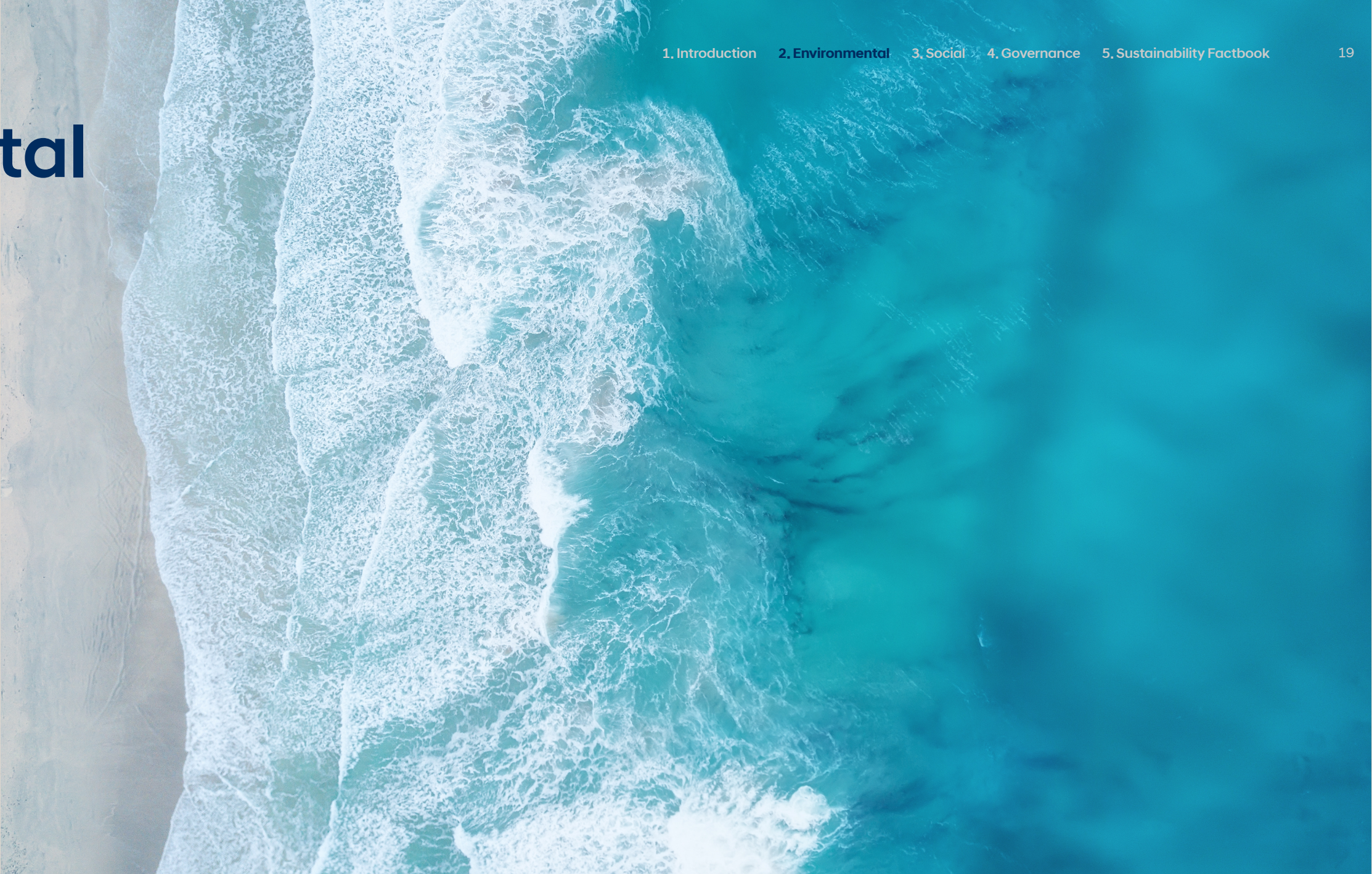


Environmental

The Earth is not only the home of mankind but also our responsibility to future generations. Hyundai has a clear understanding of its role and responsibility in reducing GHG emissions, thereby taking active parts in contributing to the global trend of achieving carbon neutrality. In particular, we are doing our best to protect the blue light of Earth with distinctive approach to climate change based on our own sustainable technology.

2.1	Environmental Management
2.2	Response to Climate Change
2.3	Circular Economy and Resource Use
2.4	Biodiversity
2.5	Pollutants



Environmental Management

Hyundai practices environmental management governance with the participation of its highest decision-making body. We have also put in place an environmental management system for sustainable business operations, based on our environmental policies. Each of our production plants has been certified to ISO 14001. In conjunction with ISO certification audits, internal environmental assessments and due diligence on our plants are conducted by Headquarters to identify and mitigate impacts and risks at each site.

Environmental Management System

Environmental Management Governance

Roles of the BOD Roles of the BOD The BOD and its subcommittee, Sustainability Management Committee oversee environmental management by regularly approving and reviewing Hyundai’s environmental performance, major risks, and improvement activities. In 2024, seven key ESG improvement tasks, including the financial impact of climate change risk and the development of financial performance calculation processes aligned with EU taxonomy of sustainable economic activities, were proposed as agendas to the Sustainability Management Committee and received approval. In the latter half of the year, the Committee also approved the 2045 carbon neutrality strategy updated to reflect our mid/long-term business plans. Other items reported to the Committee include water/waste improvement targets for 2023 as well as, due diligence results and improvements made on environmental impacts and risks in 2024 including water/waste/pollutants associated with our own operations and suppliers.

Roles of the Management The Management Committee Meeting (MCM) attended by the CEOs and other C-level executives serves to regularly review our ESG key tasks and their progress, including our net zero initiative. In 2022, we appointed a Chief Safety Officer (CSO) who oversees the safety, environment, and health management of our business sites, thereby strengthening our environmental management governance framework.

Roles of the Dedicated Environmental Organization Hyundai has a company-wide supervising organization under the CEO and CSO’s responsibility and an operating organization by business site in order to implement environmental management, and have two-way discussion on a regular basis for more efficient environmental management.

Company-Wide Supervising Organization Hyundai Headquarters’ supervising organization plays a pivotal role in global environmental management governance by implementing sustainable practices and enhancing the company’s environmental management systems at home and abroad. It performs responsibilities , including establishing an environmental accident risk response system, developing and managing environmental management KPIs, addressing regulatory compliance, and implementing internal audit on global sites. These efforts are essential to operating Hyundai’s environmental management system.

Site Management Organization The environmental management organization at each business site is in charge of such roles as establishing and operating an environmental management system; enhancing business site environmental efficiency; and operating facilities to manage and reduce pollutants that occurs in the business operation process. It also implements environmental policy; identifies and addresses environmental risks; spreads and disseminates environmental management; and receives and handles environment-related grievance.

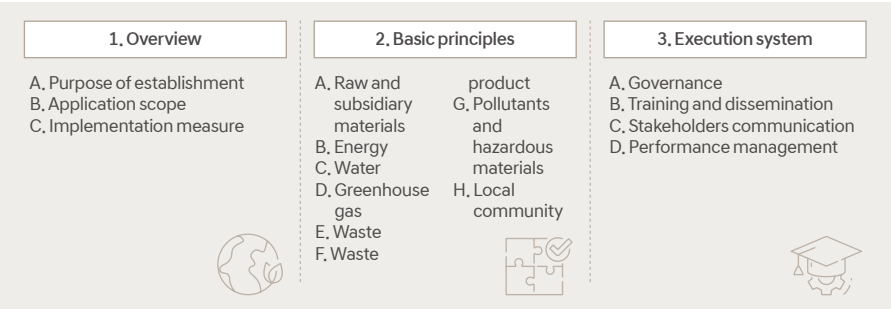
R&D Organization The R&D Center plays a pivotal role in driving product environmental improvements by conducting R&D on product-related environmental technologies and developing low-carbon products. This ranges from reducing carbon and tailpipe emissions from vehicles through electrified vehicle development, recycling-conscious designs to performing product lifecycle assessments (LCA), developing sustainable materials, substituting hazardous substances, and exploring CCUS (carbon capture, utilization and storage) technology.

Implementation of Environmental Management

Environmental Management Policy Recognizing the environment as a core element of its business, Hyundai has established the Environmental Management Policy to conduct environmental management in a proactive manner and periodically updates it (last revised in 2022) to reflect both internal and external environmental regulations and current issues, and changes in external markets and the corporate landscape. This policy consists of seven articles, each covering items of environmental management requiring our targeted management. These items include responding to climate change, reducing pollutants, protecting biodiversity, establishing a circular economy, and supporting suppliers with environmental management, embodying Hyundai’s proactive commitment to making progress on these items. The policy guides our collective efforts – at Hyundai and all its subsidiaries as well as business units - to improve environmental performance and manage our environmental impacts across the overall business operations and value chain.

Furthermore, we encourage suppliers, contract partners, and other stakeholders in our supply chain to adhere to the Environmental Management Policy, as well as providing necessary support to facilitate their compliance. We comply with the environmental laws and regulations of each country in which we run our businesses, and also adhere to this policy in situations that are not covered by local regulations or where special provisions do not exist.

Composition of Environmental Management Policy



 [Hyundai Motor Company Environmental Management Policy](#)

Environmental Management Implementation System Hyundai follows the ‘Plan-Do-Check-Action’ process in advancing environmental management. This process consists of 1) complying with applicable laws and regulations, 2) developing and updating environmental management policies, 3) establishing an environmental management system and introducing management regulations, 3) reviewing environmental performance and data, 5) assessing risks and pursuing improvement, and 6) undertaking activities to improve environmental performance.

Our entire operations in Korea and overseas production plants are establishing their Environmental Management System (EMS) in accordance with ISO 14001, the international standard for environmental management system, while achieving ISO 14001 certification from third-party organizations to ensure reliability and credibility. Notably, our domestic sites have unified their EMS through the integrated ISO 14001 certification, thereby enhancing their environmental management and work efficiency, Plants which have acquired the ISO 14001 certification undergo annual audits by certification bodies, with renewal audits every three years, and implement improvement measures based on the results of the audits. The Hyundai Environmental Assessment Tool (HEAT), developed in-house by the supervising organization at the Headquarters, enables us to internally review and assess the environmental management practices of our global operations.

Environmental Management

Environmental Investment To progress towards our mid-to long-term electrification strategy, we plan to invest KRW 120.5 trillion by 2033, comprising KRW 54.4 trillion in R&D, KRW 51.6 trillion in facilities, and KRW 14.4 trillion in strategic investment. Out of the KRW 1,279.5 billion allocated for environmental investments in 2024, KRW 971.6 billion was actually executed, and KRW 50.7 billion was directed toward environmental facilities to reduce environmental pollutant emissions from our operations in 2024. The environmental facility investments made at overseas operations are not included from the aggregated total. Meanwhile, we conduct environmental impact assessments (EIA) prior to making large-scale investments, such as new plant construction, to review potential environmental impacts and risks in advance.

Response to Environmental Accidents and Regulations Hyundai has set in place an emergency response system to take immediate measures in the event of an environmental accident, such as air/water/waste and chemical substance leakage, based on international safety, health & environment (SH&E) standards. Its headquarters and each business site have an emergency response organization and emergency contact system, and also have an emergency response manual that includes the status of disaster prevention facilities and equipment aimed at responding to environmental accidents and have employees familiarize themselves with the manual. In addition, we create an alternative scenario for environmental accidents and continually conduct an emergency response drill at each department. In particular, we estimate environmental accident cases that may occur at business sites, based on which departments disseminate and provide training on actually applicable response measures. Environmental technology exchange meetings are held quarterly among Hyundai Motor Group, the Korea Automobile & Mobility Association (KAMA), the Korea Enterprises Federation, and the Environmental Preservation Advisory Committee, ensuring environmental personnel from each company and business site engage in structured discussions and coordinated responses to environmental regulations and related issues.

Environmental Training Hyundai keeps its environmental training courses up to date each year to reflect environmental regulations, company-wide environmental management goals and plans, best practices of environmental management and matters required for performing key related duties, and benchmarking results while providing environmental training to environmental personnel for their competency enhancement. We also support employees in attending overseas forums, seminars, and exhibitions along with ISO auditor training. In 2024, such environmental training was completed by a total of 67,824 employees, with total training hours reaching 106,004 hours. Beyond employee training, we also support our suppliers with environment-related training programs. These include sustainability training courses made available on online platforms to communicate the necessity for environmental management and the roles of suppliers as well as separate in-person group trainings and seminars.

Grievance Mechanism We operate grievance mechanisms to receive environment-related concerns from employees and other varying stakeholders. Submitted grievances are handled according to the set procedures and standards and the results are notified accordingly If a grievance is likely to cause significant disruption to business operations or involves a high risk of regulatory violations such as adverse impact on local environments, the Legal Division intervenes to discuss appropriate countermeasures.

Management of Environmental Performance

Management of Environmental Goals Through our environmental management implementation system, we set mid- to long-term performance goals for environmental factors that have a considerable environmental impact due to business operations such as carbon emissions. These goals are established by taking into account external economic conditions, government policies, and internal business strategies in addition to emissions and consumption projections based on business-as-usual scenarios. To counter climate change, we have set our 'carbon neutrality by 2045' goal encompassing the entire lifecycle from the extraction of raw materials to parts procurement, production, and vehicle operation. To achieve this goal, we are implementing strategic initiatives including our EV transition strategy and the RE100 of our business sites.

To drive quantitative improvements in environmental metrics except for carbon emissions, we are striving to curb increases in water consumption and waste generation which inevitably grow in proportion to production volumes. We also ensure that the discharge of pollutants from our business sites remains within the legally permissible limits.

Environmental Management Goals and Implementation Status

Classification	Mid- to long-term goal	Performance in 2024
Transition to electric vehicles	Sell 840,000 EVs by 2027 and 2 million EVs by 2030	- Sold a total of 757,195 units of eco-friendly vehicles - Sold a total of 218,504 units of EVs
	Sell only EVs in Europe by 2035	
	Sell only EVs in main markets by 2040	
Carbon neutrality in our factories	Achieve RE100 by 2045	- Renewable energy accounted for 16.7% of total electricity consumption in 2024 - Signed the nation's largest power purchase agreement (annual supply of 610GWh of renewable energy to domestic operations)

Evaluation of Environmental Management Performance To improve environmental performance at our business sites, we manage site-specific KPIs including process efficiency improvements, GHG emissions reductions, renewable energy transition rates, and internal targets for environmental pollutant discharge. In particular, environmental pollutants from plants are monitored for their discharge volume: if year-on-year increases are observed, their causes are analyzed and actions are guided for improvement. In the area of products, we set and manage our fleet average fuel economy or CO₂ emissions, EV sales goal achievement rate, and others as KPIs.

Environmental Risk and Opportunity Analysis Hyundai carries out a materiality assessment on an annual basis. In this way, Hyundai identifies and determines the material impacts of its business activities on the environment as well as material risks and opportunities relating to climate change, the circular economy, pollutants, water consumption, and biodiversity. Sustainability assessments and due diligence conducted on our own sites and supply chains also help us identify adverse environmental impacts and risks across domestic/overseas operations and supply chains.

Water Risk/Opportunity Analysis and Financial Impact

Risk	According to the World Resources Institute (WRI), 17 countries in the Middle East, West Asia, and North Africa including India, Iran, and Pakistan which together account for nearly one fourth of the global population face the risk of water resources completely depleted over the mid-to long-term amid aggravating water shortages brought by climate change. As automotive manufacturing inherently consumes large quantities of industrial water for cooling/washing/painting processes, any disruption to reliable water supply may result in production delays or suspension.
Financial Impact	Hyundai has analyzed the potential financial impact of water scarcity due to changes in the physical environment over the mid- to long-term. We chose Hyundai Motor India, which is specifically exposed to high water risks, to calculate the magnitude of financial losses in the event of a production halt due to water shortages. Our assumptions were based on the 'Venue', a main model produced at the Indian plant, our 2024 sales in India and the vehicle price of KRW 21,700,00. Assuming that 10% of India's total sales are affected, the projected financial impacts amounted to KRW 1,319,208,100,000. * Financial Impact Calculation Number of vehicles sold in India in 2024 (609,934) × Magnitude of financial losses (10%) × Vehicle price (KRW 21,700,000) = KRW 1,319,208,100,000
Specific Response Strategy	At our Indian plant, we are progressing towards 100% self-sufficiency in water supply by 2030 to fundamentally eliminate the risk of water shortages. To this end, we are redoubling our efforts to secure independent water sources by leveraging rainwater to reduce our dependence on external water resources all while expanding water recycling. To increase water recycling, we have established a zero-liquid discharge system enabling full recycling of water resources and are operating a rainwater harvesting system to reclaim rainwater per year, strengthening our capacity to secure in-house water resources. The rainwater harvested as such is stored across six reservoirs.
Opportunity	We consume large volumes of water in cooling/washing/painting processes for vehicle manufacturing, and our manufacturing operations span overseas production plants in the US, China, and India. Ensuring a stable water supply and efficient use of water within these processes is crucial for sustainable business activities.
Financial Impact	To reduce the amount of industrial water used in the automotive production process, Hyundai focuses on expanding its water recycling. As a result, we have recycled a total of 2,928,451 tons of water as of the end of 2024, thereby saving KRW 2,190,481,348 in operating costs. * Financial Impact Calculation Total amount of water recycled in 2024 (2,928,451 tons) × Cost per ton of water (KRW 748, based on 2024 rates in Korea) = KRW 2,190,481,348
Detailed Response Strategy	Our Asan Plant and India Plant, located in water-stressed areas, utilize a zero wastewater discharge system and recycle processed water. At the Ulsan Plant, we established a wastewater recycling system that includes a water transfer pipeline. This system repurposes water discharged from the wastewater treatment plant as circulating water for cleaning dust collectors in the paint booths. By implementing such systems, we are reducing water-related costs by enhancing water recycling.

Response to Climate Change

Hyundai responds to climate change at a company level by identifying, assessing, and managing related risks and opportunities on a constant basis. We also have set major climate strategies through our climate change governance to analyze the potential impact of climate change on our business and respond to macroscopic changes in the business environment due to changes in laws and regulations. We identify various climate risk and opportunity factors, and preemptively respond to changing market demands through the expansion of eco-friendly mobility products and development of future mobility technologies such as autonomous driving and connected cars.

Governance

Responsibilities and Roles of the Highest Decision-Making Body

Sustainability Management Committee The Sustainability Management Committee, Hyundai's supreme decision-making body, is responsible for overseeing climate-related risks and opportunities, operating under the governance of the Board of Directors. According to Article 3 of the "Sustainability Management Committee Regulations" and Section 3 of the "Environmental Management Policy", the committee is responsible for deliberating and deciding on ESG policies, plans, and major activities. It reviews significant ESG issues, including climate change, semi-annually, and formulates and oversees strategic approaches to key issues, mid- to long-term plans, and improvement initiatives focusing on priority areas such as carbon reduction, climate change response, eco-friendliness throughout the product lifecycle, and supply chain ESG management.

Responsibilities and Roles of Management

Management Committee Meeting(MCM) The Management Committee Meeting (MCM) attended by the CEOs and key executive members serves to regularly review carbon neutrality and other key ESG tasks and their progress. Based on these reviews, major risks, necessary performance improvements aligned with our mid/long-term business strategies, and matters requiring deliberation and approval by the highest decision-making body are escalated to the Sustainability Management Committee.

Hyundai Motor Group Carbon Neutrality Committee To address climate change and advance its net zero initiative at the Group level, Hyundai operates the Hyundai Motor Group Carbon Neutrality Committee. The Committee convenes annually, and is presided over by the Executive Chair of the Group and attended by the CEOs of major affiliates. This serves to comprehensively assess carbon neutrality strategies, implementation plans, and progress achieved at respective affiliates.

Roles of Committee and Dedicated Teams

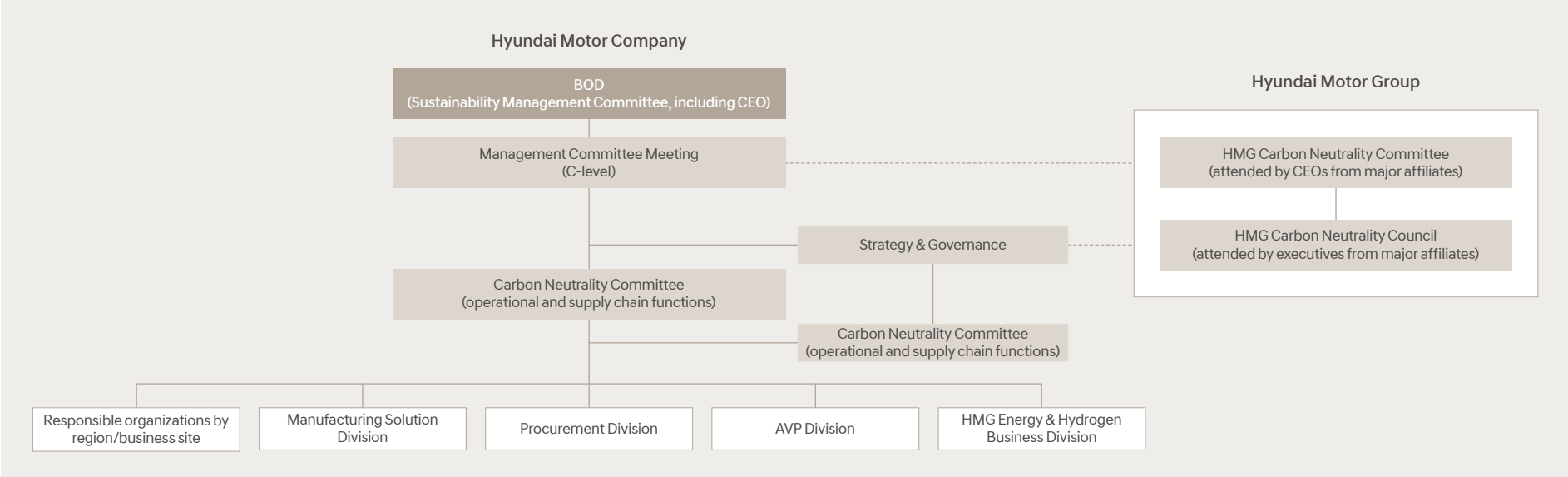
Hyundai Motor Company Carbon Neutrality Committee Hyundai operates the Carbon Neutrality Committee in each of the operational and supply chain functions under the leadership of the Carbon Neutrality Execution Team. The Committee, which consists of team leaders from relevant departments at the Headquarters, meets quarterly to drive net zero initiatives including improving operation site energy efficiency, increasing the use of renewable energy, and reducing supply chain carbon emissions.

Company-wide Planning Organization Starting with the launch of the Carbon Neutrality Execution Team in 2021, Hyundai has established dedicated carbon neutrality organizations at R&D, procurement and other relevant functions, paving the way to advance net zero initiatives across the board. This helps us further strengthen the execution of our mid-to long-term carbon neutrality roadmap along with reducing carbon emissions across the diverse domains of business operations.

Hyundai Motor Group Carbon Neutrality Council To achieve net zero emissions and attain emissions reduction targets at the Group level, the Hyundai Motor Group Carbon Neutrality Council was established in 2024. The Council is composed of vice president-level executives from key Group affiliates and meets three times a year to regularly discuss Hyundai Motor Group's carbon neutrality implementation plans.

Climate Change Governance

 [Composition of the Sustainability Management Committee](#)  [Board Member Training in 2024](#)



Key Agenda Items from the Perspective of Climate-Related Risks and Opportunities in 2024

Committee	Date	Classification	Key Agenda Items	Consideration for Climate-Related Risks and Opportunities
Sustainability Management Committee	Mar. 21	Approved	Approval of 2024 ESG Enhancement Direction	Climate change risk analysis and financial impact estimation, carbon neutrality strategy advancement plan, etc.
	Nov. 27	Approved	Approval of Hyundai's Carbon Neutrality Strategy Update	Review of reduction targets by area(site/supply chain/vehicle operation/carbon offset) and concretization of mid/long-term carbon reduction plans

Response to Climate Change

Strategy

Climate-Related Risks and Opportunities

Impact on Business Model and Value Chain

Types			Risk/Opportunity	Impact on Business Model and Value Chain	Expected Impact		
Transition	Risks	Current regulations	Policies and regulations for responding to climate change	• Strengthening of national cap-and-trade regulations and rising carbon prices • National net-zero targets in place	Short-term	Mid-term	Long-term
		New regulations		• Imposition of carbon border taxes on products exported to the European and North American markets in line with the full-scale implementation of the EU Carbon Border Adjustment Mechanism(CBAM) and the U.S. Clean Competition Act(CCA) • Intensifying competition of EV sales in the U.S, due to increasing EV subsidies under the U.S. Inflation Reduction Act	Short-term	Mid-term	Long-term
		Technical		• Loss of market share in the event of failure to lead technological change	Short-term	Mid-term	Long-term
		Legal	Tightening of fuel efficiency regulations for internal combustion engine vehicles	• Increased cost of the response to fines for non-compliance • Brand damage, disinvestment, and customer exodus due to fuel economy-related lawsuits	Short-term	Mid-term	Long-term
		Market	Instability of raw material prices	• Rising raw material procurement costs due to the imbalance between EV battery demand and the supply of key materials (lithium, cobalt, nickel)	Short-term	Mid-term	Long-term
		Reputation	Increased demand from investors and stakeholders for climate change action	• Brand damage, investment withdrawal, and customer disengagement in the event of failure to disclose and respond to climate change information	Short-term	Mid-term	Long-term
	Opportunities	Products and services	Acceleration of the transition to electrification	• Increase in EV sales due to the expansion of the electric vehicle market	Short-term	Mid-term	Long-term
		Markets	Spread of technological innovations for responding to climate change	• Acceleration in achieving price parity for electric vehicles through technological innovation, leading to market expansion • Revitalization of the hydrogen market due to climate tech R&D • Acceleration of electrification via the spread of autonomous driving technologies based on AI	Short-term	Mid-term	Long-term
		Energy sources		• Reduction in energy costs through the transition to renewable energy (RE100), as the costs of renewable energy decrease due to technological advances	Short-term	Mid-term	Long-term
		Resource efficiency		• Improvement in material efficiency and expansion of recycling	Short-term	Mid-term	Long-term
Physical	Acute risks		Extreme wind speed, wildfire, flood, hail/thunderstorms, precipitation	• Damage to asset values (buildings, equipment, inventory) and reduced revenue due to production interruptions caused by climate disasters	Short-term	Mid-term	Long-term
	Chronic risks		Heat, droughts, cold waves	• Decrease in productivity due to chronic changes in climate patterns, resulting in reduced revenue	Short-term	Mid-term	Long-term

Scope and Period of Application of Climate Risk and Opportunity Management The period and scope applied to the identification, assessment, and management of climate-related risks and opportunities at Hyundai are as follows:

Application timelines	Short-term(0-3 years) Mid-term(3-10 years) Long-term(10-25 years)	Application scope	Business sites: All global operations(including new ones, expected facility life-cycle considered) Upstream activities: Purchased goods and services, capital goods, upstream distribution, etc. Downstream activities: Transportation, use(customers), end-of-life treatment and recycling, etc.
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Strategy and Decision-Making

Efforts to Mitigate and Adapt to Climate Change

Significant Risks and Opportunities	Direct and Indirect Mitigation and Adaptation Measures		Key Contents
Policies and regulations for responding to climate change	1	Process and equipment change at business sites	Introduction of high-efficiency equipment to reduce GHG emissions
		Facility relocation	Establishment of a new plant in Georgia, USA, to meet IRA requirements
	4	Changes in product specifications	Improvements in fuel efficiency and transition to electrification in response to the EU's Fitfor-55 and North America's GHG regulations
	5	Life cycle assessment (LCA)	Conduct of Full-LCA(Life Cycle Assessment)
	6	Supply chain and stakeholder collaboration	Management of supply chain risks in response to IRA and CBAM regulations
Acceleration of the transition to electrification	3	Product technology development	Application of the dedicated electric vehicle platform E-GMP
		Facility relocation	Establishment of a new plant in Georgia, USA in order to target the North American electric vehicle market; construction of a new EV exclusive plant in Ulsan, Korea
		Changes in product specifications	Improvement of electric vehicle charging times and reduction of production costs through expanded R&D
		Supply chain and stakeholder collaboration	Demands for increased supply chain R&D for battery capacity improvement to reduce production costs
Technological innovations for responding to climate change	2	Transition to renewable energy	RE100 implementation through the construction of on-site photovoltaic infrastructure and power purchase agreement
		Changes in product specifications	Expansion of R&D aimed at improving the fuel efficiency of internal combustion engine vehicles and enhancing EV charging time and range
	6	Supply chain and stakeholder collaboration	Establishment of a low-carbon logistics and transportation ecosystem
	7	Expansion of hydrogen business	Expand the hydrogen value chain and accelerate the transition to a hydrogen society
	8	Social carbon reduction	Development of technology for carbon capture and utilization, and implementation of the East Sea Seaweed Forest Project to acquire blue carbon

Response to Climate Change

1 Process and Facility Change at Business Sites

Enhancing Energy Efficiency Hyundai identifies opportunities for improvement through analysis and diagnostics of energy usage at each business site, and implements the solutions thus derived. Through energy diagnostics and inspection, improvement themes are identified, and investment plans are formulated by analyzing the characteristics of each process and facility. We have introduced an integrated global carbon emission management system and a smart plant energy management system to analyze our company-wide carbon emissions and energy consumption and make improvements accordingly. These systems will be rolled out across all our plants consecutively. Notably, the smart plant energy management system enables us to analyze equipment-level energy consumption, breakdown rates, losses resulting from their aging, and expected cost savings relative to investments made and to assess energy-intensive areas and high-priority improvement areas. Once improvement areas are identified, measures are implemented including the application of high-efficiency motors and inverters, the installation of regenerative power equipment, the development of low-temperature curing paints, and the recovery of waste heat. Work is also underway to develop DC power distribution and compressed air reduction technologies to improve power use efficiency. Related to these energy-saving and efficiency solutions, an investment of KRW 111.2 billion has been planned for the period 2021-2030 to achieve a reduction target of 250,412 MWh of electricity and 48,880,000 Nm³ of LNG. After completing the energy-saving investment, a results report comparing the before and after performance is prepared to evaluate the progress and performance of the savings continuously. Furthermore, at each business site, employees receive education on energy-saving activities, technology, and facilities, as well as training on heating and cooling standards and energy waste prevention, in order to encourage energy-saving practices.

In addition, Hyundai has developed a low-temperature curing painting technique that reduces energy consumption and carbon dioxide emissions in the painting process, which accounts for about 43% of the energy used in the entire automobile manufacturing process. While the conventional top coat curing process is conducted at 140°C for 20 minutes, this new technique lowers the temperature to 90°C for the same duration, maintaining equivalent painting quality and yet reducing energy consumption by nearly 40%. This technique is scheduled for application at our Ulsan EV plant in 2026. In 2023, Hyundai Motor Türkiye Otomotiv A.Ş invested KRW 130 million to deploy the low-temperature curing painting technique, and Hyundai plans to invest KRW 2.6 billion by 2030 to expand its application across all global plants. This is expected to achieve an annual reduction of approximately 6,000,000Nm³ in LNG consumption and 16,000tCO₂-eq in GHG emissions per year.

GHG Reduction and Energy Saving Activities at Major Business Sites

- **R&D Center** The R&D Center in Korea is working to improve energy efficiency. To reduce energy consumption, measures are implemented each year including the efficient operation of transformers, adoption of energy-saving lighting controls, installation of high-efficiency lighting, power factor correction, and scale removal. In addition, the R&D Center uses steam supplied from heat generated during an external waste treatment process.
- **Ulsan Plant** The Ulsan Plant invested in equipment such as waste heat recovery processes at the material factory and replacement of heat sources for air conditioning units at the painting factory. By actively responding to government policies like energy mandatory diagnosis, power demand management, and ‘KEEP30,’ we continuously pursuing reductions in GHG emissions.
- **Asan Plant** To reduce Scope 1(direct combustion) emissions, the Asan Plant remains committed to the efficient use of thermal energy by reusing RTO exhaust heat from the painting shop, the deployment of new ion heating technology for decentralized hot water system operations, and direct molten metal supply at the materials shop.
- **Jeonju Plant** The Jeonju Plant continues with its activities for net-zero by promoting efficient energy use and renewable energy generation through improved efficiency and management of production facilities to achieve GHG emissions reduction. As part of its efforts to improve the efficiency of production equipment, the Plant deployed an ultra-energy-saving circuit system for the machining equipment at the engine shop and installed high-efficiency motors at the painting shop. The Plant also installed an integrated HVAC control system for plant operations, ensuring efficient heating and cooling operations through monitoring controls.

- **Hyundai Motor Manufacturing Czech** The plant operates its own cross-functional team(CFT) for energy saving, setting targets for energy consumption reduction and making corresponding investments. In 2024, its air shower system was improved, and regular air leak inspections were conducted on its assembly line, continuing with energy efficiency improvements.
- **Hyundai Motor Manufacturing Indonesia** The plant continues identifying areas requiring energy saving through the energy committee. Specific improvements include lowering the oven temperature at the painting shop, adjusting the number of engines washing machines under operation, and improving the efficiency of HVAC operations.
- **Beijing Hyundai Motor Company** The plant is identifying equipment and facilities with excessive energy consumption and focusing on their management for energy savings and efficiency improvement. By controlling the oven temperature at the painting shop, the subsidiary successfully reduced its energy loss.
- **HTWO Guangzhou** HTWO is operating utilities and HVAC facilities in sync with the operational demand from its production and research facilities, and strives to improve energy efficiency by using thermal storage in chilled water supply pipes during low cooling demand.

BUSINESS CASE

Best Energy-Saving Practice at the Asan Plant



Improving the Efficiency of Steam Energy Use

Our Asan Plant was awarded at a range of internal and external competitions in recognition of its innovative improvement efforts and their achievements in saving energy costs and reducing carbon emissions. These include the President Award for the Best EPS Demonstration Practice by the Korea Energy Agency, the President Award at the Carbon Reduction Competition hosted by the Ministry of Environment and the SDX Foundation, and the Grand Prize at the Hyundai Hero Honors Awards hosted to reward the best-performing employees for the year.

The Asan Plant took note of heat loss generated from long-distance steam supply between the powerhouse and the point of use as well as waste heat from boiler blowdown or flash steam. To address these issues, the Plant first deployed an ion heating system to improve the heat exchange process, upgrading its hot water heating method while installing small-sized boilers at the point of use to minimize heat loss from long-distance steam transmission. In addition, an optimized boiler waste heat recovery system tailored for shopfloor conditions was established to successfully enhance energy efficiency. These improvement efforts enabled the Plant to save over KRW 1.45 billion in annual energy costs while reducing annual carbon emissions by around 2,456tCO₂-eq.

These initiatives not only helped Hyundai dramatically improve its steam and thermal energy management and improvement capabilities but also created social value by providing standardization technology support for suppliers.



1. Hyundai Hero Honors 2024 Awards



2. Ion heating system equipment

Response to Climate Change

2 Transition to Renewable Energy

RE100 Implementation Plan Hyundai, along with other major Group affiliates of Kia, Hyundai MOBIS, and Hyundai WIA, declared our commitment to the global initiative RE100 in July 2021, aiming for 100% renewable energy transition for electricity. In April 2022, this commitment was approved. Hyundai now aims to achieve 100% renewable energy transition by 2045, ahead of the RE100's target year, 2050. To achieve this goal, we take into account the renewable energy supply environment, government policies and regulations, and plant-specific conditions in each country. We plan to install solar panels, purchase renewable energy certificates, and establish power purchase agreements(PPAs) with external renewable energy generators. The aim is to gradually expand the use of renewable energy until 2045 by applying optimal solutions. All of our business sites in North and Central America(the U.S., Mexico, etc.), Europe(Czech, Türkiye, etc.), and India have set a target to achieve RE100 by 2025.

Adoption of Renewable Energy at Major Business Sites

• **Domestic Operations** In 2024, Hyundai signed the nation’s largest renewable Power Purchase Agreement (PPA) under which 610GWh renewable energy will be supplied to its domestic operations for the next 20 years. This is expected to help us reduce annual GHG emissions of nearly 280,000 tons, and the resulting reliability in power sourcing will accelerate the transition to renewable energy across our domestic operations. At our Ulsan, Asan, and Jeonju Plants, photovoltaic power generators with a total capacity of over 15MW were completed on employee parking lots, staging yards and plant rooftops to build infrastructure for off-grid solar power generation. Moving forward, we will continue expanding photovoltaic power generation facilities for on-site power generation and consumption.

• **R&D Center** The R&D Center in Korea is currently operating photovoltaic power generators with nearly 4MW capacity, and plans to add approximately 8MW by 2026. Hyundai Motor Europe Technical Center is currently installing approximately 130kW of on-site photovoltaic power generators in its new research building, with operations scheduled to begin in 2025.

• **Hyundai Motor Manufacturing Czech** The plant achieved its RE100 commitments by making a 100% switch to renewable energy to power its operations in 2022. Even after this accomplishment, the plant will complete the installation of photovoltaic power generators on plant rooftops in 2025 to raise the proportion of on-site renewable energy power generation.

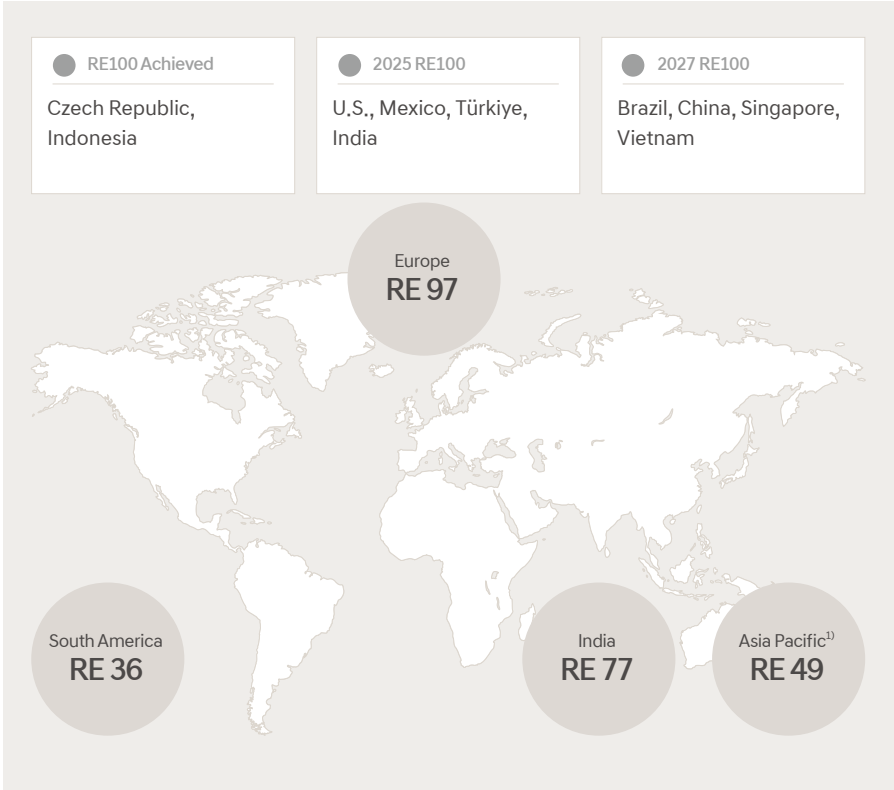
• **Hyundai Motor Manufacturing Indonesia** The plant has signed REC forward purchase agreements since 2023 to source renewable energy and operate on-site photovoltaic power generators, successfully delivering on its RE100 commitments. In 2025, the subsidiary will initiate the construction of another photovoltaic power generator with nearly 11MW capacity within the plant.

• **Hyundai Motor Türkiye Otomotiv A.Ş** In 2024, the plant shifted more than 90% of its power consumption to renewable energy through REC purchases. In the second half of 2025, the plant plans to complete and operate on-site photovoltaic power generators with a capacity of approximately 5MW to internally supply renewable energy.

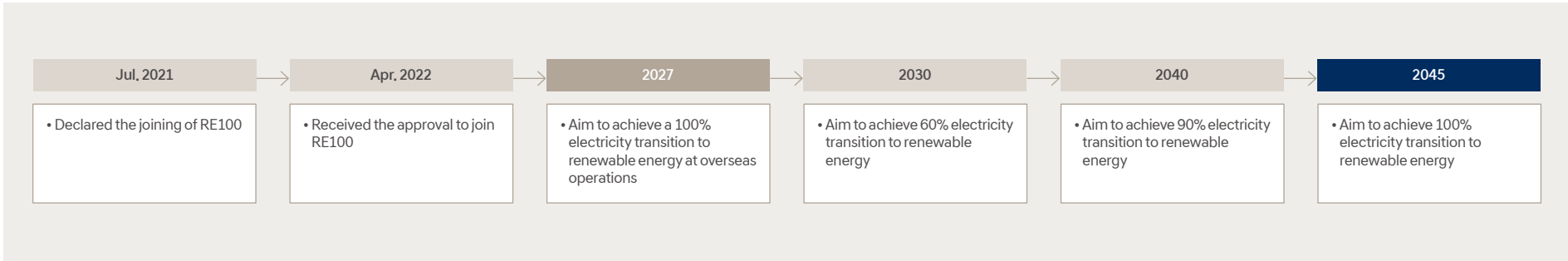
• **Hyundai Motor India** In 2024, the plant shifted more than 70% of its power consumption to renewable energy. The plant plans to achieve its RE100 goal by 2025 by continuously expanding the purchase of renewable energy through PPA signing and trading on the Indian Energy Exchange(IX), along with on-site photovoltaic power generation.

• **HMGMA** In 2024, Hyundai, in conjunction with Hyundai Mobis, Hyundai Steel, Hyundai Transys and other Group affiliate, signed a 15-year renewable Power Purchase Agreement (PPA) for their subsidiaries in the state of Georgia, the U.S. This will support Hyundai’s new EV plant Hyundai Motor Group Metaplant America (HMGMA) and other Georgia-based subsidiaries which supply electrification parts and EV steel sheets to HMGMA to source 378GWh of renewable energy annually, equivalent to an annual reduction of approximately 140,000 tons of carbon emissions.

RE100 Implementation Status of 2024 (Overseas Production Sites)



RE100 Roadmap



Business Sites		Renewable Energy Transition Rate
Europe	HMMC	100%
	HMTR	91%
India	HMI	77%
South America	HMCSA	36%
Asia Pacific	HMMI	100%
	BHMC	32%
	HTWO Guangzhou	45%

1) Excluding HMGICS

Response to Climate Change

3 Transition to Electrification

Transition Direction of Electrification Hyundai does its utmost to achieve carbon neutrality by 2045 by promoting carbon reduction in our vehicle sales. To accomplish this, we are transitioning our business structure from internal combustion engine vehicles to an electrificationfocused approach. Hyundai is continuously developing and producing not only hybrid and PHEVs but also EVs and FCEVs that have zero carbon emissions during operation. Hyundai is prioritizing the development of EV-focused technologies, such as the E-GMP (Electronic-Global Modular Platform), and enhancing the performance of hydrogen fuel cell systems that can be applied to a variety of types of vehicles, including passenger cars and commercial vehicles. Additionally, we are actively driving the expansion of electric and hydrogen infrastructure to ensure convenient and accessible charging and refueling facilities anytime and anywhere. As a Mobility Solution Provider, we are not only focused on improving the hardware performance of mobility devices but also on strengthening our software capabilities to consistently provide optimized services, generate revenue, and promote sustainable development.

Mid- to Long-Term Electrification Strategy To achieve the goals of the 2030 electrification strategy, we are implementing a comprehensive battery strategy that includes expanding production in regions with high demand for electric vehicles, developing next-generation battery technologies, and modularizing batteries, as well as enhancing the marketability of EVs by integrating hardware and software. Specifically, to achieve carbon neutrality, we are accelerating the transition to electrification, with the goals of 100% electrification in the European market by 2035 and 100% electrification in major markets by 2040. The company's share of the global sales of EVs is expected to increase to 36% by 2030, in line with plans to expand regional production through line conversions and new plant establishments, moving away from production centered in Korea.

Electrification Plan Since 2024, the pace of electrification has been slowing down amid easing environmental regulations and reduced EV subsidies in the U.S, EU and other key countries. The electrification of mobility, however, is central to the global initiative to combat climate change, and the transition to electrification is both the ultimate goal and strategic direction of the mobility industry. In this context, Hyundai remains steadfast in pursuing electrification strategies from the long-term perspective despite uncertainties caused by the deceleration of the electrification drive. Our short-term approach is to ensure agility in navigating fluctuating market demand through flexible sales strategies while building our leadership in the EV market by strengthening EV production capabilities and advancing differentiated battery technologies, shaping the future of electrification.

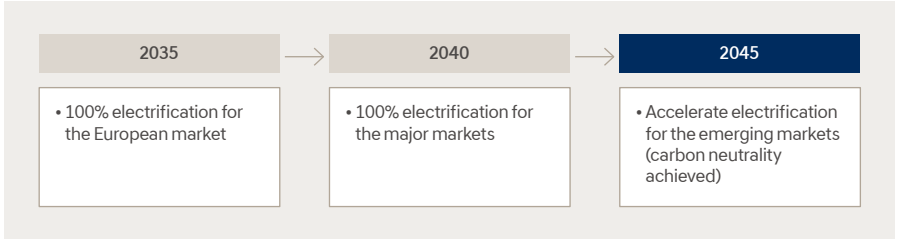
• **Responding to Market Demand** The demand for hybrid electric vehicles (HEV) is expected to rise continuously in line with the decelerating pace of electrification. Along with TMED (Transmission Mounted Electric Device)-II, the next-generation hybrid system that we developed in-house, we are adopting premium technologies tailored for hybrid models including smart regenerative braking and V2L (Vehicle-to-Load) technology, reinforcing the commercial viability and cost competitiveness of our hybrid offerings. We also expanded our hybrid lineup from seven to 14 models covering compact, large-sized and luxury segments to fully cater to consumer needs. By boosting hybrid vehicle sales, we aim to achieve 1.33 million units in global sales by 2028, which is up by over 40% from our 2023 global sales plan. To achieve this goal, we moved ahead in leveraging the mixed-model production system of our major global plants and securing parts supply chains. Additional production capacity available at HMGMA in North America will help us serve the North American market where hybrid demand is forecast to expand consistently by 2030.

EREVs(Extended Range Electrified Vehicle) combine the strengths of both ICE vehicles and EVs: while they are powered solely by electricity just as EVs in normal operations, their batteries are recharged by the engine when power runs low. Drawing on eco-friendliness and competitive pricing, EREVs are noted for their potential to catalyze the transition from conventional ICE vehicles to EVs during the upcoming recovery of EV demand. Hyundai will initiate the mass-production of EREVs in North America and China at the end of 2026, and set a goal of achieving over 110,000 units in EREV sales by 2030, with a focus on large-sized SUVs in North America and affordable C-segment platform models in China.

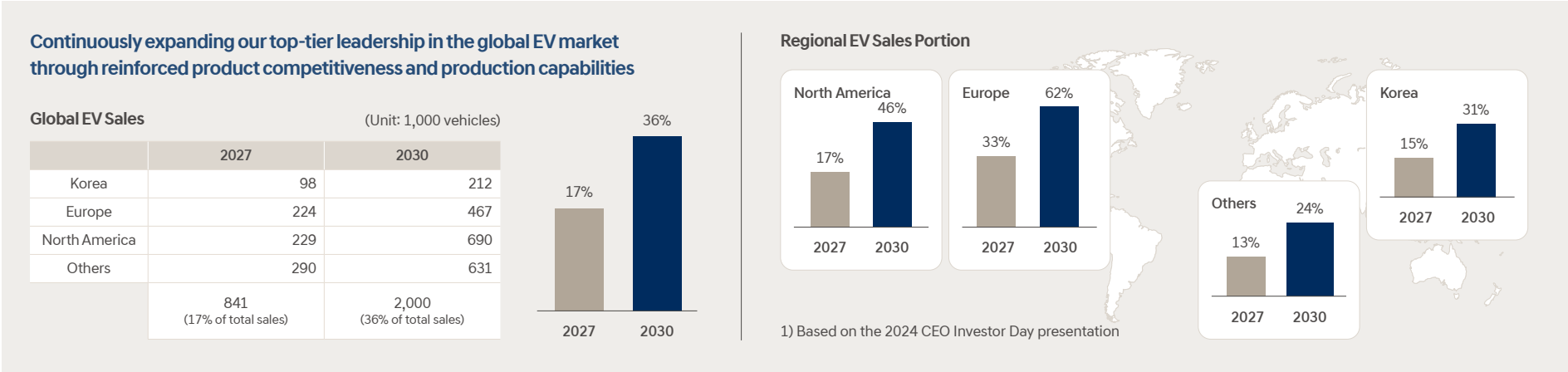
In the short-term, we are catering to market demand through our hybrid models and EREVs while progressively ramping up our EV lineup in anticipation of a recovery in electrification demand by 2030, maintaining our initial goal of 2 million EV sales. We aim to establish our EV lineup spanning from budget to luxury and high-performance models while delivering a total of 21 EV models, providing diversified and differentiated EV experiences to consumers and taking the lead in the EV market.

• **Boosting Production Capacity** Hyundai caters to market demand through global plant construction/ expansion and maximum facility utilization. Specifically, our HMGICS in Singapore serves as a hub for developing and testing innovative production technology: HMGICS deploys robotics, AI, digital twin systems and other smart technologies while operating as a sustainable manufacturing facility, independently generating approx. 2GWh of energy each year with its photovoltaic power generators. We plan to roll out HMGICS' innovative technologies to HMGMA in the U.S, to better position ourselves to navigate the transition to electrification. HMGMA in the U.S, is capable of producing up to 500,000 units per year. Having initiated its operations in Q4 2024, HMGMA has been producing the IONIQ 5 and IONIQ 9 since 2025 and is poised to play a pivotal role in building our leadership in the North American electrification market in the years ahead.

Vehicle Electrification Roadmap



2030 EV Sales Target¹⁾



Response to Climate Change

• **Internalizing Battery Development Capabilities** Batteries are instrumental in determining the competitive strengths of EVs in terms of cost, driving range, and convenience, and also hold paramount importance from the consumers’ perspective. From cell-level and system designs applied to all EVs, hybrids, and plug-in hybrids to BMS(Battery Management System) and battery stability enhancement technology, Hyundai delivers differentiated solutions to establish its global leadership in the electrification market.

To expedite the development of next-generation battery technologies including all-solid-state batteries and verify their mass-producibility, Hyundai Motor Group completed a next-generation battery research wing at the Uiwang R&D Center in 2024. This new facility will be responsible for developing all-solid-state batteries and other advanced battery technologies at scale. Drawing on the technology and expertise gained through in-house battery design efforts, we aim to pilot the mass-production of EVs equipped with all-solid-state batteries in 2025 and initiate their full-scale mass-production around 2030.

Hyundai is also focused on advancing innovative EV battery technologies essential for the transition to sustainable mobility. In September 2024, we formed strategic partnerships with Hyundai Steel and EcoPro BM to develop cathode technologies for next-generation LFP(Lithium Iron Phosphate) batteries. As part of our efforts for eco-friendly process innovation, we are developing ‘direct synthesis’ methods which eliminate the precursor production phase, reducing the use of hazardous substances all while securing cost competitiveness. By internalizing these battery material technologies, Hyundai is expected to accelerate its dominance in the EV market and enhance the group’s technological competitiveness.

As a strategic move to bridge the EV chasm, Hyundai is committed to building competitive battery solutions that meet the needs of diverse customers. To this end, we are developing entry-level NCM batteries that are more than 10% affordable compared to existing ones, in addition to performance-driven NCM batteries and cost-effective LFP batteries. We successfully improved battery energy density by over 20% compared to 2024 as part of our efforts to diversify battery chemistries. In so doing, we progress towards our 2030 EV sales goal and prepare solutions to deliver performance for eco-friendly mobility.

Our BMS (Battery Management System) supports real-time cell diagnostics, identification of abnormal sign, and early detection of potential defects. We are also developing battery life management technologies that monitor battery health using AI models, continuously advancing safety features. In terms of battery systems, we are working on emergency vents, fire-resistant materials, and structures preventing thermal propagation irrespective of cell form factor. These efforts ultimately aim to limit heat transfer between cells in the event of a fire, helping to enhance EV safety and laying the groundwork for the broader adoption of EVs.

Expanding Eco-friendly Vehicles

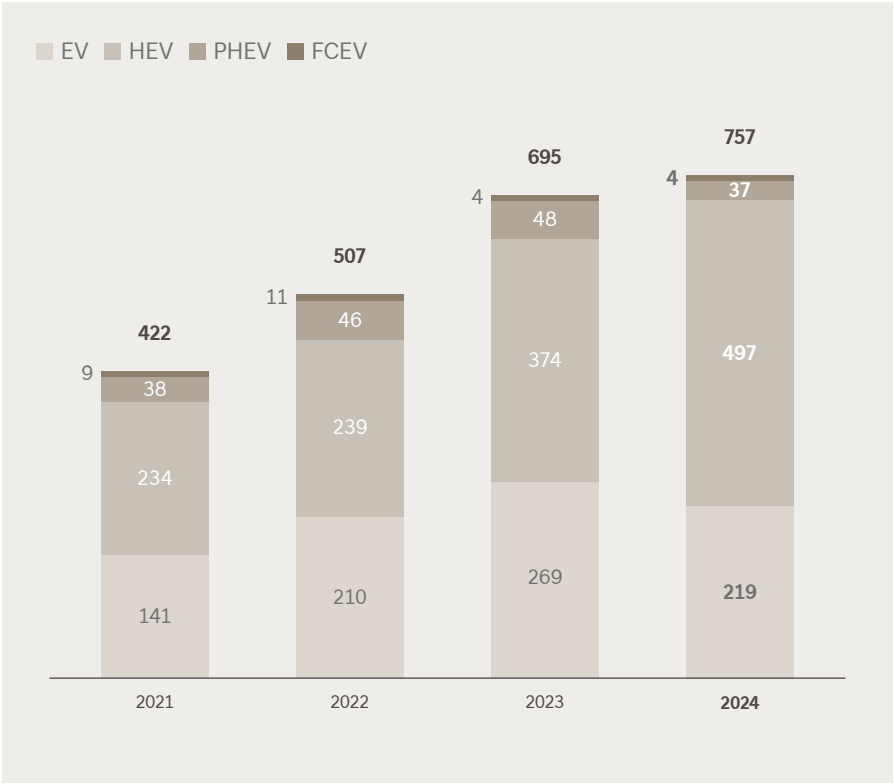
• **EV** EV Hyundai launched the dedicated eco-friendly model of the IONIQ in 2016 and introduced the Kona EV, a compact SUV electric vehicle, in 2018. We then unveiled the IONIQ brand, based on the E-GMP platform, in 2020, followed by the release of the IONIQ 5 in 2021 and the IONIQ 6 in 2022, and the IONIQ 9 in 2025. In April 2024, we launched two logistics-specialized models, the “Cargo” and the “Cargo Refrigerated”, on our new electrification business platform “ST1.”

• **HEV and PHEV** Hybrid models are available for all models except for large SUVs and small sedans such as IONIQ, Elantra(AVANTE), Kona, Sonata, Tucson, Santa Fe, and Grandeur. We are also offering a plug-in hybrid lineup in our IONIQ, Sonata, Tucson, and Santa Fe models. By 2030, Hyundai aims to expand hybrid and plug-in hybrid sales to account for 23.5% of total sales.

• **Fuel Cell Electric Vehicle(FCEV)** The NEXO that Hyundai unveiled in 2018 is a leading FCEV with a maximum driving range of 611km (US certification) and a charging time of about five minutes(6.33kg per charge). In 2025, we released the second-generation NEXO, a completely redesigned model with enhanced performance. We are expanding our leadership in FCEV, mass-producing Elec-City fuel cell buses and XCIENT fuel cell heavy-duty trucks. In October 2024, Hyundai premiered INITIUM as a FCEV concept car, steadily broadening its FCEV lineup to expedite the transition to a hydrogen society. Our 2024 FCEV sales amounted to nearly 4,000 units.

• **Other Alternative Fuel Vehicles** Hyundai continues releasing regional specialty, alternative fuel models powered by bioethanol and compressed natural gas(CNG) among others. Our flex-fuel model HB20 was designed to meet the bioethanol demand of Latin America. Our aim is to raise the proportion of flex-fuel vehicles and LPG vehicles to 3.6% and 0.5% respectively by 2030.

Global Sales of Eco-Friendly Vehicles (Unit: 1,000 vehicles)



Sales of Alternative Fuel Vehicles (Unit: vehicles)

	2021	2022	2023	2024
Flex-fuel vehicles	186,573	195,485	191,348	200,253
CNG vehicles	1,489	1,581	1,180	913
LPG vehicles	48,851	42,803	41,495	99,111
Total	236,913	239,869	234,023	300,277

Response to Climate Change

Optimizing EV Battery Performance and Efficiency Hyundai’s dedicated EV batteries are designed to provide a maximum driving range of 250,000 to 300,000 kilometers when reaching 70-80% of battery performance. This translates to a cumulative usage of 12 to 15 years when assuming an annual driving distance of 20,000 kilometers. Lithium-ion batteries that are commonly used in EVs perform at their best when temperatures range between 25°C and 35°C, delivering optimal charging speeds and extended driving range. Hyundai is developing and applying a suite of ‘thermal management technologies’ to maintain battery temperatures within this ideal range. In particular, Hyundai Motor Group’s battery preheating technology is drawing attention for its benefits in preventing battery depletion during winter. Hyundai Motor Company’s preheating technology is designed to place a heater at the inlet of coolant which regulates battery pack temperature. The heater serves to warm up the coolant and this raises the battery temperature as a result. To ensure thermal management does not compromise driving range, we are also working on an ‘external thermal management station’ that harnesses external energy from charging stations. This technology optimizes battery temperatures by injecting pre-conditioned coolant into the battery during charging, maintaining the battery’s state of charge while controlling battery temperatures to maximize charging speeds.

Hyundai is developing technologies that enhance user convenience as well as battery performance. A prime example is the ‘battery conditioning mode’, a feature adopted for EVs that leverages battery heaters. This mode is activated when a user sets a fast charging station as a waypoint or destination on the navigation system, and serves to regulate battery temperatures during driving, reducing initial charging resistance and shorten overall charging time accordingly. Aside from this, we are engaging in R&D efforts on a variety of battery technologies and structural designs, including battery cell density improvement and advanced battery materials, doing our part in bringing EVs into the mainstream.

Certified Energy Efficiency by EV Model

Model	Korea(Combined) ¹⁾	Europe(WLTP) ²⁾	U.S.(EPA) ²⁾
Electrified G80	4.3 km/kWh	19.1 kWh/100km	97 MPGe
Electrified GV70	4.6 km/kWh	19.2 kWh/100km	91 MPGe
Electrified GV60	5.1 km/kWh	17.0 kWh/100km	112 MPGe
Kona Electric	5.5 km/kWh	14.7 kWh/100km	120 MPGe
IONIQ 5	5.2 km/kWh	17.0 kWh/100km	114 MPGe
IONIQ 6	6.0 km/kWh	14.3 kWh/100km	140 MPGe

1) Electrified G80(19-inch, 2,265 kg), Electrified GV70(19-inch, 2,230 kg), GV60(standard 2WD), Kona Electric(long range, 1,720kg), IONIQ 5(long-range 2WD exclusive, without built-in cam), IONIQ 6(long-range 2WD, 18-inch)
2) Europe and the U.S. make distinctions based on the representative TRIM standards for each model

4 Improving Fuel Economy

Enhancing the Public Confidence in Fuel Economy Testing Hyundai complies with the fuel economy regulations of key markets such as Korea, North America, Europe, China, and India. To obtain fuel economy certification, we conduct tests according to the standards of each country. To enhance the reliability of fuel economy and emission measurements conducted in controlled conditions(on-cycle), Hyundai undergoes inspections of fuel economy measuring equipment by external specialized organizations such as the Korea Laboratory Accreditation Scheme(KOLAS) and the Korea Automotive Technology Institute(KATECH). Furthermore, Hyundai collaborates with a variety of government research institutes and conducts fuel economy tests jointly to ensure public confidence in the accuracy of the fuel economy measurement results. The results of on-cycle and off-cycle test comparative analysis are reported to the executive in charge of R&D at least once a year. This report is delivered to ESG Planning Team which is responsible for ESG risks annually.

• **Real-Road(Off-Cycle) Fuel Economy Test** The vehicle fuel economy is influenced by a variety of factors, including internal factors such as gear shifting, vehicle weight, and air conditioning, as well as external factors like road conditions and traffic congestion. In light of this, Hyundai conducts fuel economy tests not only in controlled conditions(on-cycle) considering a variety of factors but also performs off-cycle tests that simulate real-world driving profiles.

• **Collaboration with Third-Party Agencies** Hyundai conducts correlation analysis between the fuel economy test results obtained from real-world(off-cycle) tests and those of other organizations. In the U.S. market, we compare our fuel economy data with those published by third-party organizations such as the EPA, J.D. Power, and Consumer Reports. In the European market, comparisons are made with data from third-party organizations such as Green NCAP, Auto Bild, and Spritmonitor. By comparing the fuel economy measurement results with those of third-party organizations in each country, we enhance the credibility of our own fuel economy test results.

Responding to Fleet average CO₂ standards(Fuel Economy) in Major Markets The fleet average CO₂ standards or corporate average fuel economy regulations, implemented in major countries, are continuously being strengthened to achieve their carbon reduction targets. In the EU, regulatory targets have been adopted to reduce passenger car CO₂ emissions by 55% by 2030 compared to 2021 and achieve complete decarbonization of vehicle CO₂ emissions by 2035. The U.S. government has announced regulations to increase the fuel economy target to 49.1 miles per gallon (mpg) by 2026. They have also set a target to replace 50% of new vehicle sales with electrified vehicles (including EVs, PHEVs, and FCEVs) by 2030. The government of California in the U.S. plans to replace 35% of new vehicle sales with zero-emission vehicles (including EVs) starting from 2026, increasing to 68% by 2030, and has set plans to prohibit the sale of new internal combustion engine vehicles starting from 2035.

We will respond to increasingly stringent CO₂ regulations in respective key markets to expand our electric vehicle sales, thereby reducing regional fleet average carbon emissions. In planning annual sales volumes, we calculate regulation-compliant volumes including EV sales and incorporate them in the planning process.

Response to Climate Change

Responding to Fleet average CO₂ standards(Fuel Economy) in Major Markets

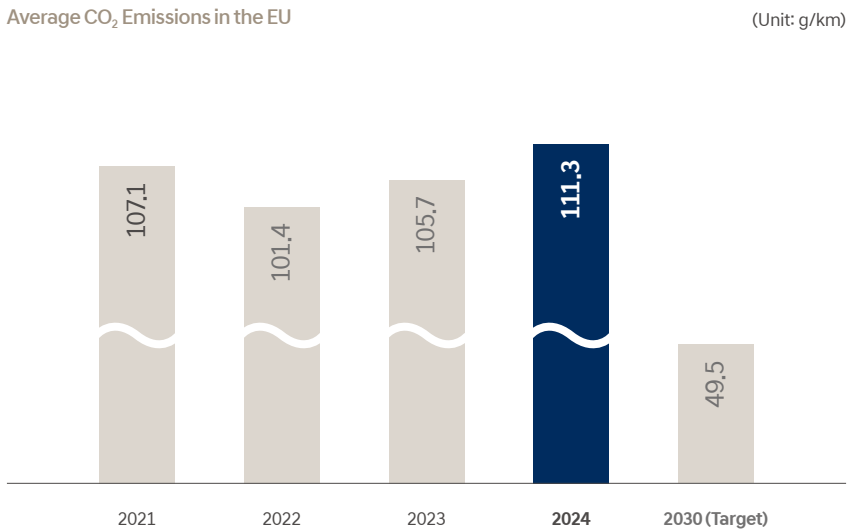
Korea

South Korea has strengthened its automotive GHG regulations, requiring a reduction in vehicle emissions from 97g/km in 2020 to 89g/km in 2025 and 70g/km by 2030. Exceeding the emission standards results in an administrative fine of KRW 50,000 per gram. In addition, the Korean government has presented a basic plan to reduce emissions by 24% by distributing 2.83 million eco-friendly vehicles, including electric and hydrogen vehicles and hybrids, by 2025, and 7.85 million vehicles by 2030.



EU

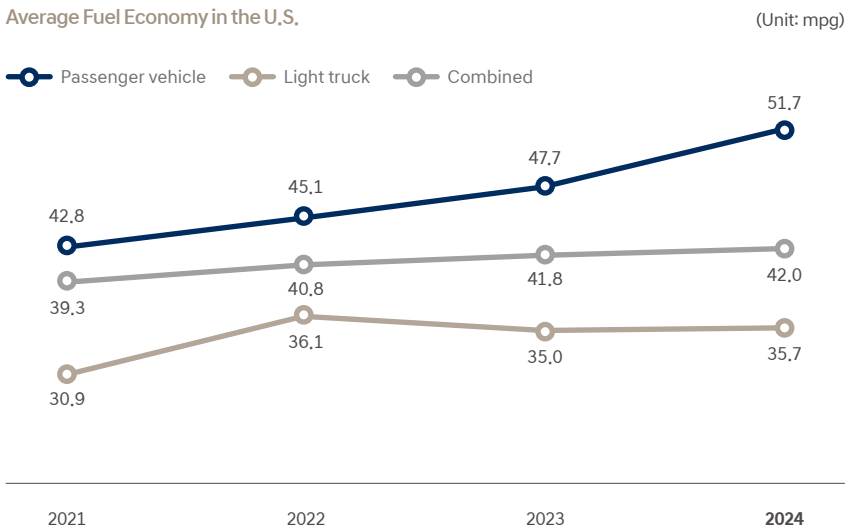
The EU has finalized its goals through a resolution by the European Parliament, with an aim to achieve a 15% reduction by 2025 and a 55% by 2030 compared to the levels in 2021. In addition, the EU has set a goal to achieve a 100% reduction in emissions from passenger cars by 2035. As a result of these regulations, starting from 2035, the sale of new ICEVs in the EU market will be practically impossible. Furthermore, countries like Norway, the Netherlands, and Germany are even pursuing individual national policies to prohibit the sale of new internal combustion engine vehicles earlier than 2035.



* The figure for 2024 is based on our sales performance and is our own estimate. Going forward the final confirmation of the figures by the EC will be necessary.

U.S.

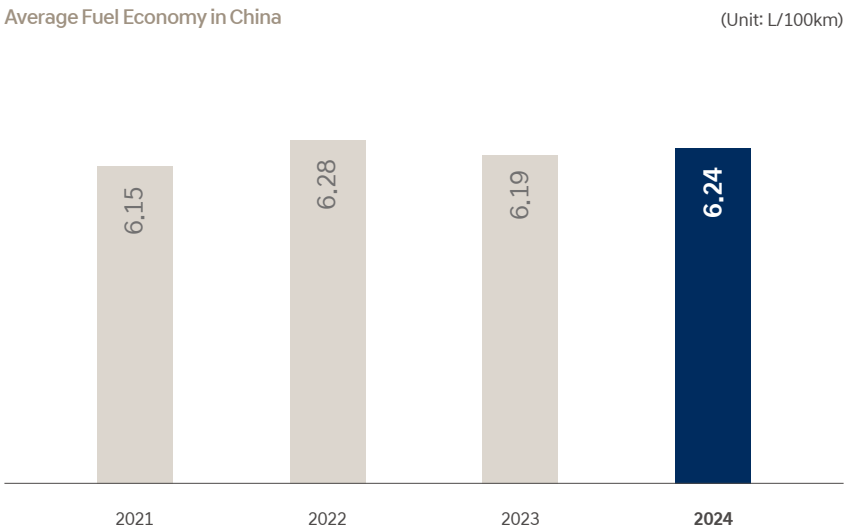
The U.S. government has increased their average fuel economy target from 40 miles(64.4km) per gallon to 49.1 miles(79km) per gallon by MY(Model Year) 2026. They have also set a goal to reduce greenhouse gas emissions from 224 grams per mile to 161 grams per mile by MY 2026. Furthermore, both the federal and state governments are expanding incentives for the transition to eco-friendly vehicles through increased purchase subsidies. The federal government has set a goal to transition 50% of all vehicles, including electric vehicles(EVs), to zero-emission vehicles by MY 2030. Additionally, the California state government is pursuing a policy to ban the sale of internal combustion engine vehicles starting in MY 2035.



* The average fuel economy in the U.S. and China is determined annually based on the average fuel economy performance of individual car brands as disclosed by the respective government agencies(NHTSA) in the U.S. and the Ministry of State Security in China
** The figure for MY 2024 is based on our sales performance and is our own estimate. Going forward the final confirmation of the figures by the NHTSA will be necessary.

China

The Chinese government is also continuously strengthening fuel efficiency regulations and enhancing the mandatory sales requirements for new energy vehicles(NEVs), including EVs. In particular, they aim to progressively increase the mandatory sales share of NEVs, reaching 20% by 2025, 40% by 2030, and 50% by 2035. Additionally, they have set a target for EVs to account for over 95% of NEV sales by 2035.



* The figure for 2024 is based on our sales performance and is our own estimate. Going forward the final confirmation of the figures by the Ministry of State Security in China will be necessary.

Response to Climate Change

5 Life Cycle Assessment (LCA)

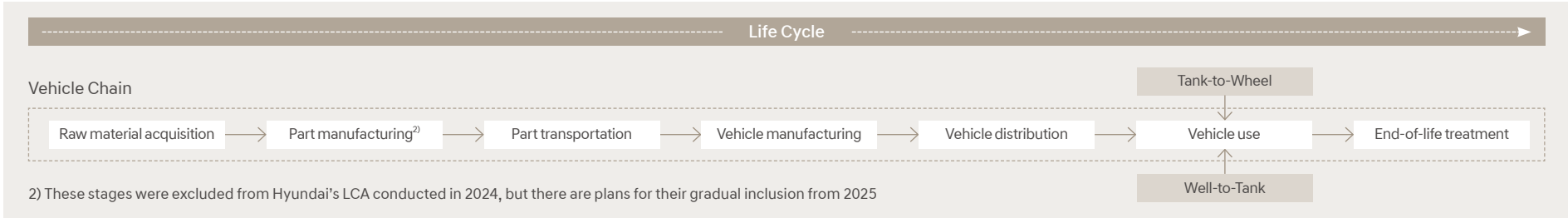
LCA Methodology Hyundai conducts life cycle assessments(LCA) based on ISO 14040 and 14044 international standards to assess the environmental impacts throughout the entire process of vehicle production, including raw material acquisition, part manufacturing, part transportation, vehicle manufacturing, vehicle distribution, vehicle operation, and end-of life treatment. As of 2024, the proportion of vehicle models that underwent LCA was 62.2%. The LCA was conducted using the full-LCA methodology for all vehicle models.

We conduct LCAs using the EF(Environmental Footprint) 3.1 methodology of the EU PEF¹⁾, assessing 13 impact categories including climate change(GWP), ozone depletion, particulate matter, ionizing radiation, photochemical ozone formation, acidification, eutrophication(terrestrial, freshwater, marine), land use, water depletion, and resource use(minerals, metals, and fossil fuels). As for vehicle transport and distribution, use of electricity and other energy sources, and pollution discharges, we utilized actual data measured from our operations. In the EV operational phase, impacts on future electricity generation were estimated based on the nation's ‘Basic Electricity Supply/Demand Plan’.

Hyundai's LCA process was verified by an external certification body(TÜV Rheinland) for its compliance with ISO 14040/44 and its scientific and technical validity, demonstrating its LCA practices are aligned with pertinent international standards.

1) EU Product Environmental Footprint: EU's methodology to assess the environmental impacts of products

Life Cycle Stages Covered by LCA



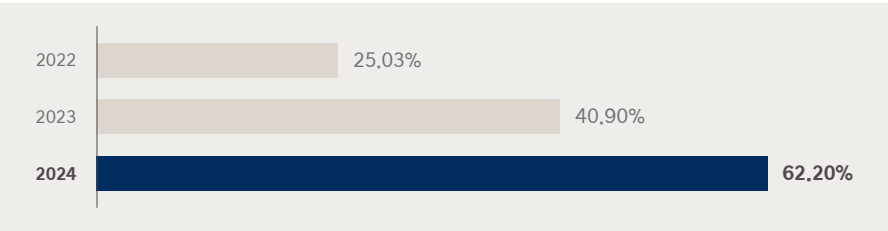
Impacts Covered by LCA

Ecological consequences						Resource use		Human health	
Acidifi- cation (AP)	Partic- ulate matter (PM)	Eutrophi- cation (EP)	Global warming (GWP)	Ozone deple- tion (ODP)	Photoch- emical ozone formation	Abiotic deple- tion (minerals, fossil fuels)	Land use	Water depletion	Ionizing radiation

Use of LCA Hyundai comprehensively analyzes the environmental impacts at each stage of the entire process based on the results of LCA. Using this information, we identify and promote activities to improve the environmental aspects of our vehicles. In the raw material acquisition stage, we are expanding the use of reduced-carbon steel and aluminum materials. In the part-manufacturing and vehicle-manufacturing stages, we are committed to carbon neutrality through initiatives like RE100 and resource circulation. When developing new models, we aim to minimize environmental impacts by considering LCA.

LCA Results In 2024, additional LCA were completed for 15 models, bringing the cumulative total of vehicles assessed by LCA up to that year to 36 models. The part manufacturing stage that is not currently included will be further refined and supplemented by updating LCA methodologies.

Sales Ratio of Vehicles with Full-LCA Conducted



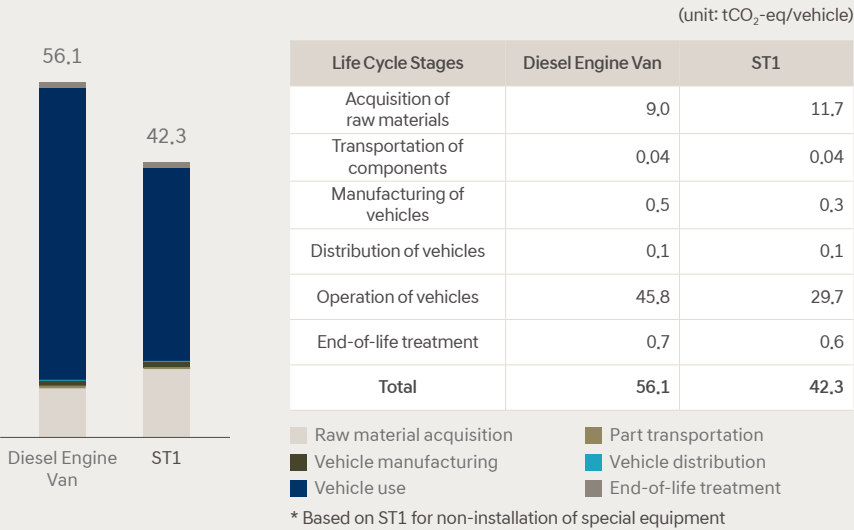
BUSINESS CASE

Conducting LCAs on Hyundai's 1st PBV (ST1) in 2024



For Hyundai, LCAs serve as a valuable tool for quantifying the potential environmental impacts of its vehicles, identifying specific areas for improvements and enhancing overall environmental performance. In 2024, we conducted LCAs on newly-released Santa Fe and Casper EV models and the ST1 as well as the Sonata, a key model in our existing lineup. Notably, the ST1 is Korea's 1st PBV(Purpose Built Vehicle) and is adaptable to various formats according to user-defined purpose based on our electrification business platform. Combining autonomous driving with eco-friendly electrification technology, the ST1 is drawing attention as a critical solution for future mobility.

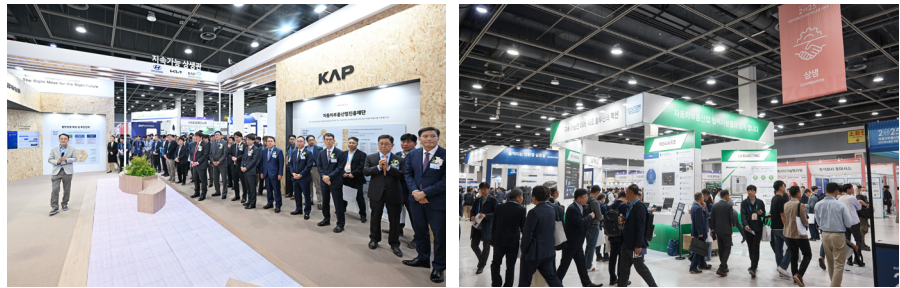
The LCA results showed that the Global Warming Potential(tCO₂-eq) of the ST1 is nearly 25% lower than that of diesel engine van models. Powered by electricity, the ST1 emits no GHG during operation and demonstrates clear environmental advantages over existing diesel engine vans even when accounting for environmental impact resulting from electricity generation. Meanwhile, the ST1 consumes various resources that are not needed in ICE vehicles and produces relatively greater environmental impacts in the raw material extraction stage. As the adoption of renewable energy gradually reduces the environmental impact of electricity production, this will further highlight the importance of environmental impacts during the raw material extraction phase from the lifecycle perspective. In response, Hyundai is committed to identifying alternative parts and developing and applying eco-friendly recycled materials.



Response to Climate Change

6 Carbon Reduction in the Supply Chain

2025 Auto Parts Industry ESG and Carbon Neutrality Fair In April 2025, we hosted Korea's first supply chain ESG/carbon neutrality fair to assist our suppliers in building sustainable future competitiveness. Focusing on carbon neutrality, a total of 111 suppliers showcased a variety of practical and immediately applicable ESG-related solutions. The event attracted over 12,000 attendees, including approximately 8,000 supplier employees. The fair also featured sessions introducing Hyundai's sustainability policies and offering expert lectures on key topics, helping tier-1 and tier-2 suppliers advance their sustainability management. The post-event survey revealed that the fair contributed to deepening understanding on ESG, carbon neutrality and other areas of sustainability for supplier CEOs and that suppliers were planning to adopt new ESG solutions in their own operations (survey results: 87% reported improvement in their understanding of ESG and carbon neutrality, 80% indicated plans to implement sustainability initiatives in their operations).



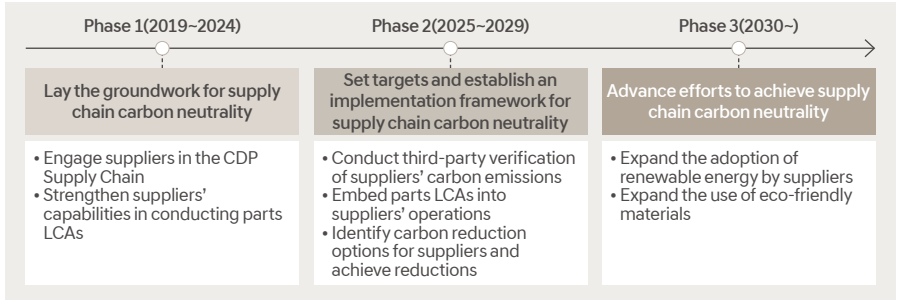
Support for Suppliers' Carbon Reduction Efforts Hyundai collects data on suppliers' carbon emissions and reduction plans, performing various tasks to support their carbon reduction. We implement projects to strengthen management systems for core suppliers with high carbon emissions, specifically supporting the establishment of GHG inventories and the development and implementation of carbon reduction roadmaps. Once suppliers have internalized their carbon neutrality implementation systems, a transition to a carbon reduction management system certified by third-party organizations is planned for high-emission suppliers.

Decarbonizing Steel Materials Hyundai plans to expand its decarbonization efforts to include steel materials that are key to vehicle manufacturing. For select vehicle models scheduled for production in Korea and Europe starting in 2026, we will prioritize the use of carbon-reduced steel produced by recycling steel scrap or using electric arc furnaces, which is expected to reduce carbon emissions by nearly 20% relative to conventional steel produced using blast furnaces. To support this approach, we will establish quality inspection and carbon emissions review procedures tailored to carbon-reduced steel, elaborating on our action plans towards decarbonization. Notably, we are considering the use of steel produced through electric furnaces at Hyundai Steel's steelworks which is slated for completion by 2029 in the state of Louisiana, the U.S., to meet growing global demand including that of our North American production plant.

Participating in the CDP Supply Chain As a member of the CDP Supply Chain, Hyundai collects objective data on the climate action of over 360 tier-1 suppliers, tracking their efforts to reduce supply chain emissions. The CDP Supply Chain is an environmental disclosure project aimed at gathering supplier data on climate-related issues and strategies as well as carbon emissions and evaluating each supplier's response based on ratings published by the CDP. We provide differentiated and customized training aligned with assessment ratings, along with targeted one-on-one consulting for suppliers with low ratings, strengthening overall climate change response capabilities throughout the supply chain and raising suppliers' awareness on carbon neutrality.

Support for Parts LCA The parts LCA support program calculates the carbon emissions generated throughout the entire process, from raw material acquisition to parts manufacturing and transportation at the supplier's facilities. It supports the objective verification of high-emission processes and facilitates reduction activities. Hyundai is collaborating with external expert organizations to enhance suppliers' capabilities in conducting comprehensive LCAs of parts. This three-year support initiative, scheduled from 2023 to 2025, aims to lay a structured groundwork for advancing vehicle-level carbon reduction efforts through LCA.

Phased Roadmap Towards Supply Chain Carbon Neutrality



Activities for Supporting Suppliers' Carbon Reduction Efforts

Activity	Description
Training for and raising awareness of suppliers	- CEOs: Hosting the Partnership Day for suppliers and introduce Hyundai's carbon neutrality strategies - Employees: Offering training on the enhancement of suppliers' capabilities of carbon neutrality(Global Partnership Center)
Participating in the CDP Supply Chain	- Training and consulting programs for suppliers(emission calculation, questionnaire guidance, etc.) - One-on-one tailored consulting program for underperforming suppliers to improve competence
Supporting for supplier parts LCA	- Support for calculating carbon emissions from raw material acquisition to component manufacturing and transportation stages - Support for reduction activities by identifying high carbon emission manufacturing processes
Supporting suppliers' carbon reduction management systems	- Establishment and provision of a computerized management system for systematic monitoring of carbon emissions - Support for the establishment of carbon emission inventories and the development of carbon reduction roadmap for high carbon emission suppliers
Supporting suppliers in purchasing carbon reduction equipment	Inducing suppliers(MEs and SMEs) to implement energy cost and carbon reduction activities by helping them replace with high-efficiency equipment(in collaboration with Foundation of Korea Automotive Parts Industry Promotion, 2023~)

Creating an Ecosystem for Low Carbon Logistics and Transportation Hyundai and Hyundai GLOVIS strive to reduce carbon emissions from the "first mile" stage, where freight moves from production plants to logistics warehouses, to the "middle mile" and "last mile" stages, where it moves from warehouses to a variety of hubs. In the first mile stage, fuel cell trucks suitable for long-distance driving are being deployed. In the middle mile and last mile stages, electric trucks and other innovative technologies such as EVs, FCEVs, urban air mobility, and robotics are being utilized to lead the reduction of carbon emissions in the logistics and transportation service ecosystem. Furthermore, Hyundai has signed a multi-stakeholder agreement with Hyundai GLOVIS, the Ministry of Land, Infrastructure and Transport, the Ministry of Trade, Industry and Energy, and the Ministry of Environment to expand the electrification of the logistics and transportation sector by 2030. Hyundai is striving to distribute 10,000 fuel cell trucks in the logistics field by 2030.

Supply Chain Carbon Information Disclosure & Activities for Logistics/Transportation Energy Efficiency

Hyundai Disclosure of supply chain carbon information	Goal	Establishing a plan to specify and support our supply chain carbon reduction strategy by disclosing information on carbon emissions of suppliers
	Efforts for education and support	- Support CDP Supply Chain assessments and operate capability enhancement programs - Support parts LCA and operate consulting programs
	Future utilization measures	Build carbon emission databases for supplier sites and parts using SCEMS¹⁾
Hyundai GLOVIS Activities for enhancing the efficiency in logistics and transportation	Achievement of packaging efficiency	- Reducing energy consumption for collecting packing materials through the development of foldable plastic boxes²⁾ - Pursuing packaging efficiency through cooperation with suppliers and expand logistics energy efficiency
	Transitioning to eco-friendly transportation	Enhancing energy efficiency and reduce GHG emissions through coastal shipping
	Eco-driving of cargo vehicles	- Enhancing the integrated transportation management system within the logistics business and improve the fuel efficiency of cargo vehicles - Monitoring of fuel economy improvement activities through real-time data analysis enabled by equipping all vehicles with Digital Tachographs(DTG)

1) Supplier CO₂ Emission Monitoring System
2) When used as a packaging material for automobile parts, foldable plastic boxes can be recovered and folded up to a fifth of their size, greatly increasing the amount of boxes that can fit into a collection container.

Response to Climate Change

7 Expanding Our Hydrogen Business

HTWO Grid Hydrogen can be produced and utilized through various methods, and is well-suited for storage and transport owing to its high energy density. These characteristics make hydrogen a viable alternative to existing fossil fuels, with demand expected to grow steadily. Hyundai Motor Group recognized the importance and economic feasibility of hydrogen early on as a critical enabler of the transition to a low-carbon energy society, and has been conducting R&D on fuel cells and hydrogen-powered EVs since 1998, leading the way in the transformation towards a hydrogen society.

Hyundai Motor Group has subsequently delivered notable outcomes in the hydrogen business, initiating the world's first mass-production of hydrogen-powered EVs and hydrogen-electric large trucks. In 2020, the Group launched its hydrogen fuel cell brand HTWO and unveiled HTWO Grid at the 2024 CES. As the Group's new brand connecting the entire value chain of the hydrogen industry, HTWO Grid provides customized solutions spanning hydrogen production, storage, transport and application. With three decades of leadership in hydrogen mobility, Hyundai Motor Group aims to combine the core strengths of Hyundai Motor Company with its extensive industry capabilities, evolving from a mobility company to a global leader in the energy transition shaping a future hydrogen energy ecosystem.

• **Closed-Loop Hydrogen Production** Hyundai Motor Group has developed W2H(Waste-to-Hydrogen) technology which converts organic waste to clean hydrogen all while providing an effective solution for waste disposal. Presently, 500kg of hydrogen is produced daily from 60 tons of food organic waste through collaboration between Hyundai E&C and Hyundai Rotem in Chungju, Korea, in combination of the commercial operation of hydrogen-powered vehicles. In 2024, a new W2H facility went into operation using sewage sludge in Cheongju, and additional W2H facilities are under construction in Poland and Indonesia. Notably, Hyundai Motor Group is establishing a closed-loop hydrogen ecosystem in Indonesia in partnership with local governments and state-owned enterprises. This project involves covering the Sarimukti Landfill with soil to prevent potential natural disasters and extracting biogas once soil covering is completed. The extracted biogas will then be converted to clean hydrogen using Hyundai Rotem's hydrogen reformers. With the feasibility study now complete, this marks the first case of scaling a closed-loop hydrogen production demonstration project - currently in progress in Korea – to an overseas location.

• **Decarbonizing Ports and Airports** Hyundai provides hydrogen energy solutions to help decarbonize logistics hubs that are heavily dependent on fossil fuels. We participated in the Northern California Zero-Emission Regional Organizing Hub(NorCAL ZERO) initiative in the U.S., supplying 30 XCIENT fuel cell trucks to the Port of Oakland in September 2023. As the largest single deployment of large-sized hydrogen fuel cell trucks in North America, this initiative contributes to replacing high carbon-intensive freight trucks. We also participated in the U.S. government's hydrogen infrastructure development project H2Hub, showcasing the excellence of hydrogen fuel cell technology. In 2024, we signed an MOU with Incheon International Airport Corporation to advance the airport's digital transformation through future mobility innovation. Under this MOU, we are establishing hydrogen energy systems and build hydrogen infrastructure throughout Incheon International Airport, including the introduction of fuel cell trucks and forklifts for logistics and electric shuttle buses powered by hydrogen fuel cells as well as the deployment of hydrogen refueling stations.

• **Expanding the Hydrogen Fuel Cell System Lineup** Hyundai became the world's first to mass-produce fuel cell EVs in 2013, maintaining a leading position in the hydrogen mobility market. Leveraging our HTWO Grid solutions, we are extending the application of hydrogen technology beyond vehicles to include trams, vessels, airplanes and other untapped areas. These efforts reflect the shared vision of Everyone, Everything, Everywhere between Hyundai and HTWO, moving forwards a hydrogen society where hydrogen is made available to everyone for everything everywhere by 2040. Through strategic collaboration with Group affiliates, Hyundai Motor Company is expanding its eco-friendly mobility solutions driven by hydrogen fuel cells. Successfully implementing a hydrogen forklift demonstration project using a hydrogen fuel cell system as well as a hydrogen electric tram development project, we are charging the way in broadening the hydrogen ecosystem. Going beyond mobility, we also advance the application of hydrogen fuel cell technology in non-vehicle sectors by developing mobile hydrogen fuel generators to transform EV charging infrastructure and deploying hydrogen-based emergency power systems for data centers. In June 2024, we acquired the domestic hydrogen fuel cell business from Hyundai Mobis, establishing the hydrogen fuel cell process quality group at the Hydrogen Fuel Cell Development Center under the R&D Division and organizing functions for manufacturing technology and mass-production quality, internalizing hydrogen technology in the process. In so doing, Hyundai will develop hydrogen fuel cell systems optimized for next-generation mobility platforms and play a role in building a hydrogen ecosystem as an integrated solution provider covering software support, system installation and maintenance, and tailored financial services.

• **Clean Logistics Business** Hyundai Motor Group established HTWO Logistics in partnership with GLOVIS America in early 2024, introducing eco-friendly logistics business solutions to HMGMA, the Group's first EV-only plant. HTWO Logistics has supplied XCIENT fuel cell trucks transporting parts and vehicles for HMGMA. These trucks are capable of handling almost half of the logistics needs of HMGMA production facilities, and are expected to significantly reduce carbon emissions compared to conventional diesel trucks.

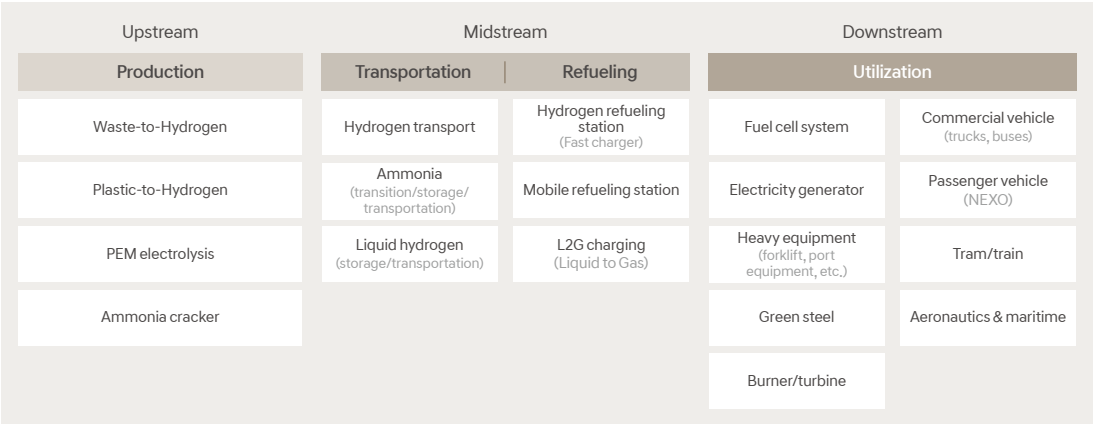
Strengthening Partnerships for Hydrogen Business

• **Hydrogen Council** The Hydrogen Council, which was inaugurated during the World Economic Forum(Davos Forum), is the first and only global coalition of CEOs established to underscore the role of hydrogen technology in the worldwide energy transition. Comprising over 140 global companies including Hyundai Motor Company, Toyota, BMW, and Air Liquide, the Council discusses initiatives to successfully progress towards the goals of the 2015 Paris Agreement. During 2018 and 2020, Hyundai Motor Company Executive Chair Euisun Chung co-chaired the Council, and Vice Chair Jaehoon Chang has been serving as co-chair since 2024, supporting full-fledged public-private efforts to realize a hydrogen economy.

HTWO Grid



Hydrogen Value Chain



Response to Climate Change

8 Social Carbon Reduction

Carbon Capture Utilization and Storage To achieve carbon neutrality, it is necessary to cease the use of fossil fuels in the automotive manufacturing process. However, reaching the target point for energy transition requires a significant amount of time. During this transitional period, carbon capture utilization and storage(CCUS) technology, which involves capturing and processing CO₂ emitted from fossil fuel combustion, is being recognized as a practical solution and a high-potential means for carbon neutrality. Hyundai's research institute is conducting CCUS pilot studies to commercialize the technology, aiming to extend its application beyond the automotive industry to other business sectors. Continuous market monitoring is also being carried out to stay updated on the latest developments in CCUS technology.

Atmospheric Carbon Capture and Utilization Academic Research Hyundai Motor Group established the “Joint Research Lab for Carbon Neutrality” in collaboration with five domestic universities to develop technologies for capturing carbon from the atmosphere and converting it into energy. By 2026, the Group and the participating universities plan to jointly research technologies to capture carbon from the air and convert it into materials or energy.

The Joint Research Lab is divided into two sections – DAC(Direct Air Capture) Section and CO₂ Utilization Section. The DAC Section will research technologies to efficiently capture CO₂, while the CO₂ Utilization Section will focus on converting captured CO₂ into methanol, methane, carbon materials, and other synthetic fuels and battery materials. Following the establishment of these basic technologies, the goal is to develop business models, including portable carbon capture devices for vehicles and large fixed module systems for use in business sites and buildings.

Through this industry-academic collaboration, we are developing key technologies for carbon neutrality that actively capture carbon from the atmosphere and convert it into useful energy, thereby contributing to climate change mitigation.

BUSINESS CASE

Blue Carbon Acquisition through the East Sea Seaweed Forest Creation Project



Hyundai is advancing ocean ecosystem restoration projects as part of its carbon offset strategy to address climate change. In 2023, Hyundai signed an MOU with the Ministry of Oceans and Fisheries and the Korea Fisheries Resources Agency to develop blue carbon from seaweed. This effort was followed by another MOU in January 2024, with Ulsan Metropolitan City and the Korea Fisheries Resources Agency to promote a seaweed forest creation project.

A marine forest consists of seaweed that grows densely in coastal waters to form a forest-like structure, providing habitats for a variety of marine life. Marine forests are recognized for their high ecological value and for their contribution to expanding 'blue carbon'- carbon absorbed by marine ecosystems. According to performance data from the Korea Fisheries Resources Agency, marine forests absorb nearly 337 tons of carbon dioxide per 1km² annually. Under this MOU, Hyundai is implementing a marine forest restoration project covering 3.96km² of coastal waters in Dong-gu and Buk-gu, Ulsan City, Korea between 2024 and 2027, which is expected to produce approximately 1,300¹⁾ tons of carbon offset per year.

For marine forest restoration, we employ methods such as direct seaweed transplantation and artificial pouch installation. In 2024, we built underwater longline systems to spread seaweed seeds and facilitated the release of large quantities of spores in a short period of time through the use of artificial pouches. We also improved habitat conditions for a variety of aquatic species by supporting the reproduction of target species suited for the local marine environment, controlling the population of herbivorous species²⁾, and conducting seabed cleaning.

Creating marine forests improves the overall marine ecosystem through increased biodiversity and pollution remediation in addition to generating carbon offset benefits. This not only helps boost the biomass of seaweed and biodiversity, but also eliminates heavy metals such as nitrogen and phosphate to purify the seawater. The resulting improvement in the sustainability of marine resources allows us to join hands with local communities in advancing the fishing industry. With a goal of contributing to climate change mitigation, we plan to explore the use of carbon credits and participate in marine forest blue carbon resource surveys to expand seaweed-generated blue carbon.

Hyundai has been a member of the seaweed forest blue carbon council launched in July 2023, comprising the Ministry of Oceans and Fisheries, the Korea Fisheries Resources Agency, academia, and NGOs. We support the Council's efforts to register seaweed as an official blue carbon absorption source with the IPCC(Intergovernmental Panel on Climate Change), shares research data, and produces results. Hyundai supports R&D efforts and participates in pilot projects to build objective and quantifiable databases, and will move ahead in building its leadership position in seaweed-generated blue carbon solutions as a potential source of demand for blue carbon credits.

1) Equivalent to reducing 337tCO₂ per 1km² of marine forests(Pohang University of Science & Technology, 2019)
2) Herbivores: Animals that feed on seaweed such as sea urchins, sea snails and sea hares.

1. Ulsan Sea Seaweed Forest Creation Project MOU
2. Direct transplantation of seaweed
3. Rescue of herbivores



Response to Climate Change

Climate-Related Transition Plan

• **Carbon Neutrality Execution** Hyundai has instituted the Integrated Solutions to Climate Change to achieve carbon neutrality by 2045 at IAA Mobility in September 2021 as part of its efforts to pass on a sustainable global environment to future generations and do the right thing for humanity. With Clean Mobility, Next-Generation Platform, and Green Energy at its core, we will establish a sustainable operating system for future generations by expanding our electrification capabilities and transitioning to renewable energy. Additionally, we will continue to strive to build a circular economy ecosystem with the goal of achieving carbon neutrality across the entire mobility value chain.

• **Carbon Neutrality Targets** Hyundai has set its mid-to long-term target of achieving carbon neutrality throughout the value chain by 2045, ranging from extracting raw materials that go into vehicles to manufacturing, product use, and disposal. To reduce Scope 1 & 2 emissions from vehicle production, we generate renewable electricity on-site using solar panels. On top of this, we aim to deliver on our RE100 (Renewable Energy 100%) commitments by 2045 through renewable PPAs (Power Purchase Agreement) and REC purchases, and other measures. Through these efforts, we have set targets to reduce Scope 1 & 2 emissions by approx. 60% by 2035 and 100% by 2045, compared to the 2023 base year (2,275,751tCO₂-eq). As to Scope 3 emissions from raw material sourcing and parts assembly (Category 1), we will support our key suppliers with their energy transition efforts and manage core raw material supply chains to cut down on emissions. Specifically, this includes using recycled materials and adopting carbon-reduced materials for steel and aluminum that are essential to body and chassis parts manufacturing. Hyundai's carbon neutrality target extends to Scope 3 – Category 11 emissions generated in the Tank to Wheel stage. We are committed to achieving 100% electrification in Europe by 2035 and in other key markets by 2040, expanding the share of EVs that produce zero emissions during their operation out of our total sales. This will contribute to our targets to reduce Scope 3 - Category 11 emissions by approx. 40% by 2035 and approx. 90% by 2045, compared to the 2023 base year (114,132,523 tCO₂-eq).

To deal with unavoidable residual carbon emissions by its 2045 carbon neutrality target, Hyundai will pursue offsetting activities. This includes investing in CCUS and implementing carbon offsetting efforts such as recycling second-life batteries for Energy Storage Systems (ESS) and restoring marine ecosystems. In addition, we plan to maximize the synergy between the hydrogen business and carbon neutrality through hydrogen power generation and processes by using the electrification process based on the hydrogen fuel cell system.

Plans to Achieve Climate-Related Targets(Carbon Neutrality Targets)

• **Reducing Carbon Emissions in Operations** Hyundai is a supporter for the Paris Agreement and recognizes its corporate role and responsibility to reduce global GHG emissions. In this regard, we strive to achieve carbon neutrality at our business sites by 2045 by switching to renewable energy, improving the energy efficiency of production processes through the introduction of high-efficiency motors and inverters, and utilizing hydrogen energy. In the short term, in conjunction with the RE100 roadmap, we plan to promote the transition from electric energy used in the manufacturing process to renewable energy first. In the long term, our goal is to achieve carbon neutrality by 2045 by expanding the application of green hydrogen and the use of renewable energy in conjunction with the realization of a hydrogen society.

• **Electrification** Hyundai is aiming to achieve carbon neutrality by going beyond carbon reduction, targeting 100% electrification of the European market by 2035 and 100% electrification of all sales vehicles in major markets by 2040. For commercial vehicles, such as large trucks and buses, the company not only aims to expand electrification but also to secure global leadership in the era of electrification by enhancing the technology and appeal of its products.

• **Support for Carbon Neutrality in the Supply Chain** Hyundai aligns with global trends such as climate change, carbon neutrality, and ESG management, not only improving the quality and technical capabilities of its suppliers but also supporting their carbon neutrality. To this end, we will check the carbon emission status of key suppliers, select core management suppliers, and provide guidelines. We also plan to organize reduction activities tailored to the grouped characteristics of suppliers and prepare supply chain collaboration programs, including carbon neutrality education and awareness enhancement. Particularly for suppliers of raw materials where carbon emissions are high, there will be a collaborative response linked to automotive design technologies, focusing on material recycling and the expanded use of new materials.

• **Technology-driven Carbon Reduction** In addition to reducing carbon emissions, Hyundai is strengthening its activities such as carbon absorption and removal and resource recycling. We developed CCUS technology in 2012 and has since applied it in Korea while continuously pursuing designs that can recycle waste batteries and maximize recycling at the scrap vehicle stage. We apply recycled plastics to wheel guards, under covers, and battery trays while actively utilizing eco-friendly materials in the production of the IONIQ 6.

Response to Climate Change

Climate-Related Financial Impacts

Method of Climate-Related Scenario Analysis

• **Information about the Scenarios Used by the Company** Hyundai is conducting transition and physical scenario analyses using qualitative and quantitative methodologies to systematically address the risks and opportunities that may arise from climate change. The sources used in the scenario are primarily from the IEA and IPCC, with some information derived from internal analysis.

Scenario		Definition	Time range	Source	Business scope
Transition	NZE (1.4°C)	Scenario that outlines a pathway for the global energy sector to achieve net zero by 2050	~2050	IEA World Energy Outlook	Entire automotive sector of Hyundai
	APS (1.7°C)	Scenario assuming the achievement of climate targets committed by governments and companies by August 2023			
	STEPS (2.4°C)	Scenario based on current energy-related policies implemented in each sector and country			
Physical	SSP1-2.6 (2°C 이하)	Scenario to achieve net zero by 2050 and limit global temperature rise to below 2 degrees Celsius	~2050	IPCC	32 business sites of Hyundai's automotive sector
	SSP2-4.5 (2~3°C)	Scenario where the temperature increase exceeds 2 degrees Celsius due to GHG emissions			
	SSP5-8.5 (4°C 이상)	Worst-case scenario where the temperature increase exceeds 4 degrees Celsius due to GHG emissions			

Financial Impact Analysis through Transition Scenario Analysis

TRANSITION RISK ANALYSIS



Tightening of Automobile Fuel Efficiency Regulations



Risk Factors

In line with enhanced global fleet CO₂ emissions regulations, exceeding set thresholds is penalized in both advanced markets(Korea, EU, the U.S., Canada) and emerging markets(China, India, Brazil, and Saudi Arabia). According to our internal analysis results, our products may exceed regulatory limits within the next few years in the U.S., China, and Saudi Arabia.

Countermeasures

To address fuel efficiency regulations, Hyundai monitors regulatory trends and regularly analyzes fuel efficiency performance, systematically reporting these findings. Particularly, the division estimates potential costs based on medium- and long-term regulatory forecasts and performance predictions, which are then incorporated into business plans.

EU Carbon Border Adjustment Mechanism(CBAM)



Risk Factors

From 2026, under the EU CBAM regulations, importers will be required to pay a carbon price for importing designated items into the EU. Consequently, Hyundai Motor Manufacturing Czech(HMMC) may face additional costs due to the purchase of carbon pricing certificates for some parts. Based on emission trading price forecasts for various scenarios, an annual financial impact of approximately KRW 2.1 billion is anticipated as of 2030.

Countermeasures

We will continue to monitor the development of the EU CBAM regulations. Over the long-term, we will gradually reduce the volume of imports requiring CBAM certification to minimize our financial burden associated with compliance.

Strengthening Emissions Trading Scheme Regulations



Risk Factors

Hyundai is subject to the Korea Emissions Trading System(K-ETS): if our emissions exceed the allocated annual allowance limit, we will incur costs to purchase additional allowances. Assuming our current intensity level(emissions per vehicle) remains unchanged, our projected emission liabilities in 2030 range from a minimum of KRW 88 billion to KRW 220 billion(presuming 70% free allocation) based on allowance price forecasts.

Countermeasures

Hyundai established the 2045 Carbon Neutrality Roadmap to reduce carbon emissions. Through various reduction activities such as increasing the use of renewable energy and reducing emissions at business sites, the company aims to minimize the purchase of emissions allowances and enhance climate resilience. When implementing the 2045 carbon neutrality roadmap, we expect to generate approximately KRW 5 billion in revenue in 2030 from the sale of surplus emission allowances.

U.S. Inflation Reduction Act(IRA)



Risk Factors

Under the U.S. IRA, US\$ 3,750 of tax credit is granted if a vehicle meets the critical minerals requirement¹⁾ and battery components requirement²⁾. These subsidies promise direct economic benefits to consumers and may significantly affect EV demand. Any failure to meet the tax credit eligibility criteria could result in declining market shares in the short term and lost competitiveness in the long term.

Countermeasures

Hyundai has completed HMGMA, its US-based EV plant with a production capacity of 300,000 up to 500,000 vehicles, establishing a reliable supply chain. We made targeted investments in modernizing and streamlining existing production equipment in an aim to remain flexible and agile amid the evolving global policy and market landscape.

- 1) 40% or more of the value of the critical minerals used in the battery should be sourced in the U.S. or in a country which signed an FTA with the U.S.
- 2) 50% or more of the value of the battery components should be manufactured or assembled in the battery manufacturing process in North America

Response to Climate Change

ANALYSIS OF
TRANSITION
OPPORTUNITIES

Acceleration of Electrification



Opportunity Factors

The transition to electrification presents new growth opportunities for Hyundai. Particularly, as price parity between EVs and ICEs is achieved and the pace of market electrification accelerates due to environmentally friendly policies, an increase in EV demand is expected. Scenario analysis predicts that Hyundai's revenue for 2030 will rise from a minimum of KRW 30 trillion to a maximum of KRW 42 trillion in response to growing EV demand.

Countermeasures

Hyundai plans to continue its proactive efforts to capture growth opportunities in the EV market. We intend to increase the production and sales of EVs and have established a strategy to convert 100% of all vehicles sold in major markets to electric by 2040. Considering this mid-to long-term business plan, our 2030 EV sales are expected to increase further, from a minimum of KRW 39 trillion to a maximum of KRW 54 trillion.

Energy Transition



Opportunity Factors

Amidst the continuous rise in electricity costs, transitioning to renewable energy could present opportunities for reducing carbon emissions as well as energy costs. Hyundai aims to use 100% renewable energy(RE100) by 2045.

Countermeasures

Hyundai plans to implement optimal solutions aimed at gradually expanding the use of renewable energy, including the installation of solar panels and the signing of PPA, to achieve RE100 by 2045. Reflecting this renewable energy transition plan, electricity cost savings of approx. KRW 66 billion are expected by 2030. By actively expanding the use of renewable energy, Hyundai expects to achieve positive effects in both environmental sustainability and cost efficiency.

ClimateTech(Hydrogen) R&D Investment



Opportunity Factors

Hydrogen is a crucial area within ClimateTech, and the hydrogen market is expected to become more active with increased R&D investment. To keep pace with these market trends, we established our Energy Mobilizer strategy in 2024 to reinforce our hydrogen energy technology and business capabilities.

Countermeasures

Hyundai will realize a sustainable future that includes a hydrogen society and smart cities, based on its proprietary hydrogen energy production technology and integrated solutions that span entire cities. This will be achieved by building our passenger/commercial fuel cell EV lineup and pursuing hydrogen business spanning the full spectrum of hydrogen energy, from production to storage, transport and charging. In line with our Energy Mobilizer strategy, we are investing KRW 5.7 trillion for 10 years between 2024 and 2033 to advance our hydrogen energy technologies and business capabilities while forging external partnerships to commercialize the hydrogen value chain, expediting our efforts to create a hydrogen ecosystem.

Response to Climate Change

Financial Impact Analysis Through Physical Scenario Analysis Hyundai has utilized the low-carbon scenario(SSP1-2.6) and high-carbon scenario(SSP5-8.5) from the IPCC’s Sixth Assessment Report to analyze the financial impacts of physical risks. For scientific analysis, Hyundai employed the climate risk analysis tool, Jupiter Intelligence, which is based on climate modeling. In some cases, the analysis granularity was refined to intervals as close as 90 meters for more precise, high-resolution analysis. The company analyzed risks associated with eight types of disasters, including acute risks(extreme wind, flood, wildfire, hail/thunderstorms, precipitation) and chronic risks(heat, droughts, cold waves). Quantitative financial impacts were specifically derived for extreme wind, flood, wildfire, and heat.

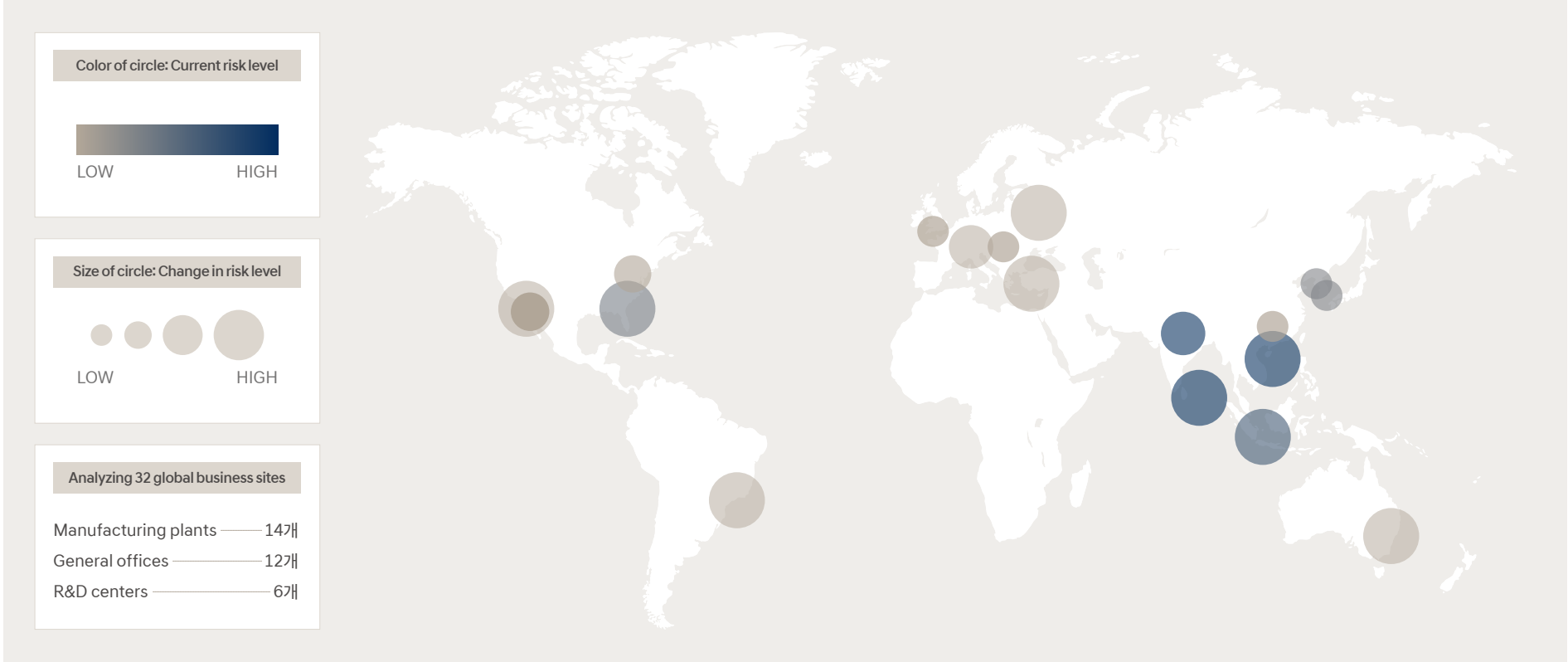
For the quantitative financial impact analysis of Hyundai’s 32 global sites – including 14 manufacturing plants, 12 general offices, and 6 R&D centers – 2023 data on tangible assets(buildings, machinery, etc.) and inventory assets, along with average site sales over three years, were utilized.

Financial impacts are calculated at five-year intervals using 1995 as the base year. Projected revenue and asset losses in 2030 are estimated to range between KRW 220 billion(SSP 1-2.6) and KRW 300 billion(SSP 5-8.5). When impact pathways are considered by type of disaster, acute disasters such as extreme wind speeds, floods, and wildfires may result in asset impairments (buildings, equipment, inventories) as well as declining sales resulting from the suspended manufacturing of products. Meanwhile, chronic changes in climate patterns caused by heatwaves could undermine the productivity of employees, leading to lower sales. These physical hazards primarily affect the ‘product manufacturing’ part of Hyundai’s business model. Such findings will base our efforts to conduct continuous monitoring on high-risk geographies and establish response strategies to ultimately enhance the resilience of our operations.

Financial Impact Analysis Results for 2030, 2040, and 2050

Classification	2030		2040		2050	
Scenario	SSP 1-2.6	SSP 5-8.5	SSP 1-2.6	SSP 5-8.5	SSP 1-2.6	SSP 5-8.5
Financial Impact (KRW billion)	220	300	430	710	550	1,220

Results of 2050 Physical Risk Analysis based on the SSP5-8.5 Scenario



Impact Analysis Results by Type of Disaster

Disaster	Analysis Results
Heat	• The risk of extreme heat is forecast to increase across all operations in the future due to global warming.
Wildfires	• While the current risk of wildfires is concentrated in California and India, this risk is projected to rise across all geographies in the future, expanding the areas exposed to wildfire risks.
Extreme wind speeds	• Among all sites, Korea(Ulsan) is exposed to the highest risk of extreme wind speeds. This risk is projected to decline in certain regions over time.
Floods	• The flood risk in Germany and Vietnam is projected to remain consistently high, just as it is currently.
Cold waves	• The risk of cold waves is forecast to decrease across all operations in the future due to global warming.
Droughts	• Across most operations, the risk of droughts is projected to remain unchanged or slightly decline over time.
Precipitation	• While the risk of heavy rainfall is currently concentrated in Asia, this risk is projected to extend to broader regions in Brazil, Australia, the U.S.(Alabama) in the future.
Hail/Thunderstorms	• The risk of hail/thunderstorms is projected to remain negligible across all operations.

Analysis Results of Financial Impact by Region ○ Very Low ● Low ● Moderate ● High ● Very High

Analysis Results of Financial Impact by Type of Business Site

Physical Risks and Key Response Activities

- Flood damage to plants and facilities
 - Flooding of plant drainages, dealer facilities and vehicles
- Reduced access to infrastructure due to heavy rainfall and floods
- Disruption to production/sales operations resulting from flooded facilities and reduced customer access

- Consider weather conditions in plant construction including elevation standards, and maximum drainage capacity
- Develop flood prevention and response systems
 - Conduct regular drainage maintenance, inspect and replace old drainage facilities/ roofs
 - Expand flood prevention materials and check the exposure of electrical equipment
 - Monitor the situation and place external flood controls at plant sites
 - Install water-blocking barricades and implement road traffic controls
- Implement support and recovery measures for damaged cars
 - Support for flooded vehicles/facilities, financing for inventory vehicles, repair support for dealers

- Dents and damage to parked/inventory vehicles at the VPC

- Establish hail damage prevention systems
 - Install anti-hail cannon systems
- Relocate and protect inventory vehicles
- Minimize losses through hail damage insurance subscription

- Damage to facilities and assets
 - Physical damage to roofs, wooden building structures, and glass windows
- Voltage drops and disrupted electricity use resulting from damaged power transmission facilities
- Increased support and recovery costs for damaged vehicles during production and sales
- Disruption to production/sales resulting from damaged facilities and delayed vehicle supply

- Implement facility reinforcement and management
 - Obtain structural stability certifications for buildings
 - Replace aging equipment (roof, pipe, gutter), relocate windbreak vegetation, and inspect tree supports
 - Reinforce and inspect facility utility control rooms and supply routes, install damage prevention equipment
 - Regularly clean vehicle storage areas(outdoor yards) including the VPC(Vehicle Processing Center)
- Operate emergency response systems
 - Operate emergency response teams for rapid production recovery
 - Operate tornado shelters
 - Implement emergency response manuals, including compliance with the FEMA(Federal Emergency Management Agency) guidelines

Response to Climate Change

Risk Management

Climate Risk and Opportunity Management

Climate Risk and Opportunity Management Process Hyundai identifies, assesses, and manages risk and opportunity factors to respond to climate change issues at the company level. The climate change issues identified by each region/organization are submitted to the head office's Strategy & Governance, which then figures out risk and opportunity factors for each issue, assesses the strategic and financial impacts of each factor on the company, and determines companywide response strategies.

• **Identification Stage** In the identification stage, we figure out issues by region and organization regarding risks and opportunities that may affect the company due to climate change at the Management Committee Meeting(C-level).

• **Assessment and Reporting Stage** The Strategy & Governance at the head office figures out the strategic and financial impact that factors and issues identified in the identification stage may have on the company, and depending on their materiality, reports them to the CEO or the BOD through the Management Committee Meeting for decision-making.

• **Management Stage** The decided climate change issues are proactively reflected in the KPIs of each working-level division of the relevant region or organization. The Strategy & Governance and related organizations join forces to systematically manage climate change factors in various areas.

Methods for Identifying and Assessing Risks and Opportunities Hyundai utilizes climate change scenario analysis to identify and assess climate-related risks and opportunities. Based on the TCFD recommendations, we have identified driving forces across STEEP(Social, Technology, Economic, Environmental, Political) categories to analyze the impact of climate change on the industry and on Hyundai itself. Among these, key driving factors were derived after evaluating their impact, uncertainty, and relevance. Impact was assessed based on effects on the company's business model and value chain(procurement, production, sales), as well as the company's resource allocation(budgeting, investments and R&D, business acquisitions and disposals, talent acquisition, etc.). Uncertainty was evaluated by the predictability of the impacts of driving factors on the company and the industry.

We have mapped the impact pathways of key factors on Hyundai's financial and business model to calculate the financial impacts of each transition risk and opportunity according to the IEA's NZE, APS, and STEPS scenarios and analyzed the intensity of these impacts. Through this process, Hyundai has identified significant risk and opportunity factors related to climate change, analyzed the impact of each according to different scenarios, and established strategies to enhance climate resilience.

Metrics and Targets

Climate-Related Metrics

Scope 1 and Scope 2 Emissions (Unit: tCO₂-eq)

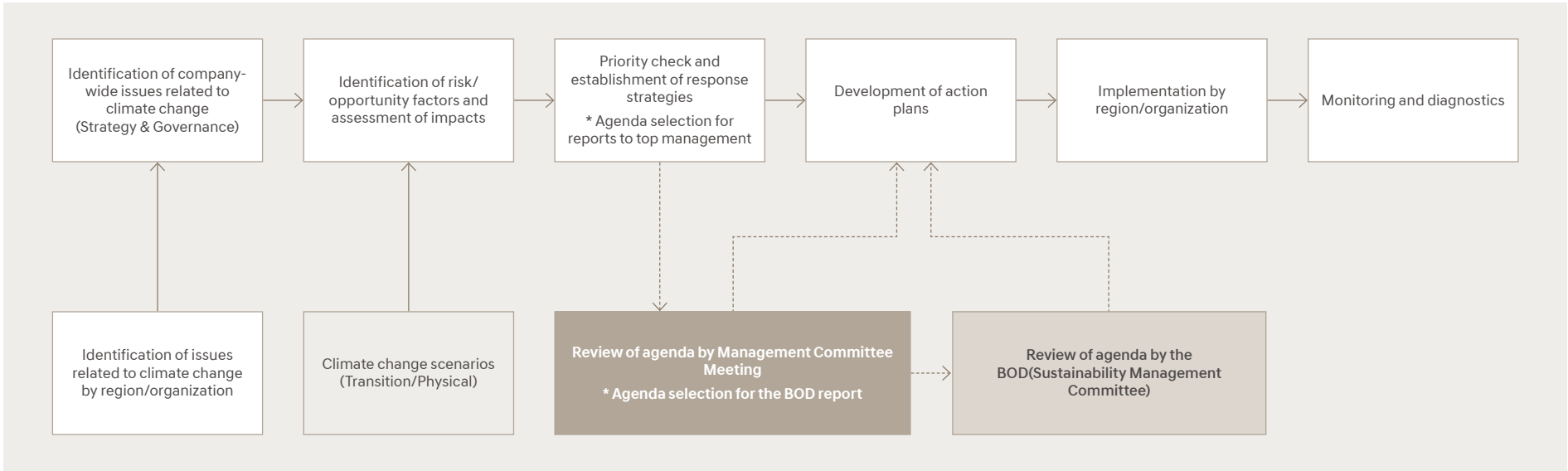
	Classification	2022	2023	2024 ¹⁾
Scope 1		719,949	696,590	679,822
Scope 2 (location-based)		1,853,813	1,831,531	1,726,829
Scope 2 (market-based) ²⁾		1,684,120	1,579,161	1,417,987
Scope 1 + Scope 2 ³⁾		2,404,069	2,275,751	2,097,809
Scope 1 + Scope 2 Emission intensity (GHG emissions per vehicle produced)		0.601	0.531	0.506

Scope 3 Emissions (Unit: tCO₂-eq)

	Classification	2022	2023	2024
Category 1	Supply chain(purchase of raw materials and parts)	19,852,763	23,518,427	22,971,847
Category 2	Capital goods(purchase of furnishings and equipment) ⁴⁾	326	134	164
Category 3	Other energy-related activities(excluding Scope 1&2 ⁴⁾⁵⁾⁹⁾	235,960	330,875	323,711
Category 5	Waste generated in operation ⁶⁾	1,978	217,737	225,938
Category 6	Employee business trip ⁴⁾	21,370	26,994	7,205
Category 7	Employee commuting(commuting buses) ⁴⁾	6,617	8,895	8,553
Category 9	Transportation and distribution(by maritime and land) ⁴⁾⁹⁾	1,457,289	1,504,972	1,505,041
Category 11	Use of sold vehicles(Tank to Wheel) ⁷⁾	109,278,795	114,132,523	114,199,544
Category 12	End-of-life treatment of sold vehicles(recovery, disassembly, disposal)	2,133,743	2,323,327	1,845,796
Category 13	Leased assets(headquarters and leased office buildings) ⁴⁾	539	1,447	1,055
Category 15	Investments ⁸⁾⁹⁾	4,946,073	6,060,822	6,164,300

1) HMGICS's emissions were not included, and their emissions in 2024 are scheduled for third-party verification in the second half of 2025
2) Scope 2 emissions: Addition of market-based emissions from 2022
3) to calculate the sum of Scope 1 and 2 emissions(market-based) from 2022
4) Based on the country where the Headquarters is located
5) Upstream emissions of fuel consumed at business sites(excluding electricity and steam)
6) Discharged amounts increased in line with the extended scope of calculation from 2023(waste from overseas operations)
7) Emissions from the energy that powers vehicles at the pre-fueling/charging stage(Well to Tank) are excluded
8) Scope 1 and Scope 2 GHG emissions from six of the listed investee companies in which Hyundai owns more than 20% of the shares (emissions are calculated based on the equity share)
9) Emissions for 2022-2023 were recalculated following a change in the estimation methodology

Identification, Assessment, and Management Process of Climate Risk/Opportunity



Response to Climate Change

• **Approach for Measuring Emissions** The guidelines applied for measuring GHG emissions are as follows, using Operational Control under the Control Approach.

Measurement Approach

Classification	Guideline
Scope 1, 2	• The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard(Revised Edition) • The Greenhouse Gas Protocol: Scope 2 Guidance Framework Act on Carbon Neutrality and Green Growth(Guidelines for Reporting and Certification of GHG Emissions Trading Scheme) • IPCC Guidelines for National Greenhouse Gas Protocol and Accounting Tool • Standards for calculating GHG emissions required by other regulatory authorities and stock exchanges
Scope 3	• GHG Protocol Corporate Value Chain(Scope 3) Accounting and Reporting Standard(2011)

* Uses the Global Warming Potential(GWP) values based on the 100-year timeframe of the IPCC(Intergovernmental Panel on Climate Change) Second Assessment Report to convert six types of greenhouse gases(CO₂, CH₄, N₂O, HFCs, PFCs, SF₆) into carbon dioxide equivalents.

Input Variables and Assumptions

Classification		Input Variables	
		Activity Data	Emission Factor
Scope 1	Stationary combustion	Consumption of natural gas(LNG), diesel, kerosene, propane	Basic emission factors from the 2006 IPCC national inventory guidelines
	Mobile combustion	Consumption of gasoline, diesel, butane, jet kerosene, CNG	Basic emission factors by fuel type and GHG for mobile combustion
	Fugitive emissions	Refrigerant	N/A
Scope 2	Purchased electricity	Electricity consumption for 2024	Application of national specific electricity emission factors
	Purchased steam	Steam consumption for 2024	Application of 2024 supplier steam emission factors and national steam emission factors
Scope 3	Supply chain(purchase of raw materials and parts)	Production volume by vehicle type in 2024	(Vehicle) Upstream emission factors
	Capital goods(purchases of fixtures and equipment)	Equipment purchase volume	Average emission factors for equipment(LCI DB)
	Other energy-related activities(excluding scope 1/2)	Fuel consumption	Production-based emission factors
	Waste generated in operations	Amount processed by waste treatment standard	Emission factors by treatment standard
	Employee business trip	Overseas trips(air travel distance), domestic trips(distance by mode of transport)	Overseas travel(air emission factors), domestic travel(emission factors by mode of transport)
	Employee commuting(commuting buses)	Annual fuel consumption of all commuter vehicles (Number of vehicles × Average speed × Operating hours × Working days ÷ Average fuel economy)	Transport(diesel) emission factors
	Transportation and distribution(maritime and land)	Emission data for vehicle transportation by Hyundai GLOVIS	N/A
	Use of sold vehicles(Tank to Wheel)	Sales volume by vehicle type in 2024	Emission factors per vehicle type at the use stage (gCO ₂ /km) × 200,000 km
	End-of-life treatment of sold vehicles(recovery, disassembly, disposal)	Sales volume by vehicle type in 2024	Emission factors per vehicle type at the disposal stage
	Leased assets(Headquarters and leased office buildings)	Total natural gas and electricity consumption of buildings × leasing ratio	Basic emission factors from the 2006 IPCC national inventory guidelines
	Investments	Emissions of investment companies	Equity share

Carbon Neutrality Investment We plan to invest approximately KRW 4 trillion between 2024 and 2035 to achieve net zero emissions across our operations. These investments will enable us to initiate activities such as implementing on-site photovoltaic power generation, procurement of external renewable energy, and expansion of the hydrogen value chain.

Compensation Hyundai operates an incentive system for managing climate change. The performance evaluation items(KPIs) for the CEO, regional directors, plant managers(Heads of manufacturing subsidiaries) and employees(related teams) include climate change-related metrics. The results of these evaluations are integrated with the incentive and salary systems. By incorporating goals related to GHG reduction and the expansion of renewable energy into the management's KPIs, we ensure that these objectives and their implementation are managed at an executive level. Additionally, employees in related organizations are assigned specific targets for reducing GHG emissions, which are reflected in their personal performance evaluations. Annually, a certain percentage of their salary is allocated as a monetary incentive based on the achievement and assessment of these key indicators.

Subject	KPIs	Incentive
CEO	1) Accomplishment rate to carbon neutrality target 2) Level of carbon neutrality implementation system	Financial rewards (Included in bonus)
Regional directors	1) Achievement rate of the RE100 target 2) Level of management of Scope 3 data	
Plant Manager (Heads of manufacturing subsidiaries)	1) Achievement rate of the RE100 goal 2) Absolute emissions	
Employees (Related teams)	Set targets related to GHG emissions reduction for staff at related teams and use them for performance evaluation	

* Refer to the industry-based metrics for the Automobiles industry in the annexed guidance “Industry-based Guidance on Implementing IFRS S2”

Response to Climate Change

Climate-Related Targets

Target Review Process

• **Third-party Verification of the Set Targets** To reduce GHG emissions, Hyundai has established mid-to long-term reduction targets in accordance with the guidelines of the SBTi(Science Based Targets Initiative).

• **Target Review Process** Hyundai's Board of Directors reviews and approves items essential for the implementation of business strategies and management activities, including the establishment of mid-to-long-term environmental management strategies that encompass carbon neutrality and environmental investments. The management, including the CEO, participates in the Management Committee Meeting to oversee company-wide major environmental management implementation plans. These include strategies for expanding EVs and achieving carbon neutrality, monitoring and reviewing implementation status, evaluating improvement outcomes, discussing responses to major risks, and managing matters deemed necessary for promoting and propagating environmental operations.

We monitor and assess our implementation of and progress towards the set targets to achieve carbon neutrality by 2045. In November 2024, our Carbon Neutrality Strategy 2.0 updated in reflection of market trends and our mid/long-term business plans was approved by the Sustainability Management Committee.

Information Related to GHG Emission Reduction Targets

• **Scope of GHG Emissions Included in the Target** The scope of GHG emissions related to Hyundai's climate targets includes Scope 1, 2, and part of Scope 3.

• **Description of the Target** Hyundai's climate-related targets pertain to the total volume of emissions.

• **Use of Sector-specific Decarbonization Approach** Hyundai is currently not using a sector-specific decarbonization approach for the GHG emission reduction targets as of the end of the reporting period, but is considering employing sector-specific decarbonization approaches in the future to effectively reduce emissions.

Performance Analysis Relative to Targets The current period's performance relative to Hyundai's climate-related targets is as follows:

Metrics for targets and progress monitoring	Unit	2022 Performance	2023 Performance	2024 Performance
Scope 1 emissions	tCO ₂ -eq	719,949	696,590	679,822
Scope 2 emissions (market-based)	tCO ₂ -eq	1,684,120	1,579,162	1,417,987
Renewable energy transition rate (electricity)	%	7.7	12.8	16.7
Scope 3 emissions – Category 11	tCO ₂ -eq	109,278,795	114,132,523	114,199,544

Circular Economy and Resource Use

The current linear economic model raises a range of environmental issues, from climate change to significant waste generation and threats to biodiversity, highlighting the imperative to transition to a circular economy. Hyundai strives to enhance product circularity early in the development phase by adopting circularity-conscious designs and using recyclable materials. We comply with country-specific regulations governing the recovery and disposal of end-of-life products, and implement Extended Producer Responsibility initiatives. We also make sure resource inputs and waste generation at our production plants do not grow in alignment with increases in production volume.

Vehicle Circularity

Developing and Applying Sustainable Materials

Regulatory Trends Related the Circular Economy The proliferation of waste is an increasingly serious global issue, particularly with regard to plastic waste, with over 200 million tons generated annually and the amount of waste generated rising by more than 10% each year. An even more serious issue is that more than 90% of this waste ends up in landfills or remains unattended, directly affecting the ecosystems and biodiversity. To decrease carbon emission related raw material, transitioning to a circular economy, which includes the increased use of recycled materials, is a prerequisite. To reduce global waste and realize carbon neutrality, the shift toward a circular economy in major countries such as EU is accelerating, which results in new legal requirements, thereby increasing corporate risks. The EU is revising the End-of-Life Vehicles Regulation (ELVR), and its draft proposal mandates a 25% recycled plastic content in new vehicles, with at least 25% of this coming from end-of-life vehicle plastics from 2032 onwards. The EU also mandates that carmakers, just as the producers of electric and electronic products, take responsibility for the collection and treatment of end-of-life vehicles. India and other countries are also pursuing regulations mandating the use of recycled materials for vehicle manufacturing.

Recycled Plastics Hyundai recognizes the essential role played by the transition to a circular economy in achieving zero waste, counteracting the shortage of raw materials, and attaining carbon neutrality across the value chain in the medium to long term. In response to recent regulations in major countries that mandate the use of recycled materials in vehicles, Hyundai is developing and intensifying its internal and external vehicle recycling material technology and its application systems for new models. To reinforce our system that incorporates recycled materials into mass-production vehicles, we operate the 'company-wide council for the expanded use of recycled plastics'. In 2024, the council produced recycled plastic guidelines compiling overall matters relating to the development of recycled plastics. These guidelines have promoted consistency in our efforts to develop recycled plastics, improve our operational efficiency in recycled plastics while deepening employees' understanding of relevant areas across the board. In preparation for the EU's enforcement of the ELVR mandating the use of recycled plastics in vehicles, we are working to step up the ratio of recycled plastics to be applied to vehicle parts year by year while establishing a regulatory compliance monitoring process and a recycling information management system.

We are pursuing a more sophisticated development and application plan for recycled plastics in our vehicle parts, covering vehicle parts including chassis, bodies, and electrification as well as interior/ exterior parts which account for the highest proportion of plastic use in a vehicle.

Bio-based Materials Bio-based materials offer a significant advantage in decarbonization efforts. Since natural materials absorb carbon dioxide through photosynthesis, developing bio-based materials out of such natural materials and using them for vehicle parts facilitates carbon fixation which refers to capturing CO₂ in the atmosphere and storing it in terrestrial systems. As such, bio-based materials not only decrease the usage of petroleum-derived materials but also contribute to reducing CO₂ concentrations in the atmosphere, helping to advance carbon neutrality goals. We are currently developing technologies that either directly use natural fiber, seashells and other natural materials or convert them into raw materials through chemical processes to be used as plastics.

Car to Car Project We are implementing the Car to Car project to recycle parts from end-of-life vehicles into materials for new cars, advancing resource material circularity in the process. The five key materials and parts chosen for this project include plastic, steel, and aluminum used widely in vehicle manufacturing as well as batteries and motors that are essential components of EVs. Through this initiative, we aim to internalize recycling technologies for these materials and parts and secure high-quality recycled raw materials, enhancing vehicle circularity through increased cost competitiveness while establishing automotive supply chains that support material circulation.

Partnership for Developing Sustainable Materials In partnership with domestic and overseas materials producers and parts suppliers, we are continuously striving to expand the development and application of recycled, bio-based and other sustainable materials in vehicle. This collaboration system enabled us to successfully develop six recycled and biomaterial-based parts including headliners, and crash pads in partnership with SK Chemical in December 2024. Leveraging SK Chemical's depolymerization technology that breaks down waste plastics at the molecular level through chemical recycling, we have successfully produced high-quality parts made from recycled PET materials.

Conventional mechanical PET recycling repurposes used PET bottles into some vehicle parts and thus is limited in sourcing and diversifying available waste resources. To address these limitations, Hyundai and SK Chemical closely collaborated for 14 months to develop a commercially viable chemical recycling technology. This enables the application of recycled materials derived from a broader range of waste sources in headliners, seats, crash pads, door panels, door armrests. Hyundai Motor Group also teamed up with MARHEN.J, a sustainable fashion brand, to develop experimental models using sustainable materials such as apple leather and vehicle.

Design for Recycling Throughout the design, planning, and development stages of new vehicles, Hyundai considers the recovery, treatment, dismantling and recycling of vehicle waste generated during the scrapping process to ensure that they can be dismantled and recycled easily based on the concept of DfR (Design for Recycling). While applying recyclable materials in the design phase based on design-for-recycling (DfR), we also choose natural materials in addition to recycled ones for non-metallic materials to enhance vehicle circularity as a result. The recyclability rate at the design stage for Hyundai's vehicles is 85% without heat energy recovery, and at 95% with heat energy recovery from waste treatment. Notably, ferrous and non-ferrous metal materials are reused and recycled.

Circular Economy and Resource Use

Application of Sustainable Materials in New Car Models

Each year Hyundai aims to further enhance the use of recycled and natural materials in its new EV models. For recycled materials, we take a double-track approach: we are striving to establish a material closed loop system to recycle waste resources recovered from end-of-life vehicles while also pursuing an open loop system to repurpose waste from other industries and domestic waste generated from households, such as PET bottles and used fishing nets. For natural materials, we are developing and applying bio-based materials derived from such natural byproducts as corn, sugarcane, and rapeseed.

IONIQ 5 Yarn made by processing recycled PET was used for armrests and seat coverings, meaning up to 32 PET bottles were recycled for IONIQ 5. The fabrics that went into seats, headliners, and carpets contain biomaterials extracted from sugar cane and corn, and interior leather was dyed using linseed oil instead of animal-derived oils. Door trims and airbag covers were finished with bio paints formulated with plant-based oils derived from such plants as rapeseed flowers and corn.

IONIQ 5 N Sustainable materials were featured throughout some interior parts of IONIQ 5 N. Door trims and console covers were coated with paints containing plant-based bio oils extracted from rapeseed flowers, corn and other plants. In addition, paints containing pigments extracted through recycling end-of-life tires were applied to door handles and door switch bezels, along with seats fitted with Alcantara made from recycled polyester.

IONIQ 6 Yarn made by processing recycled PET, bio-based yarn, bio TPO skin and other sustainable materials were used. ECONYL®, a recycled material produced by recycling discarded fishing nets from the ocean, was applied to the floor mats of the IONIQ 5 and IONIQ 6. Just as the IONIQ 5 N, paints containing pigments extracted through recycling end-of-life tires were applied to lower bumper cover which is an exterior part.

IONIQ 9 The IONIQ 9, the top-tier model in the IONIQ lineup, features sustainable materials applied to the IONIQ 5 and IONIQ 6, including yarn from recycled PET, bio TPO skin, and bio-based synthetic leather. On top of this, the IONIQ 9 was fitted with crash pads made with bio polyurethane (PU) and headliners finished with bio suede.

Other EV models The GV60, Electrified GV70 and Electrified G80 are equipped with headliners, pillar trims, sun visors, and package trays made from recycled or bio-based materials. The Electrified GV70 adopted natural fabric containing 30% wool for the front section of headrests and seat side panels. The Electrified G80 showcases forged wood decorations crafted from leftover pieces of wood.

Application of Sustainable Materials by EV Model

IONIQ 5	Rapeseed/corn-derived bio-paint, flaxseed oil, sugar cane/corn-derived bio yarn, recycled PET processed yarn
IONIQ 5 N	Rapeseed/corn-derived bio-paint, paint made from recycled end-of-life tires, Alcantara from recycled polyester
IONIQ 6	Paint made from recycled end-of-life tires, rapeseed flower/corn-derived bio paint, sugarcane/corn-derived bio yarn, recycled PET processed yarn
IONIQ 9	Rapeseed/corn-derived bio-paint, flaxseed oil, sugar cane/corn-derived bio yarn, recycled PET processed yarn, paint made from recycled end-of-life tires, paint made from plant-based materials
GV60	Bio-polyol derived from corn and sugar cane, processed yarn from recycled PET bottles
Electrified GV70	Renewable fabric containing 30% wool, processed yarn from recycled PET bottles
Electrified G80	Renewable dye, processed yarn from recycled PET bottles, forged wood made of recycled leftover pieces of wood

Application of Sustainable Materials for IONIQ Models



IONIQ 5



IONIQ 6



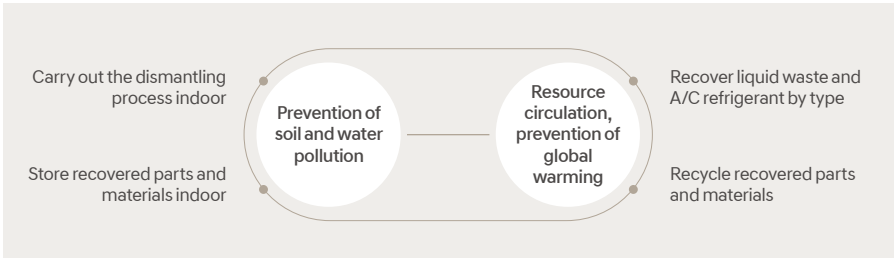
IONIQ 9

ELV Circulation System

ELV Circulation System Hyundai offers one-stop End-of Life Vehicle (ELV) services. Customers wishing to receive our ELV services in Korea are supported in the recovering, dismantling, and recycling of their ELVs, which includes vehicle transport to dismantling facilities, indoor storage of recovered parts and recycling of materials. Customers may apply for ELV services through our official website, and we pick up ELVs at their preferred date and location.

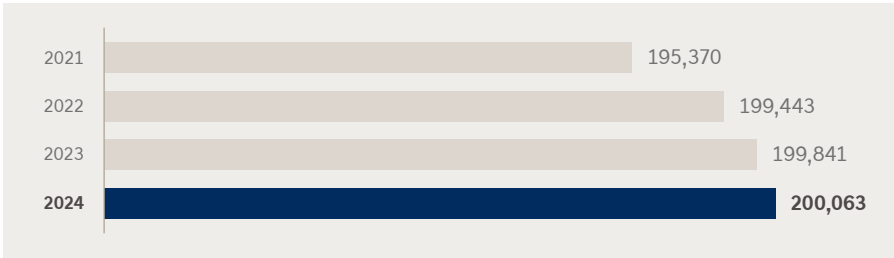
Recovering and Recycling ELVs To demonstrate the feasibility of applying the Extended Producer Responsibility (EPR) recycling system—already implemented in the packaging and electronics sectors – to the automotive sector, Hyundai signed an agreement with the Ministry of Environment in 2011 to execute a pilot project aimed at advancing the resource circulation system for end-of-life vehicles. To that end, we have facilitated recycling by providing vehicle dismantling manuals and training to scrap car companies, as this helps them to differentiate between economically viable and non-viable resources, guiding them on proper handling techniques. Notably, we support them in recovering and handling used refrigerants which negatively impact the climate and ecosystems, steel scraps generated during vehicle dismantling, and automotive shredder residue from ELV dismantling while also offering financial assistance for treating hard-to-recycle materials, further tightening our partnerships with scrap vehicle companies. In 2024 alone, we recovered nearly 200,000 tons of resources from ELVs and achieved 82.6% in ELV recycling when thermal recovery is excluded. In the meanwhile, Hyundai does not have financial benefit from ELVs' take-back program, but it financially supports recycling companies to further increase recycling rates. This reflects our commitment to the sustainable disposal of ELVs and to facilitating resource circulation over the long-term.

ELV Treatment Principles



Resources Recovered from ELVs

(Unit: Tons)



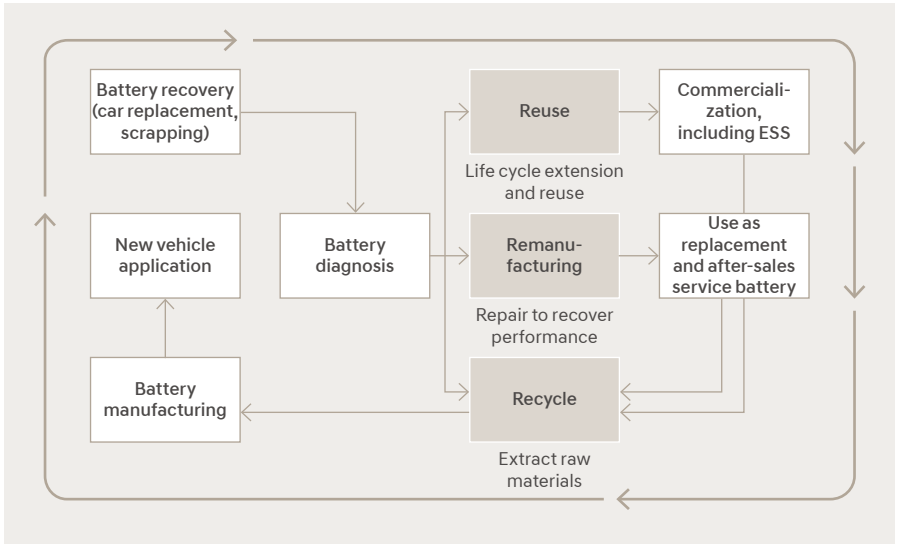
Circular Economy and Resource Use

Battery Closed Loop System

Group-wide Partnership for a Battery Closed Loop System Hyundai is establishing a battery closed loop system aimed at driving sustainability through the recycling and reuse of from EV dismantling in alignment with the battery lifecycle. The battery lifecycle encompasses the production of battery cells from raw materials, the assembly of EV battery systems, the reuse of batteries after initial use, the extraction of resources from discarded batteries, and the input of reclaimed materials back into battery manufacturing, creating a sustainable battery closed loop system. We have established a group-wide cooperative system throughout the battery life cycle, while exploring sustainable business models and developing relevant competencies.

While developing a system to treat large quantities of end-life-of batteries through our global sales and service network, we are establishing a battery closed loop system, reclaiming core battery materials such as cobalt, lithium and nickel from end-of-life batteries that cannot be reused or remanufactured and feeding them back into battery manufacturing. Hyundai Glovis, on the back of its global logistics network, engages in recovering end-of-life batteries through land and sea transport for their recycling or reuse for Energy Storage Systems (ESS). Hyundai MOBIS is planning a remanufacturing business that prolongs the life of batteries by means of new packaging, such as sorting out collected batteries and restoring performance, and inputs them for use. Remanufactured batteries will be used for old electric vehicles and repair (after-sales service). We are partnering with domestic/international companies with proven technology in the battery circular value chain while strengthening partnerships with Hyundai Motor Group affiliates, ramping up our efforts to build an ecosystem for battery recycling.

Framework for the Battery Closed Loop System



Battery Recovery Hyundai is collaborating with Hyundai GLOVIS, a group company, to establish a global network and transportation control system that systematically collects and transports waste batteries from various locations around the world, including scrapyards, dealerships, after-sales service centers, and Battery-as-a-Service (BaaS) sites. We are also building an integrated diagnostic and pre-treatment system for recovered batteries in collaboration with Hyundai Glovis. In particular, Hyundai GLOVIS has developed and patented a dedicated platform container that can transport used batteries, which are difficult to handle, safely and effectively. It is also collaborating with ER (Environment Recycling), a company possessing pretreatment technology for waste batteries, in the construction of a system that will enable easy transportation and in securing a black powder that can extract valuable metals.

Additionally, we have secured a logistics system that complies with the complex and diverse regulations of each country. Leveraging Hyundai Glovis' logistics know-how and network, Hyundai Motor Company is laying the groundwork for the recovery, diagnostics, and pre-processing of end-of-life batteries throughout the battery lifecycle, establishing a robust system for battery reuse and recycling.

Battery Reuse Hyundai has been conducting pilot projects to reuse second-life EV batteries for ESS. In December 2020, we became the first company in Korea to obtain approval to give a special regulatory sandbox demonstration of an energy storage device for reusing second-life batteries. Having built a 2 MWh ESS and a 300 kWh ESS, respectively, at our Ulsan Plant and the Gongju plant of OCI Specialty, our demonstration partner, we began commercial operations using photovoltaic power in January 2021.

In April 2022, we partnered with Korea Water Resources Corporation to deploy 400kWh ESSs for Busan Eco Delta Smart City. The ESS demonstration projects that Hyundai undertakes by reusing batteries have been led by Hyundai Glovis since 2023. Hyundai Glovis is strengthening the ESG business through a single pipeline encompassing battery recovery/diagnostics/pre-processing and reuse.

Battery Remanufacturing Among second-life batteries generated from our battery life cycle, top-quality second-life batteries with high residual value will be linked to remanufacturing business according to our own classification criteria. We work together with Hyundai MOBIS and Poen to remanufacture purchased/collected second-life batteries into batteries for old vehicles and after-sales service, thereby prolonging the service life of batteries.

Battery Recycling Under our battery closed loop system, end-of-life batteries deemed unfeasible for remanufacturing or reuse are shredded and recycled by extracting valuable metals such as lithium, cobalt, and nickel. We are focused on securing technologies that enable the sustainable and safe recycling of large volumes of batteries expected in the upcoming years, and aim to incorporate raw materials sourced as such into battery production to complete a battery closed loop system.

Establishing an Ecosystem for Battery Recycling While reinforcing our collaboration with Hyundai Motor Group affiliates, we are striving to collaborate with domestic and international companies. In 2024, we signed a contract with Lithion to advance EV battery recovery and recycling in Canada. Under this contract, automotive lithium-ion batteries nearing the end of their life are collected and sent to Lithion's recycling plant. Hyundai Glovis, which oversees the recovery and processing of second-life batteries and directs them to recycling business under Hyundai Motor Group's battery closed loop system, inked an MOU with EcoPro in 2024 to pursue upstream business for recycling used EV batteries. This partnership drives our efforts to strengthen our battery recycling value chain and leverage each party's pre-processing technologies to lay an optimal groundwork for battery recycling. In partnership with Hyundai Glovis, is building an ecosystem for battery recovery and pre-treatment.

Customer Battery Care Program We team up with battery companies early from the development stage to enhance the longevity, efficiency, recyclability, and safety of batteries. Aside from this, we operate the Customer Battery Care Program to improve the efficiency of battery use in the customer use phase: when a customer leases an EV, we reduce the lease fee in advance based on the projected residual value of the battery and offer compensation if the battery remains in good condition. This program is expected to motivate customers to better manage battery performance themselves, extending battery longevity while improving efficiency in battery use.

We launched our 'Customer Battery Care Lease Program' first with the Casper EV model in collaboration with Hyundai Capital in 2024 and expanded this program to IONIQ 9 in 2025. This program not only helps alleviate customers' concerns about battery degradation but also reduces the upfront cost burden of EV ownership, contributing to the mainstreaming of EVs. This program also enables customers to monitor battery status in real time and receive compensation after the lease is ended when the battery meets the set condition criteria. At the end of the lease term, EV batteries will be either reused or recycled depending on their remaining service life and performance.

Circular Economy and Resource Use

Resources Use

Resources Inflows

Raw Material Supply chain situations and geopolitical issues give rise to the increased volatility of raw material prices. Raw material price volatility is a factor that directly affects finance. Hyundai is therefore striving to manage internal and external risks that can be triggered by raw materials, including a rise in costs, instability in supply and demand, and depletion of natural capital, by enhancing raw material usage efficiency and promoting recycling. Vehicle manufacturing relies on a broad array of materials, including steel, aluminum, plastic, glass, wood, rubber, and critical minerals. The primary raw materials used at Hyundai's production plants include steel (iron), aluminum, paint, thinner, and casting sand. Steel and aluminum are predominantly used in the body shop, while scraps from the pressing process are fully recycled through external sales. Plastic, glass, wood, rubber, and critical minerals are primarily consumed by parts suppliers. We are reinforcing our partnerships with material producers and parts suppliers to expand the uptake of sustainable materials, including recycled materials, in the product development phase.

In 2024, steel and aluminum scrap volumes accounted for 32.6% of total raw material consumption. While our year-on-year production declined in 2024, steel and aluminum use per vehicle rose slightly.

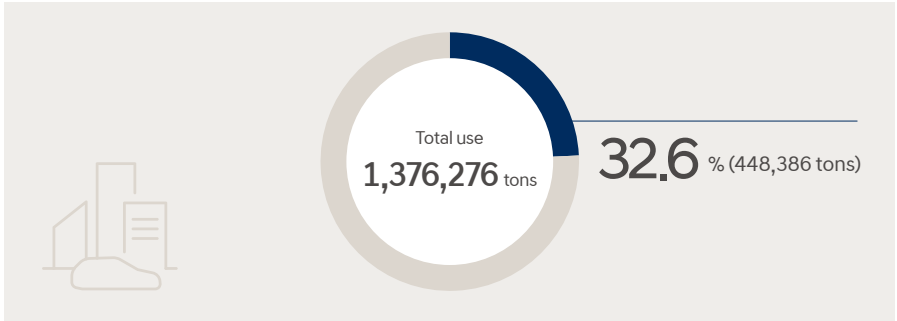
Raw Material Use

(Unit: Tons, Tons/Vehicle)

Classification	2022	2023	2024
Steel/aluminum use ¹⁾	1,297,282	1,387,729	1,376,276
Use per vehicle produced	0.32	0.32	0.33
Steel/aluminum scrap ²⁾	430,673	449,781	448,386

1), 2) Aggregated site data were restated for disclosure to reflect corrections in previously reported figures for steel consumption and scrap volumes at certain business sites.

Ratio of scrap amount in 2024



Critical Minerals EV battery manufacturing requires more critical minerals than internal combustion engine (ICE) vehicles. According to the International Energy Agency (IEA), EVs consume six times more critical minerals than ICE cars. Furthermore, these minerals, including lithium, cobalt, nickel, and manganese, are essential to battery performance, longevity, and energy density, which underscores the utmost importance of their reliable supply. To alleviate risks associated with critical minerals, we are developing mass-market batteries containing less critical minerals. Our mass-market NCM (Ni, Co, Mn) battery will be designed to reduce nickel content compared to the currently-adopted NCM battery, lowering the use of critical minerals as a result.

Water We monitor water consumption and recycling volumes along with water pollutant discharges at the production plant level. Internally, the environmental organization at the Headquarters uses the Hyundai Environmental Assessment Tool (HEAT) developed in-house to manage water efficiency and recycling, at each production plant. Externally, we receive annual ISO 14001 certification audits from third-party organizations to evaluate water efficiency and treatment.

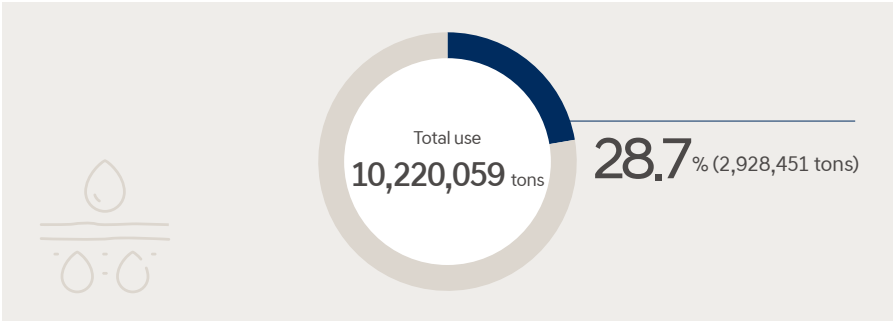
Water Consumption and Recycling

(Unit: Tons, Tons/Vehicle)

Classification	2022	2023	2024
Total use ³⁾	10,578,611	11,181,546	10,220,059
Use per vehicle produced	2.6	2.6	2.5
Recycling	2,284,154	2,631,445	2,928,451

3) Aggregated site data were restated for disclosure to reflect corrections in previously reported figures on water withdrawal volumes at certain business sites.

Water recycling rate in 2024



Water Conservation Initiative in India



Hyundai Motor India (HMI) is situated in Chennai. According to the World Resources Institute (WRI), 17 out of 28 states in India face extreme water stress. Specifically, Chennai is experiencing severe water scarcity, highlighted by its declaration of Day Zero (the projected day when a city is expected to run out of water) back in 2019.

HMI is addressing such water risks at the production plant level, conserving water resources while expanding water recycling. To reduce its reliance on external water resources, HMI is also stepping up efforts to secure in-house water sources through rainwater harvesting. This is paired with various water resources conservation initiatives to join hands in addressing the issue of water shortages in Chennai and other major communities in India.

Water Self-Sufficiency at the Production Plant

To address high water stress in India, a multi-pronged approach is needed, focusing on efficient water management, conservation, and alternative water sources. HMI's manufacturing facility at Chennai aims at achieving 100% self-sustenance in water usage by 2030. For efficient water management, HMI has implemented a zero liquid discharge and practiced effective rainwater harvesting. Six reservoirs situated in its Chennai plant premises capable of storing nearly 350,000 tons of water, facilitate rainwater harvesting.

Dry Wash Service

Through dry wash service, introduced as a water conservation initiative, HMI has reduced the water wastage in car washing significantly. Traditionally, car washing consumes about 120 liters of water per car for a single wash. The dry wash service stands as an alternative to traditional water-intensive car washing methods. This service has been used by 5.5 million cars over the past five years across HMI's service network and workshops in India, conserving a total of 650 million liters of water, which is equivalent to the daily water consumption of 4.8 million people.

Pond Restoration Project

To contribute to resolving water shortages facing local communities, HMI launched a project to restore ponds that dried up amid prolonged droughts. In 2022, this project helped restore three ponds in Hariahera, Palasoli, and Tajnagar, securing approximately 14 million liters of water. Two more ponds in Chennai were restored subsequently in 2023. This project not only ensured more reliable water supply for local people but also improved the local ecosystem.

In implementing these multi-faceted water resources conservation initiatives, HMI progresses towards water self-sufficiency in production and joins forces with local communities to combat water scarcity challenges in India.

Circular Economy and Resource Use

These internal and external environmental assessment results inform our efforts to identify opportunities and make necessary improvements to manage water efficiency while reducing water pollutants. In particular, we manage water efficiency to ensure water consumption does not rise in proportion to increased production volumes, and strive to expand water recycling. We use the WRI's Aqueduct Water Risk Atlas Tool in assessing water risks at the business site level. These assessments identified extremely high water risks at HMI(Hyundai Motor India), HMTR(Hyundai Motor Türkiye Otomotiv A..S), HMMA(Hyundai Motor Manufacturing Alabama), BHMC(Beijing Hyundai Motor Company), and HMMI(Hyundai Motor Manufacturing Indonesia). This prompted us to focus on business sites at increased water risk in improving water efficiency and increasing water recycling.

In 2024, our water recycling amounted to 2,928,451 tons, achieving a 11.3% year-on-year growth, and our water recycling rate of total water usage was increased to 28.7%, up 5.1% from the previous year. Our water consumption target for 2024 was set at 10,350,887 tons to deliver a 5% reduction from the projected water consumption based on planned production volumes for the year. Actual water consumption totaled 10,220,059 tons. In 2024, water consumption per vehicle fell by 3.8% to 2.5 tons.

Efforts are also underway to reduce water consumption while promoting recycling at the production plant level. Our Indian plant (HMI) located in Chennai facing severe water scarcity as well as our Asan Plant in Korea have established a zero wastewater discharge system to recycle water. Our Ulsan Plant has deployed a wastewater recycling system which covers water transfer pipelines with an aim to recycle effluents from its wastewater treatment facility into circulating water for the wet-type dust collector at the painting booth, which enable over 52,000 tons of water to be recycled. To reduce water consumption, our Czech plant (HMMC) will review the installation of nano filters to recycle wastewater discarded from the reverse osmosis (RO) system in its painting shop, install additional flow meters, and conduct rigorous water consumption monitoring. Our Mexican plant (HYMEX) has established a wastewater recycling system capable of repurposing treated water for production by upgrading its wastewater treatment facility with biofiltration, ultrafiltration, and RO treatment. Our HTWO Guangzhou plant is reducing the operating hours of chilled water production facilities while harvesting and recycling reaction water generated from hydrogen fuel cell activation and PMC processes.

Hyundai provides employees with annual environmental training in line with its environmental policy, encouraging water conservation and increased recycling. In particular, we send text messages to service centers through social media platforms urging employees to reduce water and energy use. On World Water Day (Mar. 22), our Indian plant displayed posters highlighting the importance and urgency of water issues for employees and shared water saving tips to further motivate employee engagement in water conservation efforts.

Resources Outflows

Waste Hyundai monitors and manages the amounts and types of waste discharged and recycled at each production plant Internally, our headquarters' environmental organization conducts audits on waste management using the Hyundai Environmental Assessment Tool (HEAT), developed in-house. Externally, we undergo annual ISO 14001 audits to assess our waste management practices. Based on the results of our self-management, as well as internal and external waste audit, we identify and act upon opportunities to reduce waste and enhance recycling efforts.

Hyundai is committed to reducing waste and expanding recycling initiatives to ensure that our waste generation do not rise in parallel with our production volumes. In our automobile production process, we successfully recycle of metal wastes and are working to broaden recycling efforts to include waste paint, waste thinner, packaging materials, and sludge waste. In 2024, Hyundai's total waste discharge (excluding recycling amount) amounted to 79,528 tons, an increase of 14.2% from the previous year. The amount of waste per vehicle also saw a slight increase, coming in at just 0.019 tons. Our recycling rate of total waste also reached 91.4%. In 2023, our waste recycling rate temporarily rose to 93.4% due to a surge in the recycling of construction waste generated from the new EV plant built at our Ulsan Plant in 2023. Our waste discharge target for 2024 was set at 70,703 tons based on the projected production plan for 2024, and actual discharge amounted to 79,528 tons. The reason for the increase in actual waste discharge compared to the 2024 target and the previous year was attributable to the temporary increase in general waste that cannot be recycled due to the removal of existing roofs and other facilities in preparation for the construction of a new hypercasting plant at Ulsan plant and the repurposing of some production processes at Czech plants.

Each production plant is working to reduce its waste, expand its recycling initiatives, and minimize its landfill use. The U.S. plant (HMMA) has developed and is implementing a plan to reduce its waste generation by 420 tons per year. While our Indian plant (HMI) had previously outsourced the disposal of phosphate sludge and ground sludge classified as hazardous waste to specialized third-party treatment companies, it has established a waste-to-resource process to transport this waste to nearby cement production facilities for recycling as alternative fuel.

Waste Discharge and Recycling

(Unit: Tons, Tons/Vehicle)

Classification	2022	2023	2024
Total waste ¹⁾	70,216	69,656	79,528
Waste per vehicle produced	0.018	0.016	0.019
Total recycling ²⁾	578,957	978,312	849,485
Recycling rate	89.2	93.4	91.4

1), 2) Aggregated site data were restated for disclosure to reflect corrections in previously reported figures on waste generation at certain business sites.

The Asan plant and Brazil plant (HMCSA) have been certified as “zero waste to landfill” plants. The Asan plant, due to its high recycling rate and landfill minimization performance, has achieved the ‘Platinum’ level (100% recycling rate) in the Zero-Waste-To-Landfill (ZWTL) certification of UL Solutions, an international safety and science certification organization. As for the Brazil plant, it has earned the highest level of the “Responsible Company Seal” for its waste management, Diamond, which is awarded by the Brazilian certification bodies PCN Do Brasil, the National Institute of Metrology Standardization and Industrial Quality (INMETRO), and the Zero Waste Institute from the Instituto Lixo Zero Brasil (ILZB). Our Indonesian plant (HMMI) enhances the sorting of in-house food waste which amounts to nearly 9.7 tons per year and regularly manages such waste through natural decomposition, converting it to natural fertilizers which are then used to cultivate landscaping plants within the plant.

Hyundai also conducts annual environmental education and campaign for its employees based on its environmental policy to promote waste reduction and recycling. In 2024, the Headquarters encouraged domestic sites to launch campaigns aimed at planning activities to promote waste recycling. Notably, the campaign led by the Asan Plant to repurpose used banners into thermal bags was chosen and has been implemented since 2025. This involves the collection of banners no longer used from within and outside the plant and their transformation into insulated bags for ready-to-eat employee breakfasts, avoiding the use of single-use plastics all while reducing banner waste. The Jeonju Plant has been supporting the use of reusable containers for the past seven years, and plans to launch a reusable tumbler use campaign across public-use facilities in 2025. In tandem with these efforts, we also make investments in waste and recycling facilities each year. Additionally, we invest in waste and recycling facilities, allocating a total of KRW 725 million to improve the waste and recycling infrastructure of our domestic plants in 2024 alone.

Waste recycling rate in 2024



Biodiversity

Biodiversity is essential for life on Earth, allowing humans, plants, and animals to live in harmony with nature. Recognizing that biodiversity has a significant impact on natural capital—including human food safety, health, air and water quality, and raw material supply—Hyundai strives to assess its impacts on, and risks to, biodiversity and to mitigate any negative impacts based on this assessment. Furthermore, under the company-wide “Colorful Life” campaign, we are implementing various projects, such as protecting endangered species and preserving natural habitants within the communities near our sites and regenerating land and marine ecosystems while taking into account their natural characteristics.

Biodiversity Response

Biodiversity Policy and Assessment

Biodiversity Protection Policy In 2022, Hyundai established the Biodiversity Protection Policy based on the Convention on Biological Diversity (CBD), Convention on International Trade in Endangered Species of Wild Fauna and Flora, and Guidelines for Applying Protected Area Management Categories. We are complying with laws and regulations on diversity promotion, wild fauna and flora management, natural habitat conservation, and use of forest/soil/water resources of countries where our business sites are located. Also implemented based on the biodiversity policy includes the assessment of environmental impact throughout our business operations and conservation/restoration activities. Implementation of our pledge on mid- to long-term biodiversity restoration and promotion, assessment of biodiversity and setting of impact reduction activities, and forest destruction prevention and reforestation project is endorsed by management (C-level).

 [Hyundai Motor Company Biodiversity Protection Policy](#)

Biodiversity Impact Assessment Hyundai conducts an environmental impact assessment of its large business sites based on relevant laws and regulations in the respective country to forecast and analyze the impact on natural environment by environmental factors that arise in the process of newly building/extending business sites or operating business sites. The air environment, water environment, land environment, fauna and flora, and other factors are subject to environmental impact assessment. Based on assessment results, we identify major risk factors and establish mitigation measures. Some production subsidiaries additionally conduct a biodiversity risk assessment that identifies numbers of fauna and flora and ecosystem status, through which they forecast impact and risk factors on specific species and population and establish mitigation measures. In addition, each business site carries out biodiversity and habitat protection activities and collaborates with relevant organizations, non-profit groups, and professional organizations to raise the effectiveness of protection activities.



Methods for assessing the species and individual inhabitation status (picture-taking, spot survey, field inquiry)

Biodiversity Impact Assessment process – Flora and Fauna Distribution Survey and Impact Analysis



Biodiversity Risk Management In alignment with the Kunming-Montreal Global Biodiversity Framework adopted in 2022, major countries in the EU and other regions have established their national 2030 biodiversity strategies to move beyond preventing additional losses of biodiversity towards achieving net gains. Building on these strategies, they are earnestly beginning to regulate the industries that have the greatest negative impact on biodiversity.

First and foremost, the EU recognizes deforestation as a major driver of biodiversity loss and has accordingly enacted the EU Deforestation Regulation (EUDR), which will take effect at the end of 2025. Under the EUDR, any operators or traders engaged in importing or exporting commodities including palm oil, cattle, coffee, wood, cocoa, rubber, and soybeans – along with relevant products such as leather, furniture and rubber tires, within the EU market must prove that the products are not linked to deforestation or forest degradation. The commodities and products covered by EUDR will be screened for links with deforestation and, if such links are confirmed, they will be banned from importation and distribution within the EU. Further additions to the list of covered commodities and relevant products are expected in the future.

Hyundai integrates biodiversity risks into its company-wide risk management system and is intensifying its sustainability risk management to prevent deforestation risks of leather and rubber supply chain, as EUDR will take affect at the end of 2025. Leather and rubber materials, designated as priority materials under the EUDR, are used for interior seats and tire and any application of rubber and leather raw materials linked to deforestation may pose the risk of delay or suspension in sourcing relevant components due to the European import ban. To prevent such risks, a preliminary investigation was completed at the Headquarters level on the leather and rubber components used in our vehicles produced in or exported to Europe to determine whether they are covered under the EUDR. Preparatory training was also provided to working-level procurement teams at the Headquarters and in the EU and suppliers sourcing affected components, offering guidelines on how to respond to the Regulation. This training forms part of our efforts to establish a risk response system covering the identification of deforestation-related risks in partnership with concerned suppliers. For risk identification, Hyundai requires the direct suppliers of parts made from leather and rubber to disclose the origin of materials they use during the bidding process. For risk prevention, the directive suppliers of parts made with leather are obligated to use LWG (Leather Working Group) certified leather. Hyundai is striving to make high-quality genuine leather even more sustainable. Regarding rubber, Hyundai collaborates with tire companies to secure and utilize natural rubber that is not linked to deforestation. Looking ahead, Hyundai will strive to develop and adopt sustainable materials over the mid-to long-term to prevent risks relating to leather and rubber materials.

Biodiversity

“Colorful Life” Campaign

Hyundai is aware of biodiversity losses that are aggravating worldwide, and has launched a company-wide biodiversity protection campaign titled 'Colorful Life' since 2023 by positioning biodiversity as the central theme of environmental contribution initiatives undertaken at the site level. Colorful Life highlights the significance of life's diversity and suggests that the conservation of biodiversity can enhance and enrich our lives. Each domestic and overseas site has developed and implemented a CSV activity business plan centered on biodiversity.

Headquarters – Public-Private Partnership for Biodiversity and Ecosystem Restoration At the end of 2024, we signed an MOU with the Korea Environment Conservation Institute and Asan City for ecosystem restoration and biodiversity promotion, and have since been committed to the restoration of degraded ecosystems in the Asan region. This partnership represents the first-ever sustainability initiative jointly led by both public and private entities for ecological restoration. The project site - Gundeok-ri, Seonjang-myeon, South Chungcheong Province - was formerly a farming area and has repeatedly transformed between lake, wetland, and farmland according to seasonal variations in water discharge, with its wetland function compromised over time due to terrestrialization. Hyundai and the Korea Environment Conservation Institute plan to transform the 9,000m²-sized site into an aquatic ecological garden by 2025, restoring its ecological environment. Asan City will take charge of maintenance following the restoration.

Ulsan Plant – Conserving the Taehwa River and Endangered Species The Ulsan Plant has been engaging in the protection and conservation of the Taehwa River, a designated ecological conservation area in its vicinity, as well as endangered species inhabiting near the river with decreasing populations. In 2024, the plant sponsored the Taehwa River Conservation Association and the East Asian-Australasian Flyway Partnership (EAAFP) to safeguard waterbirds living in the estuaries of the Taehwa River including the Black-faced Spoonbill as well as fish inhabiting the Cheokgwa Stream including Japanese minnows, along with collecting plastic along seashore areas. In 2025, the Ulsan Plant will launch an initiative to protect and restore Rosy Bitterlings in the Taehwa River. The Rosy Bitterling is a native Korean species and a legally protected flagship species, playing a vital role in the local ecosystem.

Asan Plant – Planning Trees in Yeongin Mountain Our Asan Plant has been dedicated to the Hyundai Motor Forest Program implemented for Yeongin Mountain since 2022, providing KRW 10 million budget support each year under the One Company One Mountain partnership established with the mountain situated in Asan City. In 2024, our efforts continued to plant Yoshino cherry trees recognized for their effectiveness in reducing carbon emissions in collaboration with the Asan Facilities Corporation.

Jeonju Plant – Endangered Plant Conservation & Restoration Project Starting in 2024, the Jeonju Plant is initiating agreements with organizations such as the Jeonbuk Regional Environmental Office, Deogyusan National Park, the National Park Wildlife Conservation Center Plant Center, and Good Neighbors Jeonbuk Branch, focusing on conservation activities for the newly discovered critically endangered *Cypripedium japonicum* (Gwangneung Yogang Flower), a Class I endangered species, in Deogyusan, and carrying out propagation projects for the *Lilium tsingtauense* (Nalgae Haneulnari Flower), a Class II endangered species.

Key Biodiversity Initiatives

Mitigation Hierarchy	Key Initiative															
Avoid	• Before establishing/changing/expanding a large business site, we pre-assess how the activity will impact the nature assets, including biodiversity (flora and fauna) and natural environment (air, water, soil), of the planned project site and surrounding area.															
Reduce	• We adopt environmental facilities that can minimize discharge of air/water/soil pollutants of our business sites, such as use of the regenerative thermal oxidizer (RTO), dust collector, zero liquid discharge system, and waterborne-based paint. • We conduct life cycle assessments (LCAs) in the areas of global warming, acidification, eutrophication, and photochemical oxidant to assess our vehicles' potential impact on the environment, using CML (Centre of Environmental Science – Leiden University) methodology. LCA results indicated that EVs can reduce the carbon footprint as much as 67% compared to ICEVs, when using new and renewable energy-based electricity. • Water shortages and poor water quality are direct contributors to biodiversity loss. We strive to enhance the efficiency of our water use in manufacturing processes, and manage wastewater in accordance with internal management standards. • Vehicle manufacturing relies on a wide range of raw materials, including metal, rubber, and leather. We are striving to apply sustainable materials to reduce biodiversity impact when extracting raw materials.															
Transform	• We are establishing ecological parks based on private-government cooperation and developing/spreading new technologies that restore the ecosystem. - In partnership with The Nature Conservancy (TNC) in Brazil and Sao Paulo State University's Department of Forest Science, we established a research forest to develop new technologies for forest restoration (Green Field, etc.) and are spreading new technologies.															
Restore	• We work to restore endangered, high-risk species, threatened species due to climate change, and degraded ecosystems. - Animal restoration: We strive to preserve and restore species, such as by setting protection zones for the endangered long-billed ringed plover and eagle, which is a natural monument, living in the Taehwa River in collaboration with Ulsan Metropolitan City and East Asian-Australasian Flyway Partnership. - Plant restoration: Following the cultivation and planting of Korean Fir, endangered species threatened by climate change, we collaborated with the Korea National Park Service and conducted a project on restoring plants on Mt. Deogyu that are categorized as endangered species, including cypripedium japonicum and liliium cernuum. - Ecosystem restoration: We are implementing a restoration and ecological garden development project on a site affected by ecosystem degradation (nearly 9,000m²) under the public-private partnership with Asan City.															
Regenerate	• We undertake regeneration projects for terrestrial and marine. – Terrestrial ecosystem: Through the IONIQ Forest project, we will regenerate forests by planting 2 million trees by 2035 across the globe, to provide sustainable habitats for both flora and fauna. – Marine ecosystem: In collaboration with Healthy Seas, we will collect a total of 230 tons of ocean waste (waste fishing nets, etc.) in 8 European countries (Greece, France, etc.), US and Korea by 2025 to help increase marine life populations, including the return of marine fish species. <table><tr><th>Classification</th><th>Metrics</th><th>Target</th><th>Progress</th><th>Detailed Strategies for Achieving Goals</th></tr><tr><td>Terrestrial ecosystem</td><td> • Area of regeneration • No. of trees planted to build forests </td><td> • Area of regeneration: Regenerate a total of 2,000 ha of terrestrial ecosystem(forest, grassland) by 2035 • Planting trees: Plant 2 million trees by 2035 </td><td> • Restoration area: Completed the restoration of terrestrial ecosystems of 1,803 ha, including forests and grasslands, between 2016 and 2024 • Tree planting: Planted a total of 902,439 trees between 2016 and 2024 </td><td> • Aim to achieve the goal by expanding the global market for terrestrial regeneration projects, starting in Korea and then extending the scope of the projects to major countries with our production plants in the U.S., Brazil, and the Czech Republic </td></tr><tr><td>Marine ecosystem</td><td> • Collected marine wastes, including waste fishing nets </td><td> • Collect 230 tons of marine wastes by 2025 </td><td> • Collected a total of 278 tons of marine litter on nearly 45 occasions in 8 European countries, Korea, and the US between 2021 and 2024 (collected 63.4 tons of abandoned fishing nets in 2024) </td><td> • Expand the marine litter collection initiative to include Korea and the US in addition to 8 European countries to attain the set goal </td></tr></table>	Classification	Metrics	Target	Progress	Detailed Strategies for Achieving Goals	Terrestrial ecosystem	• Area of regeneration • No. of trees planted to build forests	• Area of regeneration: Regenerate a total of 2,000 ha of terrestrial ecosystem(forest, grassland) by 2035 • Planting trees: Plant 2 million trees by 2035	• Restoration area: Completed the restoration of terrestrial ecosystems of 1,803 ha, including forests and grasslands, between 2016 and 2024 • Tree planting: Planted a total of 902,439 trees between 2016 and 2024	• Aim to achieve the goal by expanding the global market for terrestrial regeneration projects, starting in Korea and then extending the scope of the projects to major countries with our production plants in the U.S., Brazil, and the Czech Republic	Marine ecosystem	• Collected marine wastes, including waste fishing nets	• Collect 230 tons of marine wastes by 2025	• Collected a total of 278 tons of marine litter on nearly 45 occasions in 8 European countries, Korea, and the US between 2021 and 2024 (collected 63.4 tons of abandoned fishing nets in 2024)	• Expand the marine litter collection initiative to include Korea and the US in addition to 8 European countries to attain the set goal
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Biodiversity

Business Case

Metaplant America(HMGMA) – Biodiversity Impact Assessment

In line with Hyundai Motor Group's initiative to construct Hyundai Motor Group Metaplant America (HMGMA) in the state of Georgia, US, biodiversity impact assessments on the fauna and flora living in the vicinity of the plant site was conducted. The scope of these assessments includes the plant site and the areas adjacent to the mega sites developed by the Georgia state government for large-scale manufacturing. The purpose and need of assessment are to determine the potential for the occurrence of animal and plant species currently listed as threatened or endangered in Bryan County by federal regulations and whether mitigation measures will be required in coordination with the US Fish and Wildlife Service.

Description of the Assessment Area

The assessment area is located south of Interstate 16, east of GA Highway 280, near Black Creek, in Bryan County, Georgia, United States. This area had been previously managed for wood manufacturing and covers both wetland and upland areas. The wet areas are known to provide habitats for reptiles and amphibians, such as the Eastern Indigo Snake, Frosted Flatwoods Salamander, Striped Newt, and Gopher Tortoise, and surveys were conducted to evaluate the presence of legally protected reptile and amphibian species.

Biodiversity Assessment Methodology

The assessment followed a three-step process of preliminary literature review, on-site survey, and expert engagement. This started with a preliminary review of habitats using state and federal government records on the study areas, national wetland maps, and other diverse geographical information sources. With the help of the US Fish and Wildlife Service and the Georgia Department of Natural Resources, we conducted literature reviews to identify the possible presence of species listed as legally protected within the assessment areas. On-site, walking surveys were conducted to take stock of the current habitat conditions and confirm the potential inhabitation of listed species. This involved the documentation of habitat types, plant communities, and the composition of inhabiting species, along with photo-taking to document site conditions, plant communities, and the current status of habitats by type. Following the confirmation of reptile and amphibian inhabitation through preliminary and on-site habitat surveys, we sought advice from a reptile expert (John Palis) to conduct in-depth surveys on specific protected species including the Eastern Indigo Snake, Frosted Flatwoods Salamander, Striped Newt, and Gopher Tortoise.

Results of the Biodiversity Assessment

The assessment was structured around the classification of habitat types, the identification of species presence with a focus on those legally protected by the federal and state governments, and impact assessment. Bryan County had been managed for wood manufacturing, and mainly consists of uplands and wetlands, including coastal plains of Georgia. The following table illustrates the types and characteristics of habitats within Bryan County as identified by on-site surveys.

Habitat Classification Results within the Assessment Area

Type	Main Characteristics
Managed Pine Plantation Upland	Constitute plantation areas for wood manufacturing with systematically managed pine trees of varying age groups, comprise the majority of the assessment area
Managed Pine Plantation Wetland	Located in the southeastern portion of the area and subject to more frequent hydrologic saturation and inundation
Forested Wetlands	Dispersed across the assessment area with the distribution of hardwood species
Scrub-Shrub Wetlands	Previously served as hardwood harvest areas, located along the perimeter of the wetland systems and currently have a dense understory
Intermittent Streams	Located in the central portions of the forested wetland systems, consist of sand and mud lacking vegetation

Legally Protected Species Assessments were conducted on endangered (E) and threatened (T) species protected under the Endangered Species Act of the US federal government. Specifically, in-depth studies were conducted on a select group of protected species known to strongly prefer the types of habitats present within the assessment area.

- **Red-Cockaded Woodpecker (E)** : The assessment area contains scattered mature pines located primarily along Black Creek and the wetland fringes. However, the vegetation in these areas contain a dense understory and are not preferred by the Red-Cockaded Woodpecker (RCW). No individuals or colonies of the RCW were observed during the field survey and no nesting or foresting habitat was noted.
- **Eastern Indigo Snake (T)** : This species prefers a variety of habitat types, including plains with plentiful pine trees and underbrush, freshwater wetlands, and coastal dunes. The Eastern Indigo Snake co-inhabits the burrows of the Gopher Tortoise to avoid cold and dry spells. No trace of inhabitation was observed during the field survey.
- **Frosted Flatwoods Salamander (T)** : Based upon the results of this study, the presence of the flatwoods salamander within the assessment area is not likely and therefore there will be no effect on this species.

Candidate (C) Due to the confirmed potential inhabitation of the Gopher Tortoise and Striped Newt that are candidate species eligible for protection under US federal law, separate in-depth studies were conducted.

- **Gopher Tortoise (C)** : While the Gopher Tortoise is listed a candidate species under US federal law, this is classified as an endangered species under Georgia state law and is protected as such. Along with sandy soil for burrowing, sunlight availability, and abundant herbaceous vegetation are the key habitat requirements for this reptile. Gopher tortoises are a characteristic species of the rapidly disappearing longleaf pine and wiregrass community. Unfortunately, very little of this naturally occurring habitat still exists; therefore, many tortoises have been forced into artificial habitats.
- **Striped Newt (C)** : John Palis, a reptile expert, directly conducted on-site studies, and no individuals were found.

Bald and Golden Eagle The populations of Bald and Golden Eagles have recovered thanks to national conservation efforts. Since they were delisted from the endangered species list, they have remained protected according to separate guidelines. The assessments area does not contain an eagle nests, and no individuals or nests were observed within the survey area during the field investigation.

Status of Protected Species within the Assessment Area and Assessment Results

Class	Common Name	Legal Status ¹⁾		Species Present	Biological Determination
		Federal	State		
Amphibians	Frosted Flatwoods Salamander	T	T	No	No impact
	Striped Newt	C	T		
Birds	Red-Cockaded Woodpecker	E	E		
	Red Knot	T	T		
Fishes	Wood Stork	T	T		
	Atlantic Sturgeon	E	E		
Mammals	Shortnose Sturgeon	E	E		
	West Indian Manatee	E	E		
	North Atlantic Right Whale	E	E		
	Eastern Indigo Snake	T	T	None observed ²⁾	Little to no impact
	Gopher Tortoise	C	T	Yes	
Reptiles	Green Sea Turtle	T	T	No	No impact
	Leatherback Sea Turtle	E	T		
	Loggerhead Sea Turtle	T	T		

1. E: Endangered species, T: Threatened species, C: Candidate species
2) None observed: While habitats are present that are preferred by certain species within the assessment area, no individuals were observed through on-site surveys during the assessment period.

Mitigation Measures

To identify anticipated impacts on biodiversity in the vicinity of our operations, we conduct biodiversity impact assessments and implement mitigation measures based on assessment results. In November 2024 prior to initiating the operation of HMGMA, Gopher Tortoises confirmed to inhabit the assessment area had been relocated under the guidance of the US Fish and Wildlife Service and the Georgia Wildlife Resources Division. This species mainly lives in the southeastern part of the US, and has been protected as a native North American species since its designation as Georgia's state reptile in 1989. These tortoises dig burrows deeper than 40 feet underground, which not only serve as their own habitat but also provide shelter for other animals. This positions the Gopher Tortoise as a key species playing a vital role. 106 Gopher Tortoises were collected and transported about 30 miles to the Fort Stewart Army base in Georgia.



Pollutants

Hyundai takes an approach to managing the impacts of pollutants on the environment. To mitigate the environmental impacts of pollutants generated throughout the overall production process, we invest in the replacement and installation of equipment while controlling air and water pollutants in accordance with our internal management standards. For hazardous substances, we ensure compliance with global initiatives as well as regulations, recognizing their potential impact not only on the environment but also on the health and safety of our employees.

Air Pollutants

We apply internal management standards by referencing the regulatory standards limits of the countries where we operate. In accordance with our internal management standards, we regularly monitor the emission of air pollutants known for their adverse effects on the atmospheric environment, including nitrogen oxides (NOx), sulfur oxides (SOx), and particulate matter (PM), and maintain their emission levels within legal thresholds. Each business site sets internal emission targets within the scope determined based on the air pollutant emissions of the previous year, and their performance is evaluated against the set target to ensure such emissions do not rise in proportion to increased production volumes.

At the production plant level, our Ulsan Plant conducts periodic inspections, repairs, and maintenance on aging air pollution control equipment, and has installed pollutant abatement devices on its gas heat pump (GHP) HVAC system which produces high-concentration pollutants. Our Jeonju Plant has replaced packing and bag filter media to abide by the increasingly tightening Clean Air Conservation Act while upgrading its air monitoring system and conducting on-site assessments on air quality monitoring companies. Our HTWO Guangzhou plant chose to directly receive heating services from the government instead of installing boilers within the plant, reducing air pollutants as a result. Our plants in the Czech Republic(HMMC) and India(HMI) have adopted a waste heat recovery system to lower the emission of pollutants.

Water Pollutants

Before discharging wastewater from each production plant, we make sure full compliance with the effluent pollutant standards established by respective countries and regions. Employing advanced treatment techniques, we maintain pollutants in effluents well below legal limits.

Effluents released from each plant are regularly monitored for water pollutants including BOD (Biochemical Oxygen Demand), TOC (Total Organic Carbon), and SS (Suspended Solids). T-N (Total Nitrate) and T-P (Total Phosphorus) generated from automotive painting and washing processes are also subject to measurement and management.

These measurement data and actual water pollutants discharged during the previous year are used in setting the scope based on which each plant sets their internal discharge targets, followed by performance evaluations conducted against the set targets to ensure discharges do not rise in proportion to growing production volumes. We install and operate facilities aimed at reducing water pollutants, and apply advanced tertiary treatment as well as physical and chemical treatment to wastewater before its release. At the plant level, our Jeonju Plant has enhanced its wastewater pipelines and the drainage system handling indirect blowdown water from cooling towers. Our plant in the US(HMMA) has installed oil-water separators and suspended solids filters to treat wastewater containing oil substances.

Harmful Substances

Harmful Substance Management Standard Hyundai classifies and manages harmful substances in three stages – prohibition of use, limited use, strengthened management – according to international standards and initiatives. Substances classified as “prohibition of use” are banned from use as high-risk regulated substances for which substitutes must be found, while substances falling into the category of “limited use” can only be used for purposes specified in the exception article, and those falling into the category of “strengthened management” can only be used under constant monitoring and systematic management.

Although we strive to minimize harmful substances under internal standards, it is difficult to completely block harmful substances from products because automobiles consist of many thousands of parts. We request our suppliers to apply the same management standards for harmful substances in order to ensure that the products that are delivered to us do not contain any substances banned by regulations.

Substance Data Tracking and Assessment Hyundai has assessed its exposure to hazardous substances regulated by EU POPs Regulation and REACH, PBT under EPA TSCA in the United States, the Act on the Registration and Evaluation of Chemical Substances in Korea in its vehicles. The exposure assessment is carried out in two stages: the development stage of a new vehicle and the post-mass production stage. In development and design stage, we have been tracking substances used in vehicle components using IMDS (International Material Data System) and MAMS (Material Analysis Management System) to evaluate whether they contain regulated substances. Based on the tracking results, the high-risk proto and pilot components are analyzed to evaluate whether they are contained in the development stage. Even after mass production begins, considering potential changes in manufacturing process, Hyundai conducts annual inspections of suppliers to assess whether regulatory substances are in the post-mass components.

Management of Harmful Substance Hyundai strives to prevent accidents by reviewing new high-risk substances prohibited by the regulations and seeking alternative substances. Upon handling hazardous chemicals, we are striving to maintain a safer working environment by utilizing the integrated monitoring system of environmental facilities to check for leakages of hazardous chemicals in real time. Since 2003, we have been sharing information on domestic and international harmful substance regulations and response requirements with our suppliers, as well as managing harmful substances in the supply chain by helping suppliers set up their own systems of response to harmful substance regulations, whenever necessary, in addition to running annual IMDS user trainings to improve the consistency of IMDS data.

Response to Regulation and Initiatives Hyundai supports international regulations, standards, and initiatives on hazardous substances. Efforts have been made to identify and apply alternative substances even before regulations banning and restricting the use of hazardous substances are finalized at home and abroad, and in addition to hazardous substances regulated by the European Union’s End-of-Life Vehicles (ELV) and REACH (Registration, Evaluation, Authorization and Restriction of Chemicals) regulations, which regulate hazardous substances most proactively and the Toxic Substance Control Act (TSCA) in the United States, it is also seeking to replace hazardous substances regulated in Brazil and India. In addition, since it is directly related to the health of the people in relation to the regulation of biocides in Korea, we are engaged in activities to reduce them by developing the “Guidelines for Response to Biocides Regulations-Automobile Part” jointly with the government. Also Hyundai has been pushing to replace PFAS, which is discussing regulations in Europe and North America, with the aim of banning the use of PFAS before the regulation, which is expected to take effect in 2029. In addition, Hyundai is working with chemical companies and suppliers to identify and apply PFAS substitutes and has established and been operating the company-wide council for replacing PFAS in which relevant organizations participate, including the hazardous substance management, material development and product design organizations in the R&D center and purchasing organization.

Management of Four Major Heavy Metals As of July 2003, Hyundai has been mandated not to use four heavy metals in vehicles sold in the EU market in accordance with the EU’s End-of-Life Vehicle (ELV) Directive. These prohibited substances include lead, cadmium, hexavalent chromium, and mercury that may cause heavy metal poisoning when accumulated in the human body. We manage such harmful substances in accordance with the harmful substance management standards established in December 2002.

Environmental Initiatives at Global Sites

Business Case

Hyundai is improving quantitative environmental indicators for each site in Korea and overseas. Our sites also have been taking active part in environmental enhancement activities and initiatives. These qualitative activities are included in sites' performance indicators, along with quantitative indicators, and reflected in their environmental performance evaluations.



Domestic Sites

Ulsan Plant To prevent high-consequence environmental accidents and ensure agile response to such accident once they occur, our Ulsan Plant is deploying an IoT system targeting equipment at increased risk for environmental accidents. In 2024, IoT-based monitoring systems were deployed for air pollution control equipment, LNG flow meters, gas leak detectors, cooling tower water pressure gauges, and sewage sump equipment. These upgrades support real-time equipment monitoring and prompt response to accidents, contributing to the plant's goal of achieving zero high-consequence environmental accidents.

Factory No. 4 has established a wastewater recycling system that reuses ultrapure effluents from the RO system. The factory has also adopted a continuous automatic replenishment system and an alarm system operated based on water level monitoring, preventing environmental accidents caused by industrial water shortages.

Asan Plant Thanks to its high recycling rate and landfill minimization efforts, the Asan Plant became the first Korean automaker to achieve the highest Platinum level in the Zero-Waste-To -Landfill (ZWTL) external certification of UL Solutions, an international safety and science certification organization. The ZWTL certification assesses sites based on their waste recycling performance and assigns ratings according to actual recycling rates. The Asan Plant successfully achieved a 100% recycling rate.

Namyang R&D Center Multiple cooling towers are under operation for building air conditioning and research purposes within the Namyang R&D Center. To maintain cooling performance and prevent microorganism growth, a portion of the circulating water is discharged from these cooling towers and tap water is used for replenishment. We have introduced an automated valve system for cooling towers to improve on circulating water discharges and prevent excessive use of tap water. This means that cooling water is now replenished intermittently rather than continuously, allowing us to reduce water consumption and discharge volumes.

Headquarters/Namyang R&D Center/Domestic Business Divisions In the first half of 2024, our Yangjae Headquarters and Namyang R&D Center hosted the Colorful Life Education Campaign to raise awareness of biodiversity among employees and the general public, featuring an MBTI-themed endangered species exhibition. In addition, our domestic business division operated Colorful Life exhibition booths which also included an endangered species exhibition at the Longest Run event in Yeouido Park, promoting biodiversity awareness among employees and customers.

Overseas Sites

Hyundai Motor Manufacturing Alabama(HMMA) HMMA had previously placed small hazardous waste into drums and transported them to waste disposal companies. This process has since been improved by deploying a new integrated waste management system, reducing environmental pollutants as a result. Under this new system, HMMA has shifted from volume-based to weight-based waste measurement and has introduced drum shredders and compactors to eliminate empty spaces inside the drums, ultimately reducing the total volume of waste discharged. Empty drums are compacted to support the recycling of their metal materials.

Hyundai Motor Central & South America(HMCSA) HMCSA has various waste management certifications. It was the first automobile company in Brazil to receive the Responsible Company Certification for Waste Management from the Zero Waste Institute and PROCERT for Social and Environmental Corporate Responsibility. These certifications demonstrate HMCSA's sustainable treatment of waste. In 2024, HMCSA's Piracicaba plant donated soil compounds generated from its organic waste to local charities.

Hyundai de Mexico(HYMEX) To prevent environmental and social impacts, HYMEX switched from chemicals (such as thinner, methylene chloride, and alcohol.) to organic solvents (Orange, HR-454) for in-process trailer cleaning and washing. This upgrade is expected to reduce its annual VOC (volatile organic compounds) emissions by 223.5 tons (equivalent to 69% of the previous year's emissions).

Hyundai Motor Manufacturing Czech(HMMC) To reduce industrial water consumption, an environment CFT (cross-functional team) is up and running at HMMC. Through process improvements, HMMC is striving to reduce water usage. To lower the concentration of heavy metals within wastewater with a focus on nickel, neutralizer testing has been underway since last September, which will help HMMC reduce its pollutant discharges.

Hyundai Motor India(HMI) In celebration of World Environment Day on June 5, 2024, HMI launched a range of environmental improvement initiatives. In alignment with the 2024 theme of World Environment Day – Land Restoration, Desertification and Drought Resilience - internal audits were conducted on soil contamination to address soil contamination and restore land ecosystems. Under the slogan 'Soil is Soul, Conserve It', employee trainings and awareness campaigns were implemented. HMI leadership and employees also planted 100 trees within the plant.

Hyundai Truck & Bus China(HTBC) To assess its impacts on soil and groundwater, HTBC conducted inspections with the help of third-party service providers. These inspections mainly covered 13 locations – HTBC's painting shop, sewage treatment facility, and oil storage areas– and 87 metrics including heavy metals and VOCs. The inspection results will guide HTBC's efforts to mitigate potential adverse impacts on soil and groundwater.



1. HMCSA achieving a ZWTL certification
2. HMI planting trees in commemoration of World Environment Day
3. HTBC conducting soil inspections