Environmental

The European Union, the U.S., and Korea have all hurried to announce Green New Deals, showing that the environment is becoming a nexus of global economic growth and development far exceeding the need for and level of global environmental protection activities.
Hyundai is committed to playing a leading role in heading the global green economy. It will do so by realizing sustainable mobility that does not negatively affect the global environment, expanding the use and spread of hydrogen energy, and establishing a closed-loop material cycle based on its leading technologies in the fields of electric vehicles and hydrogen energy.

#EnvironmentalManagement
#CarbonReduction
#CircularEconomy
#ManagementAndReductionOfHarmfulSubstances

Environmental Management

Environmental Management Policy

Hyundai announced the contents of its environmental management policy at a declaration ceremony held in 2003. It enjoins the company's headquarters and all its domestic and overseas production and sales corporations, as well as all the employees of all its subsidiaries, to perform their duties in accordance with it. Its employees are required to comply with it even when dealing with its suppliers and sales and service companies, including joint ventures and its outsourcing partners.

Promoting Environmental Management

On Investor Day 2020, Hyundai Motor Company announced our annual targets for global electric vehicle market share for each year up to 2030, with a 3% goal for 2020. To achieve this, we have established and implemented plans to clarify the positioning of our electric vehicle brands and lineups, increase the commonality rate of standard parts to secure cost levels similar to that for internal combustion engines, and promote conversion to electric vehicles in rapidly growing markets such as Europe and China, amongst others. Based on these efforts, we sold 98,054 electric vehicles globally in 2020 to achieve our target of obtaining a 3% market share for that year.

Environmental Management Policy

1. Recognize the environment as a key success element for the company, and create corporate value through progressive and proactive environmental management activities.
2. Fulfill corporate social responsibilities as a dedicated and specialized automobile manufacturer through the development and distribution of environmentally friendly vehicles.
3. Commit to the sustainable use of resources and energy and to reductions in pollutants throughout all its manufacturing processes, from product development to production and sales to their final use and disposal.
4. Support environmental education programs targeting all its employees and the environmental management activities of its suppliers, and carry out a full range of corporate social contribution activities.
5. Comply with all domestic and overseas environmental rules and regulations, promote and commit to progressive and proactive environmental management activities, and disclose the results of its activities both internally and externally.

Environmental Management System

Hyundai is committed to minimizing the environmental impact of its products and sites through progressive and proactive environmental management activities. With regard to its products, the company is working to reduce its levels of carbon emissions and harmful gases produced in its new vehicles, systematically taking account of emission reduction and material recycling in product development stage. To do so, we define the specific emission reduction and fuel efficiency targets for new models and manage them as key developing targets in developing process. We have been realizing the environmental improvements for one vehicle generation to next, through the implementation of future-oriented eco-designs and by managing the fuel efficiency levels of all its new models.

A specialized and dedicated team has been established in the company's site environment sectors to manage the environments in each of its production plants. In addition, all of its sites have acquired ISO 14001 certifications, and are subject to audits every year and re-certifications every three.

All of Hyundai's sites in Korea were awarded integrated ISO 14001 certifications in 2018, and its overseas plants are subject to surveillance audits and re-certification every year once they have acquired an initial one. Hyundai Motor Manufacturing Indonesia, which is scheduled to begin operations at the end of 2021, expects to be awarded its ISO 14001 certification early the next year. Hyundai includes the GHG reduction performances of its domestic sites in its key performance indicators, or KPIs, while also operating a company-wide Greenhouse Gas Council that oversees reductions in its GHG emissions at all its domestic sites.
In its role as an enterprise that is subject to the requirements of the Korean government's GHG and Energy Target Management Scheme requirements, Hyundai has been set a GHG reduction target for its domestic sites and is committed to meeting it every year.

ISO 14001 (EMS) Certifications

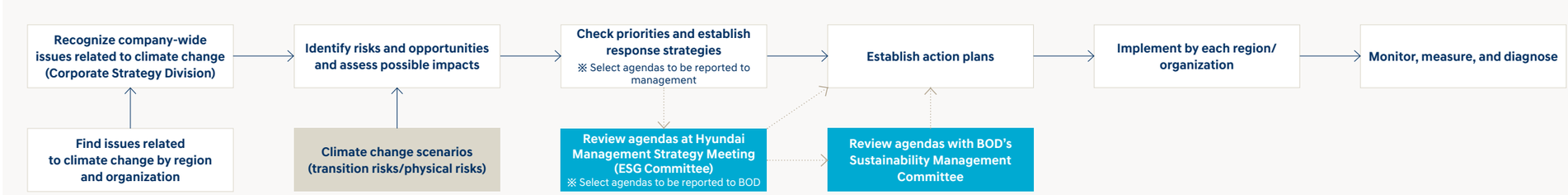
Site	Certification Term	Remarks
Domestic sites	2020-2023	Integrated certifications from 2018
HMMA	2019-2022	-
BHMC	2018-2021	-
HMI	2020-2023	-
HMMR	2019-2022	-
HMB	2021-2024	-
HMMC	2019-2022	-
HAOS	2018-2021	-
HMMI	Scheduled for certification in 2022	Scheduled to begin operations at end of 2021
HTBC	2020-2023	-

Carbon Reduction

Climate Change: Risks and Opportunities

Hyundai continuously identifies, assesses, and manages for risk and opportunity factors in its responses to climate change issues at the company-wide level. Climate change issues identified by each region and organization are delivered to the Corporate Strategy Division of its headquarters. After that, the Division derives risk and opportunity factors for each issue and assesses the strategic and financial impacts that each factor might have on the company in order to establish a company-wide response strategy.
After checking priorities, significant agenda items are reported to the Board of Directors and/or management. Action plans are then established according to the decisions that have been made. The plans are implemented by each region and organization, with the progress of their implementation being continuously monitored and diagnosed.

Climate Change Risks and Opportunities: Process of Identification, Assessments, and Management



Climate Change Risks and Opportunities: Criteria for Identification and Impact Assessments

- **Climate scenarios in use:** Transition ☑ Physical ☑
  - Transition risks: Forecasting reports[1] from IRENA, EIA, IEA, BP, and NDC[2]
  - Physical risks: RCP2.6[3] of IPCC AR5 (below 2°C scenario) and RCP1.9[4] (1.5°C scenario)
- **Scenario analysis:** Quantitative ☑ Qualitative ☑
- **Application timelines:** Short-term (less than five years) ☑ Medium-term (five to ten years) ☑ Long-term (more than ten years) ☑
- **Scope of applications:** Own operations ☑ Upstream ☑ Downstream ☑
  - Own operations: All global own operations (including new ones, taking into consideration the expected lifetime of the facilities)
  - Upstream: Supply chain
  - Downstream: Transportation, use (customer), end-of-life treatment and recycling

Key Considerations when Checking Priorities and Establishing Response Strategies

Country/region and industry trends	**Market changes**	**Likelihood of occurrence(s)**
Expected financial impact(s)	**Relevance to business strategies**	**Internal response capabilities, etc.**

1) Renewable Power Generation Costs (IRENA, 2019), Future of Solar Photovoltaic (IRENA, 2019), Annual Energy Outlook (EIA, 2020), World Energy Outlook (IEA, 2020), Energy Outlook (BP, 2020)
2) Nationally Determined Contributions: Goals that UN member countries voluntarily determine and disclose in the areas of reductions, adaptations, finance, technologies, capacity building, transparency, and others to achieve global targets set out in the Paris Climate Agreement.
3) One of four possible scenarios according to the greenhouse gas concentrations announced in the Fifth Assessment Report of the International Panel on Climate Change (IPCC) to maintain a global average temperature rise of below 2°C compared to pre-industrialization.
4) This is the scenario announced in IPCC Special Report on Global Warming of 1.5°C. Net-Zero to limit the rise in the global average temperature to 1.5°C compared to pre-industrialization levels should be achieved by 2050

Key Climate Change Risks/Opportunities and Impacts

Type		Issues	Risks	Opportunities	Response Directions	Financial Impacts
Rules and Regulations	Current	• Emissions Trading System • Vehicle CO_2 emissions regulations	• Increased operating costs due to purchasing allowances/credits to achieve regulatory or legal compliance	• Revenue generation through sale of spare allowances/credits	• Increase use of renewable energy • Increase proportion of EV/FCEVs in vehicle portfolio • Improve fuel efficiency of internal combustion engine vehicles	→ Mid
	Emerging	• Prohibiting sale of internal combustion engine vehicles • Carbon tax/carbon border tax	• Decline in sales due to ban on sales of internal combustion engine vehicles in developed markets like the EU and the U.S. • Rise in costs and shifts to customers due to tax increases	• Sales increases due to enhanced EV/FCEV performance and price competitiveness • Cost savings in responses to regulations through energy conversions and reductions in CO_2 emissions	• Establish regionally differentiated EV expansion strategy • Increase use of renewable energy	↑ High
Technologies		• Acceleration in competition for technology development for eco-friendly vehicles	• Decrease in market share if not achieving superior performances (EV mileage, FCEV fuel cell efficiency, etc.) compared to competitors	• Preemptive response to FCEV market based on hydrogen fuel cell technology competitiveness	• Increase investments in R&D • Enhance competitiveness of products • Promote partnerships with companies with leading technologies	↑ High
Markets		• Increase in EV/FCEV sales due to changes in customer preferences	• Increase in procurement costs of raw materials (lithium, cobalt, nickel) due to limited supply following rising demand for EV batteries • Decrease in sales if not achieving sufficient FCEV profitability	• Achieving large potential EV/the second life EV battery customers, including car rental/car sharing/ESS[1] companies • New industrial fuel cell (ship/UAM[2]) business expansion • Increase sales of EV/FCEV models	• Build mass production system using dedicated EV platform • Launch EV brand and build a dedicated lineup • Scale up FCEV/fuel cells	↑ High
Reputations		• Increase in demand from investors and other stakeholders to respond to climate change	• Falls in stock prices, withdrawal of investors, and customer churn at perceived lack of will to respond to climate change	• Rising stock prices, increasing investments, and enhancing brand image due to climate change response activities and reduction performances	• Provide information transparently • Set mid- to long-term reduction targets • Utilize green financing/investments	↗ Mid-high
Physical	Acute	• Increase in abnormal weather conditions, such as typhoons/ floods/heavy snowfalls	• Factory downtimes due to damage to facilities (e.g. HMMA is exposed to a tornado risk) • Production disruptions due to discontinuance of raw materials/ parts supplies	• Increased market share due to stable product supply when compared to competitors	• Develop emergency response manual (own operations/supply chain) • Reinforce stability of facilities • Buy insurance against disasters • Develop real-time inventory management system for raw materials and parts • Assess suppliers' supply stability	↑ High
	Chronic	• Changes in average temperatures and precipitation	• Lack of available resources (water/ energy, etc.) • Disruption of drinking water in areas with high water resource risks (such as India) • Destruction of ecosystems	• Reduced operating costs due to improved resources efficiency • Attracting potential customers by supporting local communities and helping them adapt to climate change • Earning offset credits through carbon absorption	• Use water and energy more efficiently • Develop better resource recycling and reuse technologies • Assist in increasing supply of drinking water for the vulnerable in developing countries • Promote forest conservation	↑ High

1) Energy Storage System
2) Urban Air Mobility

Carbon (GHG) Footprint

Hyundai supports the goals of the Paris Agreement on Climate Change, and recognizes that there are corporate roles and responsibilities for achieving globally-mandated GHG (Greenhouse Gas) emissions reductions. The company discloses emissions resulting from its own business activities (Scope 1 and Scope 2), as well as upstream and downstream emissions (Scope 3) according to the Greenhouse Gas Protocol[1)] in order to measure its GHG emissions throughout its entire value chain.
It is also carrying out a wide range of other activities to reduce its GHG emissions, and will manage its reductions by continuously monitoring them.

1) Greenhouse Gas Protocol of the World Business Council for Sustainable Development (WBCSD) and the World Resources Institute (WRI)

GHG Emissions 2018-2020

Scope			Annual emissions (tCO_2-eq)		
			2018	2019	2020
Scope 1 (direct emissions)			885,653	807,498	716,237
Scope 2 (indirect emissions)			1,936,902	1,897,885	1,680,079
Scope 1+2			**2,822,555**	**2,705,383**	**2,396,316**
Scope 3 (other indirect emissions)	Upstream	Supply chain	20,701,283	20,024,630	17,014,155
		Capital goods*	268	265	22
		Other energy-related activities*	102,005	97,253	93,518
		Waste generated during operations*	2,047	2,053	1,760
		Business Travel*	38,046	24,836	5,222
		Employee Commuting*	13,944	15,093	14,314
	Downstream	Transportation and distribution*	845,987	954,579	655,831
		Uses of sold vehicles**	101,946,509	94,210,414	75,620,514
		End-of-life treatment of sold vehicles	124,917	120,833	102,668
		Leased assets*	1,528	4,126	3,325
		Investments*	378,356	394,946	369,926
Scope 3			**124,154,890**	**115,849,030**	**93,881,255**

* Domestic emissions only
** Emissions from the “Well to Tank” stage before refueling and charging the energy that powers the vehicles are excluded. Total emissions including the “Well to Tank” stage in 2020 amounted to 101,203,073 tCO_2-eq. The scope of management will be expanded to include the “Well to Tank” stage.

Status of GHG Emissions and Reduction Strategies

Scope 1
This refers to direct emissions within the organizational boundaries of the company. Hyundai uses LNG as its main fuel for plant heating and heat production in its painting and other automobile manufacturing processes, and LNG combustion accounts for most of its Scope 1 emissions. It is continuously reducing its GHG emissions by reducing its level of LNG consumption in all its operations, and is continuously reviewing ways to convert its LNG use to hydrogen in the long term.

Scope 2
This term refers to indirect emissions caused by using energy purchased from outside the company's organizational boundaries. Emissions due to electricity use, which accounts for about two-thirds of the company’s total Scope 1+2 emissions. The company is reviewing various alternatives, such as self-generation, power purchase agreements (PPAs), and supply certificate purchases in order to convert the electricity used in its operations into renewable energy. Hyundai is planning to pursue these alternatives with a focus on its overseas subsidiaries using advanced renewable energy infrastructures and less institutional constraints. In the case of Hyundai Motor India (HMI), it has converted about 28% of its total electricity consumption to renewable energy. This was mainly done by generating photovoltaic power and purchasing wind power-based electricity.

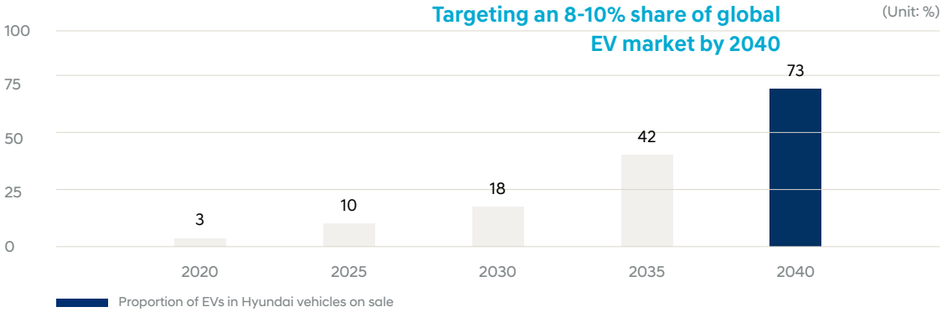
Scope 3
This includes total indirect emissions along the value chain except for Scope 1 and Scope 2, and emissions generated by the use of sold vehicles, which accounts for over 80% of the entire Scope 3 total. This has led the company to establish a strategy to reduce emissions when a vehicle is actually being driven, and to continuously improve the fuel efficiency of its internal combustion engine vehicles. Going forward, it will gradually increase its proportion of EVs and FCEVs in the global market.
Other efforts to reduce emission levels from the overall value chain include signing business agreements with the central government and Hyundai Glovis for the introduction and expansion of hydrogen-powered trucks in the transportation and logistics sector. The company has also established strategies to reduce the GHG emissions levels of its supply chain, including raw materials, while using recycled materials and promoting the recycling and reuse of waste EV batteries.

Carbon Reduction in Product Usage

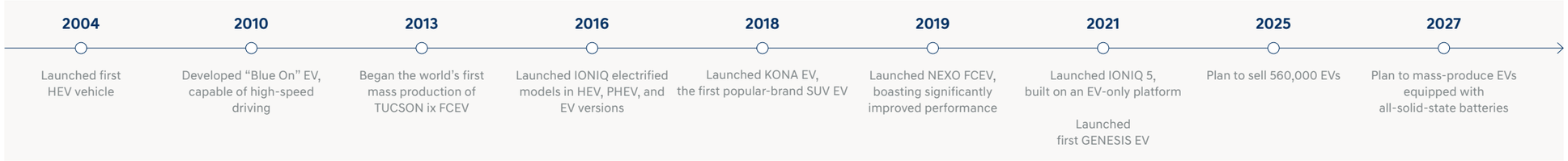
The International Energy Agency has calculated that carbon emissions from the transport sector make up about 20% of global carbon emissions. More than 70% of this comes from road traffic. Hyundai is continuously making its effort to reduce the average fleet carbon emissions to reduce such emissions in the transport sector. However, we have to pursue the carbon neutrality to contribute to accomplish Paris Agreement' goal, limiting global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels. Hyundai is converting its product and business structures centered on vehicles equipped with internal combustion engines to focus on electric vehicles to realize zero carbon emission in product usage. This transition is scheduled to be fully achieved in its key markets by 2040, by which time the company aims to secure an 8% to 10% share of the global EV market. The company's lineup change to EVs is scheduled to happen in such key markets as Europe, China and the U.S. beginning in 2030. Although it will also maintain some production capacity for internal combustion-powered vehicles in India, Russia, Brazil and other emerging countries, their proportion will be less than 50%. Its GENESIS brand is also studying electrification plans, such as launching all-electric and variant EV models.

Hyundai's Roadmap to Reduce Carbon Emissions in Product Usage

Global EV market share goal



Milestones in Hyundai's Electrified Vehicle Development



Expanding Electrified Vehicle Lineup and Sales

Hyundai is continuously expanding its lineup of eco-friendly vehicles as part of its strategy for reducing emissions and achieving a net zero carbon level in all its products. They include hybrid and plug-in hybrid cars boasting higher fuel efficiency levels than vehicles powered by internal combustion engines, as well as EVs and FCEVs that do not emit carbon or other emissions during the driving stage.

Hybrids and Plug-in Hybrids (HEVs and PHEVs)

Hybrids are eco-friendly vehicles with higher fuel efficiency levels than ones powered by internal combustion engines. Hyundai's SONATA hybrid model, for example, boasts a carbon emissions level of only 79g/km in its base domestic version, 39% less than its gasoline-powered equivalent's 131g/km. The company sells hybrid versions of all its sedans and SUVs, except for large SUVs and subcompacts. The KONA Hybrid model was introduced in 2019, to reduce carbon emissions from SUVs, which emit more carbon than sedans. Other SUV models boasting dramatically reduced carbon emissions include the TUCSON and SANTA Hybrids. In the case of plug-in hybrids—which are even more fuel-efficient than hybrids—the company launched the IONIQ Plug-In Hybrid in 2016, the SONATA Plug-In Hybrid in 2017, and the TUCSON and SANTA Fe Plug-In Hybrids in 2021.

Electric Vehicles (EVs)

Eco-friendly zero-emission EVs, along with FCEVs, do not create any emissions while they are being driven. Hyundai began marketing them in earnest with the launch of its IONIQ model, which comes in hybrid, plug-in hybrid, and EV versions, in 2016. It also began offering the KONA EV, the automotive industry's first SUV EV model, in 2018. It followed that up by launching the IONIQ 5, the first all-electric EV model based on the Electric-Global Modular Platform (E-GMP), in 2021, and is currently preparing for a full-out launch of luxury EVs as the GENESIS brand. Plans are in the works to launch more than twelve E-GMP-based EV models, including the Genesis brand, by 2025.

Fuel Cell Electric Vehicles (FCEVs)

Hyundai began offering the world's first TUCSON ix FCEV in 2013 and its NEXO FCEV in 2018. The NEXO FCEV came with a next-generation fuel cell system, boasting performance and durability equivalent to internal combustion-powered vehicles. The company began offering FCEV commercial vehicles in 2020, including the mass production of hydrogen-powered electric buses and the development of a hydrogen-powered electric truck called the Xcient Fuel Cell.

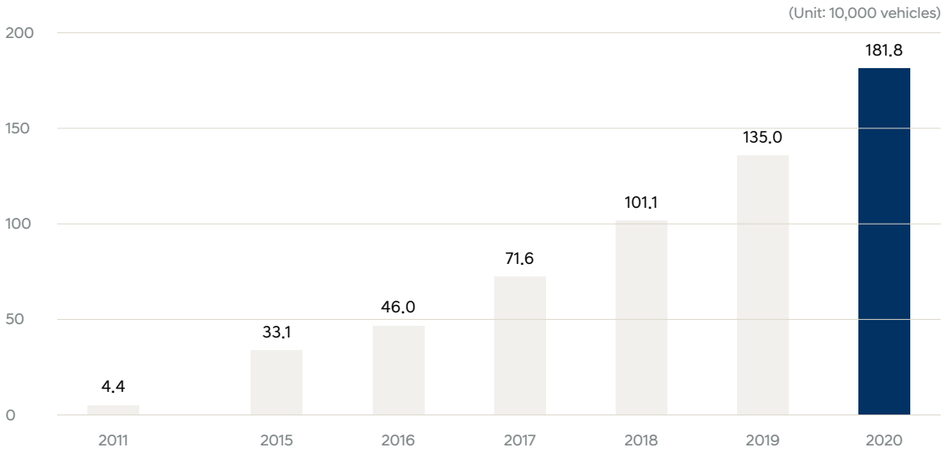
Hyundai has been continuously increasing its global electrified vehicle sales to reduce its carbon emission in product usage. Its annual electrified vehicle sales in 2020 amounted to 258,669, or 7% of its global total. Yearly sales of EVs and FCEVs exceeded 100,000 in 2020, leading the global EV and FCEV markets. The sales portion of Hyundai's electrified vehicles in Europe reached 24% in 2020. The company had set a goal to achieve the global EV sales of 560,000 units by 2025.

Number and Proportion of Electrified Vehicles Sold in 2020

Region	HEVs/PHEVs	EVs	FCEVs	Total
Europe	47,274 (10%)	60,861 (13%)	589 (0.1%)	108,135 (24%)
Korea	66,181 (9%)	18,612 (2%)	5,786 (0.7%)	90,579 (12%)
Global	154,015 (4%)	98,054 (3%)	6,600 (0.2%)	258,669 (7%)

* Excluding commercial vehicles

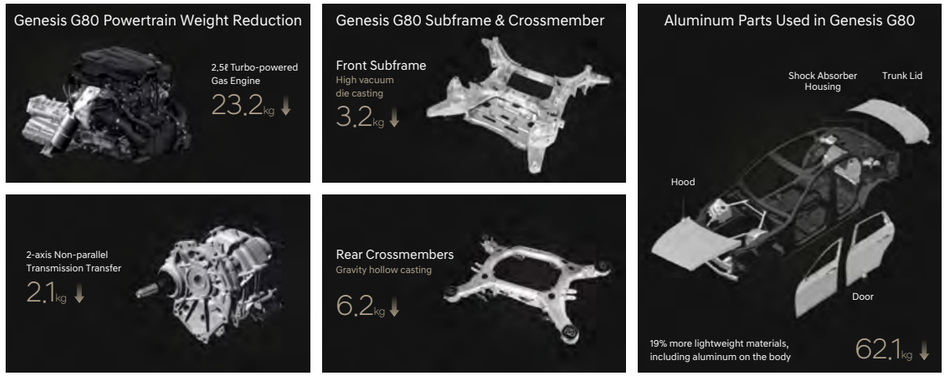
Hyundai Motor Group's Cumulative Electrified Vehicle Sales



Additional Technologies to Enhance Vehicle Fuel Economy

Hyundai is taking a series of steps to improve the fuel efficiency levels of all its new internal combustion-powered vehicles and reduce carbon emissions from its products. In order to do so, the company is also reducing their tire rolling resistance, making their designs more aerodynamic. Reducing the weight of vehicles is a key technology to improve the fuel efficiency of internal combustion-powered vehicles and EVs, as well as their performance.

The third-generation GENESIS G80 that was launched in 2020 is a prime example of these improvements. It boasts a wide range of technologies to increase its fuel efficiency compared to its second-generation version. For instance, its fuel efficiency level is more than 20% higher, mainly as a result of engine downsizing, aerodynamic and driving resistance improvements, and reductions in its weight.
Reducing its weight contributed to improvements in its fuel efficiency. It was reduced by up to 125kg, even though the car's features, including advanced convenience and safety options, were enhanced compared to its previous models. Aluminum and other lightweight materials are now used in its hoods, doors, and suspension parts, and there are more ultra-high-strength steel sheets being used in its body and seat frames. Its power train weight has also been reduced by downsizing its engine from 3.3ℓ GDI to 2.5ℓ turbo GDI. The structures of most of its parts, including its wiring, were also improved and optimized to achieve weight reduction. The company will continue developing and applying lightweight technologies to increase performance in all of its vehicles, and to provide its customers with differentiated products by efficiently using resources.



Non-polluting renewable energy is an increasingly important topic as the world tries to move away from fossil fuels. Solar power generation is one of the most common types of renewable energy. Hyundai is using solar power generation technology in some of its vehicles to reduce their carbon emissions. For example, it is already using a roofmounted solar power generation system on its eighth-generation SONATA Hybrid, allowing it to be driven about 1,300km a year without producing any carbon emissions. The company is also adding more vehicles that can use solar energy by applying this technology to its IONIQ 5 and GENESIS brand EVs to be released in 2021.

Hyundai is working hard to reduce carbon emissions in its vehicles in product usage by harnessing more renewable energy. Hyundai is also studying to raise the density levels of its solar cells and boost their performance to make the technology more viable.

Average Fleet Carbon Emission

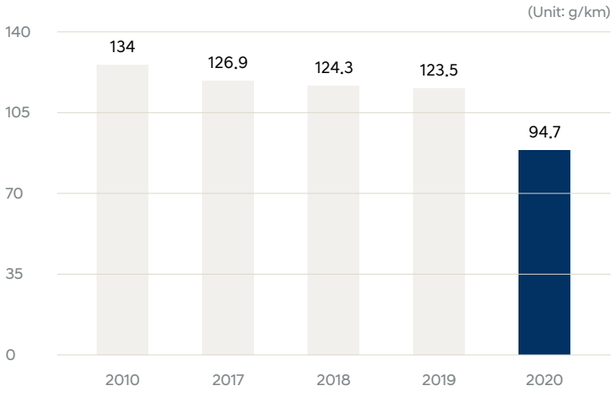
Under the Paris Agreement, countries are obligated to submit their 2030 emission reduction targets (referred to as a Nationally Determined Contribution). The European Commission presented its plan to reduce EU greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels in 2019. Korea submitted an NDC of 24.4% emission cut below 2017 level by 2030 last December. They are also strengthening their carbon regulations in the automobile sector to help achieve these goals. The European Union boasts the most stringent automotive CO_2 reduction targets for passenger cars, setting a 2030 carbon reduction goal of 59g/km, 37.5% lower than the 2021 figure of 95g/km. The Korean government's goal is to lower the country's average CO_2 emissions from 97 g/km in 2020 to 70 g/km in 2030.

The U.S. is pushing a plan to increase the Corporate Average Fuel Economy target that had been relaxed by the former Trump administration by at least 3.7% annually, while its California state government is even intensifying its zero emission vehicle sales mandate target.

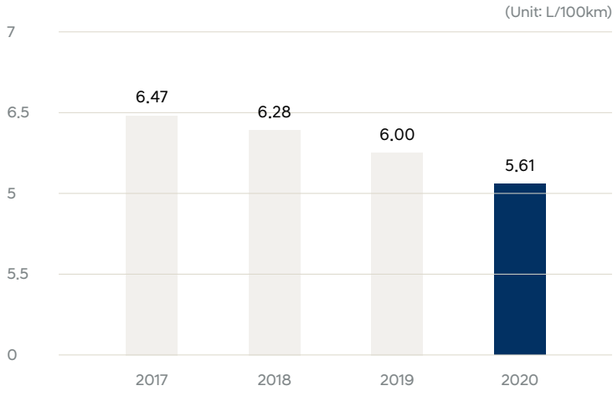
In response to these constantly tightening CO_2 regulations in many of its major markets, Hyundai is planning to minimize regulatory risks by 2030. It will do this by expanding the portion of its electrified vehicles sold, and thus reducing the average carbon emissions of all its vehicles. Hyundai is targeting zero carbon emissions in product usage over the long term. In the European market, where the strongest regulations have been implemented, the company is estimated to achieve an average passenger fleet CO_2 emissions level of 94.7g/km in 2020, a reduction of about 30% from 134 g/km in 2010. This was a result of its own analyses of the average CO_2 emissions of its vehicles sold in 2020.

The company is continuously expanding its electrified vehicles sales and improving the fuel efficiency of its internal combustion engines to meet average fuel efficiency regulations in the U.S., China, Korea, India, Saudi Arabia, Brazil, and other countries.

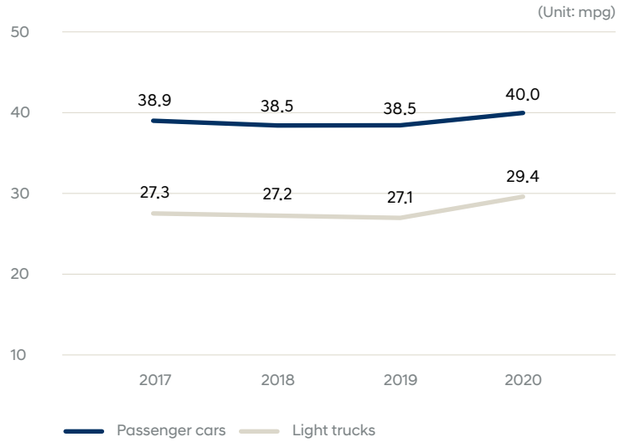
Average Fleet Carbon Emission in EU



Average Fleet Fuel Efficiency in China



Average Fleet Fuel Efficiency in the U.S.



* The EU's average carbon emissions data for 2010 and 2017-2019 reflected average CO_2 emissions calculated and disclosed by European Commission, while 2020 data is a project data calculated by Hyundai based on its sales units.
* Average fuel efficiency numbers in the U.S. and China are based on the average fuel efficiency of each automobile manufacturer in their markets as provided by their respective government agencies every year.

Conducting Life Cycle Assessments (LCAs)

Hyundai conducts life cycle assessments, or LCAs, based on ISO 14040 and 14044[1)] international standards. The purpose of the assessments is to analyze the environmental impacts of its vehicles during their entire life cycle, from the acquisition of raw materials to manufacturing, use, end-of-life treatment and recycling. The LCAs use the CML[2)] methodology to evaluate such areas as global warming, ozone depletion, acidification, eutrophication, photochemical ozone formation, resource depletion, and water depletion, in accordance with the Ministry of Environment's guidelines for the preparation of an Environmental Product Declaration. The company carried out an entire LCA process on its KONA EV in 2020, and plans to expand its target vehicle types going forward. It will continue to conduct vehicle LCA analyses to address environmental impacts throughout their life cycle, based on this.

1) ISO 14040 (Environmental management - Life Cycle Assessment - Principle and framework) / ISO 14044 (Environmental management - Life Cycle Assessment - Requirements and guidelines)
2) CML : Centrum voor Milieukunde Leiden

Environmental Impacts covered by LCAs

Assessments of the environmental impacts of automobiles are directed at determining their effects on (1) ecological consequences including global warming, (2) resources and water use, and (3) human health. Hyundai will continue to reduce the environmental impacts of its new products by using its LCA results.

Ecological Consequences			Resources and Water Use	Human Health
Global Warming	Ozone Depletion		Abiotic Depletion	Human Toxicity
Acidification	Eutrophication	Photochemical Ozone Formation	Water Depletion	

The KONA EV's Impacts on Global Warming (Carbon Emissions) Over its Life Cycle

The results of the KONA EV's LCA were that its life-cycle stages contributed to global warming in the areas of use (63.9%), pre-manufacturing (34.4%), and manufacturing (1.2%). The impacts can be gradually reduced by increasing the amount of renewable energy used during power generation in the areas of use.

* KONA EV LCA: Based on production and use in Korea and a mileage of 200,000 km

Impacts on carbon emissions by life-cycle stages

Pre-manufacturing	Transportation	Manufacturing	Distribution	Use (including electricity production)	End-of-life treatment and recycling
34.4%	0.1%	1.2%	0.1%	63.9%	0.3%






Power generation

Carbon Reduction at Sites

Carbon Reduction and Increased Use of Renewable Energy at Plants

Hyundai is carrying out a number of activities to reduce the amount of GHG emissions produced by its manufacturing processes. It is doing this to assist in efforts by the international community and Korea's central government to deal with the problem of climate change. The company's actions include continuing with its energy reduction activities (such as the introduction of high-efficiency facilities and manufacturing process improvements at all its plants) and building eco-friendly plants by converting them to renewable energy sources like photovoltaic power.

Ulsan Plant
Hyundai's Ulsan Plant recently completed the installation of a 9MW photovoltaic power generation facility in collaboration with Korea Hydro & Nuclear Power, a Korean government-owned power generation enterprise. The plant is also undertaking a demonstration project that involves installing a recycled the second life EV battery energy storage system and linking it to its photovoltaic generation system.

Asan Plant
Hyundai's Asan Plant is taking steps to reduce its equipment use during the down-times that frequently occur during its manufacturing processes. It also reduced its GHG emissions by making motor control and inverter applications to its facilities in 2020. It also carries out constant monitoring of its equipment to reduce energy leakages, and practices daily energy-saving activities by adopting power-saving circuits in its community facilities.

Jeonju Plant
Hyundai's Jeonju Plant is developing eco-friendly construction methods that will minimize the amount of energy used at its production facilities in order to reduce its GHG emissions. It is also building production-linked automation facilities.
It lowered its electricity and gas use in 2020 by improving its cleaning work processes in the truck paint shop to optimize internal temperatures, and changed its old absorption-type heating and cooling system to a high-efficiency electric heat pump one.

Beijing Hyundai Motor Company (BHMC)
BHMC is optimizing the operations of its production facilities to reduce its amount of down-time. It has reduced its GHG emissions by reducing its use of compressors and other energy-consuming equipment during its production schedule times.

Hyundai Motor Brazil (HMB)
HMB is using a system that optimizes its use of compressed air. It is reducing its GHG emissions through a number of energy conservation activities, including building high-efficiency facilities and using LED lighting.

Hyundai Motor Manufacturing Czech (HMMC)
HMMC has established an energy reduction and conversion plan to help it reduce its GHG emissions. It is also building a monitoring system to measure the amount of fuel it uses during its manufacturing processes. It is scheduled for completion in 2021. It is also promoting an "RE100" plan, meaning the 100% conversion of its electric energy use to renewable energy.

Hyundai Motor Manufacturing Alabama (HMMA)
HMMA is reducing its GHG emissions by minimizing the amount of waste energy it produces. It does this by automatically maintaining appropriate temperatures through the use of its cooling and heating monitoring system.

Hyundai Assan Otomotiv Sanayi (HAOS)
HAOS in Turkey is reducing its GHG emissions by improving its processes and introducing state-of-the-art energy reduction equipment. It is reducing its use of compressed air, optimizing its welding processes, and installing high-efficiency inverters.

Hyundai Motor India (HMI)
About 84% of the electricity that HMI uses in its plant comes from eco-friendly energy sources - wind power 20%, solar power 8%, waste incineration and cogeneration 56%. It also operates a 0.69 MW solar power plant, and is planning to install a 10MW photovoltaic power generator (5% of total usage) on its roof by 2021.

Hyundai Motor Manufacturing Russia (HMMR)
HMMR is reducing its GHG emissions by replacing the fluorescent lighting in its office and production areas with high-efficiency LED lighting. All of its office spaces' and about 38% of its plant's lighting were replaced in 2020. The entire plant is scheduled for such alterations by 2024. Energy consumption during holiday shutdowns will be reduced by upgrading its compressed air supply system in 2021.

Hyundai Motor Manufacturing Indonesia (HMMI)
HMMI installed a 3.2MW photovoltaic power facility and has completed the paperwork needed for UNFCCC[1]'s Prior Consideration of its CDM[2] project. The facility began operations in April 2021. The electricity produced there is used as an energy source for the plant.

1) United Nations Framework Convention on Climate Change (UNFCCC): An international convention adopted at the Rio Conference in June 1992 to help deal with climate change caused by global warming.
2) Clean Development Mechanism: A United Nations-run carbon offset scheme allowing developed countries to fund greenhouse gas emissions-reducing projects in developing countries and claim the saved emissions as part of their own efforts to meet international emissions targets.

Photovoltaic power generation in Hyundai's plant in India

Building a Hydrogen Ecosystem

The transition from fossil fuels to renewable energy is necessary to achieve carbon neutrality. The use of hydrogen as a future energy source is especially important, because it can compensate for instabilities in the supply of other renewable energy sources like wind power and solar power. A number of developed countries, including the U.S., Germany, and Japan, have been promoting hydrogen ecosystems recently. Hyundai boasts advanced technologies in the field of fuel cell and FCEV, and this includes the development of fuel cell systems, since 1998, culminating in the production of the world's first FCEVs in 2013. Working from its experience and expertise in these technologies, the company will continue leading the way in building a hydrogen-related industrial ecosystem, ranging from eco-friendly hydrogen fuel production such as green hydrogen production to stable storage and distribution, as well as the expansion of hydrogen mobility, such as FCEV, hydrogen trucks, and hydrogen trains.

Expanding Hydrogen Mobility

Hyundai sold a total of 6,600 NEXO FCEVs in the global market as of 2020, a 36% increase from the previous year. In addition, it is currently leading the global FCEV market with a 69% share.

With regard to the commercial vehicle market, Hyundai will continue to increase its exports of hydrogen-powered electric trucks that first started with sending 140 Xcients to Switzerland in 2021. One hundred hydrogen-powered electric buses were operating in Korea at the end of 2020, and the number is projected to eventually rise to two hundred by the end of 2021.

Hyundai is planning to continually increase its supply of FCEVs by building a production capacity to manufacture 500,000 units a year in Korea, including both passenger and commercial vehicles. In the mid- to long-term, it will increase hydrogen mobility in such non-automotive areas as hydrogen electric ships, hydrogen electric trains, and hydrogen electric Urban Air Mobility (UAM). In the case of UAM, it is promoting the development of hydrogen fuel cell powertrains for aviation, since it requires high power density. The company is also promoting the development of hydrogen construction equipment products, such as hydrogen electric excavators and hydrogen electric forklifts.

Encouraging Collaboration to Develop a Green Hydrogen Economy

According to the International Energy Agency, grey hydrogen extracted from fossil fuels like natural gas and other by-product gases accounts for about 96% of all hydrogen sources, with carbon being emitted during its production. This means that a major issue is determining how to convert this to green hydrogen. Hyundai is working with a number of companies specializing in this area to find out how to produce green hydrogen from renewable energy-based water electrolyzers and ammonia and make the process economically feasible.

One of these partners is called H2Pro. Work is currently underway with it to develop a high-efficiency water electrolysis technology that will make the development of green hydrogen profitable. The company has produced a 1kg/day water electrolysis system, and confirmed its performance in 2020. It is planning to add to the system's competitiveness by scaling it up in 2021. Hyundai is also scheduled to launch a collaborative project with Nexthydrogen of Canada in the field of high-current density stacks during the second quarter of 2021.
The goal is to develop a stack technology, which is a core part of a water electrolysis system.

Hyundai is also planning to complete the development of a high-efficiency, low-cost alkaline water electrolysis system in 2023 in collaboration with Suso Energen, in addition to H2Pro and NextHydrogen. It also started developing an ammonia cracker in collaboration with CSIRO and FMG of Australia in December 2020 to increase green hydrogen production using ammonia. Crackers are currently being utilized for that purpose in Australia and other countries.

The company will also begin developing a blue hydrogen production technology in 2021 for use in combination with carbon capture technologies. This will hopefully lower the cost of hydrogen production and help to resolve the ongoing CO_2 emissions issue of using gray hydrogen.

Promoting the Growth of a Global Hydrogen Ecosystem

Hyundai is strengthening its cooperation with the INEOS Group of the United Kingdom, a global manufacturer of chemicals, specialty chemicals, and oil products, to build a global hydrogen ecosystem. This will allow the company to build an integrated hydrogen value chain, ranging from hydrogen production, supply, and storage to FCEV development and fuel cell systems utilization, all based on Hyundai's fuel cell system technologies and the INEOS Group's chemical expertise. The hoped-for result will be the creation of a global hydrogen ecosystem that will encourage business expansion by both the public and private sectors. Because Europe has quickly become a leader in the development of a hydrogen economy, the two companies have formed a consultative body comprising key officials from both parties, and are working with it to explore immediate business opportunities in close cooperation with the European Union, countries in the EU, and private enterprises.

Jointly Developing an LPG reformer

Hyundai is promoting the joint development of an LPG reformer in cooperation with Saudi Aramco as another means of advancing the development of hydrogen energy. Saudi Aramco, for its part, wishes to develop a hydrogen production technology using its manifold petroleum resources and grow it into a global business.
This is why it is currently discussing the possibility of cooperating in developing an LPG reformer in combination with Hyundai's reformer technology. The two companies decided on a joint development agreement (JDA) schedule to begin in July 2021. They had already confirmed their roles and responsibilities in March 2021.
The jointly developed LPG reformer will be tested in 2022 using an LPG charging station.

Signing business agreement with INEOS Group

Circular Economy

The issue of disposable plastics has been increasing rapidly following a rise in non-contact consumption due to COVID-19. This phenomenon is leading to increases in the amount of plastic waste and in environmental damage caused by the GHG emissions that are produced during the waste treatment process. In addition to the environmental impact of these wastes, the supply- and demand-side risks of the excessive use of raw materials are also on the rise. This includes resources instability and price volatility due to the resources' depletion and resulting scarcity. Hyundai is attempting to move away from the current linear business structure of production and consumption and disposal by building a circulation-type business system involving production and consumption and regeneration. It is doing this in order to respond to the risks involved in resources supply and demand and to encourage a movement towards zero waste.

Product Recycling

Designs for Recycling

Designing that takes recycling into consideration in the product design stage is a must. Hyundai is designing its new vehicles by taking into account the carbon and pollutant emissions reduction as well as the circular use of materials during their development stage.
Through the above design for recycling, Hyundai is selling the vehicles which are 85% recyclable and reusable. The percentage even increases to 95% if energy recovery from wastes is included. Iron and non-ferrous materials, which together account for approximately 70% of the materials used in the company's vehicles, are all reused and recycled. And the company is continuously upping the recycling rate of the plastics, glass, and other materials it uses.

Reusing Recycled Materials

Hyundai is developing a technology that will enable scrap pieces of the fabrics used in making its airbags and tire cords to be recycled and used in other parts from a Post Industrial Recycling (PIR) perspective.
It is already using recycled plastic materials to make wheel guards, undercover parts, battery trays, and parts for fan shrouds, by utilizing waste resources recovered from waste parts. It also developed recycled materials for cowl top covers in 2020. Many more recycled materials and biomaterials are being used in the interior materials the newly-launched G80 and IONIQ 5. Waste PET bottles are being made into non-woven, knitted, and suede fabrics for use in head linings, pillar trims, sun visors, trays, trunk mats, and spare floor mats for the G80, and door trim armrests and seat coverings for the IONIQ 5. The IONIQ 5's production processes are especially eco-friendly, since they involve using vegetable oil and eco-friendly paints made with bio-oil extracted from plants in the pre-treatment process of the leather used in its seats.
In addition to the development of recycled materials and their increased application as car parts, the company is also investing in recycling technologies to realize eco-friendly production processes. This work is currently being expanded to include the development of original technologies for using recycled materials. It involves moving away from the existing method of removing coatings using chemicals when recycling painted parts to the development of a method of physically peeling off their coatings in an eco-friendly way. Hyundai is also encouraging the use of eco-friendly materials abroad. For example, it is increasing the use of recycled plastic materials to vehicles produced in Hyundai Motor Manufacturing Czech (HMMC) in response to the EU's Green Deal policy and other environmental regulations. The company did this by forming a relationship with a European recycling company. The two parties identified recycled materials that met the EU's requirements, and started developing components containing them.
Hyundai is committed to fulfilling its role as an environmentally responsible business enterprise that provides with added economic value by turning the various wastes generated during the consumption stage into resources and helping to reduce environmental pollution. One of its most worthwhile efforts in this regard is recycling waste fishing nets at home and abroad to reduce pollution in the marine environment. After being recycled, the nets are made into cowl top covers, engine covers, wheel covers, and other parts used in automobile exteriors. The company is also developing technologies that can convert such waste materials as discarded PET and water bottles into materials for use in automobile interior materials. Research is also underway to recycle carbon fibers from discarded hydrogen tank containers used in hydrogen-powered vehicles in preparation for the future hydrogen economy era.

Recycling of End-of-Life Vehicles

Hyundai has been collaborating with the Korean Ministry of Environment in carrying out a pilot project to improve the country's ELV resource circulation system. The goal is to introduce the government's Extended Producer Responsibility policy in the automobile sector. The EPR approach has been used in the fields of packaging materials and electronic products since 2011. As part of the project, the company is continuously working with auto dismantling companies in Korea to raise the reuse and recycling rate of ELV and recover resources that would otherwise go to waste. Its efforts include providing the dismantling companies with instructions on how to dismantle vehicles most efficiently, and supporting the cost of recycling materials that are hard to recycle. Approximately 210,000 tons of resources were recovered from ELVs in collaboration with auto dismantling companies in 2020 alone, with 91.9% of the cars they owned being recycled and reused (82.9% when excluding heat recovery).

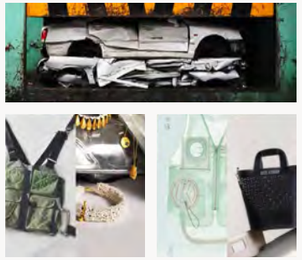
Amount of Resources Recovered When Dismantling Cars (Unit: Tons)

2017	2018	2019	2020
209,478	262,775	261,971	209,754

"Re:Style" Upcycling Project

Hyundai is supporting a "Re:Style" project to help spread the upcycling trend throughout the world through a unique collaboration involving automobiles and fashion that proves the need for and value of sustainability. Following a project that involved using the leather in ELVs that was undertaken in 2019, the company spent much of 2020 researching how to best find new uses for materials that are often discarded when a car goes to the dismantling company because of their low recycling rates. The materials included the leather used in car seats, glass, and airbags, and the company worked in collaboration with six fashion brands to find solutions.

The end result was the production of a number of unique and luxurious products, including jumpsuits made from old leather car seats, bags made from discarded car carpets, and jewelry made from scrap glass, presenting innovative solutions for sustainable society. They were sold on the website and in the London, England outlets of Selfridges, a well-known chain of high-end department stores, with the proceeds being donated to the British Fashion Council to support the promotion of eco-friendly fashions. Hyundai will continue the "Re:Style" project in the mid- to long-term to encourage further sustainability in the automobile and fashion industries by showing how discarded automobile wastes can function as valuable fashion items.

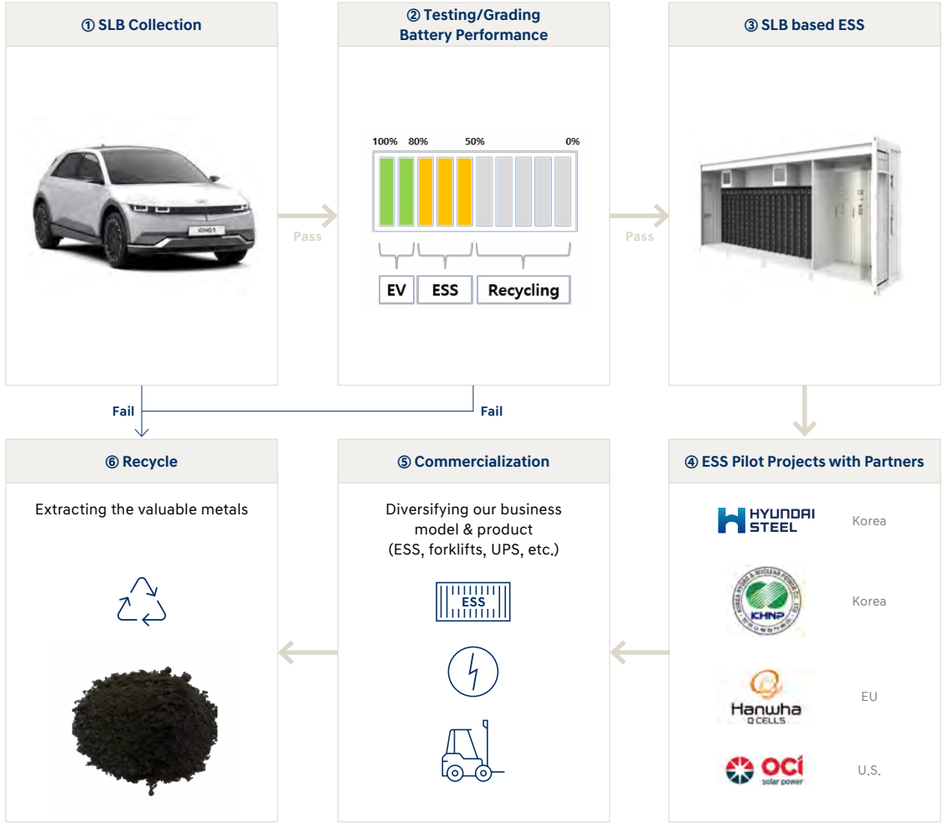


Establishing the Second Life EV Battery Circulation Process

The total number of the second life EV batteries is expected to increase in conjunction with a rise in EV sales, making it especially important to establish a recovery and recycling system for them. This will help to reduce environmental problems caused by an overflow of the second life EV batteries, and assist in the recycling of rare metals used in them. Hyundai is helping to deal with this problem by planning the building of a large-scale second life EV battery recovery network in Korea and its later expansion to Europe and the U.S.
The company is promoting this second life EV battery-based energy storage system (ESS) business so that recovered the second life EV batteries can be reused as an ESS when their remaining capacity is 70-80%.
The company is currently carrying out an ESS renewable energy pilot project in collaboration with Hyundai Steel, Korea Hydro & Nuclear Power, Hanwha Q CELLS, OCI and other energy-related companies.

Although there are also the second life EV batteries that cannot be reused in an ESS system, they can still be disassembled and recycled to extract the rare metals in them, such as lithium, cobalt, and nickel. Many of these metals are only found in very limited quantities in developing countries in Africa, Southeast Asia, and South America, presenting problems of supply instability and possible price fluctuations. On this note, Hyundai will continue to strengthen its recycling of rare metals through the recovery of the EV batteries.

The Second Life EV Battery Circulation Process



* SLB: the Second Life Battery

Korea Hydro & Nuclear Power

Hyundai has built the second life EV batteries-based ESS at its Ulsan plant with a total capacity of 2MWh. It also operates an eco-friendly power generation plant, using solar power generation resources. The two facilities allow the company to enhance its eco-friendliness and contribute to a more stable supply of renewable energy sources, which can only produce electricity on and off. This pilot project is being carried out after the company obtained the approval for a regulatory sandbox exception for a demonstration from the Ministry of Trade, Industry and Energy. It is expected to lead to the development of the nation's largest second life battery ESS business in collaboration with Korea Hydro & Nuclear Power.

2MWh ESS at Ulsan plant

Hanwha Q CELLS

Hyundai and Hanwha Q CELLS signed an MOU for the joint development of a solar energy-linked ESS in May 2020. It involves a business that will develop an ESS by reusing batteries recovered from EVs, as well as an enterprise that will resell electricity by using EV batteries from other automobiles as an ESS for homes. The project will be demonstrated at the Hanwha Q CELLS research institute in Germany. Its goal is to develop the second life EV battery-powered ESS for home use and to utilize the customers of Hyundai and the new and renewable energy-related customer infrastructures of Hanwha Group.


10kWh residential ESS

OCI

Hyundai and OCI worked together to build a 300kWh ESS system using the second life EV batteries in 2020. It is located in the solar power plant facility owned by OCI Specialty in the city of Gongju. They began operating it as a demonstration project in January 2021. Although regulations governing the reuse of EV batteries have not yet been promulgated in Korea, the demonstration project was allowed after the parties had obtained an approval for a regulatory sandbox exception for demonstration purposes from the Ministry of Trade, Industry and Energy.

300kWh commercial ESS at the OCI Plant

Resources Usage

The issue of natural resources depletion is becoming more and more serious due to people's consumption, as well as such environmental issues as wastes caused by the overuse of resources, is becoming more and more serious. Particularly, the water scarcity problem is one of the most serious risks facing the world, because water cannot be replaced even though it is an essential resource for all living things. Although most businesses see resources depletion from the standpoint of their bottom lines, it is also important for them to respond to the threat and danger of materials supply instabilities and cost increases—as well as their responsibility for environmental issues caused by their use of such resources. Hyundai is constantly striving to use resources more efficiently and responsibly.

Energy

Hyundai strives to reduce its energy consumption for cost savings as well as for environmental reasons, such as reductions in GHGs and air pollutants. It is continuously implementing energy-saving campaigns to prevent unnecessary energy use at its sites. The company is discovering energy saving items and promotion activities. One example of the company's energy-saving activities is Hyundai Motor Brazil, which has operated an Energy Efficiency Committee. Another is the Asan Plant, which monitors its premises looking for energy leakages. Some of its other efforts to reduce energy consumption include replacing outdated facilities with low energy efficiency ratings and replacing them with high-efficiency facilities, developing eco-friendly production process to minimize energy consumption, and building more production-linked automation facilities to minimize its need for standby energy. Hyundai also operates a global energy and greenhouse gas management system, or GEMS, that allows it to monitor energy consumption at all of its production sites including overseas sites in real time. It is also working to add to the efficiency of its data analysis-based energy management system, through the GEMS.

Water

Water is an essential resource for all living things, and its importance and the seriousness of its shortages are on the rise because it has no substitutes. Although water shortages vary widely by region around the world, they are expected to worsen if climate change deteriorates. The World Resource Institute (WRI) has warned that seventeen countries, including India and Iran where about a quarter of the world's population lives, are facing extremely high water stress.

Hyundai is committed to increasing its water recycling, particularly centering on Hyundai Motor India (HMI) and Hyundai Assan Otomotiv Sanayi (HAOS) in Turkey, both of which are located in countries where water shortages are especially severe. The plants operated by HMI and the Asan Plant are currently recycling 100% of their water using a zero liquid discharge system. HMI is located in Chennai, where is running out of water. It carried out the construction of additional reservoirs within its plant in 2019 to extend its water storage capacity, giving it enough to store 335,000 tons of water in six reservoirs as of the first half of 2021. The drainage canal within its plant was also integrated into the system so that it can collect the maximum amount of water when rains come. The maximum amount of rainwater that it can collect has risen from about 500 tons per 1mm to 1,000 tons to 1,500 tons per 1mm. This was done by installing a super-large pump that can pump 4,000 tons of water per hour. It is located in the company's Plant 1 area in the lowlands. The HAOS plant also recycles 40% of its water.

Raw Materials and Wastes

A large amount of raw materials, including iron and aluminum, are used in automobile production. The metal scrap derived from them is completely recycled by the company, either in-house or by other businesses. Although Hyundai's production processes generate considerable amounts of waste paint, waste thinner, waste packaging materials for parts, and sludge, it was recycling 92% of its wastes at its sites of 2020, while the remainder was being treated in an environmentally responsible manner. For example, HMB, which has been carrying out a Zero Landfill Campaign since 2018, was able to achieve its goal by recycling 98% of its wastes (including heat recovery) and turning the other 2% into compost.

Pollutants

Hyundai manages air and water pollutants generated at its sites by setting stricter management standards than those mandated in each country in which they are located. It has increased its use of waterborne paints to reduce the amount of volatile organic chemicals (VOC) generated in its paint shops, and is reducing its volume of air pollutants by installing pollution reduction facilities like Regenerative Thermal Oxidation to treat its oven exhaust gases. It is also improving the efficiency of its dust collection equipment and replacing its old exhaust equipment.

Water resources management at Hyundai's sites is an especially important environmental factor for people living in the communities in which they are located. The company has established water resource management policies and set water pollution reduction targets for each of its plants, and is carrying out a wide range of activities to meet the targets. The Ulsan plant which is the largest manufacturing facility applied for a license allowing an exemption for the mandatory installation of water pollution prevention facilities since the level of the reverse osmosis (RO) tertiary concentrated water in its paint shop was below the minimum water pollution standard. Later, though, it made improvements to its treated water transfer piping, allowing RO concentrates that used to flow into its own, unified wastewater treatment system to flow into the Bangeojin Sewage Treatment Plant instead. This resulted in reducing its wastewater treatment needs by 150 tons a day.

Hyundai Input/Output Assessment for Vehicle Production

Resource Inputs	2018	2019	2020
Energy (MWh)	8,025,478	7,680,491	6,791,666
Water (tons)	11,596,746	11,238,624	9,939,143
Raw materials (iron and aluminum, tons)	1,281,854	1,070,595	1,031,112
Outputs			
Waste (tons)	573,123	585,744	482,215
Greenhouse Gas (Scope 1/2, tCO_2e)	2,822,555	2,705,383	2,396,316
Air pollutant (tons)	1,064	1,404	936
Water pollutant (kg)	652,757	435,471	289,553
VOC* (tons)	12,493	10,944	9,903

* VOC: Volatile Organic Compounds
* The year-on-year decreases in resource inputs and environmental outputs recorded in 2020 were mainly caused by a reduction in the number of vehicles produced due to COVID-19.

Management and Reduction of Harmful Substances

Hyundai manages the harmful substances used in its plants and contained in its finished products very strictly. These activities started when it established its own standards for restricting the use of 4 heavy metals—lead, cadmium, hexavalent chromium, and mercury—in 2002. Since then, it has taken a number of steps to protect the safety and health of its workers and minimize its impact on the environment and ecosystems. This includes complying with any and all rules and regulations governing harmful substances in each country in which it operates, such as the Occupational Safety and Health Act and the Chemicals Control Act of Korea, and the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) of the European Union.

Harmful Substances Regulations and International Initiatives

Hyundai complies with international regulatory standards and initiatives governing harmful substances, and manages and reduces them based on such legislation. It is currently developing alternative substances to replace ones that have been or are about to be banned both at home and abroad. They include the European Union's End-of-Life Vehicles (ELV) Directive and its Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Regulation, the strictest regulations governing these substances.

Process of Harmful Substances Management

Hyundai manages harmful substances in three stages: Prohibition of Use, Limited Use, and Strengthened Management. All of them are based on international standards and initiatives. "Prohibition of Use" means that a high-risk and regulated substance must not be used, and that an alternative must be found to replace it. "Limited Use" allows a harmful substance to be used, but only in very limited circumstances and only according to the regulations governing it. "Strengthened Management" means that a substance can be used, and that its use must be continually monitored.

Despite these rules and policy, it is still very difficult to guarantee that parts and materials do not contain any harmful substances prohibited under applicable laws and regulations, since automobiles consist of so many parts. In response to this, Hyundai has been requesting its suppliers to abide by its harmful substance management policy (guideline) and standards. And to systematically manage and eliminate the harmful substances in the components and raw materials, the company has used IMDS (International Material Data System) since 2004.
IMDS is the automobile industry's material data system that contains information on materials used by the automotive industry and is employed by several automobile manufacturers to maintain such data for use in various reporting requirements. Hyundai uses it to access and manage information about the harmful substances that may be contained in its products, including their materials and parts.
Also, Hyundai created in-house material analysis system called MAMS (Material Analysis Management System) based material data collected from IMDS and has accessed the hazard of chemical substances and prevented the harmful substances in its product on the base of MAMS during product development stage.

In addition, in order to deal with newly regulated substances, the company first checks if they are being utilized in its new car development stage, based on information contained in the IMDS. It then gathers information about parts and materials used by its suppliers by conducting regular inspections. This is to additionally check information about harmful substances that may have changed during the company's production processes. All the parts that its suppliers deliver to it are managed to ensure that they do not contain any substances that are subject to regulation.

Status of Harmful Substances Management

Hyundai has gradually banned the use of four heavy metals (lead, cadmium, hexavalent chromium, and mercury) in its vehicles produced both at home and abroad. This process began in the EU market in July 2003. Since then, the company has also banned the use of such high-risk substances as brominated flame retardants. It has been strictly controlling the use of harmful substances since December 2002 by establishing its own management standards, beginning with the four major heavy metals mentioned earlier.
The company strengthens the management and reduction of harmful substances with its suppliers by sharing information about both Korean and international harmful substance regulations and their response requirements with them. It has been assisting them in establishing their own harmful substance regulation response systems since 2003., and carries out yearly training exercises in how to use the IMDS.