



CREATIVE INNOVATION FOR A BETTER FUTURE

HYUNDAI ROTEM SUSTAINABILITY REPORT 2022

About this Report

Report overview

As a global corporate citizen, Hyundai Rotem develops its sustainability strategies and manages its governance, environmental, social and economic performance. This is the second sustainability report published by Hyundai Rotem. Hyundai Rotem is committed to transparently disclosing information on the performance of its newly established sustainable management to stakeholders.

Reporting standards

The Hyundai Rotem Sustainability Report 2022 was prepared in accordance with the Core compliance criteria of the Global Reporting Initiative (GRI) for sustainable reporting. The standards of the Sustainability Accounting Standards Board (SASB) have also been considered to reflect issues appropriate to industry characteristics, as have the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD) to reflect how Hyundai Rotem manages climate-related risks and opportunities. Economic data are consistent with the consolidation criteria of the Korean International Financial Reporting Standards (K-IFRS). Social and environmental data are primarily based on Hyundai Rotem's Uiwang, Dangjin and Changwon business sites in the Republic of Korea. For data that were deemed significant, overseas businesses were also included in the scope of the report, but this is specified in the report in such cases.

Reporting scope

The reporting period for this report is 1 January 2021 to 31 December 2021. Non-financial performance includes some data for the first half of 2022.

Place of issue	HYUNDAI ROTEM COMPANY Headquarters : 488, Changwon-daero, Seongsan-gu, Changwon-si, Gyeongsangnam-do, Republic of Korea
Date of issue	June 2022
Inquiry	Hyundai Rotem Sustainability Team Telephone: +82 (0)31 8090 8047 Email: sustainability@hyundai-rotem.co.kr
Reporting standards	GRI Standards (Core option), TCFD recommendations, SASB standards
Reporting frequency	Once per annum (First issued: July 2021)
Verification	Korean Standards Association

Contents

OVERVIEW

Message of the Chief Executive Officer	04
Company profile	06
Our business	08
Sustainability vision and strategy	12
UN SDGs commitment	13

PEOPLE RESPONSIBLE PARTNER

Special feature No. 3 Safety-first management	49
Occupational safety and health	51
Talent acquisition, retention and development	56
Employee well-being, diversity and equal opportunities	58
Community engagement	62
Supply chain risk management	66

PRINCIPLES OF GOVERNANCE

Special feature No. 1 Systemic approach to sustainability	15
Governance integrity	17
Business ethics and compliance	21
Integrated risk management	27
Information security management	29

PROSPERITY GREEN INNOVATION

Special feature No. 4 Future-forward growth	69
Sustainability and innovation of products and services	72
Product and service safety & quality	74
Economic value creation and distribution	78
Inclusive prosperity	79

PLANET CLIMATE SMART

Special feature No. 2 Eco-friendly products and services	31
Environmental management	33
Environmental impact management	35
Climate change mitigation	38
Climate risk management (TCFD)	40

APPENDIX

Factbook	82
Global Reporting Initiative Index (GRI Index)	91
Sustainability Accounting Standards Board (SASB Index) ...	94
Materiality assessment	98
Stakeholder engagement	100
External initiatives	101
Third-party verification statement	102
Greenhouse gas verification statement	104

Message of the Chief Executive Officer

Sustainability - the driving force behind creative innovation for a better future



At Hyundai Rotem, we are driven by our mission of “Creative Innovation for a Better Future.” During this year 2022, the COVID-19 pandemic continues to drag on, the war in Ukraine is lingering and climate change is intensifying worldwide – Germany and China experienced record downpours and floods, and July 2021 was the Earth’s warmest July on record.

More than ever, our societies need innovations and solutions to overcome challenges and to prosper despite uncertainties and instabilities. Across our business areas – in Rail Solutions, Defense Solutions and the ECO-Plant Business, we are proud to serve our clients and society by providing cutting-edge technologies and tools that make our societies safer, eco-friendlier and climate resilient.

Sustainability is our growth strategy

Sustainability is a key tool for Hyundai Rotem to achieve its mission and to set its short-, mid- and long-term strategies. As we work to realize the tangible results of new projects that have been in incubation for the past two years, this year, we want make sure that we put ourselves on the pathway to sustainable growth. Our sustainability vision, established in 2021, is grounded on four pillars: the Principles of Governance, Planet, People and Prosperity. Applying these pillars across all business areas and functions can, we believe, help us to comprehensively manage risks and opportunities.

On behalf of Hyundai Rotem, I am proud to say that we are in the midst of an exciting moment on our sustainability journey, as we work to mainstream sustainability across all of our business operations and supply chain, communicating with our stakeholders and determining our sustainability pathway. In 2021, we improved our environmental, social and governance (ESG) rating from the Korea Corporate Governance Service (KCGS), evolving from an overall rating of B+ to A. Moreover, the Board of Directors, the highest decision-making body regarding sustainability, oversaw a total of sixteen sustainability-related agenda in 2021. In 2022, Hyundai Rotem plans to strengthen the board’s role in sustainable leadership through the Transparent Management Committee, a sub-committee under the board. By creating the Sustainability Team at the start of 2022, Hyundai Rotem is working to systemically promote sustainability throughout the company.

Message of the Chief Executive Officer

Since sharing our sustainability vision and declaring our support for the Task Force on Climate-Related Financial Disclosure (TCFD) in the first *Sustainability Report* in 2021, we are now incorporating the recommendations of the TCFD and the standards of the Sustainability Accounting Standards Board (SASB) in the 2022 report. Moreover, Hyundai Rotem plans to disclose its climate-related information on CDP (a global platform of environmental performance) in 2022, and we aim to proactively contribute to global climate neutrality efforts. In our survey of internal and external stakeholders, we have identified three key themes in our materiality matrix – innovation, safety and risk management. Going forward, we want to make sure our sustainability plans reflect such priorities.

We put safety first

In alignment with the findings of the materiality matrix, Hyundai Rotem prioritizes the safety of the users of its products and services, as well as that of workers who produce or provide them. Through innovation, we endeavor to reflect the importance that we put on the safety of our products.

At the business practice level, we have strengthened our approach to workplace health and safety in our business operations and supply chain by setting up the Health, Safety and Environment (HSE) Planning Team in 2021 and appointing the first Chief Safety Officer (CSO) in 2022. The CSO is actively driving initiatives to improve occupational health & safety, and reporting to the board on a regular basis. From workplace safety audits to company-wide safety idea pitch competitions, we strive to mobilize the entire staff to make our workplace safer.

At the product level, we are working to innovate in the area of safety. Our innovations in the defense sector are also serving civilians, for example with rescue drones that help to save lives and fight fires without putting rescuers' lives at risk. Wearable robots can also improve the safety and overall well-being of people engaged in manual labor. We partnered with the Korea Institute for Robot Industry Advancement (KIRIA) and the Korea Electric Power Corporation (KEPCO) to apply wearable robots to the agriculture sector and to electrical engineering work. Moreover, our virtual reality rail service simulator is designed to help prevent accidents by identifying risk factors in advance and allowing rail maintenance engineers to train in safe, virtual environments before the actual fieldwork.

We innovate to enable a hydrogen society

The signals from the global “Build Back Better and Greener” initiative are very clear, and worldwide energy transitions testify to the rapid changes taking place in the mobility and energy landscapes. Such changing business landscapes pose not only challenges but also opportunities for Hyundai Rotem, as well as for our current and potential clients and suppliers.

In 2021, the Hyundai Motor Group launched the “Hydrogen Wave” initiative to help ensure that hydrogen could be made accessible to everyone, everywhere and for every function by 2040. As part of this initiative, Hyundai Rotem is developing hydrogen mobility solutions (e.g. hydrogen fuel cell trams) and hydrogen production infrastructure, creating synergies with partners within the Hyundai Motor Group and beyond.

Over the past year, we have been strengthening partnerships with the public and private sectors to lay the foundation for a hydrogen society. Building upon co-operation between Korea and Egypt for green infrastructure, we signed a memorandum of understanding (MOU) with Egyptian partners to develop hydrogen electric-trams for the new administrative capital. Leveraging the collaborations within the Hyundai Motor Group, we are promoting a hydrogen mobility package model, which includes the hydrogen electric tram and the hydrogen refueling station, for the Neom eco-city project in Saudi Arabia. Furthermore, by signing an MOU with the North Chungcheong province for green hydrogen development and providing Chungju biogas hydrogen production facilities, we are contributing to the hydrogen ecosystem and strengthening local development.

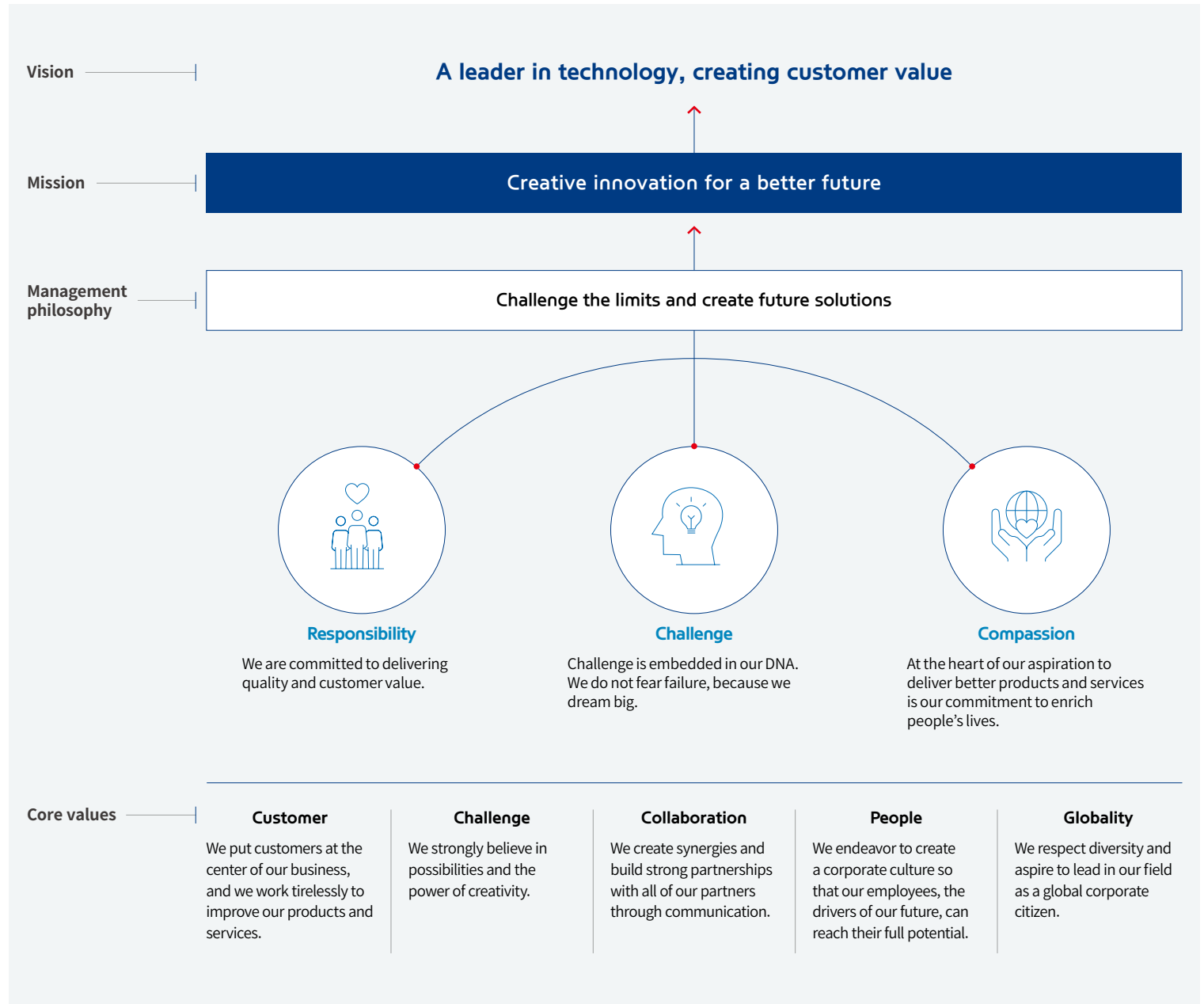
Together with our stakeholders, Hyundai Rotem will continue to innovate and to contribute to a better and more sustainable future.

CEO and President
Hyundai Rotem
Yong-bae Lee

Company profile

Overview

Hyundai Rotem was founded in 1977 and is a global heavy industry company with Rail Solutions and Defense Solutions, as well as the ECO-Plant Business. It was incorporated into the Hyundai Motor Group in 2001. Building upon technological advancements and quality improvements, Hyundai Rotem is strengthening the competitiveness of each of its business areas. Invested in future-forward technologies and promoting sustainability, Hyundai Rotem is ready to create new possibilities.




Company profile

Overview

Company overview (As of December 2021)

Company name	HYUNDAI ROTEM COMPANY
CEO	Yong-bae Lee
Date of establishment	1 July 1999
HQ location	488, Changwon-daero, Seongsan-gu, Changwon-si, Gyeongsangnam-do, Republic of Korea
Employees	3,445
Business areas	Rail Solutions, Defense Solutions, ECO-Plant Business

2021 performance (As of December 2021, consolidated)

Total assets: KRW 4.1072 trillion <small>(approx. USD 3.46 billion)</small>	Revenue: KRW 2.8725 trillion <small>(approx. USD 2.42 billion)</small>	Operating profit KRW 80.2 billion <small>(approx. USD 67.7 million)</small>
ICGS ESG rating: A (overall) 	Ministry of Gender Equality and Family: Family-friendly certification	Declaration of support: TCFD (First in heavy industry)

* The currency conversion rate: Korean won (KRW)/US dollars (USD) 1,185.5 (based on the exchange rate as of 31 December 2021).

Present in 52 countries around the world, Hyundai Rotem is working to match its products and services to the different needs of its customers and expand its global network.

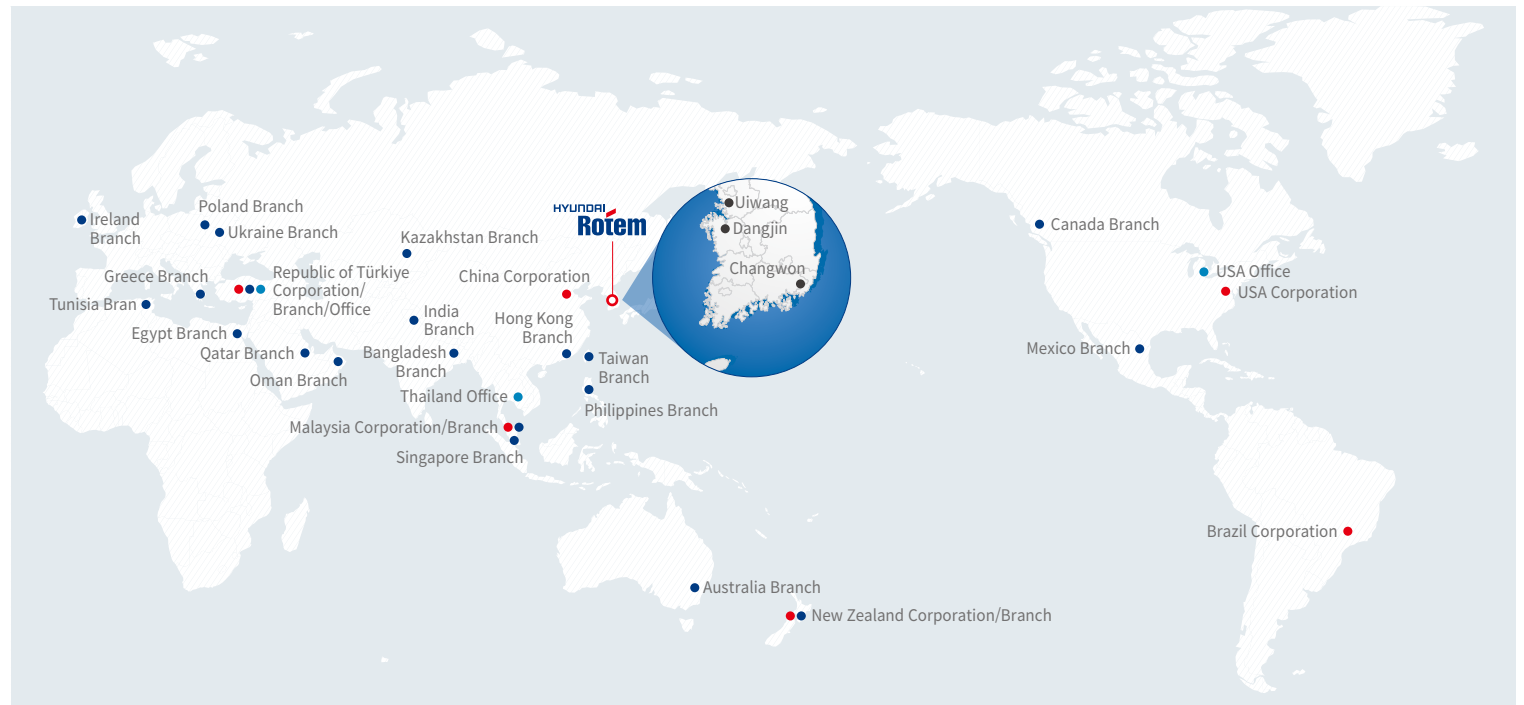
Business sites

(As of December 2021)

Domestic Uiwang R&D center and plant, Changwon and Dangjin plants

Overseas 6 corporations, 21 branches, 3 offices

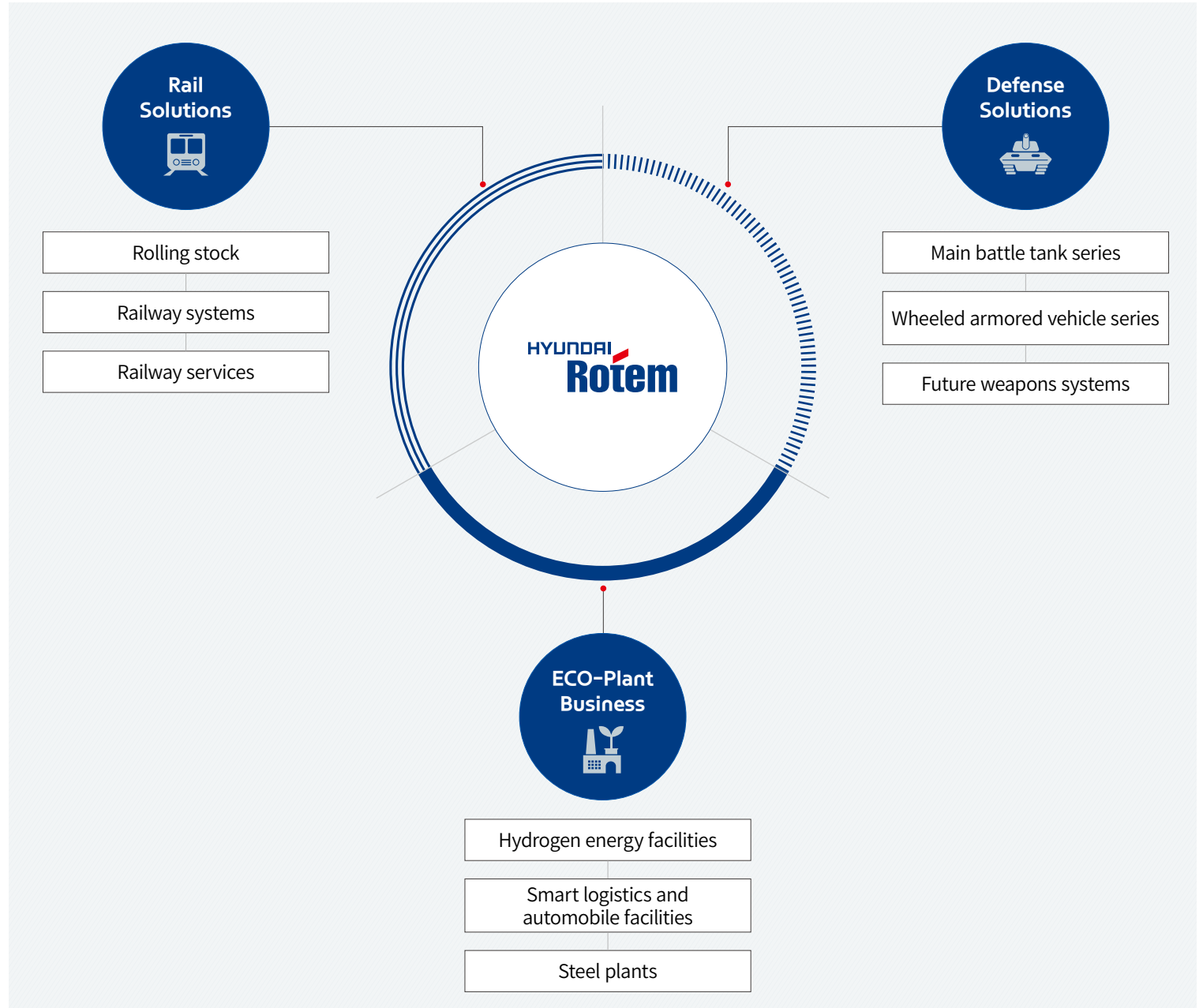
- Overseas corporations
- Overseas branches
- Overseas offices
- Hyundai Rotem plants in Republic Korea (hereafter "Korea")



Our business

Overview

Hyundai Rotem has its roots in the rail industry but has since expanded into the defense and plant industries, establishing itself as a comprehensive heavy industry company that provides high-quality products and services and advanced technological solutions. Across all of its business areas, Hyundai Rotem strives to present sustainable solutions and engineer new paradigms.



Our business

Rail Solutions



2021 Highlights



Developed and commenced testing of the hydrogen electric tram concept in Korea



Won the order for Tanzania electric multiple units and the electric locomotives project



Won the order for the Edmonton, Canada tram project

Creating a new paradigm that opens up a future era of railway transportation

Through the supply of rolling stock, railway systems and railway services in 38 countries, the Rail Solutions Division is strengthening its market position. Hyundai Rotem has supplied a wide range of rolling stock, including high speed trains, light rail vehicles, diesel multiple units and locomotives, as well as passenger cars and freight wagons. Having developed its own technologies for core electrical equipment, Hyundai Rotem also produces operation control center management systems, traction motors, and propulsion system and auxiliary power units. In recent years, the railway system segment, which includes signaling, communication, power and machinery, has been growing steadily, alongside the railway service segment, which includes rolling stock operation, maintenance and remodeling services, as well as the supply of rolling stock spare parts.

Hyundai Rotem is committed to meeting the dynamically changing needs of its customers and driving forth sustainable mobility; it will thus continue to invest in R&D for future businesses, such as high speed trains with distributed traction systems, double-deck electric multiple units, low-floor electric multiple units and hydrogen electric trams.



Our business

Defense Solutions



2021 Highlights



Finalized a contract for the development of K2 main battle tank depot maintenance



Started the pilot for the multi-purpose unmanned ground vehicle



Signed an MOU for the development of wearable robots

Providing a safer future, with advanced technologies

Representative of the Korean ground weapons systems, the Defense Solutions Division is committed to pioneering safety and peace through its state-of-the-art technology. Building upon its track record in reliable supply management and the development of its own technologies, Hyundai Rotem has gained customer trust. Moreover, it has succeeded in signing power conversion and technology export contracts through the development of the K2 main battle tank, based on the optimization performance improvement technology. In accordance with the Korean defense reform, the Defense Solutions Division developed wheeled armored vehicles independently. Hyundai Rotem is striving to lead in future weapons systems, applying advanced core technologies, such as the manned/unmanned weapon system, while at the same time contributing to civilian safety by developing rescue drones and wearable robots.

The Defense Solutions' technologies and products have been recognized both domestically and internationally as demonstrated by the supply contracts signed with Hyundai Rotem. Securing a foundation for growth through the stable performance of its main businesses, its tanks and wheeled armored vehicles, Hyundai Rotem is expanding to new business areas and looking to gain a competitive edge. It plans to expand international orders by developing export-type models optimized for regional characteristics, and is implementing a strategy to diversify its business through future-forward R&D.



Our business

ECO-Plant Business



2021 Highlights



Completed the Hynet Hydrogen Shipping Center



Developed an independent model of a hydrogen dispenser



Developed the smart factory auto-guided vehicle (AGVs)

Building a prosperous future with advanced plant technologies

The ECO-Plant Business division specializes in automotive press lines, automotive manufacturing facilities, steel plants and airport passenger boarding bridge projects. It is now transitioning to become a provider of eco-friendly plant engineering solutions, grounded firmly in innovative technologies and quality control. In recent months, Hyundai Rotem also entered the smart logistics business to become a leader in fourth industrial revolution technology industries.

Hydrogen infrastructure is a key area of our new focus: Through projects such as hydrogen reformers and hydrogen refueling stations, Hyundai Rotem is looking to contribute to the transition towards a hydrogen society. In collaboration with various industrial or academic institutions, Hyundai Rotem is trail blazing a path towards the global hydrogen economy by actively developing new technologies, such as hydrogen liquefaction storage and carbon capture.



Sustainability vision and strategy

A systems approach to sustainability

Sustainability vision

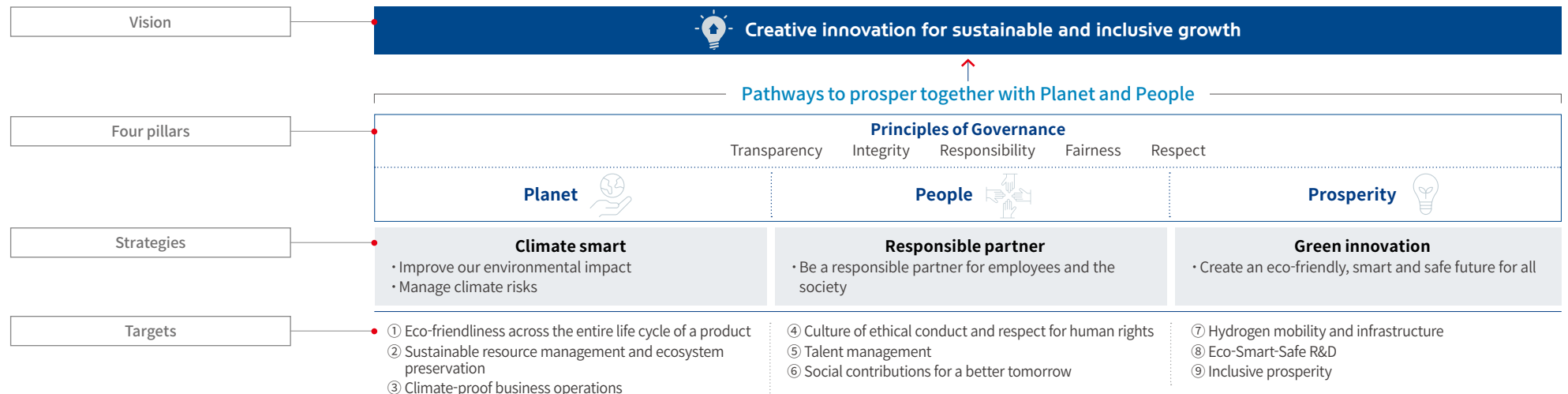
To realize our sustainability vision of “Creative innovation for sustainable and inclusive growth”, we have established a pathway to prosper together with Planet and People. This structure builds upon the four pillars of World Economic Forum (WEF) – Principles of Governance, Planet, People and Prosperity, which are aligned with the United Nations’ Sustainable Development Goals (SDGs) and the environmental, social and governance (ESG) framework. Amid challenging business environments arising from the effects of COVID-19, global supply chain disruptions and geopolitical conflicts, at Hyundai Rotem, we are working to identify and manage risks and opportunities so that we can realize sustainable growth with our stakeholders.

Sustainability strategies and targets

We have three strategies in particular to guide us on our sustainability journey: 1) Climate Smart; 2) Responsible Partner; and 3) Green Innovation. For each of these strategies, we have three targets that allow us to keep track of our progress, and help us to step back and manage the interconnections of the four pillars, because we believe in the importance of taking a systems approach to sustainability.

Sustainability governance









The Sustainability Team, created in 2022 within the Corporate Planning Group, oversees Hyundai Rotem's sustainability vision, activities and performance. Spearheaded by the Sustainability Team, a cross-functional team of sustainability focal points from across the company implements sustainability initiatives and responds to sustainability information requests and evaluations. Centered around the Executive Management Committee, led by the CEO, the Sustainability Team and the different divisions discuss sustainability strategy and performance. All significant sustainability issues are reported to, and approved by, the CEO and the Board of Directors after a review by the cross-functional team of operational sustainability staff.



UN SDGs Commitment

Hyundai Rotem's 4P and the UN SDGs

The UN SDGs are key action points from the United Nations' *Transforming our world: the 2030 Agenda for Sustainable Development*. They represent "a plan of action for people, planet and prosperity." Our sustainability vision at Hyundai Rotem, anchored in four pillars – the Principles of Governance, Planet, People and Prosperity – is thus closely aligned with the UN SDGs. In the table below, we share some of our key contributions to the SDGs.

Four pillars	Issues	Contents	UN SDGs
Principles of Governance 	Governance integrity	Board expertise and diversity <ul style="list-style-type: none"> Appointed the first female director to the board 	
	Ethics and compliance	Compliance <ul style="list-style-type: none"> Enhancing business value by establishing a transparent corporate culture with an internal compliance system Ethical management system <ul style="list-style-type: none"> Promoting sustainable growth that is shared with stakeholders through business ethics 	
Planet 	Environmental impact	Environmental impact management <ul style="list-style-type: none"> Implementing the five innovation challenges to minimize environmental impacts Establishing environmental criteria stricter than those of ISO14001:2015 certification Reducing waste by recycling and reusing waste generated on site 	
	Climate change	Low-carbon design <ul style="list-style-type: none"> Conducting a life cycle assessment of the Sydney New Intercity Fleet electric multiple units Designing lightweight trains for the Taiwan Railway Administration (TRA) to improve the environmental impact Climate resilient design <ul style="list-style-type: none"> Providing products and services that operate under various climatic conditions 	
People 	Occupational safety and health	Health, safety and environment (HSE) governance <ul style="list-style-type: none"> Appointing a Chief Safety Officer and creating the HSE Planning Team Revamping HSE governance by involving the Board of Directors Engaging all staff to be proactive about safety through safety idea pitch competitions 	
	Talent recruitment, retention and development	Capacity building <ul style="list-style-type: none"> Offering 91 879 hours of training to strengthen employee expertise Providing approximately 600 online job training sessions 	
	Employee well-being, diversity and equal opportunities	Work-life balance <ul style="list-style-type: none"> Being re-certified as a family-friendly company (since 2014) Human rights <ul style="list-style-type: none"> Conducting human rights impact assessments 	
Prosperity 	Community engagement	Community engagement <ul style="list-style-type: none"> Sponsoring housing improvements for older adults living alone in precarity Supporting underprivileged neighbors with household goods Empowerment of youth and individuals with disabilities <ul style="list-style-type: none"> Training individuals with audio-visual disabilities to be cultural commentators Supporting infants and toddlers awaiting adoption Providing scholarships to children living in poverty in the Philippines 	
	Sustainability and innovation of products and services	Eco-smart and safe R&D <ul style="list-style-type: none"> Investing KRW 16.5 billion (approx. USD 13.9 million) in eco-friendly development Developing hydrogen electric trams Entering the hydrogen infrastructure business Designing high speed trains and electric multiple units to be eco-friendly 	
	Product and service safety & quality	Product and service quality, safety management <ul style="list-style-type: none"> Investing KRW 103.5 billion (approx. USD 87.3 million) in R&D Operating the Uiwang Hydrogen Reformer H2 Facility Assembly Center 	
	Economic value creation and distribution	Economic performance <ul style="list-style-type: none"> Reached KRW 2.8725 trillion (approx. USD 2.42 billion) in sales, 3.1% year-on-year growth Achieved operating profits of KRW 80.2 billion (approx. USD 67.7 million) for the second consecutive year 	
	Inclusive prosperity	Support for our suppliers <ul style="list-style-type: none"> Providing KRW 15.2 billion (approx. USD 12.8 million) of financial support to suppliers Operating 278 technical support programs for suppliers Being awarded the highest grade for six consecutive years by the Consortium for HRD Ability Magnified Program (CHAMP). 	

Principles of Governance

Transparency, Integrity, Responsibility, Fairness, Respect

Special Feature No. 1
Systemic approach to sustainability

15



Governance integrity
17



Business ethics and compliance
21



Integrated risk management
27



Information security management
29



At Hyundai Rotem, we believe that sound governance is key to corporate sustainability, and that growth based on trust will mean a stronger company. To establish sound governance, Hyundai Rotem has set five principles of governance: transparency, integrity, responsibility, fairness and respect. By cultivating an ethical culture across the company – respected by all employees and leadership alike – which includes a well-balanced and independent Board of Directors, we work to apply these principles in practice. In addition, we want to make sure that Hyundai Rotem is resilient against any risks by responding in a pro-active manner.

Special Feature No. 1

Systemic approach to sustainability



1 External stakeholder engagement: Sustainability report and ESG evaluations

Declaration of support for the TCFD, an industry first in Korea

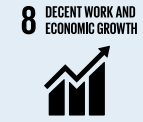
The Task Force on Climate-Related Financial Disclosures (TCFD) was mandated by the Financial Stability Board (FSB) of the G20 Finance Ministers and Central Bank Governors to develop a framework with which organizations can use to disclose climate-related financial information. Declaring support for the TCFD means committing to disclose climate-related financial information so as to internalize climate resilience. Hyundai Rotem is the first heavy industry company in Korea to declare its support, and in doing so, pledges climate action.

Transparent information disclosure

To ensure the transparent disclosure of our sustainability performance, including environmental, social, governance and economic data, we publish a Sustainability Report. Aligned with the standards of the Sustainability Accounting Standards Board (SASB), the Sustainability Report discloses information required by our industries, as we are a comprehensive heavy industry company comprised of Rail Solutions, Defense Solutions, and ECO-Plant Business Divisions. Following the TCFD recommendations, we are sharing the climate risks and opportunities that we have identified, as well as the relevant processes, metrics and targets.



Alignment with the UN SDGs



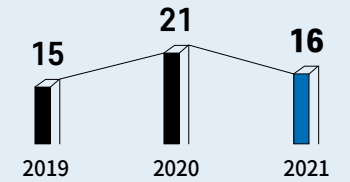
8 DECENT WORK AND ECONOMIC GROWTH



16 PEACE, JUSTICE AND STRONG INSTITUTIONS



Sustainability-related agendas presented to the Board of Directors
(Unit: number)



Korea Corporate Governance Service (KCGS) ratings



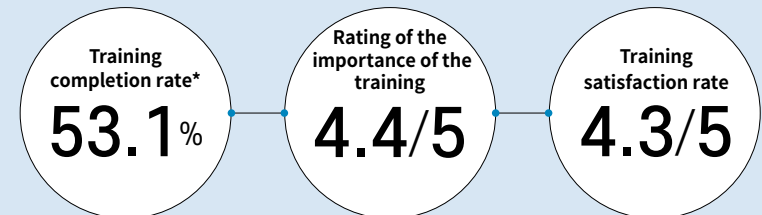
2020



2021

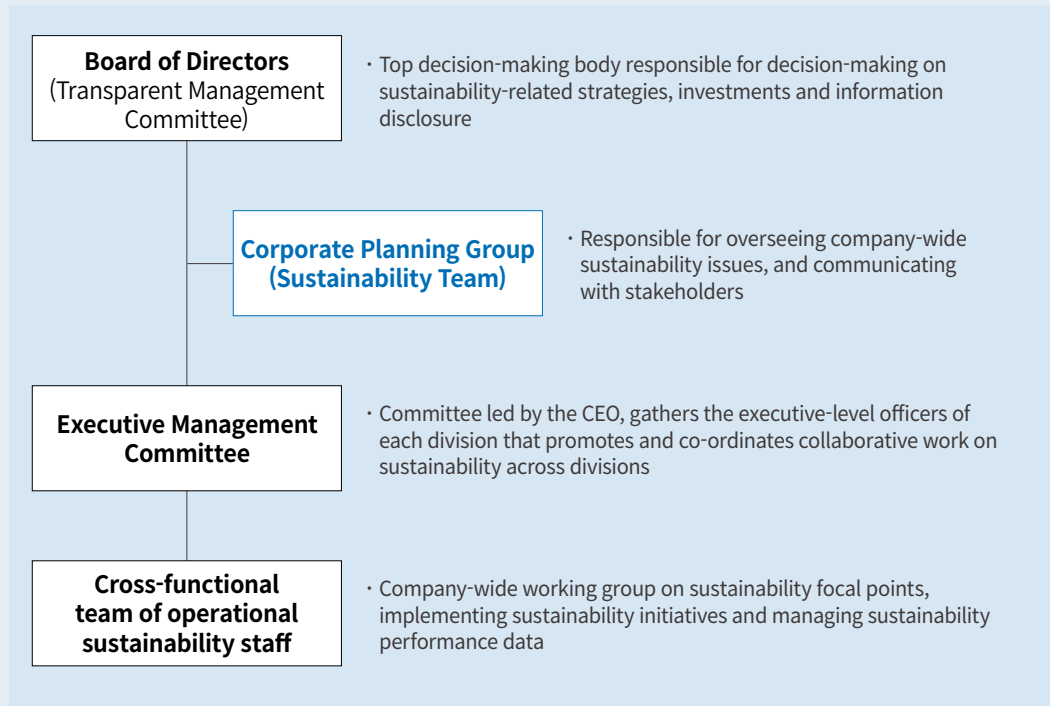
2 Internal stakeholder engagement: Sustainability awareness-raising training

We provide awareness-raising training to employees so that as a company we can internalize sustainability. The training explains what sustainability is, why it is important and what it means in practice across four modules – ethics, human rights, safety and the environment. After the training, we conduct a survey and receive feedback from staff, which recently revealed that staff would like to see follow-up training linking sustainability to business operations. Such feedback will therefore be reflected in our 2022 plans.



* The training was provided to general and research staff, and the completion rate was 95.3%. We plan to gradually expand the scope of the training target.

3 Sustainability governance



Board of Directors

The Board of Directors is the top decision-making body in relation to sustainability. To support the board’s efficient and effective sustainability governance, we are planning to expand the role of the Transparent Management Committee, a sub-committee of the board, in 2022. The board meets regularly, and may also meet on an ad hoc basis should important sustainability issues arise.

Corporate Planning Group (Sustainability Team)

The Sustainability Team oversees both the strategic and operational levels of sustainability, communicating with internal and external stakeholders. Together with the cross-functional team of operational sustainability staff, it derives sustainability-related issues, and under the supervision of the Executive Management Committee, it implements sustainability strategies and responds to global sustainability-related initiatives and evaluations.

Executive Management Committee

The Executive Management Committee meets on a quarterly basis to oversee co-operation and performance across divisions. In addition to establishing sustainability-related tasks and delineating the responsibilities and roles across divisions, it also identifies and responds to sustainability-related risks, follows up with action plans and presents information on sustainability performance to the Board of Directors.

Cross-functional team of operational sustainability staff

Operational sustainability staff from teams relevant to the governance, environmental, social and business strategy gather to review and follow up on sustainability-related activities, performance and future plans.

Governance integrity

Transparent board composition and operation

Board of Directors: Composition

Appointments to the Board of Directors

For Hyundai Rotem’s sustainable growth and the protection of shareholder interests, we appoint directors to the board according to specific regulations. For inside directors, we maintain a pool of unregistered directors, and we select inside directors based on their expertise in subjects such as management, economics, law, transportation engineering and defense security; in doing so, we ensure that the directors on the board are diverse and are experts in their relevant fields. Outside directors are selected after a thorough examination of candidates, according to the disqualification standards prescribed in Article 382 (3) and Article 542-8 (2) of the Korean Commercial Act. In March 2022, during the 23rd general shareholders’ meeting, we appointed a female director as an outside director for the first time in the company’s history.

Board independence

Outside directors make up more than half (57%) of Hyundai Rotem’s Board of Directors, helping to provide checks and balances for this top decision-making body. We strive to ensure that the appointment of the outside directors is carried out in an independent manner. At the general shareholders’ meeting, the agenda for the appointment of candidates for directors is presented separately for each potential candidate. Inside directors can be appointed after a resolution is passed at the general shareholders’ meeting upon the recommendation of the Board of Directors. Outside directors can be appointed at the general shareholders’ meeting after an objective verification by the Outside Director Nomination Committee. To maintain independence, Hyundai Rotem reviews all board members fairly and thoroughly; in the case of outside directors, we verify that they do not have any conflict of interest, either in special relationships with the management and controlling shareholders, or in holding concurrent positions. The term limit for board members is set at a maximum of six years. In addition, Hyundai Rotem has established operating regulations for the Board of Directors to correctly perform their roles, stipulating in the articles of association that directors’ responsibilities cannot be reduced, except by a board resolution.

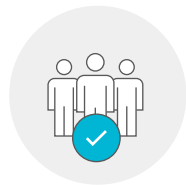
Composition of the Board of Directors

Hyundai Rotem’s Board of Directors is composed of seven members, three inside directors, including the CEO, and four outside directors. We provide the name of directors, appointment dates, terms of office, and the chair of the Board of Directors in the table below, as well as on the company website, so that all stakeholders can have easy access to this information.

Composition of board of directors (as of March 2022)

Classification	Name	Gender	Position/major career	Date of initial appointment
Inside director	Yong-bae Lee	Male	CEO · Former President & CEO, Hyundai Motor Securities	March 2020
	Doo-hong Kim	Male	CFO · Former Head of Finance Division, Hyundai Dymos	March 2019
	Jeong-hoon Kim	Male	Head of Rail Solutions Division · Former Head of the Global Rail Business Group 1, Hyundai Rotem	March 2021
Outside director	Tae-hak Chung	Male	Chair of the Audit Committee · Partner at Yulchon LLC · Former Presiding Judge at the Administrative Division of the Suwon District Court	March 2017
	Hyung-koo Yeo	Male	Chair of the Ethics Committee · Senior Advisor at Kim & Chang LLC · Former Vice Chairman & General Secretary for PyeongChang Olympics 2018	March 2019
	Sang-gyung Jun	Male	Member of the Ethics Committee · Professor of Finance Business Administration, Hanyang University · Former Chair of the Korean Financial Management Association	March 2019
	Ji-won Yun	Female	Member of the Transparent Management Committee · Professor of National Security, Sangmyung University · Former Professor for Diplomatic Security Study, Pyeongtaek University	March 2022

Governance integrity



100%

Average board meeting attendance rate (2021)

Operation of the Board of Directors

Activities of Board of Directors

The Board of Directors meets every quarter, and convenes temporary meetings as needed. In accordance with the provisions of the articles of association, each director shall be notified of the date, place and agenda of the meeting by no later than seven days before the day of the meeting. If all or some of the board members are unable to attend the meeting in person, they can participate remotely through the video conferencing system. The board meeting may be convened by the Chair or by a director otherwise designated by the board, with a resolution requiring the presence of a majority of the board and the approval of the majority of those present. In 2021, a total of nine board meetings were held, with the attendance rate at 100%.

In addition to issues outlined under the Korean Commercial Act or Capital Markets Act, the Board of Directors deliberates and decides on most major issues requiring decisions, including issues important to the company's operation and business execution. Even after the end of board meetings, we receive opinions from outside directors. Should they present opposing opinions or request revisions of resolutions, they can do so freely and their opinions are properly reflected.

Operation status of the Board of Directors

Reported contents	Unit	2019	2020	2021
No. of meetings held	Number (times)	9	8	9
No. of resolutions passed	Number	27	30	25
No. of reports approved	Number	7	11	12
Average board attendance rate of inside directors	%	85	75	100
Average board attendance rate of outside directors	%	100	100	100

Support for outside directors

To support the participation of outside directors on the board, the Board of Directors' regulations stipulate that outside directors are to be offered assistance from experts. The outside directors of the Audit Committee receive regular training, for example, to strengthen their expertise, including in relation to the internal accounting management system.

Attendance rate of outside directors

Classification	Unit	Attendance rate
Audit Committee	%	100
Outside Director Nomination Committee	%	100
Remuneration Committee	%	100

Board performance and remuneration

Hyundai Rotem designs and operates remuneration policies that match shareholders' long-term interests. Board remuneration reflects Hyundai Rotem's financial performance, as well as each director's duties and contributions to the board and the sub-committees of the board. The upper bound of remuneration is approved through resolutions made at the general shareholders' meeting after the board's deliberation, and the details of remunerations are disclosed in the Annual Report. To ensure the independence of the Audit Committee, the directors on the committee do not receive other compensation besides the remuneration received as a director. The board members are evaluated according to their individual performance, and this sets the basis of their remuneration as well as re-appointment.

Average remuneration of the Board of Directors

Classification	Unit	2019	2020	2021
CEO	KRW million	605	881	1,119
Outside directors		51	64	67
Board of Directors		598	596	312
Average employee (comparative)		85	86	91

Executive management remuneration

The remuneration of the executive management follows the official evaluation compensation system. The basic annual salary is determined according to position and responsibilities. Bonuses are determined in consideration of the business environment, and the executive officer's annual performance and contribution to the company. Such a compensation system allows Hyundai Rotem to enhance its objectivity and transparency in evaluating executive management.

Governance integrity

Subcommittees of the board

The Board of Directors operates subcommittees, including the Audit Committee, Transparent Management Committee, Remuneration Committee and Outside Director Nomination Committee. The purpose of the Audit Committee is to ensure that the board performs its managerial and supervisory roles effectively and that it maintains its objectivity and independence, while the purpose of the Transparent Management Committee is to secure transparency in internal transactions, promote ethical business practices and protect shareholder rights. The Outside Director Nomination Committee verifies that the outside director candidates meet the qualifications set out in the relevant laws and committee regulations. The Remuneration Committee deliberates on the remuneration of board members, which is then decided and approved at the general shareholders' meeting. At Hyundai Rotem, we actively support the subcommittees by covering all of the committee activity expenses and information needs, and we publish each of the committees' operation regulations on our website.

Audit Committee

To ensure independence, one member of the Audit Committee is appointed by resolution of the general shareholders' meeting, separately from other committee members. The Audit Committee is composed of outside directors with expertise in areas such as finance and accounting, as well as administration and commercial law, to allow for transparent audits. The Audit Committee meets at least every quarter; in 2021, it met nine times. It is entrusted with the audit of Hyundai Rotem's accounting and the board's activities, as well as the review of other matters as the board sees fit. The Audit Committee has the right to consent to the appointment of the chief of audits, and the committee reviews and approves of internal audit plans and results. All Audit Committee members have completed training on the internal accounting management system, organized by the Korea Listed Companies Council.

Transparent Management Committee

The Transparency Management Committee consists entirely of outside directors, for reasons of independence and transparency. The committee reviews the transparency of internal transactions among Hyundai Motor Group subsidiaries, checks the implementation of the Fair Trade Compliance Program and deliberates on major business decisions, such as guarantees, mergers and acquisitions, and the acquisition and disposal of major assets. Expanding its existing role in promoting business sustainability through transparent and ethical business practices, revisions of the Transparent Management Committee's operation regulations began in 2021 to strengthen its role in sustainability oversight, which includes safety and the environment. The committee's activities are disclosed through various channels accessible to all stakeholders, including the *Corporate Governance Reports*.

Outside Director Nomination Committee

The Outside Director Nomination Committee consists of one inside director and two outside directors, and thus outside directors account for the majority, in accordance with the relevant laws and the board's regulations. To appoint suitable outside directors, the committee selects candidates for outside directors fair and objective verification process. Once selected, the candidates are appointed as outside directors through a resolution of the general shareholders' meeting.

Remuneration Committee

The Remuneration Committee consists of one inside director and two outside directors, ensuring its independence by maintaining a majority of outside directors. The Remuneration Committee deliberates and decides on the remuneration of registered directors and on the inside director remuneration system. Established in 2021, the Remuneration Committee aims to be objective and transparent in deciding the board's remuneration, and it meets at least once a year.

2021 operation of subcommittees of the board

Classification	Unit	Meetings held
Audit Committee	Number (times)	8
Transparent Management Committee	Number (times)	2
Outside Director Nomination Committee	Number (times)	1
Remuneration Committee	Number (times)	1

Board subcommittees	Members			Main functions
	Committee Chair	Inside directors	Outside directors	
Audit Committee	Tae-hak Chung	-	Hyung-koo Yeo, Sang-gyung Jun	<ul style="list-style-type: none"> Perform accounting and business audits Investigate business operations and company assets Request directors to report on sales Approve of appointments and the dismissal of external auditors
Transparent Management Committee	Hyung-koo Yeo	-	Tae-hak Chung, Ji-won Yun	<ul style="list-style-type: none"> Approve internal transactions with Hyundai Motor Group subsidiaries Inspect the implementation of the Fair Trade Compliance Program
Outside Director Nomination Committee	Sang-gyung Jun	Yong-bae Lee	Hyung-koo Yeo	<ul style="list-style-type: none"> Verify the qualifications of outside candidates and make recommendations on appointments
Remuneration Committee	Hyung-koo Yeo	Yong-bae Lee	Sang-gyung Jun	<ul style="list-style-type: none"> Set the upper bounds of remuneration for registered directors and make decisions on the overall remuneration system Enact, amend or abolish remuneration policies related to registered directors

Governance integrity

Shareholder value

Enhancing shareholder value

Protection of shareholder rights

Enacted in July 2020, the Corporate Governance Charter aims to enhance shareholder rights and interests. To make the exercise of shareholder rights more convenient, we have also introduced an electronic voting system for the general shareholders' meetings. When selecting the date for the general shareholders' meetings, we avoid days that are expected to overlap with other shareholder meetings. Once the date is set, we communicate the venue, agenda and other information four weeks in advance so that the shareholders have enough time to review the agenda (the Korean Commercial Act stipulates a minimum notice period of two weeks). We disclose – on our website and on the Data Analysis, Retrieval and Transfer System (DART) electronic disclosure system – information on attendance at the general shareholders' meetings by number of voting rights, voting results by agenda item, and the attendance rate of shareholders, excluding the largest shareholders, along with other relevant information.

Every year around January, April, July and October, we hold regular domestic and international investor relations meetings for the purpose of announcing annual, quarterly and semi-annual earnings; we also frequently engage with institutional and foreign investors through special investor relations meetings and conference calls. Information on the attendance of such events can be found on the Korea Investor's Network for Disclosure System (KIND) and on DART.

Guaranteeing shareholder rights

Hyundai Rotem's shareholders participate in the distribution of corporate profits and assets and in corporate decision making at the general shareholders' meetings. Significant changes that may affect Hyundai Rotem's existence itself and shareholder rights are managed as top priorities to protect the shareholders' rights. Hyundai Rotem's dividend information from the past five years can be found on our website and on DART.

Public disclosure

By being unwavering in our obligations to disclose information and to keep up to date on relevant regulations, we make sure that our shareholders have the information that they need. Given the nature of our businesses, we receive frequent requests for disclosures. To systematically respond to such requests, we established an internal disclosure system in 2017. Since its establishment, the Information Disclosure Management Committee has been working to increase the

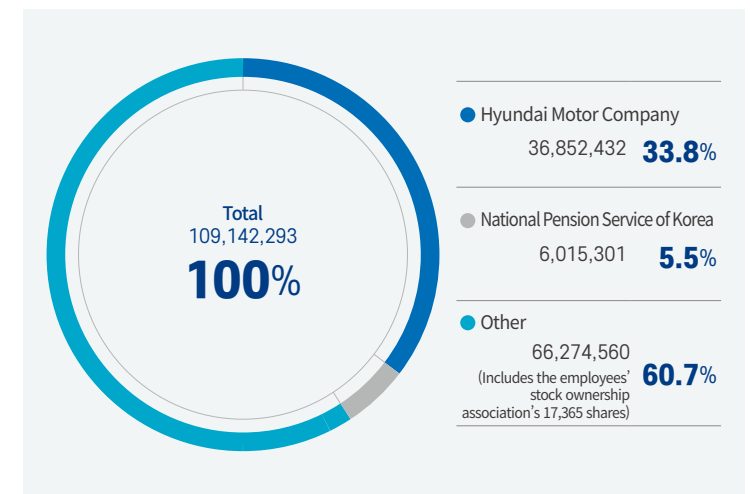
accuracy and timeliness of disclosures, and it does so by designating a disclosure focal point for each business unit. In 2021, we disclosed a total of 159 items on the Korea Exchange, including 45 general disclosures and 8 English disclosures. In 2020, we were designated as an excellent public disclosure corporation.

The disclosure focal points participate in training sessions hosted by the Korea Listed Companies Association (KLCA) to develop expertise in disclosure regulations. These focal points meet regularly with relevant teams to identify and reflect issues subject to disclosure each month. New employees undergo training to learn the importance of disclosures and any pertinent work for such disclosures. At Hyundai Rotem, we are committed to a comprehensive and systematic information disclosure to enhance shareholder value.

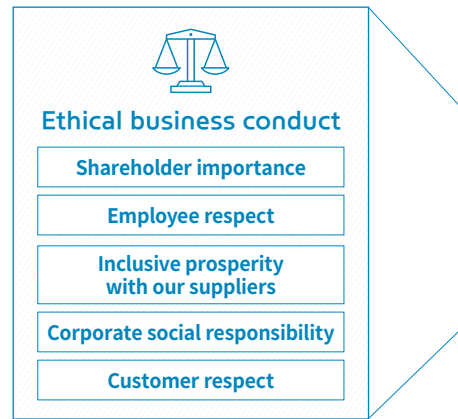
Shareholder status

According to the articles of incorporation, the total number of shares that can be issued is 200,000,000 shares. Currently, 109,142,293 shares are issued and the par value per share is KRW 5,000. All issues of shares are common shares, and fair voting rights are granted according to the number of shares. As of the end of December 2021, Hyundai Rotem's largest shareholder was the Hyundai Motor Company, which holds 33.8% of total shares.

Hyundai Rotem's shareholders (as of December 2021) (unit: number of shares)



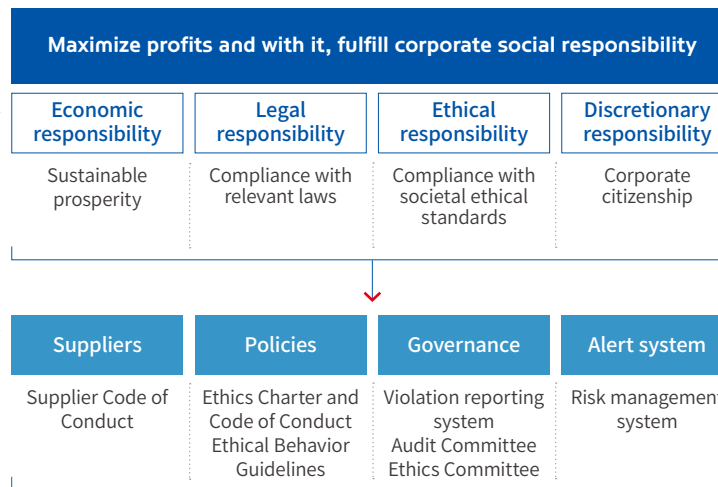
Business ethics and compliance



Establishment of an ethical management system

Ethical management system

Our employees are entrusted by stakeholders with the responsibility of ensuring ethical business conduct. Beyond our economic, legal, ethical and discretionary sense of corporate social responsibility, we work to make our culture stronger and more competitive by identifying room for improvement and following up with action plans.



Ethics Charter and Code of Conduct

Our Ethics Charter and Code of Conduct was enacted and revised because we believe it is important to build trust with our stakeholders and enhance customer value. The Ethics Charter and Code of Conduct applies to all of the affiliates of Hyundai Rotem, including domestic and international production and sales corporations, subsidiaries and second-tier subsidiaries, as well as joint ventures. Our employees must comply with the Ethics Charter and Code of Conduct when interacting with customers and suppliers, and we encourage all of the stakeholders engaged in business relationships with us to partake in such efforts.

Ethics Charter

- Hyundai Rotem fulfills its responsibilities based on clear and transparent standards.
- Hyundai Rotem competes in the market and conducts business with its partners fairly.
- Hyundai Rotem delivers values to customers through safe products, excellent services, accurate information and the protection of personal information.
- Hyundai Rotem treats everyone with respect and provides a safe and fair workplace.
- Hyundai Rotem fulfills its social responsibilities as a global corporate citizen and pursues sustainable prosperity for diverse stakeholders.

Employee and supplier ethics pledge

We ask both our employees and our suppliers to sign the ethics pledge in order to strengthen our competitiveness since markets require not only product integrity but also transparent and ethical corporate cultures. Procurement Division employees, for example, are asked to take an ethics pledge once a year, and 1,411 suppliers complied with this pledge in 2022. Twice a year, we send official letters to our suppliers, requesting them to comply with transparency and fairness standards. Through various initiatives, we raise employee awareness of ethical business conduct as a pre-condition for sustainable growth.

Four principles of Ethical Behavior Guidelines

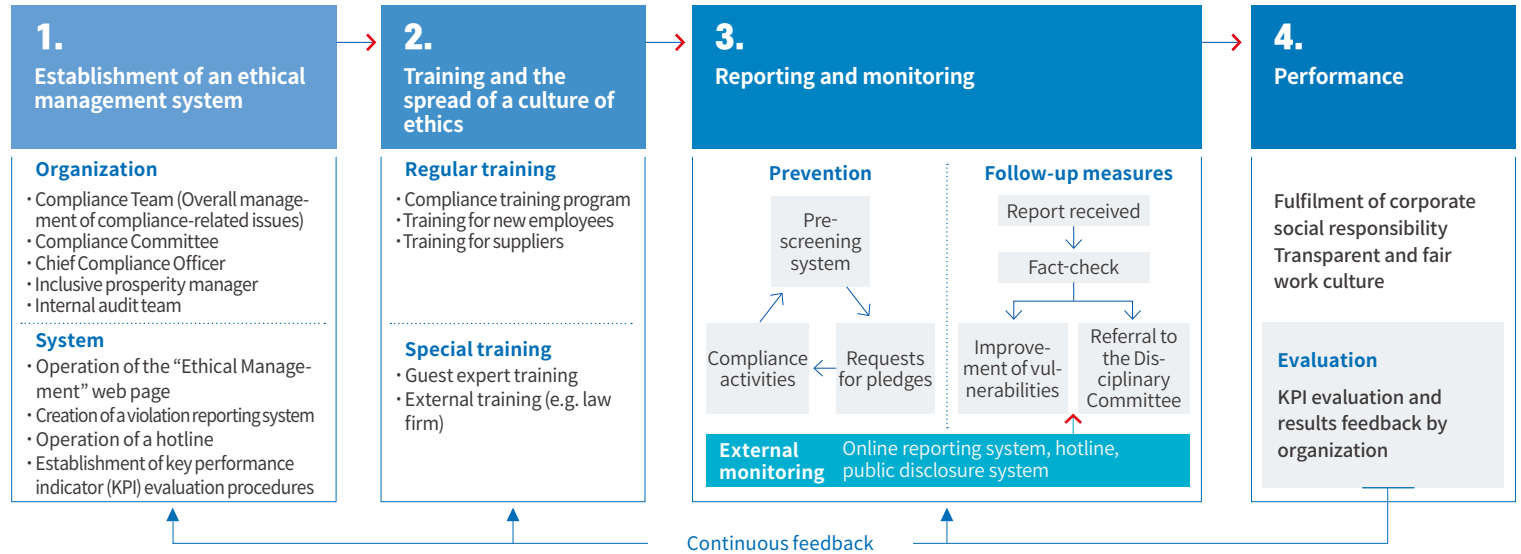
1. Transparency and fairness in business conduct
2. Transparency and fairness in relationships with stakeholders
3. Prohibition of individual profiting from company assets
4. Protection of corporate information

Ethical Behavior Guidelines

Our Ethical Behavior Guidelines encourage our employees to make ethical judgments when performing their duties. The guidelines outline “what to do” and “what not to do”, and focus on cases that may commonly occur.

Business ethics and compliance

Promotion of ethical management



Establishment of an ethical management system

Ethics governance

Centered around the Compliance Team, the Compliance Committee, Chief Compliance Officer, inclusive prosperity manager and the internal audit team collaborate to promote ethical business conduct. In addition to the Fair Trade Compliance Program, the Compliance Team leads relevant training, promotes a culture of ethics and monitors processes. The Compliance Committee and the compliance manager regularly inspect the operation of the Fair Trade Compliance Program. The inclusive prosperity manager is also responsible for ethical issues that may arise from transactions with suppliers, while the Audit Committee governs internal ethical issues.

Ethical management system

Details on the implementation of our ethical management system can be found on the “Ethical Management” page of our website, where the CEO’s declaration of fair trade compliance has also been posted. We have plans to upload a revised fair trade compliance manual in 2022. In addition, we support internal and external stakeholders to freely report on ethical management through the violation reporting system.



Ethical management website



Fair Trade Compliance Manual

Business ethics and compliance



2,885 persons

Number of employees who have completed courses on fair trade training in 2021

Training and the spread of a culture of ethics

Ethics training program

Regular ethics training programs support employees in complying with all regulations. We are devising new programs in response to new or revised regulations, as well as changing market environments. Since the outbreak of COVID-19, we have expanded ethics training programs to video format, which allows employees to complete ethics training without any restriction on the time or place and to watch the training program repeatedly for better information retention.

Classification	Contents	Target	Number of training programs
Compliance training	Training for new employees	Understanding fair trade and the Compliance Program (CP) operation status	New employees When a new employee arrives
	Online (or in-person) training	The Fair Trade Act, the amendments to the Subcontracting Act, cases of violations	All employees Once per year
Fair Trade Act training	Subcontracting Act, internal transactions, collusion, transparency, fairness	Relevant departments	Once per year
Subcontracting Act training	Subcontracting Act (e.g. use of technical data, cases of violations)	Relevant departments	Once per year
Training for suppliers	Meetings with suppliers, sharing of inclusive prosperity programs	Suppliers	Twice per year

* As a result of COVID-19, online/video training was provided in 2021. In-person training was provided in 2018 and 2019.



Online (video) training

Legal Newsletter

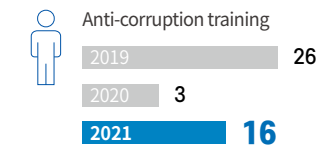
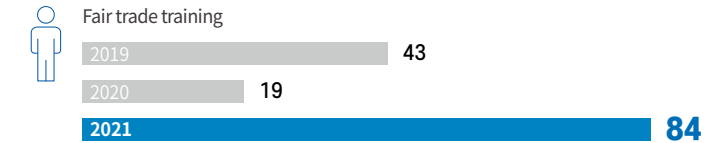
Spreading a culture of ethics among employees

In addition to the training programs, we also offer programs such as the monthly Legal Newsletter, accessible to all employees on the intranet, to strengthen our employees' legal compliance and ethical business conduct. The Legal Newsletter contains easy to understand information on relevant legislation and the revisions thereof, on fair trade trends and civil laws. Starting in 2022, we introduced a legal quiz to increase employee interest and reinforce their knowledge base in this area.

Every year our employees complete training on fair trade, and our sales and project management staff receive training on anti-corruption and on any potential legal risks that may arise during the course of business procurement and operations.

Ethics and compliance management training 2019-2021 (unit: % and time)

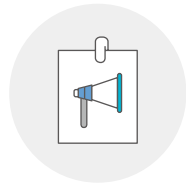
Percentage of employees who have completed ethics & compliance training



Total training hours for ethics & compliance training



Business ethics and compliance



100%

Processing rate of internal and external reports received in 2021

Reporting and monitoring

Internal and external reporting system

Hyundai Rotem operates an internal/external reporting system to oversee ethical management issues, such as unfair business practices, unfair demands, verbal abuse and employee assault. A groupware in-house reporting system is available on the Hyundai Rotem website, along with outside reporting system on groupware websites that can accept external reports, including from business partners. Hyundai Rotem communicates with executives and employees, as well as business partners through, various communication channels in order to ensure ethical management values.

Internal and external reporting 2019-2021 (unit: case, %)

Classification	Number of cases			Processing rate		
	2019	2020	2021	2019	2020	2021
Internal	1	1	1	100	100	100
External	8	9	4	87.5*	88.9*	100

* Two reports have not been processed for reasons of personal privacy and for fact-checking.

Whistleblower protection system

Our whistleblower protection system promises confidentiality, identity security and exemption of responsibility in order to allow whistleblowers the freedom to report with confidence. This system prohibits the disclosure, or any suggestion, of the whistleblower's identity and protects the whistleblower from any disadvantages resulting from a report or statement. Should the whistleblower be found at fault or negligent regarding the report, they will be exempt from or face reduced disciplinary action in order to encourage whistleblowers to come forth with reports.

Internal and external whistleblower protection system

- Confidentiality** We do not disclose any of the whistleblower's personal information that may reveal his or her identity. Disciplinary action is taken against anyone who discloses the whistleblower's identity.
- Fair treatment** The whistleblower must not receive any unfair treatment, nor be pressured or forced to drop the report.
- Protective measures** In case of retaliation or unfair treatment after the report, the whistleblower may apply for support that helps him or her return to normal duties, or helps with other necessary measures.
- Priority in human resources measures** The whistleblower may demand transfer, reassignment or dispatch, and such demands must be prioritized if deemed reasonable.

Ethical management performance

Through a series of initiatives, such as the compliance pledge, compliance training and a project pre-screening system, we continue to expand upon and improve our ethical management performance, as measured by key performance indicator (KPI).

By actively promoting strong ethical corporate culture, we are enhancing our competitiveness and corporate value.

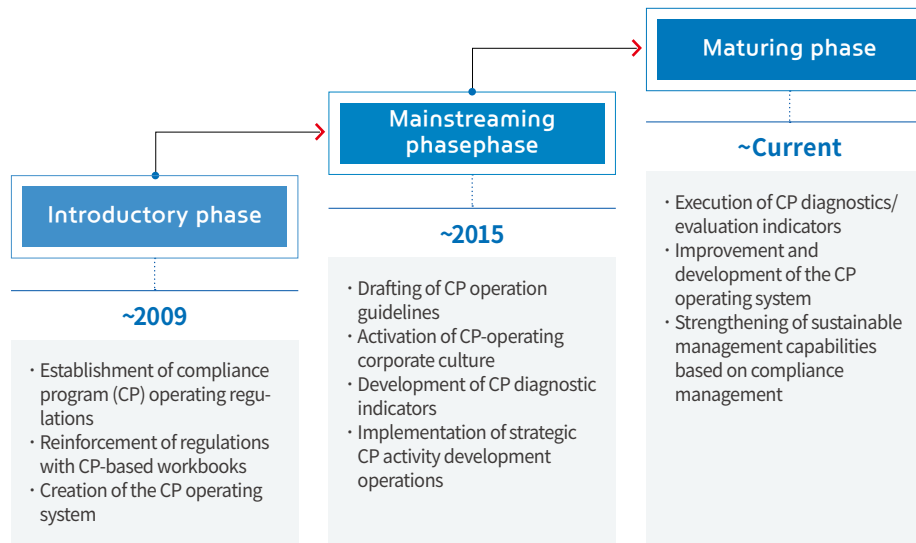
Business ethics and compliance

Fair trade culture

Fair Trade Compliance Program and operations

For our sustainable growth, we promote free competition and a creative corporate environment. As part of our efforts, we operate the Fair Trade Compliance Program in accordance with 13 laws, including the Korean Fair Trade Act, Subcontracting Act and the Franchise Business Act. This Program provides clear standards for all employees so that they do not violate fair trade related laws or undermine the integrity of individuals and the company. Proof of our commitment to build a transparent corporate management and ethical culture can also be found on our website in our Code of Conduct and the Fair Trade Compliance Declaration.

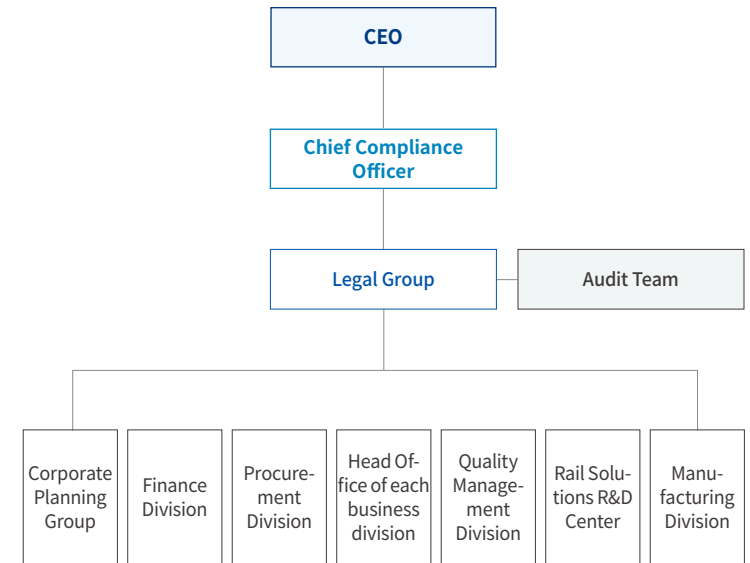
Different phases of the compliance program



Compliance committee

Led by the Legal Group, the Compliance Committee consists of the Chief Compliance Officer (the Head of the Management Support Division), who has practical authority and responsibility for CP operation, and of compliance focal points from each division. The Committee meets every quarter to set action plans and monitor them. It also delineates basic fair trade related policies, and it regularly inspects compliance activities at headquarters and in business units, and reports the monitoring results to the Board of Directors. In the event of a fair trade violation during the monitoring process, the violators would face disciplinary action.

Compliance Committee



Business ethics and compliance

Fair trade compliance and monitoring

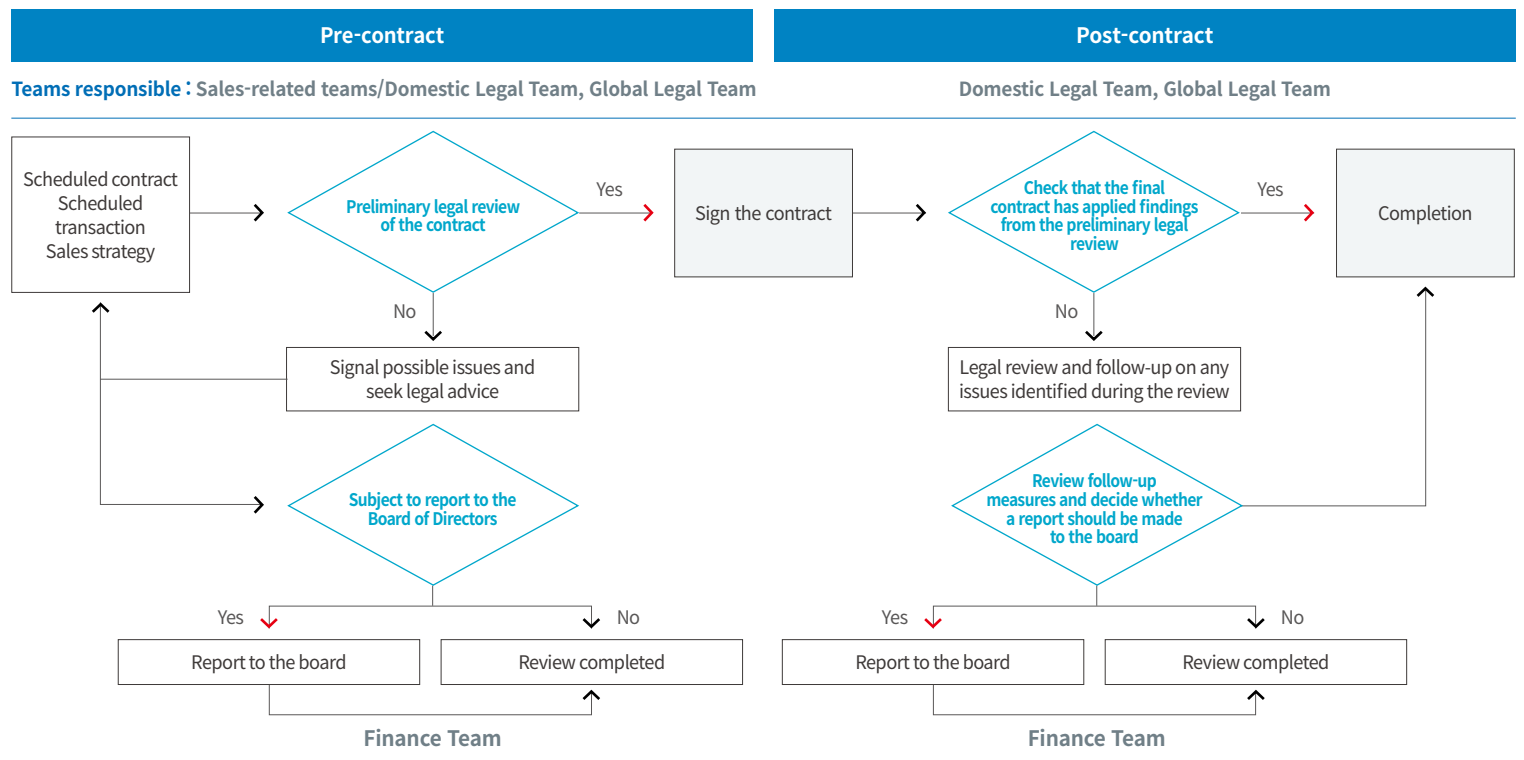
Pre-contract screening system

Through the fair trade pre-contract screening system, we examine whether contracts comply with fair trade before they are signed, and then follow up at the post-contract stage. When signing a contract with a supplier or an ordering company, a preliminary inspection review is carried out to determine the legality of the contract and whether it is subject to disclosure requirements. The system is designed to prevent legal risks in advance, with the Legal Team checking the implementation from pre-contract inspection to post-contract management, and the Finance Team reviewing whether to disclose or announce the contract to the Board of Directors.

Fair trade training

Hyundai Rotem designates a Chief Compliance Officer to provide fair trade education to executives and employees, with the rate of employees completing fair trade training reaching 83.7% in 2021. Regular training is provided at least on a biannual basis (for two hours or more) on compliance regulations that may have changed as a result of revisions to competition laws, and periodic briefings are also held for the purpose of keeping up-to-date on compliance regulations. In addition, Hyundai Rotem is striving to spread a sense of compliance and raise awareness on fair trade among stakeholders by making available a manual on fair trade compliance, which is posted on the ethics management web page of the company website, for easy access by all employees.

Fair trade pre-contract screening process

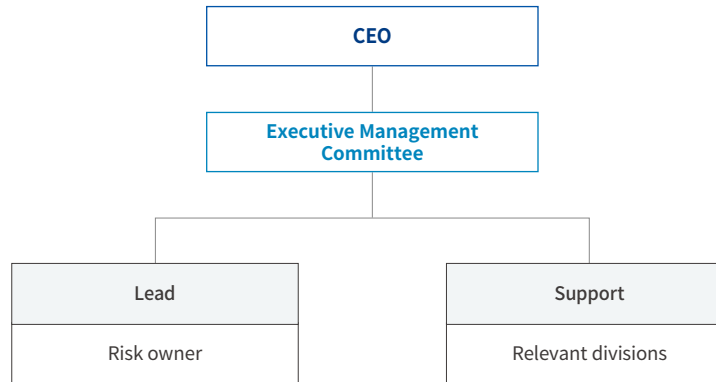


Integrated risk management

Risk management system

Risk management governance

Our integrated risk management system allows us to make rational decisions, thus helping us to minimize losses. The risks identified by the risk owner are registered in the system, and if deemed important, the risk management status is shared with the Executive Management Committee, which includes the CEO and the heads of divisions. The Executive Management Committee, convening the highest levels of risk owners, will adapt its discussions and decisions to the type of risk.



Risk management process

1. Identification

- Share the identified risk with relevant teams
- Designate the risk owner

※ Issues considered during risk identification process : Unresolved risks previously identified during the project procurement phase, risks relevant to projects in progress and to the external business environment (Competitor trends, industry trends, policies/laws, etc.)

2. Assessment

- Analyze risks and manage the risk pool based on the likelihood and business impact of such risks



3. Response

- Set risk response measures
- Ensure discussions among divisions for co-operation needs
- Report to management if decision making is required
- Check and evaluate actions taken

Risk types

Internal risk

- Profitability
- Technical specifications
- Performance capabilities (design, purchase, production, delivery, etc.)
- R&D

External risk

- National politics/economy/diplomacy/infrastructure
- Environmental problem
- Human rights impact
- Financial soundness of a client
- Contract terms and conditions
- Local laws and regulations

Integrated risk management

Risk management and monitoring

We classify risks mainly into project risks and business environment risks, and we manage these risks in a company-wide integrated management system.

Project risk management

Covering issues such as human resources, and processes and systems across a project, it is important for project risks to be managed through internal resource management and action plans because of their potential to affect business goals and operational efficiency. At Hyundai Rotem, we systematically manage project risks, the pre- and post-contract project risk management system and any risks that have materialized as an 'issue' through the open issue management system.

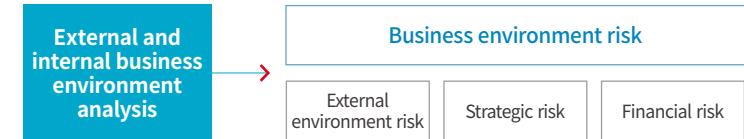
At the project bidding stage of a contract, we identify risks through order deliberation, and we prepare measures to resolve any potential risks. During the post-contract stage, as we start the project, we work to manage unresolved risks that were identified during the pre-contract stage, and monitor any additional risks that have been identified. Major risks, where loss may be expected, or other important issues are monitored on a monthly basis through the open issue management system to minimize loss. Moreover, the CEO leads project checks by division twice a month to minimize any loss from risks.

Project risk management system



Business environment risk management

We rigorously manage business environment risks by identifying major risks through internal and external business environment analyses and by ensuring the ownership of the identified risks. Business environment risks are classified into external environment risks, strategic and financial risks.



External environment risk

External environment risks refer to those risks that concern management uncertainty arising from macro-environmental changes. These risks include natural and social environment factors that may not have direct implications on Hyundai Rotem's interests but may affect the industry overall.

Strategic risk

Strategic risks are linked to the possibility that an established strategy may fail to achieve the goals set out. These risks can have ripple effects across the company.

Financial risk

Financial risks refer to risks that affect financial operations, and therefore require management through the pre-contract risk management system.

Tax strategies

Our tax strategies are established and implemented to maximize shareholder interests and contribute to national finances. We comply with tax laws and actively co-operate in information requests, solidifying our relationship of trust with the tax authorities, and our tax responsibilities support national and local developments. We do not allow the transfer of assets to tax havens or the use of tax avoidance structures without commercial substance. To address double taxation risks, we trade in accordance with the "normal price principle." We also strive to prevent tax risks resulting from participation in new projects both domestically and internationally, as well as from changes in local tax laws.

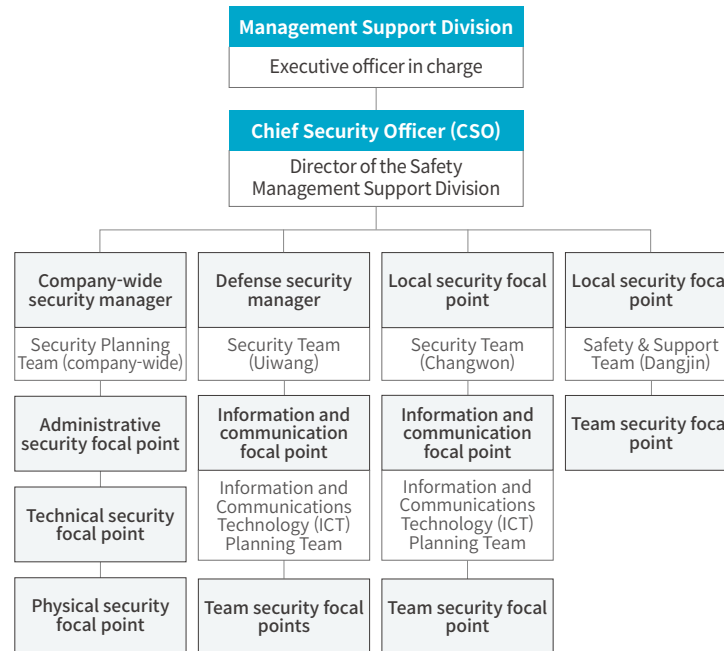
Information security management

Strengthening information security

Information security system

Information security governance

By operating information security units for each plant, we are working to strengthen information security. Each plant's security manager, the security focal points and the respective supporting unit carry out activities related to information security. The information security units are responsible for protecting information from external cyber threats and preventing internal information leakage. In addition to establishing and implementing security policies, these units respond to external audits and conduct internal security audits and security training. Moreover, they regularly operate a company-wide security committee to share current security concerns and relevant action plans to further strengthen information security. We are committed to managing intellectual property and information.



Protecting information

Employee awareness

We proactively respond to information security issues through employee training and system improvements, for example by providing malicious mail simulation training and security training to employees so as to prevent information leakage.

Information protection activities

Security solutions, such as information asset leakage control and storage medium control, are applied to internal systems and computer equipment throughout the company to prevent external data leakage. We are also preparing for cyber-attacks that are on the rise each year, and we conduct regular security inspections and recovery training for important systems.

Personal information protection

As prescribed by the Personal Information Protection Act, personal information protection measures are in place to observe the principles of collection, use and destruction of personal information. Furthermore, through our systems we limit the processing of personal information, such as sensitive information, unique identification information, resident registration numbers, or the installation of video information processing machines.

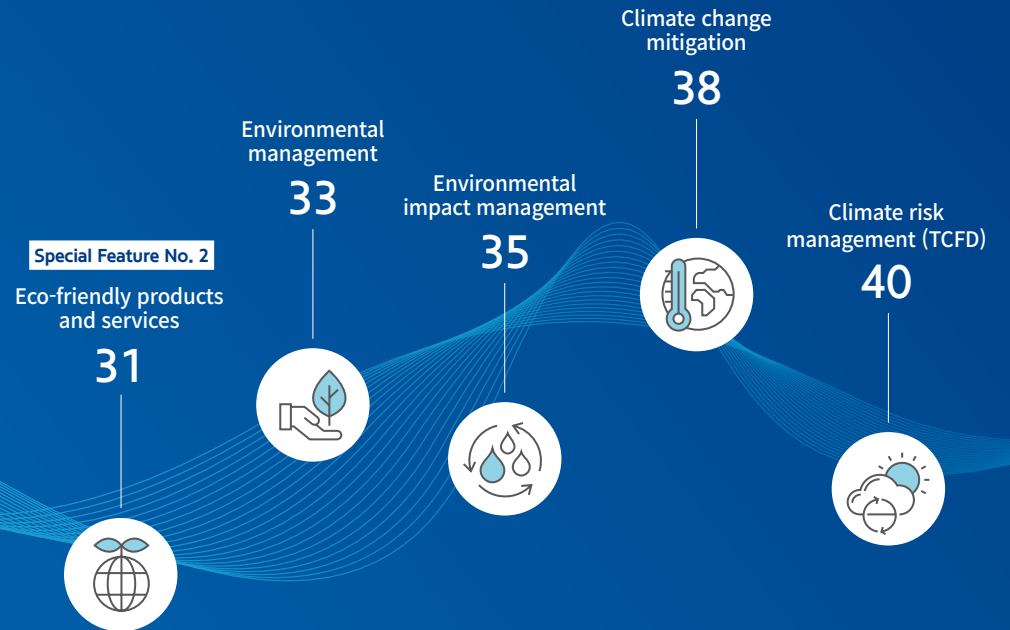
For staff who are in charge of personal data, we provide data security related training at least once a year and request a personal information protection pledge, which helps them become familiar with and reinforce protection measures that secure personal information.

Personal information treatment

Personal information type	Security focal point by division
Internal staff and recruitment information	Human Resources Team
Partner user information	Procurement Team, Business Support Team
Personal information system	ICT Planning Team
Visitor information	Biz. Support Team, security officer

Planet

Climate Smart



Governments around the world have declared their carbon neutrality commitments and are urging companies to join in climate action. Investors and customers also recognize that the transition to a low-carbon economy is a prerequisite for a sustainable society. At Hyundai Rotem, we have strengthened our response to climate change by establishing a “Climate Smart” strategy and declaring support for the Task Force on Climate-Related Financial Disclosures (TCFD), the first among heavy industry companies in Korea. We are working to strengthen our competitiveness by producing low-carbon, eco-friendly products, managing environmental impacts and promoting biodiversity throughout the product cycle.

Special Feature No. 2

Eco-friendly products and services



Alignment with the UN SDGs



7 AFFORDABLE AND CLEAN ENERGY



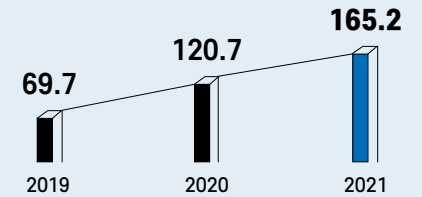
11 SUSTAINABLE CITIES AND COMMUNITIES



12 RESPONSIBLE CONSUMPTION AND PRODUCTION

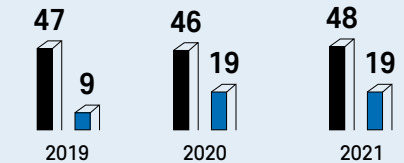


Green investments
(Unit: KRW 100 million)



Percentage of sales of eco-friendly products
(Unit: %)

High speed trains and electric vehicles ■
Third party eco-certified products ■



1 The greening of mobility and heavy industry

At the 2021 International Transport Forum Annual Council of Ministries of Transport, transport ministers from around the world underlined that responding to climate change and recovering from the COVID-19 pandemic could represent opportunities to reshape transportation systems. Ministers thus pledged to provide people with a means of greener transportation through electrification, hydrogen fuel cells and battery innovation. At Hyundai Rotem, we are expanding our investments in low-carbon transportation systems, and our employees are reinforcing their capabilities so that we can be a leading provider of low-carbon mobility.

Through the 2030 nationally determined contributions and carbon neutrality declarations, countries are demanding a systematic change across society, going beyond a handful of industries. The European Union in particular announced the Carbon Border Adjustment Mechanism (CBAM), which urges heavy industry actors towards a shift to carbon neutrality. We are monitoring global trends to reflect them in our sustainable business strategy.

2 Green investments

Green investment categories

Category	Investment goals
Resource circularity	Save resources, save water, improve recyclability, increase recycling rate, etc.
Energy conservation	Conserve energy, use renewable energy, etc.
Environmental pollution reduction (global)	Reduce greenhouse gas emissions and the use of ozone-depleting substances, etc.
Environmental pollution reduction (local)	Reduce air, water and soil pollutants and reduce waste generation, etc.
Reduction of hazardous substances	Reduce the use of and exposure to harmful substances
Environmental pollution reduction (daily life)	Reduce indoor air pollutant emissions, reduce light pollution, etc.
Noise pollution reduction	Reduce noise and vibrations in products

At Hyundai Rotem, we are expanding our green investments; in 2021, our investments increased by 37% compared to 2020. Korean government-led projects, worth KRW 3.19 billion (approx. USD 2.7 million), and Hyundai Rotem-led projects, worth KRW 9.07 billion (approx. USD 7.7 million), were conducted on green R&D in 2021, and KRW 4.26 billion (approx. USD 3.6 million) of investments went to building eco-friendly facilities.

To provide for low-carbon mobility, the Rail Solutions Division is working to develop core technologies for hydrogen trams. The Defense Solutions Division is working to develop an electric power system, which includes a commercial magnetorheological (MR) damper and a high-capacity hybrid propulsion system. With the goal of contributing to the transition to a hydrogen society, the ECO-Plant Business Division is focusing on developing technologies related to hydrogen production and charging facilities.

3 Eco-friendly products

Eco-friendly high speed trains

The Rail Solutions Division has developed cleaner and more convenient railway mobility, notably through the “KTX-EUM” and “EMU-320” high speed trains. The KTX-EUM is the first Korean high speed train with a distributed traction system. It can carry more passengers by distributing the power throughout the entire train rather than placing separate power cars at the front and rear of the train, which also allows for faster acceleration and shorter operation times. In addition, track maintenance costs are minimized because of the re-distribution of power equipment and the resulting axle weight reduction (from 17 to 15 metric tons). This re-distribution also reduces risks and provides increased availability in the event of major device failures, such as those related to propulsion and control. In recognition of this technological achievement, the KTX-EUM was named in the “Top 10 Railway Technology Awards” in 2021 by the Korea Railroad Association. The KTX-EUM was also selected to participate in the “2021 Korea Green Product Service of the Year” and it won the “Consumer Popularity Award.”

The EMU-320 is a high speed train that has increased passenger capacity whilst also reducing power consumption per person. With a total number of 515 seats, passenger seat capacity has increased by 25%, in comparison with the KTX-Sancheon. The EMU-320 has been designed to reduce power consumption per passenger by 27% when driving at 300 km/h, again when compared to the KTX-Sancheon.



KTX-EUM

Biogas based hydrogen reformer

We supplied Chungju with an eco-friendly hydrogen reformer that extracts hydrogen from biogas generated during the food waste treatment process. The reformer produces 597 kilograms of hydrogen per day, which allows the Hyundai NEXO, a hydrogen car, to travel a distance of 57,431 km; in other words, a longer distance than the earth’s circumference (40,075km). The equivalent distance for a gasoline-based car would require 4,418 liters of gasoline (assuming that Hyundai NEXO runs 96.2 km per 1 kg of hydrogen and a gasoline car runs 13 km per 1 l of gasoline). Our biogas hydrogen reformer produces hydrogen in a stable manner, with an efficiency of more than 76% based on the higher heating value. We are currently conducting R&D activities to localize key parts of the hydrogen reformer.

Hydrogen refueling station

We are engaged in the supply of various hydrogen refueling systems. Fixed hydrogen refueling stations, similar to conventional gas stations, can charge ten cars per hour and two buses per hour. In collaboration with the Hyundai Motor Company, we are developing mobile hydrogen charging stations, which combine hydrogen refueling charging systems with vehicles, and thus are helping to provide hydrogen refueling infrastructure to regions with infrastructural limits.



Hydrogen reformer

Environmental management

Environmental management system

Environmental objectives and five innovation challenges

At Hyundai Rotem, we have set environmental objectives and five innovation challenges to proactively respond to environmental regulations that are becoming increasingly stringent and to manage and minimize any environmental risks that may arise.

Environmental objectives



Prevention of industrial accidents



Compliance with Environment, Health, Safety (EHS) regulations



Reduction of environmental pollutants



Reduction of energy intensity



Efficient use of raw materials and development of eco-friendly products

Innovating environmental performance: Five objectives

Greenhouse gas emissions and energy consumption reduction

1. Improve energy efficiency by comparing and analyzing the design capacity, operating range, and power consumption for each facility.

Air pollution management

2. Minimize air pollutants such as fine dust, sulfur oxides, and nitrogen oxides, by applying internal standards more stringent than current laws and regulations.

Closely monitor facilities through regular detailed inspections, including of air pollutant emission concentration levels.

Hazardous chemical control

3. Minimize the use of hazardous chemical by securing safe alternatives after identifying the hazardous chemicals through the procurement processes and monitoring systems.

Wastewater and waste management

4. Minimize the discharge of water pollutants by applying and monitoring the applications of internal standards for wastewater (which go beyond legal requirements).

5. Increase recycling rates by improving waste collection standards.

Environmental management



ISO 14001

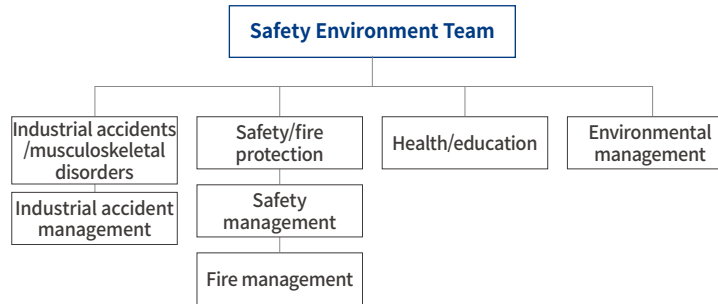
Establishment of an environmental management system

Development of eco-friendly products (2019-2021)

Catenary-free low-floor tram	Prevention of high voltage wire accidents
High speed freight train	An expected 20% reduction in carbon emissions expected by replacing 30% of diesel cargo vehicles
Double-decker high speed train	An expected 20% reduction of carbon emissions from reduced car use and the train's increased passenger transport capacity
High speed train efficiency technology	An expected 10% reduction in carbon emissions by increasing energy efficiency
Active suspension system	An expected 20% reduction in vehicle vibration and driving noise
Near-surface urban railway system	An expected 30% reduction in energy for track construction and a 20% reduction in energy consumption for rail operations
Smart bogie	An expected 20% reduction in energy use on operations and 20% improvement in ride comfort and noise reduction
Hydrogen-electric tram	An expected 30% reduction in carbon emissions
Residual welding stress	An expected 50% reduction in carbon emissions during welding by eliminating heat treatment

Environmental and safety governance

The Safety Environment Team oversees safety, health, industrial accidents and environmental management. The team consists of 18 experts, all of whom are responsible for laying the foundation for sustainable environmental management.



Environmental management monitoring

Continuous monitoring and follow-up are essential for successful environmental management systems. Our environmental management system, through which we monitor environment and safety issues, is not only ISO 14001:2015 certified, but it is also stricter than the standards stipulated in ISO 14001 certification. Through such a system, we manage environmental pollutants and promote eco-friendly production systems. By using a systematic approach, we continuously monitor and improve environmental and safety related issues and proactively manage potentially new risks.

Environmental performance

Environmental goals are established on a yearly basis. Our environmental performance is then inspected and monitored against these goals. In 2021, inspections of environmental performance were carried out eight times during the course of the year, and no cases of legal violations were found. We also met our carbon and pollutant emission reduction goals, which exceed the targets set by the Ministry of Environment.

We inspect the water and air quality, as well as waste generation, once a week. For major environmental facilities on our plants, we undertake mandatory inspections twice a month and carry out detailed inspections twice a year. Since 2019, we have implemented ten projects related to the development of eco-friendly products, and we will continue our research so as to build an eco-friendly portfolio.

Environmental impact assessment

For each of our business areas, we conduct environmental impact assessments once every three years. The scope of the environmental impact assessment includes the organization's activities, design, products and services. There are a total of seven assessment criteria: water pollution, air pollution, soil pollution, noise pollution, waste generation, ecosystem impact and resource use. These assessments help us to identify which businesses have higher environmental impacts and inform us on how to move forward.

Environmental incident response system and training

Thanks to our environmental incident response system, employees are trained to respond quickly to environmental emergencies. Employees are thus trained to report, alert all relevant people and take initial action should an environmental accident occur. Once the situation has been closed, a thorough investigation is conducted to establish follow-up measures that will help prevent any recurrence. We also conduct fire drills to minimize possible damage from a potential fire. Regular training was conducted throughout 2021, and a fire drill took place in October 2021. Fire drills consist of both theoretical training, to raise awareness among executives and employees, and practical training, such as firefighting exercises.

Environmental impact management



13% reduction

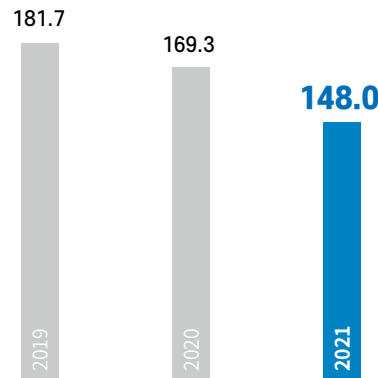
Water usage in 2021 compared to 2020

Water resource management

Conserving water

We are replacing water pipes to reduce water leakages as part of an overall water conservation campaign. Water supply piping drawings in all plants are being updated periodically, and aging carbon steel pipes that easily leak are being replaced with stainless steel pipes sequentially. In addition, we have been placing “Save Water” stickers throughout the company to remind our employees that they can play a part in water conservation.

Water use intensity by sales (unit: ton/KRW billion)



Water pollutants and wastewater

Considering biodiversity at the production stage

We manage water pollutant emissions with strict standards for biodiversity preservation. The discharge concentration is managed at below 50% of the level prescribed by law, and the wastewater discharge is managed at below 21.7%. In addition, discharge facilities and spill prevention facilities are inspected once a week to check the proper inflow of wastewater and to prevent leakage. With these efforts, no wastewater discharge accidents occurred in 2021, and we intend to continue contributing to the protection of water resources and the preservation of biodiversity.

Concentration of water pollutants

Classification	Unit	2019	2020	2021	Legal standard
COD	ppm	24.4	15.1	22.3	130
SS	ppm	8.2	6.1	9.0	120

* COD = chemical oxygen demand; SS = suspended solid; ppm = parts per million. The figures are based on the Changwon Plant.

Reducing wastewater

After checking the frequency of use of environmental facilities, we have merged less frequently used facilities in an effort to reduce wastewater. In the case of the Changwon Plant, 23 wastewater discharge facilities were closed; as a result, the wastewater discharge in 2021 was 14,210 m³, a 39% reduction compared to 23,153 m³ in 2020.

All wastewater discharged from the Dangjin Plant is consigned to a professional treatment company, and a person is assigned on site to oversee and prevent unnecessary wastewater from being generated during the automotive press testing. By setting notifications and training managers, we seek to prevent the overflow of wastewater storage and prevent an inflow of waste oil from the underground trench, which thus prevents environmental accidents.

Water conservation

In Uiwang and Changwon, our major business sites, we are carrying out water protection activities. For Uiwang, where our research institute is located, we selected the Wangsong Lake as our target water resource protection site. For Changwon, where our Manufacturing Division is located, we targeted the banks of the Nam Stream as our plugging location to improve the surrounding environment. For further improvement in water quality, we are planning to implement direct purification activities.

Environmental impact management



56.6%

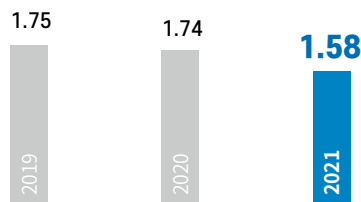
Waste recycling rate in 2021

Waste management

Industrial waste

We recycle and reuse waste generated from our business operations through strict waste classification schemes. In particular, we aim to increase the recycling rate by 5% in 2022 by separating synthetic resin waste from solid waste. We want to improve the recycling rate for wood, waste paper, waste oil and waste activated carbon that arises during business operations. The Dangjin Plant is also planning to partner with a recycling company to strengthen its dust management.

Waste generation intensity by sales (unit: ton/KRW billion)



Total waste recycling rate

Classification	Unit	2019	2020	2021
Waste subtotal	Ton	3,906	4,663	4,449
Recycling subtotal	Ton	1,911	2,473	2,517
Recycling rate	%	48.9	53.0	56.6

* The figures are based on the Changwon and Dangjin Plants.

Hazardous chemicals

Before purchasing chemicals, the procurement team undertakes an inspection to determine the presence of hazardous chemicals. Chemicals are inspected according to the material safety data sheet, which prohibits the purchase or import of products containing toxic, restricted or prohibited substances or highly toxic or inflammable substances that are prone to accidents. The results of the preliminary review are forwarded to the team in charge of finding alternative substances for the identified hazardous chemicals. In addition, through our chemical purchase monitoring system, we conduct frequent checks for any unreported purchases of imported chemicals.

Regarding harmful chemicals that are already in use, we are continually checking for replacement substances and encourage the use of alternatives. As a result, since October 2021, we have switched to an alternative to the X-ray developing chemical (i.e. hydroquinone, a harmful chemical). The overall objective is to create a safe workplace by managing hazardous chemicals.

Air pollutants

Monitoring criteria

We monitor air pollutants at our plants, aiming for levels of 50% below the standard set by the Korean Clean Air Conservation Act. The 2021 measurements showed that the average dust emission concentration was 1.53 ppm (well below the legal limit at 30 ppm), with 20.91 ppm for nitrogen oxides (NOx) and 9.60 ppm for sulfur oxides (SOx), both of which are also below legal standards.

Facility management

After careful inspection of our environmental facilities in the first and second half of 2021, we decided to replace the dust collection machines in an effort to improve our environmental performance. Taking into consideration the condition of existing machines and operations, we replaced two aging facilities and added new equipment where exhaust capacity was insufficient. We will continue to inspect and improve our facilities to minimize environmental pollutants and maintain a safe and healthy working environment.

Air pollution emission concentrations

Classification	Unit	2019	2020	2021	Legal standard
NOx	ppm	9.6	7.5	20.9	83.3
SOx	ppm	-	-	9.6	52.5
Dust	mg/m ³	3.2	1.7	1.5	30

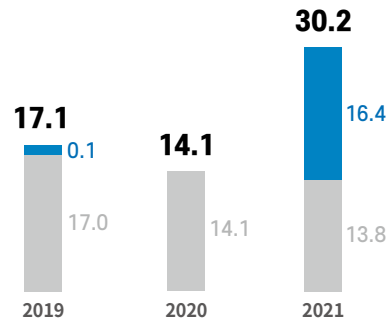
* The figures are based on the Changwon Plant; the standards for aggregation and the legal standard vary from facility to facility and are stated as an average value.

Environmental impact management



Green purchase(unit: KRW 100 million)

- Purchase of eco-friendly parts
- Purchase of green IT products



Resource use and circularity

Resource efficiency

To use less raw and processed materials, we practice efficient packing and transportation, as well as inventory management. In 2021, we established a steel and cable inventory management plan and conducted a survey of the Rail Solutions and Defense Solutions Divisions. In the case of cables, for example, we determined after surveying four suppliers that we could reduce the use of cables by identifying surplus inventory and by transferring surplus cables to other projects.

Improved use of cables

Target	Item	Total length saved	Total amount saved
Rolling stock cable	35 types	436 km	KRW 470 million (approx. USD 396,500)

Green procurement

To minimize our products' environmental footprint, we practice green procurement across the entire production process. Such purchases include Energy Star certified IT equipment and eco-certified steel. In 2021, we purchased a total of KRW 3.02 billion (approx. USD 2.5 million) of eco-friendly products, and we plan to expand such green procurement. We are currently in the process of establishing a green procurement policy, which will prioritize eco-certified suppliers that are eco-certified and that have green technologies.

Biodiversity

A public-private academic partnership for biodiversity conservation

Beginning in 2022, we will participate in a biodiversity conservation partnership led by the Changwon City Council for Sustainable Development. Through this partnership, a joint team will investigate what endemic and protected species can be found in Changwon. In this way, we will support Changwon City in protecting its ecological resources and ecosystem services and encourage citizens to partake in ecological protection measures.

Community cleanup

As part of our biodiversity conservation efforts, we participate in community cleanup initiatives, including the Nam Stream cleanup organized by Changwon City in 2021. Companies and civic groups in Changwon worked to make the river a cleaner habitat for local aquatic species, including otters, pond herons, egrets, mallards and spoonbills. We will not only continue to participate in such cleanups, but will also operate our own cleanup activities – we are planning to expand the “One Company One River” clean-up plan in 2022.

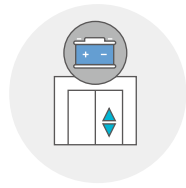


Nam Stream cleanup



“One Company One River” cleanup

Climate change mitigation

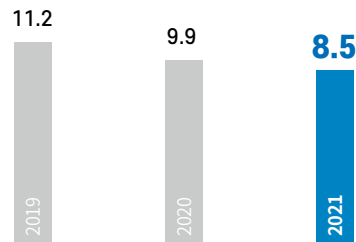


60%

Energy savings from replacing old elevators



Greenhouse gas emissions by sales
(Unit: tons of carbon dioxide equivalent (tCO₂eq)/KRW billion)



Greenhouse gas and energy

Reducing greenhouse gas emissions

Factory-level efforts

We are working to reduce greenhouse gas emissions in the production stage, including by improving our facilities to use electricity and gas (LNG) more efficiently – this accounts for 97% of all energy sources in plants.

To reduce electricity consumption, we are replacing obsolete and low-efficiency equipment in factories sequentially. In Changwon, we replaced an elevator in the main building that had been in use for more than 20 years with a new power regenerative elevator, which is expected to reduce power use by about 60%. Every year, we check the conditions of the transformers and replace power-intensive machines such as those with large motors with high-efficiency machines. Furthermore, by using the Energy Service Company system, the Changwon Plant will replace the metal haloid lamp ceiling lights in plants with ultra-efficient LED lights; this will reduce power use by 55.5%. By replacing cooling and heating facilities in use for more than 20 years with new equipment, we expect to improve power efficiency by 18%.

In addition, we have been improving fuel efficiency by replacing LNG pipe heater burners and radiators that have been in use for more than 20 years. We are also working to reduce greenhouse gas emissions by replacing old boilers in bogie factories that have been in use for more than 15 years, as well as by replacing paint drying facilities that cause duct heat loss.

Greener commute and transportation

For a greener commute, we actively encourage our employees to use the company shuttle buses, and we have limited parking permits to reduce greenhouse gas from commutes. Our internal guidelines stipulate that for business trips within Korea, employees are to use public transportation. Only in unavoidable cases, such as the transfer of test equipment or in the case of a large number of people travelling together, can individual cars be permitted for business trips within Korea.

Scope 3 greenhouse gas emissions

Starting in 2021, we are calculating our scope 3 emissions to better manage the greenhouse gas generated from employees' commutes and the import and export of products. Our scope 3 emissions are calculated through a spend-based method, and we are working to improve the accuracy of the methodology and the data collection to cover all relevant categories of scope 3 and to set greenhouse gas emission reduction goals.

Domestic scope 3 greenhouse gas emissions

Classification		Unit	Emissions
Business trips and commutes	Business trips	tCO ₂ eq	3,466
	Employee commutes	tCO ₂ eq	6,290
Transportation and distribution	Downstream transportation & distribution	tCO ₂ eq	61,913
	Upstream transportation & distribution	tCO ₂ eq	21,887
Total scope 3 emissions		tCO ₂ eq	93,556

Climate change mitigation

Energy saving activities

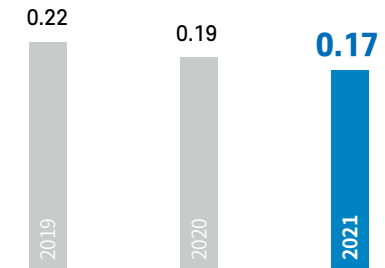
Efforts to save energy

Our air conditioning and heating system operation guidelines dictate how these systems are operated and help us to save energy. The air conditioners are activated when the discomfort index is at 75% or higher, based on the outdoor temperature. The heaters are operated when the outdoor temperature is below 5 degrees Celsius (°C) in the office and 10 °C or less in the factory.

We also encourage our employees to participate in energy saving activities, such as turning off lights during lunch and after work. The timers of the streetlights installed in our factories are adjusted according to quarterly sunrise and sunset times as well.

Through energy patrol activities, we regularly check for pipe leakages and unnecessary uses of electricity, and we share the results with the relevant teams.

Energy use intensity by sales (unit: terajoule (TJ)/KRW billion)



Energy consumption at production sites (unit: TJ)

Classification		2019	2020	2021
Direct energy	LNG	148.40	153.57	142.81
	Diesel	11.13	11.37	11.63
	Gasoline	0.29	0.29	0.25
	Kerosene	1.04	1.07	0.69
Indirect energy	Electricity	320.42	349.42	319.55

* The figures are based on the Changwon and Dangjin Plants.

Climate risk management (TCFD)

Climate change can have significant impacts not only on businesses but also on society as a whole. As a responsible corporate citizen, and for the sustainability of our business, we are transparently disclosing our climate-related risks and opportunities. Based on the recommendations of Task Force on Climate Change Financial Disclosures (TCFD), which was established by the G20 Financial Stability Board (FSB) in 2015, we are disclosing governance, strategy, risk management, metrics and targets related to climate change. Through systemic climate action and transparent disclosure, we intend to lead on the heavy industry's climate pathway.

Governance

Our integrated enterprise risk management system systematically covers climate risks and allows the Board of Directors and the management to manage climate risks across the different business areas. The Board of Directors and the management are responsible for establishing and overseeing the response strategies; the management, through the Executive Management Committee, oversees how operational staff apply strategies and implement tasks.

Board of Directors

The Board of Directors, chaired by the CEO (who also presides as President), oversees Hyundai Rotem's management strategies, targets and performance, and reviews financial decisions regarding various issues, including but not limited to capital expenditures, mergers and acquisitions. The Board meets at least once every quarter.

In April 2021, the Board approved of Hyundai Rotem's Sustainability Vision, which includes targets such as climate-proofing business operations and developing hydrogen products and infrastructure. Based on this vision, we have declared our support for the TCFD as the first heavy industry company to do so in Korea, and we are subsequently sharing our climate information.

Following amendments to the operation regulations in 2022, the Transparent Management Committee will review sustainability risks and opportunities, including those related to climate change, to allow for increased engagement at the Board level. Sustainability issues that the members of the Committee deem important, including those related to climate change, will be taken to the Board.

Management

At the management level, the CEO is ultimately responsible for overseeing and managing risks and opportunities, including those related to climate change. Climate change risks and opportunities are integrated across the different management pillars in the Executive Management Committee. The chief financial officer (CFO), Head of the Corporate Planning Group and heads of divisions are all part of management, with the CEO at the center.

Executive Management Committee


Through the Executive Management Committee, management monitors and creates strategies for company-wide risk responses, including those related to climate change. The Executive Management Committee holds nine types of meetings, according to the different functions and themes (e.g. sales and project management, research, production, overseas corporations, branches and offices), and the committee evaluates the effectiveness of the risk management strategies once or twice a month and sets new risk management strategies as necessary.

The Corporate Planning Group organizes Executive Management Committee meetings to review the appropriateness of measures designed to identify key risks and evaluate the effectiveness of risk responses. All agenda items are classified and managed as short-, medium- and long-term tasks, according to priorities established by the committee.

Climate risk management (TCFD)

Strategy: Company-wide


Upon reviewing our climate risks and opportunities across the different business areas, we have identified common transition and physical risks and opportunities, but have concluded that there is some variation in terms of the level of climate sensitivity depending on the sector. Overall, because our businesses are B2G and B2B, and many governments and businesses are under pressure to implement climate action, we expect reinforced investments and demand for low-carbon and climate resilient products and services. As one of the key strategic partners in rail transport and defense in Korea, we can expect the Korean government's carbon neutrality commitments to result in increased policy incentives and R&D investments. In particular, the public interest in greener, low-carbon infrastructure and mobility, as well as energy transition, present many opportunities for our Eco-Plant Business and Rail Solutions Divisions.


		Climate-related risks	Likelihood	Time frame	Magnitude of impact	Impact on Hyundai Rotem	Hyundai Rotem's strategy
 <p>Transition risks</p>	Policy and legal	<p>Domestic carbon tax</p> <ul style="list-style-type: none"> Short term: bill currently proposed but under the current version, not applicable to Hyundai Rotem Mid-term: The bill passes; under the current proposal, Hyundai Rotem's products not subject to the carbon tax; but a possibility that the bill may align with US and EU carbon border adjustment mechanism (CBAM) to strengthen Korea's stance Long term: carbon tax similar to EU level 	Likely	Long term	Low	<ul style="list-style-type: none"> Necessity of reflecting the carbon tax to calculate the cost of materials and resources Scope 1: KRW 690 million (approx. USD 582,000)/year Scope 1+2: KRW 1.94 billion (approx. USD 1.6 million)/year * Assumption: Scope 1, 2 emissions remain as 2021 levels (23,856 tCO₂eq) 	<ul style="list-style-type: none"> Research: Design strategically to increase production and material efficiency Production: Achieve the greenhouse gas and energy targets set by the Ministry of Environment every year, and conduct energy diagnoses Introduce high-efficiency equipment: Replace old refrigerators, boilers, compressors and transformers Reduce the unnecessary use of machines: operate tube heater timers
		<p>Carbon border adjustment mechanism (United States, EU)</p> <ul style="list-style-type: none"> Short term: Not applicable to Hyundai Rotem's businesses Mid-term: CBAM applicable industries to expand and cover Hyundai Rotem's businesses after 2026 Long term: high possibility of carbon taxation on direct or indirect emissions 	Likely	Mid/long term	Medium	<ul style="list-style-type: none"> Necessity of reflecting the carbon tax to calculate the cost of materials and resources; higher level of impact expected, given 1) EU CBAM nearly twice the Korean carbon tax, and 2) the currency exchange rate volatility Scope 1: KRW 1.17 billion (approx. USD 1.0 million)/year Scope 1+2: KRW 2.15 billion (approx. USD 1.8 million)/year * Assumption: Scope 1+2 emissions remain at 2021 levels (23,856 tCO₂eq) 	
		<p>Enhanced climate-related reporting standards</p> <ul style="list-style-type: none"> Increased demand for transparency and integrity of the climate plans, actions and results, with increasing verification of climate change-related data 	Likely	Short term	Low	<ul style="list-style-type: none"> [Article 64 (Penalty) of the Framework Act on Low Carbon and Green Growth] Penalty of up to KRW 10 million (approx. USD 8,400) imposed if the target company fails to comply with its obligations; Reputation risk resulting from the failure to comply with the carbon target management system can lead to significant impact on sales 	<ul style="list-style-type: none"> Calculate energy consumption and greenhouse gas emissions by plant Collect the data for third-party verification and the Korean government's target management system Identify and replace low-efficiency machines
	Market	<p>Increase in raw material costs</p> <ul style="list-style-type: none"> Risk of rising purchasing costs resulting from the rising costs of raw materials 	Likely	Mid/long term	High	<ul style="list-style-type: none"> Material cost 1.5 to 1.7 times higher depending on the raw material in question Increase in transportation costs Delay in material import schedule possible 	<ul style="list-style-type: none"> Ensure price competitiveness When the raw material price is expected to rise, secure the supply before the price increases (at the design stage, identify the expected amount needed) Consider long-term supply contracts or framework agreements for economically advantageous terms Transportation of imports: Apply the annual unit price contract Transportation of exports: Sign annual contracts to minimize transportation fee fluctuation risks Secure sufficient production time for suppliers Seek out suppliers before Hyundai Rotem officially wins project contracts Better manage the lead times for material sourcing International procurement: directly contract the logistics/transportation provider for better control of transportation and prices. Optimize and simplify the design Diversify suppliers (including from different countries)

* Short term: 0 to 1 year, mid term: 1 to 3 years, long term: 3 years or more

Climate risk management (TCFD)

The physical risk that climate change may pose to businesses can be divided into acute risks (i.e. sudden climate events) and chronic risks (i.e. slow onset hazards). To climate-proof business operations, companies need strategies to respond to and minimize the potential negative impacts of such physical risks. At Hyundai Rotem, we have identified physical risks, as well as their respective risk management strategies, and climate-related opportunities that apply across the different business areas.

Climate-related risks				Likelihood	Time frame	Magnitude of impact	Impact on Hyundai Rotem	Hyundai Rotem's strategy
 Physical Risks	Acute	Production site	<ul style="list-style-type: none"> Production sites affected by natural disasters (e.g. typhoons and heavy downpour) Increased production costs (e.g. to manage disruption and recoveries) 	Possible	Short term	Low	<ul style="list-style-type: none"> Reduced revenue from lower production capacity (e.g. transportation failure, supply chain disruptions) Reduced revenue and increased costs due to negative impact on the workforce (e.g. health, safety, absences) Increasing recovery costs (e.g. plants, facilities, infrastructure damage) Potential for higher insurance premiums and reduced insurance availability for high-risk assets 	<ul style="list-style-type: none"> Assess and monitor natural disaster risk of assets in partnership with insurers
	Chronic	Product Quality	<ul style="list-style-type: none"> Production and business operation disruptions and accidents, from climate change 	Possible	Long term	Low	<ul style="list-style-type: none"> Risk of more extensive customer service operations because of extreme temperatures causing equipment failure 	<ul style="list-style-type: none"> Incorporate climate-thinking into the design Climate proof the machines and secure stable production and product quality
		Labor	<ul style="list-style-type: none"> Reduction of working days due to heat wave-related labor restrictions 	Possible	Mid term	Low	<ul style="list-style-type: none"> Production schedule pushback due to labor restrictions, rising project costs 	<ul style="list-style-type: none"> Reflect climate-related changes into the project schedule


Climate-related opportunities			Likelihood	Time frame	Magnitude of impact	Impact on Hyundai Rotem	Hyundai Rotem's strategy
 Opportunities	Energy source, markets	<ul style="list-style-type: none"> Prolific domestic and international research projects on energy transition and low-carbon activities 	Likely	Short term	Medium	<ul style="list-style-type: none"> More opportunities to participate in Korean government-led projects concerning the climate or environment (In 2021, Hyundai Rotem was involved in national government projects worth approximately KRW 3.2 billion) (approx. USD 2.7 million) 	<ul style="list-style-type: none"> Obtain incentives from customers by presenting quantifiable low-carbon results


* Short term: 0 to 1 year, mid term: 1 to 3 years, long term: 3 years or more

Climate risk management (TCFD)

Strategy: Rail Solutions

Using the TCFD framework, the Rail Solutions Division has developed strategies to manage climate-related risks and opportunities. The Rail Solutions Division considers the reduced demand for diesel and hybrid vehicles as a transition risk, while the increased demand for hydrogen and low-carbon products are considered opportunities. Internationally, the commitments to “Build Back Better and Greener” and the “Green New Deal” projects translate to heightened interest in eco-friendly and climate resilient mobility. By managing our risks and opportunities, we aim to make our business more competitive.

	Climate-related risks	Likelihood	Time frame	Magnitude of impact	Impact on Hyundai Rotem	Hyundai Rotem’s strategy
 Transition risks	Market · Decreasing demand for diesel, hybrid vehicles	Likely	Mid/long term	Low	<ul style="list-style-type: none"> Decreased demand for diesel/hybrid vehicles in countries where we operate Average sales of diesel vehicles (including locomotives) in the last three years (2019-2021) are approximately 3.4% of total sales (consolidated basis) – an average of KRW 50 billion (approx. USD 42.2 million) per year 	<ul style="list-style-type: none"> Find alternative revenue streams to replace diesel/hybrid vehicle revenue (e.g. develop alternatives and plan out the sales strategy); Develop hydrogen electric trams (tasked by the Ministry of Trade, Industry and Energy to conduct a field test, to be completed by the end of 2023) and a full lineup of hydrogen vehicles, locomotives and high speed trains by 2030


	Climate-related opportunities	Likelihood	Time frame	Magnitude of impact	Impact on Hyundai Rotem	Hyundai Rotem’s strategy
 Opportunities	Products and services, markets · Increasing demand for hydrogen and/or low-carbon products	Likely	Mid/long term	High	<ul style="list-style-type: none"> Increased demand for hydrogen trams, low-carbon rolling stock and related infrastructure Domestic: By 2025, local governments are expected to introduce trams, worth an annual average of KRW 140 billion (approx. USD 118.1 million) Overseas: The global hydrogen rolling stock market is expected to grow to an average of KRW 330 billion (approx. USD 278.4 million) per year by 2025 and to KRW 2.4 trillion (approx. USD 2.0 billion) per year by 2030 (including light rail vehicles/trams, locomotives, and multiple units) <p><i>Source: SCI Analysis: Hyundai Rotem H₂ Market</i></p>	<ul style="list-style-type: none"> Research <ul style="list-style-type: none"> Develop hydrogen-based rolling stock Develop highly efficient electronic equipment (improve energy efficiency and reduce weight of the equipment) Increase sales of hydrogen trams and infrastructure <ul style="list-style-type: none"> Target domestic and international local governments that may introduce hydrogen-based rolling stock. Legal and policy-related strategies <ul style="list-style-type: none"> Promote a flexible approval procedure compared to conventional rolling stock Promote fuel subsidies for trams and policies to stabilize hydrogen prices Standardize domestic tram technological specifications

* Short term: 0 to 1 year, mid term: 1 to 3 years, long term: 3 years or more

Climate risk management (TCFD)

Strategy: Defense solutions

Using the TCFD framework, Hyundai Rotem has developed strategies to manage climate-related risks and opportunities. The Defense Solutions Division has considered the transition risk due to climate change as insignificant, but has judged the increase for the need of climate resilient products and the increase in product sales due to the expansion of the hydrogen market and eco-friendly government projects as opportunities.


	Climate-related opportunities	Likelihood	Time frame	Magnitude of impact	Impact on Hyundai Rotem	Hyundai Rotem's strategy
 <p>Opportunities</p>	<p>Resilience</p> <ul style="list-style-type: none"> Increased demand for climate resilient products 	Likely	Short term	High	<ul style="list-style-type: none"> Opportunity to leverage products/services resilient to extreme weather (heat, cold, etc.) as a competitive edge 	<ul style="list-style-type: none"> Design products and conduct R&D appropriate for different climates
	<p>Products and services, markets</p> <ul style="list-style-type: none"> Increased product sales as hydrogen market expands 	Likely	Mid term	Low	<ul style="list-style-type: none"> Increased business opportunities using future weapons technology (next generation main battle tank, hydrogen-powered wheeled armored vehicles, etc.) 	<ul style="list-style-type: none"> Gain competitive advantage through cutting-edge future weapons technologies Strengthen technology and innovation capacity by participating in national government-led projects (e.g. develop hydrogen fuel cell powered wheeled armored vehicles and a common platform for electric vehicle driving) Maintain technology application performance and product competitiveness (reliability, operability, price)
	<p>Products and services, markets</p> <ul style="list-style-type: none"> Increased national government-led environment and/or climate projects 	Likely	Mid term	Medium	<ul style="list-style-type: none"> Increased sales by participating in Korean government-led projects with a focus on climate and/or environment 	<ul style="list-style-type: none"> Apply climate lens to review products and services Promote partnership with the Korean national government for the application of hydrogen fuel cells to power future mobile weapons systems Develop power generation devices for use in the civilian market


* Short term: 0 to 1 year, mid term: 1 to 3 years, long term: 3 years or more

Climate risk management (TCFD)

Strategy: ECO-Plant Business

The ECO-Plant Business Division considers as transition risks the increasing demand for lower environmental impact products and services, the decreasing demand for diesel and gasoline cars, and thus their production facilities, and increasing production costs. The ECO-Plant Business Division considers low-carbon energy trends, prolific domestic and international research on the energy transition and low-carbon activities, as well as increasing climate investments, as climate-related opportunities. To fully take advantage of such opportunities, we are working to strengthen and implement our hydrogen and low-carbon market strategy.

Climate-related risks		Likelihood	Time frame	Magnitude of impact	Impact on Hyundai Rotem	Hyundai Rotem's strategy
 Transition risks	Technology · Increasing demand for products and services with lower environmental impact (e.g. high energy efficiency products)	Likely	Short term	Medium	· Clients demanding products and services with lower environmental impact (e.g. low-carbon, lightweight products)	· Develop production facilities for lightweight materials that are in increasing demand · Develop composite-material automotive presses and an electric car parts production press · Commercialize servo automotive presses, which consume less energy than mechanical automotive presses (at standby, the servo press motor does not run, while the mechanical press motor does run)
	Market · Increasing production costs	Likely	Short term	Low	· High cost of domestic renewable energy production · High cost of transporting gaseous hydrogen	· Develop optimal technology through open innovation · Establish a design plan for a zero-/low-carbon hydrogen production facility that uses renewable energy

Climate-related opportunities		Likelihood	Time frame	Magnitude of impact	Impact on Hyundai Rotem	Hyundai Rotem's strategy
 Opportunities	Energy sources · Increasing demand for low- carbon energy	Likely	Short term	Medium	· Increased demand for biogas-fueled hydrogen reformer · Further business opportunities to transition from a manufacturer of automotive machines and facilities to a provider of biogas-based hydrogen products and services (e.g. hydrogen fuel cells, carbon capture and hydrogen refueling stations)	· Analyze market trends in energy transition value chains resulting from global movement to reduce carbon emissions - Leverage bio-gas based hydrogen reformer projects to secure market position in the developing hydrogen market - Expand to international markets by developing Hyundai Rotem's own model of products (e.g. hydrogen reformer)
	Market · Increasing climate investments	Likely	Short term	High	· Steel mills investing in decarburizing facilities in response to future or current carbon taxes Investment in decarburizing equipment in steel mills (in accordance with the carbon tax) · Steel mills investing in desulfurization and denitrification equipment in response to environmental standards · Government investment in and incentives for the development of the hydrogen market	· Initiate technology partnerships with companies that have environmental equipment technologies, such as decarbonization and denitrification facilities · Expand business areas beyond steel mills, informed on the basis of the environmental performance of steel mills - Expand hydrogen projects in accordance with the Korean Green Taxonomy (2021) - Leverage government subsidies to build hydrogen reformers
	Resource efficiency · Expansion of high-efficiency plants to reduce energy use and carbon emissions	Likely	Short term	High	· Clients' demands for high-efficiency products to reduce energy use and carbon emissions - e.g. auto power off function to save energy - e.g. high energy efficiency in motors or electrical parts - e.g. installation of an energy monitoring system	· Develop highly efficient low-carbon products to gain a competitive edge in terms of product quality and price · Shift the focus of partner company selection criteria from price to technology - e.g. specify machines with high energy and material efficiency - Secure cost competitiveness of high-efficiency products based on purchasing power
	Products and services · Shrinking diesel, gasoline car market and expanding electric vehicle market	Likely	Short term	Medium	· Increasing demand for electric vehicle production facilities	· Change business focus from diesel/gasoline to electric vehicle production facilities · Create production system engineering strategies tailored to electric vehicles and batteries

* Short term: 0 to 1 year, mid term: 1 to 3 years, long term: 3 years or more

Climate risk management (TCFD)

Risk management

Climate-related risks are embedded within Hyundai Rotem’s Enterprise Risk Management (ERM) processes. The two main types of risks identified are business environment risks and project risks. Business environment risks are further classified into internal or external risks. Project risks are further classified into pre- and post-contract risks. The Executive Management Committee rates the risks on a scale of one to five, according to importance, and the risk is managed differentially depending on the level of importance.

Enterprise risk management process



Business environment climate risk management

Business environment risks are divided into internal and external risks, with climate-related risks embedded within the identification, assessment and management processes for risks. Risks identified and assessed as being important, according to the risk categorization evoked above, are then elevated to the appropriate risk owner level.

Internal risk

For internal risks, we consider climate mitigation, adaptation and resilience to develop our business portfolio and operations. Because of such risk considerations, Hyundai Rotem has identified the importance of developing its green and blue hydrogen portfolio and relevant technologies. We understand that low-carbon transitions taking place globally are pushing our clients to change their portfolios and that, for the sustainability of our business, we need to adapt our portfolio in order to be resilient to the changing dynamics related to climate change. Our R&D centers consider the extreme temperature variations under which our products may be used and the climate mitigation related requirements of our clients. Our procurement division is working to extend such climate-related risk management across our supply chain.

External risk

For external risks, Hyundai Rotem considers how different countries – as well as different stakeholders, such as clients, financial institutions, consortium members and subcontractors – are affected by and take against regarding climate change. Sales-related teams analyze the markets while the compliance team reviews relevant legislation and the Corporate Planning Group examines the overall business environment. External factors include transition risks, for example policies and regulations, and physical risks, such as climate-related disasters (e.g. storms, flooding or wildfires), which can disrupt business operations and the supply chain.

Project climate risk management

Given our project-based business model, our risk management system is best suited to project cycles. All projects are managed in the context of the online Enterprise Resource Planning system, to keep a thorough and organized record of the projects and their risks so as to better monitor them across the project cycle, which often lasts a few years.

Pre-contract risk

Prior to the project order, project teams assess the project using a checklist. This checklist includes climate-related assessments, such as the climate of the location in which the relevant product or service will be utilized and the required technologies to adapt to the local climate. The checklist also includes an assessment of whether the project is risky or not, as well as an assessment of any further implications that the project may have.

Post-contract risk

After the project order, the project management team ensures the relevant input of data related to risks to the system, which is then monitored continuously. At the design stage, we refer to our internal design guidelines that have explicit mention of climate-related requirements, such as how to ensure products or services maintain their quality in extreme temperatures or climate conditions. Once the products have been manufactured and assembled, they undergo different climate-related testing, and we consider which methodology would be best suited to each project.

Climate risk management (TCFD)

Metrics and targets

At Hyundai Rotem, we are committed to setting and implementing carbon reduction targets, and we are disclosing relevant indicators to manage climate change risks and opportunities.

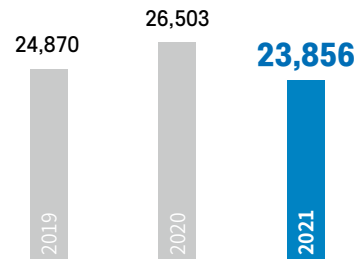
Greenhouse gas emissions: Status quo and targets

Compared with the end of 2020, our carbon emissions have decreased by about 10% as of the end of 2021, which amounts to 2,603 tons of greenhouse gas reduction. Scope 1 and scope 2 goals for greenhouse gas reduction goals have also been set in our efforts to achieve a low-carbon economy.

Greenhouse gas emissions

Greenhouse gas emissions		Unit	2019	2020	2021
Scope1 emissions	Changwon Plant	tCO ₂ eq	7,607	7,663	7,374
	Dangjin Plant	tCO ₂ eq	1,701	1,870	1,190
	Subtotal	tCO ₂ eq	9,308	9,533	8,564
Scope2 emissions	Changwon Plant	tCO ₂ eq	12,701	14,125	13,109
	Dangjin Plant	tCO ₂ eq	2,861	2,845	2,183
	Subtotal	tCO ₂ eq	15,562	16,970	15,292
Total		tCO ₂ eq	24,870	26,503	23,856
Sales (non-consolidated basis)		KRW billion	2,230	2,677	2,814
Greenhouse gas emissions by sales		tCO ₂ eq/ KRW billion	11.2	9.9	8.5

GHG emissions (unit: tCO₂eq)



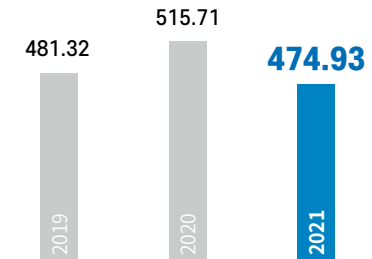
Energy use: Status quo and targets

Energy use at Hyundai Rotem decreased by 8% in 2021 compared with 2020. We are continuously working to reduce our energy use, and we are currently considering energy savings targets.

Energy use

Energy		Unit	2019	2020	2021
LNG	Changwon Plant	TJ	131.59	131.84	124.77
	Dangjin Plant	TJ	16.81	21.73	18.04
Diesel	Changwon Plant	TJ	10.93	11.17	11.49
	Dangjin Plant	TJ	0.25	0.19	0.14
Gasoline	Changwon Plant	TJ	0.29	0.29	0.23
	Dangjin Plant	TJ	-	-	0.02
Kerosene	Changwon Plant	TJ	1.04	1.07	0.69
Electricity	Changwon Plant	TJ	261.51	290.84	273.94
	Dangjin Plant	TJ	58.91	58.58	45.61
Total		TJ	481.32	515.71	474.93
Sales (non-consolidated basis)		KRW billion	2,230	2,677	2,814
Energy use intensity by sales		TJ/KRW billion	0.22	0.19	0.17

Energy use (unit: TJ)



People

Responsible Partner

Special Feature No. 3

Safety-first management

49



Occupational safety and health

51



Talent acquisition, retention and development

56



Employee well-being, diversity and equal opportunities

58



Community engagement

62



Supply chain risk management

66



One of the four pillars of our sustainability vision is People, for whom we aim to be a Responsible partner – a partner who works with all stakeholders for sustainable growth. We believe that a human-centered approach is key to sustainable growth. As such, we are working on employee safety and health issues, including regarding COVID-19 and workplace safety improvements, as well as the rights and welfare of the employees of our suppliers.

Special feature No. 3

Safety-first management



Alignment with the UN SDGs



Fatality rate per 10,000 employees in 2021
(unit: %)

ZERO



Industrial accident rate in 2021
(unit: %)
* The average industry accident rate is 0.59%

0.11



Safety inspection activities in 2021
(unit: number of inspections)

661

1 Health, safety and environment (HSE) vision

Vision



Building a secure workplace that puts people and the environment first

Four objectives

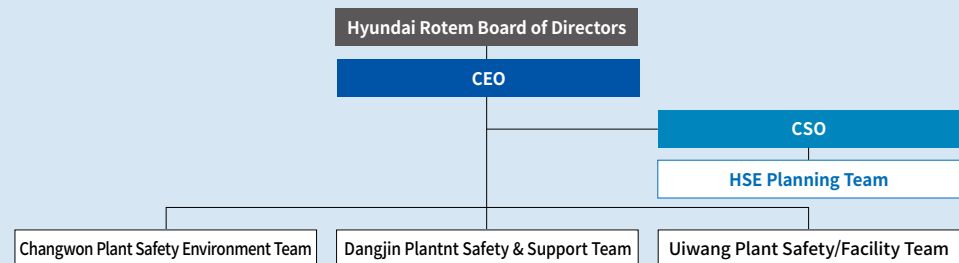
- 1 Establish an advanced safety culture
- 2 Manage risks efficiently
- 3 Establish the HSE management system
- 4 Strengthen staff's health and safety capabilities

- Diversify communication channels available to workers by introducing a mobile safety reporting system
- Improve the engagement of workers in safety prevention plans
- Improve the efficiency of safety management through online systematization
- Identify potential risks using safety priority indicators
- Identify and eliminate hazard factors using various approaches
- Establish safety evaluation system for suppliers
- Strengthen the operation of the Health, Safety and Environment (HSE) Management Committee
- Implement enterprise-wide HSE auditing and reporting operations
- Certify and maintain the health, safety and environment management system (ISO 45001, ISO 14001)
- Strengthen safety training for employees and reinforce safety awareness
- Train safety professionals through specialized training

2 Appointment of the Chief Safety Officer and establishment of an organization dedicated to safety at headquarters

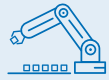
HSE governance

The Korean Serious Accidents Punishment Act came into effect in 2022, requiring companies to systematically manage safety. At Hyundai Rotem, we appointed the head of the Management Support Division as our first Chief Safety Officer (CSO) and established the HSE Planning Team to strengthen our safety management system. Since 2021, the Board of Directors has been overseeing safety issues.



3 Our products that innovate in safety

Wearable robots



In cooperation with the Hyundai Motor Company, we have introduced Vest Exoskeleton (VEX) and H-Frame wearable robots to assist human muscular strength. The VEX is a vest-type wearable robot that can reduce arm and shoulder fatigue during prolonged arm lifting, while the H-Frame was developed to effectively lower the risk of injury to workers when lifting objects from the floor. We have signed an MOU with the Korea Electric Power Research Institute to jointly develop and commercialize wearable robots for electrical engineers. The goal of the wearable robot is to reduce the fatigue caused by the direct and indirect work of construction workers in the electrical sector. We also plan to conduct educational seminars to foster talent in technology development.

Wearable robots can be used in agriculture as well. In August 2021, the Korea Institute for Robot Industry Advancement selected Hyundai Rotem to develop and disseminate wearable robots for agriculture. This is the first time that the Korean national government is sponsoring both the R&D and commercialization of robots for agriculture. At Hyundai Rotem, we are developing wearable robots that can help prevent musculoskeletal disorders in increasingly aging farmers.



H-Frame



Multi-purpose unmanned ground vehicles



In November 2020, we were awarded the order for a multi-purpose unmanned ground vehicle by the Korean military. After conducting performance evaluation tests, we delivered the vehicles to the military in July 2021. For six months, the vehicle's performance was thoroughly verified through field battle simulations, including at the general outposts and the demilitarized zone. In this pilot operation process, Hyundai Rotem's multi-purpose unmanned ground vehicle assumed various combat situations, performing in a variety of terrains and environments, and was fully monitored and tested using the route-point autonomous driving mode and automatic driving mode, which automatically follow predetermined vehicles or personnel. The vehicle has been recognized for its technical skills and reliability, having completed diverse operations, such as close combat and material movement missions. This multi-purpose unmanned ground vehicle is the first of its kind in the military to complete pilot operations, and in line with the 4th Industrial Revolution for unmanned combat equipment, these vehicles are considered an essential element of future battlefield environments. Through delivery of this reliable advanced unmanned ground weapon system, we are making an important contribution to safer defense activities.

Rescue drones



Hyundai Rotem's "rescue drone" is an unmanned vehicle developed for surveillance and reconnaissance. The rescue drone can operate in restrictive terrain by means of the rugged independent steering system, and can be used in various ways, including for the transportation of casualties. The rescue drone is equipped with a remote controllable firefighting gun so that it can be used to extinguish fires in remote areas. In addition, rescue drones can provide reconnaissance information to situation rooms, supporting decision making and the establishment of operations for individual situations.



Multi-purpose unmanned ground vehicle



Rescue drones

Occupational health and safety

Strengthen employee health and safety

Health, safety and environment (HSE) system

HSE management policy

Health, safety and environment (HSE) are key considerations for sustainable business practices. At Hyundai Rotem, HSE policies are accessible on our website. All of our employees and suppliers observe these policies, and in so doing, create a culture that respects people and the environment.

HSE management policy

- 1 HSE as a top priority of management**
 All executives, employees and stakeholders shall do their best to ensure the operation of the HSE system, and shall promote HSE policies as a top priority.

- 2 Compliance**
 All executives, employees and stakeholders shall comply with laws, regulations and procedures in relation to HSE. Hyundai Rotem also establishes its own standards in this regard and will continue to promote and ensure activities to improve safety, health and the environment.

- 3 Accident prevention**
 By identifying risks in advance, Hyundai Rotem shall do its best to create a safe and pleasant working environment and to prevent injury or property loss among executives, employees and stakeholders.

- 4 Transparent management**
 Hyundai Rotem shall ensure the transparent disclosure of safety and health management information to all employees and stakeholders.

- 5 Conservation of the environment**
 Hyundai Rotem shall contribute to environmental preservation through the development of eco-friendly technologies and products, and through low-carbon green management.

Health, Safety and Environment (HSE) Management Committee

Organized by the CEO, the Health, Safety and Environment (HSE) Management Committee convenes the CSO and all heads of divisions every month to oversee safety management performance and accident cases, as well as to address safety and health risks. The committee also connects online to monitor daily HSE activity by business area, to share major safety issues, and to maintain the safety management system and ensure regular monitoring.

Labor union participation in safety

Our industrial accident prevention plan is created in consultation with the labor union, meaning that the prevention plan is also subject to formal agreement processes. The plan establishes and revises HSE management regulations and implements essential requirements for promoting HSE education for all employees.

Labor union membership

Classification	Unit	2019	2020	2021
Union membership rate	%	63.1	62.7	69.5
Number of labor union members	Number of persons	1,346	1,274	1,307
Workers eligible for union membership	Number of persons	2,133	2,032	1,880

Labor-Management Health and Safety Committee

The Labor-Management Health and Safety Committee consists of the same number of members from labor and management, with the intention of ensuring fair discussions at regular quarterly meetings on matters related to workers' health and safety. Major agenda items have included compliance with COVID-19 quarantine rules, health education, regular health checkups and the selection of institutions to assess the work environment, as well as activities for workers' safety and health, including prevention/education courses to prepare for emergency situations.

Strengthening the health, safety and environment (HSE) system

To prevent serious industrial accidents and strengthen the safety and health system, we have established a team in charge of company-wide HSE management, as well as an independent safety and health team for each workplace. The CSO ensures that the delegation of roles and responsibilities are clear among HSE managers and supervisors. As part of safety management, we conducted safety consultations for about eight months, and accordingly established and improved safety management processes that reflect the characteristics of our business operations. Based on these improved processes, all workplaces are carrying out serious accident prevention activities, and we are doing our utmost to minimize risks such as those outlined in the Severe Accidents Punishment Act.

Occupational health and safety

Health, safety and environment measures

At Hyundai Rotem, we manage the health of our employees at the company level, and we have developed various safety and health measures. A safety environment inspection meeting is held, for example, on a monthly basis to review cases of safety rule violations and accidents, and to identify and improve risks in relation to the overall industrial environment by sharing and discussing the latest issues concerning the safety environment.

“Zero hazard” campaigns and related training are carried out at each plant to help raise awareness and mobilize all employees in making our working environment safer. Safety inspections, overseas medical and security support and comprehensive health checkups also contribute to our employees’ health and safety. In addition, our periodic supplier HSE assessments encourage them to improve the safety of their working environments.

HSE measures: Company-wide

Classification	Measures	Frequency
Health and safety	HSE Management Committee meetings supervised by the CEO	Once per month
	HSE Management Committee meetings by heads of each business division	Once per month
Safety inspection	Safety inspection supervised by the CEO	Once per month
	Safety inspection by the head of each business division	Once per month
	Safety inspection supervised by the head office	Every six months
Safety education	Safety and health education for new employees	When recruited
	Regular safety education/safety education for contractors and for employees going on business trips	Ad hoc
Overseas medical/security assistance	Medical/security consultation for overseas branch employees and their families, business trips and contractors	Ad hoc
Comprehensive health checkups	Comprehensive employee checkups Comprehensive examinations of executives and employees	Once per year
Supplier HSE assessments	Evaluations during the bidding and/or construction stage	Ad hoc
	Evaluation results reflected in future bidding	Ad hoc

We are committed to preventing accidents in factories, research institutes and on construction sites, and we will continue to operate HSE programs for our employees.

HSE measures: Production sites

Classification	Measures	Frequency
Factories and R&D centers	Labor-Management Health and Safety Committee	Once per month/ once per quarter
	Risk assessments	Once per year/ ad hoc
	Safety inspections of suppliers	Once per quarter
	Fire drills	Once per quarter
	Safety awareness campaigns	Ad hoc
	Safety awareness training for site supervisors	Once per quarter
	Regular/special health and safety training	Ad hoc
	Safety patrols	On a daily basis
	Safety inspection of dangerous machinery and equipment	Ad hoc
	Site evaluation	Every six months
	Detailed safety assessment of the Uiwang R&D center	Once per year
	Investigation of musculoskeletal disorder hazards and disease prevention	Ad hoc
	Reward system* *Employees and suppliers with excellent safety records	Ad hoc
Construction site	Morning meetings and toolbox meetings before starting work	Ad hoc
	Safety training (new hire/regular/special)	Ad hoc/once per month
	Safety inspection by on-site managers	Once per week
	Labor-Management Health and Safety Committee	Once per quarter
	Emergency trainings (evacuation /fire drill/rescue)	Once per quarter
	Risk assessment by construction type	Ad hoc
	On-site safety inspection	Ad hoc
	Inspection of blind spots (using drones)	Ad hoc
	Interactive virtual reality (VR) training for on-site risk factors	Ad hoc

HSE measures: Company-wide performance

Inspection by the CEO	14 times
Inspection by the head office	115 times
Company-wide HSE Regular Inspection	4 times
Site inspection	528 times

Occupational health and safety



Selection of outstanding ideas from the “safety ideas contest”

(8 selected from 630)



Safety pledge



Contest poster

Occupational health and safety education

All employees receive monthly safety-related education, and supervisors receive annual education so that all of our employees at all levels take a proactive approach to safety and know how to improve safety. New employees are required to complete industrial safety training under the supervision of the safety team so that they are aware of any safety issues that may arise at work.

Following the government’s strengthening of the heavy equipment pilot training system, we conducted training regarding the use of heavy equipment for workers who use them. Imported chemical purchase procedures and monitoring systems were introduced to manage hazardous chemicals, in accordance with the Korean Green New Deal policy. In addition, we train our employees going on business trips abroad with relevant training on safety and diseases.

To strengthen our internal competence, we plan to provide safety education for the management level and to appoint an internal safety instructor. By establishing an online training center, we also plan to make the safety training more accessible to our employees who work on-site.

Health-related programs

At Hyundai Rotem, we protect our employees’ and their families’ health and well-being. Our employee benefits program provides employees and their families with annual comprehensive health checkups and medical expense coverage. Moreover, our counseling center allows employees to discuss their work life, stress and difficulties in a safe space, and thus address their mental and emotional health and well-being. Outside of our business sites and work, we also support our employees’ active lifestyles by providing subsidies for gym and sports memberships.

Items	Contents
Comprehensive health checkup	Support for comprehensive health checkups for employees and their families
Counseling center	Psychological support for employees
Medical expense coverage	Support for medical expenses (going beyond medical expenses incurred from occupational accidents)
External gym membership	Subsidies for external gym or sports center memberships

Safety campaign

The CEO, management and safety-related managers have signed the safety pledge, and thus have committed to applying the principle of zero tolerance for safety infractions and to fulfilling their duty to protect the safety and health of all staff. In 2021, we conducted a “safety ideas contest” to promote safety awareness among employees and suppliers, partners and we selected ideas that would help to prevent serious industrial accidents. During three weeks of July, a total of 630 ideas were received, and of these eight excellent ideas were selected for gradual implementation.

Hyundai Rotem also plans to implement a safety management declaration ceremony and launch a safety campaign in 2022 to share the newly established HSE management policy. At the safety management declaration ceremony, a joint message from management level and representatives of workers expressed their desire to achieve an accident -free workplace. In addition, Hyundai Rotem will continue to promote and internalize safety-first management policies by ensuring that all employees wear safety badges at all times.

Strengthening the safety management system

A mobile HSE application was developed to enhance communication with workers. This mobile-based safety reporting system now allows us to receive workers’ reports and feedback in real time, even faster than the existing web portal. However, our efforts do not stop there. We plan to continuously improve the safety management system by also reflecting our workers’ feedback in real time. In urgent or time-sensitive cases, this mobile application lets the workers use this system to manage risks and communicate with supervisors in a timely way, which in turn allows supervisors to better monitor and follow-up on the situation. Furthermore, we plan to revise work manuals with a stronger emphasis on safety-related risk prevention and management.

Occupational health and safety



0.11%

Industrial accident rate among employees in 2021

* The average industrial disaster rate is 0.59%

Health and safety management and evaluation

Health and safety management of high-risk workers

Workers with a higher risk in terms of health and safety receive specialized preventative training, checkup and care, in particular regarding potential cumulative musculoskeletal injuries, as well as hearing loss. Production line workers with an elevated risk of hearing loss receive training materials that explain the potential harm; they also provide feedback through surveys and participate in prevention programs. All staff receive training every year on cumulative musculoskeletal injuries, and every three years with an external specialist on-site. On-site inspections by external experts to verify musculoskeletal injury risk factors occur every three years. The results of these inspections form the basis of improvement programs that are implemented following the inspections.

Industrial accident rate of employees

Classification	Unit	2019	2020	2021
Accident rate*	%	0.24	0.17	0.11
Labor loss accident rate (LTIFR)	Number per 1 million hours worked	1.77	1.72	1.35
Work-related deaths	Number	0	0	0

* Accident rate: ((number of casualties/number of workers) x 100), based on the Korea Occupational Safety and Health Agency accident rate confirmation letter.

Health and safety evaluation

Our annual health and safety evaluations cover over ten categories, including the industrial accident rate, critical/severe fires and safety education. Our health and safety management system has been certified ISO 45001:2018. Based on the results of ISO certification and the assessment of risk and exposure level, we formulate a health and safety improvement plan. The plan covers machines as well as manufacture and operation processes. According to the 2021 evaluation results, we had no serious accidents, fires or environmental accidents in the workplace.

Health and safety evaluation criteria

Accident rate	Number of accidents per year/month
Major disasters/fires	Occurrence of major disasters/fires
Safety training	Record management of regular safety training and training attendance rate
Voluntary safety activities	Participation in safety campaigns at least once every six months
Daily safety activities	Resolution of problems identified during on-site safety environment team patrols
Accident Prevention	Problem-solving in response to written requests to fix problems related to the violation of laws and serious risks
Wearing of personal protective equipment	Application of personal protective equipment upon entering factories
Compliance with safety rules	Compliance with safety rules in case of minor injuries
Minor injuries	Point deductions due to accidents resulting from negligence

Occupational health and safety

Response to COVID-19

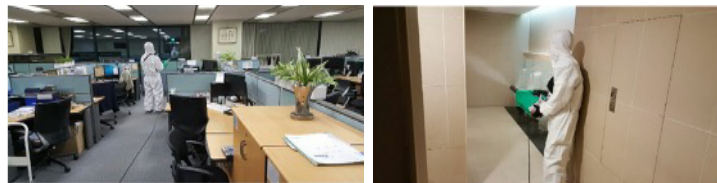
Domestic plants and employees

Our COVID-19 response follows the guidelines that we established to support our employees' health and sanitation measures. In cases of confirmed COVID-19 patients, we co-operate fully with the health authorities to minimize the spread of the virus. We have purchased diagnostic kits for employees' use, and we have limited both domestic and international business trips, while at the same time adopting teleworking and flexible working systems. Vaccinations are encouraged with paid leave so that employees can fully rest before returning to work.

On our business sites, we have conducted temperature checks to control the access of symptomatic people and minimize contamination risks. Disinfection and ventilation measures are regularly carried out in the workplace, and all amenities on-site operate according to internal guidelines and in compliance with sanitation standards going beyond the level recommended by government.



COVID-19-related on-site access control



Workplace sanitation measures



Supplementary facilities/business establishment management

Overseas business establishments and overseas workers

Our overseas workplaces have also provided diagnostic kits, quarantine suits and masks to staff in an effort to prevent the spread of COVID-19. Our online medical and security support system helps employees abroad to find pertinent information, including verified local hospitals. Moreover, by signing an MOU with Inha University Hospital, we are now able to operate a virtual medical consultation service.

Overseas medical and security assistance system

Country-specific information available

Business trip management

Checklist

Technical support request

Talent acquisition, retention and development

Fair recruitment and evaluation process

Fair recruitment process

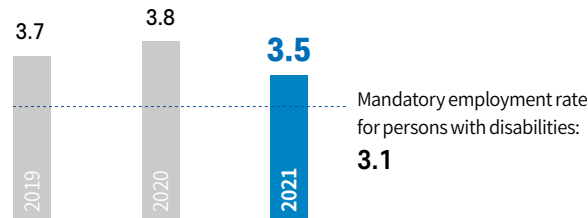
Talent acquisition

At Hyundai Rotem, we are eager to cultivate a collaborative culture of innovation. To this end, we recruit visionary individuals who are great communicators and who can drive change. As an equal opportunity employer, we do not discriminate on the basis of gender, race, ethnicity, nationality, religion, disability, age, family status, social status or political affiliation. We also go beyond the requirements under Articles 27(1), 28, 28-2, and 25 of the Korean Act on the Employment Promotion and Vocational Rehabilitation of Persons with Disabilities.

What we look for in our employees

- Professionalism: Leading with expertise in their field
- Teamwork: Collaborating with others, driven by values
- Innovation: Driving change and progress

Percentage of employees with disabilities (unit: %)



Future-forward hiring

In order to drive our future growth, it is important that our talent acquisition policies match our business visions. As such, we are pro-actively hiring in the fields of hydrogen, robotics, unmanned vehicle technologies and more. To make the recruitment process more accessible and convenient for our applicants, we have introduced a virtual interview system, and we are constantly working to improve this process.

Performance evaluation and promotion

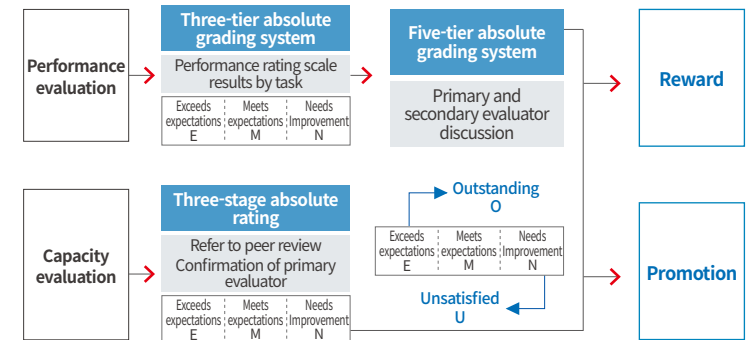
A fair performance assessment

All employees are evaluated objectively and fairly. Our performance evaluations are established to ensure clear communication between the assessor and the employee.

Project-based and annual evaluations

We have a two-track performance evaluation system: project-based evaluation and annual evaluation. For each evaluation, the assessor evaluates the performance and competence of the employee based on an absolute grading scale. Objective evaluations are recorded for each employee based on three tiers: exceeds expectations (E), meets expectations (M), and needs improvement (N).

Performance appraisal process



Revision of the promotion system

To provide fair promotion opportunities in recognition of individuals' performances and achievements, we have revised the promotion system. Instead of the previous system where promotion required four to five years of experience in a job tier, any employee with three or more years in a job tier is now eligible for promotion. We are working to prioritize individual work performance and achievements.

Talent acquisition, retention and development



91,879 hours

Total training hours for employees in 2021

26.6 hours

Average annual training hours per person in 2021



Community of Practice (CoP)

Capacity building for employees

Capacity-building system for employees

Supporting employee growth and development

Our employees are our strength. That is why we support our employees' professional development, by providing training to build their capacities. Beyond structured training courses, we also support our employees through learning with peers in the context of the Community of practice (CoP) system. In 2022, we plan to use metaverse to enhance the virtual training experience.

From language courses to courses targeting expatriated employees for their successful integration into our overseas business sites, to special courses for each division and onboarding programs, we offer a wide range of educational programs for executives and employees alike.

Professional training courses for employees

Training by career level



- Training for new employees
- Training for the newly promoted
- Leadership training (for team leader/executive)
- Company-wide special lectures

Training by job function



- Community of practice (CoP): systematically supporting employees' voluntary network of learning and knowledge-sharing
- Function-specific training: capacity building
- Project manager and project engineer training: project leadership
- Support for external job training: tuition fees for outside educational institutions
- Support for external job training: financial support to cover fees
- E-learning

Language programs

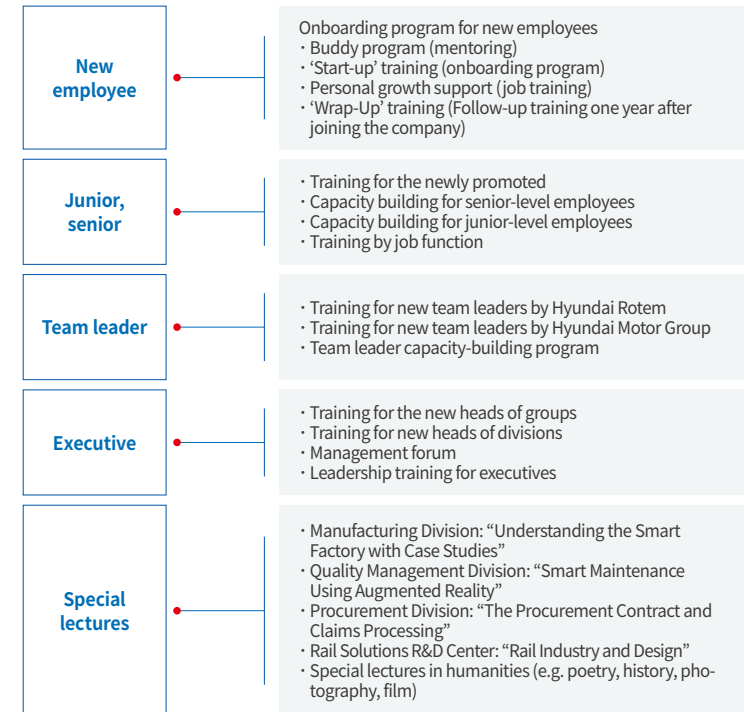


- One-on-one tutoring: in-house instructor for business English and speaking proficiency assessment tests
- E-learning
- Online English tutoring

Training provided by the Hyundai Motor Company

- Opportunities to participate in training programs offered by the Hyundai Motor Company's Human Resources Development Center

Training by career level



Operation of "Support for our retirees"

Since 2015, we have been operating a retirement support system to assist employees during their retirement. We have partnered with the Korea Labor and Employment Service to provide various three-day programs to help employees successfully develop their lives after retirement, such as through start-ups, financial management and employment or social activities during retirement, as well preparations for a return to farming and rural areas.

Retirement support program participation (unit: number of participants)



Employee well-being, diversity and equal opportunities



Family-friendly company certification (2014~)

Ministry of Gender Equality and Family

Employee welfare and work-life balance

Employee welfare

Employee welfare program

If we want to do well, we need our employees to do well. We therefore offer our employees a range of benefits, and we encourage them to find a balance between their work and their lives. In addition to the programs listed in the table below, we will continue to improve and expand upon the employee welfare system to support our employees.

Employee well-being

Financial assistance



- Financial assistance for medical care and health screenings for employees and their families
- Subsidies for vehicle purchase and fuel; employee shuttle service

Housing assistance



- Financial assistance for housing and operation of company-provided accommodation
- Pension contributions
- Relocation allowance

Leisure support



- Summer holiday allowance and holiday gifts
- Support for club activities (allowances and space for activities)
- Year-round access to resorts

Family-friendly benefits



- Marriage and bereavement leave and allowances
- Financial support for childbirth and child-rearing
- Tuition support for dependent children attending secondary and/or higher education
- Flexible working arrangements

Miscellaneous

- Long-service awards
- COVID-19 teleworking arrangements

Family-friendly culture and work-life balance

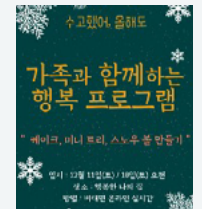
Creating a family-friendly workplace culture

To retain the best talent, we believe that creating a family-friendly workplace is crucial. As such, we have established a variety of systems, including support for childbirth and child-rearing, a flexible work system, and childbirth and childcare leave. The average number of years of service of employees, at 16.4 years, is well above the industry average. In recognition of these efforts, the Ministry of Gender Equality and Family first certified our company as family-friendly in 2014 – valid for three years – and once again certified it in 2019.

In 2021, as part of our efforts to create a family-friendly workplace culture, the “Happy together with family” program was initiated to help employees and their families through the COVID-19 period with various activities. Given the COVID-19 restrictions, the program was held virtually on weekends, during both the first and second halves of the year.

“Happy together with family” program

- Online sessions during weekends to improve the well-being of participating families (online)
- Baking Christmas cakes, making snowballs, creating refresh scented candles (first half/second half of year)



“Work Smart” system

The “Work Smart” system promotes flexible working hours and a work-life balance for Hyundai Rotem employees. Through the e-HR intranet portal, the platform for the “Work Smart” system, employees manage their tasks, work hours and work plans. In accordance with the Korean labour standards, we follow the 40-hour work week and enforce the legal maximum of a 52-hour work week through an installed computer program. Work computers will also send alarms and shut down according to the work plan set by the user. The “Work Smart” system helps increase work efficiency, by giving employees the autonomy to carry out their work and by preventing unnecessary overtime.

Employee well-being, diversity and equal opportunities

Human rights management

Human rights management policies

Protection of human rights

We place human rights at the center of our business management. In order to ensure that the human rights of employees, suppliers and stakeholders are protected, a Charter of Human Rights has been enacted, alongside corresponding human rights risk management, the operation of a grievance system and educational courses. We regularly review human rights management procedures and improve the risk management system by reflecting ongoing social changes.

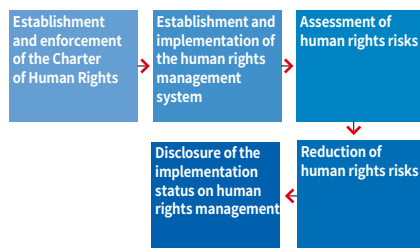
Charter of Human Rights

We established and published the Charter of Human Rights on our website in compliance with international standards and guidelines related to human rights, including those of the Universal Declaration of Human Rights, the United Nations' Guiding Principles on Business and Human Rights and the International Labour Organization. The Charter of Human Rights covers employees, corporate bodies, subsidiaries, joint ventures, suppliers and sales service organizations, and it reflects the principles of global initiatives and the understanding of relevant stakeholders.

Fundamental principles of the Charter of Human Rights

Anti-discrimination	<ul style="list-style-type: none"> Prohibition of discrimination in hiring, promotion, wages, or benefits based on gender, nationality, or socioeconomic status
Compliance with working conditions	<ul style="list-style-type: none"> Compliance with statutory working hours by country Provision of sufficient educational opportunities and work environment to build capacity and improve quality of life
Humane treatment	<ul style="list-style-type: none"> Protection of privacy Prohibition of coercion, abuse or unreasonable treatment
Guarantee of the freedom of association and collective bargaining	<ul style="list-style-type: none"> Provision of sufficient opportunities to communicate with all employees, respecting labor laws
Guarantee of occupational safety	<ul style="list-style-type: none"> Periodic inspection of facilities, equipment, tools, etc. Adequate measures for preventing risks and managing follow-up
Protection of the human rights of residents	<ul style="list-style-type: none"> Protection of local residents' rights to safety, health and freedom of residence
Protection of customers' human rights	<ul style="list-style-type: none"> Protection of personal information collected through business activities

Human rights risk management system



Human rights risk management

Human rights impact assessment

By conducting human rights impact assessments, we aim to identify human rights risks that may arise from business operations. Following a pilot assessment in 2021, we

expanded the assessment to all staff in 2022. Based on the results of the evaluation, we will implement measures to prevent and mitigate negative human rights impacts.

Reporting system for human rights violations

To receive and resolve cases of human rights violations, we operate both an internal and an external reporting system. Once the report is filed, based on the nature of the report, relevant departments are called upon to discuss and propose specific solutions. If such cases could potentially evolve and represent corporate reputation risks, the discussions will be expanded to relevant committee discussions that involve executive management. The reporter's personal and other information, identified at the reception of the complaint and during the resolution process, are kept thoroughly confidential in accordance with the reporter protection system.

Modern slavery, a human rights issue

Modern slavery is a complex set of human rights violations that can occur in every sector. Businesses, especially those operating across a global supply chain, are not immune from such risks. At Hyundai Rotem we take seriously the risks of modern slavery and we recognize our corporate responsibility to assess and address any potential risks of modern slavery. Since the first release of the modern slavery statement under the "Australia Modern Slavery Act 2018," we have been working to identify human rights risks that may be present in our business operations and our supply chain through risk assessments, including the human rights impact assessment. Together with our suppliers and other relevant stakeholders, we are committed to protecting human rights.

Human rights education

Disabilities

Human rights education at Hyundai Rotem includes a focus on improving the perception of persons with disabilities at work, as per Article 5-2 of the Korean Employment Promotion and Vocational Rehabilitation Act for Persons with Disabilities. Every year all employees receive training to broaden their awareness in relation to persons with disabilities at work. In November 2021, for example, online training was conducted for all executives and employees, and various efforts continue to be made to bring attention to this important subject.

Human rights management

Human rights are one of the key issues addressed in the all-staff sustainability training. This training aims to raise awareness on the importance of human rights management and to guide employees with relevant case studies and with human rights related company policies. Some of the topics discussed in the online training course include: human rights management, the European Union (EU) directive on corporate sustainability due diligence, and the Korean Framework Act on Human Rights Policy. Our plan is to expand this training to our suppliers.

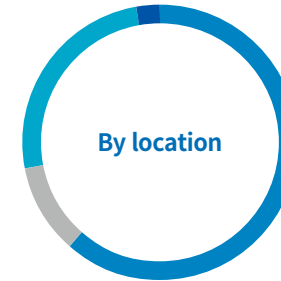
Employee well-being, diversity and equal opportunities

Human rights impact assessment

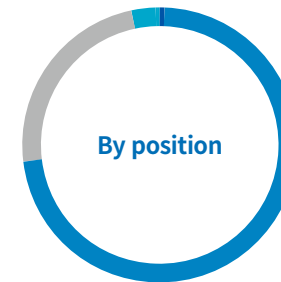
Following global guidelines on human rights, we conduct human rights impact assessments for all staff. The questionnaire covers human rights management, industrial safety and human rights risks; the list of questions can be found in the table below. The anonymous survey format helps ensure that employees would not feel hindered in any way from providing truthful answers and opinions. The survey results will allow Hyundai Rotem to better manage and improve potential risks in relation to human rights.

Human rights management	<ul style="list-style-type: none"> The company has made a policy declaration to the effect that it is striving to fulfill its duty to respect human rights. The company has appropriate policies and programs in place to improve the human rights of its staff members.
Fundamental human rights	<ul style="list-style-type: none"> Company employees are prohibited from engaging in any rude or intimidating acts, such as verbal abuse, assault or personal attacks. Company employees are prohibited from verbally abusing, or carrying out personal attacks on stakeholders, such as the employees of suppliers Company staff members are prohibited from engaging in any form of sexual misconduct or other misleading behavior.
Anti-discrimination	<ul style="list-style-type: none"> The company does not discriminate against employment and performance on the grounds of gender, religion, disability, age, social status, region of origin, educational background, etc. When the company recruits female workers, criteria related to physical appearance, height, etc., or marital status, cannot be considered during the recruitment process. The company does not discriminate against foreign workers.
Forced labor	<ul style="list-style-type: none"> The company prohibits any form of forced labor. The company is making every effort to ensure that all staff members comply with working hours. The company does not require the submission of identity cards, travel certificates (e.g. passports), or other documents for the purpose of restricting the behavior of its staff members.
Prohibition of child labor	<ul style="list-style-type: none"> The company does not employ minors under the age of 15. The company does not employ workers under the age of 18 for long shifts and night work.
Industrial safety	<ul style="list-style-type: none"> The company maintains safety equipment and other devices in the workplace to the highest safety and hygienic standards at all times. The company provides workers with essential protective equipment for job performance and sufficient education on industrial safety. The company provides regular medical checkups to protect and maintain the health of workers. The company has sufficient support programs to accommodate workers who are injured or who are ill at work.

Breakdown of human rights impact assessment participants



● Uiwang	62%
● Dangjin	10%
● Changwon	25%
● Others (overseas)	3%



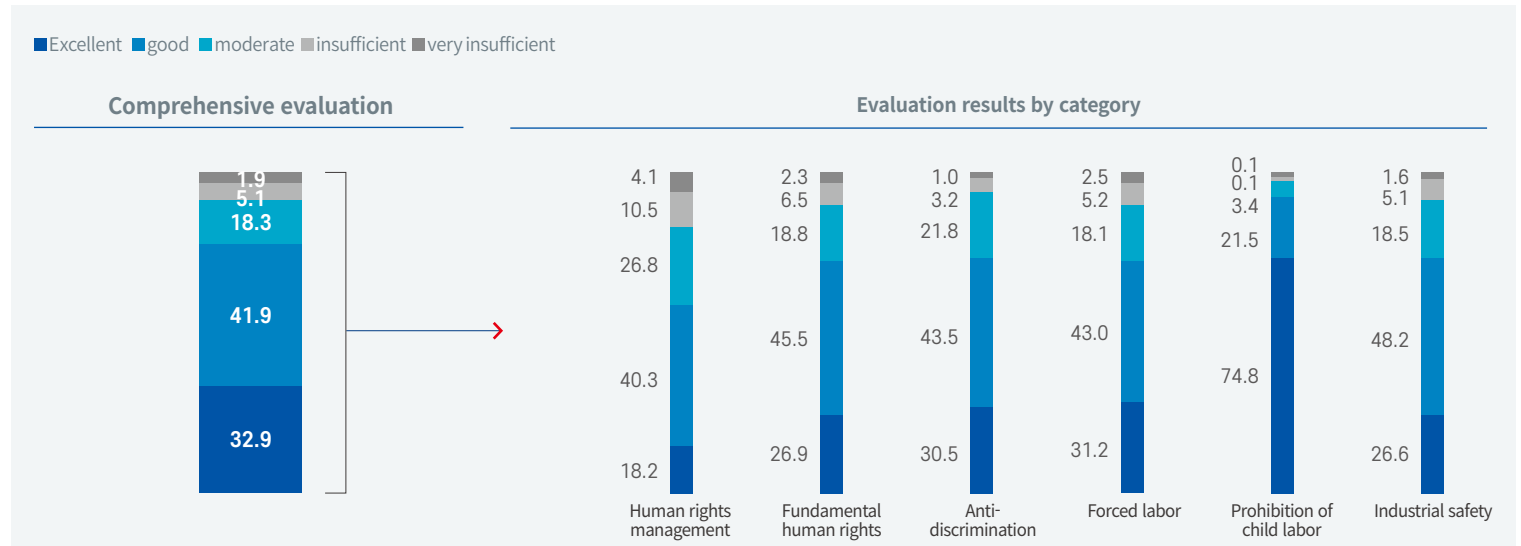
● Senior manager	73%
● Manager	24%
● Other	3%
● Executives	1%



● Over 15 years	38%
● 10 to 15 years	25%
● 5 to 10 years	18%
● Under 5 years	19%

Employee well-being, diversity and equal opportunities

Human rights impact assessment results (unit: %)



The results of the human rights impact assessment, consisting of 17 questions across six categories, showed a 74.8% rate of positive responses (excellent, good) and a 7.0% rate of negative responses (insufficient, very insufficient). In all categories, the majority of respondents indicated that there were no potential human rights risks in terms of Hyundai Rotem's management activities, and no potential human rights risks were identified by gender, workplace, position or by duration of service. However, we found that the human rights management category was attributed a relatively higher rate of negative responses compared to other categories, and so we will work to improve in this regard.

Improvement activities

Building upon our human rights policies and initiatives in place, we plan to actively carry out campaigns to raise the awareness of executives and employees and realize tangible improvements in human rights management.

Monitoring

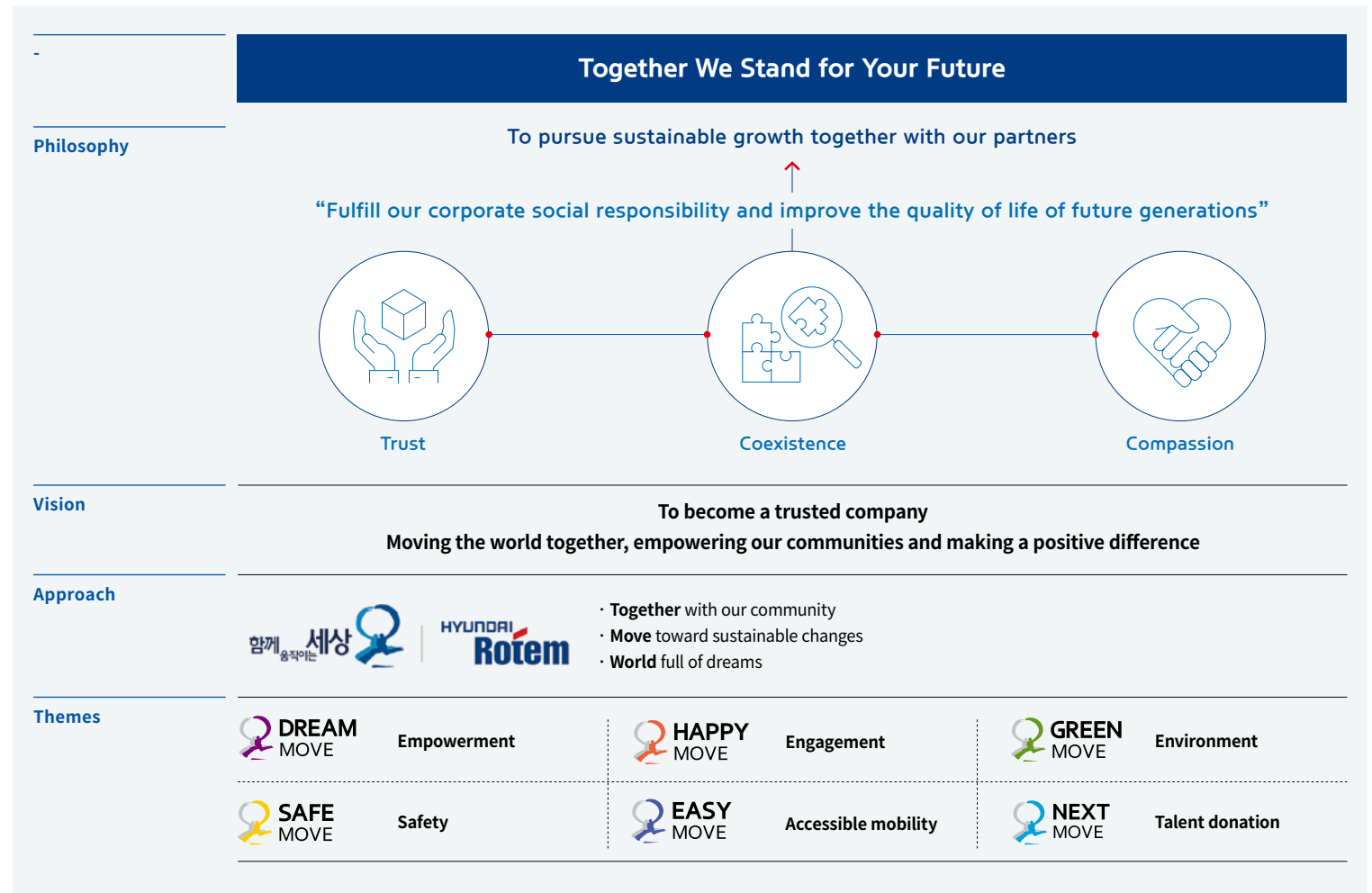
We identify and manage the potential risks of human rights management and operates various communication channels to prevent serious human rights abuses. Cases are reported through the human rights violation reporting system, and the company adapts the response according to the specific case. Serious cases are further reported to the committee which involves top decision-making authorities so as to address them in a more urgent manner. Anonymity is ensured in the reporting process in order to protect against any additional harm.

Community engagement

Social contribution strategy

Strategic framework for social contributions

As a global corporate citizen, we at Hyundai Rotem are actively engaging with our communities and working to strategically contribute to bettering the lives of our community members.









Community engagement

Social contribution activities

Dream Platform: Along the railway

The Dream Platform is a community outreach program designed to support and empower our community members. Given our Rail Solutions business, we focus on areas near train stations. Alongside our financial support of about KRW 75 million (approx. USD 63,300) every year, we are gradually expanding our scope of beneficiaries. Currently, we are working with a variety of beneficiaries, including older adults living alone, individuals with visual or hearing impairments and child abuse survivors. As a corporate citizen taking its social responsibility seriously, we are committed to empowering our community members.

SAFE MOVE	HAPPY MOVE	DREAM MOVE	EASY MOVE	SAFE MOVE	HAPPY MOVE
1 Line	2 Line	3 Line	4 Line	5 Line	KTX
 <p>Low-income families, basic livelihood recipients, etc.</p> <p>2015-2017 • Housing improvement project around Seoul station to protect against extreme weather conditions</p> <p>2018-2020 • Housing improvement project and mental health support for vulnerable populations around Dongdaemun station, Seoul, Korea</p> <p>2021- • Support for medical expenses for low-income families in Uiwang.</p>	 <p>Newborns waiting for adoption</p> <p>2015-2016 • Support for the renovation of a foster care center • Employee volunteer work as caretakers at childcare facilities</p> <p>2017- • Album making activities and the organization of children's first birthday parties</p>	 <p>Individuals with disabilities</p> <p>2016-2020 • Support for job training (cultural commentator) and independent living for individuals with audiovisual disabilities • Palace visits for low-income persons with disabilities</p> <p>2021- • Capacity building for employment support of people with developmental disabilities</p>	 <p>Persons of distinguished service to the state</p> <p>2017- • Provision of electric wheelchairs or electric scooters to improve mobility for low-income persons of distinguished service to the state (in cooperation with the Gyeonggi Southern Veterans Affairs Office)</p>	 <p>Child abuse survivors</p> <p>2018- • Financial support for emergency medical treatment • Employee volunteer work to make and deliver care packages for child abuse survivors</p>	 <p>Vulnerable children and neighbors in the community</p> <p>2019- • Support for the Changwon community childcare center program • Donation of care packages to local communities during heat waves and cold waves</p>

Community engagement








KRW 12 million
(approx. USD 10,100)

Donation for low-income families

Social contribution activities centered on domestic business establishments

Across our business sites in Dangjin, Changwon and Uiwang, Korea, 49 employee volunteer groups, including the ‘Three Wheels of Love’, are actively contributing to their local communities. Our employees’ voluntary work focus on five areas: environmental cleanup, social welfare, disaster recovery, arts and culture, and rural development.

Environmental cleanup	Social welfare	Disaster recovery	Arts and culture Support for the military	Rural development
 <p>‘Green vitamin’ 2016-2019 Sapgyo Lake, Dangjin</p> <p>Plogging 2021-present Wangsong Lake, Uiwang Nam Stream, Changwon</p>	 <p>‘Three Wheels of Love’ social contribution 2000-present Support projects for community members and employees in need</p> <p>2019-present Sponsor the local children’s center</p> <p>Blood donation 1994-present Biannual blood drives</p> <p>Kimchi donation in Uiwang 2016-present Kimchi for low-income families</p>	 <p>Home improvements 2016-2017 Housing improvement for elderly adults living alone</p> <p>Installation of fire-fighting equipment for households vulnerable to fire 2017-present Support for low-income families in partnership with the Uiwang fire department</p>	 <p>Cultural heritage conservation 2016-2021 Palace conservation work</p> <p>Support for the military 2021-present Visits and activities to show support for active-duty service members</p>	 <p>Corporate-village partnership 1994-present Volunteer partnership with Buksang-myeon</p>

Partnerships with our communities

Since 1994, the Changwon Plant, Hyundai Rotem’s main production base, has been contributing to the local community through our ‘One Company One Village’ project, in partnership with Buksang village in Changwon and with Dongjin, a social welfare corporation. Every year, the Changwon Plant donates around KRW 5 million (approx. USD 4,200), hosting sports days for the local community, providing support for holidays and during extreme heat and cold events, and organizing farmers’ markets.

Fundraising for the Changwon community

Our employee volunteer groups, including the ‘Three Wheels of Love,’ have been carrying out fundraising to support access to rehabilitation services and neighborhood improvement projects in vulnerable communities. Members of ‘Three Wheels of Love’ also provide in-kind support to community child-care centers in Changwon to better design and execute programs.

Kimchi donation and support for the Uiwang fire department

Through our partnership with the Uiwang city government, our Uiwang business site donates KRW 12 million (approx. USD 10,100) to low-income community members. We also support Uiwang community members through kimchi donations and fire safety equipment for homes.

Medical support for low-income families in Uiwang

In co-operation with the Uiwang Dental Association, we are promoting a dental treatment support project to help improve access to dental care. Ten beneficiaries from low-income families, recommended by the local community center, have thus far received dental treatment of up to KRW 3 million (approx. USD 2,500). With the information that we have received via feedback from project beneficiaries, we intend to improve our social projects.

Community engagement



277 persons

Support for school supplies and school transportation services for underprivileged children in the Philippines

Support to persons of distinguished service to the state

As a company engaged in the defense sector, we are at the forefront of supporting soldiers who have devoted themselves to Korea. We sponsor scholarships for children of veterans and persons of distinguished national merit. In partnership with the Korean military, we also financially support active-duty soldiers, and organize events to commemorate Korean War veterans together with local troops. We plan to develop more projects to commemorate such sacrifices and patriotic acts.

Global Dream Platform

Since 2015, we have been undertaking international social projects, focusing on the areas in which we conduct our business. Our objective is to empower children and youth to realize their potential as future talent by improving access to better education. For instance, we partner with local governments to reduce poverty, improve hygiene and sanitation, and provide hygiene and sex education. We plan to carry out different projects to contribute to local development and talent development and in so doing, support the sustainable development of countries in which our businesses are present.



Korean war veterans' event

Empowering children living in poverty in the Philippines

As part of our global social contribution projects, we support children's academic careers and provide scholarships to support the operation of child-care centers in Baguio and Angeles in the Philippines. Furthermore, we have renovated public schools and provided school supplies and commuting services to a total of 277 children in low-income communities.

While the COVID-19 pandemic precipitated the switch to virtual classes, many children in poverty have difficulty accessing stable internet connections and thus quality education. By providing learning material tailored to individual student's needs and supporting regular online classes, we are working to narrow the educational gap. Regarding hygiene, we have also produced and distributed hygiene manuals to increase awareness.



Global CRS_Philippines

Supply chain risk management

Assessment of suppliers

To evaluate and manage supply chain risks, we undertake regular due diligence assessments, ESG assessments and safety assessments. Each assessment is conducted in accordance with relevant management procedures, or a separate implementation plan. Based on the results, suppliers may benefit from incentives.

Regular due diligence assessments of suppliers

A total of 167 suppliers were assessed in 2021 under our regular due diligence assessment, which rates suppliers on a scale of one to five based on factors such as management system, design and technology capacity and quality improvement. These suppliers were selected based on consultations between the Quality Management Division and the Procurement Division, as well as in consideration of the proportion of sales and the importance of transactions. Suppliers' partners are encouraged to increase their ratings with incentives, such as simplified procurement screening procedures or a selection as priority supplier for the following year.

Regular due diligence assessments of suppliers

Classification		Evaluation criteria
Management evaluation	Management level	Management system * factory environment, industrial safety, labor relations
		Management status
		Design and technology
		Environmental management
Performance	Business improvement	Field claim feedback
	Cost reduction and timely delivery	Purchasing price reduction rate and shortage rate
	Cooperation for inclusive prosperity	Level of cooperation
Quality evaluation	Management level and performance	

Sustainable management of suppliers

Sustainability risk assessment of suppliers

With the objective of strengthening our supply chain, we have established *Sustainable Management Evaluation Guidelines* comprised of four modules: 1) ethics; 2) environment; 3) labor and human rights; and 4) safety and health. For the trial conducted in 2021, a total of 12 suppliers were selected from among suppliers who obtained the 1st to 3rd grades in the 2020 regular evaluation. Based on the evaluation results, we plan to expand the scope of evaluation, as well as support our suppliers to better manage their sustainability-related risks.

Ethics



Identification of ethical risks in relation to such issues as transparent management, forged parts, information protection, corrupt practices and conflict minerals.

Environment



Identification of environmental risks, such as those related to an environmental management system, energy management and emission of environmental pollutants or hazardous chemicals.

Labor and human rights



Identification of labor practices and human rights risks of workers, such as those related to wages, working hours, grievance handling and discrimination factors.

Health and safety



Identification of safety and health risks in workplaces, such as those related to facility licensing, emergency response measures, industrial accidents and worker health.

Supply chain risk management

Supplier safety

Supplier safety management system

By strengthening our safety management policy, we are working to create an environment where workers across our supply chains can work safely. We highly recommend and monitor the implementation of these policies. We also provide training and support accident prevention-related initiatives for our suppliers.

Supplier health and safety committee

To prevent occupational accidents, we convene a monthly safety and health consultative meeting to share with our suppliers the details of the latest revised laws, measures to respond to occupational accidents, changes in internal regulations and cases of accidents.

Preventative measures

Together with our suppliers, we conduct a joint safety check every quarter to identify risk factors and provide customized guidance. Suppliers conduct daily safety inspections, and we check whether the inspections are carried out and whether safety training and safety procedures are observed. If suppliers identify hazards during such inspections, they are to address the hazard immediately and monitor as a follow-up. Through the 'safety work permit system' we conduct risk assessments of our suppliers in advance to prevent accidents.

Safety management activities of supplier

Health and Safety Purchasing Process

Our procurement processes include health and safety assessments for designated projects. Suppliers that receive a score of 70 or lower in the evaluation cannot participate in the bidding. By expanding the scope of procurement projects that apply a cut-off score system, we will work to improve our supply chain's health and safety standards.

Regular safety assessments of on-site suppliers

The Changwon Plant assesses the safety management of on-site suppliers on a quarterly and yearly basis. On-site suppliers with excellent safety records receive incentives, while on-site suppliers with room for improvement receive continuous support and guidance so that Hyundai Rotem can continue to prioritize safety. We will continue to work with our suppliers and provide tailored guidance and inspections according to the different tasks that each supplier performs.

Prosperity

Green Innovation



Given the importance of stakeholder capitalism, green innovation cannot be stressed enough in the work of Hyundai Rotem. In collaboration with various stakeholders, such as shareholders, customers, employees, suppliers and local communities, we are developing innovative, future-oriented technologies and securing the basis of new growth. Hyundai Rotem is leading the heavy industry, facing challenges with creativity and constant innovation for the future.

Special feature No. 4

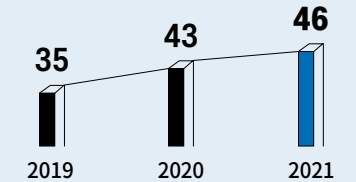
Future-forward growth



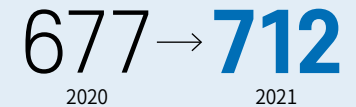
Alignment with the UN SDGs



R&D investment share (unit: %)



Number of R&D personnel (unit: number of persons)

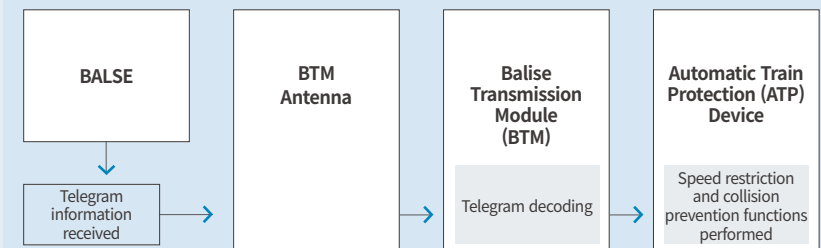


1 Securing our competitive edge through the localization of core components

At Hyundai Rotem, we have completed developments for the localization of the Balise Transmission Module (BTM), a key component of the Korea Train Control System (KTCS). The BTM is a device that receives ground information to determine the train's location and speed, and it is a major contributor to the train's safe operation. Since we started localized development in 2017, we have succeeded in securing our first independent certified model in Korea after a period of five years.

The BTM, developed by Hyundai Rotem, has completed low temperature testing at -40°C and has been confirmed to operate at even lower temperatures than other imported products. In addition, with the success of localization measures, a stable maintenance system will be established, and an import substitution program of about KRW 15 billion (approx. USD 12.7 million) should be achieved by 2027.

Train control system



2 Space industry: Towards the future

As the era of private-led space development, or “new space”, enters full swing, the defense industry is securing future growth in the engine sector based on the technologies and capital accumulated in the defense business. After first participating in the space industry in 1994, we remain competitive with the development of small engines.

In 2002, we participated in the assembly and engine development of Korea’s first liquid propulsion rocket, the Korean Sounding Rocket-III (KSR-III), and led its successful launch by building various facilities, such as a combustion test site, assembly tower and launch pad. In addition, since 2011, we participated in the propulsion engine system test facility project that tests the overall system and combustion performance for each stage of the Korean launch vehicle, Nuri. The Korea Aerospace Research Institute in Daejeon also established a test facility in 2015 for the Korean launch vehicle propulsion supply system, which successfully completed performance testing in 2020. Our ambitions are to continue to expand our role in the domestic space industry and ultimately become a leader in this field. Based on our past business experience and our expanding R&D activities in this area, we expect that our contribution to the national space industry will continue to grow.



Comprehensive combustion test equipment

3 Hydrogen industry: Starting the “Hydrogen Wave”

In accordance with the “Hydrogen Wave” vision announced by the Hyundai Motor Group, we aspire to play a leading role in the transformation towards a hydrogen-fueled society. The “Hydrogen Wave” vision refers to the beginning of a wave of change to transform the energy paradigm for the sustainability of humankind. Hyundai Rotem has joined the “Hydrogen Vision 2040,” to make hydrogen readily accessible by 2040, and as such, it will act as a front runner in the hydrogen industry to enable hydrogen energy use by “Everyone, Everything and Everywhere.”



Hydrogen electric trams

The hydrogen electric trams under development by Hyundai Rotem utilize the electrical energy produced by hydrogen fuel cells mounted on the trams, applying a hybrid method that combines hydrogen fuel cells and batteries. A hydrogen fuel cell is a device that generates electricity directly through an electrochemical reaction between hydrogen and oxygen. The hydrogen fuel cell receives hydrogen from a hydrogen tank in order to produce electricity, and any surplus power is stored in an energy storage system, i.e. the battery. Hyundai Rotem’s hydrogen electric tram can travel about 150 km at a speed of 70 km/h. The hydrogen electric tram can be considered as an eco-friendly means of transportation as it produces about 107.6 kg of clean air for each running hour, typically the same consumption as that of 170 adults for the same period. At Hyundai Rotem, we are developing new hydrogen electric trams, devising ways to overcome the limitations of existing catenary-based trams and dramatically increase efficiency. Hydrogen electric trams are part of Hyundai Rotem’s eco-friendly portfolio, and we plan to complete vehicle test by 2023. Once complete, we shall participate in the hydrogen electric tram business with the introduction of these vehicles throughout Korea.

MOU with Egypt for a hydrogen tram business partnership

Following the first Cairo electric multiple units project in 2012, we were subsequently awarded an order for 256 cars on Cairo Line 3 in 2017, and for 48 cars on Line 2 in 2019, successfully supplying vehicles for all Cairo subway commuters. With the help of this business foundation, and cooperation between Korea and Egypt in establishing an eco-friendly infrastructure, an MOU with local Egyptian companies was signed to enter the field of hydrogen electric tram development within Egypt’s new administrative capital.



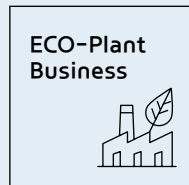
The hydrogen electric tram





Defense drone

Hyundai Rotem presented a number of products, including its defense drones, at the Seoul International Aerospace and Defense Industry Exhibition (ADEX). Defense drones are four-wheeled vehicles, based on the rescue drones described earlier. They are unmanned, eco-friendly vehicles powered by hydrogen fuel cells. The defense drones can travel up to the speed of 120km/h and have a range of 450 km on a single charge. As well as being able to record videos, it can perform communication relay and surveillance reconnaissance missions, and can also provide fire power support with the installation of a remote-controlled weapon station (RCWS) on top of the vehicle. Remote and autonomous driving, an impressive “crab walk” function that allows the vehicle to move diagonally and fitted off-road tires provide the advantage of allowing the vehicle to operate in rough terrain.



Hydrogen infrastructure

Hyundai Rotem announced its entry into the hydrogen business in June 2020, contractually agreeing to supply eight hydrogen reformers and six hydrogen refueling stations by the end of 2021. The hydrogen reformer production plant, H2 unit assembly center, began production of eight units in 2021, with one being delivered in October 2021 and starting operation in March 2022. All eight units are scheduled to be completed by August 2022, and the production volume is expected to increase with additional orders in 2022.

Agreement for green hydrogen industry

In November 2021, Hyundai Rotem signed an MOU with 12 entities, including North Chungcheong Province, Chungju and Chungbuk Technopark, for a regulation-free green hydrogen industry zone. In 2022, we delivered biogas-based hydrogen production facilities to the city of Chungju, and we are in the process of testing carbon capture and utilization facilities, in connection with the hydrogen reformer. The aim is to finish developing the facility by 2023.



A hydrogen reformer



H₂ unit assembly center



A hydrogen dispenser

Sustainability and innovation of products and services



KRW 1.78 billion
(approx. USD 1.5 million)

Amount of investment in renewable energy in 2021

Eco-Smart-Safe R&D

Rail Solutions

Future-oriented technology development

The Rail Solutions Division is focusing on R&D activities for smart train technology development with the aim of strengthening its global technology competitiveness by securing future leading technologies. Examples include an active/semi-active suspension that mitigates the impact and vibration that occur during train operation, as well as mechatronics bogie technology, which supports the vehicle load while transmitting traction and braking forces to the body so as to increase stability and ride comfort. In addition, the company has succeeded in developing standard train performance simulation tools and high-efficiency operation patterns for energy savings to reduce life cycle cost and enable more efficient train operation. Also, a single Ethernet network connects all of the devices and sensors in the vehicle to a single network, enabling large amounts of information to be transmitted in real time.

Rail Solutions technology development vision

Vision	Strengthening global technology competitiveness by securing the leading technologies of the future
Implementation strategy	<ol style="list-style-type: none"> 1. Create a lineup of new high speed vehicles (e.g. high speed magnetically levitated vehicles (MAGLEVs) and hyperloop vehicles) and eco-friendly rolling stock (e.g. hydrogen electric trams, locomotives and eco-friendly high speed trains) 2. Produce high-efficiency electrical equipment (e.g. permanent magnets, silicon carbide applications), improvements in weight reduction and construction methods, as well as strengthened technological capabilities for continental railroads and networks (e.g. high speed variable gauge bogies) 3. Design customized solutions through the Smart Train (e.g. state-based maintenance, design reviews using virtual reality, design verification and maintenance training) and passenger convenience technologies

ECO-Plant Business

Promotion of eco-friendly projects

The ECO-Plant Business Division continues to expand through investment and R&D focused on building infrastructure for eco-friendly industries, and this sector will continue to grow into a foundation industry for Hyundai Rotem. The company intends to continue with plans to localize activities and investments for many parts of the small hydrogen reformer until 2022, with R&D being conducted to secure the technology for large hydrogen extraction facilities. In addition, cooperation with Hyundai Steel will lead to the completion of the Dangjin Oxygen Plant No. 8 during the first half of 2022. Hyundai Rotem is working with Hyundai Steel to secure new technologies that will help reduce carbon emissions in the steelmaking industry.

In the field of smart logistics system Hyundai Rotem has overcome its dependence on overseas technologies for the automated guided vehicle (AGV) and has succeeded in localizing this core technology. In addition, the smart factory logistics automation system, an intelligent manufacturing platform, is participating in the construction of the Hyundai Mobility Global Innovation Center in Singapore, which is scheduled for completion in 2022. In terms of the automotive manufacturing facility, the mechanical servo automotive press and automation facilities have been developed as core technologies, and R&D activities have been carried out on new material (i.e. composite) production facilities and the motor core lamination automotive press line.

Investment in new and renewable energy

In 2021, Hyundai Rotem started operation of the “H2 Facility Assembly Center,” which can produce up to 20 hydrogen reformers per year. It has in fact invested a total of KRW 1.78 billion (approx. USD 1.5 million) in renewable energy-related projects.

Sustainability and innovation of products and services

Defense Solutions

Promotion of overseas expansion

The Defense Solutions Division is continuing to pursue overseas expansion based on R&D in relation to weapons systems. Hyundai Rotem has completed developments to demonstrate the interoperability of the RCWS and to improve the durability of major components of the tank. In addition, we have introduced autonomous driving (i.e. unmanned technology) through the release of the HR-Sherpa, a multi-purpose unmanned ground vehicle, and have also improved export competitiveness by strengthening landmine protection on wheeled armored vehicles developed with domestic technology.

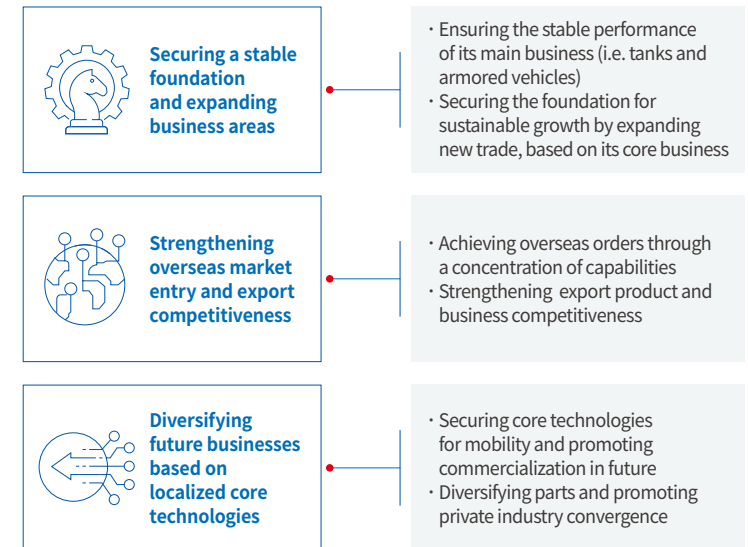
In 2021, in connection with the Norwegian military modernization project, Hyundai Rotem proposed a local production plan with a tank model suitable to regional characteristics, thus promoting a mutually beneficial defense technology cooperation (i.e. B2B and G2G) between the two countries.

By successfully conducting a cold environment test and evaluation for the Norwegian project, the K2 battle tank proved it can be operated in various climatic conditions. It is expected that through the success of this project, new overseas markets will be discovered, reviving domestic defense companies and creating new jobs.

In addition, the Defense Solutions Division intends to promote the export of tanks and armored vehicles to Poland in order to strengthen defense cooperation between Korea and Poland and contribute to the development of the Polish defense industry by investing resources that would help to create stability in the country.

Operation of sustainable defense projects

As sustainable management gains in importance, we are evaluating and monitoring sustainable management risks both domestically and at the international level. A non-financial risks checklist has thus been prepared to apply at the initial order review stage. By using this risk checklist for the evaluation of a defense project related to a minesweeping armored vehicle, risks were identified in relation to environmental factors (e.g. pollution/forest destruction) and social factors (e.g. human rights and safety), leading to Hyundai Rotem withdrawing its participation. Hyundai Rotem will continue monitoring non-financial risks in an effort to avoid violations in relation to sustainability management, and to discover and respond to risks that may occur during the course of existing projects.



Product and service safety & quality

Product and service quality management

Quality management strategy and certification

Our three-part quality strategy has helped us gain the trust of our customers, by responding to internal and external business uncertainties, managing the spread of COVID-19 and ensuring the quality of products and services. Quality certification is disclosed and managed by each business, and efforts are also being made to secure the quality and technical skills needed for new businesses.

Quality strategy

Quality assurance system	<ul style="list-style-type: none"> Strengthen detection of major parts problems and standardize the acceptable quality level for all projects Improve activities designed to prevent recurring problems and strengthen step-by-step management of design changes Enhance design/part suitability and pilot car quality verifications, and process quality improvements and pre-validations
Customer trust	<ul style="list-style-type: none"> Strengthen schedule management of field claim improvement goals and systematize collaborative management among departments Ensure preventive maintenance of major functional products and strengthen customer collaboration management related to vehicle maintenance Optimize durability testing through key devices and performance testing based on the customer operating environment
Quality infrastructure	<ul style="list-style-type: none"> Establish the quality of new business manufacturing/functions (e.g. hydrogen trams, reformers and refueling stations) and the quality of the diversification business (e.g. export vehicle, mixer) Automate testing/inspection, simplify/repeat, improve manual efficiency and expand computerization Expand professional qualifications and strengthen professional training/seminars

Quality certification status

Classification	Certification year	Authentication details
Rail Solutions	2015 (valid until 2024)	International Railway Industry Standard (IRIS)* * IRIS is an international standard for the simultaneous acquisition of ISO 9001 and ISO 22163.
	2009 (valid until 2023)	Hyundai Rotem Republic of Türkiye corporation ISO 9001 Quality management systems
	1994 (valid until 2024)	ISO 9001 (Quality management systems)
Defense Solutions	2020 (valid until 2023)	ISO 9001 (Quality management systems)
	1999 (valid until 2023)	Defense quality management system (DQMS)
ECO-Plant Business	1996 (valid until 2022)	ISO 9001 (Quality management systems)



IRIS



Defense quality management system



ISO 9001

Quality control activities

Electronic units to improve product quality

Detailed plans have been established and implemented to improve the quality of electronic units used in on-board signal devices and train control devices. The printed circuit board (PCB) verification tool software is applied in the design of the electronic unit, and the manufacturer's verification is carried out during the durability test for the main components. The process for applying robust components is thus established and also improved. In the case of defective parts, the high analysis process is improved in an effort to prevent similar failures.

A complete revision of environmental durability tests is currently being planned, including for conditions for memory stress tests and aging tests, and to carry out life acceleration experiments that will determine any potential weaknesses in electronic units. In addition, the company is working to ensure the efficiency and effectiveness of inspections by improving the PCB verification tool mentioned above and by exploring new ways to automate device hardware inspections.

Improve quality testing and inspection infrastructure

Hyundai Rotem develops parts and process equipment for product and service quality management, ensuring that they undergo quality testing and inspection. In 2021, the Rail Solutions Division developed a total of nine forms of automation equipment tests or inspections, and the Defense Solutions Division developed a total of seven. The Defense Solutions Division is planning to develop a total of nine additional types of equipment in 2022. As such, Hyundai Rotem is improving inspection methods to increase the accuracy of inspections and continue to expand the overall efficiency of its work.

Status of automation of test/inspection in 2021

Classification	Performance	Contents
Rail Solutions Division	A total of nine types of process equipment	Automated inspection equipment for encoders, multi-buzzer automatic inspection equipment, etc.
Defense Solutions Division	A total of seven types of process equipment	Stacker module performance test equipment, rescue electronics performance test equipment, etc.

Product and service safety & quality

Safety assurance guidelines



- **Safety evaluation:** conduct a safety evaluation that verifies whether established safety measures are adequate demonstrating that safety is secured accordingly
- **Hazard identification:** identify potential hazards, such as collisions, derailments and fires that may occur in the vehicle through various techniques, such as preliminary hazard analysis, subsystem risk analysis, interface risk analysis and operational/support risk analysis
- **Risk analysis:** assess risks by considering the frequency of occurrence and expected severity of each identified risk factor
- **Establish safety measures:** based on the results of risk analyses, safety measures that can reduce the risk to an acceptable level are established and reflected in the design of the vehicles

Product safety management

Product safety management by business sector

Hyundai Rotem is developing a customer-first culture by performing product safety management in each business sector. The overall objective of such product safety management is to ensure the safety of our customers by actively verifying and improving the safety of our products.

Rail Solutions: Minimization of risk factors

The Rail Solutions Division is responsible for identifying potential hazards in our vehicles by carrying out R&D on safety systems to reduce or eliminate any hazards that might be found. Based on these efforts, Hyundai Rotem designed 214 new vehicles for Seoul Line 2 by applying international standards to prevent occupational accidents in accordance with the safety requirements specified in standards IEC 62278, IEC 62279 and IEC 62425. In addition, Seoul Line 2 vehicles were evaluated according to the recommended life cycle stage (e.g. requirements analysis, design, fabrication, installation, testing and commissioning) by Ricardo Rail, an internationally accredited certification body, to verify safety.

Furthermore, the Rail Solutions Division is developing passive safety technology to reduce injuries to drivers and passengers in the event of a railway accident. Research is being conducted based on a specific research model that evaluates human injury, with information gained from the New Intercity Fleet (NIF), in Sydney, Australia, during a driver injury simulation in 2019.

Defense Solutions: Enhancement of product safety

Hyundai Rotem's Defense Solutions Division conducts testing and inspections for user convenience and safety. Incidents that may occur during operation of the maneuvering vehicle are analyzed, with the data derived from the safety tests further analyzed and verified by each design representative. These inspections have led to important developments in various products. The combat engineering vehicle, for instance, has high survivability and can continue its missions even if landmines explode, with fire extinguishers installed inside the tanks to ensure user convenience and safety. Wheeled armored vehicles were developed in collaboration with the Hyundai Motor Company, and Hyundai Rotem has improved safety by increasing the durability of its components.

ECO-Plant Business: Safety evaluation and safety design

Safety at plant facilities has been identified as a major risk to the company because it can be directly linked to industrial accidents. As a result, industry safety regulations and norms are being strengthened, and the level of facility safety requirements for customers and real users (i.e. workers) is continuously being enhanced. Hyundai Rotem's ECO-Plant Business Division reviews the possibility of accidents that may include fires, falls, stenosis or electric shock, all of which are serious accidents that can occur in facilities and factories. It conducts safety evaluations according to customer requirements, and ensures, from the initial design stage, that safety design is applied to meet all of its customers' needs.

Safety design

Rail Solutions safety design policy

Hyundai Rotem supplies various types of rolling stock, including electric multiple units, high speed trains, light rail vehicles, trams, locomotives and passenger coaches to 38 countries around the world. As a global and comprehensive rolling stock company, Hyundai Rotem has established and implemented its own System Safety Assurance Practice Guide (S.RMS-D324) to meet the requirements of the Korean Railway Safety Act, as well as both domestic and international rolling stock safety standards.

Safety design scope

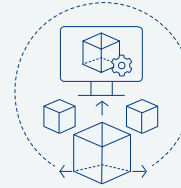
The scope of the safety design carried out by Hyundai Rotem takes into account all potential hazards that could harm passengers, crew and the general public, and respects the essential safety requirements defined in the Railway Safety Act's (Korea) *Technical Standards for Korean rail vehicles*, and/or any specific countries railway safety acts, dependent upon the vehicles operational location.

Vehicle gauge	Considering dynamic behavior in exterior design to avoid interference with facilities where the vehicles will operate.
Safe operation	Designing vehicles so that driving safety factors, such as wheel load, derailment factors and wheel lateral pressure, are managed within acceptable limits. Assuring the safety of the occupants by designing the vehicle with sufficient body rigidity in consideration of collision accidents and energy absorption.
Fire safety	Considering the minimization of fire factors, prevention of fire propagation and rapid evacuation in case of fire in the design.
Electrical safety	Designing vehicles that consider insulation distance, electric shock protection and grounding, malfunction prevention, redundancy control and suppression of electromagnetic induced disturbance.
Risk analysis	Ensuring that potential risk factors, including in relation to vehicle gauge, safe operation, crashworthiness, fire safety and electrical safety, are registered in the hazard logs, and that the results of risk analyses and the applicability of established safety measures are verified.

Product and service safety & quality

[CASE]

Strengthening the safety and quality of products and services



Use of realistic technologies: Virtual and augmented reality

To enhance the safety and quality of products and services, we utilize virtual Reality (VR) and Augmented Reality (AR) in the design and production stages to increase design accuracy and verification efficiency. Digital mock-up, in particular, uses VR technology to model the interior and exterior of the train in a virtual environment, allowing the user to see the interior design before the train is even built. The use of VR technologies enable closer collaboration in design and production, and contribute to improving the quality of the vehicles, including manufacturing, maintenance convenience and safety.

We have also introduced AR technology in the field of training for operators and maintenance personnel for subjects such as status diagnosis information, failure measures and preventive inspection methods, as well as maintenance manuals in real-time. Maintenance personnel training is conducted using AR technology to support learning such as maintenance and repair of difficult-to-access areas, for example the underframe and roof elements of the train. In addition, the driver simulator with AR technology allows driver training so that they can learn how to operate the train without having to board the actual vehicle.



Product and service safety & quality

Product safety assessment

Conducting product safety assessments by business sector

Obtaining independent safety assessment (ISA) certification for railway systems

By applying the ISA certification, we are able to minimize defects that might be associated with human error in safety analysis. Independent safety assessment refers to a system in which an independent and professional institution evaluates the integrated safety of the entire vehicle, including all safety-related parts such as signaling systems, brakes and vehicle doors, in accordance with international railroad safety standards.

In 2021, Hyundai Rotem's Rail Solutions Division received Korea's first ever vehicle safety certification. In addition, the United Kingdom Accreditation Service awarded Hyundai Rotem certification for ISO 17020. A total of 16 safety verifications were prepared to obtain certification, as well as to perform various safety management activities. As such, we have proven our safety management capability for the complete vehicle unit.

In addition, the Korean Minister of Land, Infrastructure and Transport has formally approved Hyundai Rotem's design of rolling stock vehicles in accordance with Article 26 of the "Railway Safety Act" and Article 48 of the Enforcement Rules of the same act. Furthermore, Hyundai Rotem vehicles are designed in compliance with the safety requirements stipulated by international standards, with the verification data submitted to the relevant inspection agencies for confirmation of the suitability of the design. Moreover, evaluations of hazard logs, safety integrity levels and safety cases are carried out to improve product safety.

Safety evaluation of plant industrial facilities

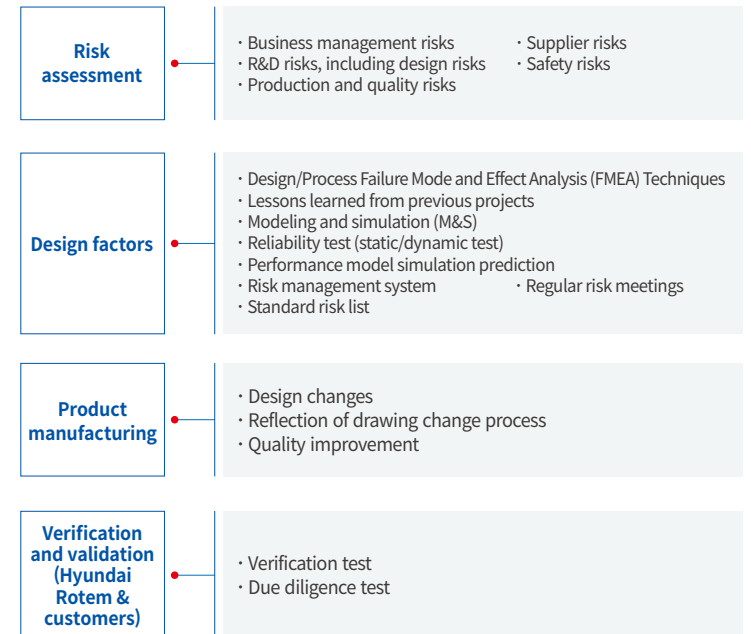
Automotive part production and assembly facilities in the ECO-Plant Business Division are also evaluated by the International Testing and Certification Authority (TUV) in accordance with Council Directive 2006/42/EC, the European Union directive for safety verification of specific parts of the machine. These facilities also meet customer safety requirements, including ISO or National Fire Protection Association specifications.

Developing competency: International evaluation certification

In 2020, the Defense Solutions Division acquired a level 4 international accredited certificate, a "high maturity level" from the Capability Maturity Model Integration (CMMI). CMMI certification is an international accredited indicator of an organization's performance process maturity and project performance. It is based on an organizational process improvement and evaluation model developed by the Software Engineering Institute of the Carnegie Mellon University in the United States. Level 4 refers to the maturity stage of an organization where project activities are quantitatively managed and controlled, and performance is predictable.

Based on CMMI certification, our R&D processes prevent possible safety problems, and we improve product safety through process and product quality assurance activities and through step-by-step testing. Risk management is embedded in the product design, and we conduct further testing on our own and with our customers to validate product safety.

CMMI safety and risk assessment



Economic value creation and distribution



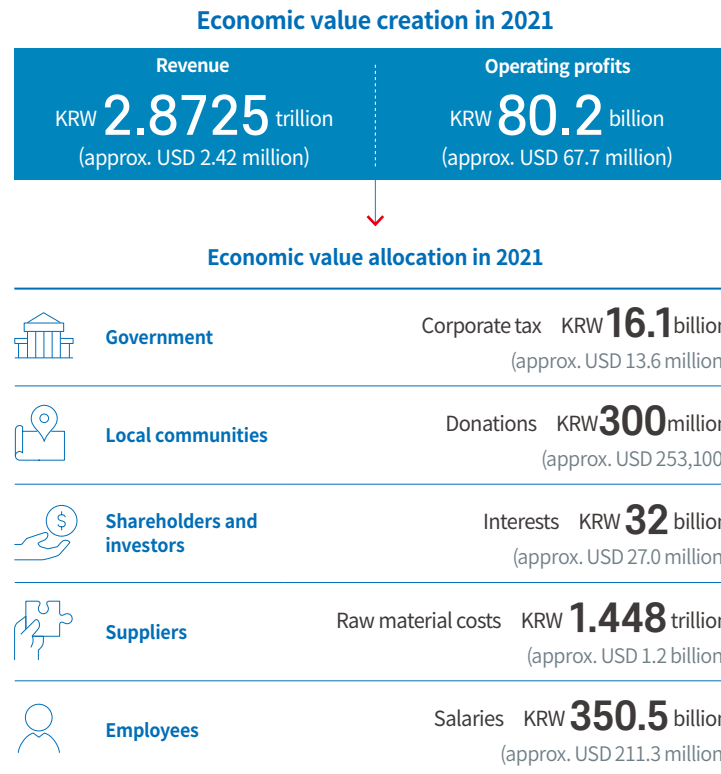
3.1%

Revenue growth (compared to 2020, consolidated basis)

Creating sustainable economic value

Economic value creation and distribution

As of 2021, Hyundai Rotem recorded KRW 2.8725 trillion (approx. USD 2.42 billion) in sales, up 3.1% year-on-year, realizing a net profit surplus for the second consecutive year. Hyundai Rotem distributes the economic value created to stakeholders, including its shareholders and investors, government, communities, suppliers, and employees, and it is striving to continue growing as a company with its stakeholders.



Hyundai Rotem's economic value creation in 2021

Despite the stagnant market situation resulting from the continued spread of COVID-19, we recorded steady growth over the year 2021, with increasing sales as a result of expanding production for overseas projects in the Rail Solutions Division and orders in the Defense Solutions Division.

The Rail Solutions Division achieved 15% year-on-year sales growth thanks to the steady production of domestic Korail and Taiwan Railways Administration (TRA) electric multiple units, along with orders for electric multiple units and electric locomotives from Tanzania and Edmonton trams in Canada. In addition, we launched developments for the hydrogen electric trams concept car and a demonstration project to pave the way for sustainable growth in the future.

The Defense Solutions Division is showing a 9% increase in sales compared to the previous year given the new contract for K-series depot maintenance, along with the new contract for the creation of K2 tanks. It is expected that sales will continue to increase in future with the launch of a pilot operation of multi-purpose unmanned ground vehicles.

The ECO-Plant Business Division is experiencing slow growth across the plant industry as COVID-19 impacts reduce corporate infrastructure investment. As a result, new orders for domestic and foreign plants have decreased, but new opportunities are being sought after the successful performance of the AGV Plant 1, and the introduction of a coke dry quenching system at the Hyundai Steel Dangjin Plant.

Inclusive prosperity

Code of conduct for suppliers

Ethics

- Transparency and anti-corruption
- Conflicts of interest
- Information protection
- Physical and intellectual property rights

Labor/human rights

- Non-discrimination
- Wages and benefits
- Prohibition of forced labor
- Prohibition of child labor

Safety/health

- Safe management of machines, equipment and tools
- Occupational Health and Safety Management System
- Safety inspections

Environment

- Compliance with environmental laws and regulations
- Management of energy consumption, greenhouse gas emissions, water resources, air pollutants, waste and chemical substances

Support for inclusive prosperity

Current status and code of conduct of suppliers

Our suppliers are categorized according to whether they are primary or general trading companies, taking into account the possibility of replacement parts, the proportion of transactions and core technologies. All suppliers who have provided goods or services to Hyundai Rotem or have signed contracts for other transactions observe a code of conduct. The code of conduct requires thorough compliance with laws and regulations applicable to corporate management activities and best operating practices in the fields of ethics, labor/human rights, safety, health, environment and management systems.

We have created economic value amounting to KRW 29.5 billion (approx. USD 24.9 million) through the development of new technologies and through partnerships with overseas businesses in the establishment of a sustainable supply chain. The growth and development of our suppliers lead to our own growth, and so we strive to create a virtuous cycle that links the growth of our suppliers and the growth of Hyundai Rotem.

Current status of suppliers in 2021 (unit: number of suppliers, KRW 100 million)

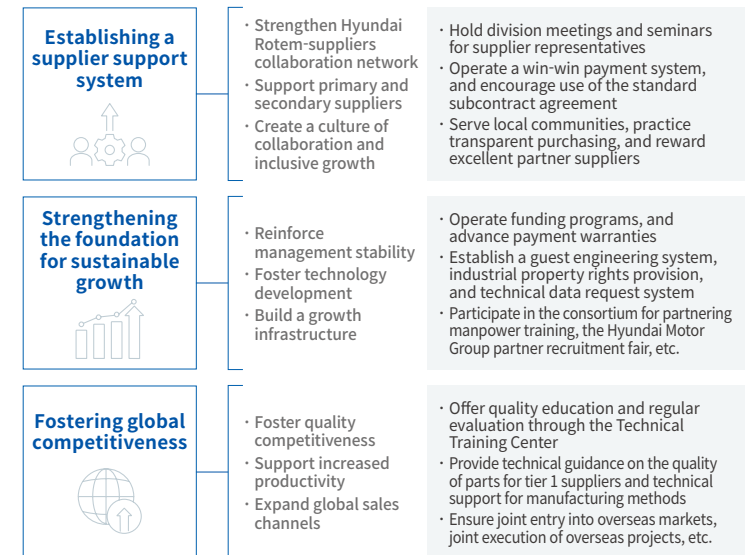
Classification	Number of suppliers			Transaction amount		
	Primary transaction	General transaction	Total	Primary transaction	General transaction	Total
Domestic	153	1,042	1,195	8,431	6,055	14,486
Overseas	51	349	400	596	4,755	5,351
Total	204	1,391	1,595	9,027	10,810	19,837

Strengthen the competitiveness of suppliers

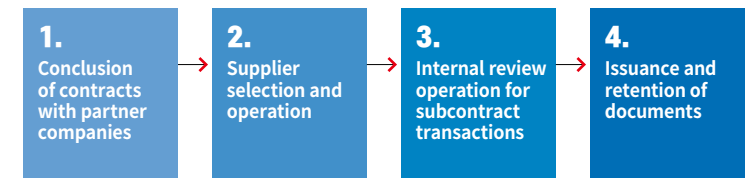
Inclusive prosperity program

We distribute four guidelines, as shown in the figure below, concerning the subcontracting of transactions to our suppliers, and we help to ensure continued growth through financial, technology and education support and communication. By developing different programs, we plan to continue strengthening the competitiveness of our suppliers.

Supplier support system



Hyundai Rotem's four guidelines for subcontracting transactions

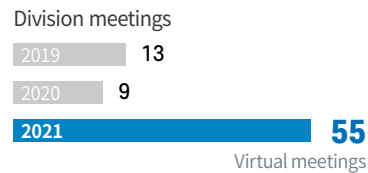


* Detailed information on Hyundai Rotem's four guidelines for subcontracting can be found on the Hyundai Rotem website.

Inclusive prosperity



Regular consultation channel for partner companies
(unit: number of meetings)



Supporting our suppliers

Financial support

The aim of financial support to our suppliers is to help them create capabilities in sustainable management and strengthen their competitiveness. Suppliers use these funds for their operation costs and for the purchase of machines and equipment.

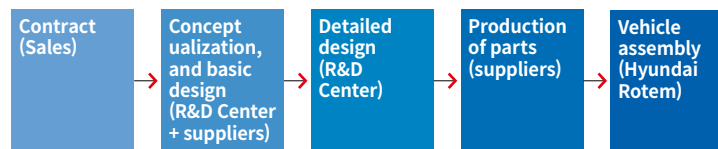
Financial support status (unit: KRW 100 million)

Classification	2019	2020	2021	Description
Direct support	30	30	57	Direct loans for suppliers
Indirect support (Win-win fund)	30	30	95	Deposits (fund development) for the financial support of suppliers through a loan institution: Industrial Bank of Korea, IBK

Technical support

Our technical support goes beyond helping our suppliers to improve design quality, and includes securing design technologies, improving research capabilities and reducing development costs. In 2021, a total of 278 projects were carried out through the guest engineering system.

Guest engineering system process



Educational support

With the advent of a fourth industrial revolution, the demand for new technologies, such as the Internet of Things (IoT), big data and artificial intelligence (AI), continues to grow. To meet this market demand, we have created a training course to develop the vocational skills tailored to the needs of small and medium enterprises (SMEs), in cooperation with the Consortium for HRD Ability Magnified Program (CHAMP), a national human resource development consortium in Korea. Our training is systematic, and we are devising curriculums that are in line with changes in the market.

In addition, the Hyundai Rotem Technical Training Center operates courses in design, machinery, electricity, and quality & production in cooperation with the Ministry of Employment and Labor and the Korea Industrial Manpower Corporation. In 2021, we provided training to a total of 3,627 people among our suppliers. With an overall score of 98.78 points in the performance evaluation of CHAMP in 2020, we ranked first in the country, and we were selected as the best-rated (A-rated) institution for six consecutive years in Korea.

Creating jobs for suppliers

A total of 14 recruitment fairs for suppliers were held in 2021; we also supported the recruitment of 25 persons by our suppliers through the Hyundai Motor Group recruitment fairs, as well as training at the Technical Training Center. We support job creation for suppliers by hiring SME representatives participating in training at the Korea Institute of Technology Education and through recruitment that takes place via i-ONE JOB, a job platform initiated by the Industrial Bank of Korea (IBK) and Hyundai Rotem.

Strengthening communication with business suppliers

Enabling communication with suppliers

Suppliers have access to multiple communication channels, such as regular consultation channels, complaint handling processes and dispute settlement councils. Suppliers receive training on fair and transparent management as they are encouraged to signal any issue or suggest proposals for improvement. Every year, we communicate with our suppliers through seminars for representatives of suppliers and division meetings for regional suppliers. In addition, if a complaint is received through the complaint handling process or through the cyber reporting system, the Dispute Review Council is convened within three days of the complaint, if deemed necessary. The Dispute Review Council investigates the facts, shares the results with the relevant divisions and reports the results directly to the CEO. In addition, the dispute settlement plan derived through the Dispute Review Council is presented to the suppliers, and if the suppliers do not accept the settlement plan, assistance is requested from related agencies, such as the Fair Trade Adjustment Institute, in order to resolve the dispute to everyone's satisfaction.

Number of complaints filed by suppliers

Classification	2019		2020		2021	
	Cases	Resolved cases	Cases	Resolved cases	Cases	Resolved cases
Division meetings	56	16	52	4	36	17

Appendix

Factbook	82	Stakeholder engagement	100
Global Reporting Initiative Index (GRI Index)	91	External initiatives	101
Sustainability Accounting Standards Board (SASB Index)	94	Third party verification statement	102
Materiality assessment	98	Greenhouse gas emissions verification statement	104

Fact book

Organization status

Classification		Unit	2019	2020	2021	Remarks
Organization						
Business sites	Domestic	Number	3	3	3	
	Overseas	Number	15	15	22	
	Total	Number	18	18	25	
Shareholders						
Shareholder composition	Hyundai Motor Company	Shares	36,852,432	36,852,432	36,852,432	
	National Pension Service of Korea	Shares	3,811,092	5,502,839	6,015,301	
	Individuals and others	Shares	38,550,089	57,317,228	58,349,559	
	Institutional investors	Shares	2,781,306	3,873,751	3,297,629	
	Foreign investors	Shares	2,902,040	5,565,162	4,610,007	
	Treasury stock	Shares	-	-	-	
	Employee Stock Ownership Association	Shares	103,041	30,881	17,365	
Total	Shares	85,000,000	109,142,293	109,142,293		

Classification		Unit	2019	2020	2021	Remarks	
Employment status							
Total number of employees			Person	3,588	3,426	3,455	
Employment by gender	Domestic	Male	Person	3,456	3,292	3,329	Individuals in an employment relationship with the organization under national law (as of December 2021).
		Female	Person	86	94	93	
	Overseas	Male	Person	46	40	33	
		Female	Person	-	-	-	
	Total	Male	Person	3,502	3,332	3,362	
		Female	Person	86	94	93	
Ratio of female employees			%	2.4	2.7	2.7	
Employment by workplace	Domestic	Uiwang	Person	1,471	1,375	1,417	
		Changwon	Person	1,855	1,825	1,835	
		Dangjin	Person	216	186	170	
	Overseas	Person	46	40	33		
Gender breakdown of employees by contract type	Permanent	Male	Person	3,354	3,116	3,228	Individuals in an employment relationship with the organization under national law (as of December 2021).
		Female	Person	56	58	64	
		Subtotal	Person	3,410	3,174	3,292	
	Contractual	Male	Person	148	216	134	
		Female	Person	30	36	29	
		Subtotal	Person	178	252	163	
	Full-time	Male	Person	3,501	3,331	3,361	
		Female	Person	83	92	91	
		Subtotal	Person	3,584	3,423	3,452	
	Part-time	Male	Person	1	1	1	
Female		Person	3	2	2		
Subtotal		Person	4	3	3		

Suppliers							
Total number of suppliers managed by the organization			Number of companies	204	204	204	Primary trading company
Total number of suppliers in the entire supply chain			Number of companies	1,623	1,589	1,595	Primary trading companies and general transactions
Value of financial support provided to suppliers (down payment)			KRW 100 million	17,540	19,192	19,837	Based on payment

Fact book

Governance

Classification		Unit	2019	2020	2021	Remarks
Board structure and activities						
Board of Directors	Inside director	Person	3	3	3	
	Outside director	Person	4	4	4	
	Subtotal	Person	7	7	7	
Board diversity	Male	Person	7	7	7	
	Female	Person	-	-	-	
Board efficiency	Average attendance rate	%	94	89	100	
	Minimum attendance rate	%	78	63	100	
	Average attendance rate of outside directors	%	100	100	100	
Number of Board meetings	Times	9	8	9		
CEO and employee remuneration						
CEO remuneration		KRW	604,573,206	880,550,000	1,119,000,000	Total annual compensation
Employee remuneration	Compensation for all employees except CEO	KRW	85,201,348	86,046,971	90,689,942	Average salary per person
	Percentage of CEO remuneration in total executives and employees (excluding CEO)	%	0.19	0.29	0.35	
Code of Conduct and training on ethics and compliance						
Application of the Code of Conduct	Board members	%	100	100	100	
	Employees	%	100	100	100	
	Primary supplier	%	-	-	100	Key suppliers
	Secondary supplier	%	-	-	63	
Percentage of employees who have completed ethics/compliance management training	Fair trade training	%	43	19	84	
	Anti-corruption training	%	26	3	16	
Total training hours for ethics/compliance management	Hours	12	7	8		
Ethics/compliance management evaluation and report of violations/actions						
Internal/external reporting system	Violations reported	Cases	9	10	5	
	Percentage of violations processed	%	87.5	88.9	100	Two reports received (one case in 2019 and one case in 2020) have not been processed for reasons of personal privacy and for fact-checking.
Completion of disciplinary action, etc.	Person	2	5	55		

Environment

Classification		Unit	2019	2020	2021	Remarks
Scope 1, 2 GHG emissions						
Changwon Plant	Scope 1 emissions	tCO ₂ eq	7,607	7,663	7,374	
	Scope 2 emissions	tCO ₂ eq	12,701	14,125	13,109	
	Subtotal	tCO ₂ eq	20,308	21,788	20,483	
Dangjin Plant	Scope 1 emissions	tCO ₂ eq	1,701	1,870	1,190	
	Scope 2 emissions	tCO ₂ eq	2,861	2,845	2,183	
	Subtotal	tCO ₂ eq	4,562	4,715	3,373	
Total (domestic)	Total scope 1 emissions	tCO ₂ eq	9,308	9,533	8,564	GHG emissions from energy combustion and industrial processes: gas fuel combustion, liquid fuel combustion and mobile combustion
	Total scope 2 emissions	tCO ₂ eq	15,562	16,970	15,292	GHG emissions indirectly emitted by electricity, steam, etc. (purchased externally, for example the use of external electricity)
	Total	tCO ₂ eq	24,870	26,503	23,856	
Scope 1, 2 GHG management						
GHG management performance per unit	Revenue*	KRW billion	2,230	2,677	2,814	
	GHG emissions	tCO ₂ eq	24,870	26,503	23,856	
	GHG emissions per unit	tCO ₂ eq/ KRW billion	11.2	9.9	8.5	
	GHG reduction per unit	%	-27.1	-11.2	-14.2	
	Three-year average GHG reduction per unit	%	-17.5			
Scope 3 GHG emissions						
Scope 3 emissions (domestic)	Business trip by employees	tCO ₂ eq	-	-	3,466	Scope 3 GHG emissions (first estimation in 2021)
	Commuting by employees	tCO ₂ eq	-	-	6,290	
	Shipment of products	tCO ₂ eq	-	-	61,913	
	Transportation of products (incoming)	tCO ₂ eq	-	-	21,887	
	Total	tCO ₂ eq	-	-	93,556	

* Based on revenue (non-consolidated basis) from the Annual Report.

Fact book

Environment

Classification		Unit	2019	2020	2021	Remarks
Energy consumption						
Changwon Plant	Direct energy	LNG	TJ	131.59	131.84	124.77
		Diesel	TJ	10.93	11.17	11.49
		Gasoline	TJ	0.29	0.29	0.23
		Kerosene	TJ	1.04	1.07	0.69
	Indirect energy	Electricity	TJ	261.51	290.84	273.94
	Subtotal	TJ	405.36	435.21	411.11	
		TOE	9,710	10,354	9,840	
Dangjin Plant	Direct energy	LNG	TJ	16.81	21.73	18.04
		Diesel	TJ	0.25	0.19	0.14
		Gasoline	TJ	-	-	0.02
	Indirect energy	Electricity	TJ	58.91	58.58	45.61
	Subtotal	TJ	75.96	80.50	63.81	
		TOE	1,807	1,920	1,514	
Total		TJ	481.32	515.71	474.93	
		TOE	11,517	12,274	11,354	
Energy management						
Energy management performance per unit	Revenue*	KRW billion	2,230	2,677	2,814	
	Energy use per unit	TJ/KRW billion	0.22	0.19	0.17	
	Energy reduction per unit	%	0.5	-10.7	-12.4	
	Three-year average energy reduction per unit	%		-7.5		

* Based on revenue (non-consolidated basis) from the Annual Report.

Classification		Unit	2019	2020	2021	Remarks
Total water intake and usage by source						
Changwon Plant	Industrial water	Ton	-	-	-	
	Residential water	Ton	389,039	436,575	400,528	
	Groundwater	Ton	-	-	-	
	Sewage use water	Ton	-	-	-	
	Subtotal	Ton	389,039	436,575	400,528	
Dangjin Plant	Industrial water	Ton	-	-	-	
	Residential water	Ton	16,034	16,700	16,022	
	Groundwater	Ton	-	-	-	
	Sewage use water	Ton	-	-	-	
Subtotal	Ton	16,034	16,700	16,022		
Total	Ton	405,073	453,275	416,550		
Water management						
Water management performance per unit	Revenue*	KRW billion	2,230	2,677	2,814	
	Water use per unit	Ton/KRW billion	181.7	169.3	148.0	
	Water reduction per unit	%	-13.1	-6.8	-12.6	
	Three-year average water reduction per unit	%		-10.8		

* Based on revenue (non-consolidated basis) from the Annual Report.

Fact book

Environment

Classification		Unit	2019	2020	2021	Remarks
Waste emissions and recycling rates						
Changwon Plant	Hazardous waste	Disposal	Ton	102	127	109
		Recycle	Ton	321	288	340
	General waste	Incineration	Ton	1,199	1,467	1,465
		Landfill	Ton	94	98	125
		Recycle	Ton	1,281	1,613	1,809
	Waste subtotal		Ton	2,997	3,593	3,848
	Waste recycled subtotal		Ton	1,602	1,901	2,149
	Recycling rate		%	53.5	52.9	55.9
Dangjin Plant	Hazardous waste	Disposal	Ton	83	57	24
		Recycle	Ton	22	43	8
	General waste	Incineration	Ton	113	122	87
		Landfill	Ton	-	-	7
		Recycle	Ton	286	529	360
	Sales of scrap iron		Ton	405	319	115
	Waste subtotal		Ton	909	1,070	601
	Recycling subtotal		Ton	309	572	368
Recycling rate		%	34.0	53.5	61.2	
Waste total		Ton	3,906	4,663	4,449	
Waste recycled total		Ton	1,911	2,473	2,517	
Waste management						
Waste management performance per unit	Revenue*		KRW billion	2,230	2,677	2,814
	Waste use per unit		Ton/KRW billion	1.75	1.74	1.58
	Waste reduction per unit		%	36.7	-0.6	-9.2
	Three-year average waste reduction per unit		%	9.0		

* Based on Revenue (non-consolidated basis) from the Annual Report

Classification		Unit	2019	2020	2021	Remarks
Raw material usage						
LNG		km ³	3,018	3,024	2,895	
LPG		Ton	3	3	6	
Kerosene		Kiloliter (kℓ)	28	29	19	
Gasoline		kℓ	9	9	7	
Diesel		kℓ	290	296	304	
* Raw material usage is calculated based on Changwon Plant						
Air pollutant emissions						
Changwon Plant	NOx	kg/yr	81	104	1,606	NOx legal acceptance criteria: 83.3 ppm*
		ppm	9.6	7.5	20.9	
	SOx	kg/yr	-	-	117	SOx legal acceptance criteria: 52.5 ppm*
		ppm	-	-	9.6	
	Dust	kg/yr	7,924	3,257	3,499	Dust legal acceptance criteria: 30 (mg/m ³)
		mg/m ³	3.2	1.7	1.5	
Dangjin Plant	Dust	kg/yr	1,435	759	616	

* The NOx and SOx legal acceptance standards vary by facility and are recorded as average values.

Fact book

Environment

Classification	Unit	2019	2020	2021	Remarks	
Water pollutant emissions						
Changwon Plant	BOD	kg/yr	-	-	-	BOD is not included in the pollutant items registered in the wastewater discharge facility permit, and thus it has not been measured to date. * biochemical oxygen demand (BOD)
	COD	kg/yr	512.3	349.2	317.1	COD legal acceptance criteria: 130 ppm
		ppm	24.4	15.1	22.3	
	SS	kg/yr	172.6	140.3	128.0	SS legal acceptance criteria: 120 ppm
		ppm	8.2	6.1	9.0	
	T-N	kg/yr	200.2	158.3	185.3	Total nitrogen (TN)
T-P	kg/yr	6.7	22.9	2.6	Total phosphorus (TP)	
Percentage of green product sales						
High speed trains and electric vehicles	%	47	46	48		
Third party green certified products	%	9	19	19		

Classification	Unit	2019	2020	2021	Remarks	
Green investment						
Research investment (state-led projects)	Planned	Amount	KRW 100 million	3.1	22.1	75.3
		Number of tasks	Number	2	3	8
	Executed	Amount	KRW 100 million	3.9	7.6	31.9
		Number of tasks	Number	4	4	9
Research investment (Hyundai Rotem-led projects)	Planned	Amount	KRW 100 million	50.5	87.5	33.0
		Number of tasks	Number	13	11	13
	Executed	Amount	KRW 100 million	42.6	71.1	90.7
		Number of tasks	Number	15	12	16
Current investments in facilities	Planned	Amount	KRW 100 million	25.7	32.8	41.1
		Number of tasks	Number	6	8	9
	Executed	Amount	KRW 100 million	23.2	42.0	42.6
		Number of tasks	Number	8	9	11
Total	Planned	Amount	KRW 100 million	79.3	142.4	149.4
		Number of tasks	Number	21	22	30
	Executed	Amount	KRW 100 million	69.7	120.7	165.2
		Number of tasks	Number	27	25	36

Green product purchased performance						
Purchase	Purchase of green IT products	KRW 100 million	17.0	14.1	13.8	ENERGY STAR-certified IT devices, product purchases
	Purchase of green parts	KRW 100 million	0.1	-	16.4	Green certified parts
Total		KRW 100 million	17.1	14.1	30.2	

Environmental training						
Total number of training sessions		Number	2	3	4	
Total number of employees participating in training		Person	1,866	1,775	1,899	

Fact book

Social

Classification		Unit	2019	2020	2021	Remarks	
Recruitment of new employees							
By age	20s and below	Person	205	81	100		
	30s	Person	47	21	107		
	40s	Person	6	5	23		
	50s	Person	5	19	7		
	Over 60	Person	-	-	3		
	Total	Person	263	126	240		
By gender	Male	Person	245	111	224		
	Female	Person	18	15	16		
	Total	Person	263	126	240		
By location	Uiwang	Person	67	37	105		
	Changwon	Person	193	89	135		
	Dangjin	Person	3	-	-		
	Total	Person	263	126	240		
By position	Office workers	New	Person	50	-	60	G1 and G0 positions among new hires in 2021
		Experienced	Person	76	95	75	
	Technicians	New	Person	141	35	105	
		Experienced	Person	-	-	-	

Classification		Unit	2019	2020	2021	Remarks
Employee turnover status						
By age	20s and below	Person	20	24	30	
	30s	Person	42	32	54	
	40s	Person	15	31	24	
	50s	Person	66	82	11	
	Over 60	Person	-	-	115	
	Total	Person	143	169	234	
By gender	Male	Person	134	160	217	
	Female	Person	9	9	17	
	Total	Person	143	169	234	
By location	Uiwang	Person	78	106	85	
	Changwon	Person	45	51	140	
	Dangjin	Person	20	12	9	
	Total	Person	143	169	234	
Total employee turnover rate		%	4.0	5.0	6.8	
Voluntary turnover		Person	65	64	59	Dismissals, retirement, termination of service, and voluntary termination are included
		%	45.5	37.9	25.2	
Average years of employment		Year	17.8	17.3	16.4	

Compensation system

Number of pension support subscribers	Defined Benefit Plan (DB)	Person	3,588	3,426	3,455
	Defined Contribution Plan (DC)	Person	-	-	-
Stock ownership status of the Employee Stock Ownership Association	Number of shares owned	Shares	103,041	30,881	17,365
	Shareholding ratio	%	0.12	0.03	0.02
	Depository institution	%	-	-	-

Fact book

Social

Classification		Unit	2019	2020	2021	Remarks	
Employee diversity status							
Female	Total female employees	Person	86	94	93		
	Percentage of female employees in total workforce	%	2.4	2.7	2.7		
	Female Managers by position	Manager	Person	10	10	14	Senior Manager
		Low level manager	Person	65	71	67	Manager
		Revenue-generating department	Person	26	26	28	Rail Solutions, Defense Solutions and ECO-Plant Business Division
STEM position	Person	19	22	24	STEM: Science, technology, engineering and mathematics		
Impairments	Personnel	Person	132	131	122		
	Ratio	%	3.7	3.8	3.5		
Veterans	Personnel	Person	92	112	112		
	Ratio	%	2.6	3.3	3.2		
Labor union*							
Percentage of employees in trade unions and collective bargaining	Number of employees with labor union membership	Person	1,346	1,274	1,307	With the exception of technical staff	
	Number of employees eligible for labor union membership	Person	2,133	2,032	1,880		
	Labor union membership rate	%	63.1	62.7	69.5		
* Labor union subscription applies to employees at G2 level or lower (excluding some employees).							
Employee satisfaction survey							
Satisfaction survey	Participation rate	%	86.8	85.3	80.0	Results of the diagnosis of the organizational culture	
	Number of participants	Person	1,673	1,548	1,460		
	Average score	Score	62.7	67.6	69.7		
Training for employees							
Average training hours per person	Hours	29.6	24.1	26.6	Total training hours/total number of employees		
Average training costs per person	KRW	242,056	133,455	237,524	ERP and total end-of-year training costs/total number of employees		
Total number of employees participating in training	Person	1,895	1,797	1,817	e-Campus		
Total training hours	Hours	106,097	82,652	91,879			
Total training costs	KRW	868,495,688	457,217,891	820,645,799			

Classification		Unit	2019	2020	2021	Remarks
Number of persons who have completed training on human rights policies and procedures						
Training hours	Hours		1	1	1	Education data to improve disability awareness
Number of trainees	Person		3,588	3,426	3,455	
Percentage of employees who completed training	%		100	100	100	
Safety						
Industrial accident	Number of cases	Cases	15	14	11	Based on confirmed cases by the state
	Occurrence rate	%	0.24	0.17	0.11	Based on the confirmation letter from the Korea Occupational Safety & Health Agency attesting to the company's industrial accident rate
LTIFR	Permanent	Number/1 million working hours	1.77	1.72	1.35	Number of work loss accidents x 1 million/total working hours
	Contractual	Number/1 million working hours	-	-	-	
TRIFR	Permanent	Number/1 million working hours	1.77	1.72	1.35	Number of industrial accidents x 1 million/total working hours
	Contractual	Number/1 million working hours	-	-	-	
TRIR	Permanent	Number/1 million working hours	1.77	1.72	1.35	Number of incidents x 1 million/total working hours
	Contractual	Number/1 million working hours	-	-	-	
Industrial accident mortality rate	Permanent	%	-	-	-	
	Contractual	%	-	-	-	
Total working hours	Hours	8,611,200	8,222,400	8,292,000		
Number of work-related fatalities	Employees	Person	-	-	-	
	Suppliers	Person	-	-	-	
	Ratio	%	-	-	-	

* LTIFR = lost time injury frequency rate; TRIFR = total recordable injury frequency rate; and TRIR = total recordable incident rate.

Fact book

Social

Classification	Unit	2019	2020	2021	Remarks		
Parental leave							
Number of employees on parental leave	Person	8	7	14			
Number of employees returning to work after parental leave	Person	11	4	1			
Number of employees who have worked more than one year since returning to work after parental leave	Person	9	2	1			
Regular performance evaluation							
Employees subject to regular performance evaluation and career development evaluation	Person	3,413	3,324	3,331	Those excluded from the evaluation include employees who joined the company mid-year and those who have been on leave for more than six months.		
Percentage of employees subject to regular performance evaluation and career development evaluation	%	95.1	97.0	96.4			
Social impact-related complaints received through the grievance mechanism*							
Number of social impact related grievances	Cases	20	27	29			
Number of complaints being processed	Cases	-	-	-			
Number of complaints resolved	Cases	20	27	29			
* Based on the agenda items of the regular Labor-Management meetings.							
Investment and participation in CSR activities							
Socially responsible investment	CSR Expenses	KRW million	110	117	273	Determined as the total amount of social contribution-related expenses, including company donations, social contribution funds, in-kind resources, etc.	
Participation in CSR activities	Number of people participating	Service	Person	1,450	962	641	Including duplicate personnel
		Contributions	Person	658	1,442	1,456	
	Total hours of participation	Hours	7,344	2,716	1,700	Volunteer work hours	
Contributions to sales*		%	0.004	0.004	0.010		
Input cost of CSR activities	Cash donations	Rate of charitable donations	%	68.2	72.6	74.3	
		Rate of community donations	%	31.8	27.4	25.7	
		Total cash donations	KRW million	108	115	273	
	In-kind donations	KRW million	2	2	-		

* Based on Revenue (non-consolidated basis) from the Annual Report

Classification	Unit	2019	2020	2021	Remarks	
Customer satisfaction measurement						
Satisfied customers among the number of customers who answered the survey	Rail Solutions	Score	73	72	80	Results of customer satisfaction survey by year.
	Defense Solutions	Score	81	83	83	
	ECO-Plant Business	Score	72	-	-	
Rate of response to total number of customers	Rail Solutions	% (person/person)	75(325/434)	95(38/40)	66(173/261)	
	Defense Solutions	% (person/person)	38(125/333)	43(168/389)	33(98/320)	
	ECO-Plant Business	% (person/person)	36(33/92)	-	-	
Information and cyber security						
Number of information security violations, cybersecurity and customer privacy incidents	Cases	-	-	-	No occurrences	
Number of customers affected by information security issues	Person	-	-	-		
Primary trading suppliers who conducted regular evaluations						
Primary trading suppliers	Periodic assessment* of target suppliers	Number of suppliers	168	146	167	Selection of evaluation targets based on the management procedures for the evaluation of suppliers

* Some of the sustainable management items, such as safety, are included in the regular evaluation.

Fact book

Economic

Classification	Unit	2019	2020	2021	Remarks
R&D investment					
R&D cost	KRW million	110,700	104,924	103,540	
Number of R&D positions	Person	748	677	712	Number of employees
R&D cost to sales*	%	4.9	3.9	3.7	
Korean government-funded R&D					
Government subsidies	KRW 100 million	591.4	358.0	309.5	
* Based on Revenue (non-consolidated basis) from the Annual Report					
Financial status					
Asset	KRW billion	4,084	4,197	4,107	
Liabilities	KRW billion	3,201	2,851	2,839	
Equity	KRW billion	883	1,346	1,268	
Management performance					
Sales	KRW billion	2,459	2,785	2,873	
Sales (non-consolidated basis)	KRW billion	2,230	2,677	2,814	
Cost of sales	KRW billion	2,553	2,541	2,620	
Gross profit	KRW billion	-94	245	253	
Operating profit	KRW billion	-280	82	80	
Earnings before interest, taxes, depreciation and amortization (EBITDA)	KRW billion	-268	99	84	
Net income before corporate tax (loss)	KRW billion	-349	15	35	
Corporate tax expense (income)	KRW billion	6	-7	-16	
Net profit (loss)	KRW billion	-356	22	51	

Classification	Unit	2019	2020	2021	Remarks	
Creating and distributing economic value						
Distribution of economic value (consolidated basis)	Total amount of dividends	KRW billion	-	-	-	Shareholders and investors
	Interest expense	KRW billion	49	36	32	
	Employee salary	KRW billion	353	339	351	Employees
	Raw material cost	KRW billion	1,149	1,281	1,448	Suppliers
	Corporate tax	KRW billion	6	-7	-16	Government
	Donation	KRW billion	-	-	0.2	Communities
	Total	KRW billion	1,557	1,650	1,815	
	Distribution of economic value (non-consolidated basis)	Total amount of dividends	KRW billion	-	-	-
Interest expense		KRW billion	44	34	32	
Employee salaries		KRW billion	326	316	324	Employees
Raw material cost		KRW billion	1,149	1,273	1,453	Suppliers
Corporate tax		KRW billion	8	-14	-17	Government
Donation		KRW billion	-	-	0.2	Communities
Total		KRW billion	1,527	1,610	1,792	

Patent registration and application							
Number of patent registrations	Rail Solutions	Domestic	Cases	21	33	38	Recorded as the sum of patents, utility models, and designs.
		Overseas	Cases	-	-	1	
	Defense Solutions	Domestic	Cases	15	14	15	
		Overseas	Cases	-	1	-	
	ECO-Plant Business	Domestic	Cases	-	3	2	
		Overseas	Cases	-	-	-	
Number of patent applications	Rail Solutions	Domestic	Cases	43	57	55	
		Overseas	Cases	4	-	3	
	Defense Solutions	Domestic	Cases	19	21	40	
		Overseas	Cases	-	-	-	
	ECO-Plant Business	Domestic	Cases	-	2	1	
		Overseas	Cases	-	-	-	

Global Reporting Initiative Index (GRI Index)

1. Universal Standards

Topic	Index	Index description	Reporting page/ reference	Remarks
Organizational profile	102-1	Name of the organization	2	
	102-2	Activities, brands, products and services	8-11	
	102-3	Location of headquarters	7	
	102-4	Location of operations	7, 82	
	102-5	Ownership and legal form	7, 20	
	102-6	Markets served	8-11	
	102-7	Scale of the organization	7, 9-11, 82	
	102-8	Information on employees and other workers	56, 82	
	102-9	Supply chain	79, 82	
	102-10	Significant changes to the organization and its supply chain	-	Increase by one business establishment (enhancement of business operations in Southeast Asia).
	102-11	Precautionary principle or approach	27-28	
	102-12	External initiatives	91-97	
	102-13	Membership of associations	100-101	
Strategy	102-14	Statement from senior decision maker	4-5	
	102-15	Key impacts, risks and opportunities	27-28, 40-46	
Ethics and integrity	102-16	Values, principles, standards and norms of behavior	6, 21	
	102-17	Mechanisms for advice and concerns about ethics	21-24	
Governance	102-18	Governance structure	12, 17, 19, 25, 27, 29, 46, 83	
	102-21	Consulting stakeholders on economic, environmental and social topics	15-16, 19, 100	
	102-22	Composition of the highest governance body and its committees	17	
	102-24	Nominating and selecting the highest governance body	17	
	102-26	Role of highest governance body in setting purpose, values and strategy	18	
	102-27	Collective knowledge of highest governance body	18	
	102-29	Identifying and managing economic, environmental and social impacts	27-28	
	102-30	Effectiveness of risk management processes	12, 19, 40	
	102-35	Remuneration policies	18	
	102-36	Process for determining remuneration	18	
	102-38	Annual total compensation ratio	83	

Topic	Index	Index description	Reporting page/ reference	Remarks
Stakeholder engagement	102-40	List of stakeholder groups	100	
	102-41	Collective bargaining agreements	51, 85	
	102-42	Identifying and selecting stakeholders	100	
	102-43	Approach to stakeholder engagement	100	
	102-44	Key topics and concerns raised	100	
	102-45	Entities included in the consolidated financial statements	-	Disclosed in Annual Report
Reporting practice	102-46	Defining report content and topic boundaries	98-99	
	102-47	List of material topics	98-99	
	102-48	Restatements of information	-	No changes
	102-49	Changes in reporting	-	
	102-50	Reporting period	2	
	102-51	Date of most recent report	2	
	102-52	Reporting cycle	2	
	102-53	Contact point for questions regarding the report	2	
	102-54	Claims of reporting in accordance with the GRI standards	2	
	102-55	GRI content index	91-93	
	102-56	External assurance	102-104	

Global Reporting Initiative Index (GRI Index)

2. Topic Specific Standards–Material Topics

Topic	Index	Index description	Reporting page/ reference	Remarks
Organizational profile	102-11	Precautionary principle or approach	27-28	Same as universal standard indicators
Ethics and integrity	102-16	Values, principles, standards and norms of behavior	6	
	102-17	Mechanisms for advice and concerns about ethics	21-24	
Governance	102-18	Governance structure	12, 17, 19, 25, 27, 29, 46, 83	
	102-30	Effectiveness of risk management processes	12, 19, 40	
Economic performance	103	Management approach	68-73	Disclosed in Annual Report
	201-1	Direct economic value generated and distributed	78, 90	
	201-2	Financial implications and other risks and opportunities due to climate change	40-47	
	201-3	Defined benefit plan obligations and other retirement plans	87	
Energy	103	Management Approach	30-31	
	302-1	Energy consumption within the organization	39, 47, 84	
	302-3	Energy intensity	39, 47, 84	
Water	103	Management approach	30-31	
	303-3	Water recycled and reused	35, 84	
	303-4	Water discharge	35, 84	
	303-5	Water consumption	35, 84	
Emissions	103	Management approach	30-31	
	305-1	Direct (scope 1) GHG emissions	38, 47, 84	
	305-2	Energy indirect (scope 2) GHG emissions	38, 47, 84	
	305-4	GHG emissions intensity	38, 47, 84	
	305-5	Reduction of GHG emissions	38, 47, 84	
Employment	103	Management approach	48, 56	
	401-1	New employee hires and employee turnover	56, 87	

Topic	Index	Index description	Reporting page/ reference	Remarks
Occupational health and safety	103	Management approach	48-49	
	403-1	Occupational health and safety management system	49-55	
	403-2	Hazard identification, risk assessment and incident investigation	27-28, 54, 66	
	403-3	Occupational health services	52-55	
	403-4	Worker participation, consultation, and communication on occupational health and safety	51-53	
	403-5	Worker training on occupational health and safety	53-54	
	403-6	Promotion of worker health	53	
	403-7	Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	51-52	
	403-8	Workers covered by an occupational health and safety management system	52	
	403-9	Work-related injuries	54, 88	
Training and education	103	Management approach	48, 57	
	404-1	Average hours of training per year per employee	57	
	404-2	Programs for upgrading employee skills and transition assistance programs	57	
Local communities	103	Management approach	48, 62	
	413-1	Operations with local community engagement, impact assessments, and development programs	64	
Customer health and safety	103	Management approach	68, 74	
	416-1	Assessment of the health and safety impacts of product and service categories	74-77	
-	R&D	Product R&D	69-73, 90	

Global Reporting Initiative Index (GRI Index)

3. Topic Specific Standards–Non Material Topics

Topic	Index	Index description	Reporting page/ reference	Remarks
Economic performance	201-3	Defined benefit plan obligations and other retirement plans	87	
	201-4	Financial assistance received from government	90	
Anti-corruption	205-2	Communication and training about anti-corruption policies and procedures	21-23	
Materials	301-1	Materials used by weight or volume	37	
Water	303-4	Water discharge	35, 84	
	303-5	Water consumption	35, 84	
Biodiversity	304-2	Significant impacts of activities, products and services on biodiversity	35	
Emissions	305-7	NOx, SOx and other significant air emissions	36, 85	
Environmental compliance	307-1	Non-compliance with environmental laws and regulations	-	No cases of law violations
Employment	401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	58	
	401-3	Parental leave	58, 89	

Topic	Index	Index description	Reporting page/ reference	Remarks
Diversity and equal opportunity	405-1	Diversity of governance bodies and employees	17, 56, 88	
Non-discrimination	406-1	Incidents of discrimination and corrective actions taken	-	No incidents occurred
Rights of Indigenous Peoples	411-1	Incidents of violations involving rights of indigenous peoples	-	No cases of Indigenous rights violations occurred
Human rights assessment	412-2	Employee training on human rights policies or procedures	59-61, 88	
Marketing and labeling	417-2	Incidents of non-compliance concerning product and service information and labeling	-	No cases of violations
	417-3	Incidents of non-compliance concerning marketing communications	-	No violations of regulations related to marketing communications
Customer privacy	418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	-	No cases of customer privacy violations or loss of customer information

Sustainability Accounting Standards Board (SASB Index)

Industrial Machinery & Goods

Topic	Code	Accounting metric	Reporting page/ reference	Remarks																														
Energy management	RT-IG-130a.1	1) Total energy consumed; 2) percentage grid Electricity; and 3) percentage renewables	39, 47, 84	<table border="1"> <thead> <tr> <th colspan="2">Classification</th> <th>Unit</th> <th>2019</th> <th>2020</th> <th>2021</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Total energy consumption</td> <td>TJ</td> <td></td> <td>481.32</td> <td>515.71</td> <td>474.93</td> </tr> <tr> <td>TOE</td> <td></td> <td>11,517</td> <td>12,274</td> <td>11,354</td> </tr> <tr> <td>Percentage grid electricity</td> <td></td> <td>%</td> <td>100</td> <td>100</td> <td>100</td> </tr> <tr> <td>Percentage renewables</td> <td></td> <td>%</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table>	Classification		Unit	2019	2020	2021	Total energy consumption	TJ		481.32	515.71	474.93	TOE		11,517	12,274	11,354	Percentage grid electricity		%	100	100	100	Percentage renewables		%	-	-	-	
				Classification		Unit	2019	2020	2021																									
				Total energy consumption	TJ		481.32	515.71	474.93																									
					TOE		11,517	12,274	11,354																									
Percentage grid electricity		%	100	100	100																													
Percentage renewables		%	-	-	-																													
Employee health and safety	RT-IG-320a.1	1) TRIR; 2) fatality rate; and 3) near miss frequency rate (NMFR)	-	<table border="1"> <thead> <tr> <th colspan="2">Classification</th> <th>Unit</th> <th>2019</th> <th>2020</th> <th>2021</th> </tr> </thead> <tbody> <tr> <td rowspan="2">TRIR</td> <td>Permanent</td> <td>Number/1 million working hours</td> <td>1.77</td> <td>1.72</td> <td>1.35</td> </tr> </tbody> </table>	Classification		Unit	2019	2020	2021	TRIR	Permanent	Number/1 million working hours	1.77	1.72	1.35																		
				Classification		Unit	2019	2020	2021																									
TRIR	Permanent	Number/1 million working hours	1.77	1.72	1.35																													
	-				Not applicable																													
Fuel economy and emissions in use-phase	RT-IG-410a.1	Sales-weighted fleet fuel efficiency for medium- and heavy-duty vehicles	-	Not applicable																														
	RT-IG-410a.3	Sales-weighted fuel efficiency for stationary generators	-	Not applicable																														
Materials sourcing	RT-IG-440a.1	Description of the management of risks associated with the use of critical materials	-	Hyundai Rotem selects and works with suppliers before the official signing of the contract that Hyundai Rotem expects to win. In doing so, our suppliers have sufficient time to produce parts. We have a checklist that tracks imported materials and the production update of parts so that we can manage the availability of parts in a pro-active manner. External factors, including COVID-19, can affect supplies, production and transportation, and therefore we work to manage these issues before they may arise.																														
Remanufacturing design and services	RT-IG-440b.1	Revenue from remanufactured products and remanufacturing services	-	<table border="1"> <thead> <tr> <th colspan="2">Classification</th> <th>Unit</th> <th>2019</th> <th>2020</th> <th>2021</th> </tr> </thead> <tbody> <tr> <td colspan="2">Rail Solutions (vehicle renovation projects, etc.)</td> <td>KRW</td> <td>1,978,509,093</td> <td>-28,991,714</td> <td>361,848,226</td> </tr> <tr> <td colspan="2">Defense Solutions (depot maintenance)</td> <td>KRW</td> <td>219,570,912,393</td> <td>209,274,806,761</td> <td>202,874,834,426</td> </tr> <tr> <td colspan="2">ECO-Plant Business (facility overhaul, etc.)</td> <td>KRW</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td colspan="2">Total revenue</td> <td>KRW</td> <td>221,549,421,486</td> <td>209,245,815,047</td> <td>203,236,682,652</td> </tr> </tbody> </table>	Classification		Unit	2019	2020	2021	Rail Solutions (vehicle renovation projects, etc.)		KRW	1,978,509,093	-28,991,714	361,848,226	Defense Solutions (depot maintenance)		KRW	219,570,912,393	209,274,806,761	202,874,834,426	ECO-Plant Business (facility overhaul, etc.)		KRW	-	-	-	Total revenue		KRW	221,549,421,486	209,245,815,047	203,236,682,652
				Classification		Unit	2019	2020	2021																									
				Rail Solutions (vehicle renovation projects, etc.)		KRW	1,978,509,093	-28,991,714	361,848,226																									
				Defense Solutions (depot maintenance)		KRW	219,570,912,393	209,274,806,761	202,874,834,426																									
ECO-Plant Business (facility overhaul, etc.)		KRW	-	-	-																													
Total revenue		KRW	221,549,421,486	209,245,815,047	203,236,682,652																													
Activity metrics	RT-IG-000.A	Number of units produced by product category	-	<table border="1"> <thead> <tr> <th colspan="2">Classification</th> <th>Unit</th> <th>2019</th> <th>2020</th> <th>2021</th> </tr> </thead> <tbody> <tr> <td colspan="2">Production volume (Changwon Plant)</td> <td>Volume</td> <td>472</td> <td>719</td> <td>954</td> </tr> <tr> <td colspan="2">Production weight (Dangjin Plant)</td> <td>Ton</td> <td>7,353</td> <td>6,553</td> <td>2,942</td> </tr> </tbody> </table>	Classification		Unit	2019	2020	2021	Production volume (Changwon Plant)		Volume	472	719	954	Production weight (Dangjin Plant)		Ton	7,353	6,553	2,942												
				Classification		Unit	2019	2020	2021																									
				Production volume (Changwon Plant)		Volume	472	719	954																									
Production weight (Dangjin Plant)		Ton	7,353	6,553	2,942																													
RT-IG-000.B	Number of employees	-	<table border="1"> <thead> <tr> <th colspan="2">Classification</th> <th>Unit</th> <th>2019</th> <th>2020</th> <th>2021</th> </tr> </thead> <tbody> <tr> <td colspan="2">Total number of employees</td> <td>Person</td> <td>3,588</td> <td>3,426</td> <td>3,455</td> </tr> </tbody> </table>	Classification		Unit	2019	2020	2021	Total number of employees		Person	3,588	3,426	3,455																			
			Classification		Unit	2019	2020	2021																										
Total number of employees		Person	3,588	3,426	3,455																													

Sustainability Accounting Standards Board (SASB Index)

Engineering & Construction

Topic	Code	Accounting metric	Reporting page/ reference	Remarks																										
Environmental impacts of project development	IF-EN-160a.1	Number of incidents of non-compliance with environmental permits, standards and regulations	-	No environmental violations																										
	IF-EN-160a.2	Discussion of processes to assess and manage environmental risks associated with project design, siting and construction	28, 46	Hyundai Rotem systematically manages risks, including environmental impacts, during the bidding stage before being awarded a project. Confirmed risks are minimized through a company-wide consultative body, and through intensive management that is carried out through monitoring of orders after they have been received.																										
Structural integrity and safety	IF-EN-250a.2	Total amount of monetary losses as a result of legal proceedings associated with defect- and safety-related incidents	-	No losses occurred																										
Workforce health and safety	IF-EN-320a.1	1) TRIR; and 2) fatality rate for: a) direct employees and b) contract employees	-	<table border="1"> <thead> <tr> <th colspan="2">Classification</th> <th>Unit</th> <th>2019</th> <th>2020</th> <th>2021</th> </tr> </thead> <tbody> <tr> <td rowspan="2">TRIR</td> <td>Permanent</td> <td rowspan="2">Number/ 1 million working hours</td> <td>1.77</td> <td>1.72</td> <td>1.35</td> </tr> <tr> <td>Contractual</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td rowspan="2">Industrial accident mortality rate</td> <td>Permanent</td> <td rowspan="2">%</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>Contractual</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table>	Classification		Unit	2019	2020	2021	TRIR	Permanent	Number/ 1 million working hours	1.77	1.72	1.35	Contractual	-	-	-	Industrial accident mortality rate	Permanent	%	-	-	-	Contractual	-	-	-
				Classification		Unit	2019	2020	2021																					
				TRIR	Permanent	Number/ 1 million working hours	1.77	1.72	1.35																					
					Contractual		-	-	-																					
Industrial accident mortality rate	Permanent	%	-	-	-																									
	Contractual		-	-	-																									
Lifecycle impacts of buildings and infrastructure	IF-EN-410a.1	Number of 1) commissioned projects certified to a third-party multi-attribute sustainability standard; and 2) active projects seeking such certification	-	One project: Australia New Intercity Fleet (NIF) trains																										
Climate impacts of business mix	IF-EN-410b.1	Amount of backlog for 1) hydrocarbon-related projects; and 2) renewable energy projects	-	No project applicable																										
	IF-EN-410b.2	Amount of backlog cancellations associated with hydrocarbon-related projects	-	No project applicable																										
	IF-EN-410b.3	Amount of backlog for non-energy projects associated with climate change mitigation	-	No project applicable																										

Sustainability Accounting Standards Board (SASB Index)

Engineering & Construction

Topic	Code	Accounting metric	Reporting page/ reference	Remarks																								
Business ethics	IF-EN-510a.1	1) Number of active projects; and 2) backlog in countries that have the 20 lowest rankings in the Transparency International Corruption Perception Index	-	No project applicable																								
	IF-EN-510a.2	Total amount of monetary losses as a result of legal proceedings associated with charges of 1) bribery or corruption; and 2) anticompetitive practices	-	No Incidents																								
	IF-EN-510a.3	Description of policies and practices for the prevention of 1) bribery and corruption; and 2) anticompetitive behavior in the project bidding processes	21-25	Hyundai Rotem has established an ethical management system to prevent corruption and create a clean corporate culture during the bidding process. It also provides ethical education to all executives and employees.																								
Activity metrics	IF-EN-000.A	Number of active projects	-	<p>The number of projects being launched in the Defense Solutions Division has been marked as confidential given the nature of such projects.</p> <table border="1"> <thead> <tr> <th>Classification</th> <th>Unit</th> <th>2019</th> <th>2020</th> <th>2021</th> </tr> </thead> <tbody> <tr> <td>Rail Solutions</td> <td>Cases</td> <td>5</td> <td>6</td> <td>10</td> </tr> <tr> <td>Defense Solutions</td> <td>Cases</td> <td colspan="3">Confidential</td> </tr> <tr> <td>ECO-Plant Business</td> <td>Cases</td> <td>-</td> <td>-</td> <td>148</td> </tr> </tbody> </table> <p>* Rail Solutions : E&M Business in progress</p>	Classification	Unit	2019	2020	2021	Rail Solutions	Cases	5	6	10	Defense Solutions	Cases	Confidential			ECO-Plant Business	Cases	-	-	148				
	Classification	Unit	2019	2020	2021																							
	Rail Solutions	Cases	5	6	10																							
Defense Solutions	Cases	Confidential																										
ECO-Plant Business	Cases	-	-	148																								
IF-EN-000.B	Number of commissioned projects	-	<p>The number of projects being launched in the Defense Solutions Division has been marked as confidential given the nature of such projects.</p> <table border="1"> <thead> <tr> <th>Classification</th> <th>Unit</th> <th>2019</th> <th>2020</th> <th>2021</th> </tr> </thead> <tbody> <tr> <td>Rail Solutions</td> <td>Cases</td> <td>1</td> <td>-</td> <td>-</td> </tr> <tr> <td>Defense Solutions</td> <td>Cases</td> <td colspan="3">Confidential</td> </tr> <tr> <td>ECO-Plant Business</td> <td>Cases</td> <td>234</td> <td>241</td> <td>306</td> </tr> </tbody> </table> <p>* Rail Solutions : E&M Business commissioned</p>	Classification	Unit	2019	2020	2021	Rail Solutions	Cases	1	-	-	Defense Solutions	Cases	Confidential			ECO-Plant Business	Cases	234	241	306					
Classification	Unit	2019	2020	2021																								
Rail Solutions	Cases	1	-	-																								
Defense Solutions	Cases	Confidential																										
ECO-Plant Business	Cases	234	241	306																								
IF-EN-000.C	Total backlog	-	<table border="1"> <thead> <tr> <th>Classification</th> <th>Unit</th> <th>2019</th> <th>2020</th> <th>2021</th> </tr> </thead> <tbody> <tr> <td>Rail Solutions</td> <td>KRW million</td> <td>73,383</td> <td>70,676</td> <td>80,650</td> </tr> <tr> <td>Defense Solutions</td> <td>KRW million</td> <td>10,878</td> <td>16,144</td> <td>17,033</td> </tr> <tr> <td>ECO-Plant Business</td> <td>KRW million</td> <td>5,151</td> <td>3,430</td> <td>3,966</td> </tr> <tr> <td>Total</td> <td>KRW million</td> <td>89,412</td> <td>90,250</td> <td>101,649</td> </tr> </tbody> </table>	Classification	Unit	2019	2020	2021	Rail Solutions	KRW million	73,383	70,676	80,650	Defense Solutions	KRW million	10,878	16,144	17,033	ECO-Plant Business	KRW million	5,151	3,430	3,966	Total	KRW million	89,412	90,250	101,649
Classification	Unit	2019	2020	2021																								
Rail Solutions	KRW million	73,383	70,676	80,650																								
Defense Solutions	KRW million	10,878	16,144	17,033																								
ECO-Plant Business	KRW million	5,151	3,430	3,966																								
Total	KRW million	89,412	90,250	101,649																								

Sustainability Accounting Standards Board (SASB Index)

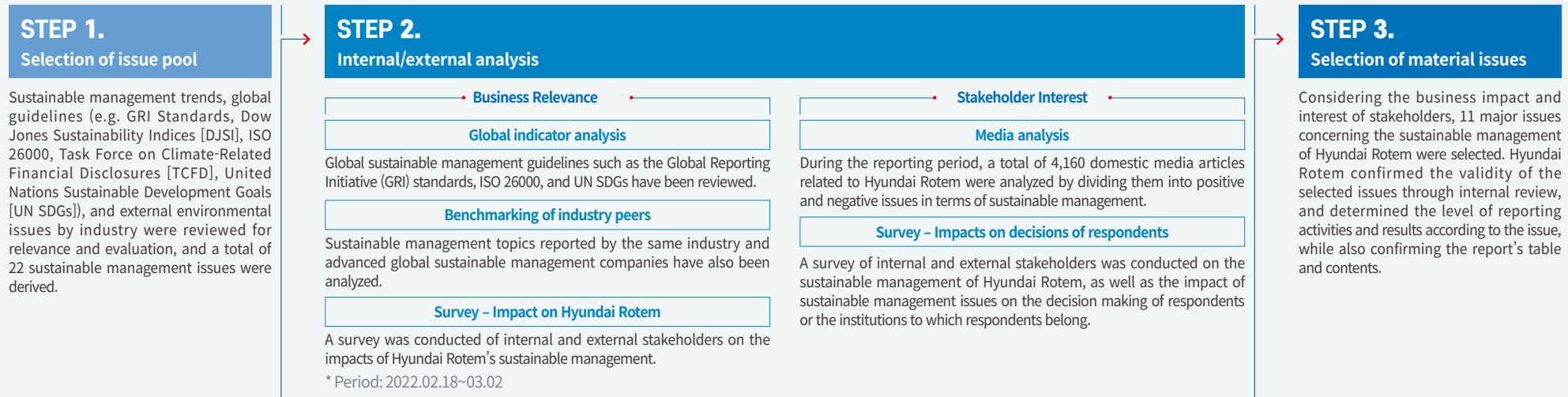
Aerospace & Defense

Topic	Code	Accounting metric	Reporting page/ reference	Remarks																									
Energy management	RT-AE-130a.1	1) Total energy consumed; 2) percentage grid Electricity; and 3) percentage renewable	39, 47, 84	<table border="1"> <thead> <tr> <th>Classification</th> <th>Unit</th> <th>2019</th> <th>2020</th> <th>2021</th> </tr> </thead> <tbody> <tr> <td>Total energy consumption</td> <td>TJ</td> <td>481.32</td> <td>515.71</td> <td>474.93</td> </tr> <tr> <td></td> <td>TOE</td> <td>11,517</td> <td>12,274</td> <td>11,354</td> </tr> <tr> <td>Percentage grid electricity</td> <td>%</td> <td>100</td> <td>100</td> <td>100</td> </tr> <tr> <td>Percentage renewables</td> <td>%</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table>	Classification	Unit	2019	2020	2021	Total energy consumption	TJ	481.32	515.71	474.93		TOE	11,517	12,274	11,354	Percentage grid electricity	%	100	100	100	Percentage renewables	%	-	-	-
				Classification	Unit	2019	2020	2021																					
				Total energy consumption	TJ	481.32	515.71	474.93																					
					TOE	11,517	12,274	11,354																					
Percentage grid electricity	%	100	100	100																									
Percentage renewables	%	-	-	-																									
Hazardous waste management	RT-AE-150a.1	Amount of hazardous waste generated and percentage recycled	85	<table border="1"> <thead> <tr> <th>Classification</th> <th>Unit</th> <th>2019</th> <th>2020</th> <th>2021</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Hazardous waste</td> <td>Processed</td> <td>185</td> <td>184</td> <td>133</td> </tr> <tr> <td>Recycled</td> <td>343</td> <td>331</td> <td>348</td> </tr> </tbody> </table>	Classification	Unit	2019	2020	2021	Hazardous waste	Processed	185	184	133	Recycled	343	331	348											
				Classification	Unit	2019	2020	2021																					
				Hazardous waste	Processed	185	184	133																					
Recycled	343	331	348																										
Data security	RT-AE-230a.1	1) Number of data breaches; and 2) percentage involving confidential information	-	No data leakage cases																									
	RT-AE-230a.2	Description of the approach to identifying and addressing data security risks in 1) company operations; and 2) products	29	-																									
Fuel economy and emissions in use-phase	RT-AE-410a.1	Revenue from alternative energy-related products	31, 86	<table border="1"> <thead> <tr> <th>Classification</th> <th>Unit</th> <th>2019</th> <th>2020</th> <th>2021</th> </tr> </thead> <tbody> <tr> <td>Third party eco-certified products</td> <td>%</td> <td>9</td> <td>19</td> <td>19</td> </tr> </tbody> </table>	Classification	Unit	2019	2020	2021	Third party eco-certified products	%	9	19	19															
Classification	Unit	2019	2020	2021																									
Third party eco-certified products	%	9	19	19																									
Materials sourcing	RT-AE-440a.1	Description of the management of risks associated with the use of critical materials	-	Hyundai Rotem selects and works with suppliers before the official signing of the contract that Hyundai Rotem expects to win. In doing so, our suppliers have sufficient time to produce parts. We have a checklist that tracks imported materials and the production update of parts so that we can manage the availability of parts in a pro-active manner. External factors, including COVID-19, can affect supplies, production and transportation, and therefore we work to manage these issues before they may arise.																									
Business ethics	RT-AE-510a.1	Total amount of monetary losses as a result of legal proceedings associated with incidents of corruption, bribery and/or illicit international trade	-	No cases																									
	RT-AE-510a.2	Revenue from countries ranked in the "E" or "F" category of the Transparency International Government Defence Anti-Corruption Index	-	No cases																									
	RT-AE-510a.3	Discussion of processes to manage business ethics risks throughout the value chain	66-67	Hyundai Rotem conducts risk management for its suppliers in the supply chain through regular evaluations.																									
Activity metrics	RT-AE-000.B	Number of employees	-	<table border="1"> <thead> <tr> <th>Classification</th> <th>Unit</th> <th>2019</th> <th>2020</th> <th>2021</th> </tr> </thead> <tbody> <tr> <td>Total number of employees</td> <td>Person</td> <td>3,588</td> <td>3,426</td> <td>3,455</td> </tr> </tbody> </table>	Classification	Unit	2019	2020	2021	Total number of employees	Person	3,588	3,426	3,455															
Classification	Unit	2019	2020	2021																									
Total number of employees	Person	3,588	3,426	3,455																									

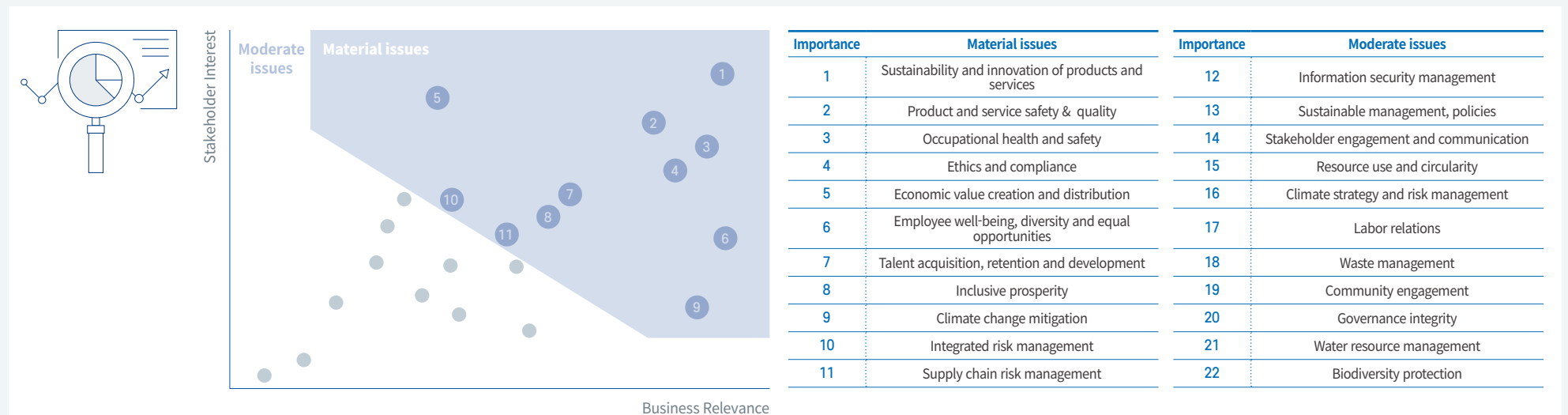
Materiality assessment

Identification of material issues

Materiality assessment process



Results of materiality assessment



Materiality assessment

Material issues management







Material issues management and UN SDGs

Hyundai Rotem understands the impact of material issues and manages them in conjunction with the UN SDGs goals for each issue.

The four pillars	Strategies	Material issues	Rank	Scope of the impact						Reporting page/reference	GRI Standards	UN SDGs
				Employees	Shareholders and investors	Clients	Partners	Communities	Government/NGOs			
Principles of Governance	<ul style="list-style-type: none"> Transparency Fairness Integrity Respect Responsibility 	Ethics and compliance	4	●	○	○	○	○	○	21~26	102-16~17	16. FAUCILITY AND STRONG INSTITUTIONS, 17. PARTNERSHIPS FOR THE GOALS
		Integrated risk management	10	●	○	○	●	●	●	27~28	102-11	16. FAUCILITY AND STRONG INSTITUTIONS, 17. PARTNERSHIPS FOR THE GOALS
Planet	Climate Smart	Climate change mitigation	9	○	○	○	○	●	●	38~39	302-1,3, 305-2,4	7. AFFORDABLE AND CLEAN ENERGY, 12. RESPONSIBLE CONSUMPTION AND PRODUCTION, 13. CLIMATE ACTION
People	Responsible Partner	Occupational health and safety	3	●	○	○	○	○	○	51~55	403-1~10	3. GOOD HEALTH AND WELL-BEING, 8. DECENT WORK AND ECONOMIC GROWTH, 12. RESPONSIBLE CONSUMPTION AND PRODUCTION
		Talent acquisition, retention and development	7	●	○	○	○	○	○	56~57	401-1~3	8. DECENT WORK AND ECONOMIC GROWTH
		Employee well-being, diversity and equal opportunities	6	●	○	○	○	○	○	58~61	404-1~3, 405-1, 412-2	5. GENDER EQUALITY, 8. DECENT WORK AND ECONOMIC GROWTH, 10. REDUCED INEQUALITIES
		Supply chain risk management	11	○	○	○	●	●	○	66~67	-	7. AFFORDABLE AND CLEAN ENERGY, 8. DECENT WORK AND ECONOMIC GROWTH, 9. INDUSTRY, INNOVATION AND INFRASTRUCTURE, 12. RESPONSIBLE CONSUMPTION AND PRODUCTION, 13. CLIMATE ACTION
Prosperity	Green Innovation	Sustainability and innovation of products and services	1	○	●	●	○	○	○	72~73	R&D	7. AFFORDABLE AND CLEAN ENERGY, 9. INDUSTRY, INNOVATION AND INFRASTRUCTURE, 11. SUSTAINABLE CITIES AND COMMUNITIES, 12. RESPONSIBLE CONSUMPTION AND PRODUCTION, 13. CLIMATE ACTION, 15. LIFE ON LAND
		Product and service safety & quality	2	○	○	●	○	○	○	74~77	416-1	9. INDUSTRY, INNOVATION AND INFRASTRUCTURE
		Economic value creation and distribution	5	●	●	○	○	○	○	78	201-1~2	8. DECENT WORK AND ECONOMIC GROWTH, 9. INDUSTRY, INNOVATION AND INFRASTRUCTURE
		Inclusive prosperity	8	○	○	○	●	○	○	79~80	-	7. AFFORDABLE AND CLEAN ENERGY, 8. DECENT WORK AND ECONOMIC GROWTH, 9. INDUSTRY, INNOVATION AND INFRASTRUCTURE, 12. RESPONSIBLE CONSUMPTION AND PRODUCTION, 13. CLIMATE ACTION

Stakeholder engagement

Channels for stakeholder participation in sustainable management

Major stakeholders	Customers 	Shareholders and Investors 	Suppliers 	Local Communities 	Government/NGOs 	Employees 
Main interests	<ul style="list-style-type: none"> Product and service quality improvements Eco-friendly products Product safety Customer privacy R&D and technological innovation 	<ul style="list-style-type: none"> Governance integrity ensured Risk management R&D and technological innovation Economic performance 	<ul style="list-style-type: none"> Mutual growth Fair trade Supplier safety management Human rights in the workplace 	<ul style="list-style-type: none"> Social contribution activities, such as volunteering, donations, etc. Environmental impacts minimized 	<ul style="list-style-type: none"> Fair trade Environmental impacts minimized Compliance system Contribution to UN SDGs 	<ul style="list-style-type: none"> Recruitment and empowerment Work-life balance Employee health and safety strengthened
Major communication channels and number of operations	<ul style="list-style-type: none"> Hyundai Rotem Blog (on a continuous basis) Customer survey by business sector (once a year) Domestic/foreign exhibitions (once or twice a year) Commanding officer and quality meetings (60 times in total, periodically) Equipment management/business development meetings (2 times in total, semi-annually) 	<ul style="list-style-type: none"> Corporate website (on a continuous basis) Shareholders' meetings (once a year) Electronic voting system (once a year) Stock exchange disclosure (recurrent, semi-annually, quarterly) Performance presentation conference calls (quarterly) Non-deal roadshow (NDR) (once or twice a month) 	<ul style="list-style-type: none"> External reporting system (on a continuous basis) Supplier management portal site (on a continuous basis) Seminars for representatives of suppliers (once a year) Division meetings (first half/second half of year) Visiting suppliers and face-to-face/non-face-to-face interviews with suppliers (periodically) Safety training for suppliers (periodically) Safety and Health Council for suppliers (once a month) 	<ul style="list-style-type: none"> Semi-annual events by Hyundai Rotem's volunteer group 'Three Wheels of love' Community contribution activities through partnership with Dongjin, a social welfare corporation (once a year) Blood donation campaign (once a year) Uiwang Kimchi donation and fire department support (once a year) Donation for Gyeongnam community social welfare (periodically) 	<ul style="list-style-type: none"> General meeting and the Board of Directors meeting for the Korea Railway Association, Korea Rolling Stock Industries Association and Korean Urban Railway Association (once a year) Research seminars and association meetings (periodically) 	<ul style="list-style-type: none"> Hyundai Rotem intranet (on a continuous basis) Employee surveys (periodically) Communication Bulletin: Rotem Agora 2.0, Human Resources Improvement Q&A (on a continuous basis) Activities to promote organizational culture <ul style="list-style-type: none"> Motivation campaign: 'Compliment each other, Find the best compliment message', 'Vacations needed for hard-working employees' (every month) Employee development activities: "Career coaching activities", "Mentor-mentee" activities (monthly) Labor-Management meetings (quarterly) Management status briefing sessions (once a year) Defense solutions headquarters management briefings (quarterly)

External initiatives

Memberships Hyundai Rotem is involved in various industry and other associations.

Number	Name of organization	Year of subscription
1	Korea Defense Industry Association	1980
2	Korea Association of Defense Industry Studies	1992
3	Korea Rolling Stock Industries Association	1996
4	Korea Institute of Military Science and Technology	1998
5	The Korean Society for Railway	1999
6	Korea Enterprises Federation	1999
7	Railway Signal Research Association	2003
8	Korea Association of Robot Industry	2008
9	The Korea Railway Association	2009
10	Korea Association for Space Technology Promotion	2009
11	Korea Urban Railway Association	2010
12	Korea Authorized Economic Operator (AEO) Association	2011
13	Korea Listed Companies Association	2013
14	Defense Quality Society	2014
15	Military Robotics Society	2021
16	Korea Association of Machinery Industry	2021

Third-party verification statement

Dear Management and Stakeholders of Hyundai Rotem Company,

Introduction

The Korean Standards Association (“KSA”) was commissioned by Hyundai Rotem Company (“Hyundai Rotem”) to perform a third-party Assurance Engagement of ‘HYUNDAI ROTEM SUSTAINABILITY REPORT 2022’ (the “Report”). KSA presents independent opinions as follows as a result of feasibility of the data contained in this Report. Hyundai Rotem has sole responsibility for content and performance contained in this Report.

Independence

As an independent assurance agency, KSA does not have any kinds of commercial interest in businesses of Hyundai Rotem apart from undertaking a third-party assurance on the Report. We have no other contract with Hyundai Rotem that may undermine credibility and integrity as an independent assurance agency.

Assurance Standards and Level

This Assurance Engagement followed the AA1000AS v3 assurance standards to provide Moderate Level assurance. We checked the four principles of inclusivity, materiality, responsiveness and impact in combination with information credibility of the Report. We also reviewed whether the Report content was created in accordance with the GRI Standards.

Assurance Type and Scope

This Assurance Engagement followed the AA1000AS v3 assurance standards to provide Type 2 assurance, which means that the assurance assessed the accuracy and reliability of the company’s statements and performance data provided in the Report. The assurance scope is from January 1 2021 to December 31 2021 and the assurance focused on systems and activities including policies and goals, businesses and programs, standards, and achievements of the Company’s sustainability management. While the company’s environmental and social data as well as financial data was verified, the scope of review concerning stakeholder engagement was limited to the materiality test process.

Assurance Methodology

We used the following methods to gather information, documents and evidence with respect to the assurance scope.

- Analyses of articles related to Hyundai Rotem’s sustainability management published by domestic media outlets
- Review of management system and process used in improving the performance of sustainability management and preparing the Report
- Review of the consistency between the financial performance data and the company’s audit report/ publicly announced data
- Examination of internal documents and basic materials

Assurance Results and Opinions [On an assurance principle/process level]

KSA reviewed the draft version of this Report to present our opinions as an assurance provider. Modifications were made of the Report content if deemed necessary. We were not aware of any significant errors or inappropriate descriptions in this Report as a result of our Assurance Engagement. As such, we present our opinions of the HYUNDAI ROTEM SUSTAINABILITY REPORT 2022 as follows.

Inclusivity

Has Hyundai Rotem engaged its stakeholders in strategically responding to sustainability?

KSA believe Hyundai Rotem is aware of the importance of stakeholder participation and is making an all-out effort to establish a process that will increase their participation. Hyundai Rotem has selected stakeholders including government and related organization, employees, corporate customers, individuals, partner companies, local communities and NGO to receive diverse feedbacks and opinions.

Materiality

Has Hyundai Rotem included material information in the Report to help stakeholders make informed decisions?

We are not aware of any significant omissions or exclusions of data that is material to stakeholders. We verified that Hyundai Rotem conducted materiality test with issues identified from analyses of internal and external environments and reported according to the result.

Responsiveness

Has Hyundai Rotem appropriately responded to stakeholder requirements and interest in this Report?

We verified that Hyundai Rotem responded stakeholders’ needs and interests through reflecting stakeholders’ opinions in the Report. We are not aware of any evidence that Hyundai Rotem’s response to significant issues of stakeholders was reported inappropriately.

Impact

Has Hyundai Rotem appropriately monitored its impact on the stakeholders?

We verified that the Company is monitoring and assessing its impact on the stakeholders by conducting an enhanced verification of its standard business activities. Furthermore, it has been verified that the Company appropriately publishes its findings in the Report.

Third-party verification statement

GRI Standards Disclosure

We confirmed that this Report was prepared in accordance with GRI Standards Core Option. Based on data Hyundai Rotem provided, we also confirmed a validity of the contents related to General Standard Disclosure and Specific Standard Disclosur

Universal Standards

We have verified that the Report complied(s) with the requirements of the Universal Standards of Core Option, and (have) reviewed the following disclosures:

GRI Index 102-1 ~ 102-13(Organizational profile), 102-14 ~ 102-15(Strategy), 102-16 ~ 102-17(Ethics and integrity), 102-18, 102-21, 102-22, 102-24, 102-26, 102-27, 102-29, 102-30, 102-35, 102-36, 102-38(Governance), 102-40 ~ 102-44(Stakeholder engagement), 102-45 ~ 102-56(Reporting practice), 103(Management Approach)

Topic-specific Standards

We have checked the material topics identified from a materiality test process in which content to be disclosed. We examined disclosures below:

GRI Index 201-1, 201-2, 201-3, 302-1, 302-3, 303-3, 303-4, 303-5, 305-1, 305-2, 305-4, 305-7, 401-1, 403-1, 403-2, 403-3, 403-4, 403-5, 403-6, 405-7, 403-8, 403-9, 403-10, 404-1, 404-2, 404-3, 413-1, 416-1

Opinions and Recommendations [Performance/Issues]

We present the following recommendations to help Hyundai Rotem establish a company-wide sustainability management strategy and respond to continuous issues of sustainability.

Economy

Hyundai Rotem has been continuously delivering tangible performances in the general industries including railway, defense, and plant facilities, and the Report — prepared in accordance with the global guidelines — reveals to stakeholders information on the value that the Company has created as well as distributed economic sources. We hope that Hyundai Rotem will strengthen its responsible management through value distribution and collaboration with business partners in the value chain and local communities, and reinforce the establishment and implementation of internal controls that enhance transparency and reliability in the accounting, which are gaining more importance.

Environment

Hyundai Rotem publishes this Report in line with global environmental trends, recognizing the impact of business activities on the environment, society, and the economy. Collecting and disclosing environmental indicators to fulfill its corporate responsibility for global climate change and environmental improvement is recognized as a positive effort, and it is expected that the Company's current awareness and activities will contribute to the reduction of environmental pollution. The Company is monitoring environmental indicators such as water and air quality, as well as energy and greenhouse gases; but relating to some quantitative indicators, the Company needs to improve the accuracy and appropriateness of the data criteria based on the GRI standard, to establish a standard calculation guideline and to strengthen the data collection system. We hope that Hyundai Rotem will strengthen the process of setting specific goals, while executing, reviewing and evaluating such goals.

Society

In the first Sustainability Management Report published in 2021, Hyundai Rotem introduced the Company's ESG strategy and announced the implementation of various ESG tasks. In the Sustainability Report 2022, we could confirm the improvement in the Company's ESG performance achieved through faithful implementation of the previous year's commitments, and its continued improvement efforts. It has also been confirmed that Hyundai Rotem has disclosed information in accordance with the TCFD declaration and TCFD recommendations, established ESG governance by strengthening the existing ESG-related organization, and ensured that ESG issues are actively discussed within the BOD. In addition, it is highly appreciated that the Company has conducted human rights impact assessments for all employees, including those dispatched to the Company, beyond carrying out passive human rights management, such as compliance with laws and expressions of its commitment to respect human rights. We expected that the Company will reinforce the expertise and independence of its human rights impact assessment to upgrade it to a level that can prevent and mitigate human rights risks by identifying human rights risks that may arise in the course of operating the organization at the major business sites.

May 2022

KSA Chairman & CEO **Myung Soo Kang**




AA1000
Licensed Report
000-70/V3-JK95C

The Korean Standards Association (KSA), established as a special corporation in accordance with the Law for Industrial Standardization in 1962, serves as a knowledge service provider that distributes and disseminates such services as industrial standardization, quality management, sustainability management, KS certification and ISO certification. The KSA is committed to the sustainable development of Korean society as an ISO 26000 national secretary, certified GRI training partner, AA1000 assurance provider, KSI (Korea Sustainability Index) operator, and UN CDM DOE (development operational entity), and as an assurance provider of the Korean government's greenhouse gas energy target management system.

Greenhouse gas emissions verification statement

Hyundai Rotem Co., Ltd.

Introduction

Hyundai Rotem Corp. implements annual MRV based on the standards including ISO 14064 to respond to climate change risks. KMR confirms the verification results of 2021 as below.

Scope

- Organizational boundary : The whole business under control of organization
- Verification object workplaces : Hyundai Rotem Co., Ltd. Changwon Plant
- Reporting period : Calendar year of 2021
- Reporting greenhouse gas : CO₂, CH₄, N₂O, HFCs, PFCs, SF₆
- Type of emission : Direct (Scope 1), Indirect (Scope 2)
- The level of assurance : Reasonable assurance (materiality threshold : ±5.0%)

Standard

- ISO 14064-1(2018), ISO 14064-3(2018), WRI/WBCSD GHG Protocol(2004), IPCC Guidelines(2006)
- Verification guidelines for the ETS operation (Notification No. 2021-112, MOE)
- KMR GHG & energy verification manual and procedure

Results

Year	Site	GHGs Emission (tCO ₂ -eq)			Energy Consumption (TJ)			
		Scope1	Scope2	Total	Fuel	Electricity	Steam	Total
2021	Changwon Plant	7,374	13,109	20,483	138	274	0	412

Conclusion

KMR confirms that the calculation of the Greenhouse gas emissions and energy consumption of the organization are proper.



May 9, 2022
Authorized By CEO **Eun Ju Hwang**

E J Hwang

Contributors to the Preparation of This Report

General-Sustainability Team

Shin, Kyoung Hoon	Shim, JaeHeon	Hwang, Sihyuk	Shin, Heiwon
-------------------	---------------	---------------	--------------

Contributors

Lee, Hunsoo	Lee, Kang Won	Roh, JooHyun	Mun, Chan Sik
Song, Gihyun	Shin, HyunCheol	Yu, TaeJin	Lee, SeongHo
Park, HyeongJin	Lee, DongMin	Choi, Hyung Suk	Kang, Min Sun
Choi, YongJin	Jeon, JoonWon	Bae, Seokju	Sung, Yongwon
Kim, Minsu	Hwang, YongKil	Kim, Sojin	Hwang, Junkyu
Jang, Hyun-young	Byun, Kyowon Peter	Kim, Yong Hwan	No, Gi Man
Choi, Jun Ho	Choi, DongShin	Huh, Eun Ji	Song, Young Sin
Je, SukHyun	Kang, DoYeon	Staniforth, Dale	



HYUNDAI ROTEM
SUSTAINABILITY REPORT 2022



MIX
Paper from
responsible sources
FSC® C011053



This report has been printed with soy ink on FSC™ certified paper.