Hyundai Motor will be 100% carbon-neutral by 2045

Genesis brand 100% electrification by 2030, 100% electrification by 2035 in EU market, 100% electrification by 2040 in major markets

Top player in global EV market

EV sales of 1.87 million units by 2030 (Hyundai + Genesis), HMG global EV M/S 12%, EV sales of 840K units by 2026

From Vehicle to Experience

Establish a roadmap for 3 key factors to achieve EV sales target

1. Capacity
   - Expand local production in major markets including localized sourcing of batteries
     (Develop next gen. battery technology and stabilize sourcing)

2. Product
   - Apply next generation Modular Architecture
     (Enhance competitiveness in vehicle system)

3. Software
   - Secure S/W competitiveness and expand investment
     → Achieve S/W Transformation
CARBON NEUTRALITY
Summary of carbon neutral strategy

Road to Net Zero

- **2030:** Genesis 100% electrification
- **2035:** 100% electrification in EU market
- **2040:** Achieve 80% electrification in major markets
- **2045:** Carbon Neutrality
2021 REVIEW
2021 Review

Despite challenging market conditions caused by chip shortage issue and rising raw material prices, HMC generated solid business results in 2021 with global sales of 3.9 million units and consolidated operating profit margin of 5.7%.

Carbon Neutral
Hyundai is progressing to achieve carbon neutrality by 2045.
- Clean Mobility
- Green Energy
- Next Gen. Platform

Electrification
2021 EV global sales (units)
- 98K
- 141K (44% increase)

Dedicated EV platform (E-GMP)
Launched IONIQ5 and GV60, first dedicated EV models under Hyundai and Genesis brand.
- E-GMP
- IONIQ 5
- GV60
EV SALES TARGET
**EV Sales Target**

**Core Strategy**

- **EV Line up Expansion**
  - Expand line ups of SUV/mid-large sized EVs
  - Electrification of Genesis
  - Regional strategic models

- **Production Optimization**
  - Optimize EV production in major markets
  - Improve production efficiency

- **Product Competitiveness**
  - Launch next-gen platform
  - Strengthen S/W technology

**1.87 million units by 2030**

HMG M/S 12%
EV Sales Target by 2030

EV Sales of 1.87 million units & HMG M/S of 12% by 2030

2021
- Korea: 141 (4%)
- US: 70
- Europe: 20
- Others: 10

2026
- Korea: 270
- US: 230
- Europe: 120
- Others: 40

2030
- Korea: 570 (36%)
- US: 290 (22%)
- Europe: 480 (16%)
- Others: 530 (36%)

EV sales portion (%): Korea 58%, US 36%, Europe 69%, Others 58%.
## Expansion of EV line ups

Establish 17 EV models by 2030 *(11+ models for Hyundai, 6+ models for Genesis)*

### 100% electrification of Genesis & Line up expansion focusing on SUVs & Regional strategic models

<table>
<thead>
<tr>
<th></th>
<th>2016~2020</th>
<th>2021</th>
<th>2022</th>
<th>~2030</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sedan</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ioniq EV</td>
<td></td>
<td></td>
<td>IONIQ 6</td>
<td></td>
</tr>
<tr>
<td>La Festa EV</td>
<td>Mistra EV</td>
<td></td>
<td>G80 EV</td>
<td></td>
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<tr>
<td><strong>SUV</strong></td>
<td></td>
<td>IONIQ 5</td>
<td>GV60</td>
<td></td>
</tr>
<tr>
<td>Kona EV</td>
<td></td>
<td></td>
<td>GV70 EV</td>
<td></td>
</tr>
<tr>
<td><strong>Truck</strong></td>
<td>Porter EV</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Expand line up focusing on SUV**
  - *11+α models*
  - 3 sedans, 6 SUVs, 1 commercial, 1 other model
- **100% Electrification**
  - *6+α models*
  - 2 sedans, 4 SUVs
- **Regional strategic models**
  - **EU**, **US**, **CN**, **EM**...
CAPACITY
Improvement of EV Production Efficiency _HMGICS

Adopt production flexibility system, real-time customized logistics system, and utilization of digital twins* to innovate overall value chains and promote customer-centric manufacturing platform

* Digital twins: A technology that makes a digital replica of an actual car for simulation not only in a virtual space but also in the physical world to innovate products by linking data obtained through it to the actual car

Demand Driven, Pull Method Production System
Eliminate unnecessary process in value chain, Lean Production
Industry 4.0, Digital Transformation

HMGICS: Pilot for HMG’s future innovated manufacturing system
Optimization of Global EV Production

- Optimize EV production in major electrified markets
- Continue sourcing through long-term supply agreement with major battery makers and secure additional sourcing by forming strategic partnerships with multiple battery suppliers

Production optimization to expand market presence in the global EV market

More than 1.87 million units

Expand production + Local sourcing via partnering with battery makers

Expand production

Secured 10GWh via partnering with LGES

Expand production + Local sourcing via partnering with battery makers
Comprehensive Battery Strategy

Enhance comprehensive battery strategy from sourcing/development/modular to improve profitability and achieve sales target in 2030.

**Secure battery from strategic partnerships with battery makers**
- Formed JV with LG Energy Solution to produce 10GWh lithium-ion battery
- Response to high EV demand in major markets from entering new partnerships
- 50% of next generation lithium-ion batteries after ’25 will be sourced from JVs

**Expand markets by diversifying sourcing of NCM / LFP battery**

**Improve pricing from diversifying sourcing**

**Combine modular architecture platform and modular battery system to improve battery performance and reduce cost**
- Apply cell-to-pack and review adoption of cell-to-frame from advancing modular architecture

**Enhance performance and reduce cost from next generation battery development**
- Improve lithium-ion battery performance
- Invest in solid state battery and technology development
- Next-generation battery technology development with various startups

To secure 170GWh of batteries by 2030.
Battery Modular Strategy

Enhance comprehensive battery strategy from sourcing/development/modular to improve profitability and achieve sales target in 2030

2030

Sourcing

Modularization

Combine modular architecture platform and modular battery system to improve battery performance and reduce cost

Apply cell-to-pack and review to adopt cell-to-frame from advancing modular architecture

to secure 170GWh of batteries by 2030

Technology Development
PRODUCT
Product Competitiveness _ Integrated Modular Architecture

Adopt Integrated Modular Architecture (IMA)* concept by 2025

→ Efficient expansion of EV line up, increase of profitability, enhancement of performance

IMA

EV development based on platform

Platform

- New EV platform with improved commonization range & technology compared to the current E-GMP

<table>
<thead>
<tr>
<th>Applicable</th>
<th>B2C, B-E segment, Entry-Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>AER</td>
<td>50%+ improvement compared to the current level (IONIQ 5)</td>
</tr>
<tr>
<td>Energy Efficiency</td>
<td>Maintaining the current Tier1 level</td>
</tr>
<tr>
<td>Autonomous Driving</td>
<td>ADAS Lv.3 +</td>
</tr>
<tr>
<td>New Technology</td>
<td>Space : B-pillarless &amp; swing door, 1st row swivel seat, 2nd row seat long sliding</td>
</tr>
<tr>
<td></td>
<td>Customer care : Controller FOTA** update as a basic option, built-in air purifier</td>
</tr>
</tbody>
</table>

Integrated Module-based EV development

- PBV-dedicated platform
- Focusing on B2B demands including delivery and hailing service

* Integrated Modular Architecture
**FOTA : Firmware OTA
IMA_Battery System

Apply standardized batteries based on modular battery system to each segment
→ Increase energy density, reduce cost, improve charging time

Introduce Cell-to-Pack system

**Modular battery system: Cell - Module - Pack**

- **Battery cell**: Pouch Cell, Prismatic Cell
- **Battery module**: 16Cell = 1Module
- **Battery pack**: 10Module = 1Pack

**Simplify battery packs for new modular platform: 9 types**

<table>
<thead>
<tr>
<th>PF</th>
<th>Sys.V</th>
<th>Performance</th>
<th>Entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>eM</td>
<td>800V</td>
<td>6 types</td>
<td></td>
</tr>
<tr>
<td>eS</td>
<td>400V</td>
<td>3 types</td>
<td>PBV dedicated battery pack</td>
</tr>
</tbody>
</table>

**Competitive-ness**

- **Factors**: Energy density, Cost, Charging time
- **2021 E-GMP**: (NCM)
- **3gen.**: (NCM)
- **4gen.**: (NCM)
- **2025 eM**: (LFP)
- **5gen.**: (SSB)

**2030 vs. 2021**

- **50%**
- **40%**
- **Improved**
IMA_Motor System

Apply standardized motors based on modular motor system to each segment

→ Increase efficiency, reduce cost and weight

**Modular Motor System based on Φ200mm core**

- Inverter power module, Topology
- Motor core diameter

**Simplify motor packs for new modular platform : 5 types**

<table>
<thead>
<tr>
<th>PF</th>
<th>Sys.V</th>
<th>Type</th>
<th>Power</th>
<th>Torque</th>
<th>Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>eM</td>
<td>800V</td>
<td>M-1</td>
<td>M-3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>M-4</td>
<td>M-5</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>eS</td>
<td>400V</td>
<td>M-2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Competitive-ness**

- **Factors**: 2021 E-GMP, 2025 eM, 2030
- **Efficiency**: vs. 2021
  - Minimal loss
- **Cost**
- **Weight**

35% ↓

30% ↓
EV Product Competitiveness_S/W

Introduce standardized electronic architecture and apply FOTA update to all models to expand new functions based on vehicle to customer connectivity

**Connected Car**

**Connected Car H/W Platform**
- Electronic Architecture (Electronic Controller Network)
- Improve performance / Expand volume

**Cloud Infrastructure**
- VCRM Customer Data
- Infotainment/Controller OTA update
- Establish OTA update system: Provide new functions

**Big Data**
- Big Data/Al
- Provide business insights and services based on customer/vehicle data
- Based on creation of new customer value
- Expand profit model

**Service / Business**
- Research/Development
- Quality
- Service
- Sales/Marketing
- Shopping/Travel
- Safety/Security
- Insurance/Finance
- Media
- Charging/Parking

**Standardization of S/W Architecture**
- **AS-IS**
  - Fragmented controller composition by vehicle & Increased complexity
  - Controller A
  - Controller B
  - Controller C
  - Controller D
- **TO-BE**
  - Expand application of standardized S/W architecture
  - Integrate controllers: 1/3 of current number of units
  - S/W Architecture

**Application of FOTA update to all models**
- GV60: First introduction of FOTA update in 2021
- Apply to Newly launched models from the end of 2022 (including some Modified/PE models)
- Apply to 23 models by 2025 (Hyundai 17, Genesis 6)
- Expand new functions and technologies in the future with S/W architecture based FOTA update (Continuous update after launch)
EV Product Competitiveness_S/W

Expand autonomous driving business with internalized technologies & development of integrated controller

<table>
<thead>
<tr>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026~</th>
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<tbody>
<tr>
<td>HDP* Lv 3</td>
<td>Advanced HDP Lv 3</td>
<td>Commercialize RoboRide Lv 4</td>
<td></td>
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<tr>
<td>Apply to G90 (Dec. 2022)</td>
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<tr>
<td>RoboRide Pilot Service Lv 4 Gangnam, Pangyo</td>
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<tr>
<td>RSPA* 2 Update</td>
<td></td>
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<tr>
<td>OTA Update, Lidar Fusion</td>
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<tr>
<td>Remote Parking Pilot</td>
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<tr>
<td>Indoor/Outdoor Parking lot HD map / Localization</td>
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<tr>
<td>RoboShuttle Test Drive / Pilot Service Lv 4 Sejong, Namyang, Pangyo</td>
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<tr>
<td>Remote Parking Pilot</td>
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<tr>
<td>RoboDelivery Test Drive / Pilot Service Lv 4 Link to logistics service</td>
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<tr>
<td>RoboDelivery Test Drive / Pilot Service Lv 4 Link to logistics service</td>
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<td>Commercialize robotaxi Lv 4 us</td>
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<tr>
<td>Expand Service Regions Lv 4</td>
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</tbody>
</table>

* HDP: Highway Driving Pilot
RSPA: Remote Smart Parking Assist
EV Product Competitiveness_S/W Transformation

Achieve S/W Transformation target by securing manpower and expanding mid- to long-term investment

**S/W Transformation Target**
Achieve 30% Revenue with S/W business by 2030

**Mobility**
- Transport: RoboRide, RoboShuttle
- Logistics: RoboDelivery/FMS
- Car subscription service

**Connectivity**
- Infotainment: Customized content, Subscription (New technologies/functions)
- Convenience: EV charge, Vehicle remote management, In-car payment

**Data Business**
- Finance: Insurance, Lease, Maintenance, Advertising, Shopping

**Secure S/W experts**
Establish company-wide S/W centered development system

- Secure capabilities of organizations
  - Establish S/W specialized organizations globally
  - Increase S/W experts by 20% annually
  - Accelerate standardizing and applying S/W architecture with S/W specialized organizations

- Develop S/W to optimize Device & Service

**Expand mid-to long-term investment**
Invest KRW 12tr by 2030

- **Technology Development**: KRW 4.3 tr
  - Connectivity, AI, Robotics, Mobility and Autonomous Driving

- **Strategic Investment**: KRW 4.8 tr
  - Investment for start-ups and research institutes

- **Company-wide ICT Investment**: KRW 2.9 tr
  - Big Data Center: Establishment of Server and Cloud, Operation fees
  - Service Development: Platform, Applications
FINANCIAL TARGET
2022 Annual Guidance

Wholesale
4.32 million Units

OPM (Consolidated)
Revenue Growth 13~14%
OPM 5.5~6.5%

Investment • FCF
Investment Plan KRW 9.2 tr
Auto FCF -0.5~+1.0 tr

Shareholder Return
Similar level or higher Compared to 2021

* Manage flexible shareholder return policy considering investment resources and earnings improvement trend etc.
EV Profitability Target

Target to achieve $10\% + \alpha$ EV OP margin in 2030

- EV sales volume expansion
- Next generation battery
- Integrated Modular Architecture
- ~2030 OPM 10% + \alpha

Sales per model:
- 2021: 20k
- 2030: 110k
Mid-to Long-term financial target

2021 OP Margin: 5.7%
- Improvement factors:
  - Global demand rebound
  - Continued product mix improvement
  - Increased market share in the US
- Constraints:
  - Semiconductor shortage issue
    → Production disruption
  - Increased raw material costs

2025 OP Margin: 8%
- Improvement factors:
  - Continued profit improvement of ICE
    - Mix improvement of SUV and Genesis
    - Cost reduction including low incentive spendings
  - Securing stable foundation for EV profitability
    - Accelerating cost reduction
    - Sales volume expansion

2030 OP Margin: 10%
- Improvement factors:
  - Stabilized EV profit
    - Modular architecture, battery systems, etc., Improve profits from standardized systems
  - Full-scale sales of S/W related businesses and new services

*OP Margin: Consolidated basis*
Mid-to Long-term Investment Plan

Investment plan by 2030

(Unit : KRW Trillion)

- **R&D**: 95.5
  - 39.1
  - **CAPEX**: 43.6
  - **STRATEGIC INVESTMENT**: 12.8

Investment for Electrification by 2030

- 19.4
  - Product development
  - Development of advanced technology for electrified parts
  - Construction of new plants and production line
  - Establishment of EV charging station
  - Strategic alliance, stake acquisition, etc