

INVESTMENT
OPPORTUNITIES
IN KOREA

Automotive Parts



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* Figures on the report show the likely adjustment of average yearly currency rates from Korean Won (KRW) to the US dollar (USD). A rate adjustment is adopted particularly reflecting the recent average market variations to eliminate the valuation effects arising from movements in exchange rates in case when the data expressed shows an annual growth rate on the paper.

* Rate adjusted figures are rounded off, but the sum is correct down or up to the decimal when the rounded values are not equal to the adjustment.



1 Industry Trends

Definition and Classification

- (Definition of the industry) The automotive parts industry produces components that are indispensable for constructing automobiles, such as power generators, power trains, suspensions, steering systems, brakes, electrical and electronic devices, and body parts, as well as the parts for the intermediate stage where the vehicle is constituted by assembling the parts of the lower units.
- Newly developed technologies created electric-powered vehicles, such as electric vehicles, plug-in hybrid vehicles, and fuel cell vehicles, which use electricity as power sources, and autonomous driving systems. Thus, the range of automotive components, including batteries, motors, inverters, automotive semiconductors, radars, Light Detection and Ranging (LIDAR), and camera modules, is further expanded.

▪ Classification of Automotive Parts ▪

Classification criteria	Description
By function	Body (panels, doors, bumpers, etc.) Power generators (engine bodies, fuel devices, intake and exhaust devices, cooling devices, etc.) Power trains (transmissions, axles, clutches, gears, etc.) Suspensions (shock-absorbers, springs, cross/side members, etc.) Steering system (steering gears, columns/shafts, steering wheels, etc.) Brakes (brake systems, discs, drums, cylinders, etc.) Electrical and electronic devices (batteries, wiring, motors, switches, sensors, lamps, etc.) Others (air conditioners, heaters, tire wheels, wipers, rubber products, seats, airbags, etc.)
By manufacturing process	Castings (cylinder blocks, cylinder heads, piston rings, brake drums, etc.) Forgings (crankshafts, camshafts, connecting rods, axle shafts, etc.) Machined products (piston pins, bearings, bolts, etc.) Press processed products (wheel discs, fuel tanks, body parts, frames, etc.) Assembly parts (radiators, fuel injection devices, air cleaners, carburetors, etc.)

1.1 Market Trends in Korea

▶ Status and position of the automotive parts industry

- The Korean automotive parts industry continued to grow until 2014, but as the sales of finished cars continued to decrease recently, 2018 sales fell 1.7% year-over-year to USD 64.89 billion.



- The sales volume of the automotive parts industry grew steadily, thanks to the growth of the front-end industry, recording a steady growth rate of 2.2% annually, reaching USD 53.44 billion in 2010.
- Sales by sector are USD 42.44 billion in OEM, USD 19.44 billion in exports, and USD 2.9 billion in spare parts, accounting for 65.4%, 30.0%, and 4.6% of the total, respectively, with the largest portion coming from the OEM sales.
- Exports of automotive parts in 2018 were USD 23.1 billion, down 0.1% year-on-year, and overall parts exports from Korea also reduced because of a decline in global auto demand, leading to sluggish overseas production by Korean automakers.
 - The automotive parts industry accounted for 3.8% of the total exports, and the trade surplus reached USD 17.7 billion.
 - The main export items include miscellaneous automotive parts, transmissions, miscellaneous parts of the body, brakes, and their parts. Among them, the demand is increasing for core parts such as transmissions, brake system parts, and drive axle parts.

Status of Korea’s Motor Vehicle Industry (as of 2017)

Classification	No. of companies	Employment (thousand people)	Production amount (USD 100 million)	Added value (USD 100 million)	Export (USD million)	Trade balance (USD million)
Finished car industry	30	94	810	220	40,887	28,787
Ratio	0.04%	3.2%	6.0%	4.6%	6.8%	
Automotive parts industry	4,575	258	898	266	23,119	17,701
Ratio	6.6%	8.7%	6.7%	5.6%	3.8%	

Source: Statistics Korea, Korea International Trade Association

Note: 1) Number of companies, employment, production, and added values as of 2017 (the average annual exchange rate of 2017 was used), and exports and balance of trade as of 2018,

2) The ratios are the shares in the manufacturing industry. However, the ratios of export are the shares in the total exports.

- The main export destinations of automotive parts are the United States, China, Mexico, Russia, and Slovakia, where there are overseas production plants of finished cars.
 - The United States accounts for 25.8% of the automotive parts exports (as of 2018), and the increase in demand for Korean automotive parts is mainly due to the demand by local automakers such as GM, Chrysler, as well as the country’s automakers that have local plants there.

- As competitiveness in local companies in China has improved recently, the local production volume of finished cars in Korea has decreased, leading to a sharp decline in demand for parts. Thus, Korea is seeking to increase sales to local companies in China, which has a high export proportion (12.8%) after the United States.
- As a North American manufacturing base of automobiles, Mexico has become a major importer of Korean automotive parts because of its sharp increase in automobile production.
- In 2018, the number of first-tier suppliers that deal directly with automakers decreased by 2.4% year-on-year, with 831 companies, including 257 large companies (30.9%) and 574 SMEs (69.1%; based on the data from the Korea Auto Industries Coop. Association).
 - Specialized and large-scaled parts makers are producing core parts such as transmissions and axles with their world-class technology, and are increasing sales through local production in China and the United States, trading actively with global automakers.
 - Secondary parts makers in Korea are estimated to be about 3,000, and most of them are SMEs. Including third-party parts makers that supply low-level parts of the automotive industry, the number reaches 6,000.

▶ **Changing trends in the automotive parts industry**

- Amid stagnant demand in advanced markets such as the United States and Europe, the Chinese market, which had driven the global demand for automobiles, has also turned downward. Thus, automakers and governments are trying to respond to paradigm shifts through electrification, autonomous driving, and mobility to pursue continuous growth in the automotive industry.
 - Korea's automotive industry, which is currently stagnant in growth, is also implementing innovative growth strategies to overcome the limitations of the existing growth paradigm and the structural stagnation of the industry.
 - Environmental issues across the society and the strengthening of environmental regulations have shifted the structural center of the industry from gasoline vehicles to hybrid and electric cars. The new trends of motorization, autonomous driving, and mobility have broadened the scope of automotive technology from machinery to IT, communications, and software.



- As the automotive industry environment is changing, the companies' strategies are also shifting from the growth led by finished cars to the network-led growth based on the partnership among parts and software companies. As the vertical relationship among automakers and parts suppliers is weakening, the companies are moving toward horizontal collaboration.
 - Other sectors newly participating in the parts industry are increasing their roles because of the spread of motorization and autonomous driving paradigms, and those new sectors include IT, electronics, chemistry, entertainment, and semiconductors.

1.2 Industrial Competitiveness

▶ Global status of the Korean automotive industry

- According to IHS*, Korea ranks in the world's top five as an automotive parts producer, after China, Japan, the United States, and Germany (as of 2017).
 - * About IHS Markit (IHS): A global market research firm based in London that provides information and perspectives on key industries and markets, as well as financial analysis of individual companies.
 - The share of Korean automotive parts makers in the global parts production increased from 2.1% in 2000 to 3.1% in 2005 and to 5.1% in 2017.
 - Exports of the Korean automotive parts industry also increased significantly, from 1.1% in 2000 to 3.7% in 2017 of the global total of the auto parts exports.
 - In the case of finished cars, Korea fell to 7th place by falling behind emerging automakers such as Mexico and India. However, it now maintains its position as the fifth largest producer with its advantages in eco-friendly parts, advanced features, and modularization.
- Six Korean parts makers were among the top 100 parts makers in the world (based on sales), with their sales amounting to USD 53.3 billion, accounting for 6.2% of the total sales of the top 100 parts makers.
 - Hyundai Mobis is in 7th place with USD 25.6 billion, showing 2.6% year-on-year increase, HYUNDAI WIA in 36th with USD 7.7 billion, HYUNDAI TRANSYS in 38th with USD 7.5 billion, Hanon Systems in 46th with USD 5.3 billion, Mando in 47th with USD 5.2 billion, and HYUNDAI KEFICO in 96th with USD 1.7 billion.

Ranking of Korean Companies among the World's Top 100 Automotive Parts Makers (based on sales)

(Unit: USD million)

2010		2013		2018	
Company name	Sales amount	Company name	Sales amount	Company name	Sales amount
Hyundai Mobis (9th)	14,433	Hyundai Mobis (6th)	24,677	Hyundai Mobis (7th)	25,624
HYUNDAI WIA (45th)	4,115	HYUNDAI WIA (35th)	6,741	HYUNDAI WIA (36th)	7,758
Mando (53rd)	3,827	Mando (43rd)	5,145	HYUNDAI TRANSYS (38th)	7,574
Hyundai Dymos (92th)	1,338	Hyundai POWERTECH (54th)	3,885	Hanon Systems (46th)	5,396
		Hyundai Dymos (76th)	2,434	Mando (47th)	5,219
				Hyundai KEFICO (96th)	1,754

Source: Automotive News

Development potential of Korea's automotive parts industry

- In Korea, accelerated convergence of industries into the automotive industry increases the share of the automotive parts in the overall automotive industry.
 - In terms of production amount, the proportion of finished cars and automotive parts in the automotive industry in 2010 was 53.1% and 46.9%, respectively, but in 2017, they accounted for 47.4% and 52.6%, respectively, with reversed outcomes.
 - This is attributable to the increase in the automotive parts industry's sales because of the growing importance of automotive parts such as modularization, the expanded roles with their adoption to electronic components, the rising demand of high value-added parts by the advancement of convenience devices, and the export-led industrialization of automotive parts.
- Korea has a strong foundation in automotive parts, and as an IT powerhouse, it also has the ability to properly respond to the smartization of automobiles.
 - The ecosystem in the automotive industry, built on the experience in producing more than 4 million vehicles annually, serves as the foundation for the sustainable development of the industry.
 - With the development of the IT industry, IT convergence in the automotive industry is expected to be quick and effective.



1.3 Promising Fields in Korea

- In the future, India and Mexico are expected to show prominence in the global automotive industry with their competitiveness in general vehicles and general-purpose parts, while developed countries such as Japan and Germany will hold a dominant position in electric power vehicles and autonomous vehicles.
 - Late starters such as China are expected to show their advantage in small- and medium-sized passenger cars, in which Korea has a comparative edge. It is expected to compete with developed countries such as Japan and Germany, keeping ahead of the competition in electric vehicles, hydrogen fuel cell vehicles, autonomous vehicles, and related parts.
 - While the Korean automotive industry is striving to secure its competitiveness in electric power vehicles, autonomous vehicles, and related parts, advanced countries are concentrating their core competencies on the preoccupation of the futuristic car market where full-scale distribution will begin before long.
 - The global EV market is expected to grow 46% annually, creating a market of 4.5 million units in 2022, driven by the paradigm shifts in the automotive industry such as electric power vehicles and autonomous driving. Moreover, the autonomous car market is expected to grow from USD 4.48 billion in 2016 to USD 137 billion in 2021.
- The Korean government has established a strategy to develop and lay the foundation for the growth of the futuristic car industry through innovations in electric-powered cars and autonomous cars, and it plans to invest USD 31.8 billion in public-private partnership projects over the next five years.
 - (Early opening of the era of electric vehicles) Subsidies and incentive systems are in place to improve gas mileage and charging infrastructure to increase user acceptance of EVs.
 - (Securing world-class autonomous driving competitiveness) To secure autonomous driving technology, Korea seeks to localize core parts, establish a demonstration complex, foster workforce, standardize parts, and conduct pilot projects beneficial to people.
 - * A plan for the localization of nine key parts for autonomous driving: Imaging sensor modules for front and side, 77/79 GHz dual-band radars, low-cost rider's sensors, accident data storage (ADR), vehicle-to-everything (V2X) communications technology, digital maps, entry-level compound positioning apparatus, driver-vehicle interface (HVI module), and integrated domain control unit (DCU)
 - (Creating new industries and jobs based on futuristic cars) Promoting core businesses to create a new service market, demonstrate a new service industry based on electric vehicles, and discover and nurture Korean game changers

- (Activating the hydrogen economy by supplying hydrogen cars) Expanding mass production and the distribution of hydrogen car systems and preoccupying fuel cell system module systems for exporting to global markets
 - * Planning to supply 6.2 million hydrogen cars (2.9 million for use in Korea and 3.3 million for exports) and build 1,200 hydrogen charging stations in 2040
- The promising fields of technologies in the Korean automotive industry include electric power vehicles and related parts such as hybrid cars, electric cars, and hydrogen fuel cell cars, as well as autonomous vehicles and related parts based on the country's advanced IT technology.
 - Power-based vehicles such as hybrid and electric vehicles, which are in the early stages in the market, are expected to be commercialized in 2025, and will be positioned in the futuristic car market according to the level of future technology development.
 - The most promising area is vehicle weight reduction to lessen environmental problems, which requires new core materials.
- The Korean automotive parts industry is also moving its center of gravity from parts related to internal combustion engines to electric power and autonomous vehicle parts.
 - Hyundai Motor Group, Korea's leading automaker, has expanded its lineup of electric power vehicles, and plans to develop the Electric-Global Modular Platform (E-GMP), which is dedicated to electrification by 2020, aiming to increase their EV models to 44 in 2025 to achieve its sales target of 1.67 million units, which accounts for 25% of their total sales.
 - In the first half of 2019, Hyundai Motor Group sold 66,578 units of electric power vehicles (PHEVs), battery electric vehicles (BEV), and fuel cell electric vehicles (FCEV), accounting for 1.9% of their total sales.
 - To advance the autonomous driving technology, the company has acquired related startups in cooperation with Intel, Nvidia, and Baidu. By 2022, the company plans to release a level 4 autonomous car that can safely drive itself even when the driver cannot return to the manual operation mode.
- Korea has selected the electric power vehicles as a strategic investment field to respond to the paradigm change in the automotive industry and to explore new opportunities; thus, the related parts are also emerging as a promising field.
 - The demand is growing for battery cells, battery modules, battery management systems (BMS), and on-board chargers (OBC) because of the proliferation of the electric vehicle market. The government's support for technology development is also focused on these areas.



- Hydrogen fuel cell vehicles were commercialized in Korea for the first time in the world, but Korean companies still need to develop their technology in the fields of core materials and membranes in the fuel cell stacks, so the government's support for R&D will continue to improve the production rate of Korea.
- Promising items that can be used in electric power vehicles such as electric vehicles or hydrogen fuel cell vehicles include the following: drive motors, regenerative brake systems, electric cooling pumps, reducers, power converters, vibration attenuation systems, and others, which convert the generated electricity according to the driving conditions.
- If the electronic and information technology of Korea can be applied to the automotive industry, automotive electronic parts and smart cars based on which will emerge as promising fields in the future.
 - Improved functions related to the safety and convenience of cars using IT can be continuously promoted and evolved into autonomous vehicles.
 - Currently, smart car technology is centered on driver convenience and data convergence technology, and the fields emerging as promising fields include basic IT parts and software for automobiles such as semiconductors, sensors, various control units for vehicles, etc.

2 Foreign Direct Investment Trends

2.1 Foreign Direct Investment Status

- In 2018, the total amount of foreign investment in Korea's automotive parts industry was USD 7.18 million for seven cases, as reported.
 - Foreign investment is stagnant because of the global automotive industry's slow growth, but the investment into the Korean automobile industry is continuously being made for participation in its value chain.
 - Korea has signed an FTA with main car-buying regions such as the United States, Europe, and Australia to open mutual markets. Other foreign companies are also active in investing in Korea to take advantage of tariff benefits.
 - Further foreign investment is anticipated to support Korean companies that have technological capabilities in the fields of electric cars and autonomous driving vehicles, but lack capital and experience.

Yearly Foreign Investment in the Automotive Industry

(Unit: USD thousand)

Classification		2013	2014	2015	2016	2017	2018
Finished car	Amount	799,563	10,000	186,000	755,924	504,763	3,674
	No. of cases	6	1	3	6	6	2
Automotive parts	Amount	289,075	142,157	110,998	171,068	322,344	718,173
	No. of cases	43	45	29	33	42	7

Source: Korean Ministry of Commerce, Industry and Energy

Note: Based on the report

2.2 Success Cases of Major Foreign-Invested Companies

Investment status of major foreign companies

- In 2018, 163 foreign-invested companies were active, accounting for 19.6% of primary automotive parts makers.
 - Most of the world's top 10 automotive parts makers are investing in Korea's auto parts industry, each with several subsidiaries in the country.
 - Investors in Korea include Delphi and Visteon of the United States, Bosch and ZF of Germany, Calsonic Kansei and Denso of Japan, and Valeo of France.
 - Foreign-invested companies mainly supply core parts with their high technological skills, and their operating margins exceed the industry average because of their parent companies' high bargaining power.
- Advanced automotive parts makers invest in Korea to make it an important part of their global network.
 - Global auto parts makers are investing in the front-end and rear-end industries in the country (materials and parts) to establish a cooperative model with large Korean companies and to participate in the value chain. Foreign investments are in progress in Korea's flagship industries, including semiconductors, automotive parts, and precision machinery.
 - Korean automakers are investing in the country's automotive parts industry to secure future markets, according to the rapid commercialization of not only internal combustion engine locomotives but also electric and hydrogen fuel cell vehicles.



Status of Advancement of Global Major Automotive Parts Manufacturers in Korea

Country	Parent company	Name of Korean company	Address	Production items	No. of employees in Korea
Germany	Continental	Continental Automotive Systems	Icheon	ECU	1,075
		Continental Automotive Electronics GmbH	Sejong	Clusters and sensors	682
	MAHLE	MAHLE Donghyun Filter Systems	Hwaseong	Filter (oil, fuel, air), plastic intake manifold	581
		MAHLE Behr Korea Inc.	Busan	Automotive engine cooling systems and air conditioning units	162
	BOSCH	Robert Bosch Korea GmbH	Daejeon	Diesel engine electronic control units and related parts	1,237
		BOSCH Electrical Drives	Sejong	Small electric motors and motor controllers for automobiles	541
	ZF	ZF SACHS Korea	Changwon	Shock absorbers	338
		ZF Lemforder Chassis Technology Korea	Gumi	Car chassis and shock absorbers, etc.	63
MANN+HUMMEL	MANN+HUMMEL Korea	Wonju	Filters (for oil, fuel, air, and auto T/M oil)	332	
USA	Borg-Warner Inc.	Korea Borg-Warner TS	Eumseong	Disk set, one-way clutch	435
	Cooper Standard	Cooper Standard Automotive Korea	Seocheon	Weather strips	203
	Federal Mogul	Dongsuh Federal Mogul	Ansan	Pistons and piston pins	310
		Federal Mogul Sejong	Sejong	Engine bearings	326
Japan	Denso	Denso Korea Automotive	Changwon	Automotive air-conditioning and heating, motors and electronic parts	1,255
	Yasunaga	Yasunaga Korea Corporation	Iksan	Crankshafts and connection rods	36
	Calsonic Kansei	Calsonic Kansei Korea	Gimhae	Muffler systems	207
Canada	Magna	WIA Magna Powertrain Co.	Asan	Mirror actuators for cars	24
France	Valeo	Valeo Pyeong Hwa	Daegu	Clutches, cylinders, and torque converters	862
		Valeo ED Systems Korea	Gyeongju	Starter motors, alternators, and distributors	740
		Samsung Valeo Thermal Systems	Changwon	Parts for air-conditioning systems	247
		Valeo Kapec	Daegu	Torque converters and gear actuators	741
	Faurecia	Faurecia Korea	Yongin	Mufflers and exhaust manifolds	579

Source: Korea Auto Industries Coop. Association, Kisvalue

▶ Success cases of foreign-invested companies: Valeo Pyeong Hwa

- Valeo Pyeong Hwa was co-founded in 1988 by Pyeong Hwa Clutch and Valeo, the largest automotive parts maker in France.
 - In December 1990, it was designated as one of the top 100 small- and medium-sized technology-advanced companies, and won the second-year award of the Foreign Investment Award from the Ministry of Commerce, Industry and Energy in July 1999 for continuous technology transfer, development, and quality improvement. It also won the 200 Million Dollar Export Tower on “Trade Day” in 2011.
 - Based on its technological prowess, the company has supplied its parts directly to major automakers in the United States, Japan, and Europe, and has grown into a global company, specializing in automotive parts such as clutches and power trains.
- Valeo Pyeong Hwa is prominent not only in its products but also in its sales and R&D activities, with many of its R&D achievements published.
 - In 2008, the company developed Korea’s first commercial dual-mass flywheel (DMF) and dry double clutch (DDC) in cooperation with Keimyung University, and supplied it to Hyundai Motor Company and Chinese automobile-related companies.
 - In 2015, the company succeeded in localizing and mass-producing the dry dual clutch, a key component of automobile transmission, through relevant industry-academia research and development. This is a unique technology successfully developed by German LUK and Valeo Pyeong Hwa.
- Valeo has continued to grow since its merger with Pyeong Hwa, based on regional cooperation and efforts considering Korea’s local features and culture.
 - Valeo Pyeong Hwa started a business with the largest automotive parts manufacturer in France, securing overseas customers from the beginning and solving technological problems.
 - To cope in the era of competition, the company prioritizes quality competitiveness and strives to create a global competitive advantage through continuous reform and innovation.
 - In 2017, Valeo Pyeong Hwa recorded USD 660 million in sales through successful foreign investment, quality control, and management innovation, with about 22% of its sales coming from exports.



3 Policy and location

3.1 Key Policies and Incentives

▶ Plan to promote the automotive parts industry

- As auto parts makers were facing difficulties because of automakers' poor performance, the government announced its plans to enhance the automotive parts industry to create a healthy and sustainable ecosystem.
 - By utilizing the Support Program for Advancement of Industrial Structure (USD 9 billion over three years) and the Corporate Structure Innovation Fund (USD 900 million), the government is providing customized support for each business, which includes facility investment in new growth areas such as electric vehicles and autonomous vehicles.
 - The government offers customized support for each part maker to enter the global parts market by introducing overseas buyers to them (KOTRA) → R&D and certification (Ministry of Commerce, Industry and Energy, etc.) → Investment and trade insurance support (Korea Development Bank, Korea Trade Insurance Corporation).
- Strengthening R&D programs by investing USD 1.8 billion in developing the core parts of futuristic cars such as electric power vehicles and autonomous vehicles to support small- and medium-sized enterprises (SMEs) that are struggling because of the lack of funds and information during their journey to the era of futuristic cars
 - (Electric cars) Advancement of core parts technology by improving gas mileage (400 km → 600 km) and shortening charging time (200 kW → 400 kW) (USD 450 million, preliminary feasibility study in progress)
 - (Hydrogen Fuel Cell Vehicles) Planning to secure the world's best hydrogen vehicle technology by extending the durability from 160,000 to 500,000 km (preliminary feasibility study in progress worth an amount of USD 330 million)
 - (Autonomous vehicles) Development of technology through the convergence of different sectors such as electronics, telecommunications, IT, etc. (convergent sensing by using camera, radar, LIDAR, and AI-based driving control technologies) and support for mobility service demonstration (about USD 900 million, preliminary feasibility study in progress)
 - (Professional workforce) For the training program for master's and doctorate-level future car developers, the number of member universities will be increased from 7 to 11 in 2020 to foster more than 1,000 specialists by 2022.

- Promoting the expansion of demand for SMEs to enter the futuristic car market and grow into new players in the market
 - When SMEs are commissioned to produce cars, they can receive financial, technological, and other forms of support (employment subsidies, local investment promotion subsidies, etc.).
 - Promote mass production and improve the competitiveness of electric bus makers through private investment, and support distribution by creating a cooperation model among the local government, private funds, and bus makers.
 - Provide an open electric vehicle platform for SMEs to develop and sell electric vehicles directly (2019-2021, USD 30 million), modularize and commonize core parts, and lower the costs of the parts through joint purchases.

🔹 **Expansion and advancement strategy for smart factories**

- Supporting SMEs to establish and advance various types of smart factories suitable for the situation in Korea and to enhance the competitiveness of their manufacturing sites
 - To improve the product design and production process, build smart factory solutions using cutting-edge technologies such as IoT, 5G, and big data, and support in purchasing automation equipment, controllers, and sensors (USD 90,000 support per new smart factory).
 - Upgrade the existing systems to improve the utilization and dissemination of smart factories, and further build and link the systems associated with smart factories' facilities (USD 135,000 support for upgrading existing systems).
- Support the advancement of process technology and parts for automotive parts companies.
 - Support construction of smart factories for 2,000 small- and medium-sized parts companies by 2022 through loans from Korea Development Bank (KDB) and Industrial Bank of Korea (IBK) (500 companies per year).
 - Implement pilot projects to build smart industrial complexes in the areas with a high concentration of parts companies, add high values to internal combustion engine parts, and support technology development based on orders.



Smart Factory Support Project

Project name	Type of support	Content of support	Government support funds (per industry, max)
Smart factory construction and advancement	New construction	• Support the establishment of solutions and interlocking facilities for companies that do not have smart factories.	Up to USD 90,000 (up to 50% of the total project cost)
	Advancement	• Support the upgrading of smart factories for companies that have built smart factories.	(Basis) USD 90,000 (Medium 1* or more) USD 135,000
	Win-win of large-SME	• The government will partially support the cost if a host entity (large company, etc.) cooperates with SMEs to build a smart factory.	Up to USD 45,000
	Pilot factory	• Support the establishment of pilot plants that can be benchmarked by a company.	USD 270,000 (Supported about 30 companies in 2019)
	Specialization by category	• Support companies with similar manufacturing processes to build common specific solutions for smart factories.	USD 90,000
Smart Meister	• Offer problem-solving services to companies during their on-site diagnosis and construction of smart factory building.	Meister's labor costs (for two days a week with USD 2,800 per month for six months)	
Strengthening smartization capacities		Consulting costs (up to USD 6,900 will be offered out of a total of USD 8,600 for up to six months (the remainder of USD 1,700 will be paid by the company)	

Source: Ministry of SMEs and Startups

Note: A smart factory is constructed in the following stages: The basic stage (tracking of production history), middle stage 1 (decision-making through the real-time aggregate analysis of production equipment information), middle stage 2 (sharing information of the supply chain with the parent company, real-time decision-making, and automation of controls), and advanced stage (IoT and flexible, customized production based on CPS).

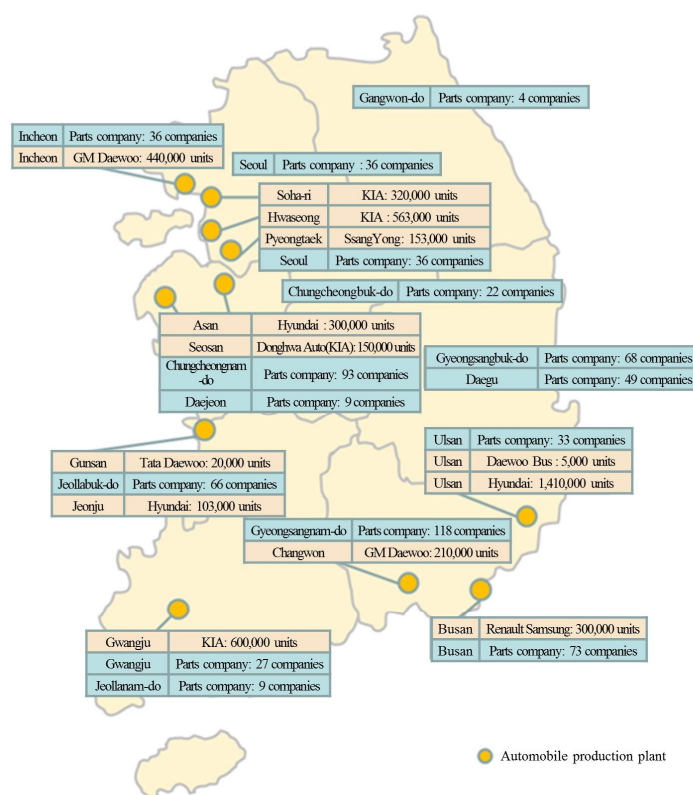
3.2 Major Locations

▶ Status of Locations of the automotive industry

- The Korean automotive industry is relatively scattered nationwide, with a high proportion of the auto industry in each region and playing an important role in revitalizing the local economy such as job creation and maintenance.
 - The automotive industry is divided into three clusters: The West Coast cluster, including the Seoul metropolitan area, Southeast cluster centered on Ulsan, and the Honam cluster including Gwangju and Gunsan.

- In the metropolitan area, there are finished car factories of Kia Motors and GM Korea as well as research centers and factories of major parts companies, including Namyang R&D Center of Hyundai Motor Group, etc.
 - This area has the driving test routes of Hyundai Motors, Korea Automobile Testing and Research Institute of Korea Transportation Safety Authority, etc., along with an autonomous car testing city (K-City, Hwaseong, Gyeonggi-do) with areas dedicated to autonomous vehicle testing.
- The Chungcheong region, which belongs to the West Coast cluster, has the third largest production capacity in Korea after Ulsan and Gyeonggi-do, based on finished car production. Moreover, 124 primary suppliers are concentrated in Cheonan, Asan, and Dangjin, which include Hyundai Mobis (Asan), Daihan Climate Control (Cheonan), and HYUNDAI POWERTECH (Seosan).
 - In Cheonan, the Automotive Parts Research Institute is located to support automotive parts manufacturers through R&D, test certification, training, and information provision.
 - In Chungcheongbuk-do, a fuel cell stack factory for hydrogen fuel cars will be located, producing 40,000 stacks annually.

Distribution of Korean Automobile Factories and Primary Auto Parts Makers



Source: KAICA and automakers Note: Based on 2018 capacity



- The automobile industry in the Honam region forms a belt that extends to Kimje, Iksan, Jeongeup, Gunsan, Wanju, and Gwangju, accommodating finished car factories such as Hyundai Truck & Bus, Tata Daewoo, and Kia Motors.
 - The region produces about 94% of Korean mid- and large-sized commercial vehicles, and 100% of medium- and large-sized trucks. A large number of its industries concentrated are related to commercial vehicles, special vehicles, tractors, and agricultural machinery.
 - Located in Gwangju, Kia Motors has a production capacity of 600,000 units, which are mainly SUVs and CUVs. It plans to produce small cars in 2021 by attracting automotive factories joined the Gwangju Job Project* in 2018.
 - * Automotive factories adopted the Gwangju Job model, which aims to achieve labor-management win-win and social integration to improve workers' quality of life and enhance the sustainability of existing jobs.
 - In 2018, the production capacity was reduced by 300,000 units because of the closure of GM Korea's Gunsan plant. However, MS, a first-tier parts maker, will take over the Gunsan plant and begin to commission the production of electric vehicles from 2021.
- In Southeast, major Korean automakers are located, such as Hyundai Motors, Renault Samsung Motors, and GM Korea, along with 337 primary parts makers.
 - The three regions, Gyeongsangnam-do, Ulsan, and Busan, have established divisions of labor, while Gyeongsangnam-do and Ulsan have high self-procurement rates.
 - Daegu and Gyeongsangbuk-do have parts companies related to body parts, design, chassis, power train, and electronic parts, with the parts supplied to Gyeongsangnam-do and the metropolitan area as there are no automakers nearby.
 - With automobile production plants with a long history, these regions have ports, transportation infrastructure, logistics systems, and skilled workers. Moreover, related industries such as steel, petrochemical, and machinery industry are located nearby.

▶ Project to support the regional specialization of the automotive industry

- As the technological paradigm changes, local governments are supporting the development and commercialization of electric vehicles, hydrogen fuel cell vehicles, and autonomous vehicles, as well as the development of core components for these new vehicles. They are also seeking to maximize regional synergy effects by strengthening regional innovation capacity and specialization by supporting industry-academic cooperation projects that are appropriate for local conditions.

- Daegu and Gyeongsangbuk-do are focusing on the development of autonomous vehicle-related technologies, and plan to build infrastructure such as roads and control systems to test autonomous vehicles.
- The Jeollabuk-do region will build a production base of commercial hydrogen cars using its existing production base; Ulsan will build infrastructure to develop core technologies for fuel cells and electric vehicles; and Chungcheongnam-so will specialize in hydrogen vehicle parts.

4 Potential Partners

4.1 List of Related Companies

Company name	Main items	Website	Location
Hyundai Mobis	Chassis modules, driver seat's modules, electronic parts, and brake systems	www.mobis.co.kr	Ulsan, Asan, Gwangju, Seosan, Chungju, Cheonan
Mando	ABS, ECPS, brakes, and steering systems	www.mando.com	Pangyo, Pyeongtaek, Wonju, Iksan
Hanon Systems	Compressors, intercoolers, and air-conditioning modules	www.hanonsystems.com	Daejeon, Pyeongtaek, Ulsan
Sungwoo Hitech	Body parts	www.swhitech.com	Busan, Yangsan
HYUNDAI WIA	Transmissions and CV joints	www.hyundai-wia.com	Changwon, Ansan, Pyeongtaek, Seosan, Ulsan
Inzi Controls	Engine cooling systems and sensors	www.inzi.co.kr	Siheung, Gyeongju, Okcheon
SL Corporation	Lamps, chassis, steering, power trains, levers, and door modules	www.slworld.com	Gyeongsan
Hwashin	Chassis modules, body parts, and engine parts	www.hwashin.co.kr	Yeongcheon
DY	DC motors and wipers	www.dy.co.kr	Incheon, Asan, Changwon
S&T Motiv	Transmissions, chassis, and ECUs	www.sntmotiv.com	Busan, Incheon, Changwon, Yangsan, Boryeong
SEOYON E-Hwa	Door trims, interior parts, and seats	www.seoyoneh.com	Ulsan, Asan, Anyang
Pyeong Hwa Automotive	Door modules, latching systems, and system modules	www.phakr.com	Daegu, Asan, Suwon
Sejong Industrial	Silencer mufflers and purifiers	www.sjku.co.kr	Yongin, Asan, Ulsan



Company name	Main items	Website	Location
Motonic	Engine parts, sensors, and rocker arms	www.motonic.co.kr	Daegu, Seongju
YURA	Wire harnesses	www.yuracorp.co.kr	Cheongju, Pyeongtaek, Gyeongju
HYUNDAI TRANSYS	Transmissions, axles, and seats	www.hyundai-transys.com	Asan, Ulsan, Seosan, Hwaseong
Korea Flange (KOFKO)	Axles, flanges, and half shafts	www.kofco.co.kr	Ulsan
HYUNDAI KEFICO	Power train control systems	www.hyundai-kefico.com	Gunpo
Kyungshin	Wire harnesses, junction blocks, and connectors	www.kyungshin.co.kr	Incheon, Hwaseong, Gunsan
DONGHEE	Fuel tanks, roof systems, axle housings, and electronic components	www.donghee.co.kr	Hwaseong, Asan, Ulsan, Gwangju
Duckyang Ind.	Driver modules, crash pads, door trims, consoles, and antipads	www.dyauto.kr	Ulsan, Gyeongju, Yesan
Austem Company Ltd.	Steel wheels, body parts, chassis parts, and seats	www.austem.co.kr	Cheonan, Incheon
Sangsin Brake	Brake parts	www.sangsin.com	Daegu
Hwaseung R&A	Brake hoses and conveyor belts	www.hsrna.com	Yangsan
Doowon Climate Control	HVAC, cooling motors, condensers, and compressors	www.dwdcc.com	Asan
MANN+HUMMEL Korea	Oil filters, air filter cabin filters, and suction systems	www.mann-hummel.com	Wonju
Erae Automotive Systems	HVAC modules, steering devices, converters, and braking parts	www.erae-automotive.com	Daegu, Gunsan, Jincheon-gun
Daewon Kang Up	Coil springs, leaf springs, stabilizer bars, and vehicle seats	www.dwku.com	Cheonan, Changwon
Autoliv Korea	Airbags and seat belts	www.autoliv.com	Hwaseong
Samkee Automotive	Head covers, oil pans, valve bodies, and oil pump covers	www.samkee.com	Pyeongtaek, Seosan
Hands Corporation	Aluminum alloy wheels	www.handscorp.co.kr	Incheon, Hwaseong
Yoosung Enterprise	Piston rings and cylinder liners	www.ypr.co.kr	Asan, Daegu, Ulsan
Korea Electrical Terminal	Automotive connectors and lead frame	www.ket.com	Incheon, Pyeongtaek, Gwangju

Company name	Main items	Website	Location
Daehan Solution	Vibration and noise system engineering parts	www.dhsol.com	Incheon, Gwangju, Gyeongsan
Seojin Automotive	Clutch covers, clutch discs, flywheels, and clutch facings	www.secoautomotive.com	Siheung
Myunghwa	Engine water pumps, engine oil pumps, input shafts, and planet carriers	www.myunghwa.com	Ansan, Ulsan, Asan
Kwangjin	Door modules and window regulators	www.kwangjin-kr.com	Gwangju, Hwaseong, Gyeongju
GMB Korea	Bearings, cooling systems, transmissions, pumps, and rollers	www.gmb.co.kr	Changwon, Seosan, Anyang
Woojin Industry	Oxygen sensors, air heaters, and spark plugs	www.ngkntk.co.kr	Ansan
Central	Ball joints, control arms, stabilizer links, tie rods, and transmissions	www.ctr.co.kr	Changwon, Ulsan, Daegu
Ajin Industrial	OBC, PTC heaters, air-conditioning parts, and voltage controllers	www.wamc.co.kr	Gyeongsan
Woory Industrial Company	Heater controllers, fuel sensor assemblies, LPM, and MPM	www.woory.com	Yongin, Daegu, Pyeongtaek
MANDO-HELL A Electronics	Sensor and ECU	www.mandohella.com	Incheon
Castec Korea	Turbin housings and center housings	www.castec.co.kr	Busan, Changwon
Kodaco	Valve bodies, converter housings, throttle bodies, and water pump housings	www.kodaco.co.kr	Cheonan, Anseong
Korea Fueltech Corporation	Filler necks and canisters	www.kftec.com	Anseong, Gyeongju
SJM	Bellows	www.sjmflex.co.kr	Ansan
Dae-II Corporation	Transmission gears	www.dicorp.co.kr	Ulsan
Daewoo Electronic Components	Regulators and condensers	www.dwecc.com	Jeongeup, Daejeon
Keyang Electric Machinery	DC/BLDC motors and power seat motors	www.keyang.co.kr	Ansan and Cheonan

4.2 Related Associations

Company name	Website	Major roles
Korea Automobile Manufacturers Association	www.kama.or.kr	<ul style="list-style-type: none"> ▪ The association is a representative of automakers and offers recommendations to the government to help carry out projects to promote the automobile industry and improve policy systems related to the automobile industry. ▪ It also plays a role in establishing international cooperation and building overseas trade networks with major countries.
Korea Auto Industries Coop. Association	www.kaica.or.kr	<ul style="list-style-type: none"> ▪ The association represents the auto parts industry and provides various support to auto parts companies, as well as helps them enter global markets by offering opinions to the government and promoting exports as a supporter and mediator.
Foundation of Korea Automotive Parts Industry Promotion (KAP)	www.kapkorea.org	<ul style="list-style-type: none"> ▪ The organization is a private-public corporation that is established to secure the global competitiveness of the auto parts industry. ▪ It performs various support projects for small and medium auto parts companies to solve their technological difficulties, establish quality systems, and improve their business management. Moreover, it provides useful information on the entire automotive industry.
Korea Automotive Technology Institute	www.katech.re.kr	<ul style="list-style-type: none"> ▪ The institute performs various support activities such as R&D, test certification, education, and information provision to secure the self-sustainability of the Korean auto parts companies, and to foster the industry. ▪ It performs research on green car power systems, smart car technology, material technology, convergence systems, and reliability. ▪ It provides support to enhance the research capacity of regional areas through research project planning by region, technical support, and joint research with local automobile companies.
H2 Korea	www.h2korea.or.kr	<ul style="list-style-type: none"> ▪ H2 Korea helps create the policy road map and grow hydrogen economy through the revision of laws and construction of infrastructure for private production and the supply of hydrogen. ▪ It provides statistics and information about the distribution of hydrogen electric vehicles, hydrogen electric vehicles, and hydrogen charging stations. Moreover, it performs planning and research activities for domestic and overseas projects related to hydrogen electric vehicles.

Company name	Website	Major roles
<p>Busan Automobile Parts Industries Corp. Association</p>	<p>www.baica.or.kr</p>	<ul style="list-style-type: none"> ▪ The association supports the development of new technology and improvement of quality for its members engaged in the automotive parts industry in Busan. ▪ To revitalize the automotive parts industry, it also conducts industry-related research activities, offers technological education, and supports its members in increasing exports and participating in exhibitions locally and abroad.
<p>Korea Electric Vehicle Association</p>	<p>www.keva.or.kr</p>	<ul style="list-style-type: none"> ▪ To expand the distribution of electric vehicles, the association supports companies through the exchange of information with overseas organizations, research on related industries, the optimization of related infrastructure, and improvement measures to expand distribution.



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