.1	-	-	-
Gender	Male	Hours	-	-	46.2	-	-	23.0	29.9	20.2	16.9	-	-	-
	Female	Hours	-	-	39.1	-	-	27.3	25.4	12.9	17.2	-	-	-
Managment level	Management (Executives)	Hours	-	-	13.0	-	-	14.2	-	-	11.5	-	-	-
	Senior managers or above (office job)	Hours	-	-	47.9	-	-	35.6	-	-	27.0	-	-	-
	Managers or below (office job)	Hours	-	-	32.8	-	-	29.3	-	-	34.1	-	-	-
	Entire production workers	Hours	-	-	-	-	-	16.7	-	-	9.7	-	-	-
Age groups	Age below 30	Hours	-	-	46.6	-	-	22.5	-	-	47.6	-	-	-
	Age 30 or above and below 50	Hours	-	-	46.5	-	-	23.8	-	-	16.1	-	-	-
	Age 50 or above	Hours	-	-	26.2	-	-	22.1	-	-	10.8	-	-	-

※ Detailed training indicators will be disclosed from 2021, HSHI data will be disclosed from 2022

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Human Rights

Strategy

KSOE and its shipbuilding subsidiaries respect the dignity and human rights of all stakeholders in direct and indirect relationships, based on which we are making every effort to put into human rights management. Since 2022, human rights management has been in full swing with the launch of Human Rights Management Committee and the declaration of human rights management at the company level. Going forward, we will conduct human rights impact assessments, and provide relevant education and relief of human rights violations.

Target

Target 1	At least one human rights training for all employees besides compulsory education
Target 2	100% handling of received complaints
Target 3	Annual human rights impact assessment

Performance Data

Human Rights Management Declaration

In 2022, KSOE and each of the shipbuilding subsidiaries launched Human Rights Management Committee under the Chief ESG Officer and adopted the Human Rights Declaration. Following the establishment of the roadmap for human rights management and the stipulation of the human rights protection clause in the Code of Ethics, the practice guidance for human rights management will be prepared to put human rights management into practice.

Grievance Handling System

KSOE and its shipbuilding subsidiaries make the installation of grievance handling system mandatory, assigning more than two personnel in charge of by subsidiaries (company and labor). Disciplinary Measures are taken for perpetrators based on the inspection over the details and facts of all complaints received while necessary information and assistants are provided to the victims.

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Human Rights

① Grievance Handling

Category		Unit	KSOE			HHI			HMD			HSHI		
			2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Number of reports related to human rights violation		Cases	0	82	60	192	1,080	955	35	35	28	35	31	28
Number of reports handled	Total	Cases	0	82	60	192	1,080	955	35	35	27	35	31	28
	Representative organization of employees ¹	Completed / reported cases	0	100 (5/5)	0	100 (79/79)	100 (46/46)	100 (48/48)	100 (32/32)	100 (14/14)	91 (10/11)	100 (32/32)	100 (29/29)	100 (16/16)
	Intranet ²	Completed / reported cases	0	100 (77/77)	100 (60/60)	100 (102/102)	100 (1,027/1,027)	100 (900/900)	0	100 (21/21)	100 (16/16)	0	0	0
	Hotline ³	Completed / reported cases	0	0	0	100 (11/11)	100 (7/7)	100 (7/7)	100 (3/3)	0	100 (1/1)	100 (3/3)	100 (2/2)	100 (4/4)
	Offline ⁴	Completed / reported cases	– ⁵	– ⁵	– ⁵	– ⁵	– ⁵	– ⁵	– ⁵	– ⁵	– ⁵	– ⁵	– ⁵	100 (8/8)

1. Reports received regarding wage/benefits, policies/systems, corporate culture, working hours, infra, safety environment, etc.
2. Reports received regarding personnel/compensation/education, general affairs/fringe benefits, job, safety and health, computing system, etc.
3. Reports received regarding workplace bully, etc.
4. Reports received regarding various grievances handled
5. The cases of meetings by department or individual consulting were excluded. Received cases were immediately handled or handled by the relative department.
※ No report regarding discrimination

② Education on Human Rights

Category	Unit	KSOE			HHI			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Human rights training hours per employee	Hours	2	2	2	2	2	2	2	2	2	2	2	2
Sexual harassment training hours per employee	Hours	1	1	1	1	1	1	1	1	1	1	1	1
Training hours to raise awareness of the disabled	Hours	1	1	1	1	1	1	1	1	1	1	1	1

Next Plan

KSOE and its shipbuilding subsidiaries will implement human rights impact assessment from 2022 in line with the global trend in human rights. Our mid- to long-term tasks will be set to be promoted based on the assessment results.

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Health and Safety

Strategy

KSOE and its shipbuilding subsidiaries operate a safety management system based on the global HSE standard such as ISO 45001(safety management system) and make step-by-step preparation for the response to the Serious Accidents Punishment Act to instill a culture of safety throughout the yards. Moreover, in order to create a healthy workplace with a focus on prevention, we support employees’ medical checkups and medical expenses, and provide in-house medical services including the operation of Health Promotion Center, Oriental Medical Center, and Counseling Clinic.

Category	KSOE	HHI	HMD	HSHI
Management System	Occupational health and safety certification (ISO 45001) to be obtained (end of 2022)	Occupational health and safety certification (ISO 45001) obtained	Occupational health and safety certification (ISO 45001) obtained	Occupational health and safety certification (ISO 45001) obtained
Key decision making bodies (Frequency of convocation)	Laboratory Safety Management Committee (Comprised of 15 laboratory representatives, quarterly convened)	- Safety Management Committee (Comprised of 7 internal members and 3 external experts, quarterly convened) - Occupational Safety and Health Committee (Comprised of 10 members each from the labor and management, quarterly convened)	Occupational Safety and Health Committee (Comprised of 8 members each from the labor and management, quarterly convened)	Occupational Safety and Health Committee (Comprised of 6 members each from the labor and management, quarterly convened)
Organizations in charge and their key roles	- HSE Strategy Team (directly under the CEO): Planning company-wide HSE systems, policies, and programs - Regular external inspection on its safety management system (DNV) to be conducted	- Integrated Safety Management Office (directly under the CEO) · Company-wide safety management dep’t: the company-wide HSE system·policy·program planning, etc. · Business safety management dep’t: operation of on-site safety organizations, shipowner HSE on-site management, etc. - External regular audit on the safety (DNV)	- Safety Team (directly under the CEO): technical support related to company-wide HSE system for the business owner, guidance and advice, supervision for supervisors - External regular audit on the safety management system (LRQA)	- Safety Team (directly under the CEO): company-wide HSE system, policy, program planning - On-site safety organization operation, HSE site management for shipowners - External regular audit on the safety management system (DNV)
Key performance indicators	Number of serious accidents and accident rate	Accident rate, death rate per 10,000 workers, and accident management goal completion rate	Number of fatal accidents and accident rate	Number of fatal accidents and accident rate

Target

- **KSOE:** Zero fatal accidents and zero accident rate
- **HHI:** Zero fatal accidents and accident rate of 0.195% or less
- **HMD:** Zero fatal accidents and reducing accident rate by 0.02% per year from 2022 to 2025
- **HSHI:** Zero fatal accidents and accident rate of 0.165% or less

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Health and Safety

Assessment

The shipbuilding subsidiaries of KSOE have obtained ISO 45001, an international standard for health and safety at work. We will continue to retain the certification with an aim of removing hazards and upgrading the safety health management system to the next level.

Category	Unit	KSOE ¹			HHI			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
ISO 45001	%	0	0	0	100	100	100	100	100	100	100	100	100

1. To be obtained within 2022

Performance Data

KSOE and its shipbuilding subsidiaries regard occupational safety and health as an integral part of corporate sustainable growth, hence we have built the high-risk task management system at the company level, and inspected the implementation, thereby reducing risk factors on the shop floor.

KSOE	HHI	HMD	HSHI
Conduct thorough safety diagnosis on laboratories - Carry out inspections on 17 research centers under Future Technology Research Institute to examine their status in safety and health management, achieving the highest grade (Grade 1) in the thorough safety diagnosis (thorough safety diagnosis on our laboratories objectively conducted by an external organization registered in Ministry of Science and ICT)	High-risk task management - Categorize tasks with a history of having a serious accident or high potential of occurrence as high-risk ones, establish management standards for each task (serious accident prevention measures), and control hazards on the shop floor. - Classify tasks as high-risk ones subject to PTW (Permit to Work), make it obligatory to obtain PTW to perform such tasks, and carry out through a three-layer safety management system conducted by supervisor, safety keeper, and safety agent. - Conduct on-site safety management, form a TF to improve the safety of three facilities: scaffolding, lighting, and ventilation, and carry out safety management for partner companies.	Establish standardized ventilation system for confined spaces - Categorize confined spaces by area, block, process, and vessel type, and calculate appropriate ventilation by toxic chemical to install ventilation system by block and vessel type based on the results - Use the ventilation system as database when receiving the application of PTW by linking PTW with ventilation systems Chemical management system - Before receiving chemicals, register them into MSDS ¹ and conduct a risk assessment	Reinforce the comprehensive health management - Carry out a variety programs to promote its employees' health including the operation of Health Promotion Center, Oriental Medical Center, and Rehabilitation Center, as well as the provision of medical checkups or special checkups for employees - Support comprehensive medical checkups every other year and expand the scope of checkup items to include low-dose chest CT, carotid ultrasound and echocardiography for employees aged over 40 to ensure early diagnosis - Provide quality health care services for employees in 2022, offer a range of health promotion programs by signing MOUs with local health centers, and provide health care services tailored to health risk factor for each employee through mobile health care businesses - Operate a company-wide COVID-19 Emergency Response Committee, a preemptive musculoskeletal disease prevention program, chemical control system, and a rehabilitation program

1. MSDS: Material Safety Data Sheet

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① Safety Management Indicators

Category			KSOE		HHI			HMD			HSHI		
			2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Employee	Fatalities	Persons	0	0	0	2	1	0	0	0	0	0	0
	Fatality rate	Occurrence per 0.2 million hours	0	0	0	0.01	0.007	0	0	0	0	0	0
	Lost Time Incident (LTI)	Cases	1	0	36	45	44	18	11	12	22	22	8
	Lost Time Injury Frequency Rate (LTIFR)	Occurrence per 0.2 million hours	0.15	0	0.24	0.31	0.32	0.62	0.38	0.42	0.64	0.64	0.24
	Accident rate	%	0.14 ²	0	0.25	0.33	0.34	0.43	0.20	0.20	0.60 ³	0.61 ³	0.23
	Occupational Illness (OI) ¹	Cases	0	0	356	307	349	33	34	30	51	84	98
	Occupational Illness Frequency Rate (OIFR)	Occurrence per 0.2 million hours	0	0	2.41	2.15	2.54	1.13	1.18	1.06	1.49	2.45	2.94
Partner Company	Fatalities	Cases	0	0	1	2	2	0	0	0	0	0	0
	Fatality rate	Occurrence per 0.2 million hours	0	0	0.008	0.015	0.015	0	0	0	0	0	0
	Lost Time Incident (LTI)	Cases	0	0	10	12	14	5	9	9	7	9	10
	Lost Time Injury Frequency Rate (LTIFR)	Occurrence per 0.2 million hours	0	0	0.08	0.09	0.10	0.09	0.19	0.18	0.08	0.09	0.08
	Accident rate	%	0	0	0.08	0.09	0.11	0.05	0.10	0.10	0.07 ³	0.09	0.10
	Occupational Illness (OI) ¹	Cases	0	0	- ⁴	- ⁴	- ⁴	20	19	25	27	21	40
	Occupational Illness Frequency Rate (OIFR)	Occurrence per 0.2 million hours	0	0	- ⁴	- ⁴	- ⁴	0.36	0.40	0.51	0.29	0.22	0.30

1. Major disease types: Lumbar herniated intervertebral disc, rotator cuff tear, arthritis, tennis elbow, etc.
2. Changes made in calculation criteria may lead to discrepancies with the previous report.
3. Changes made in rounding decimals may lead to discrepancies with the previous report.
4. Non-managed indicator

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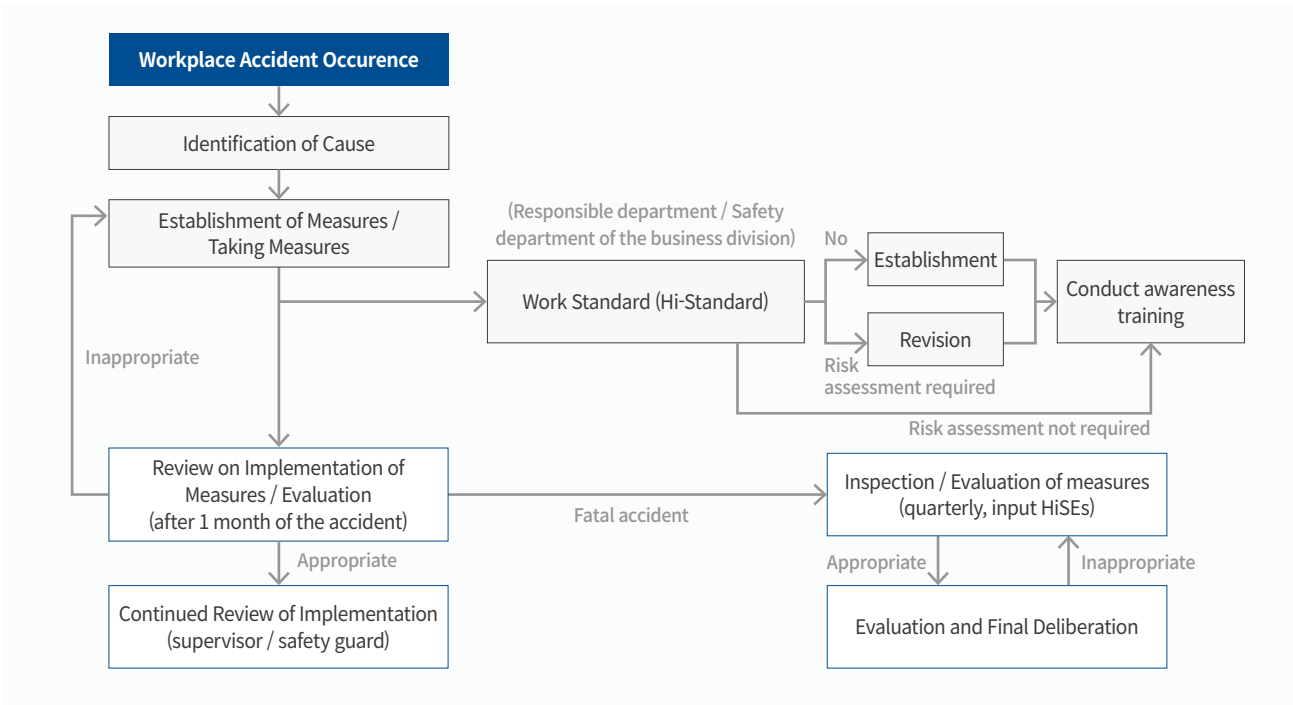
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② Violation of laws

Category	Unit	KSOE			HHI			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Fatal accident	Cases	0	0	0	1	4	3	0	0	0	0	0	0
Ratio of fatal accident	Occurrence per 0.2 million hours	0	0	0	0.01	0.14	0.10	0	0	0	0	0	0
Violation of laws	Cases	0	0	0	4	1	1	0	0	0	0	0	0

③ Accident Inspection Process

In the event of an accident, we analyze the root cause and establish measures to prevent a recurrence. The implementation of the measures is thoroughly monitored.



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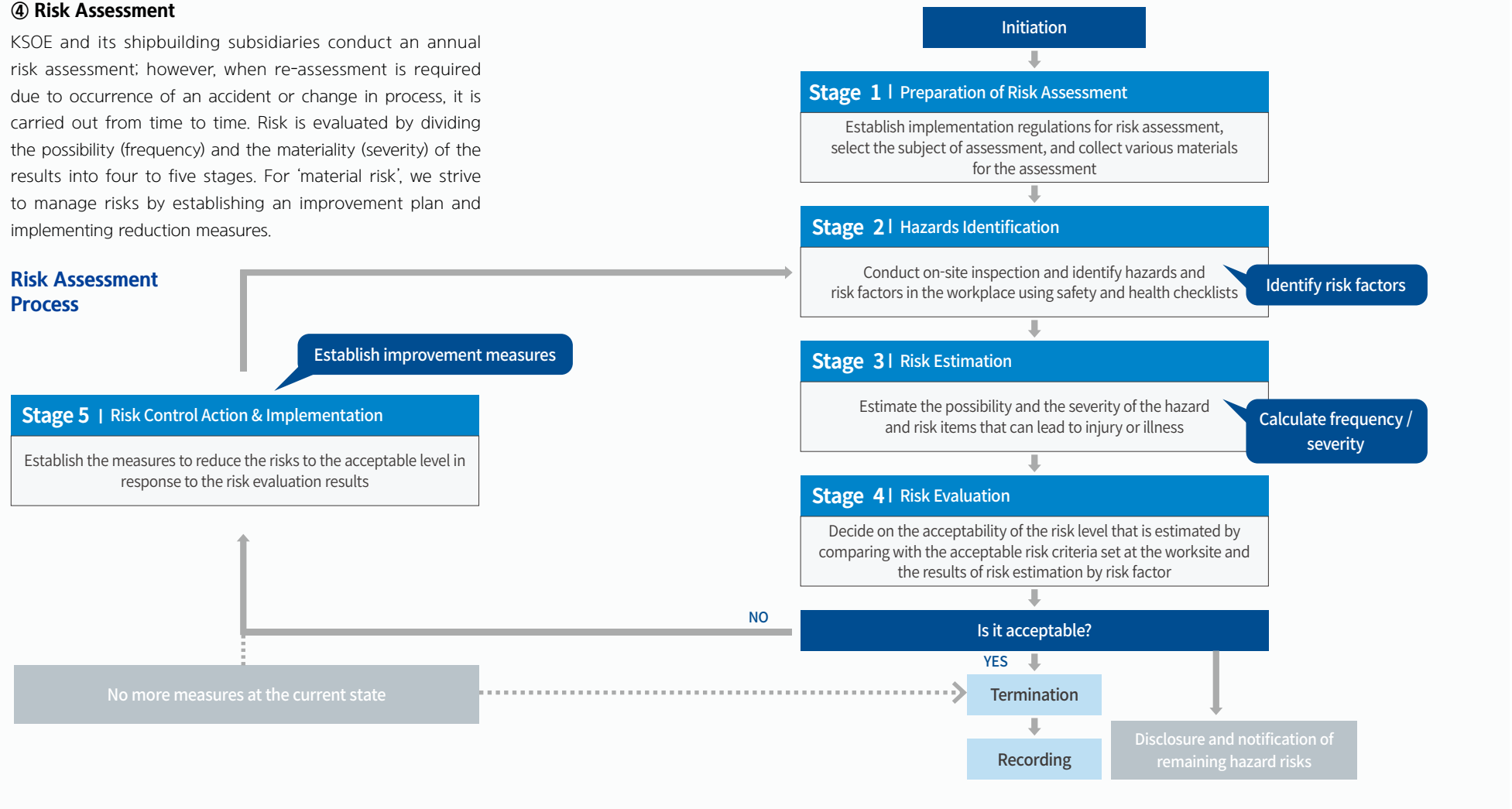
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④ Risk Assessment

KSOE and its shipbuilding subsidiaries conduct an annual risk assessment; however, when re-assessment is required due to occurrence of an accident or change in process, it is carried out from time to time. Risk is evaluated by dividing the possibility (frequency) and the materiality (severity) of the results into four to five stages. For 'material risk', we strive to manage risks by establishing an improvement plan and implementing reduction measures.

Risk Assessment Process



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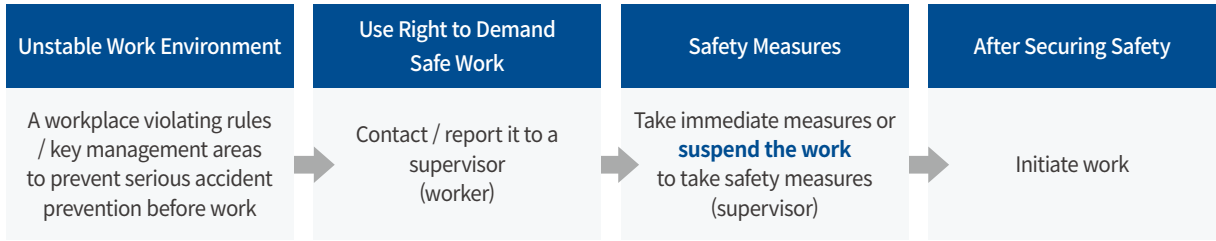
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Right to Demand Safe Work

The 'Right to Demand Safe Work' system helps workers work in a safe work environment by giving them the authority to request improved safety in an unsafe work environment to the supervisor before starting work. If an unsafe work environment is found, we manage it in accordance with the process below so that work can be initiated after taking safety measures.



Securing Safety Authority

All workers in the HHI worksites have the right to request safety improvement to a supervisor when they face an urgent risk that might lead to occupational accidents (unsafe work environment or conditions in violation of key management items in severe accidents or safety rules).
Through the 'Securing Safety Authority', workers can put the safety of themselves and coworkers first while they work, and it will never lead to any disadvantages.

CEO of HHI

◁ We produced a Securing Safety Authority Card and distributed it to all workers so that they can check the details and exercise their rights while carrying around with their employee ID cards. The card clearly states that there is no penalty for exercising the right to demand safe work.

⑤ Safety preventive management for partner companies

Category	Unit	KSOE			HHI			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Safety preventive management for partner companies	Implementation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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⑥ Health Management

We formed an organization responsible for health to prevent accidents and diseases that may arise in the workplace.

- **Safety and health preventive activities:** We provide health check-ups for employees, and special check-ups are conducted for those in charge of tasks such as noise, harmful rays, metals, and organic compounds. After the health check-up, we provide professional counseling, medication, and health education through dedicated medical personnel for high-risk groups and patients with a relatively high risk of causing cerebrovascular diseases such as high blood pressure, dyslipidemia, and diabetes. In particular, those diagnosed with occupational diseases (D1) are the subject of follow-up management, such as job change in accordance with Article 43

(5) of the Occupational Safety and Health Act. For those who require monitoring of occupational diseases (C1), we provide disease prevention education so that their health does not contract a disease and become D1.

- **Management of personal protective gears.:** We give out appropriate safety gear and personal consumables for each individual worker and have established and applied customized size standards in consideration of the job, location, and environment. We continuously manage protective gears to prevent using expired or damaged gears on site.
- **Working environment:** In accordance with Article 125 of the Occupational Safety and Health Act, we inspect the working environment twice a year and conduct chemical MSDS management, industrial ventilation facility management, and chemical risk assessment.

Category	Unit	KSOE			HHI			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Physical health care support	Introduced	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mental health care support	Introduced	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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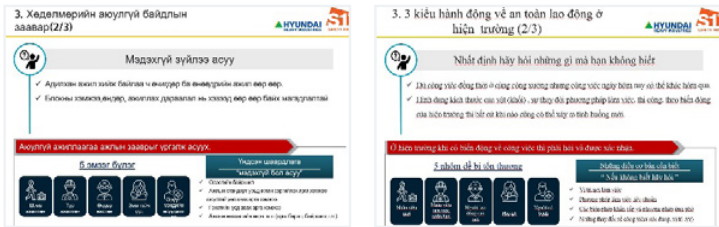
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Health and Safety

⑦ Safety and Health Education

Besides legally mandatory education, we provide various safety and health education for our employees. We provide a wide range of special safety training, especially for workers in high-risk jobs and new supervisors. In addition, aiming to tighten the accessibility of safety education for foreign workers, who have difficulty communicating in Korean, we offer educational materials in various languages such as Mongolian, Vietnamese, and Chinese in the statutory mandatory education for new employees. We also provide safety training once a year in their native languages of each nation.

Category	Details
Statutory education on safety and health	<ul style="list-style-type: none">· New hires, supervisors, employees (regular), and job changers· Safety and health management supervisors, safety managers, and health managers.· Special safety and health, hazardous chemicals, and material safety and health document
Our own education on safety and health	<ul style="list-style-type: none">· New supervisors, reinstated workers, foreign workers, violators of regulations, traffic safety, and safety academy· Education on safety and health for labor union members, HSE promoters, and safety agents' leadership development (partner companies' employees in charge of safety included)· Qualification training (scaffold, crane, gondola, forklift, high-altitude work car, etc.)· Special lectures on safety



△ Safety education materials in native languages targeting foreign workers

Category		Unit	KSOE			HHI			HMD			HSHI		
			2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Employee	Participants	Persons	646	647	648	26,693	26,462	26,912	8,912	8,106	8,069	13,709	13,791	14,026
	Education hours	Hours	7,752	7,764	7,776	927,947	850,020	871,550	213,888	194,544	193,656	329,016	330,984	336,624
	Education hours per employee	Hours	12	12	12	35	32	32	24	24	24	24	24	24
	Ratio of participants	%	100	100	100	100	100	100	100	100	100	100	100	100
Partner Company	Health and safety training for staff of partner company on site	Implementation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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Supply Chain Management

① Procurement

Category	Unit	HHI			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021
Total Purchases	KRW 100 million	54,829	44,658	66,683	19,397	17,583	20,506	31,906	23,294	34,526
- Purchase of green products	KRW 100 million	1,734	2,312	3,399	1,387	1,464	1,841	12,879	8,429	13,615

② Supply Chain

Category	Unit	HHI			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021
Total Number of suppliers	Number	2,989	3,018	3,135	1,880	1,898	1,870	1,126	1,159	1,178
Suppliers with high risk ¹	%	Below 3%	Below 3%	Below 3%	Below 0.5%	Below 0.5%	Below 0.5%	6.1	5.7	7.1

1. The suppliers classified as 'high risk' in the risk assessment

ESG Evaluation of Partner Companies

With the aim of diagnosing the ESG management status of our supply chain, HHI supported its 74 suppliers in assessing their ESG management in 2021. In 2022, it assists its 400 key suppliers in conducting self-diagnosis and providing relevant education based on ESG indicators tailored to each of them, and also help its 30 significant suppliers enhance their ESG management following due diligence.

Co-Prosperity Activities

We are delivering consistent policies to achieve co-prosperity through the Group Co-Prosperity Committee. As part of the effort, HHI Group has raised the fund for co-prosperity at the group level to provide financial assistance for partner companies to pay their interests on loans. Especially, HHI evaluates safety management capabilities of its partner companies and give rewards in order to settle a self-regulating safety culture and give motivations to practice safety-first principle for partner companies. On top of that, it supports partner companies in developing and protecting technologies through the deposit of technical material system, nurturing their manpower, and educating their employees on human rights management.

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Relationship with Local Community

Strategy

Staying true to our management philosophy, ‘We contribute to the development of our country and local communities’, KSOE and its shipbuilding subsidiaries are committed to social contribution to become a beloved company. In line with the group’s vision, ‘A Better World, A Brighter Future’, we have carried out social contribution activities in various forms; participation-based ones which engage all of our employees in sharing, sustainable activities that shapes the future together with the company, and empathy-oriented ones which value the fulfillment of social responsibilities and sincerity. In addition, we give a hand to the marginalized in need, revitalize local communities, and cultivate future generations.

Target

In order to practice corporate social responsibility, we have established and managed a goal for 2022 to extend our employees’ volunteer hours and expand the group’s social contribution projects.

- **KSOE**: 2,752 hours of volunteer work, KRW 160 million for social contribution projects
- **HHI**: 7,800 hours of volunteer work, KRW 473 million in social contribution expenses
- **HMD**: 2,880 hours of volunteer work, KRW 100 million for social contribution projects
- **HSHI**: 6,000 hours of volunteer work, KRW 100 million for social contribution projects

Performance Data

① Social Investments

Category	Unit	KSOE			HHI			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Social investments	KRW million	-	74	140	541	373	404	192	68	81	144	78	72

② Volunteering Hours per Employee

Category	Unit	KSOE			HHI			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Volunteering hours per employee	Hours	-	0.8	0.6	0.9	0.9	0.6	0.6	1.3	0.7	0.3	0.8	1.8

③ Evaluation of Social Contribution Program Operation

We evaluate the social contribution programs by checking the achievement rate compared to the goal of donations and volunteer activities and confirming the number of beneficiaries in the region.

Category	Unit	KSOE			HHI			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Evaluation of social contribution program operation	Implementation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Next Plan

In line with our social contribution vision and direction, we will never relent in our efforts to develop and expand our key business areas. Taking the goals for sustainable growth, key businesses, and local communities into account, we will give concrete shape to social contribution activities and put them into action. Our relevant activities and progress will be shared with stakeholders through our integrated reports and homepage.

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Quality Management

Performance Data

① Evaluation

Category	Unit	KSOE			HHI			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Quality evaluation of partner companies	Cases	10 ¹	5 ¹	4	293 ¹	319 ¹	241	485	503	517	276	267	279

1. Changes made in missing performance reflected may lead to discrepancies with the previous report.

② Quality Training¹

Category	Unit	KSOE			HHI			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Number of employees completed quality trainings (overlap of employees of the Quality Management Dep’t allowed)	Persons	661 ²	179 ²	3,015	402 ²	93 ²	992 ²	983	341	345	164	165	690

1. In case of KSOE, all employees are subject to data coverage.

2. Changes made in education eligibility criteria may lead to discrepancies with the previous report.

③ Certification

Category	Unit	KSOE			HHI			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Ratio of business sites obtaining quality certification	ISO 9001 (Quality Management System)	%	- ¹	100	100	100	100	100	100	100	100	100	100
	ISO 3834 (Quality requirements for fusion welding) ²	%	-	-	-	50	50	50	-	100	100	-	100

1. Changes made in data errors may lead to discrepancies with the previous report.

2. In case of HHI, the scope of its business site ranges from the entire shipbuilding to some of marine/naval and special vessels.

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Corporate Governance

Strategy

KSOE and its subsidiaries are committed to building an advanced corporate governance structure. Our direction is to minimize the risk of damaging corporate value due to conflicts of interest, abiding by the laws and regulations over the governance including internal transaction and circular shareholding and we achieve the establishment of governance that enables the realization of the management philosophy of HHI. In 2022, KSOE, HHI, and HMD have appointed female outside directors to reinforce diversity within the BOD while promoting reasonable operation of the BOD and enhancing shareholder value.

Performance Data

① Board of directors (KSOE) (as of Jul 2022)

Type	Name	Gender	Major career	Appointed date	Specialized in
Internal Director	Ka Sam-hyun (Chair)	Male	Yonsei University Former CEO of HHI Vice Chairman & CEO of KSOE	March 2020	Sales
	Chung Ki-sun	Male	Stanford University (MD) Former Vice President, Head of Management Support Division, HD Hyundai President & CEO of HD Hyundai and KSOE	March 2022	Business management
Outside Director	Choe Hyuk	Male	University of Chicago (Ph.D.) Former Non-executive member, the Securities and Futures Commission Emeritus Professor, Seoul National University	March 2017	Finance
	Lim Suk-sig	Male	University of Minnesota (Ph.D.) Former President of the Korea Accounting Standards Institute Emeritus Professor, University of Seoul	December 2018	Finance
	Jo Young-hee	Female	Harvard Law School (MD) Former Attorney, Sejong law firm Partner Attorney, LAB Partners	March 2022	Corporate Legal

Category		KSOE		
		2019	2020	2021
Board Composition	Ratio of outside directors (%)	57	50	60
	Number of other mandates allowed	1	1	1
	Ratio of board members with industry experience (%)	43	50	40
	Number of risk experts on the board	1	1	0
	Number of financial experts on the board	3	3	3
	Average tenure	2.7	2.7	2.8
Board Operation	Number of board meetings held	9	11	9
	Attendance rate	91	96	89
	Number of agenda reported	11	10	10
	Number of agenda approved	37	23	27
	- Approved (case/%)	37 (100)	23 (100)	27 (100)
	- Disapproved (case/%)	0 (0)	0 (0)	0 (0)
	- Amended (case/%)	0 (0)	1 (4.35)	0 (0)
	- Abstained (case/%)	0 (0)	0 (0)	0 (0)
Support of Board Operation	Board liability insurance	✓	✓	✓
	Company education provided	✓	✓	✓
	Utilization of outside experts on demand	✓	✓	✓
Outside Director Recommendation Committee	Number of members	5	4	4
	Ratio of outside directors	80	75	75
	Inclusion of CEO	✓	✓	✓
	Number of meetings held	2	1	1
	Attendance rate	88	80	75
	Number of agenda resolved	2	1	1
	Number of agenda reported	0	0	0

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Corporate Governance

Category		KSOE		
		2019	2020	2021
Audit Committee	Number of members	4	3	3
	Ratio of outside directors	100	100	100
	Financial expertise of the chairman	✓	✓	✓
	Number of financial experts	3	3	3
	Number of meetings held	7	5	5
	Attendance rate	92	100	100
	Number of agenda approved	3	3	5
	Number of agenda reported	14	19	19
	Number of against or amendment	0	0	0
Related Party Transactions Committee	Number of members	5	4	4
	Ratio of outside directors	80	75	75
	Number of meetings held	3	3	1
	Attendance rate	86	92	100
	Number of agenda approved	2	2	0
	Number of agenda reported	1	1	1
	Number of against or amendment	0	0	0

Category		KSOE		
		2019	2020	2021
ESG Committee ¹	Number of members	-	-	4
	Ratio of outside directors	-	-	75
	Number of meetings held	-	-	2
	Attendance rate	-	-	88
	Number of agenda approved	-	-	1
	Number of agenda reported	-	-	2
Key ESG agenda	Review of CP Program	✓	✓	✓
	Approval of anti-corruption program results	✓	✓	✓
	Establishment and inspection of risk management system	✓	✓	✓
	Review and approval of non-financial risks (ESG)	-	-	✓

1. Establishment date of ESG Committee: April 28, 2021

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② Board of directors (HHI)

(as of July 2022)

Type	Name	Gender	Major career	Appointed date	Specialized in
Internal Director	Han Young-seuk (Chair)	Male	Chungnam National University Former CEO of HMD	June 2019	Business management
	Lee Sang-kyun	Male	Inha University Former CEO of HSHI	April 2021	Business management
Outside Director	Cho Jae-ho	Male	Johns Hopkins University (Ph.D.) Former Visiting Professor, Harvard University, USA Honorary Professor, Economics, Ulsan University	June 2019	Finance
	Chae Joon	Male	MIT (Ph.D.) Outside director, LG Innotek Professor, Seoul National University Business School	March 2020	Finance
	Park Hyun-jung	Female	Seoul National University (MD) Former Judge, Seoul Central District Court Professor, Hanyang University Law School	March 2022	Legal

Category		HHI		
		2019	2020	2021
Board Composition	Ratio of outside directors (%)	57	57	57
	Number of other mandates allowed	1	1	1
	Ratio of board members with industry experience (%)	60	57	57
	Number of risk experts on the board	1	1	1
	Number of financial experts on the board	2	3	3
	Average tenure	3	3	3
Board Operation	Number of board meetings held	5	11	10
	Attendance rate	96	94	100
	Number of agenda reported	3	6	8
	Number of agenda approved	27	21	31
	- Approved (case/%)	27 (100)	21 (100)	31 (100)
	- Disapproved (case/%)	0 (0)	0 (0)	0 (0)
	- Amended (case/%)	0 (0)	0 (0)	0 (0)
	- Abstained (case/%)	0 (0)	0 (0)	0 (0)
Support of Board Operation	Board liability insurance	✓	✓	✓
	Company education provided	✓	✓	✓
	Utilization of outside experts on demand	✓	✓	✓

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Category		HHI		
		2019	2020	2021
Outside Director Recommendation Committee	Number of members	4	6	5
	Ratio of outside directors	75	67	80
	Inclusion of CEO	✓	✓	✓
	Number of meetings held	1	2	0
	Attendance rate	100	83	-
	Number of agenda resolved	1	2	-
	Number of agenda reported	0	0	-
Audit Committee	Number of members	3	4	4
	Ratio of outside directors	100	100	100
	Financial expertise of the chairman	✓	✓	✓
	Number of financial experts	2	3	3
	Number of meetings held	3	6	7
	Attendance rate	100	100	100
	Number of agenda approved	2	2	11
	Number of agenda reported	2	5	4
	Number of against or amendment	0	0	0

Category		HHI		
		2019	2020	2021
Related Party Transactions Committee	Number of members	4	5	5
	Ratio of outside directors	75	80	80
	Number of meetings held	1	1	1
	Attendance rate	100	100	100
	Number of agenda approved	3	0	0
	Number of agenda reported	0	1	1
	Number of against or amendment	0	0	0
ESG Committee ¹	Number of members	-	-	5
	Ratio of outside directors	-	-	80
	Number of meetings held	-	-	2
	Attendance rate	-	-	100
	Number of agenda approved	-	-	1
	Number of agenda reported	-	-	3
Key ESG agenda	Review of CP Program	✓	✓	✓
	Review and approval of non-financial risks (ESG)	-	-	✓

1. Establishment date of ESG Committee: April 22, 2021

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③ Board of directors (HMD)

(as of July 2022)

Type	Name	Gender	Major career	Appointed date	Specialized in
Internal Director	Shin Hyeon-dae (Chair)	Male	Graduated from Chungbuk National University, Electrical Engineering Former Representative of HHI Shipbuilding Business CEO of HMD	March 2021	Business management
	Jo Jin-ho	Male	Graduated from Yonsei University, Business Administration Executive officer at the Financial Support Unit, Management Support Office, HD Hyundai	March 2022	Business management
	Joo Hyung-hwan	Male	Graduated from Seoul National University, Business Administration Seoul National University (MBA) University of Illinois (Ph.D.) Passed the 26th Administrative Examination Former Minister of Trade, Industry and Energy Former Professor, University of Hawaii Chair Professor, Sejong University	March 2021	Business Admin.
Outside Director	Yu Seung-won	Male	Graduated from Seoul National University, Business Administration Seoul National University (MBA) University of Wisconsin-Madison(Ph.D.) Former Professor, Hong Kong University of Science and Technology Former Outside Director, KB Kookmin Bank Professor, Business Administration, Korea University	March 2020	Finance
	Kim Seong-eun	Female	Graduated from Cornell University, Business Administration, University of Southern California (MD) Former President of Korea Management Education Association Former Advisory member, the National Economic Advisory Council Former Outside Director, Citibank Korea	March 2022	Business Admin.

Category		HMD		
		2019	2020	2021
Board Composition	Ratio of outside directors (%)	60	60	60
	Number of other mandates allowed	1	1	1
	Operation of outside director recommendation	✓	✓	✓
	Ratio of board members with industry experience (%)	40	40	60
	Number of risk experts on the board	1	1	1
	Number of financial experts on the board	1	1	2
	Average tenure	2.6	2.6	2.6
Board Operation	Number of board meetings held	7	7	8
	Attendance rate	100	100	100
	Number of agenda reported	10	9	9
	Number of agenda approved	16	13	16
	- Approved (case/%)	16 (100)	13 (100)	16 (100)
	- Disapproved (case/%)	0 (0)	0 (0)	0 (0)
	- Amended (case/%)	0 (0)	0 (0)	0 (0)
	- Abstained (case/%)	0 (0)	0 (0)	0 (0)
Support of Board Operation	Board liability insurance	✓	✓	✓
	Company education provided	✓	✓	✓
	Utilization of outside experts on demand	✓	✓	✓

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Category		HMD		
		2019	2020	2021
Outside Director Recommendation Committee	Number of members	4	4	4
	Ratio of outside directors	75	75	75
	Inclusion of CEO	-	✓	✓
	Number of meetings held	1	2	2
	Attendance rate	100	100	100
	Number of agenda items resolved	1	1	2
	Number of agenda reported	0	1	0
Audit Committee	Number of members	3	3	3
	Ratio of outside directors	100	100	100
	Financial expertise of the chairman	✓	✓	✓
	Number of financial experts	1	1	2
	Number of meetings held	8	7	6
	Attendance rate	100	100	100
	Number of agenda approved	5	7	5
	Number of agenda reported	8	13	15
	Number of against or amendment	0	0	0

Category		HMD		
		2019	2020	2021
Related Party Transactions Committee	Number of members	4	4	4
	Ratio of outside directors	75	75	75
	Number of meetings held	2	1	2
	Attendance rate	100	100	100
	Number of agenda approved	1	0	1
	Number of agenda reported	1	1	1
	Number of against or amendment	0	0	0
ESG Committee ¹	Number of members	-	-	4
	Ratio of outside directors	-	-	75
	Number of meetings held	-	-	3
	Attendance rate	-	-	100
	Number of agenda approved	-	-	1
	Number of agenda reported	-	-	3
Key ESG agenda	Review of CP Program	✓	✓	✓
	Review and approval of non-financial risks (ESG)	-	-	✓

1. Establishment date of ESG Committee: April 27, 2021

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④ Board of directors (HSHI)

(as of July 2022)

Type	Name	Gender	Major career	Appointed date	Specialized in
Internal Director	Kim Hyung-Kwan (Chair)	Male	Seoul National University Former Head of Technology Division, HHI Former Head of Production Division, HSHI CEO of HSHI	July 2021	Business management
	Kim Sung-joon	Male	MIT University (Ph.D.) Former CEO of Hyundai Mirae Partners Former Inside director, Hyundai Global Service Head of KSOE Future Technology Research Center	March 2017	Marine technology
	Song In-jun	Male	Seoul National University CEO of IMM Private Equity	September 2017	Finance
Outside Director	Jeong do-sam	Male	Hongik University (Ph.D.) Former Vice President, Samil Accounting Corporation Former Advisor, Samil Accounting Firm Auditor, Orion Foundation	March 2017	Finance
	Kim Hyoung-joo	Male	University of Texas (Ph.D.) Outside Director, Doosan Corporation Professor, Computer Engineering, Seoul National University	March 2018	Computer Engineering
	Ko Chang-hyeon	Male	Harvard University (MD) Attorney, Kim & Chang Law Firm	March 2021	Corporate Legal
	Shin Ho-young	Female	Dongguk University (Ph.D.) Honorary Professor, Business Administration, Hanyang University	March 2022	Business Admin.

Category		HSHI		
		2019	2020	2021
Board Composition	Ratio of outside directors (%)	57	50	50
	Ratio of board members with industry experience (%)	29	33	33
	Number of financial experts on the board	1	2	1
	Average tenure	2.7	4.1	4.1
Board Operation	Number of board meetings held	8	10	8
	Attendance rate	98	92	100
	Number of agenda reported	8	9	9
	Number of agenda approved	14	22	17
	- Approved (case/%)	14 (100)	22 (100)	17 (100)
	- Disapproved (case/%)	0 (0)	0 (0)	0 (0)
	- Amended (case/%)	0 (0)	0 (0)	0 (0)
	- Abstained (case/%)	0 (0)	0 (0)	0 (0)
Support of Board Operation	Board liability insurance	✓	✓	✓
	Company education provided	✓	✓	✓
	Utilization of outside experts on demand	✓	✓	✓
Outside Director Recommendation Committee	Number of members	4	4	4
	Ratio of outside directors	75	75	75
	Inclusion of CEO	✓	✓	✓
	Number of meetings held	3	3	1
	Attendance rate	100	100	100
	Number of agenda resolved	3	3	2
	Number of agenda reported	0	0	0

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Category		HSHI		
		2019	2020	2021
Audit Committee	Number of members	4	3	3
	Ratio of outside directors	100	100	100
	Financial expertise of the chairman	✓	✓	✓
	Number of financial experts	1	2	1
	Number of meetings held	7	7	6
	Attendance rate	100	96	100
	Number of agenda approved	6	6	7
	Number of agenda reported	5	10	13
	Number of against or amendment	0	0	0
Related Party Transactions Committee	Number of members	4	3	3
	Ratio of outside directors	100	100	100
	Number of meetings held	2	2	2
	Attendance rate	100	100	100
	Number of agenda approved	1	1	1
	Number of agenda reported	1	1	1
	Number of against or amendment	0	0	0

Category		HSHI		
		2019	2020	2021
ESG Committee ¹	Number of members	-	-	4
	Ratio of outside directors	-	-	75
	Number of meetings held	-	-	2
	Attendance rate	-	-	100
	Number of agenda approved	-	-	1
	Number of agenda reported	-	-	2
Key ESG agenda	Review of CP Program	✓	✓	✓
	Review and approval of non-financial risks (ESG)	-	-	✓

1. Establishment date of ESG Committee: April 27, 2021

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⑤ Evaluation and Remuneration

Category			KSOE			HHI			HMD			HSHI		
			2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Remuneration	Guidelines on variable remuneration for CEO	Operated	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CEO-to-Employee Pay Ratio(%)	%	6.78	7.58	8.54	6.95	8.43	8.89	12.86	9.75	9.92	10.07	13.52	13.59
	Guidelines on remuneration for outside directors	Operated	✓	✓	✓	-	-	-	-	-	-	-	-	-
	Executive pay disclosure (including amount and metrics)	Disclosed	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	✓	✓
Stock ²	Management ownership (CEO and other executives)	%	0.001	0.004	0.006	0	0	0.001	0.010	0.010	0.010	0	0	0
	Ratio of shares among CEO incentives	%	0	0	0	0	0	0	0	0	0	0	0	0
	Governmental institutions ownership (NPS)	%	10.90	10.34	5.94	0	0	5.47	12.59	11.05	8.20	0	0	0
	Payment of treasury stock to employees for the past two years	%	0	0	1.90	0	0	0	0	0	0	0	0	0

1. The amount of remuneration exceeding KRW 500 million

2. As of the publication date of annual business report of each company

⑥ Enhanced Rights of Shareholders

Category			KSOE			HHI			HMD			HSHI		
			2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Electronic voting system		Executed	-	-	✓	-	-	✓	-	-	✓	-	-	-
Proxy solicitation for all shareholders		Executed	✓	✓	✓	-	-	✓	✓	✓	✓	-	-	-
Dividend policy		Disclosed	✓	✓	✓	-	-	-	✓	✓	✓	✓	✓	✓
Notice of agenda items before general meeting		Executed	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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Ethical Management

Strategy

KSOE and its shipbuilding subsidiaries have enacted the Code of Conducts, a set of standards that all employees comply with in conducting themselves, and ‘Practice Guidance for Business Ethics’, the detailed guidelines on the implementation of business ethics in the workplace on the basis of Charter of Ethics which proclaims our ethical management philosophy. We are also regularly making revisions to reflect the changing social aspect such as amendments of related laws and regulations, social perception, and the prohibition of illegal solicitation and bribery with an aim of enhancing effectiveness of ethics regulations.

Performance Data

① Business Ethics Pledge

Category		Unit	KSOE			HHI			HMD			HSHI		
			2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Business ethics pledge	All	%	98.3	98.3	99.4	98.2	98.1	99.5	99.3	99.5	99.4	97.5	100.0	98.9
	- Office workers	%	98.5	98.1	99.4	98.5	97.8	99.5	99.4	99.4	99.5	97.2	100.0	98.7
	- Production workers	%	97.3	99.1	99.6	97.0	99.0	99.6	98.8	100.0	98.8	100.0	100.0	100.0
	Partner companies	%	- ¹	- ¹	- ¹	95.4	92.9	99.0	34.1	85.2	96.4	100.0	97.6	90.5

1. KSOE has no partner company subject to business ethics pledge

※ Compared to the target (target company)

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② Ethics Education

Category	Unit	KSOE			HHI			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Training hours on ethics per employee	Hours	0.53	0.25	0.31	0.86	0.27	0.23	0.53	0.25	0.31	0.80	0.41	0.27
Ratio of employees completed trainings on ethics	%	28.3	27.9	59.5	82.1	48.0	38.4	28.3	27.9	59.5	87.1	80.2	50.6
Trainings for partner companies	Implemented	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Trainings on prevention of sexual and workplace harassment	Implemented	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

③ Reporting and Violation

A total of 81 reports were received in 2019 among which 42 cases were investigated. The violations of ethical management were 17 cases, leading to disciplinary measures taken to related employees in accordance with the relevant regulations and procedures. Besides, 39 other complaints were transferred to the relevant departments and the results were confirmed.

In 2020, 36 cases were investigated among 66 received reports which led to the 14 violations confirmed regarding ethical management. Related employees were placed under personnel transfer in accordance with the relevant regulations and procedures. A total of 30 cases of complaints were transferred to related departments, and the results were verified.

We received 52 reports in 2021 while 28 cases were inspected. A total of 14 cases were identified as the violations of ethical management, resulting in disciplinary measures taken to related employees in accordance with the relevant regulations and procedures. The rest 24 complaints were transferred to the relevant departments and the results were confirmed.

Next Plan

In 2022, we will provide educational content to overseas corporations and prepare measures to reinforce ethical management by analyzing best practices of foreign countries, thereby consolidating ethical management that meets global standards and establishing a culture of practice. Continuous self-inspection on ethics management will enable us to view the group's ethical management level with an objective perspective through which we identify our vulnerabilities and develop strategies to promote ethical management.

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Compliance

Strategy

We are committed to raising awareness of ethical and lawful conduct and complying with all applicable laws and regulations by ensuring the compliance guidelines are embedded in all business activities. In order to practice the compliance management, we run a compliance program (CP) mainly consisting of training and consulting on fair trade. Many supportive activities are being made to establish an effective compliance monitoring system, settle a compliance management culture, meet the social demand for corporate roles, and ultimately achieve sustainable growth.

Assessment

CP management

We closely look into the operation status of CP and conduct penetrative survey to assess the compliance of employees at least once a half year according to the CP regulations. The results of inspection are reported to the BOD twice a year along with the training results that was provided to the departments with high risk of violation including the provision of work manuals and outreach training.

① Department subject to compliance inspection

Category		KSOE			HHI			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Department subject to compliance inspection	Departments	1	43	34	4	92	121	7	29	17	26	43	44

Performance Data

① Commitment to Fairtrade

Category			KSOE			HHI			HMD			HSHI		
			2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Compliance Program (CP)	Risk assessment	Included	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Prior consultation system	Included	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Internal supervision system	Included	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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Compliance Training

We conduct regular compliance training targeting newly appointed executives, head of each department, team leaders, section chiefs, and new hires, identifying business areas where training is needed based on the risk assessment results to provide on and offline training and consulting to increase awareness of compliance management among employees.

Category	Unit	KSOE			HHI			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Compliance training sessions	Times	14	47	9	23	99	135	4	32	6	1	45	48
Compliance training participants	Persons	449	551	563	1,361	3,513	3,687	195	797	383	170	1,255	1,134

Compliance Newsletter

KSOE selects compliance issues such as amendments to the relevant laws, fair trade, anti-corruption and economic sanctions, and violation cases in a timely manner, and disseminates them in the form of newsletters to raise the awareness of the compliance management among the employees.

Compliance Newsletter Issuance in 2021		
Number 79 Revision of Enforcement Decree of Subcontract Act	Number 82 US Economic Sanctions on Myanmar	Number 85 Sanctions against Unfair Subcontracting Costs of housing OOO Co., Ltd
Number 80 Increasing the Amount Limit of Agricultural and Fishery Products That Can Be Given as a Gift	Number 83 Conflict of Interest Act for Public Officials	Number 86 Revision of the Guidelines for Requesting the Provision of Technical Data
Number 81 Violations of U.S. Economic Sanctions against Iran	Number 84 Amendment of Subcontracting Act	Number 87 Establishment and distribution of the Screening Guidelines for Information Exchange Collusion

Category	Unit	KSOE			HHI			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Compliance Newsletter	Times	4	13	9	8	13	9	8	13	9	8	13	9

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Compliance

Anti-corruption / Compliance on Laws Related to Economic Sanctions

In securing fairness and high integrity in our management and managing the risk of possible violation of the law, we conduct intensive inspections and reviews abiding by Anti-Corruption laws and carefully scrutinize our business activities to prevent risks of economic sanctions at home and abroad in advance in accordance with related regulations. Employees can minimize the risk of violations with the advance approval system where the checklists review the compliance of business activities before the approval of economic profit and due diligence on transactions related to economic sanctions as well as one-on-one consultation with experts backed by the legal support system.

Category	Unit	KSOE			HHI			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Number of legal consultations on Fair Trade Act	Times	57	11	11	59	87	48	3	0	1	2	4	2
Number of legal consultations on anti-corruption and economic sanctions	Times	15	8	1	10	29	51	0	1	0	0	0	1
Other legal advice	Times	152	638	946	605	579	537	261	386	394	181	181	365

Online Channel for Contractor Corruption Complaints

KSOE operates an online channel through which a partner company can directly contact and report suspicious business transactions indicative of corruption, thereby contributing to the establishment of a fair subcontracting culture. In the process, we do our best to protect the whistle blower from being disadvantaged; disclosure of personal information of the whistle blower is prohibited, and the whistle blower who has suffered a disadvantage such as disclosure of identity or discrimination is allowed to apply for a protective measure or relief to the ethical management team.

Category	Unit	KSOE			HHI			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Operation of online channel for contractor corruption complaints	Cases	0	0	0	4	3	2	1	0	1	0	2	2

Next Plan

Plans for 2022

- Inspection of anti-corruption system through Anti-Bribery Management System (ISO 37001) certification to advance the system
- Reinforcement of work process and education regarding the risk management for responding to economic sanctions triggered by wars and inflation
- Settlement of compliance management culture by disseminating compliance information and system improvement

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Risk Management System

Given the corporate sustainability, timely response is gaining its significance since climate change, the COVID-19 pandemic, the spread of global protectionism, political instability in emerging countries, and disputes around the world are posing a constant threat. Against this backdrop, we are laying a foundation for sustainable growth by identifying financial and non-financial risks and establishing preemptive countermeasures depending on the impact of the risks.

① Financial Risk

We established risk management regulations in 2019, aiming to ensure efficient risk management together with risk management committee in charge of managing risks in foreign exchange, commodities and other major sectors. The internal accounting management regulations have been implemented in accordance with the Act on External Audit of Stock Companies, the Enforcement Decree of the Act, and the Regulations on an External Audit and Accounting.

We also have set the policies and procedures necessary for evaluation and reporting in this regard. Through the rational and effective operation of the accounting management system, we enhance the reliability of the KSOE financial statements.

② Non-Financial Risks

The ESG Council composed of the ESG chief executives of each company serves as the platform to discuss major ESG policies and current issues at the group level and support each company's ESG management. ESG Advisory Group has heightened its expertise and objectivity taking advantages of outside experts for each ESG section. We manage ESG risks such as environment, safety/health, ethics/compliance, supply chain, and information security, fully harnessing the ESG governance system.

Classification	Details
Chair	- Group's Chief Finance Officer (CFO)
Members	- Foreign Exchange (FX) Risk Committee: Head of Finance Division, Finance Officer, Accounting Officer, Purchasing Executive - Commodities Risk Committee: Head of Finance Division, Accounting Officer, Cost Executive, Head of Integrated Purchasing Division, Purchasing Executive
Meeting	- FX: monthly - Commodities: quarterly or on demand
Deliberation / Resolution	- Agendas concerning the determination of standard indicators applicable to the management plan - Agendas regarding changes in the standard indicators applied to the estimated cost and performance estimation - Agendas related to the change of the standard indicator applicable to a quotation - Agendas of the management of risk exposure - Agendas in respect of risk management policies including the implementation of hedging policies - Agendas of other risk management requirements
Scope of resolution	- FX: Exchange rates in quotation, hedging policies for three shipbuilding subsidiaries, or estimated exchange rates in balancing accounts for all group companies - Commodities: Index of Raw material unit price and quotation

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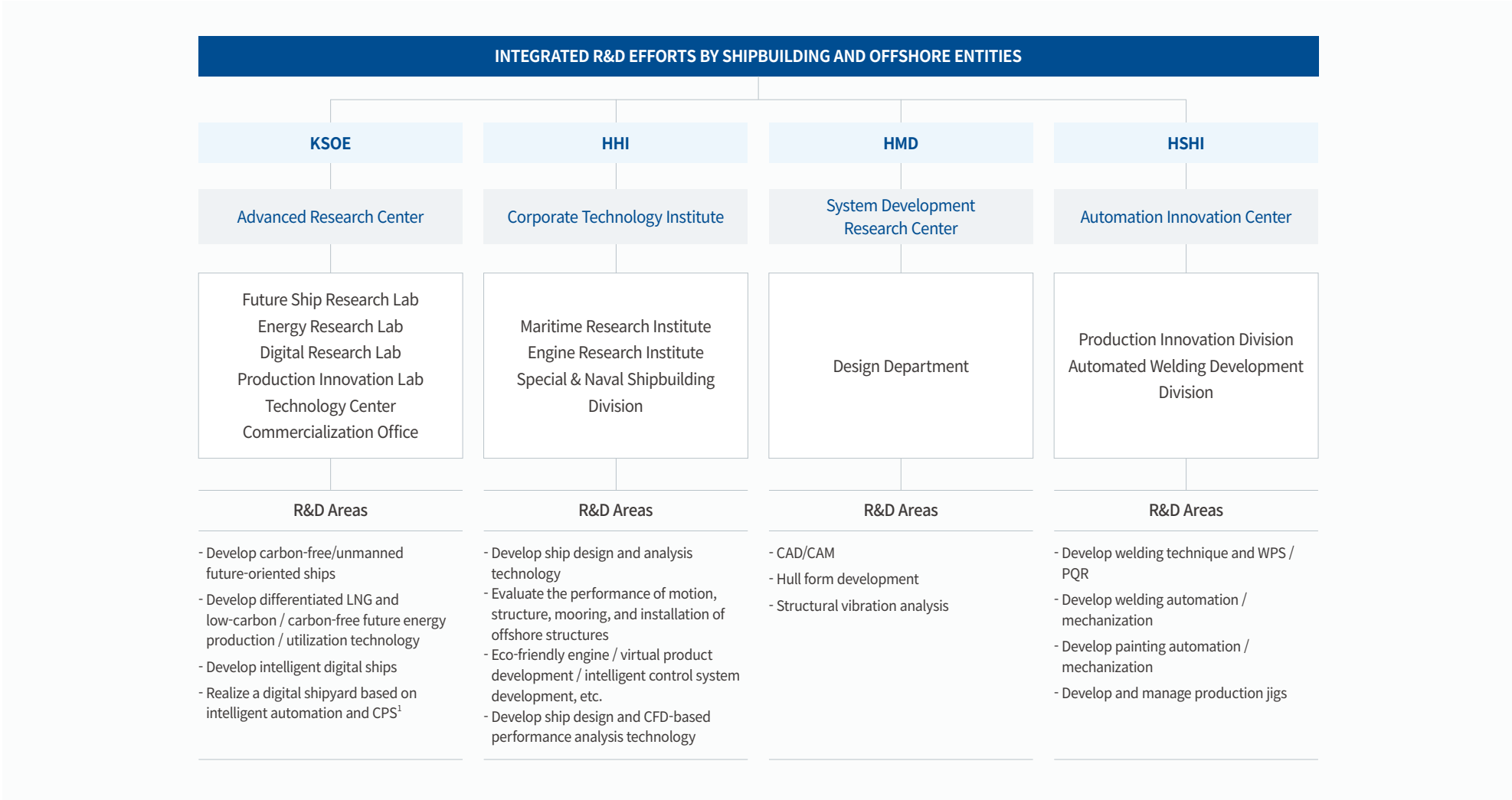
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R&D

R&D Governance



1. CPS: Cyber Physical System

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R&D

① Research and Development

Category	Unit	KSOE			HHI			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
R&D investments	KRW 100 million	842 ¹	852 ¹	924 ¹	485	808	774	64	90	112	191	290	339
Ratio of R&D investments to revenues	%	0.55	0.57	0.60	0.89	0.97	0.93	0.21	0.32	0.39	0.55	0.74	0.80
R&D personnel	Persons	307	327	308	200	186	192	-	-	12	-	-	20

1. R&D expenses specified in the consolidated financial statement

② Patent

Category	Unit	KSOE			HHI			HMD			HSHI		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Patent application	Cases	273	179	174	123	237	162	9	10	9	7	4	6
Patent application related to eco-friendly technologies	Cases	111	116	86	40	161	117	1	0	2	-	-	-
Intellectual property applications ¹	Cases	400	248	176	165	265	166	18	13	14	7	4	6

1. Patent, utility model, design, trademark included.

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Information Security

Strategy

KSOE and its subsidiaries protect internal data from the external threats with 24/7 security controls. All subsidiaries obtained International Standard Information Protection Certification (ISO 27001) to comply with the Domestic Information Network Act and the European Information Protection Act (GDPR), thereby protecting major computer systems from cyber security threats. HHI has acquired ISO 27701 (personal information protection management system), ISO 27017 (cloud security system) and ISO 27018 (cloud personal information protection system) certifications while HMD and HSHI are making strenuous effort to acquire additional certifications. We establish and revise security-related regulations regarding security management, national core technology security management, computer security, and personal information protection management based on relevant laws and regulations which are disclosed on Intranet to ensure that all employees are aware of and comply with the regulations. Security Management Committee, the highest-level security organization, establishes an annual security business plan to inspect, improve, and share business performance with an aim of safeguarding important assets of the company. KSOE and its subsidiaries designate those who experienced in security as a chief information security officer (CISO) and a chief privacy officer (CPO) in every company to report security inspection results.

Incident Response

Since our internal data includes major technical data which is classified as national core technologies and subject to the Act on Prevention of Divulgence and Protection of Industrial Technology, we are doing our best to prevent technology leakage by taking administrative and technical protection measures. Employees who recognize security incidents immediately report the situation to the employee in charge of security in the relevant department, and Security Incident Response Team composed of security managers of departments, computer infrastructure managers, and security organizations will urgently take measures by playing the roles of each person.

Target

In response to intensifying data and security risks, we have established the company-wide data protection management system while providing relevant education and training for our employees. Going forward, we will draw up a long-term roadmap for data protection, and expand the scope of management to all our business sites.

- **KSOE:** It will establish a roadmap to obtain domestic and overseas certifications (ISO 27001 → ISO 27701), and secure seven experts in this field.
- **HHI:** With the goal of managing the percentage of violators of the malicious email mock training, we continuously secure information security experts, conduct company-wide information protection training, and diversify public relations channels to raise security awareness.
- **HMD:** HMD will expand the application of ISO 27001 to all business sites and keep securing information security experts. In addition, we will conduct company-wide information protection training and strive to diversify public relations channels to raise security awareness.
- **HSHI:** We will implement inspections and training on electric data management of personal information, file encryption, and prevention of personal information leakage to help them properly perform the roles of personal information manager and handler.

Performance Data

We regularly train employees who handle personal data based on our security and personal data protection management regulations. We also conduct malicious e-mail mock training for internal employees on a quarterly basis to raise security awareness. KSOE, HMD, and HSHI continue to maintain zero cases of information leakage related to the company and customers. We have expanded security training to prevent confidential information and customer-related data leakage by raising security awareness.

- Online security training: Once a month for all employees (KSOE and its shipbuilding subsidiaries)
- National core technology security education: Once a year for national core technology-related experts (KSOE, HHI)
- Security training for security officers in each department: Once a year for KSOE, HHI, HSHI, and twice a year for HMD
- Security training for new hires: Every time a new employee joins (KSOE and its shipbuilding subsidiaries)
- Personal data protection education Target: Once a year for personal data handlers (KSOE and its shipbuilding subsidiaries)

We follow an internal security review process to check vulnerabilities, network configuration, and whether or not critical information is included before all services are launched. Also, the vulnerabilities are analyzed by mock hacking through external professional agencies once a year.

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Information Security

① Information Leakage

Category	Unit	KSOE		HHI			HMD			HSHI		
		2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Total number of information leaks	Cases	0	0	0	0	0	0	0	0	0	0	0
Number of leaks related to customer data	Cases	0	0	0	0	0	0	0	0	0	0	0
Amount of fines for violating laws related to information leakage	KRW 1,000	0	0	0	0	0	0	0	0	0	0	0

② Information Security Measures

Category	Unit	KSOE		HHI			HMD			HSHI		
		2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Personal data protection training	Implemented	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Information security training	Implemented	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ratio of business sites certified to international standards ¹	%	100	100	100	100	100	100	100	100	100	100	100

1. Information security management (ISO 27001)

Next Plan

KSOE and its shipbuilding subsidiaries will continue to improve security levels by acquiring personal information management system certification, introducing cloud-based security solutions, and conducting inspections on the Group's security status for management, aiming to respond to various threats in remote working environments. On top of that, we will establish a seamless security system by obtaining information business continuity certification (ISO 22301) for HHI Group's Global R&D Center (GRC), in which we are scheduled to move in.

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Summary of Consolidated Financial Statements

(Unit: KRW million)

Title of Account	48th reporting period (as of late Dec. 2021)	47th reporting period (as of late Dec. 2020)	46th reporting period (as of late Dec. 2019)
Current assets	14,562,196	13,001,433	12,545,989
Cash and cash equivalents	4,567,468	3,703,410	2,225,143
Trade and other receivables	1,067,698	1,045,149	1,442,649
Contract assets	5,502,878	4,761,935	4,729,633
Inventories	1,554,137	1,252,995	1,318,326
Other current assets	1,870,015	2,237,944	2,830,238
Non-current assets	12,730,898	12,242,758	12,509,384
Investment in associates and joint ventures	321,972	460,240	458,658
Long-term financial assets	194,920	128,597	112,101
Investment properties	231,499	243,193	248,108
Property, plant and equipment	9,872,012	9,970,539	9,946,724
Intangible assets	133,536	117,284	115,422
Other non-current assets	1,976,959	1,322,905	1,628,371
Total assets	27,293,094	25,244,191	25,055,373
Current liabilities	11,286,468	9,511,529	8,941,941
Non-current liabilities	3,592,871	3,311,437	3,187,117
Total liabilities	14,879,339	12,822,966	12,129,058
Capital stock	353,866	353,866	353,866
Capital surplus	2,400,507	2,400,507	2,483,377
Capital adjustments	(8,697,363)	(8,478,316)	(8,478,316)
Accumulated other comprehensive income	1,332,379	1,211,159	1,027,409
Retained earnings	14,467,170	15,419,079	16,180,566
Non-controlling interests	2,557,196	1,514,930	1,359,413
Total equity	12,413,755	12,421,225	12,926,315

(Unit: KRW million)

Title of Account	48th reporting period (Jan. 1 - Dec. 31, 2021)	47th reporting period (Jan. 1 - Dec. 31, 2020)	46th reporting period (Jan. 1 - Dec. 31, 2019)
Valuation method for the stocks of associates and joints	Equity method	Equity method	Equity method
Sales	15,493,382	14,903,658	15,182,553
Operating profit (loss)	(1,384,816)	74,367	290,168
Profit (loss) for the year	(1,141,204)	(835,178)	213,081
Profit(loss) attributable to:			
- Owners of the Parent Company	(929,319)	(833,787)	164,079
- Non-controlling interests	(211,885)	(1,391)	49,002
Total comprehensive income (loss)	(1,046,938)	(553,318)	179,700
Profit(loss) attributable to:			
- Owners of the Parent Company	(829,592)	(577,737)	128,753
- Non-controlling interests	(217,346)	24,419	50,947
Earnings(loss) per share attributable to owners for the Parent Company (KRW)	(13,142)	(11,791)	2,183
Number of consolidated subsidiaries	20	24	23

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GRI Universal Standards

Indicator	GRI Standards	Disclosure	Reporting Requirement	Page
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		102-3	Location of headquarters	6, 14, 18, 22
		102-4	Location of operations	12
		102-5	Ownership and legal form	6, 12
		102-6	Markets served	12
		102-7	Scale of the organization	6, 25
		102-8	Information on employees and other workers	6, 25, 102-107
		102-9	Supply chain	75-79, 122
		102-10	Significant changes to the organization and its supply chain	75-79, 122
		102-11	Precautionary Principle or approach	59-62, 139
		102-12	External initiatives	149-152
		102-13	Membership of associations	158
Strategy	GRI 102: General Disclosures 2016	102-14	Statement from senior decision-maker	5, 13, 17, 21
		102-15	Key impacts, risks, and opportunities	5, 60
Ethics and integrity	GRI 102: General Disclosures 2016	102-16	Values, principles, standards, and norms of behavior	138-139
		102-17	Mechanisms for advice and concerns about ethics	112-113, 139
Governance	GRI 102: General Disclosures 2016	102-18	Governance structure	125-133
		102-20	Executive-level responsibility for economic, environmental, and social topics	52-53, 125, 127, 129, 131
			Chair of the highest governance body	125-133
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Indicator	GRI Standards	Disclosure	Reporting Requirement	Page
Stakeholder engagement	GRI 102: General Disclosures 2016	102-40	List of stakeholder groups	54
		102-41	Collective bargaining agreements	102
		102-42	Identifying and selecting stakeholders	54
		102-43	Approach to stakeholder engagement	54
		102-44	Key topics and concerns raised	56
		102-45	Entities included in the consolidated financial statements	12
Reporting practice	GRI 102: General Disclosures 2016	102-46	Defining report content and topic Boundaries	2, 56
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		102-53	Contact point for questions regarding the report	2
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GRI Topic Specific Standards

Economic Performances (GRI 200)

Indicator	GRI Standards	Disclosure	Reporting Requirement	Page
Economic performance	GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its Boundary	55-56
		103-2	The management approach and its components	9-11, 13-24
		103-3	Evaluation of the management approach	9-11, 13-24
	GRI 201: Economic Performance 2016	201-1	Direct economic value generated and distributed	25
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Indirect economic performance	GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its Boundary	55-56
		103-2	The management approach and its components	27-49
		103-3	Evaluation of the management approach	27-49
	GRI 203: Indirect Economic Impacts 2016	203-1	Infrastructure investments and services supported	84-86, 123
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		103-3	Evaluation of the management approach	136-138
	GRI 205: Anti-corruption 2016	205-1	Operations assessed for risks related to corruption	136
		205-2	Communication and training about anti-corruption policies and procedures	137-138

Environmental Performances (GRI 300)

Indicator	GRI Standards	Disclosure	Reporting Requirement	Page
Energy	GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its Boundary	55-56
		103-2	The management approach and its components	58-65
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	GRI 302: Energy 2016	302-1	Energy consumption within the organization	94-95
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Social Performances (GRI 400)

Indicator	GRI Standards	Disclosure	Reporting Requirement	Page
Employment	GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its Boundary	55-56
		103-2	The management approach and its components	102-107
		103-3	Evaluation of the management approach	102-107
	GRI 401: Employment 2016	401-1	New employee hires and employee turnover	105
		401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	106-107
		401-3	Parental leave	107
Labor/ management relations	GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its Boundary	55-56
		103-2	The management approach and its components	72-74
		103-3	Evaluation of the management approach	72-74
	GRI 402: Labor/ Management Relations 2016	402-1	Minimum notice periods regarding operational changes	102
Occupational health and safety	GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its Boundary	55-56
		103-2	The management approach and its components	66-69
		103-3	Evaluation of the management approach	66-69
	GRI 403: Occupational Health and Safety 2018	403-1	Occupational health and safety management system	66-69, 114-121
		403-2	Hazard identification, risk assessment, and incident investigation	
		403-3	Occupational health services	
		403-5	Worker training on occupational health and safety	
		403-6	Promotion of worker health	
		403-7	Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	
		403-9	Work-related injuries	
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Indicator	GRI Standards	Disclosure	Reporting Requirement	Page
Training and education	GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its Boundary	55-56
		103-2	The management approach and its components	108-111
		103-3	Evaluation of the management approach	108-111
	GRI 404: Training and Education 2016	404-1	Average hours of training per year per employee	111
		404-2	Programs for upgrading employee skills and transition assistance programs	108-111
		404-3	Percentage of employees receiving regular performance and career development reviews	105
Non-discrimination	GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its Boundary	55-56
		103-2	The management approach and its components	70-71
		103-3	Evaluation of the management approach	70-71
	GRI 405 : Diversity and Equal Opportunity 2016	406-1	Incidents of discrimination and corrective actions taken	113
Local communities	GRI 103:Management Approach 2016	103-1	Explanation of the material topic and its Boundary	55-56
		103-2	The management approach and its components	84-86
		103-3	Evaluation of the management approach	84-86
	GRI 413 : Local Communities 2016	413-1	Operations with local community engagement, impact assessments, and development programs	123
Supplier social assessment	GRI 103:Management Approach 2016	103-1	Explanation of the material topic and its Boundary	55-56
		103-2	The management approach and its components	75-79
		103-3	Evaluation of the management approach	75-79
	GRI 414: Supplier Social Assessment 2016	414-1	New suppliers that were screened using social criteria	122

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TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

Governance

	Recommendations	Page
a	Describe the board’s oversight of climate-related risks and opportunities	52-53, 59
b	Describe management’s role in assessing and managing climate-related risks and opportunities	

Strategy

	Recommendations	Page
a	Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	60-61
b	Describe the impact of climate-related risks and opportunities on the organization’s businesses, strategy, and financial planning.	62-63
c	Describe the resilience of the organization’s strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	

Risk Management

	Recommendations	Page
a	Describe the organization’s processes for identifying and assessing climate-related risks	64-65
b	Describe the organization’s processes for managing climate-related risks	
c	Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization’s overall risk management	

Metrics and Targets

	Recommendations	Page
a	Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process	55-56, 60-61
b	Disclose Scope 1, Scope 2 and, if appropriate, Scope 3 greenhouse gas (GHG) emissions and the related risks	92-93
c	Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets	65

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SUSTAINABILITY ACCOUNTING STANDARDS BOARD

Category	SASB Code	Accounting Metrics	Unit	KSOE			HHI			HMD			HSHI		
				2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Energy Management	RT-EE-130a.1	Total energy consumed	TJ	154	140	153	8,803.65	8,993.62	9,192.60	2,847	2,690	2,865	4,059	4,348	4,399
		Percentage grid electricity	Ratio (%)	52.60	56.43	58.82	70.24	69.71	66.68	76.54	76.73	76.72	69.82	71.87	71.04
		Percentage renewable	Ratio (%)	0	0	0	0.019	0.018	0.017	0	0	0	0	0	0
Employee Health & Safety ¹	RT-IG-320a.1	Total Recordable Incident Rate (TRIR)	Ratio (%)	0	0.143	0	-	0.714	0.929	-	0.260	0.272	-	1.230	0.763
		Fatality rate	Ratio (%)	0	0	0	-	0.014	0.011	-	0	0	-	0	0
		Near Miss Frequency Rate (NMFR)	Ratio (%)	0	0	0	-	9.433	8.302	-	3.603	3.256	-	7.778	7.538
		Sales-weighted fleet fuel efficiency for medium- and heavy-duty vehicles	gal/1,000ton-mile	-	-	-	-	N/A	N/A	-	N/A	N/A	-	N/A	N/A
	RT-IG-410a.2	Sales-weighted fuel efficiency for non-road equipment	gal/hr	-	-	-	-	N/A	N/A	-	N/A	N/A	-	N/A	N/A
	RT-IG-410a.3	Sales-weighted fuel efficiency for stationary generators	W/gal	-	-	-	-	N/A	N/A	-	N/A	N/A	-	N/A	N/A
	Fuel Economy & Emissions in Use-phase	RT-IG-410a.4	Sales-weighted emissions of nitrogen oxides (Nox)	g/kWh	-	-	-	Marine Engine Tier II 12.8 Tier III 2.2 HiMSEN Engine Tier II 8.6 Tier III 1.9	Marine Engine Tier II 12.1 Tier III 1.9 HiMSEN Engine Tier II 8.4 Tier III 1.8	-	N/A	N/A	-	N/A	N/A
Sales-weighted emissions of particulate matter (PM) for: (a) marine diesel engines, (b) locomotive diesel engines, (c) on-road medium- and heavy-duty engines, and (d) other non-road diesel engines			g/kWh	-	-	-	Not managed	Not managed	-	N/A	N/A	-	N/A	N/A	
Materials Sourcing	RT-IG-440a.1	Description of the management of risks associated with the use of critical materials	Reporting currency	-	-	-	N/A	N/A	-	N/A	N/A	-	Management of impact and risks posed by the changes in raw material (iron ore, copper, nickel, crude oil) prices and exchange rate	Management of impact and risks posed by the changes in raw material (iron ore, copper, nickel, crude oil) prices and exchange rate	
Remanufacturing Design & Services	RT-IG-440b.1	Revenue from remanufactured products and remanufacturing services	Reporting currency	-	-	-	N/A	N/A	-	N/A	N/A	-	N/A	N/A	
Activity Metrics	RT-IG-000.A	Number of units produced by product category	Number	-	-	-	T/K 2 ships SHTTLE T/K 2 ships LNGC 7 ships LPGC 7 ships VLCC 5 ships VLOC 5 ships CNTR 5 ships LNGFSRU 1 ship TOTAL 34 ships	T/K 6 ships LNGC 10 ships LPGC 8 ships VLCC 1 ship VLOC 2 ships VLEC 3 ships CNTR 13 ships LNGFSRU 1 ship TOTAL 44 ships	PC선 43 ships LPGC 2 ships ROPAX 1 ship CONT 20 ships B/C 4 ships TOTAL 70 ships	P/C 35 ships LPG 4ships LNG 1ships RO-PAX 1ships CONT 4ships RO-RO 1ships TOTAL 46ships	-	T/K 9 ships LNGC 6 ships VLCC 6 ships VLOC 2 ships CNTR 3 ships B/C 2 ships TOTAL 28 ships	B/C 1 ship CNTR 2 ships COT 6 ships LNGC 9 ships LPGC 2 ships PC 3 ships VLCC 6 ships VLOC 3 ships TOTAL 32 ships		
	RT-IG-000.B	Number of employees	Number	652	655	649	13,863	13,423	12,811	3,094	3,066	3,024	3,681	3,636	3,506

1. Partner companies are included.

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UN SDGs Index

UN SDGs (Sustainable Development Goals) were adopted by the United Nations as a universal call to action for all members of the global community to achieve sustainable growth by 2030. The accomplishment of the goals requires all levels of society to make efforts in unison. The roles of companies are to create a growth engine and achieve innovation for job creation and economic development.

Aligning corporate management directions with the SDGs enables companies not only to create new business models but also to become sustainable. KSOE and its shipbuilding subsidiaries are striving to keep up with global trends through the SDGs, and map out mid- to long-term strategies for growth. Especially, putting our focus on 11 SDGs, including 3, 4, 6, 7, 8, 9, 10, 12, 13, 14, and 16, along with 22 targets, we are committed to contributing to the goal achievement.

KEY UN SDGs		Target	Page	Contribution Made by KSOE and Its Shipbuilding Subsidiaries
	Ensure healthy lives and promote well-being for all at all ages	3.4 • Reduce non-communicable diseases through prevention and treatment and promote mental health and well-being	69, 74, 96, 101, 115	• Healthcare and medical expense support for the healthy lives of personnel through various programs; operation of the Health Promotion Center and Oriental Medical Center; and the provision of professional mental health promotion services such as psychological evaluation, group counseling and group psychological education
		3.8 • Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all		• Prevention of infectious disease by tightening the response management system and the formulation of the manuals for infectious disease prevention and response
		3.9 • Substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination		• Operation of the chemicals hazardous assessment through the chemical substance management system
	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	4.4 • Substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship	86	• Identification of tech talents through the Core Skill Transfer Program, and cultivation of excellent talents through technology educational programs
		4.5 • Eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations		• Participation in the national human resources development consortium and talent nurturing in the shipbuilding sector
	Ensure availability and sustainable management of water and sanitation for all	6.3 • Improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally	96-97, 99, 101	• Effluent reduction and water quality improvement by reducing industrial water consumption and reuse • Pollutant emission management through the integrated HSE management system
	Ensure access to affordable, reliable, sustainable and modern energy for all	7.2 • Increase substantially the share of renewable energy in the global energy mix	35-39, 90	• Development of green vessels and zero-carbon engines
		7.3 • Double the global rate of improvement in energy efficiency		• Preservation of an efficient energy management system through ISO 50001 (energy management system) certification • Establishment of an optimal ship energy management system through developing autonomous intelligent ships
	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	8.2 • Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors	34-48, 75-79	• Expansion of high value-added industries, improvement of economic productivity, and job creation through establishing the DT-based smart shipyard
		8.3 • Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services		• Provision of education and financial services for co-prosperity with partner companies
		8.5 • Achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value		• Management of the disabled employment rate and equal pay data for women and men

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KEY UN SDGs		Target	Page	Contribution Made by KSOE and Its Shipbuilding Subsidiaries
	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	9.4 <ul style="list-style-type: none">• Upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities	62	<ul style="list-style-type: none">• Fuel cost reduction and energy optimization through smart ship solutions and the ship equipment management system
	Reduce inequality within and among countries	10.4 <ul style="list-style-type: none">• Adopt policies, especially fiscal, wage and social protection policies, and progressively achieve greater equality	84-86	<ul style="list-style-type: none">• Sharing through assistance for the marginalized, co-existence with local communities, and support for future generations' self-reliance
		12.2 <ul style="list-style-type: none">• Achieve the sustainable management and efficient use of natural resources		<ul style="list-style-type: none">• International Certification (ISO 14001) in the environmental management system
	Ensure sustainable consumption and production patterns	12.4 <ul style="list-style-type: none">• Achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment	90, 98-101	<ul style="list-style-type: none">• Establishment of prevention facilities and environment personnel training• Minimization of pollutant discharge through the regular monitoring of concentration
		12.5 <ul style="list-style-type: none">• Substantially reduce waste generation through prevention, reduction, recycling and reuse		<ul style="list-style-type: none">• Find alternatives for hazardous chemicals and inspect facilities on a regular basis• Data management regarding waste generation and recycling rates
				Take urgent action to combat climate change and its impacts
	Conserve and sustainably use the oceans, seas and marine resources for sustainable development	14.1 <ul style="list-style-type: none">• Prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution	101	<ul style="list-style-type: none">• Provision of repair services to make existing ships more eco-friendly by installing ballast water treatment systems and SOx exhaust gas cleaning systems
		14.2 <ul style="list-style-type: none">• Sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans• Take measures to restore the sea for making a healthy and productive ocean		<ul style="list-style-type: none">• Possession of marine accident prevention equipment and safety management associated with the arrival/departure of ships• Operator training, and joint training on a continual basis
	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	16.3 <ul style="list-style-type: none">• Promote the rule of law at the national and international levels and ensure equal access to justice for all	134-138	<ul style="list-style-type: none">• Implementation of transparent and responsible management by valuing compliance and business ethics
		16.5 <ul style="list-style-type: none">• Substantially reduce corruption and bribery in all their forms		<ul style="list-style-type: none">• Realization of reasonable governance structure to maintain checks and balances
		16.7 <ul style="list-style-type: none">• Ensure responsive, inclusive, participatory and representative decision-making at all levels		<ul style="list-style-type: none">• Pursuit of inclusive management activities by engaging various stakeholders in management, including active communication with the labor union

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LRQA Independent Assurance Statement

Relating to Korea Shipbuilding & Offshore Engineering Co., Ltd.’s Integrated Report for the calendar year 2021

This Assurance Statement has been prepared for Korea Shipbuilding & Offshore Engineering Co., Ltd. in accordance with our contract but is intended for the readers of this Report.

Terms of engagement

LRQA was commissioned by Korea Shipbuilding & Offshore Engineering Co., Ltd. (KSOE abbreviated) to provide independent assurance on its ‘KSOE Integrated Report 2022’ (“the report”) against the assurance criteria below to a “moderate level of assurance and materiality of professional judgement” using “Accountability’s AA1000AS v3”, where the scope was a Type 2 engagement.

Our assurance engagement covered the operations and activities of KSOE and its three major affiliates - Hyundai Heavy Industries Co., Ltd., Hyundai Mipo Dockyard Co., Ltd. and Hyundai Samho Heavy Industries Co., Ltd. in Korea and specifically the following requirements:

- Evaluating adherence to the AA1000 AccountAbility Principles¹ of Inclusivity, Materiality, Responsiveness and Impact
- Confirming that the report is in accordance with GRI Standards² and core option

- Evaluating the accuracy and reliability of data and information for only the selected indicators listed below:

- GRI 103 (Management Approach): 103-1, 103-2, 103-3
- GRI 200 (Economic): 201-1, 201-2, 203-1, 205-1, 205-2
- GRI 300 (Environmental): 302-1, 302-4, 303-1, 303-2, 303-3, 305-1, 305-2, 305-5, 305-7, 306-1, 306-2, 306-3, 306-4, 306-5
- GRI 400 (Social): 401-1, 401-2, 401-3, 402-1, 403-1, 403-2, 403-3, 403-4, 403-5, 403-6, 403-7, 403-9, 403-10, 404-1, 404-2, 404-3, 406-1, 413-1, 414-1

Our assurance engagement excluded the data and information of KSOE’s and its three major affiliates’ suppliers, contractors and any third-parties mentioned in the report.

LRQA’s responsibility is only to KSOE. LRQA disclaims any liability or responsibility to others as explained in the end footnote. KSOE’s responsibility is for collecting, aggregating, analysing and presenting all the data and information within the report and for maintaining effective internal controls over the systems from which the report is derived. Ultimately, the report has been approved by, and remains the responsibility of KSOE.

LRQA’s Opinion

Based on LRQA’s approach nothing has come to our attention that would cause us to believe that KSOE has not, in all material respects:

- Met the requirements above
- Disclosed accurate and reliable performance data and information as all errors or omissions identified during the assurance engagement were corrected
- Covered all the issues that are important to the stakeholders and readers of this report.

1. <https://www.accountability.org>

2. <https://www.globalreporting.org>

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The opinion expressed is formed on the basis of a moderate level of assurance and at the materiality of the professional judgement of the verifier.

Note: The extent of evidence-gathering for a moderate assurance engagement is less than for a high assurance engagement. Moderate assurance engagements focus on aggregated data rather than physically checking source data at sites. Consequently, the level of assurance obtained in a moderate assurance engagement is substantially lower than the assurance that would have been obtained had a high assurance engagement been performed.

LRQA’s approach

LRQA’s assurance engagements are carried out in accordance with our verification procedure. The following tasks though were undertaken as part of the evidence gathering process for this assurance engagement:

- Assessing KSOE’s and its three major affiliates’ approach to stakeholder engagement to confirm that issues raised by stakeholders were captured correctly. We did this through reviewing documents and associated records.
- Reviewing KSOE’s and its three major affiliates’ process for identifying and determining material issues to confirm that the right issues were included in their Report. We did this by benchmarking reports written by KSOE and its three major affiliates, and their peers to ensure that sector specific issues were included for comparability. We also tested the filters used in determining material issues to evaluate whether KSOE and its three major affiliates make informed business decisions that may create opportunities that contribute toward sustainable development.
- Auditing KSOE’s and its three major affiliates’ data management systems to confirm that there were no significant errors, omissions or mis-statements in the report. We did this by reviewing the effectiveness of data handling procedures, instructions and systems, including those for internal verification. We also spoke with those key people responsible for compiling the data and drafting the report.

- Checking whether direct (Scope 1) and indirect (Scope 2) GHG emissions, and energy consumptions in the report were transposed correctly from the GHG inventory which was verified by each third party assurance provider.
- Reviewing additional evidence made available by KSOE and its three major affiliates at KSOE’s head office in Seoul, and the shipyards of Hyundai Heavy Industries Co., Ltd. and Hyundai Mipo Dockyard Co., Ltd. in Ulsan City.
- Checking that the GRI Content Index allows stakeholders to access sustainability indicators.

Observations

Further observations and findings, made during the assurance engagement, are:

- Inclusivity:
We are not aware of any key stakeholder groups that have been excluded from KSOE’s and KSOE and its three major affiliates’ stakeholder engagement process.
- Materiality:
We are not aware of any material issues concerning KSOE’s and KSOE and its three major affiliates’ sustainability performance that have been excluded from the report. It should be noted that KSOE and its three major affiliates have established extensive criteria for determining which issue/aspect is material and that these criteria are not biased to the companies’ management.
- Responsiveness:
KSOE and its three major affiliates enhanced their governance to address ESG issues by establishing a group-level ESG working group.
- Impact:
KSOE and its three major affiliates formed the human rights management committee and set goals including human rights impact assessment. We expect that KSOE and its three major affiliates would report concretely in the future the actual and potential human rights impacts and approaches to address them.
- Reliability:
KSOE and its three major affiliates should improve their standards to collect and consolidate ESG data from multiple entities for complying with the reporting principles of accuracy, comparability and completeness.

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LRQA’s standards, competence and independence

LRQA implements and maintains a comprehensive management system that meets accreditation requirements for ISO 14065 Greenhouse gases – Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition and ISO/IEC 17021 Conformity assessment – Requirements for bodies providing audit and certification of management systems that are at least as demanding as the requirements of the International Standard on Quality Control 1 and comply with the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants.

LRQA ensures the selection of appropriately qualified individuals based on their qualifications, training and experience. The outcome of all verification and certification

This verification engagement is the only work undertaken by LRQA for KSOE and as such does not compromise our independence or impartiality.

Dated: 28 June 2022

Tae-Kyoung Kim
LRQA Lead Verifier
On behalf of LRQA

17th Floor, Sinsong Building, 67 Yeouinaru-ro, Yeongdeungpo-gu, Seoul, Korea
LRQA reference: SEO00000656



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INDEPENDENT VERIFICATION STATEMENT

Korea Shipbuilding & Offshore Engineering Co., Ltd.

Introduction

Korea Management Registrar has been requested by KSOE Co.,Ltd to verify its greenhouse gas emissions in 2020, 2021. The verification was conducted on the organization and operation boundaries and the results are as specified as below. This verification statement is valid from the day of publication.

Scope

- **Organization and operation boundary:**
 - Greenhouse gas emissions: The organizational boundary is limited to Scope 3 of Korea Shipbuilding & Offshore Engineering, Hyundai Heavy Industries, Hyundai Samho Heavy Industries, and Hyundai Mipo Dockyard in accordance with the operational control approach of WRI/WBCSD GHG Protocol Chapter 3.
- **Verification period:** 01/01/2020 ~ 31/12/2020
01/01/2021 ~ 31/12/2021
- **Types of Greenhouse Gases:** CO₂, CH₄, N₂O, HFCs, PFCs, SF₆
- **Verification scope:**
 - Scope 3 (all other indirect emissions)
 - Scope3 are limited to emissions from 10 categories of 15 categories.
- **Performed verification work:**
 - Visiting sites and Interview with relevant personnel responsible for collecting greenhouse gas emission data
 - Reviewing the MRV system and process for gathering method for greenhouse gas emission.
 - Examination on raw data including information system, bills and payment statements related to verification scope.
 - Comparative examination through on-desk review, risk analysis, observation and inspection, etc.
 - Level of assurance: Limited Assurance

Standard & Guidance

ISO 14064-1 Greenhouse gases -- Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals (2018),
ISO 14064-3 Greenhouse gases -- Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions(2018),WRI/WBCSD GHG Protocol (2004)
Verification guidelines for operation of GHG ETS, IPCC Guidelines for National Greenhouse Gas Inventories (2006), International Standard on Assurance Engagements 3000 (Revised) - 'Assurance Engagements other than Audits or Reviews of Historical Financial Information'
KSOE Co.,Ltd. and its subsidiaries's Scope3 emissions by category in 2020 and 2021 are as follow.

Results

KSOE Co.,Ltd. and its subsidiaries's Scope3 emissions by category in 2020 and 2021 are as follow.

① Greenhouse gas emissions in 2020

(Unit : tCO₂-eq./yr)

Type	KSOE	HHI	HMD	HSHI	Total
Category 1	-	2,139,001	788,095	1,770,478	4,697,575
Category 2	-	24,574	15,613	11,077	51,264
Category 3	573	30,474	9,390	14,211	54,648
Category 4	-	37,405	1,141	2,069	40,615
Category 5	44	5,628	19,934	40,839	66,445
Category 6	109	95	95	52	351
Category 7	1	15	10	3	29
Category 11	-	38,689,326	65,209,103	26,568,387	130,466,816
Category 12	-	3,506	1,225	3,777	8,508
Category 15	14,141	-	-	-	14,141
Total	14,868	40,930,026	66,044,605	28,410,893	135,400,391

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GHG & Energy Assurance Statement
INDEPENDENT VERIFICATION STATEMENT

② Greenhouse gas emissions in 2021

(Unit : tCO₂-eq./yr)

Type	KSOE	HHI	HMD	HSHI	Total
Category 1	-	2,155,703	887,624	1,726,616	4,769,943
Category 2	-	23,106	12,305	13,683	49,094
Category 3	553	31,793	10,352	14,255	56,953
Category 4	-	38,570	1,416	1,848	41,833
Category 5	49	6,658	20,357	39,830	66,895
Category 6	75	65	65	53	258
Category 7	1	15	10	3	28
Category 11	-	51,022,580	63,866,452	30,861,662	145,750,694
Category 12	-	4,114	1,225	4,181	9,519
Category 15	14,660	-	-	-	14,660
Total	15,338	53,282,604	64,799,803	32,662,131	150,759,877

Conclusions

As a result of the verification according to the verification scope and standard presented above, the assurance opinion of Korea Management Registrar is as follows.

- KMR verified the greenhouse gas emissions of Korea Shipbuilding & Offshore Engineering Co., Ltd in 2020, 2021. Based on the procedures performed, nothing has been found in all material respects not to meet standard in accordance with the verification purpose and the applicable criteria
- This opinion may be influenced by the limitations of provided data, sampling methods, etc., and because of these limitations of verification, there could be unavoidable possibility of existence of undiscovered misstatements.

July 5, 2022
Korea Management Registrar
President Hwang Eun Ju

E. J Hwang



KMR is an ETS & TMS verification institution authorized by Republic of Korea Government.
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Membership Status & Public Information

Membership Status

Membership Status	KSOE	HHI	HMD	HSHI
Korea Enterprises Federation		•	•	•
Korea International Trade Association	•	•	•	•
Korean Standards Association		•	•	•
Korea Chamber of Commerce & Industry	•	•	•	•
Korea Listed Companies Association	•	•	•	
Fair Competition Federation	•		•	
Korea Offshore & Shipbuilding Association		•	•	•
Korea Association of Machinery Industry		•		
Korea Defence Industry Association		•		
Korea Association for Space Technology Promotion		•		

Public Information

Disclosure Channels for Additional Management Information		Details
HD Hyundai Website	http://www.hdhyundai.co.kr/	Group introduction, major affiliates, media center, investor information, talent recruitment
KSOE Website	http://www.ksoe.co.kr/	Company introduction, sustainable management, media center, investor information
HHI Website	http://www.hhi.co.kr/	Company introduction, business areas, public relations, sustainable management, co-prosperity
HMD Website	http://www.hmd.co.kr/	Company introduction, major facilities, business areas, customer service, public relations, recruitment, investment information
HSHI Website	http://www.hshi.co.kr/	Company introduction, business areas, social contribution, information center, cyber PR center, news
HHI Group Ethical Management Website	http://ethics.hhigroup.kr/	Group’s ethical management direction, ethical regulations, online reporting / consultation, etc.
Financial Supervisory Service (FSS) Data Analysis, Retrieval and Transfer System (DART)	http://dart.fss.or.kr/	Various disclosed information submitted voluntarily or obligated as a listed company
Company briefing	http://www.ksoe.co.kr/ir05	Regular management performance and business prospects
HHI Group ESG Website	https://esg.hhigroup.kr/	Group ESG framework, activities, data, reports, news, etc.

