


HYUNDAI MOBIS NET-ZERO REPORT 2023

NAVIGATE TO NET-ZERO

Our Journey Towards a Sustainable Tomorrow



- 
- Green Plant
 - Green Supply
 - Green Product
 - Green Partnership



About This Report



The “Global Stocktake (GST¹)” is a process to appraise and assess the implementation status and the likelihood of meeting the goals agreed upon in the Paris Agreement for mitigating climate change. It takes place every five years, beginning with the Paris Agreement’s adoption in 2015. The inaugural global stocktake took place during the 28th Conference of Parties (COP²/28) held this year. The assessment outcome revealed that the use of renewable energy must be dramatically increased and the use of fossil fuels must be reduced in order to meet the goals of the Paris Agreement. In order to effectively reach near- to long-term goals, it is important to review whether we have deviated from the mitigation pathway through periodic stocktakes and, if so, find ways to get back on track.

As global efforts to address the climate crisis scale up, numerous companies have set a goal of net-zero and developed strategies for reducing emissions. These commitments act as their pledge to a wide range of stakeholders—including investors and clients—and are directly related to their competitiveness for sustainable growth. The systematic implementation of these established reduction strategies and the transparent disclosure of the execution status are now of paramount importance.

Hyundai Mobis declared its commitment to net-zero emissions by outlining the “Green Transformation to 2045 Net-Zero” vision in December 2021, and is implementing phased reductions in accordance with its four major promotion strategies. We are particularly dedicated to our reduction efforts related to the transition to renewable energy at our business sites, while conducting life cycle assessment (LCA³) in stages to manage our Scope 3 emissions.

This report serves as a transparent disclosure of our ongoing efforts and implementation status following our net-zero declaration.

1) GST (Global Stocktake)

2) COP (Conference of the Parties)

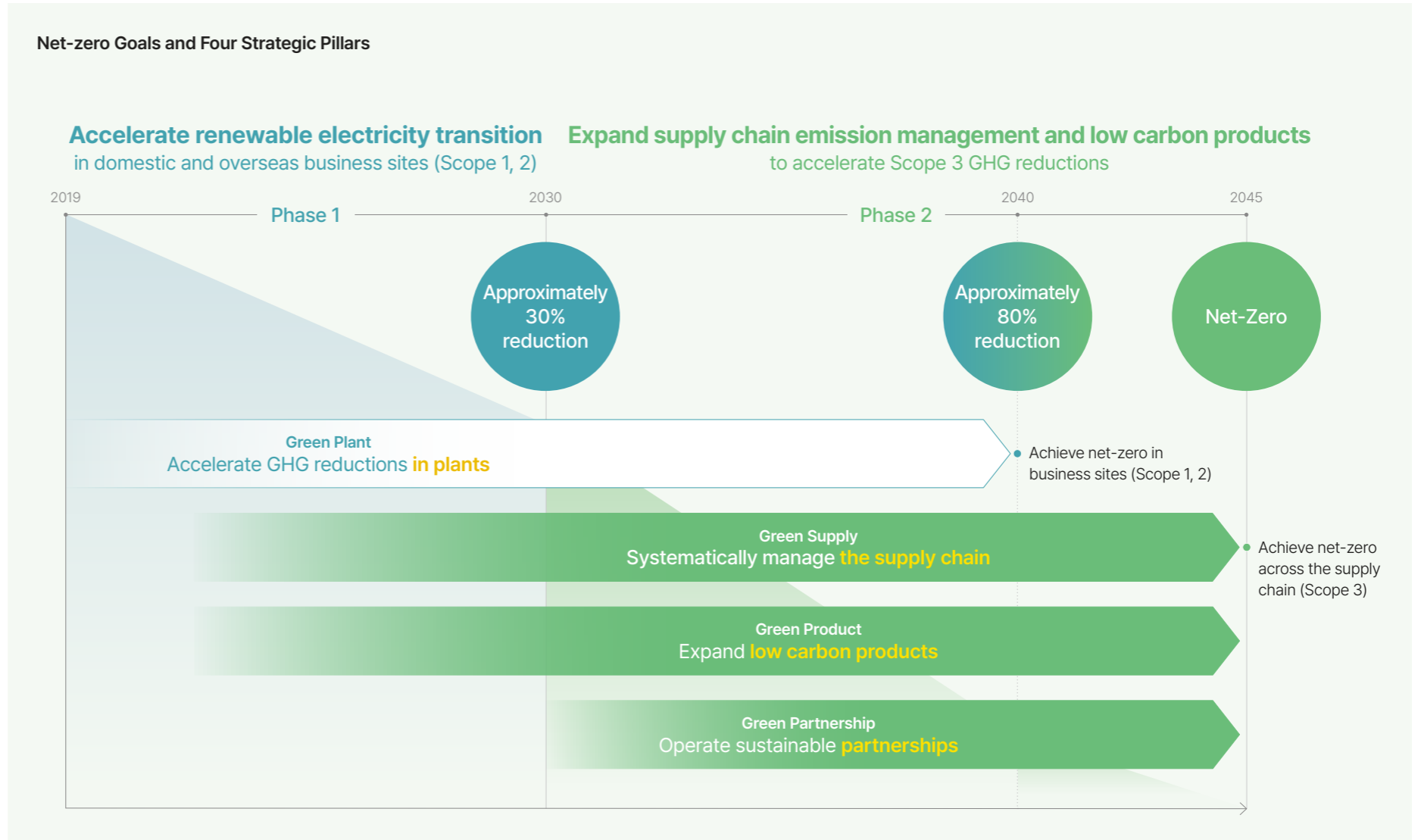
3) LCA (Life Cycle Assessment)

Net-Zero Promotion Strategy: Green Transformation to 2045 Net-Zero

Hyundai Mobis aims to achieve net-zero emissions at its business sites by 2040, and complete net-zero across the entire supply chain (Scope 3) by 2045. Along the way we will adjust the implementation of our four promotion strategies as necessary to ensure we are reaching our near- to long-term reduction targets: ① Green Plant ② Green Supply ③ Green Product and ④ Green Partnership. Specifically, we plan to promote renewable electricity (RE) transition at our business sites, placing an emphasis on the Green Plant strategy by 2030, and accelerate Scope 3 GHG reductions in earnest starting in 2030.

Hyundai Mobis is implementing greenhouse gas reduction measures at its domestic and overseas business sites. Recognizing that more than 85% of the total emissions stem from electricity use, our pivotal action plan involves transitioning to renewable electricity through the promotion of RE100 (Renewable Electricity 100%). At the same time, we are laying a solid foundation to achieve reductions across the entire value chain by understanding the quantifiable impact of our products on the environment through the entire production process by establishing a life cycle assessment system.

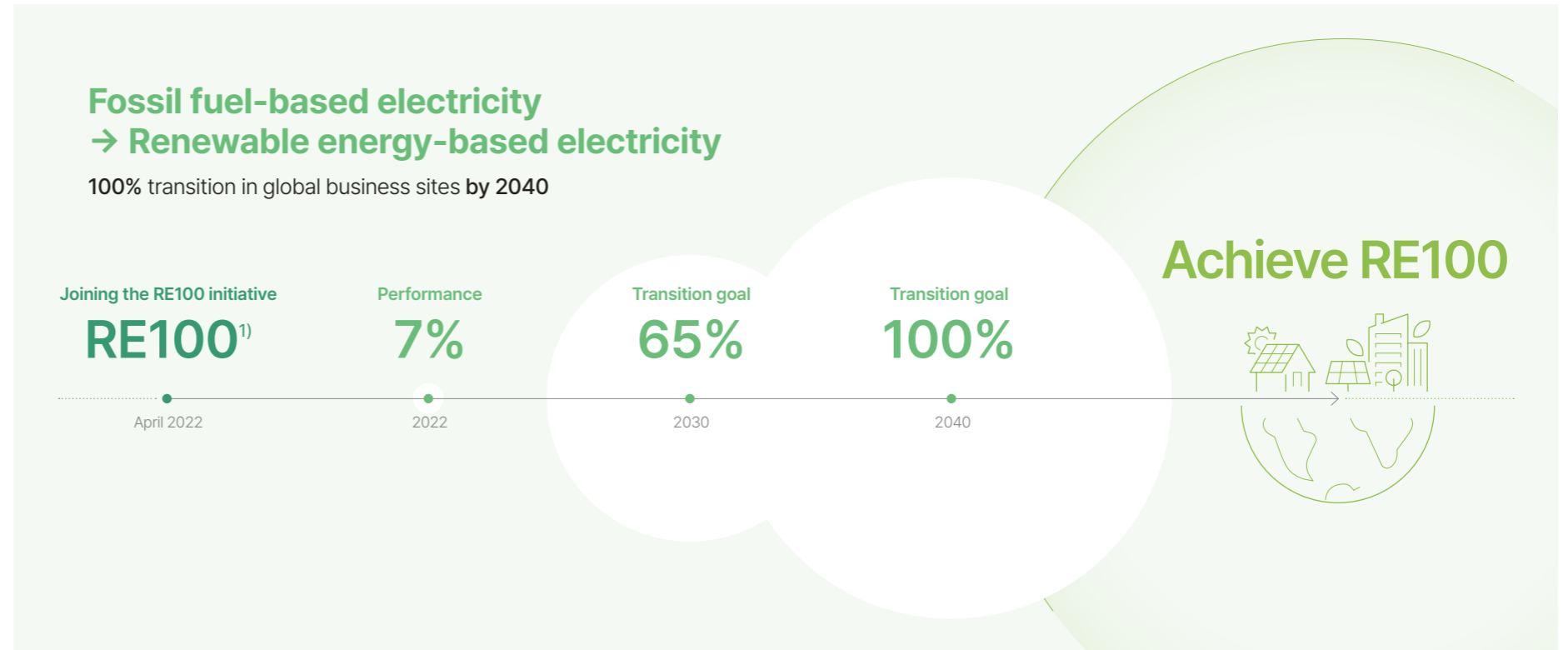
This report is designed to disclose our net-zero implementation status, highlighting the RE100 implementation progress and the results of life cycle assessment of our signature products.



RE100 Transition Strategy

Hyundai Mobis has established near- to long-term goals for transitioning to 65% by 2030 and 100% by 2040. This serves as a key implementation tool to facilitate the shift to low carbon energy, meeting the energy needs of our business operations and advancing towards net-zero.

As the first step for renewable energy transition, we defined our RE100 Roadmap which specifies the transition timeline by country and business site and operational plans. We aim to fully shift to renewables by 2030 in the USA, the Czech Republic, and other countries where the renewables market is active, and to achieve 35% transition by 2030 in South Korea in consideration of the nation's renewable energy supply expansion plan.

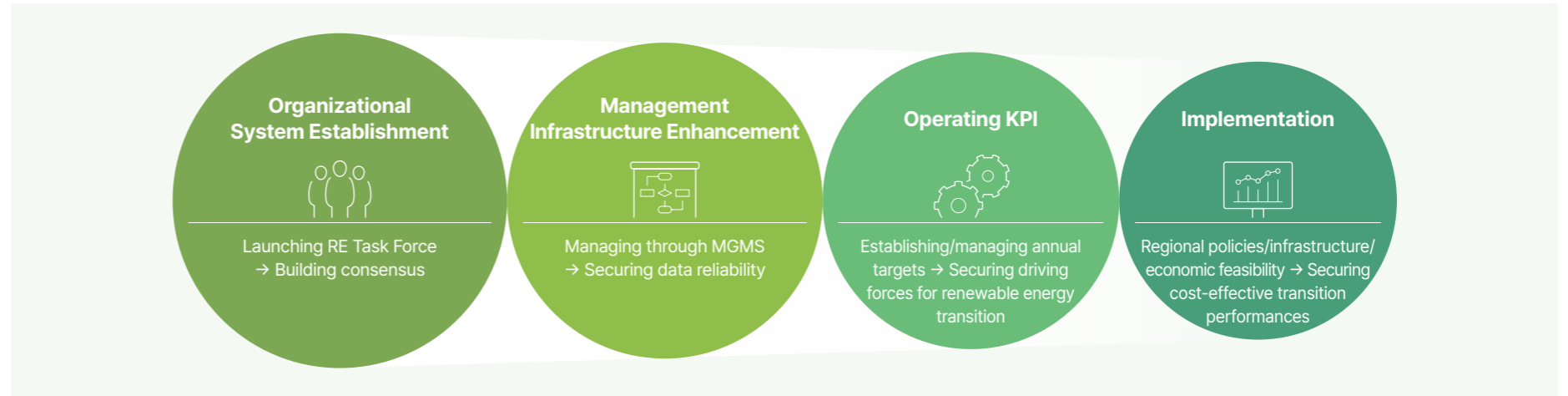


1) Joining the RE100 initiative

Hyundai Mobis became the first company in the domestic automobile industry to join the RE100 initiative in April 2022. RE100 is a global corporate renewable energy initiative bringing together hundreds of large and ambitious businesses that are committed to achieving 100% renewable electricity. Ultimately, the initiative aims to respond to climate change by expanding the production and use of renewable energy. As of the first half of 2023, over 400 global companies have participated in this initiative, with Asian businesses accounting for approximately 38% of the total. Hyundai Mobis has identified its energy consumption structure and electricity usage status in order to systematically implement RE100, establishing renewable energy transition goals and implementation plans.



RE100 Implementation Plans



Securing RE100 Implementation Momentum Through Organizational System Development and KPI Operations

Since the establishment of the “RE Task Force” in 2021, Hyundai Mobis has been actively monitoring crucial policies and trends associated with the transition to renewable energy. Efforts are being made to promote efficient energy transition by encouraging each business sector to share their transition experiences. Beginning in 2023, the transition to renewable energy has been identified as a Key Performance Indicator (KPI). Each business sector has solidified the transition’s momentum through meticulous planning and performance evaluations. This procedure contributes significantly to ensuring ongoing momentum by aligning with assessments from individual divisions and management.

Enhancing Management Infrastructure

Hyundai Mobis calculates and monitors its greenhouse gas emissions by aggregating energy consumption data at its domestic and overseas business sites based on the Mobis Greenhouse Gas Management System (MGMS¹). This enables us to establish GHG reduction targets and manage the implementation performance for each individual site. Throughout 2023 we also focused on enhancing our infrastructure by improving our functional capabilities. This included company-wide annual renewable energy transition goals, performance management, and the expansion of data coverage.

1) MGMS (Mobis Greenhouse gas Management System)

Ensuring Cost-effective Transition

Hyundai Mobis is strategically establishing detailed plans by considering priority options for sourcing renewable energy to achieve a successful transition. By examining regional renewable energy policies and trends, we are striving for effective energy transition through a portfolio comprising “Self-generation,” “Power Purchase Agreements (PPAs²),” “Certificate Purchase,” and “Green Pricing.” This effort enabled us to secure performance records for all options within the transition portfolio in 2023, and we aim to continue building upon economically and efficiently sustainable transition achievements in the future.

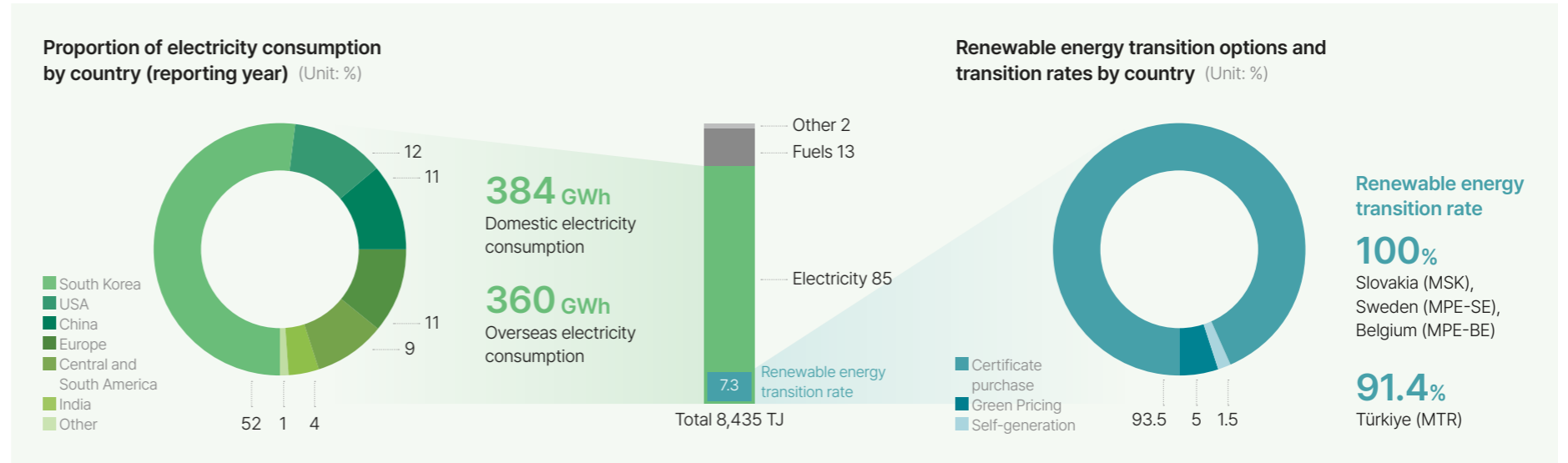
2) PPA (Power Purchase Agreement)

RE100 Transition Status

Hyundai Mobis uses various energy sources throughout all the businesses from research and development to production, logistics and sales. In 2022, approximately 8,435 TJ of energy was consumed, accounting for activities such as the use of municipal gas for indoor heating at business sites, fuel consumption for business travel, and electricity usage for operating production facilities. Over 85% of this energy usage was attributed to electrical energy, resulting in the majority of greenhouse gas emissions being generated from electricity produced from fossil fuels.

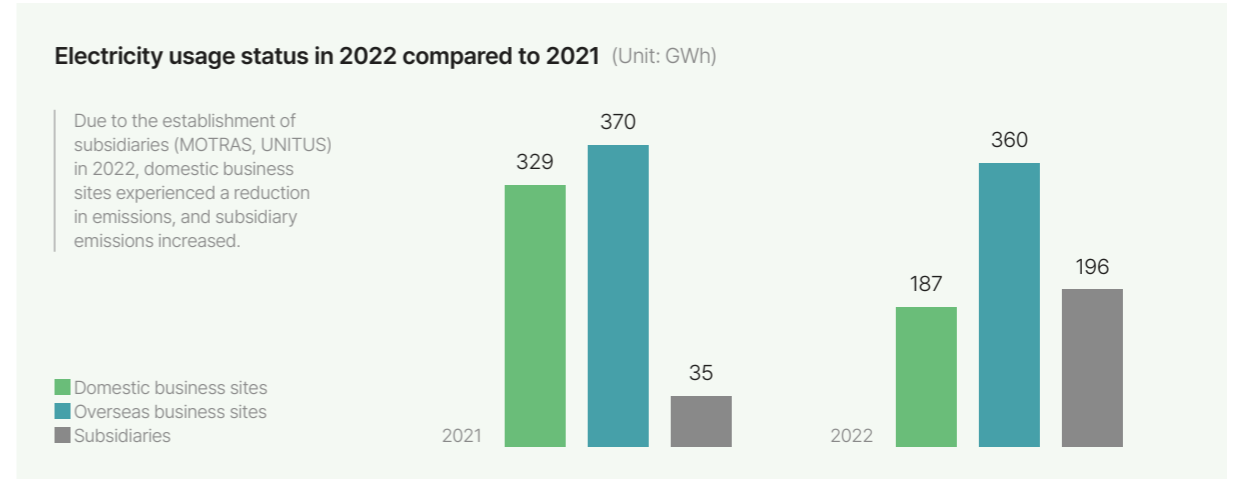
When examining power consumption by country, South Korea holds the largest share at 52%, followed by the United States at 12% and China at 11%. Within Europe, Slovakia, the Czech Republic, Russia, and Türkiye show significant usage, accounting for 11% of the total electricity consumption, including Germany and Belgium. Central and South America, including Mexico and Brazil, constitute about 9% of the total, while India accounts for 4%. Other countries such as Canada and the United Arab Emirates make up 1%.

The portion of renewable energy usage constitutes 7.3% of the total electricity consumption, with plan to expand in align with the RE100 Roadmap. In 2022, Hyundai Mobis achieved its internal targets by utilizing 40 GWh of renewable energy, resulting in an overall renewable energy transition rate of 7.3%.



Regionally, priority was given to Europe, followed by domestic consumption, and the primary method of renewable energy transition was through certificates, accounting for 93.5%. By expanding regions in 2023, Hyundai Mobis aims for an overall 8.2% transition by utilizing 487 TJ of renewable energy.

The total annual electricity consumption, including five subsidiaries, amounted to approximately 744 GWh as of 2022. Domestic electricity consumption increased to 384 GWh, marking a 5% rise compared to the previous year (2021), while overseas facilities witnessed a slight decrease, consuming 360 GWh, which is 3% lower than the preceding year.



Renewable Energy Transition Cases

1 Self-generation¹⁾



Domestic

Hyundai Mobis has completed the installation of a 2.5 MWp capacity solar power generation facility at its Ulsan Electrification Factory, Daegu Electrification Factory, Gimcheon Factory, and Changwon Factory, which has been fully operational since 2023. Through this initiative, an expected transition to 1% renewable energy usage for domestic business site power consumption is anticipated, along with an annual reduction of 1,521 tCO₂eq of greenhouse gas emissions. Additionally, besides the reduction in greenhouse gas emissions, improvements in parking convenience are expected, such as decreased internal temperatures in parked vehicles achieved by blocking direct sunlight.

1) Self-generation: Companies install their own renewable energy facilities allowing for direct production and use of electricity.

2 Power Purchase Agreement (PPA)²⁾



Domestic

Hyundai Mobis has promoted Virtual PPA contracts for its domestic business sites. This encompasses a total capacity of 6,000 MWh, and review for further expansion plan is in process.

Overseas

Hyundai Mobis's corporation in India (MIN) has secured and implemented renewable energy through a rooftop solar on-site PPA with a capacity of 5.5 MW. It is projected that this will lead to a 22% transition of power consumption to renewable energy for this site, as well as 5,898 tons of GHG reductions on an annual basis. Looking ahead, MIN is actively exploring the expansion of RE100 implementation through the use of a variety of options such as Captive PPA (equity investment-type PPA), and REC³⁾ purchases.

2) Purchase of Power Agreement (PPA): Companies purchase electricity by way of a direct contract with an external renewable energy power generation business.

3) REC: Renewable Energy Certificate

3 Certificate (REC) Purchase⁴⁾



Domestic

Hyundai Mobis secured RECs with its subsidiary UNITUS. It amounts to a total of 9,678 RECs, which is projected to result in a reduction of 4,446 tCO₂eq of GHG emissions annually.

Overseas

Hyundai Mobis's Slovakia corporation (MSK) achieved RE100 through GO⁵⁾. Moreover, our corporations in Türkiye (MTR) and Tianjin (MTJ) are driving renewable energy transition through I-REC⁶⁾, while our Georgia corporation (MAL-GA) is promoting it through REC purchases.

4) Renewable Energy Certificate (REC) Purchase: Companies purchase certificates that prove that the electricity used is produced by renewable energy resources.

5) GO: Guarantee of Origin

6) I-REC: International REC

4 Green Pricing⁷⁾



Domestic

Hyundai Mobis's subsidiaries, UNITUS and MOTRAS, transitioned a total of 5,374 MWh of electricity to renewable energy through the Green Premium.

Overseas

Small business sites with low electricity consumption, such as those in Belgium (MPE-BE), Sweden (MPE-SE), and Germany (MPE-FRA), are using renewable energy through Green Pricing products.

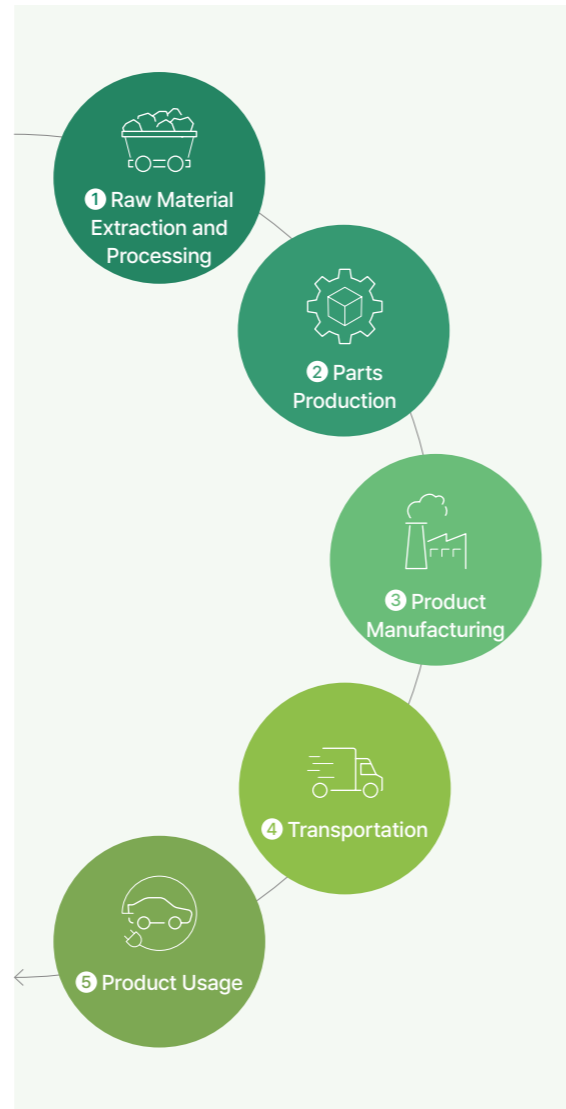
7) Green Pricing: Purchase of electricity to which a renewable energy premium has been added.

LCA Results: Center Lamp

Hyundai Mobis selected the center lamp as its second pilot product to be used to conduct a life cycle assessment. The environmental impact category chosen for assessment was global warming, which required the calculation of three key types of GHG emissions: CO₂, CH₄, and N₂O.

The production process for the center lamp includes five stages: raw material extraction and processing; parts production; product manufacturing; transportation; and product usage. Primary and secondary data were collected during each stage of production in order to calculate the emissions created. From this data the “Life Cycle GHG Emissions (Carbon Footprint) per Center Lamp” was derived.

We used the “Greenhouse Gases, Regulated Emissions, and Energy Use in Technologies (GREET)” model developed by Argonne National Laboratory in the United States to derive quantitative results.



1 Raw Material Extraction and Processing

We collected raw material data for each piece of the center lamp to identify which raw materials are used in its production. The LCI¹⁾ database was used to measure GHG emissions at each stage, from extraction to the processing of each raw material.

2 Parts Production

To calculate the life cycle GHG emissions of the parts that comprise the center lamp, we gathered data on the weight of each part, the ratio of raw materials, and the ratio of parts per center lamp. Since each part of the production supply chain uses electricity as an energy source, we also calculated the life cycle GHG emissions using the annual energy consumption and electricity emission factor for each part of the supply chain. Subsidiary materials are also in the production of center lamps. GHG emissions were calculated by measuring the energy consumption during the production stages of both raw materials and subsidiary materials.

3 Product Manufacturing

Electricity is used as an energy source at the UNITUS’s Gimcheon Plant where the center lamp is produced. To calculate life cycle GHG emissions, we used annual energy consumption and electricity emission factors, which are consistent with the parts production stage.

4 Transportation

The transportation stage can be broadly divided into two parts. The first is the process of moving subsidiary materials and parts produced in the supply chain to UNITUS using trucks and other vehicles. The second is the process of moving the products from UNITUS to the customer using container trailers, ships, and railways. We used calculations such as fuel economy, travel distance, loading capacity, the lower heating value of fuel, and the fuel emission factor of each transportation method to determine the total life cycle GHG emissions of each transportation stage.

5 Product Usage

Since the center lamp used in this analysis is produced for use in battery electric vehicles, no GHGs are emitted from vehicle exhaust during the usage stage. Therefore, GHG emissions in this stage were calculated in two ways: First, we considered the life cycle GHG emissions of electricity. This was calculated by comparing the ratio of the weight of the center lamp to the curb weight of the battery electric vehicle. Secondly, we considered the emissions related to the use of the LED bulbs in the center lamp. To generate this number, we calculated the amount of GHG emissions needed to create the necessary amount of electricity to power the LED bulbs when the vehicle is driven.

1) Life Cycle Inventory Database (LCI DB): A list of all data collected and calculated related to the life cycle assessment of a product.

LCA Results: Center Lamp



The “Cradle-to-Grave” result shows that the usage stage accounts for more than half of its total life cycle emissions at 55.4%. The raw material extraction stage accounts for 28.2%, and the product manufacturing stage accounts for 14.1%. The electricity consumption during the use and production stages together encompasses approximately 70% of total emissions. Although the percentage of emissions from the usage stage is relatively low compared to the products used

in internal combustion engine vehicles, electricity use during the usage and product manufacturing stages accounts for approximately 70% of emissions.

The “Cradle-to-Gate” result shows that the raw material extraction stage accounts for approximately 63.3% of the total GHG emissions, while the product manufacturing stage accounts for 31.5% when excluding emissions from the product usage stage.

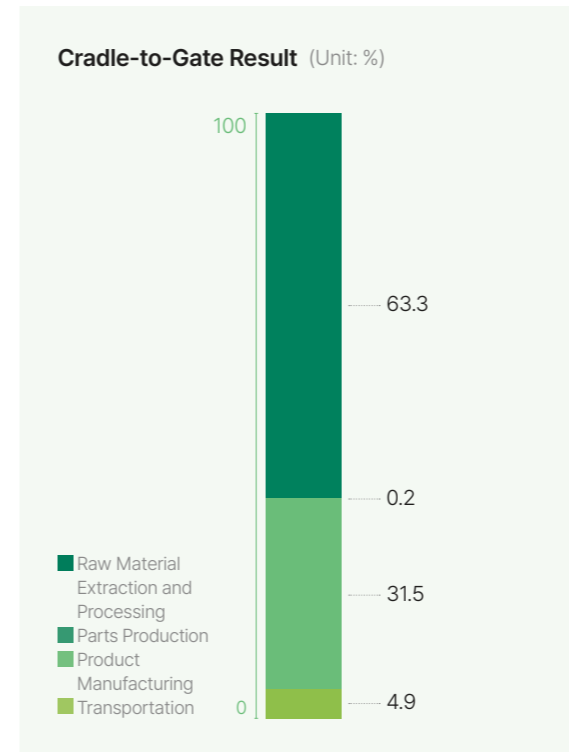
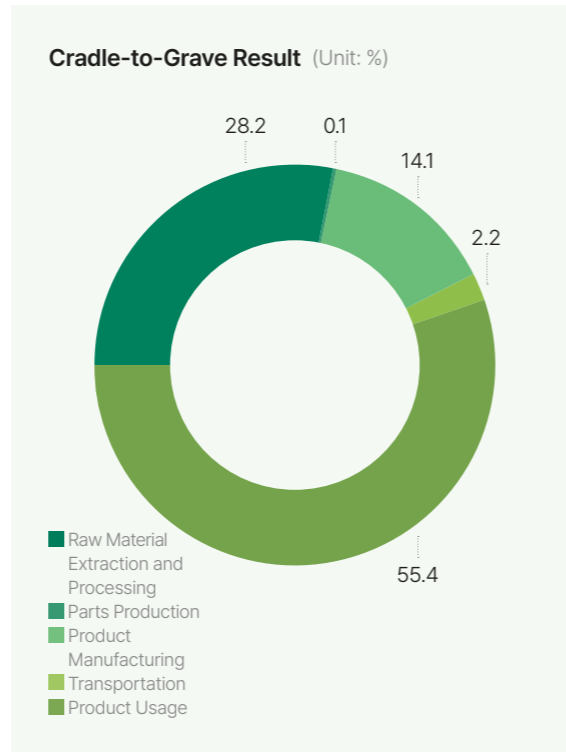
This is because most center lamp raw materials are polymer-based, which account for a high proportion of GHG emissions throughout their life cycle.

Compared to the Drum In Hat (DIH) product that was analyzed as the first pilot, the results of the center lamp have the following characteristics and implications.

First, since the center lamp are used as part of a battery electric vehicle, the proportion of emissions during the usage phase is comparatively smaller than that of an internal combustion engine vehicle. However, the usage phase still accounts for the highest proportion of its total life cycle emissions. However, it still accounts for the highest proportion, making it very important to choose which power source to generate electrical energy from.

This demonstrates that the RE100, which Hyundai Mobis is promoting as part of its net-zero promotion strategies, can greatly contribute to reducing the carbon footprint of its products.

A second important consideration is the emissions factor of the raw material extraction stage. Since the center lamp component parts are made of polymer rather than iron or aluminum-based raw materials, the recycling rate becomes an important factor in the overall emissions rate. To mitigate this, we aim to reduce GHG emissions at the raw material stage by using polymers with increased recycling rates as well as developing other eco-friendly methods and materials.



Hyundai Mobis declared net-zero with the announcement of its “Green Transformation to 2045 Net-Zero” vision in December 2021.

We are committed to systematically reducing greenhouse gas emissions as outlined in our four major strategies, and will continue to transparently disclose our reduction efforts and results.

We promise to fulfill the pledge that we made to our stakeholders and the global community to respond to the climate crisis with decisive action, while also reinforcing our corporate competitiveness for sustainable growth.



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