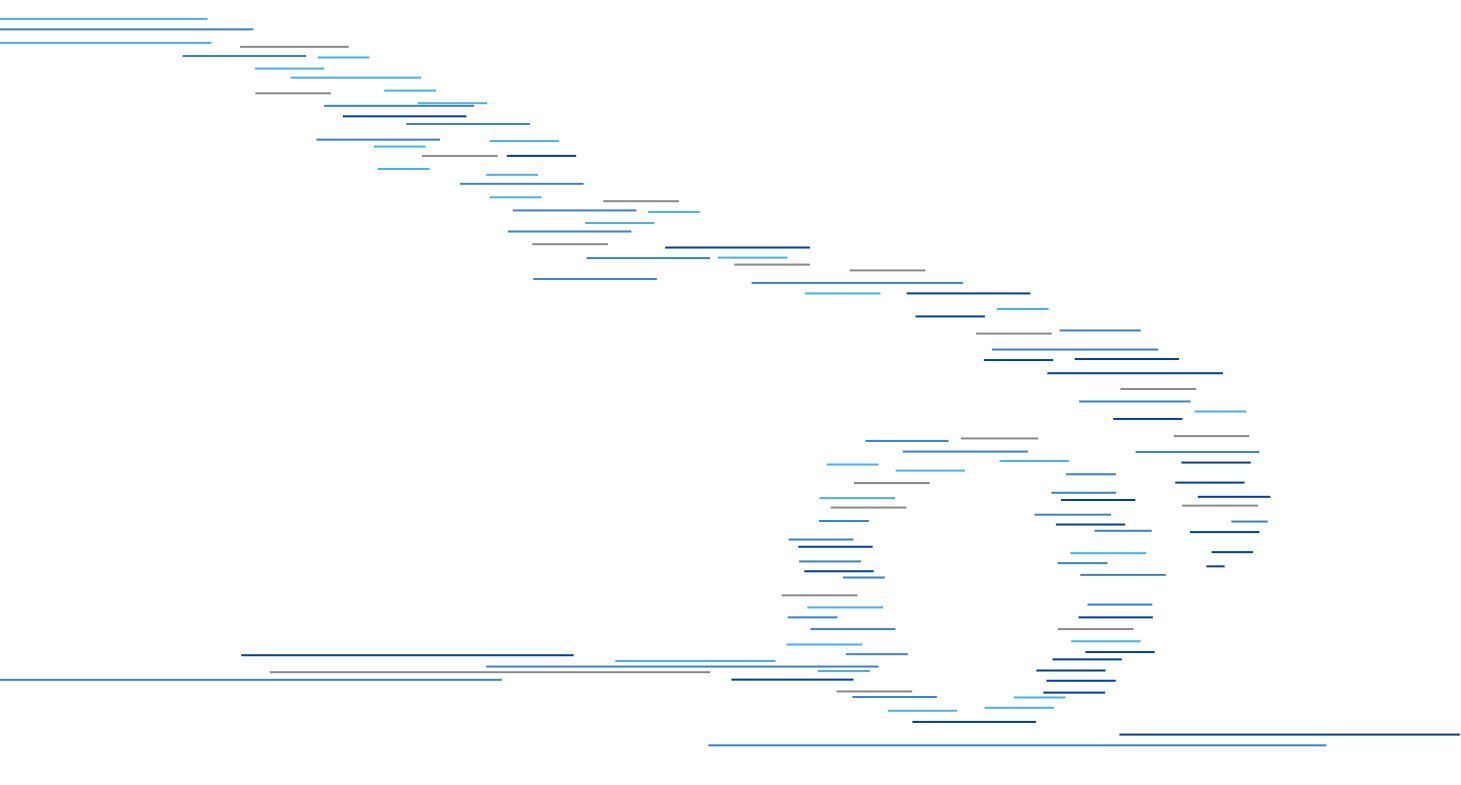


Mando

Driving with Technology

Mando Sustainability Report 2019



About this report

In hopes of sharing Mando’s sustainability management activities and performances with our stakeholders from various fields, we published our second Mando Sustainability Report for the year of 2020, following the first publication in 2019. In this report, we introduced our key future technologies developed to realize Mando’s vision, “Our vision is your freedom,” which aims towards stakeholders' ultimate freedom. We also report the economic, environmental, and social values that have been created in 2019, based on the 15 material topics of sustainability for the sustainable development of Mando.

Report Standards

This report is reported in accordance with core options of GRI Standards, which is a global reporting guideline; and it contains contents from ISO 26000 and UN SDGs.

Report Boundaries

Pangyo R&D Center and regional offices in Wonju, Pyeongtaek and Iksan (Data of activities and performances of global site partially included)

Report Period

January 1-December 31, 2019
(Achievements for the first half of 2020 partially included)

Report Cycle

Annually (publication date of the previous report: April 2019)

Report Assurance

Independent third-party assurance



This report is published on an interactive PDF in which a reader can easily access to relative pages within the report and external websites by one click.

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Contents

About Mando

CEO Message	04
Company Overview	06
Mando's Business	10

Our Vision is Your Freedom

Our Products, Your Freedom	16
Safer	18
Greener	20
Easier	22

Approach to Sustainable Values

Governance	26
Ethics and Compliance	28
Risk Management	30
Stakeholder Engagement	32
Sustainability Management System	34
Materiality Assessment	36

Creating Sustainable Values

Value Creation Business Model	40
Economic Values	42
Securing the Future Growth Engines	43
Realizing of the Optimal Quality	50
Environmental Values	54
Response to Climate Change	55
Reduction of Environmental Pollution	57
Social Values	60
Creation of a Safe Working Environment	61
Expansion of a Happy Corporate Culture	63
Mutual Growth with Partners	67
Domestic and Overseas Social Contribution Activities	70

Appendix

Data Center	75
GRI Content Index	80
Independent Assurance Statement	84
Membership of Associations	86
2019 List of Awards	86

CEO Message



Dear distinguished stakeholders,

The global automotive market is facing unprecedented changes with the emergence of stagnant growth, peak car, falling demands, and the expansion of the sharing economy. The outbreak of COVID-19 that started in the first quarter of 2020 is raising uncertainties and a sense of crisis within these shifts. Despite the management difficulties in this kind of situation, Mando is taking a variety of approaches in the economy, environment, and society to wisely overcome the crisis. This report presents the economic, environmental, and social values we achieved together with our stakeholders in 2019 and our plans for the year of 2020. I extend my gratitude to all of you for your endless care and support, and here, I share with you our activities and achievements of the year.

Going Beyond Manufacturing

The automotive industry can no longer survive adhering to the conventional manufacturing practices only. Bold innovations must be taken to respond to the market demand and changes, such as autonomous driving, electric cars, and artificial intelligence in cars, to name a few. To realize this, we eliminated unnecessary factors in all of our work processes and commenced digital transformation activities for added value. We intend to improve how we work in innovative ways, such as data-driven decision-making, smart factory, and robotic process automation.

Moreover, “Something New” is one of Mando’s 2020 management policy for which we are striving to discover new growth engines. We established WG Campus, a fully devoted organization for developing new technologies and investing in promising startups, to create new business for Mando. In addition to expanding our business scope through these new businesses, we desire to create more values beyond being a manufacturing company in a collaboration with the global players.

Our Vision for a Better Tomorrow

“Our vision is your freedom. In our creation, your tomorrow will be safer, greener, and easier,” the vision of Mando for a better tomorrow. “Safety” is the start for a better tomorrow. The safety of drivers, not to mention, of passengers and pedestrians, definitely come first as our utmost priority, thus we verify the performance and reliability of our products by testing in far more extreme conditions than the actual environment.

We also consider eco-friendly factors from the product design stage and make efforts to find solutions for environmental issues. In 2019, we participated in the governmental project called “Reduction of Non-Exhaust Emissions from Vehicles” hosted by the Ministry of Trade, Industry, and Energy. Furthermore, all of our global sites are advancing the environmental management system by acquiring ISO 14001 certification and enhancing the compliance system for environmental laws in each country. We aim to lead the future mobility industry with our core technologies. We will expedite to secure the necessary technology for each level of autonomous driving and quickly put them into products/services to promote the convenience of both drivers and passengers. These activities will lead us in achieving our vision, and become the cornerstones of creating a better tomorrow.

Mando’s Future Created by All of Us

The achievements Mando has seen so far undoubtedly come from active cooperation with our stakeholders. We will continue to communicate with our stakeholders and seek ways to grow together. We are committed to strengthening our connections with local communities around the globe through social contribution activities, including the “Roly-poly Love Wheelchair” that we have been doing for 9 years as well as “Seed School” and “Halla Biscuit Camp”, the career counseling programs for adolescents.

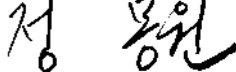
We were also recognized for our efforts to achieve mutual growth with partners, receiving an “Excellent” grade for 2018 and 2019 Mutual Growth Indexes. By sharing our royalty-free patents and facilitating the certification of quality system, we will step up our commitment to support our partners.

To provide a safer working environment for our employees, we aim to reduce the factor of safety index by 50% until 2024. As much as we care about the physical environment, we also strive for creating a strong corporate culture. We have a town hall meeting on regular basis for transparent and active communication within an organization, and simplified the hierarchy system for flexible and horizontal corporate culture. We are building a genuine communication, where employees are encouraged to speak up and listen to one another. By doing so, we will become a flexible and agile company in responding to any future changes that may come.

In 2019, we created economic values as well as social and environmental values embracing the needs of many stakeholders. We all know 2020 will be a tough year due to the spread of COVID-19, but we will strengthen our resilience by changing the way we work and trying new attempts, and continue pursuing the economic, social and environmental values. We look forward to your continued interest and support in Mando and our journey of preparing the future based on sustainable values.

May 2020

CEO and Chairman Mong-Won Chung



Company Overview

About Mando

Mando is a global automotive parts company, supplying automotive parts to over 60 domestic and overseas car manufacturers. In Pangyo Global R&D Center and over 50 global sites, including those in Asia, North America, South America, and Europe, we execute the processes of design, assembly, manufacture, supply, and sales. We also focus on developing advanced technologies with high added-value for automotive parts that form the basis of automobile safety, such as chassis products, autonomous driving, and hybrid/electric/hydrogen fuel cars.

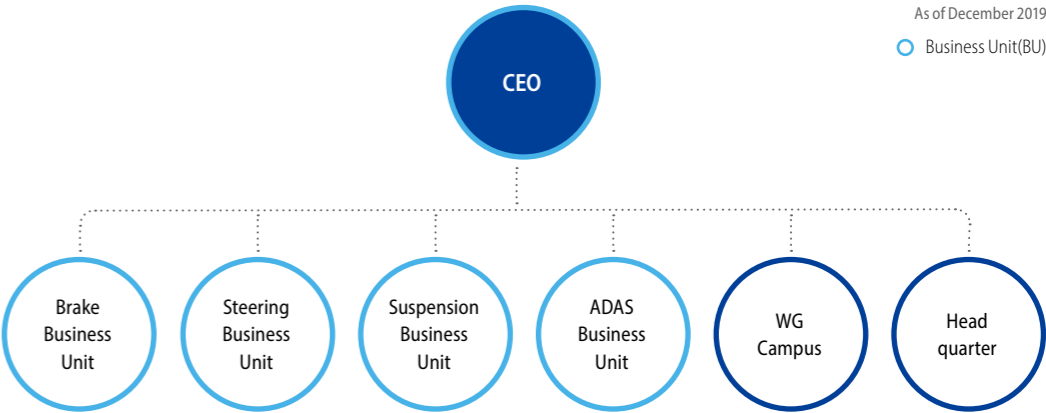
Company Name	Mando Corporation ¹⁾
Date of Establishment	October 1, 1962
CEO	Mong-Won Chung, Il-Hwan Tak, Kwang-Heon Kim (each CEO system)
Headquarters	32, Hamanho-gil Poseung-eup, Pyeongtaek-si, Gyeonggi-do
Business Activities	Manufacturing and sales of automotive parts
Number of Business Sites	20 manufacturing plants, 18 R&D centers, 8 sales and trade office, 7 vehicle test sites
Liability	KRW 3,010 billion
Capital	KRW 1,586 billion
Sales	KRW 5,982 billion
Credit Rating ²⁾	AA-
Number of Employees	12,061 (Including global site)

As of December 2019

1) Established as a spinoff of the automotive parts manufacture/sales section of Halla Holdings Corporation on September 2, 2014. Listed on the Korea Exchange securities market on October 6, 2014.
2) Source: Korea Investors Service

Corporate Organization

To quickly respond to changing automotive industry and strengthen the responsible management of products, Mando formed business units in accordance with four product sectors: Brakes, Steering, Suspension, and Advanced Driver Assistance System (ADAS), in January 2019. In September 2019, WG Campus for the development of new business, which is composed of EV Lab for developing parts of eco-friendly vehicle. F3 Lab for discovering new business, and New Business Team for discovering and investing in domestic and overseas startups, were established in preparation to lead the future market.



History of Mando

Since its establishment in 1962, Mando has been growing as a global specialist in automotive parts with footprint all around the world, including in China, the US, and India. It has expanded its number of overseas orders and is recognized for its outstanding product quality and advanced technologies. We will continue our research, development, and discovery of future growth engines to be recognized worldwide not only by the existing projects, but also by the many new ones to come.

1962~1999

- 1962** Founded Hyundai Yanghaeng
- 1989** Established Winter Test Center in Sweden
- 1996** Established Mando America Corporation (MCA; production corporation in the US)
- 1997** Established Mando India Limited (MAIL; production corporation in India)
Established Maysan Mando Turkey (MMT; production corporation in Turkey)
- 1999** Established as a new company, Mando Corporation

First Korean Automotive Parts Company

2000~2007

- 2002** Established Mando Suzhou China (MSC; production corporation in Suzhou, China)
- 2003** Established Mando Beijing China (MBC; production corporation in Beijing, China)
Established Mando R&D Center China (MRC; R&D center in Beijing, China)
- 2004** Established Mando Tianjin China (MTC; production corporation in Tianjin, China)
- 2005** Established Mando Softtech India (MSI; R&D center in India)
- 2007** Established Mando (Beijing) Trading Co., Ltd. (sales corporation in Beijing, China)

Expansion of New Investments and Mando into the Global Community

2008~Present

- 2008** Established joint venture Mando Hella Electronics with Germany's Hella
- 2010** Established Mando Corporation Europe (MCE; production corporation in Europe)
Established Mando Corporation Brazil (MCB; production corporation in Brazil)
Mando's ABS and TCS selected as top 100 Korean technologies
Received National Green Tech Award for Mando's eco-friendly, motor-driven steering system
- 2011** Established Mando Corporation Poland (MCP; production corporation in Poland)
Established a joint automotive part venture with Brose of Germany
- 2012** Constructed Global R&D Center in Pangyo, Korea
Established Mando China Holdings Limited
Established Mando Ningbo Automotive Parts (MNC; production corporation in Ningbo, China)
- 2013** Established Halla Mechatronics (R&D center in the US)
- 2014** Independently developed the world's first Active Retraction Caliper (ARC)
- 2015** Established Mando Corporation Mexico (MCM; production corporation in Mexico)
Established Mando Chongqing China (MCC; production corporation in Chongqing, China)
- 2016** Received grand prize in conglomerates category of the 2016 Korea Labor and Management Cooperation Awards
- 2017** Established Mando Innovations Silicon Valley (MISV)
- 2018** Commenced first production of Mando's Integrated Dynamic Brake (IDB)
Held Mando Mobility Tech UP+ Program (startup cultivation program)
- 2019** Established development organization for new business (WG Campus)
Demonstrated Hockey, Level 4 autonomous driving

For a Sustainably Growing Company

Vision and Philosophy

Vision

Mando's vision is to contribute to a safer, greener, and easier tomorrow for all the stakeholders, including our customers and the Mando family. Our ultimate goal is to pursue freedom from inconveniences concerning safety, environment, and our daily lives through innovative technology.



Core Values

Core values refer to the code of conduct that Mando's members must pursue for the realization of its vision. Under our core values of "Integrity, Frontier, and Cooperation," we aim towards becoming a global player by continuously developing a corporate culture that faces towards one direction.

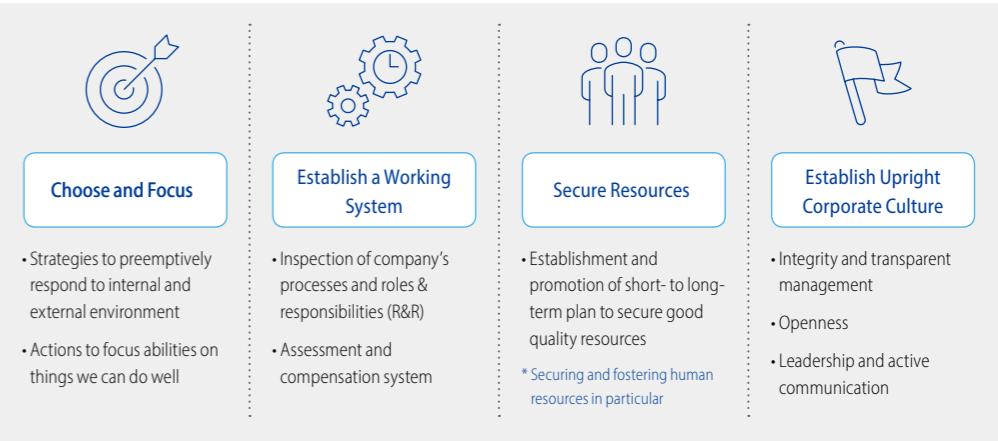
Code of Conduct



Management Philosophy

Mando established "Halla Way" as its business philosophy, aiming to become a company that continues to grow under any circumstances. Halla Way is a path to which all our members must walk together for realization of a better future while also being a necessary task to be fulfilled in management activities.

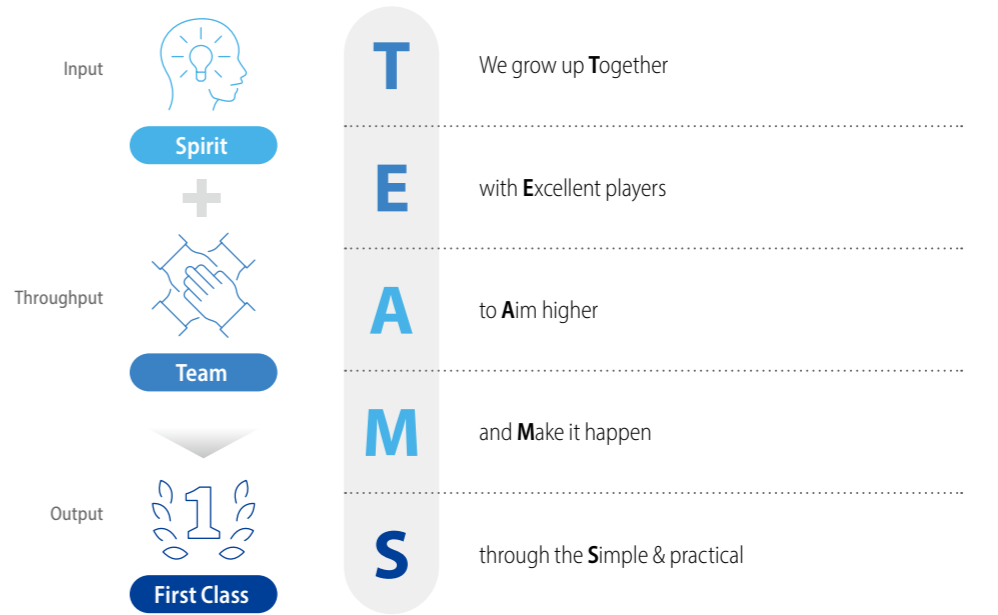
4 Assignments to Practice for Halla Way



HR Philosophy

Mando views its human resources as its main source of value creation and pride. In order to be recognized as a "First Class" company through a "Spirit" that overcomes difficult circumstances and a "Team" that creates synergy with collaboration, we follow the 5 principles of the Halla people "T.E.A.M.S." as our HR philosophy.

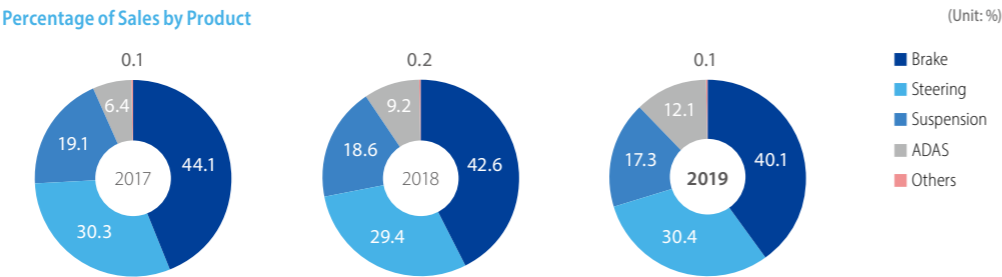
The 5 Principles of Halla People



Mando's Business

Mando Products

Mando produces brake, steering, suspension, ADAS (Advanced Driver Assistance Systems) and other electrical components required for electric vehicles and mobility. It also provides a total solution for sensors, integrated control processors, and driving control devices. We currently supply our automotive parts to the world's top 10 automobile manufacturers and continue to seek more customers through the development of our outstanding technology, quality, and price competitiveness.

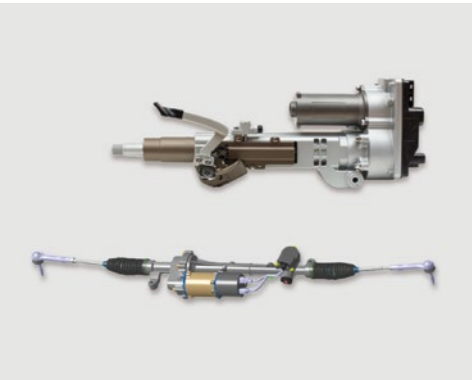


Brake System

High-quality brake system recognized by global automotive industry

Mando is fully equipped with mechanical/electric brake products and control systems. We also contribute to securing the safety of internal combustion engine, electric and self-driving vehicles, as well as the safety of drivers and pedestrians in a driving environment.

MoC, ABS / ESC, Integrated Dynamic Brake



Steering System

Powerful and competitive premium steering system

Mando independently developed a steering system composed of a gear system, column, IMS, electric power steering, and control logic, which is needed for controlling the direction of vehicles. The development of its innovative redundancy increased the safety and convenience of all vehicles, including internal combustion engine and battery electric vehicles.

Ball Nut EPS, Redundant Powerpack, Steering Torque Overlay, Steer by Wire



Suspension System

World-class suspension system for the best ride quality

Mando's suspension systems, including struts and shock absorbers, provide optimal ride quality, dynamic driving performance, and steering stability.

Smart Damping Control, Active Motion Control



ADAS

ADAS Technology for absolute autonomous driving

Mando's ADAS technology, which assists drivers by providing a comfortable driving environment through advanced convenience and safety, features accident-preventing technologies such as preventing lane departure and collisions.

Front Radar, Corner Radar, Front Camera, Long Range, Short Range



xEV

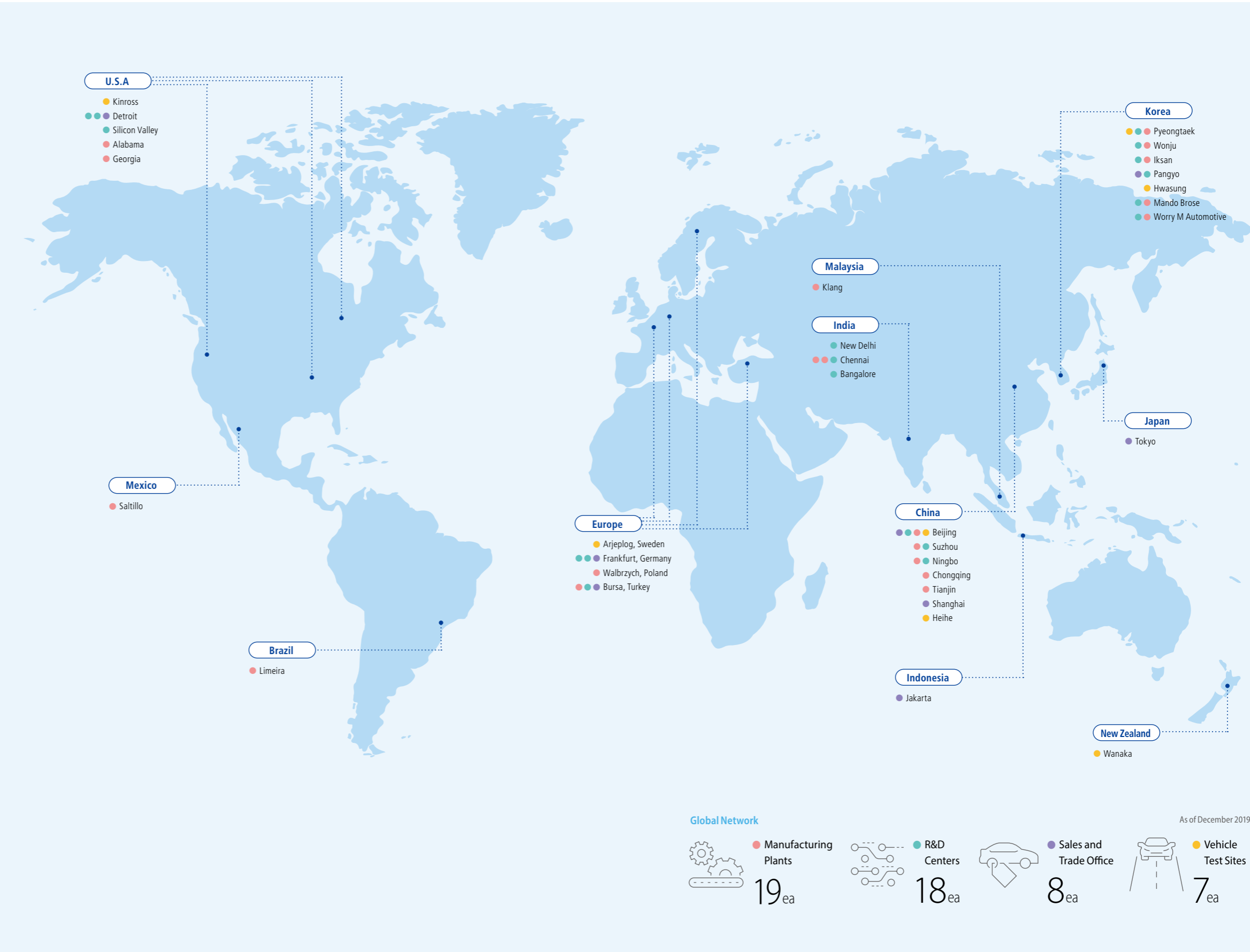
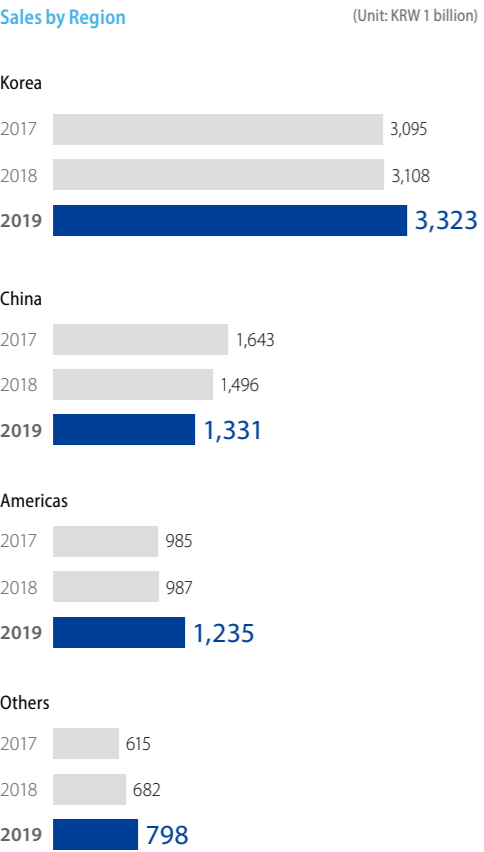
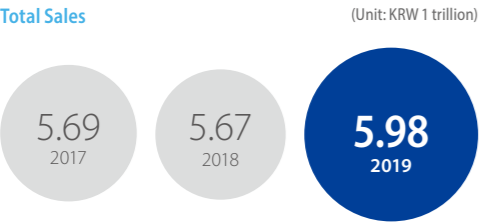
Eco-friendly vehicles for leading the future automotive market

Mando is developing advanced technologies and products in preparation for the future automotive market of eco-friendly cars and micro e-mobility based on Mando's capabilities, from eco-friendly electric vehicle charging devices and driving system products to service platforms.

On-Board Charger, e-Drive, Fuel Cell DC-DC Converter, H2 Care (Service App), e-Mobility Module

Global Business Sites

Mando is proactively expanding its business into the domestic and overseas markets, striving to solidify its position in the global market. As of the end of 2019, we are operating over 50 establishments in 14 countries, including China, the US, Germany, and India, retaining global hubs in Asia, North America, South America, and Europe.



Our Vision is ————— Your Freedom

We lead the global automotive market
with sustainable core technologies

Mando prides itself on its R&D technology striving for
a safer, greener, and easier lifestyle.

Our Products, Your Freedom

Safer	18
Greener	20
Easier	22



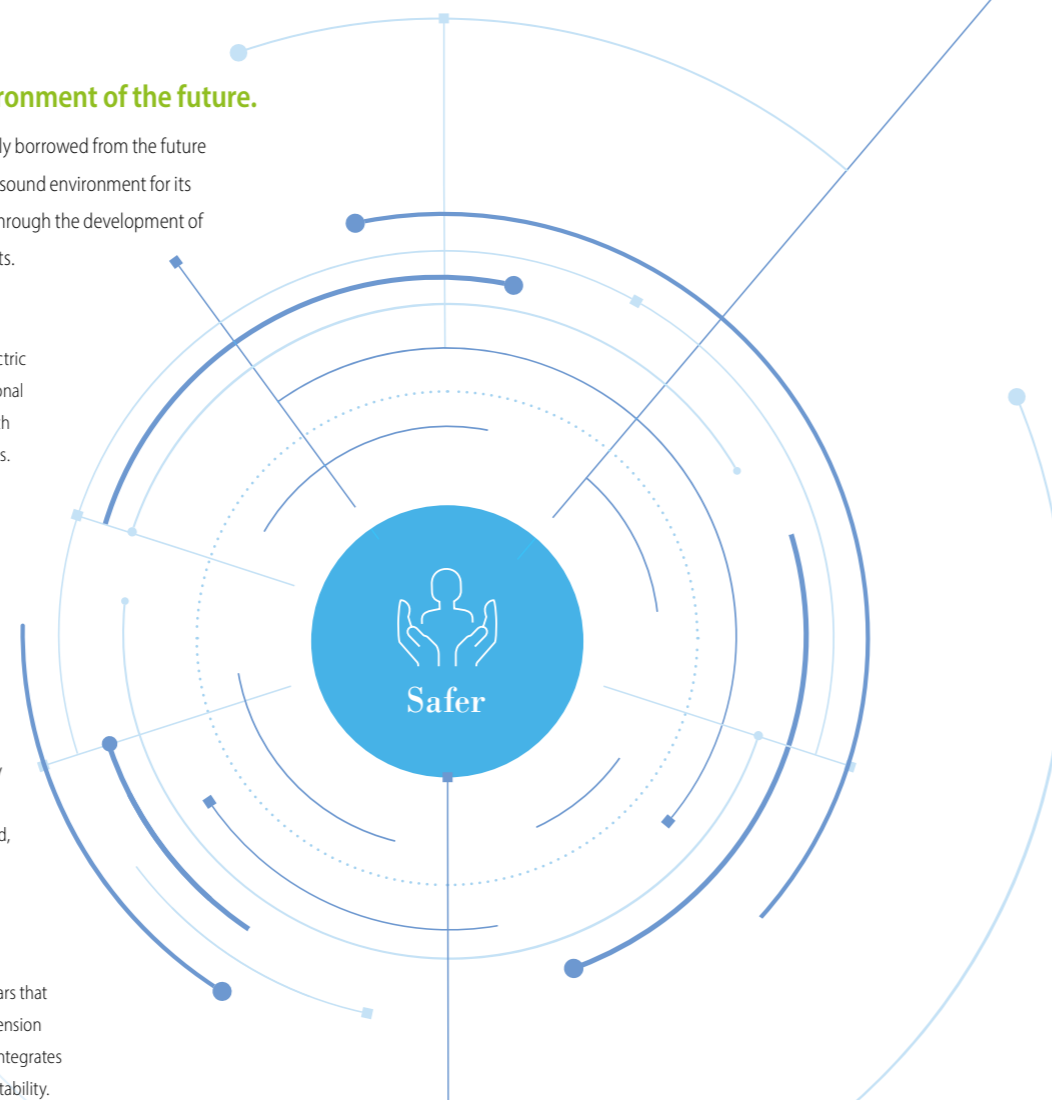
Our Products, Your Freedom



We contribute to the environment of the future.

The environment we live in today is simply borrowed from the future generation. Mando provides a clean and sound environment for its customers and the members of society through the development of eco-friendly and state-of-the-art products.

- Integrated Dynamic Brake (IDB)**
 The IDB is a new brake system of electric cars that integrates the electric power booster with the electric control system. While the conventional hydraulic brake functions with the step of a driver, the IDB works with an electric signal, making it a technology fit for autonomous vehicles.
- Integrated Charging Control Unit (ICCU)**
 The on-board charger, a power conversion device for charging high-voltage batteries, was integrated with the DC-DC converter for the development of a high-efficiency, high-powered, eco-friendly electric/hydrogen-fueled vehicles that contribute to improved fuel efficiency and cost reduction.
- Smart Personal Mobility(SPM)**
 We contribute to the future means of transportation for the physically disabled and seniors by providing an integrated e-Mobility Module platform. The module can be applied to two-wheeled, three-wheeled, four-wheeled, and other types of SPMs. It reduces carbon dioxide emissions and energy use through the application of electric power.
- e-Corner Module**
 The e-Corner Module is an electric wheel for eco-friendly cars that electrically integrates the driving, brake, steering, and suspension systems. The need for e-Corner Modules is increasing as it integrates the four systems that determine driving performance and stability.



We are responsible for safety.

"Safety" is the reason for Mando's existence. For the safety and convenience of our customers, we develop core products for car safety and create a safer world with the best quality.



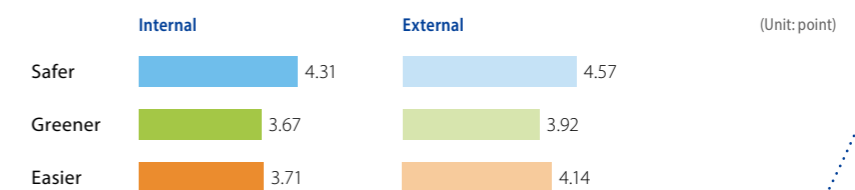
We make life more convenient.

In the world of smart mobility, the lives of our customers become more comfortable and easier than ever through Mando's core technologies. We pursue a lifestyle change through the development of products that apply the advanced driver assistance system (ADAS), the core technology of autonomous driving technology.

- Steer-by-Wire(SbW)**
 The electronically controlled SbW system that Mando aims to produce by 2021 can control the vehicle's direction with an electric signal while eliminating mechanical linkage between steering wheel and steering gearbox. The steering can also be fixed in a self-driving mode for a safer cruise.
- Smart Cruise Control (SCC)**
 The SCC system recognizes the distance from the car in front and the lanes on the road, which automatically adjusts the vehicle speed to maintain distance from car ahead while moving along the center of its current lane for safe driving on highways.
- Lane Keeping Assist System (LKAS), Blind Spot Detection (BSD)**
 The LKAS that prevents lane departure and BSD that discerns blind spots allow for safer and easier lane changing in a self-driving mode.
- Remote Smart Parking Assist System (SPAS, RSPAS)**
 The SPAS operates the steering with an ultrasonic sensor, without the driver having to steer the wheel while parking, and the RSPAS allows for remote parking with a smart device.
- Autonomous Emergency Braking (AEB)**
 The AEB is a system that uses a combination of front radar and front camera. It shoots laser to the car in front to elaborately calculate the distance from the car in front, stopping the car immediately when it detects an obstacle or a collision risk.
- Autonomous Emergency Steering (AES)**
 When an obstacle suddenly appears in front of a vehicle and it is determined that an impending collision is not avoidable by braking only, the AES system automatically steers the vehicle to avoid a collision by directing the vehicle to an escape zone
- Smart Damping Control(SDC)**
 The SDC optimizes the ride quality and cornering depending on the road surface condition and car speed: softly at low speeds and heavily at high speeds.

Results of the survey on the awareness of the vision keywords

In a survey conducted with 1,141 internal and external stakeholders in February 2020, we asked whether the Mando products and services contribute to realizing our vision keywords: Safer, Greener, Easier. As a result, the vision keyword, "Safer," had the highest score with people thinking that we create products that guarantee the safety of drivers.



Safer



Mando strives for the safety of automotive parts with the ultimate goal of ensuring the safety of drivers. To hear more about the safety of our products and drivers, we met with the team leader in charge of the integrated dynamic brake (IDB), our product with the highest demand for safety, and a supplier of the electronic control unit (ECU), the control system that greatly affects the safety of IDBs.

Q. What are the major issues on safety in the recent automotive industry?

Director Gi-Yung Kim The demand for safety has always been high for automotive systems, but the expansion of the autonomous driving market made this demand even higher. Conventional vehicles, those before the creation of autonomous driving, enabled drivers to control situations if a problem should occur with the brake system. However, self-driving that allows for the absence of drivers made it most important for the system to resolve problems on its own. As a result, more customers are demanding an effective safety system that works with the least driver intervention, which Mando is working on in response.

Manager Sung-Wook Choi By reflecting countless needs of drivers, automobiles have become much more than a simple means of transportation today. In order to actualize the various

features to enhance driver convenience, more automotive parts have been added to vehicles, and the added parts increased the potential for problems, leaving an important task of ensuring safety of each of the vehicle components.

Team Manager Hyung-Uk Lee Unlike the vehicles of the 80s and 90s that were usually controlled mechanically, most of today's vehicle system are electronic. This is associated with risks such as malfunction of electrical control, which can immediately lead to safety accidents by erroneous operation. The steering system is also no longer operated by oil pressure, but by motors, which emphasize the significance of electrical control units (ECUs) that control most parts of vehicles.

Q. You mentioned that safety has become more significant with the digitalization of automotive parts. Please elaborate on what safe quality activities are done in response to this.

Team Manager Hyung-Uk Lee Mando Hella Electronics produces its products based on the design specifications received from Mando Corp. and requests for a design change to the latter in the event an issue occurs during regular reviews. With the rising demand for safety in electronic parts, we are focusing on designing accident prevention products and adding redundancy by creating duplications of electrical architecture in one ECU. This ensures the safety of drivers by proper operation of the component in the event the other breaks down.

Manager Sung-Wook Choi The brake and steering systems are the vehicle functions that require the most safety and reliability, by which Mando Hella Electronics puts utmost attention in producing issue-free, fine-quality products for



Manager Sung-Wook Choi
Mando Hella Electronics Corp.
Project Support Team

the safety of drivers. We conduct quality tests based on the quality standards provided by our automobile manufacturing customers. New car inspections are done in more extreme conditions than real life to capably secure safe quality. For instance, temperature tests are done from as low as -40°C to as high as 125°C.

Director Gi-Yung Kim It is critical that an autonomous vehicle maintains the basic control performance, even when an issue occurs. The current autonomous vehicles have a risk of completely shutting down when a problem occurs in the power line. In response, for our IDB 2.0 generation, Mando is currently working on separating the power line and developing a system for redundancy. This will enable normal operation of all vehicle systems, even in the event the battery line goes out of order. We are also focusing on securing the safety of our existing IDB products that are already commercialized. For instance, the brake system is regulated by law for it to generate a certain brake force when the driver brakes in the event the brake system completely breaks down. For this, we generated a minimum brake force that is 2.5 times stronger than that regulated by law to secure the safe quality of IDBs.

Q. Along with the vehicle performances becoming more advanced, what are Mando's tasks to secure the safety of drivers?

Director Gi-Yung Kim We are working on developing safe and strong features specialized for highly automated driving (HAD) products. We need practical and active research on an

overall product that can respond immediately to individual components of vehicles, oversee the chassis and advanced driver assistance system (ADAS), and control the vehicle in the most optimal route by combining different systems.

Q. What can external interested parties expect from Mando for the production of safe products?

Team Manager Hyung-Uk Lee Currently, Mando is working on safely commercializing already-designed units. However, we believe that integrating the product design and production phases through cooperation instead of dividing them will create an outcome that is not only safer but also higher in overall quality.

Manager Sung-Wook Choi One of the greatest concerns as a manufacturer is the occurrence of a problem in the production stage that was not found in the development stage. The costs for settling the problem after the production stage is much greater than that spent for predicting and handling the problems in advance. From a quality-oriented perspective, it is critical that the borderline between designing and manufacturing is removed and expand reviewing and cooperation efforts with manufacturers for the production of better and safer products.



Team Manager Hyung-Uk Lee
Mando Hella Electronics Corp.
R&D Team 1



Director Gi-Yung Kim
Mando Brake R&D Center

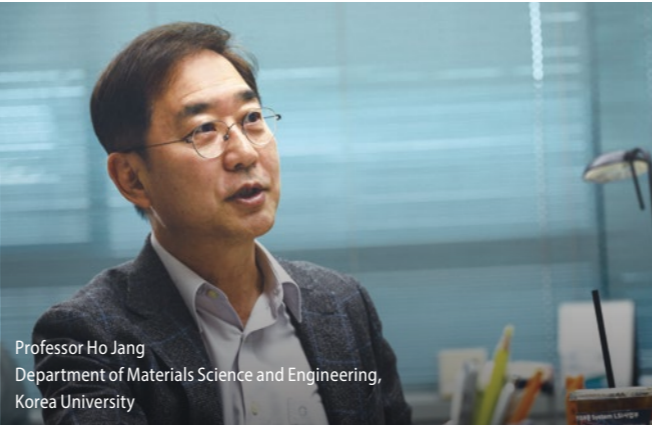
Greener



Mando is conducting a national project on “Reduction of Non-exhaust Emissions from Transportation” by forming a consortium with specialists of Korea University and other related research agencies, aiming for the reduction of brake wear particle emissions by 30 percent by 2023. In relation to this, we heard from the internal and external interested parties of this project on the story of our development of eco-friendly products.

Q. What are the recent major environmental issues in the automobile industry?

Professor Ho Jang Brake wear particle emissions emerged as a global issue for the past 6-7 years. The brake wears out by friction between the brake’s pads and discs, creating emissions. Despite its long existence, the topic is relatively new in Korea as we simply did not notice about it. With the anticipation of the expanding of the electric car market, it is viewed that exhaust gas created by car exhaust systems will eventually disappear. For environmental concerns, all eyes are now on the brake wear particle emissions.



Q. With the non-exhaust emissions from cars being a global issue, does Mando feel the need to develop eco-friendly products that could combat this kind of environmental problem? What are the demands of your customers and interested parties in relation to this?

Senior Engineer Jin-Tack Park The development of eco-friendly products is a global trend. For the automotive industry, it is foreseen the electric vehicle’s share in the market, which currently is at 3 percent, will grow to 20 percent in a decade and up to 50 percent in two decades. Mando must prepare and follow this market trend. Also, similar to how we are proactively developing eco-friendly products in preparation of the new regulations on brake wear particle emissions to be executed from 2025, development of eco-friendly products is no longer an option, but a must. The principal agents who are legislating the environment-related regulations include major European OEMs that currently have business relationship with Mando. We are preparing for the market changes by collecting environment-related information from our customers, feeling the dire need for the development of eco-friendly products.

Senior Engineer Je-Kyun Kim The development of eco-friendly products, which has become a global environmental trend, is the government’s responsibility as well as corporate social responsibility. We are developing eco-friendly products to resolve the environmental problems our existing products are causing and to respond to the strengthened environmental regulations. This is not only for Mando’s sake, but also to satisfy our customers’ demands and to fulfill corporate responsibilities to society.

Q. What is your role in the national project on “Reduction of Non-exhaust Emissions from Transportation?”

Senior Engineer Je-Kyun Kim Our role is to develop the optimized elements of pads and discs of brakes that minimize the emission of brake wear particles and apply them to products. A consortium formed of several related agencies are doing their part, and Mando, as a specialized brake developer, is

guiding the way to create products and materials with satisfying performance, such as safety, quality, and noise.

Senior Engineer Jin-Tack Park We are developing the technology to decrease the amount of emissions itself by collecting the brake wear particles when the brake is used. Mando is advising on brakes to ceramic and material research institutes for the benefit of their research, and we will take the leading role in producing and assessing the prototype. We are conducting workshops and regular meetings on a quarterly basis and have been consulting with each other frequently to study various fields such as improving efficiency.

Professor Ho Jang In our pad research lab, we take charge of basic research in relation to the national project. We find the fundamental cause of the problem by studying the size of brake wear particles and the mechanism of the emission of the particles. Through these studies, companies are able to find the exact cause of brake wear particle emissions and develop more effective products to reduce environmental impact.

Q. What is the anticipated benefit through this national project? Are you optimistic that the brake wear particle emission will hit the goal of dropping by 30 percent? What is the effect on Mando regarding the development of eco-friendly products?

Professor Ho Jang We foresee that the goal of reducing brake wear particles by 30 percent by 2023 will surely go beyond, possibly reducing by 50 percent. Given that the number of automobiles in Seoul excluding buses and trucks is 12 million, the amount of brake emissions is 5-10µg/m³. Considering the fact



that car brakes emit a significant amount of brake wear particles, this national project will contribute greatly to improving air quality.

Senior Engineer Jin-Tack Park Whilst electric and hybrid cars are equipped with regenerative braking devices, internal combustion engine cars do not have such regenerative braking devices, which relatively cause more emissions. Considering the fact that internal combustion engine cars will still take up at least 50 percent of cars by 2040 despite the largely increasing number of electric cars, Mando’s emission-reducing device developed through the national project is expected to create more business fields of Mando.

Q. What should Mando pursue in the further development of eco-friendly products?

Professor Ho Jang I hope Mando will expand its research networks with related industrial research and academic circles. Concentrating on the quality of the final product is surely important but identifying fundamental issues will create a firm foundation to become an even more competent corporation.

Senior Engineer Je-Kyun Kim We are currently focusing on the brake wear particles, but we will work on new projects with a broader vision on environment and safety later. The environment is not an optional factor, but an essential one that must be considered for development. We will differentiate ourselves with this and eventually establish an eco-friendly image.

Easier



Mando pursues innovation in the future lifestyles by increasing drivers' convenience through core technologies. To hear more about the advanced driver assistance system (ADAS) that allows for more convenient driving experience, we interviewed our ADAS R&D manager and an autonomous driving expert from the academic field.



Professor Kun-Soo Huh
Department of Automotive Engineering,
Hanyang University

Q. What is the rising issue in the autonomous driving market?

Professor Kun-Soo Huh The autonomous driving market is putting great focus on when each autonomous driving level will commercialize. However, at this point, we believe it is more important to focus on securing the core sensor technology of autonomous driving, because the current autonomous driving systems still have a high level of uncertainty on safety. The sensor markets, such as those of cameras, radars, and lidars, are continuously expanding regardless of the commercialization timing of autonomous driving. These sensors require countless software programs for operation, therefore companies that independently develop sensor technologies will take the greatest market share in the future.

Q. What are Mando's developments or the developing items/technologies for securing ADAS and the sensor technology essential for autonomous driving?

Director Dae-Gun Hong Some of Mando's ADAS features that reduce drivers' fatigue and increase driving convenience are automatic acceleration/deceleration depending on the distance with the front vehicle and automatic lane-keeping system. Also, there is the automatic brake and steer system for securing safety when it detects nearby vehicles, pedestrians, or cyclists. The recent development of ADAS is expanding driver convenience and safety in various driving environments. We are the only Korean company that independently developed and commercialized the technology of the front radar sensor, which is the core component for ADAS operation, securing technology competitiveness on driver convenience.

Q. What has been done to increase drivers' convenience through ADAS technology? Please introduce a technology Mando is developing or a related project for the development.

Director Dae-Gun Hong Mando recently successfully demonstrated level 4 autonomous driving by applying a commercialized sensor, but as Professor Huh mentioned earlier, a lot more research needs to be done to realize an absolute level of autonomous driving. That is why we are not only focusing on the development of level 4 autonomous driving, but we are also aiming attention at the development of level 3 autonomous driving, which its market is expected to grow with the advance of ADAS technology and its commercialization that is about to realize soon. Of course, the development of level 4 autonomous driving is simultaneously conducted, and the major results

of the development, which are cognition, decision-making, and control are applied for the furthering of ADAS and the development of level 3 autonomous driving.

Professor Kun-Soo Huh About four years ago, we worked with Mando on developing the cross-traffic assist (CTA, the current AEB-Junction) algorithm that judges whether an accident will occur in an intersection. Detecting the movement of vehicles on intersections was a lot more challenging than that on straight roads, but I heard that this technology was finally produced early this year. Of course more development is indeed needed for more precise performance of the technology. Recently, we signed an MOU with Mando on education and research cooperation on the integration of automotive technology and software. The university produces software professionals to go on-site for hands-on training and works together to provide software training to Mando's automotive practitioners to be professional and competitive. Through this cooperation, the advance in technology will contribute to creating a more convenient and safer driving environment.

Q. Along with Mando's development of autonomous driving, what is Mando's goal for the commercialization of autonomous driving, and what are the tasks that are being done to achieve the goal?

Director Dae-Gun Hong Mando aims for early commercialization of level 3 autonomous driving technology. To realize this, cooperation among our customers and technology research agencies is essential. We will maintain a cooperative relationship with competitive companies, and proceed with technology development, testing, and commercialization of autonomous driving. Also, in order to target a larger spectrum of customers in the level 3 autonomous driving market where we are aiming for production, we are concentrating on Mando's individual development of an autonomous driving platform.

Q. As Mando's external interested party, what do you expect from Mando for safer and more convenient product development?

Professor Kun-Soo Huh In the future, it is critical to develop ADAS features that prevent accidents on regular streets that drivers use every day. Korea's population is aging faster than ever, with an increased number of drivers over 65 and car accidents related to this population group. I hope Mando will contribute to the actual convenience and safety of drivers by developing effective ADAS features that benefit people like seniors and novice drivers. Lastly, to realize true innovation, I hope to see Mando establishing an advanced R&D organization that autonomously keeps upgrading the existing technologies and securing competitiveness by devoting to a specialized field.

Director Dae-Gun Hong
Mando ADAS R&D Center



Approach to Sustainable Values

We create a firm foundation for sustainability management through stakeholder-centered activities

Mando pursues sustainable values based on transparent and ethical governance and communication with stakeholders.

Governance	26
Ethics and Compliance	28
Risk Management	30
Stakeholder Engagement	32
Sustainability Management System	34
Materiality Assessment	36



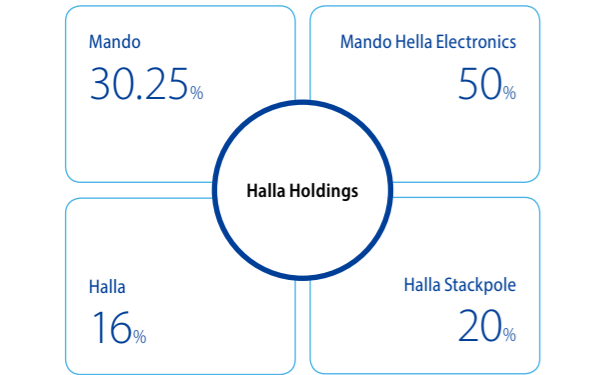
Governance

Governance is a system that arbitrates and makes decisions on the various interests of major stakeholders, including customers, shareholders, and employees. Mando's operation is centered on the Board of Directors, the highest-level decision-making group, and serves an essential role in transparent and effective management. We regularly hold board meetings for discussions on financial and non-financial factors for contributing towards creating values and understanding each other.

Governance Structure

Mando was separated from Halla Holding Corporation on September 1, 2014 and established as a spinoff for the automotive parts manufacture/sales section on September 2, 2014. Later, on October 6, 2014, we were listed on the Korea Exchange securities market, with Halla Holdings being the largest shareholder, holding a 30.25% of our shares.

Halla Group Governance StructureAs of late 2019



Korea	100% Mando China	India	71% Mando India
	50% Mando Brose		100% Mando Softtech
America	100% Mando America	Europe Others	100% Mando Poland
	100% Mando Brazil		100% Mando Europe
	100% Mando Mexico		50% Maysan Mando
			30% Autoventure Mando



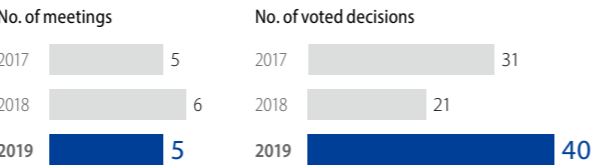
Composition of Board of Directors

The Board of Directors is the highest-level decision-making group that possesses voting rights in the overall corporate management and business operations. Article 33 of the Articles of Incorporation states that the Board of Directors shall be composed of three or more directors, and one fourth of them must be external directors. If the total asset is over KRW 2 trillion at the end of the most recent fiscal year, the number of external directors shall be three or more and shall account for more than half of the total number of directors. Accordingly, Mando's Board of Directors is composed of three internal directors and four external directors, making a total of seven directors as of March 2020. The CEO holds the position of the chair considering his/her expertise in the automotive industry and past experience. The director tenure is three years, and a maximum of six years for external directors in the case of a reappointment.

Composition of Board of DirectorsAs of late March 2020



BOD Meetings(Unit: Session, Cases, %)



Average Attendance Rate of External Directors



Appointment of Board of Directors

According to Article 38 of the Articles of Incorporation, Mando can appoint one or more CEO decided upon by the Board, and the appointed CEO(s) receive(s) the authority to represent the corporation for the appointed year. The internal directors are selected among our major executives while the external directors are selected among the qualified individuals in accordance with Article 382(3) (Appointment of Directors, Relationship with Company and Outside Directors) and Article 542-8 (Appointment of Outside Directors) of the Commercial Act of Korea. They are voted in with at least one fourth of shares issued at a general meeting of shareholders and with more than half of the votes of the attending shareholders. We appointed lawyers, financiers etc. with expertise who are qualified as specialists for law, and finance. To maximize the efficiency of their roles as directors, we held an orientation for newly appointed external directors.

Operation of Subcommittees

According to the Articles of Incorporation, Mando operates three subcommittees, the External Director Nomination Committee, Audit Committee, and Transparent Management Committee, within the Board of Directors to strengthen professionalism and efficiency in decision-making. The External Director Nomination Committee guarantees independence by organizing a majority of external directors. The Audit Committee, composed of directors with professionalism and independence, transparently discloses the attendance rate of external directors and pros and cons of the agendas through business reports. In order to strengthen ESG (environmental, social and governance) activities, the previous internal trading committee was expanded and reorganized. The Transparent Management Committee plays an important role in realizing our sustainable future by inspecting and supervising the implementation of the

Composition of SubcommitteesAs of late March 2020



Fair Trade Compliance system and major policies and activities related to ESG. Through the first implementation of the Transparent Management Committee among Halla Group affiliates, we plan to discuss ways to increase social and shareholder values and verify the results of our diverse activities.

Remuneration and Compensation for Directors

Mando pays executives according to the remuneration regulations of the executive and outside directors. It is set through individual consultation for each year, and the remuneration of registered directors and outside directors is executed within the remuneration limit approved by the general meeting of shareholders. Moreover, the remuneration of registered directors is set within the limit decided at the general meeting of shareholders, considering the corporation's and individual's performance, in accordance with the standard of executives' performance pay. At the regular general meeting of shareholders held in March 2020, a wage limit of KRW 10 billion was approved.

Directors' Remuneration StatusAs of late December 2019

(Unit: KRW 1 million)

Category	No. of People	Total Remuneration	Average Remuneration per Person
Registered Director	3	5,910	1,970
External Director	3	224	75
Audit Committee Members	3	211	70

Ethics and Compliance

In the midst of uncertainties in the management environment due to a prolonged slowdown in growth in the automotive industry, the demand for corporate social responsibility, such as anti-corruption and fairness, is increasing now more than ever. In times of dramatic changes in management, we should stick to the basics, focusing on realizing a culture of integrity management as we call it at Mando. With legislations on proper management, such as prohibition of harassment in the workplace and bribery, corporate ethics is what we must pursue for sustainable growth.

Integrity Management

Integrity Management System

Mando's integrity management represents a management system that fairly competes and fulfills social responsibilities and obligations based on transparent and right decision-making and while focusing on the basics and principles. Our Audit Office takes responsibility in performing the Integrity Management System by addressing important issues in relation to ethics and applying them in the management policies and corporate goals. In order to perform such tasks, internal surveillance activities on illegality, regulation compliance, nonperforming loans, risk management status, and other management factors are regularly conducted.

2020 Integrity Management Policy

2020 Goal

“Eradicate dishonesty through strict standards, and proactively manage risks with active participation.”

Directions

Strict Standards against Misconduct

Active Participation

Proactive Management

Ptomotion/ Education

Objectives

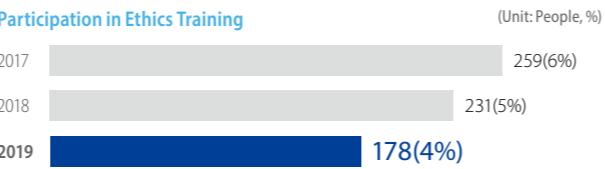
Strict Standards against Misconduct	<ul style="list-style-type: none">Advanced audit technique (digital forensic, risk factors/collection of information)Strengthening of auditing competency (CIA, CCPG certificates)
Active Participation	<ul style="list-style-type: none">Prevention of reoccurrence through horizontal developmentOperation of an agile organizationStrengthening of supervision of training and performance
Proactive Management	<ul style="list-style-type: none">Management diagnosis (accounting/tax adequacy)Strengthening of monitoring (use of ERP, compliance)
Spread/Training	<ul style="list-style-type: none">Strengthening of communication (external stakeholders, resignees, employees, etc.)Utilization of on/offline educationDiscovery of positive cases (awarding and sharing of case)

Operation of a Report System

Mando operates a “Cyber Report Center” on the Integrity Management website¹⁾ to encourage the reporting of unfair transactions and violations of ethical standards of employees and external stakeholders. All information is strictly anonymous to avoid any disadvantage to informants, and the website states the Code of Ethics to promote awareness amongst all our members. Moreover, we operate a “Ethics Hotline” for our employees for voluntary returning or donating of gifts received by other stakeholders.

Execution of Ethics Training

In order to strengthen our employees’ awareness surrounding ethics and prevent any related risks, we created educational videos translated into English and Chinese to share with all our members. The offline educational session targeted towards new and manager-level employees addresses the need for Integrity Management and the risks that come with violations. In 2019, 178 employees received the ethics education, and 169 partners received information on the process of dispute mediation and the online reporting center in hopes of creating a decent corporate culture. In 2020, we plan to hold a seminar on integrity management to strengthen the culture of ethics one step farther.



Information Security

Due to the rapid changes in the IT environment, the increase in internal and external security threats is affecting corporations with critical damage. In response, Mando established an Information Security Management System to protect essential information assets and customers’ information and to conduct thorough inspection activities. We also abide with the local and overseas regulations on security, such as Korea’s Personal Information Protection Act, Information and Communications Network Act, and the EU’s General Data Protection Regulation, in an effort to establish a transparent corporate culture and guarantee a safe management environment against security threats.

Information Security Management Organization

Mando composed an information security team in July 2019 for the establishment of an information security management system. We created the basic system of security management by carefully determining the duties and responsibilities of the information security management organization and the countermeasures for information security threats in 4 areas: technologies, process, people, and governance. We are working to apply these measures in our executives’ decision-making process.

Countermeasure Categories for Information Security Threats



International Certification of Information Security Management System

Mando established the foundation for safely protecting information assets by acquiring the ISO 27001, or the Information Security Management System certification, of the International Organization for Standardization in 2013. We are constantly monitoring international information security to maintain our certification and meet the international standards. Acquiring this international certification has put us in an advantageous position on winning competitive domestic and overseas biddings for being highly evaluated on information security.

IT System Security Management

Mando endeavors to prevent security risks by finding and improving the threat factors to safety and credibility of corporate information assets through an IT system security diagnosis. More specifically, in 2019, we conducted a security diagnosis program for about two months with a security company and worked on improving our vulnerabilities.

Management of Employees’ Personal Information

Mando continues to inspect the level of management of employees' personal information to prevent any risks that may arise due to noncompliance with the Personal Information Protection Act. In 2019, we conducted an inspection on the protection of personal information and mock hacked our HR system that has all our employees’ sensitive personal information. As a result, we were able to find our own vulnerabilities that did not pass the criteria for information safety and immediately take proper measures.

Strengthening the Security Awareness of Employees

Mando conducts security education affiliated with training courses of the Human Resources Development (HRD) Center in an effort to improve the security awareness of employees. In 2019, a total of 2,266 employees participated in this educational course. Moreover, we require our employees to sign a non-disclosure agreement once a year and attend our monthly “Security Day” event to participate in safety activities, such as selecting security themes and office safety inspections.

Stronger Compliance with Global IP Regulations

Mando regularly conducts an Intellectual Property (IP) compliance training for R&D engineers all over the world to prevent the potential risks of global IP disputes with third parties. Local lawyers visit our workplaces to deliver a training session. In 2019, a total of 738 employees from all over the world attended the training. Moreover, we are strengthening our awareness of compliance with global IP laws by each employee drawing up a pledge of compliance.

No. of Complaints Concerning Breaches of Customer Privacy (Unit: Cases)

Category	2017	2018	2019
Complaints received from outside parties and substantiated by the organization	0	0	0
No. of identified leaks, thefts, or losses of customer data	0	0	0



▲ 2019 Employee Information Security Training

1) Halla Group Integrity Management Website: www.ethics.halla.com

Risk Management

The quickly changing automotive market and expanded services, such as autonomous driving and robot shuttles, have made the associated risks unpredictable and more diverse than ever. In order to proactively manage the major risks that may potentially arise, Mando operates a supervising division fully dedicated to monitoring and correcting the possible risks.

Risk Management System

Corporate Risk Management

Each of Mando’s divisions, Audit Office and Internal Accounting Management Team conduct the risk management of the corporation as a whole. They identify the possible risks that may arise and apply them in their projects. The risks that need management are segregated by financial and non-financial risks, subject to proactive prevention according to the Halla Group internal control guidelines. The final objectives of risk management are decided at the highest-level executive meeting, if needed.

Risk Audit and Monitoring

Audit Office mainly focuses on internal audit on general risks, including corruption, performance status of management policies and instructions, and non-performing loans. Particularly, after the internal accounting control system has been included for auditing according to the amendment of the Korean Act on External Audit of Stock Companies, we strengthened the internal accounting control system for advanced inspection and prevention of financial risks. We are following a strict internal assessment based on our control matrix, establishing a regular monitoring system by appointing an officer in charge of control, and applying key management indicators of executives and management by the objectives of employees.

Financial Risk Management

Minimization of Currency Risk

Mando’s Global Finance Team is regularly monitoring the diverse variety of financial risks. Ever since we expanded international trade, we are exposed to foreign exchange risks, especially those from fluctuating foreign exchanges of USD, CNY, and EUR. To minimize such risks, we established standards for operating foreign exchange transactions and a hedging management process to prevent foreign exchange risks.

Liquidity Risk Management

As part of our management of liquidity risks, we establish our monthly and yearly fund balance plans and internal target financial ratios to predict our fund balance for activities in sales, investment, and finance. Through this, we acknowledge and maintain the needed volume of liquidity to prevent the violation of debt ceilings or contracts. More specifically, we implemented and operate the cash pooling system to share our internal funds among subordinate organizations and secure additional short-term debt ceilings.

Prevention of Tax Risk

Mando complies with the laws in relation to tax return and payment, diligently fulfilling tax obligations to prevent the risk of additional taxation. We were never subject to additional taxes due to delays in payment nor missed out tax refunds. Also, our executives regularly review the policies we applied for tax return in preparation for situations that may arise due to different interpretations of policies.

Non-Financial Risk Management

Securement of Disaster/Emergency Response Capability

Mando operates a business continuity management system to maintain its customers’ trust by securing business continuity, even in emergency situations, such as natural disasters, fires, and infectious diseases. We identified the 103 tasks for safety environments, production management, and parts management among the 242 that must continue operating in emergency situations through organizational situation analysis and business impact assessment. We also reflected the 31 risks that may affect the 103 identified tasks through risk assessment in the business continuity planning. Moreover, we established the emergency response process and task recovery plan for each risk, and we are securing their reliability through mock training and by raising awareness.

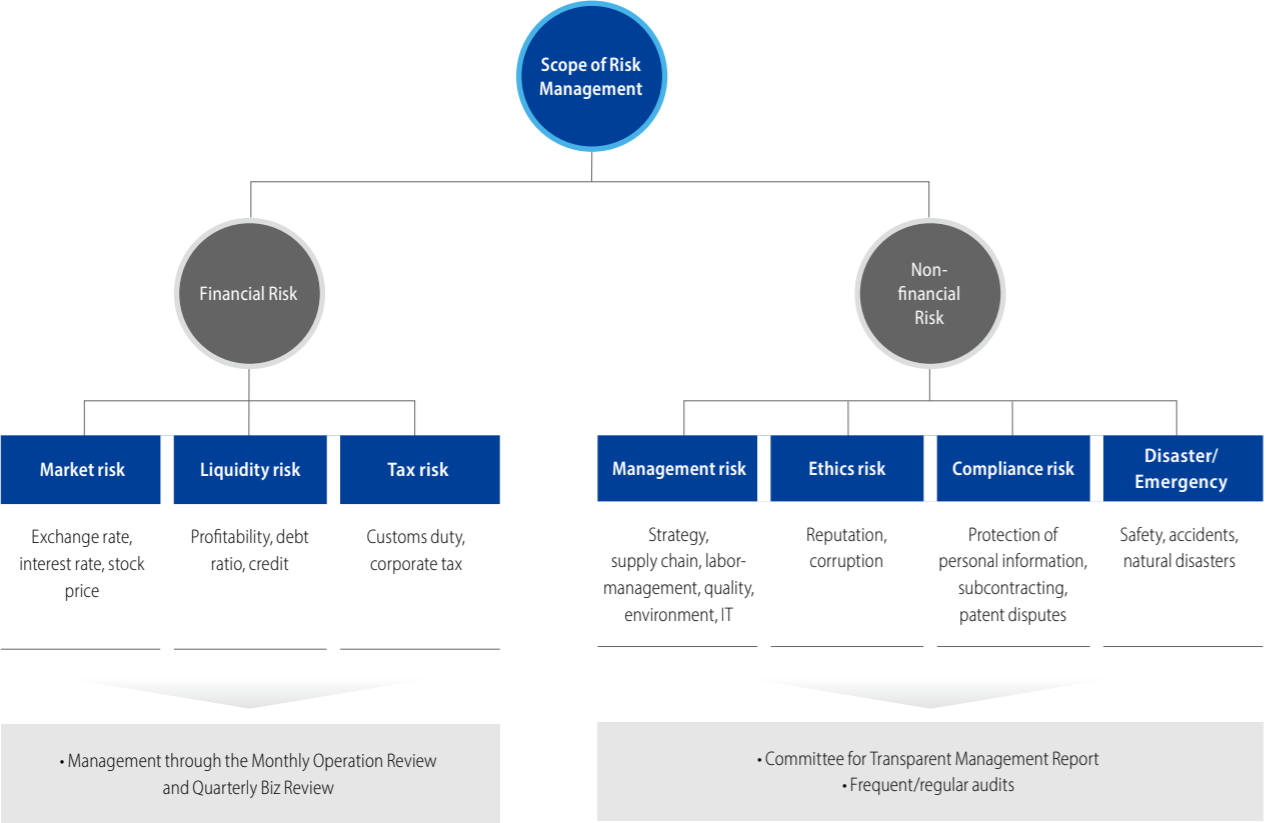
Supply Chain Risk Management

The supply chain is an extension of Mando’s production line. Therefore, we are managing the supply chain risk by analyzing the quality and technology of our supply chain from a financial and non-financial perspective. The current supply chain risk management is conducted quarterly on three levels, namely sensing, leveling, and mitigation. We identify companies that fall in the risk category according to the financial and non-financial assessment standards, for which the risk from a liquidity perspective is determined. Accordingly, we establish countermeasures and work towards improvement. As of March 2019, 38 among 115 supply chain companies were assessed as high-risk, for which we consequently established responsive measures for each company. Moreover, for the enhancement of quality and certification of supply chains, the Company Assessment Team conducts training programs for quality certification and grade improvement.

Minimization of Compliance Risk

To minimize the number of compliance risks that may arise in domestic and overseas plants, Mando regularly supervises the compliance with regulations by reviewing any law violations when making decisions or signing contracts. Additionally, to comply with existing statutes, such as the Personal Information Protection Act and Communications Network Act, we diagnose the security of IT systems and secure the stability of our internal human resources management system. Moreover, we conduct compliance training sessions on personal information, intellectual property, and anti-corruption for our employees.

Risk Management System



Supply Chain Quality Certification System

Mando Quality (MQ)	Mando Assessment Policy (MAP) Regular Assessment of Tier-1	Supplier Process Audit (SPA) Regular Assessment on Quality System of Tier-1	Others
<ul style="list-style-type: none">Quality certification system used in the condition of supplying to MandoEstablishment of MQ Assessment Center in the 32 among 47 tier-1 conducting the MQ certification	<ul style="list-style-type: none">Annual assessment system of tier-1 organized by the Company Assessment TeamAssessment on quality, delivery, and quality system	<ul style="list-style-type: none">Annual assessment on quality system of Mando’s tier-1Assessment of outstanding companies every two or three years	<ul style="list-style-type: none">Potential supplier assessment (PSA) for newly registered companies in Mando’s sourcing poolPSA conducted on 11 companies in 2019 (including one overseas company)

Stakeholder Engagement

Mando defines all subjects who directly or indirectly influence the business management of Mando as stakeholders. Stakeholders are classified as customers, shareholders/investors, partners, employees, local communities/NGOs, academia, and government/associations. We are operating various communication channels for smooth communication among stakeholders for a solid, trusting relationship.

Outcomes of Stakeholder Engagement

Stakeholder	Communication Channel	Main Interests
Customers	<ul style="list-style-type: none">Global motor shows (Frankfurt Motor Show)Tech shows (Suzuki Tech show / TATA Tech Show)Summer / Winter Ride Sessions	<ul style="list-style-type: none">Obtaining contracts related to products and technologiesTest-driving of cars equipped with Mando partsStatus of product competitiveness and development, and schedule of production
Shareholders / Investors	<ul style="list-style-type: none">General shareholder meetingsCorporate disclosureDomestic or Overseas NDR(Non Deal Roadshow) and ConferenceInvestor Day	<ul style="list-style-type: none">Stock price and economic achievementStable corporate governanceSecuring new technologies with potential for sustainable growth
Partners	<ul style="list-style-type: none">Partners' DayActivities to Become FriendlyMando Cooperation Seminar	<ul style="list-style-type: none">Sharing trends and visions of MandoProspects of the automobile market, Mando's orders/sales results and plansImproving difficulties of suppliersPromoting Mando's activities for mutual growth and difficulties
Employees	<ul style="list-style-type: none">M Forum (Town hall meeting)Open Committee/Team DavidValue BoardWith Mando	<ul style="list-style-type: none">Sharing Mando's business status/direction and free communicationInternal communication channel for executives and employeesRealizing HR philosophy/improvement of corporate cultureHolding cultural activities and initiating change by sector
Local Communities / NGOs	<ul style="list-style-type: none">Local volunteer groupsChildFund KoreaKorea Transportation Safety Authority ('Roly-Poly Love Wheelchair' program)	<ul style="list-style-type: none">Social contribution activities (donation, charity, etc.)Revitalizing local economiesHelping/cooperating for victims of traffic accidents
Academia	<ul style="list-style-type: none">Industry-academic cooperationTechnology councilTechnology advisor	<ul style="list-style-type: none">Industry-academic scholarship programs connected to recruitmentImprovement of fundamental technology and establishment of a cooperation systemMando's advanced/next-generation technology and technology for new business
Government / Associations	<ul style="list-style-type: none">Ministry of Employment and Labor (MOEL)/Korea Occupational Safety and Health Agency (KOSHA)Minister of Environment/Agency for EnvironmentBritish Standards Institution (BSI)Fair Trade Commission (FTC) Implementation and Evaluation System Briefing SessionKorea Commission for Corporate Partnership Index Evaluation System Briefing SessionSeminars of Korea Automobile Manufacturers AssociationRegular General Meeting and Breakfast Seminar of Korea Auto Industries Coop. AssociationRegular General Meeting of Korea International Trade Association	<ul style="list-style-type: none">Compliance to safety related regulations/KOSHA 18001 CertificationCompliance to environment related regulations/Certification of eco-friendly companyCertification of Safety Environment and Building Control Management System (BCMS)/Verification of greenhouse gas emissionsMando-related products and technologiesAssessment system of Fair Trade Commission (FTC)Assessment system of Korea Commission for Corporate PartnershipCurrent status of the automobile market and collection of information

Highlights of Stakeholder Engagement in 2019



Communication Activities with Executives and Employees ①

Internalization of Sustainability Management for Employees

- Holding of the "TFT Workshop for Mando's Sustainability Management," prior to the publication season of the Sustainability Report, in efforts to raise ESG (environmental, social, governance) awareness of the task force team members, on February 2020
- Introduction of the concept of sustainability management, TFT group activities for the activation of sustainability management
- Distribution of monthly newsletters on ESG for raising awareness on sustainability management of employees



Communication Activities with Executives and Employees ②

Hosting of the M Forum

- Hosting of the first M Forum under the theme "Something New, Future Preparation"
- Participation of about 940 executives and employees of Mando in YouTube livestreaming and KakaoTalk Open Chat for active discussion on discovery of new business, competitiveness, and the future of Mando
- M Forum is a platform for sharing transparent information and a young and vibrant communication channel that is scheduled to open at least 3 times a year

Communication Activities with External Stakeholders ①

Hosting of Investor Day

- Hosting of Investor Day with 50 guests, including stock analysts and local asset managers
- Enhancing the understanding of Mando's technologies through a gallery tour of Mando's products
- Introduction of the response to auto mega trends and sharing of the status of future technologies and the roadmap of future products
- Q&A session with stock analysts and local asset managers



Communication Activities with External Stakeholders ②

Mando Cooperation Conference

- Acknowledging difficulties of partners through regional conferences and "Activities to Become Friendly"
- Sharing of efforts for improvement with partners and receiving feedback on satisfaction improvement
- Sharing of FAQs with partners for problems that cannot be resolved immediately and improving problems through benchmarking competitors
- Improved 85% of the problems raised by partners, as of October 2019



Sustainability Management System

Sustainability Management System

To realize sustainable growth, Mando pursues sustainability management based on creating economic, environmental, and social value. In 2019, to strengthen the sustainability management system one step further, we set 10 goals and 20 specific tasks and improved our performance indicator, striving for the realization of sustainability management that leads to the actual creation of values.

	Goals	Tasks	Key Performance Indicator		Unit	2017	2018	2019
<div>Economic Values, Global Player</div> <div></div>	Strengthening of a stable foundation for growth	Expansion into international markets	Sales		KRW 1 trillion	5.69	5.67	5.98
	Realization of customer satisfaction	Quality risk management	Increase in rate of quality failure cost		%	-34	37	11
	Securing future growth engines	Expansion of investments in new business	R&D investment	Cost	KRW 1 billion	302	315	361
			Percentage of sales		%	5.3	5.6	6.0
			R&D head count		People	2,040	2,115	2,319
			Development of core technologies for future mobility	Intellectual Property	Registered	Cases	435	326
Applied		Cases		924	807	695		
<div>Environmental Values, Safe & Green Company</div> <div></div>	Environmental risk management	Strengthening of the environmental management system	Percentage of worksites with ISO 14001 certification ¹⁾		%	100	100	100
		Compliance with local and international environmental regulations	No. of violations of environmental regulations		Cases	0	0	0
	Response to climate change	Reduction of the energy consumption	Energy consumption within the organization		TJ	2,296	2,258	2,131
		Greenhouse gas management	GHG emission	Direct emission	tCO ₂ -eq	8,608,433	9,007,097	7,911,469
				Indirect emission	tCO ₂ -eq	103,695.43	101,194.85	95,612.10
	Efficient resource management	Reduction of the amount of wastewater and waste	Amount of wastewater generated		m ³	273,504	272,198	240,857
			Amount of waste generated		kg	18,048,055	17,575,810	16,875,490
			Recycling of waste		%	92	93	93
			Using eco-friendly products and services		Amount of green purchasing	KRW 1 million	1,476	1,585
	<div>Social Values, Mutual Growth Partner</div> <div></div>	Establishment of a transparent and ethical culture	Elimination of any corruption		No. of participants in ethics training	People	259	231
			No. of corruption violations	Cases	0	0	0	
Protection of human rights at workplaces			No. of human rights management trainees ²⁾	People	2,280	2,311	2,282	
Strengthening of the information security management system			No. of violations of information security regulations	Cases	0	0	0	
Expansion of a happy corporate culture		Creation of a safe working environment	Factor of Safety Index		-	0.44	0.30	0.45
		Fostering of future talents	Training hours per employee		Hours	41	40	43
			Total training expenses ³⁾		KRW 1 million	5,774	6,013	5,258
		Improvement of employees' satisfaction	No. of resigned employees		People	64	96	73
			No. of employees using flexible work hour system		People	2,285	2,336	2,231
			No. of employees on parental leaves	Male	People	3	9	10
				Female	People	14	12	14
Sustainability management of supply chains		Strengthening of a mutual cooperation with partners	Mutual Growth Index		Level	Fair	Excellent	Excellent
		Supply chain CSR management	Percentage of new partners screened using social/ environmental criteria		%	33	100	92
Strengthening social contribution in local communities		Expansion of volunteer activities for employees	Hours of volunteer activity by employees		Hours	11,022.7	11,062	9952.2
			No. of employees in volunteer activity		People	1,573	1,652	1,607
		Initiation of new social contribution activities	Donations to local communities		KRW 1 million	458	567	474

1) Including global site
2) Training of employees on prevention of sexual harassment
3) Including training center operation costs

Mando's UN Sustainable Development Goals (UN SDGs)

The global community, including governments, companies, and social communities, is performing various activities in order to achieve the 17 Sustainable Development Goals of the United Nations. In 2019, Mando also selected five UN SDGs and seven targets and indicators to achieve through its projects and effectively contribute to society as a member of the global community.

UN SDGs	Targets	Activities	Page
<div></div> <div>No Poverty</div>	<p>[1.2]</p> <p>At least 50% reduction of the proportion of men, women and children of all ages living in poverty at all levels according to national definitions by 2030</p>	<ul style="list-style-type: none">• Goal of Love Fund• Scholarship for local teenagers in the regions surrounding Mando's business divisions• Roly-Poly Love Wheelchair for the disabled• Donation activities for communities in the U.S.• Charitable activities in Poland• Support for vulnerable social groups in China• Support for children of vulnerable social groups in Brazil• Support for self-development of students of vulnerable social groups in Mexico	Domestic and Overseas Social Contribution Activities (70-73p)
<div></div> <div>Decent Work and Economic Growth</div>	<p>[8.3]</p> <p>Promotion of development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation; encouragement for the formalization and growth of micro-, small- and medium-sized enterprises, through access to financial services</p> <p>[8.8]</p> <p>Protection of labor rights and promotion of safe and secure working environments for all workers, including migrant workers, in particular female migrants, and those in precarious employment</p>	<ul style="list-style-type: none">• Labor-management joint strengthening of accident prevention• Symbiotic cooperation programs for the safety of partners• Customized management for high-risk workers• Communications platform "Mantong" for employees, activities for open communication, operation of value board• Shortening of work hours for parents with young children, expansion of paternity leave, operation of daycare centers, expansion of flexible working hours• Support for job training programs, such as the Work Smart Program and Halla Business School• Operation of support system for resigning employees• Development of mutual growth programs, such as financial support, training support, and strengthening of technology competitiveness, for partners	Creation of a Safe Working Environment (61-62p) Expansion of a Happy Corporate Culture (63-66p) Mutual Growth with Partners (67-69p)
<div></div> <div>Industry, Innovation and Infrastructure</div>	<p>[9.4]</p> <p>Upgrade of infrastructure and retrofit industries to make them sustainable by 2030, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with action by all countries in accordance with their respective capabilities</p>	<ul style="list-style-type: none">• R&D of eco-friendly automotive technology• Project for the development of robot solutions• Investment in promising startups• Operation of a smart factory• Automation of work processes	Discovering New Business (44-47p) Strengthening the foundation for Digital Innovation (49p)
<div></div> <div>Climate Action</div>	<p>[13.2]</p> <p>Integration of climate change measures into national policies, strategies, and planning</p>	<ul style="list-style-type: none">• Management of the greenhouse gas emissions through the Emissions Trading Scheme (ETS)• Reduction of energy costs through operation of the energy storage system (ESS)• Technological support for energy reduction of small- and medium-sized enterprises• Reduction of the energy consumption during non-operating hours• Maintenance of the ISO 14001 Certification• Green Company Certification	Response to Climate Change (55-56p)
<div></div> <div>Partnerships for the Goals</div>	<p>[17.17]</p> <p>Encouragement for and promotion of effective public, public-private, and civil society partnerships, building on the experience and resourcing strategies of partnerships</p>	<ul style="list-style-type: none">• Development of a night patrolling robot for a park in Baegot New Town in Siheung-si, Gyeonggi-do• Development and operation of a hydrogen station app (Ministry of Trade, Industry and Energy, H2KOREA)• R&D for the response to the regulation on brake wear particle emission (Ministry of Trade, Industry and Energy)	Discovering New Business (45p) Reduction of Air Pollutants Emissions (58p)

Materiality Assessment

In an effort to initiate sustainability management based on the various opinions of stakeholders, Mando conducts materiality assessment that strategically analyze important business impacts and their effects on stakeholders to determine significant topics. Through an integrated analysis of surveys conducted with both internal and external stakeholders, media analysis, and benchmarking of global corporations, we came up with the 15 most material topics of sustainability management that must be managed and reported.

Process for Selecting Material Topics

Step 1

Formation of a pool of sustainability topics

We composed a pool of 32 topics by analyzing the data from media analysis, internal material analysis, benchmarking of global corporations, ESG evaluation topics of KCGS and DJSI, and the GRI Standards.

Step 2

Materiality assessment

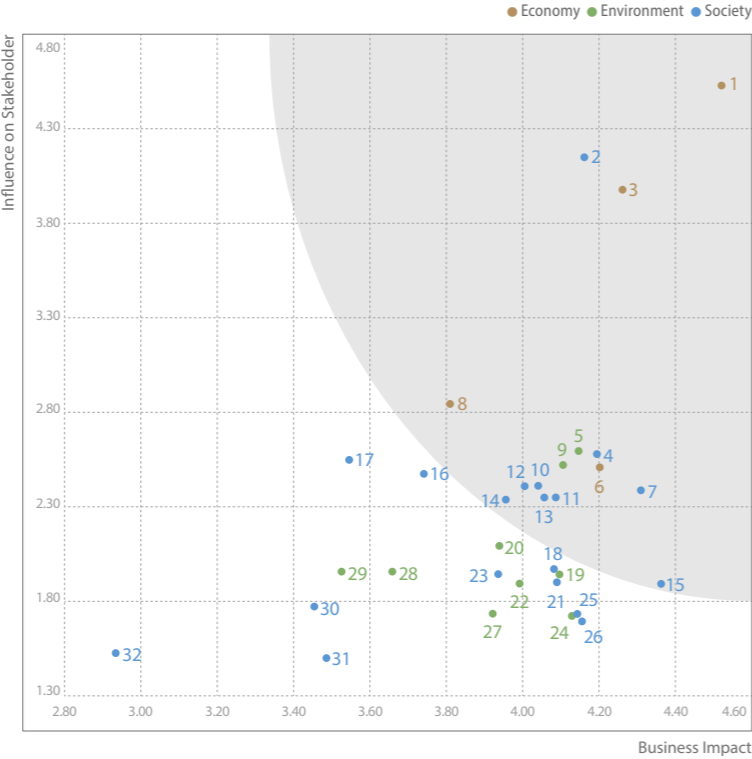
We determined the materiality of the 32 topics by integrating the results of the material topics selected by the sustainability management TFT through media analysis, benchmarking of global corporates, and surveys of stakeholders. The survey was conducted on 1,141 internal and external stakeholders in nine countries.

Step 3

Selection of material topics

The top 15 sustainability management topics that scored the highest on the materiality assessment were selected as Mando's material topics.

Results of Materiality Assessment



Rank	Category	Material Topic	Page of Report
1	Economy	Reinforcement of investment and technology development	45-49p
3		Improvement of customer satisfaction	51-53p
6		Discovery of new business	47-48p
8		Expansion of overseas markets	46p, 48p
5	Environment	Designing of eco-friendly products	58p
9		Response to climate change	55-56p
2	Society	Establishment of a cooperative labor-management relationship through active communication	63p
4		Creation of a safe working environment	61-62p
7		Fostering of talents	65-66p
10		Strengthening of information security of customers and products	29p
11		Elimination of any corruption	28p
12		Strengthening of competitiveness and mutual cooperation with partners	67-69p
13		Creation of a flexible corporate culture	63-64p
14		Supply chain CSR management	31p
15		Strengthening of work and life balance	64p

Rank	Category	Material Topic
16	Society	Diversity of employees
17	Society	Actions on sustainable and systematic social contribution activities
18	Society	Communication and formation of trusting relationships with partners
19	Environment	Management of air pollutants created from manufacturing
20	Environment	Clean and safe treatment and management of waste/wastewater
21	Society	Strengthening of human rights management for employees
22	Environment	Use of sustainable materials
23	Society	Strengthening of compliance with social and economic regulations
24	Environment	Strengthening of compliance with environmental regulations
25	Society	Eradication of illegal labor practices
26	Society	Fair opportunities and prohibition of discrimination
27	Environment	Safe management and treatment of chemicals
28	Environment	Protection of water resources
29	Environment	Protection of the biodiversity in the Mando's work sites
30	Society	Maintenance of a good relationship and communication with local residents in the regions of Mando's work sites
31	Society	Contribution to invigorating local economies
32	Society	Participation in nation's politics/policies

Opinions of Stakeholders

Through the 2020 Survey on Sustainability Management, Mando collected opinions of various stakeholders on important points that Mando should consider based on six topics, including business management/economy, environment, employees, human rights, customers/partners, and local communities. Over 1,500 comments were carefully analyzed and conveyed to the related departments for consideration and reflection in our sustainability activities.

Q. In relation to the 6 topics below, what are important areas that Mando should consider?

Business Management/Economy

- Concrete future planning by departments and the company as a whole
- Discovery of new business, going beyond automotive parts
- Active technology exchange with advanced companies and investment in business ventures
- Settlement of the most appropriate work process by country
- Global activities for raising awareness on sustainability for related employees
- Strengthening of risk management through research and updates on core risks

Environment

- Establishment of an environmental problem response system
- Support for partners for environmental improvement
- Regular monitoring and reporting of environmental compliance
- Securing of environment professionals and training of employees
- Investment in the use of renewable energy sources
- Preemptive response to environmental regulations through development of eco-friendly products and technologies

Employees

- Building of trust through transparent disclosure of information
- Development of participation programs for enhancing pride and teamwork of employees
- Formation of a horizontal and open communication culture
- Strengthening of a work-life balance
- Securing and retaining of outstanding personnel through appropriate rewarding
- Strengthening of professionalism through establishment of job/technology training programs
- Expansion of training programs for locally hired employees in global sites of Mando

Human Rights

- Announcement and promotion of punishment for violation of human rights
- Constant monitoring of sexual harassment and bullying
- Sharing of specific grievance handling procedures and maintenance of confidentiality
- Raising awareness on human rights through consistent, relevant education programs
- Equal treatment of workers regardless of gender (work hours, use of parental leave, etc.)
- Application of the same human rights policies for employees of partners
- Strengthening of privacy protection of employees

Customer/Partners

- Establishment of a partnerships, starting from the stage of contract conclusion, through close cooperation
- Establishment of a partnership through practical support and open communication
- Improvement of technology and price competitiveness through the establishment of a global supply network
- Diversification of customers by responding sensitively to changes in the industry
- Reflection of corporate social responsibility (CSR) assessment (environment, safety, etc.) for selecting partners
- Inspection of the compliance with the Act on Fair Trade, etc.
- Fostering of purchasing experts for strengthening purchasing capacities

Local Communities

- Global social contribution activities regarding diverse cultures
- Planning of social contribution activities considering effectiveness and company image
- Establishment of a social contribution system
- Constant monitoring and proactive response to social regulations
- Expansion of welfare for local residents nearby Mando's plants
- Fostering of local talented individuals and creation of jobs

Creating Sustainable Values

We create sustainable values for stakeholders in all areas of business

Mando maximizes economic, environmental, and social values in all business processes from R&D to product sales

Value Creation Business Model	40
Economic Value	42
Environmental Value	54
Social Value	60

Value Creation Business Model

Mando creates economic, environmental, and social values, which are the key foundation for sustainability management, across all areas of business activities, from R&D to purchasing, production, sales/customer service, and contributions to local communities. We strive to enhance the values of stakeholders, including employees, partners, and customers through activities and achievements at each stage of our business.



Economic Values
Global Player



Environmental Values
Safe & Green Company



Social Value
Mutual Growth Partner

R&D

Securing future mobility technology through consistent investment in R&D

Innovation of Future Lifestyle

- Developing a total solution for autonomous driving
- Securing technology for eco-friendly vehicle
- Developing a platform for mobility service
- Investing in new business based on market intelligence analysis

Minimizing the Environmental Impact of Products

- Developing eco-friendly, high-performance brakes
- Developing a filter for collecting fine-dust

Investment in the Values of Future Talents

- Establishing a fostering system for talent management
- Reinforcing tailored capacity-building programs
- Localizing technology from global sites of Mando
- Strengthening intellectual property(IP) compliance

Sales / Customer Service

Enhancing customer satisfaction with reliable and fair sales

Securing the Fundamentals of Customer Trust

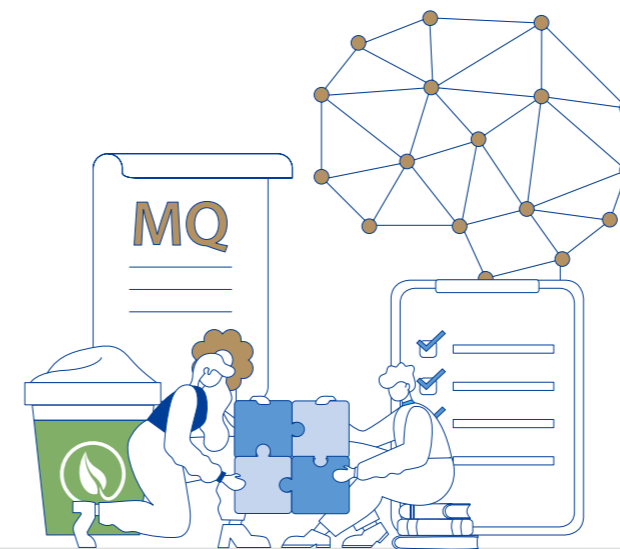
- Compliance with on-time delivery
- Improving satisfaction with product quality
- Customer networking and technology exhibition

Enhancing Competitiveness as a Green Company

- Transparent disclosure of environmental performances
- Strengthening environmental system based on international certifications
- Re-certification as a green company

Anti-corrupt Commitments and Strengthening Compliance

- Operating a report system on unjust actions
- Regular operation of internal auditing activities
- Strengthening employees' awareness on ethics
- International certification for information security management system



Purchasing

Creating a mutual environment to prepare for the future with our partners

Virtuous Cycle of Supply Chain

- Quarterly assessment of financial and non-financial risks
- Mando Quality (MQ) Certification for tier-1 to tier-3 partners
- Fostering of MQ assessment experts

Expanding Eco-friendly Activities

- Utilizing eco-friendly raw materials
- Mentoring support for environmental technology of SMEs

Establishing a Mutually Cooperative Culture with Partners

- Acknowledging and resolving difficulties of partners
- Strengthening quality and technical capabilities of partners
- Financial assistance for partners
- Expanding a fair-trade culture

Production

Producing impeccable products through an optimal production process

Best Quality Assurance

- Implementing smart factories
- Advancing global quality management system
- Verifying appropriateness of production phase
- Improving quality by BU

Creating Clean Local Environments

- Symbiotic cooperation for safety of partners
- Joint labor- management safety inspections
- Emergency response training
- Managing high-risk workers

Creating Clean Local Environments

- Establishing highly efficient utilities of workplace
- Efficient use and recycling of resources
- Preventing wasted resources in the production process
- Managing hazardous chemical and air pollutant emissions



Maximizing values of stakeholders through social responsibility activities

Responsible Activities for Local Community

Social contribution activities tailored for regions

Fostering Employees' Happiness

Supporting active communication and work/life balance

Strengthening Cooperation with Government

Compliance with government regulations and participation in national projects

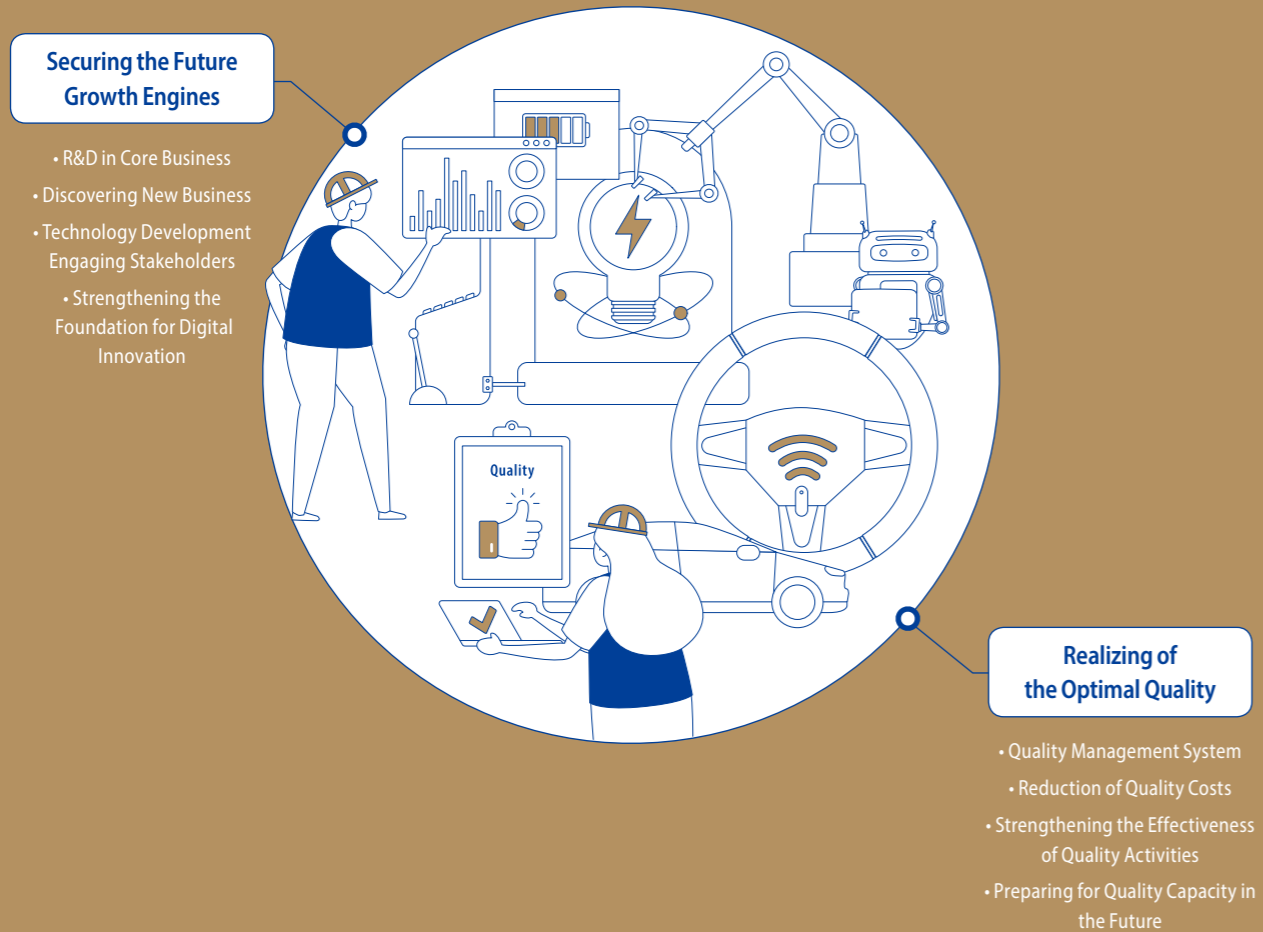
Fostering of Future Talents

Industry-academic exchange programs and scholarship support

Economic Value

Pioneering future automotive technologies

In order to maximize the economic values directly related to the operation of the company, Mando focuses on the R&D of technologies and new business that will become future growth engines to quickly satisfy the needs of the changing market. Moreover, we improve product competitiveness through capacity enhancement on quality and safety, and we continuously grow by adapting to the changing market, as many industries, including manufacturing, continuously innovate through the application of new digital technologies.



R&D investment to sales ratio

6.0 %

Winter Test operating expenses

KRW 5 billion

Investment in startups

KRW 41.4 billion

Establishment of new business organization

WG Campus

Reduction in the working hours through RPA*

1,200 hours

*Robotic Process Automation

Steer by wire (SbW)

World's First Production Planned

Securing the Future Growth Engines

With the hardships of the automotive industry and the rise in uncertainties in the global management environment due to the quickly changing market, the necessity for securing future growth engines cannot be emphasized enough. Mando not only strengthens the competitiveness of its core business through R&D and investment activities, but also concentrates on discovering new business for a pursuit of diverse changes. Moreover, we are creating an agile culture through task innovation in response to the digital transition generation, adjusting to the new changes to come.

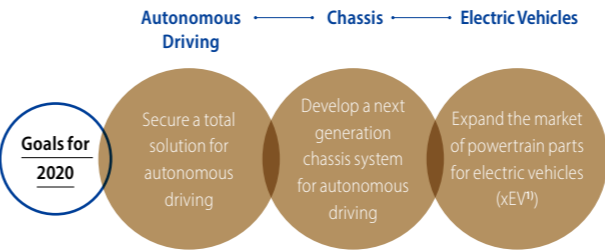
R&D in Core Business

R&D Strategy System

With the goal of becoming a globally leading automotive parts company through the development of world-class technologies, the core technology of Mando is the automotive chassis system, which is the basis of a vehicle, and Mando puts its best efforts to strengthen the competitiveness to the next generation of chassis module. As of 2019, a total of 2,319 R&D engineers from 5 countries, including Korea, dedicated themselves to the advanced development, designing, test evaluation, and research planning.

As for the advanced development aimed towards the creation of the next generation of products, we develop intelligent and eco-friendly parts for future automobiles. For designing, we focus on developing the overall chassis products such as brake, steering, suspension, and advanced driver assistance systems. The reliability and validation part tests our products and technologies in proving grounds with various environments located in Korea, Europe, the US, and China. The R&D planning part establishes the strategies for technological development. In order to develop products with high added value and state-of-the-art technologies and lead the future automotive market, we will increase our R&D investments up to 8% of total sales by 2025.

R&D Mid-term Goals



R&D Head Count and Investment (Unit: People, KRW 1 billion, %)			
Category	2017	2018	2019
R&D head count	2,040	2,115	2,319
R&D investment	302	315	361
Percentage of sales	5.3	5.6	6.0

1) xEV: Hybrid and Electric Vehicles
2) SbW: Steer-by-Wire

Total Solution for Autonomous Driving

Mando's advanced driver assistance system (ADAS), which facilitates convenient parking, safe control, and maintaining a safe distance between cars, continues to progress to realize self-driving accident free smart vehicles, the core of the Fourth Industrial Revolution.

We are giving its all to develop advanced sensors for self-driving cars. A Lidar, the core component for autonomous driving, applies laser to measure the distance between objects; a camera recognizes obstacles surrounding the vehicle; and a Radar uses electromagnetic waves to detect the distance between objects, direction, and speed.

We are developing a system that provides "a self-following the front car in high/low-speed" by combining the smart cruise control (SCC) that maintains a safe distance between cars as well as the lane keeping assist system (LKAS) that features an optimal lane keeping for vehicles. This system automates driving in traffic congestion, providing convenience and preventing accidents. We will continue R&D and investment in this area to possess outstanding technologies of the autonomous vehicle market.

World's First Production of the Electric Signal-Type Steer-by-Wire Planned

Mando will produce the SbW²⁾ system which is controlled by electric signals only by 2021. The SbW system gives precise road information to the driver and fixes the steering wheel in self-driving mode for a safe and convenient driving experience. In 2020, we signed supply contracts with several electric car startups in the US and will be producing the SbW system for the electric autonomous-driving vehicle that will be launched in 2021. This will be the first type of vehicle without a mechanical device that connects the steering wheel to the tires.

Pre-emptively Securing the Core Technologies for Future Mobility

Mando strives to secure the core technologies required for the future generation of vehicles by studying the technology trends of the automotive market. For this, we list all the technologies we need every year and based on "3B Strategy," which stands for "build," our own development, "borrow," the technical partnership and license from external channels, and "buy," paying to buy the technology, we systematically categorize and manage the list.

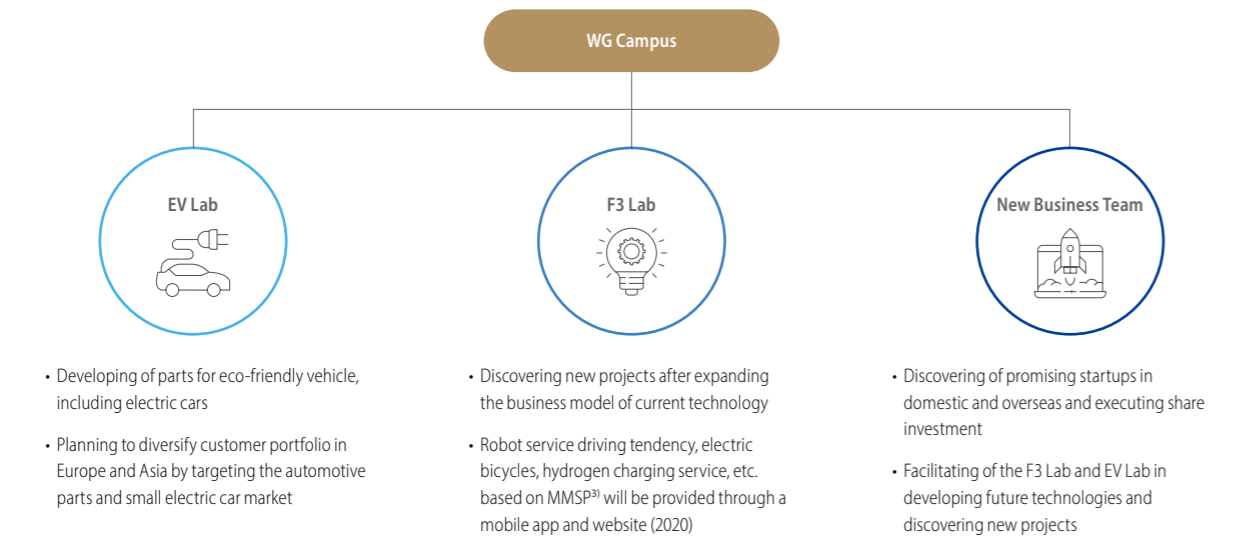
3B Strategy and Achievement (Unit: Cases)			
Category	2017	2018	2019
Build	56	61	51
Borrow	50	22	19
Buy	6	3	4
Total	112	86	74

Discovering New Business

Establishing “WG Campus” for the Development of New Business

In September 2019, WG Campus for the Development of New Business was established in hopes of discovering and systematically cultivating new projects.

WG Campus is composed of 80 selected R&D engineers of Mando and three divisions, including F3¹⁾ Lab, EV²⁾ Lab, and New Business Team. Through WG Campus, we will create a growth platform that will flourish beyond the advanced driver assistance system (ADAS).



▲ WG Campus Launching Ceremony

1) F3: Future, Frontier & Freedom
2) EV: Electric Vehicle
3) Mando Mobility Service Platform: Composed of the device management server, data server, artificial intelligence (AI) server, and service server



EV Lab

Securing of Eco-friendly Vehicle Technologies

With the expansion of electric vehicle (EV) and mobility markets due to increasing enormity of the global environmental pollution, the EV Lab intends to increase the sales of future vehicles parts and diversify domestic and overseas customers. Mando will quickly adapt to the changing market and secure product competitiveness through our experience in producing electric vehicles' OBCs⁴⁾.

R&D of the EV Lab

Personal Mobility 	<ul style="list-style-type: none">Providing a driving module for small mobility of two/three-wheeled SPMS⁵⁾Establishing a platform for EV operation by launching network service-based products
OBC, FDC/LDC 	<ul style="list-style-type: none">Developing of high-power specialized productsEnhancing the capability to downsizing partsProduction of price competitive products based on cost tracking
E-Drive System 	<ul style="list-style-type: none">Providing an integrated system of driving and chassis control technologySecuring the capability with small EV first and expanding the market
E- Corner⁶⁾ 	<ul style="list-style-type: none">Simplifying the structure and securing price competitiveness of the e-corner module for shuttles that can be operated in smart cities

4) OBC: On-Board Charger
5) SPM: Smart Personal Mobility
6) E-Corner: A system reducing the need for a separate mechanic driving device by integrating the brake, steering, and suspension system that are on the corners of a vehicle where the wheels are placed
7) Application Programming Interface: An interface designed to control the functions provided by the operating system or programming language for use by application programs.



F3 Lab

Robot Solution Development Project: “Patrol Robot Goalie”

The F3 Lab is developing a mobile robot platform based on autonomous driving technologies, aiming towards the cultivation of new projects. Based on leading technology of ADAS and autonomous driving, Mando wants to provide a robot solution contributing to the upcoming smart city generation by developing robots that can provide services such as night patrol, autonomous parking, EV charging, and more. The first project for this is the development of the patrol robot, “Goalie,” which is scheduled for its first night patrol trial in a park in Baegot New Town, Siheung-si, Gyeonggi-do Province in the second half of 2020. We hope “Goalie” would contribute to improving people’s satisfaction with safety and invigorating the use of parks by preventing crimes during at night and increasing the safety of residents.

Launch of Hydrogen Charging Station Information App: “H2Care”

In hopes of reducing inconvenience due to a lack of information on hydrogen charging stations, Mando launched a beta version of the hydrogen charging station information app called “H2Care” in November 2019. The main features of the app include operation information on the hydrogen charging stations nationwide (location, hours of operation, price of hydrogen, charging pressure, etc.), real-time information (out-of-service chargers, exchange of trailers, number of vehicles waiting for service, etc.), and a suggestion page for users. The full version of the app will be launched in February 2020. The application programming interface (API⁷⁾) service of H2Care will be offered to the external service companies or services will be added using external data, actively engaging in creating one more major business sector of Mando.



▲ “Goalie” Conducting Night Patrol

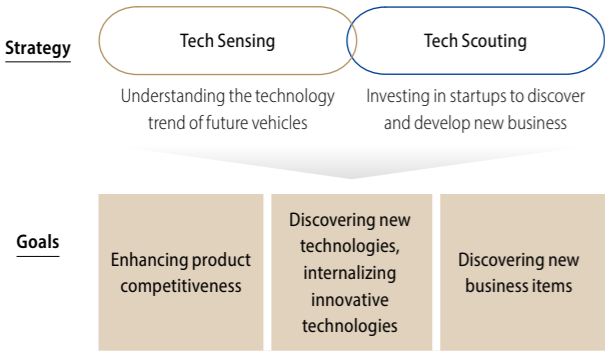


New Business Team

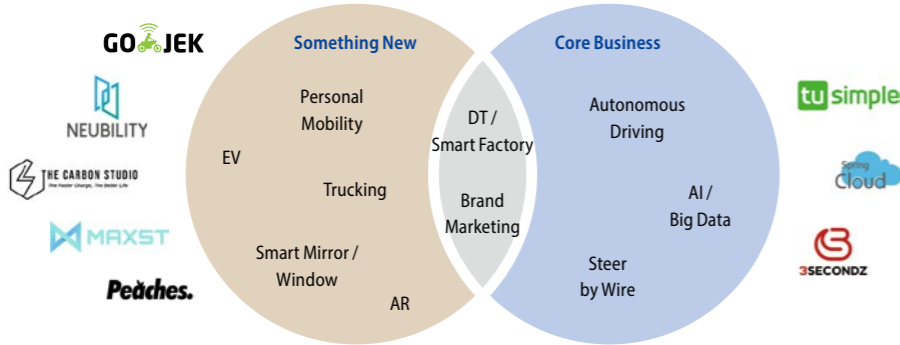
Global Technology Exchange at Mando MISV

Mando Innovations Silicon Valley (MISV) located in Silicon Valley, US, has been actively engaging in technology exchanges with international corporates and promising startups since its establishment in 2017. In 2019, Mando conducted a Startup PoC¹⁾ to expand its R&D cooperation activities. Through this project, startup products were installed in MISV autonomous vehicles, which allowed us to compare and evaluate our sensor performances and develop the necessary software and products. Also, by establishing partnerships with auto-tech ventures based in Silicon Valley, we have expanded active market sensing and investment deal sourcing. Moreover, MISV continues to seek more partnerships and competitiveness in Silicon Valley by participating in various networking activities for gathering information on the trends of artificial intelligence.

Objective of MISV



Investment in Startups in 2019



Company Name	Core Technology (Product)
SpringCloud	Control/management solution for self-driving shuttle service
3SECONDZ	Racing driving data analysis and coaching system
The Carbon Studio	Activated carbon manufacturing technology using super capacitors ²⁾ (using coffee residue as raw material)
Neubility	Map information for Last Mile ³⁾ robots and SW solution for cognition/decision/control

“Tech UP+,” Fostering of Startups in the Mobility Field

Mando Mobility Tech UP+ is a program, run by Mando and Future Play, a tech startup builder, to cultivate and invest in young startups in the mobility field. 3SECONDZ, The Carbon Studio, and Neubility are the three startups that were selected for investment from the first program that began in 2018. The on-going second program expanded the eligible fields to transportation, logistics, and robot, and the four selected teams are receiving dedicated supports in all areas of entrepreneurship, including funding, office space, mentoring of employees, patent and brand registration, and attracting follow-up investments. We will continue discovering, cultivating, and investing in startups in response to the quickly changing automotive technologies of the future.

Investment in Promising New Business Startups

Mando actively invests in startups to strengthen competitiveness in its core business and enter into newly rising business fields. In 2019, we invested in eight startups, including the three that were selected by Tech UP+. We attained more partners by investing in various business models, such as augmented reality, car sharing, self-driving trucks, and more, and have plans for strategic investment in more fields to realize autonomous driving and future mobility.

Company Name	Core Technology (Product)
MAXST	Augmented reality development tools (SDK ⁴⁾ , solution)
Gojek	On-demand service platform (motorcycle/car sharing, food delivery, etc.)
TuSimple	Self-driving truck delivery solution
Peaches	Video content creators based on cars, fashion/car supplies

1) PoC: Proof of Concept
2) Super capacitor: Ultra-high capacity accumulator
3) Last Mile: The final step in delivering a consumer's purchased product to its destination.
4) SDK: Software Development Kit

Participation in IAA 2019 - Exhibition of Future Autonomous Driving Technology

In September 2019, Mando disclosed the three main technologies for future autonomous vehicles such as lidar, radar, and camera, at the International Motor Show held in Frankfurt, Germany. It was the first time that the lidar technology was announced externally, and we plan to complete the prototype development of both mechanical and solid state type lidars for commercialization within the next 2-3 years. Apart from the autonomous driving, we also exhibited over 50 products and new technologies, including eco-friendly products and brake-steering-suspension systems of the next generation. We once again highlighted our image as a leading technology-focused supplier targeting global automobile manufacturers, including Ford, Dyson, and Volkswagen, all of whom visited Mando's exhibition booth.

Suzuki Tech Show

Mando organized a 'Suzuki Tech Show' in May 2019 in the headquarter of Suzuki located in Hamamatsu, Japan. The show included VIP meetings, exhibition tours, and seminars for Suzuki officials. We promoted our technologies and products through this event, and witnessed that we proved our technology and quality competitiveness in the show which could create a potential business. We plan to actively increase the sales through the development reflecting customer's needs and price competitiveness based on the local market trend.

TATA Tech Show

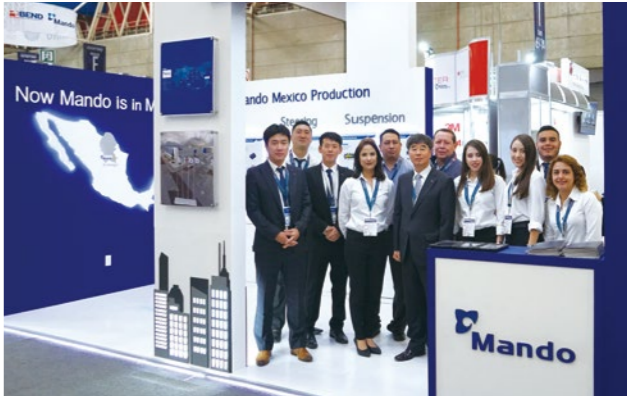
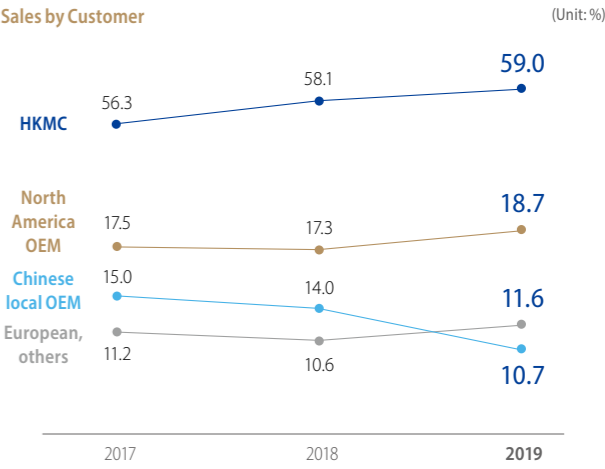
Mando Automotive India Limited (MAIL) hosted a tech show for TATA, targeting the Indian automotive parts market. This tech show was the first solely dedicated tech show for a customer in India and it served as a good opportunity to verify how much attention Mando was receiving from its customers. The tech show was composed of not only an exhibition, but also a technology seminar and purchase consultation. During the technology seminar, we delivered a presentation on the core technologies and products of Mando, sharing the technology trends of the automotive parts industry. We hope to expand our business with TATA in the future and will continue to build a trusting relationship through a mid-term report on the new technology application road map.



▲ Mando's Exhibition Booth at the IAA in Frankfurt

Participation in the El Foro de Proveeduría Automotriz in Mexico

Mando Corporation Mexico (MCM) participated in the 6th El Foro de Proveeduría Automotriz of 2019 for meeting with potential buyers and discovering new suppliers. El Foro de Proveeduría Automotriz is the largest Latin American automotive industry fair since 2013. We opened an exhibition booth and a buyer desk for holding private meetings with OEM buyers and promoting the global status of Mando and our expansion into Mexico. Buyers showed great interests in the localization rate of MCM's products, holding about 20 separate meetings with potential partners. This event laid the foundation to strengthen the local marketing activities of Mando and to increase the localization rate through the discovery of new suppliers.



▲ Mando's Exhibition Booth Installed at El Foro de Proveeduría Automotriz in Mexico

Technology Development Engaging Stakeholders

Fostering of R&D Specialists

To enhance the competitiveness and technical skills in the global market, it is critical to create an environment in which R&D engineers can efficiently work and make achievements. In order to break away Mando’s general promotion ladders, where one becomes a manager with organizational management duties on top of the original R&D work, we operate a HR system called the 'Fellow' and 'Pro-Engineer' system to encourage R&D engineer to fulfill and contribute their roles as engineers and provide an alternate career path of becoming a research expert. In this way, engineers can grow into ‘R&D Specialist’ based on their accumulated experience and capability which leads Mando as a high-technology company with quality competitiveness.

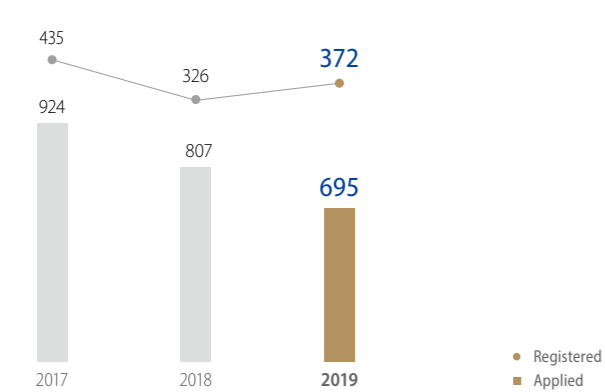
Support for Employees' Inventions

To encourage active research and development, Mando actively supports a patent application for both R&D engineers and non-engineers to manage their inventions as Mando’s intellectual properties. In order to create high quality patents, we provide an intellectual property-related education and workshops, build an environment to improve creativity, provide a reward for job invention, and select “the best inventor” of each business units to keep motivating our engineers. In 2019, our inventions were also recognized externally, winning an award on National Invention Day and being nominated as the Intellectual Property Management Corporation of the year.

External Awards for Inventions

Date	Award	Awardee
May 2019	Commendation for the Production Industry at the 54th Invention Day Ceremony	Managing Director Seong-Hee Jeong, ADAS BU
	Presidential Award at the 54th Invention Day Ceremony	Senior Research Engineer Hyun-Bi Kwon, Steering BU
November 2019	Minister of Trade, Industry, and Energy Award at the Intellectual Property Management Corporation	Mando Corp. (represented by Director Kung-Hyun Nam, Global Legal Center)

IP Applied and Registered (Unit: Cases)





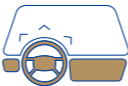
Status of Applied Patents by Technology (Unit: Cases)

Category	2017	2018	2019
Brake	340	308	235
Steering	236	239	181
Suspension	84	61	49
ADAS	190	159	186
Electric/Electronic	47	38	34
Electric bicycle	19	2	6
Etc.	8	0	4

‘Open Innovation’ : External Cooperative Research Activities

Mando conducts “Open Innovation,” a cooperation activity with external organizations, such as corporations, research bodies, and academic fields, in the process of securing core technology and R&D activities; developing and testing. Excellent example of our Open Innovation is the technology council composed of technology specialists and advisors. The council internally assists in overcoming the difficulties with limitations, reviewing technology, and developing new technologies. In 2019, three technology advisor seminars were conducted in hopes of maximizing synergy with the outsiders, such as studying the trends of future technologies.

2019 Research Topics of Technology Advisors’ Seminar by Session

1 st Session	2 nd Session	3 rd Session
		
The Present and Future of Self-Driving Robots	The Present and Future of Collaborative Robots	The Development and Proving of the Advancements of Autonomous Driving Technology and Fully Self-driving Shuttle

Outstanding Theses Awards

For the quality enhancement of Mando’s research achievements, we annually select the outstanding R&D theses. Each business unit including global site can participate by submitting at least one thesis reflecting the philosophy and a research achievement. The top six theses selected after a preliminary screening go through the second screening by the Head of R&D Center. The screening criteria are quality (60%), contribution and achievement (30%) and presentation (10%). Through a fair screening process, we selected the 1st, 2nd, and 3rd place winners and rewarded them with monetary rewards. We will continue to support the engineers releasing outstanding thesis and passionately concentrating on R&D, to steadily strive and push forward.

Results of the Thesis Evaluation of 2019

Category	Thesis
1 st Place	Research on new caliper piston retraction system for zero drag
2 nd Place	A Mode-changing LLC/CLLC Bi-directional DC/DC Converter for OBCM of 800V Battery Systems
3 rd Place	Total Solution for Enhanced EMI Shielding Using Nano Materials Impact analysis of automotive radar on bumper & fascia

Strengthening the Foundation for Digital Innovation

Innovation Operation of a data-based Intelligent Plant

For the improvement of manufacturing productivity and customer satisfaction, Mando initiated the “smart factory,” an intelligent factory that can make decisions based on data. In the first phase, we came up with 14 tasks by diagnosing the current status of duties and systems directly associated to the operation of the smart factory. By the end of 2019, we completed ten 10 tasks, including the establishment of a key performance indicator monitoring system for global production. In the second phase activity of smart factory operation, we plan to initiate the core duties of establishing a production plan based on artificial intelligence and developing the prediction system with applied big data.

Business Process Innovation: Robotic Process Automation

Mando implemented the robotic process automation (RPA) to automate repetitive PC-based manual labor. By utilizing the RPA for 6 duties, including the input of research expenditures for governmental R&D tasks and registering customer information, we reduced the frequency of typographical errors and mistakes and shortened the process time of repetitive tasks. RPA also maximized work efficiency with the result of reducing the working hours by 1,200 hours from 1,572 hours in a year. In this manner, RPA will be spread wider and advanced further in the future to establish an agile corporate culture .

Lecture on “Digital Transformation” for Raising Digital Awareness

In hopes of raising awareness on the quickly changing global industry in this digital transition era, Mando conducted a lecture on digital transformation (DT) for its employees. Through various opportunities, such as Work Smart program, lectures on digital transformation, and IT lectures within Halla Group, a total of about 1,685, 100, and 150 employees participated each event mentioned above and received overall training on everything, from the definition and actual activities of digital transformation to the understanding of new IT technologies. We will continue to expand our educational programs for equipping employees with a digital mind and conducting DT-based duties.



▲ Performance Review Meeting for the 1st Phase Activity of Smart Factory Operation



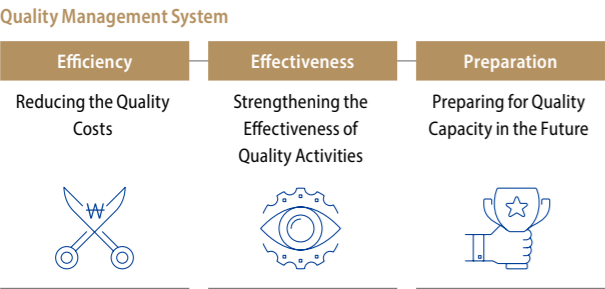
▲ Lecture on Digital Transformation

Realizing of the Optimal Quality

For companies that manufacturing automotive parts like Mando, quality and safety are of the utmost important matter as they are directly associated with drivers' lives. To prevent any cause of quality issues and counteract to the strengthened safety regulations, Mando conducts a systematic quality management system. Mando puts our best efforts such as thorough quality management of partners, enhancing in-house quality capability, and in-depth verification in all process of product development, to secure drivers' safety and maximize customers trust and satisfaction.

Quality Management System

Mando continuously improves its quality activities in line with the changing market demands with the advent of the Fourth Industrial Revolution to prevent safety quality problems. Mando is enhancing the effectiveness of quality activities to secure the safety of quality. Those activities include reducing the quality cost through systematic risk management, securing quality fundamentals, and complying with basic principles of quality. Mando is also securing the optimal quality by enhancing the capability to prepare for the future through expanding the infrastructures for electronics quality.



Reduction of Quality Costs

Reduction of Quality Costs and Failure Costs

In order to reduce unnecessary costs that occur during quality activities, Mando identified high-cost items based on the Early Detection, Early Resolution (EDER) system. Moreover, we are systematically managing the risks in quality costs, such as warranty, and opportunity factors to minimize the predicted costs and risks for the optimization of quality costs.

Step-by-Step Quality Cost Reduction Activities

In order to reduce quality costs, Mando strategically created steps in which quality costs occur. As a short-term resolution, the replacement of the parts for major systems, including the brakes, steering system, suspension system, and advanced driver assistance system, are conducted "partially," meaning only the parts that need replacement are being replaced in an effort to cut unit costs. From a mid-term perspective, our task force team, which is composed of members of the laboratory and the quality and production divisions, is working to reduce chronic regional problems.

Strengthening the Effectiveness of Quality Activities

Improvement of the Risks in Quality Processes

In order to prevent recurrence of quality problems and to quickly identify the causes of fatal quality issues, Mando reduced the risks in quality processes from development to production. For strengthening the foundation of quality tasks, we selected the 16 major processes and analyzed the differences and vulnerabilities per business unit to focus on improving them for the optimization of quality processes.

Standard Operation of Global site

For enhancing the quality level of not only the domestic location, but also that of global site, Mando is concentrating on improving weak points such as the stabilization of process defects. Also, since 2018, Mando has been cooperating with the Halla Human Resources Development (HRD) Center on creating projects for the global standardization of quality education and improvements in employees' quality capacities. As a result, we successfully localized our job capacity model in China's quality-related job training system, and based on this program, we developed a "Quality Training Course for New Employees in China," in 2019. In August 2019, we completed the first training course for 14 newcomers, and the same will be adapted to global site in the US, India, and Europe in hopes of strengthening the global standardization of quality job training.

Product Quality Control of Partners

In order to offer products of the best quality through thorough management of the whole production process, Mando is carefully managing the qualities from tier-1 to tier-2 and tier-3 partners. For our tier-1 partners, we conduct regular assessments on the quality, shipment, and quality system. As for the tier-2 and tier-3 partners, we request companies to conduct a Mando Quality (MQ) certification to weed out unqualified companies and strengthen our sourcing pool. Moreover, in 2019, we made a certification center for 32 partners among the 47 that conduct MQ certification, and we plan to make the same for the rest of our partners. Mando will continue practicing strong quality control by strictly monitoring the quality of our partners.

Compliance with Basic Principles of Quality Control

With the increased demand for the safety of product quality and strengthening of related regulations, Mando is strictly managing its plants and partners in compliance with the basic principles of quality control. We comply by regularly inspecting the security processes and reinspect product audit sheets.

Preparing for Quality Capacity in the Future

Stabilization of Global Quality Management System "G-QMS"

In 2018, Mando established Global Quality Management System (G-QMS) to share data and indexes in relation to quality among Mando global site. Since then, we have reduced quality risks by applying the system in our regular tasks for the inspection of quality information in real time and the integrated management of quality information. In 2019, we stabilized the existing system and added new features, including the "Managing Quality Document" tab and search filters, finalizing the G-QMS Ver 2.0. For a more stabilized system, we will finish the development and implementation of G-QMS Ver 3.0 by the first half of 2020 with improvements in the main page and list of history.

Expansion of Quality Improvement Infrastructure for

Automotive Electronics

With the development of the automotive industry and diversification of automotive electronics, Mando plans to expand its quality improvement infrastructure for automotive electronics to enhance its quality competency in preparation for the future market. We have started improving the quality of automatic semiconductors by strengthening the management of semiconductor devices. Also, we created a specialized e-learning program to secure professionals in the field of semiconductor quality. In 2020, we are improving the software development process through improvements in the management of software design changes in pilot-stage software and the internalization of the software engineering process.

Strengthening of Reliability Tests

With the spread of autonomous driving and a sharing economy, vehicle mileages are increasing, emphasizing the need to maintain the function of products without failure during the target period. Moreover, as the automotive quality paradigm emphasizes the quality of durability, Mando conducted the Weibull Analysis¹⁾ in 2019 to optimize the reliability of advanced OEMs and enhance competitiveness. Also, we confirmed the points of improvement with the Field Claim Weibull Analysis which helped in reducing complaints and quality costs. In 2020, we will continue to cut costs in terms of quality, development, and testing, and improve the reliability of new products and specifications through the Weibull Life Data Analysis.

Establishment of a Brake Quality Verification Environment

In order to meet the high levels of customer demand to reduce operational sounds and abnormal operational sounds, and especially that for noise, vibration, and harshness (NVH²⁾), Mando intends to establish a verification environment and process to ensure quality robustness. For this, we made it possible to check the causes and major factors of NVH by establishing a verification environment that conforms to the actual vehicle conditions to quickly reproduce the problem and determine the validity of our measures for improvement. Also, we plan to establish a process by which all NVH issues can be pre-validated during the development stage and strengthen the issue detection ability by 2020, considering the fact that there are various and different evaluation methods but no standardized quality control system for NVH.

Winter Test for Flawless Quality Verification

The safety of automotive parts is directly associated with the safety of drivers thus, it is most important to secure problem-free quality in all kinds of driving environments. For this reason, Mando conducts winter tests for its product and system performance in extreme environments like severe cold, slippery roads, and bumpy surfaces in Sweden and China. In winter test 2019, over 200 engineers verified the performance of the newest technology including the integrated dynamic brake and advanced driver assistance system, receiving positive feedback from customers on technology readiness. Based on these feedbacks, we will continue to conduct improved winter tests to develop safer and more convenient products next year.




▲ Winter Test on Off-road

1) A reliability analysis method developed by Waloddi Weibull (1887-1979), which can estimate products' life cycles with a few test sample
2) NVH: The noise, vibration, and harshness caused by automotive parts.

Operation of R&V Units by BU

Mando conducts numbers of quality tests on all of its products to ensure safe operation in any condition or environment. In 7 vehicle test sites located in Korea, China, New Zealand, US, and Sweden, we conduct performance and durability tests in extreme environments to contribute to creating satisfying quality for our customer.

Reliability & Validation Work Scope of BU

 Environment Test	Performance test of parts under extreme conditions, such as high or low temperatures, corrosion, etc.
 Vibration Test	Durability test against vibration by applying shock with certain frequency to the product
 Noise Test	Noise measurement and analysis in an anechoic chamber with almost no sound reverberation
 Radar Test	Performance test by distance by controlling the radar transmission and reception time
 ABS/ESC Test	Ceramic surface test track simulating a slippery icy road
 FCA Test	Front collision prevention test for automatic braking of autonomous braking by detecting the objects ahead
 LKAS Test	Lane keeping assist system test for autonomous steering of a vehicle on straight and curvy roads
 HDA Test	Highway driving assist system test through test drive on real roads

Verification of Materials for Robust Design

Mando is securing robust design and parts by reviewing the suitability of material in the drawing starting from the product development stage. The co-signing system for drawings that verifies the materials from the early stage of development is conducted on new products, new technologies, and other products that had defects in the past. In 2019, we accomplished the co-signing of 51 material drawings, contributing to minimizing material errors and reducing the development period.

Moreover, we are securing quality cost of development stage and robust parts

through a step-by-step design and product validation (DV¹⁾, PV²⁾ of material appropriateness. In 2019, we accomplished 94 cases of DV and PV, and established a database on such information which served for immediate detection of the cause in case of quality issue. With this systematic plan, we plan to continue securing advanced quality for our products in 2020.

Receiving the Quality Excellence Award for Suppliers

At TATA Motors Annual Supplier's Conference in August 2019, Mando received the Quality Excellence Award, a recognition given to suppliers who provided the best of quality for the past year. The Indian automotive company TATA Motors, which has been working with us since 2014, highly evaluated the flawless quality of our brake systems, including calipers and master booster brakes, and electronic power steering that reduced total development time and was successfully produced. This award is significantly meaningful as it represents that our quality and technologies were well-received in the Indian market. We will continue expanding its presence in India for customers' safety and convenience.

International Certification on Automotive Quality Management System

Mando values enhancing reliability and customer satisfaction by acquiring and maintaining international certifications of international quality systems to guarantee the quality of its products. In 2018, Our plants in Pyeongtaek, Wonju, and Iksan received the modified IATF16949 certificate, enhancing the responsiveness and safety of quality in accordance with the latest laws and regulations. We will continue to prioritize the safety of products and lay the foundation for a quality of zero defects.



▲ Awarding of Quality Excellence Award from TATA Motors

Hockey, Testing Level-4 Autonomous Driving

Special Page

By succeeding with the level 4 autonomous driving demonstration, Mando took one step closer to realizing full autonomous driving and the commercialization of autonomous driving. Level-4 autonomous driving is equivalent to the full self-driving automation level defined by the National Highway Traffic Safety Administration, which signifies that a vehicle can travel to a destination by itself without a driver. Chairman Mong-Won Chung, President Il-Hwan Tak, and related engineers rode the self-driving vehicle “Hockey” and successfully cruised 2.7 km of autonomous driving at a speed of 40 km per hour on the public roads of Pangyo, Gyeonggi-do Province. “Hockey” is the name of Mando’s autonomous driving platform and the vehicle of which the use was approved by the Ministry of Land, Infrastructure and Transport in February 2017.

The testing route in Pangyo is considered unfavorable for autonomous driving as it has a restricted driving environment, including a large number of illegally parked vehicles on the sides of the roads and a large amount of reflected sunlight from high-rise glass buildings. However, this day, “Hockey” successfully performed driving straight and along curves, turning right and left, and changing lanes by receiving signals from lidar and independently developed front radars and front camera. These technologies are critical for autonomous driving and the advanced driving assistance system as they feature optimized control based on the recognition sensors and meticulous map information.

Furthermore, “Hockey” demonstrated the “Prediction and Planning”, finding a safe route itself to prevent collisions by predicting the movements of adjacent vehicles, and also showed a more advanced self-driving performance by accurately recognizing the complicated surrounding environment of intersections and presuming the exact location of vehicles to make a left turn according to the traffic signal at an intersection. This is based on a communication technology called the vehicle-to-everything (V2X) that enables cars to pass through intersections by recognizing the traffic light information they receive through a communication service provider. With this successful demonstration, we plan to reinforce our artificial intelligence technology and achieve commercialization of our self-driving vehicles through partnerships with domestic and overseas partners by 2021.

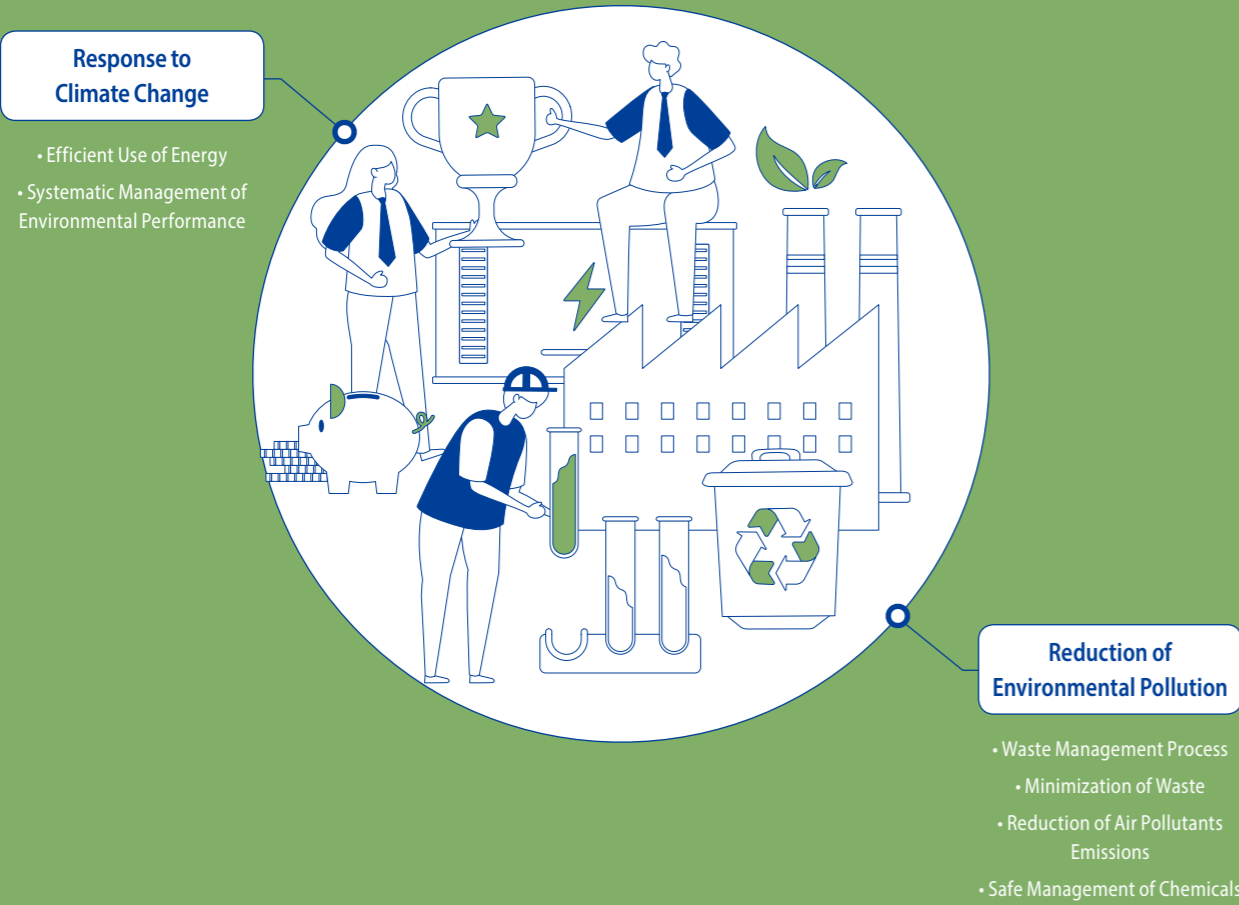


1) Design Validation: Design validation at the development stage
2) Product Validation: Verification of suitability for production at the production stage

Environmental Values

Combating against climate risks

Since the Paris Agreement, demand for eco-friendly technologies and reusable energy have increased as the restrictions on the environment and greenhouse gas have been strengthened. Accordingly, Mando established an environmental management system in order to proactively respond to the climate change. Also, by monitoring the entire auto parts manufacturing process, from essential resources (e.g. electricity, water) to other materials generated by production (e.g. greenhouse gas, waste), we are consistently identifying and implementing tasks to reduce negative environmental impacts.



Reduction of yearly electricity costs through operation of ESS

KRW **439** million

Energy usage saving compared to 2018

2,131 TJ

Reduction of incinerated waste compared to 2018

100 tons

2019 Green Company and Green Management Award from Ministry of Environment and Ministry of Trade, Industry and Energy

Awards

Reduction of VOC emission compared to 2018

43 %

ISO 14001, Green Company

Maintenance of environmental certification

Environmental Management System

From production to waste and recycling, Mando aims for systematic environmental management in hopes of minimizing negative environmental impacts caused by industrial activities. Our Environment & Safety team practices environmental management through thorough work divisions while making decisions through Global Environmental Safety Conference. By setting and implementing core tasks and detailed goals, we pursue “Zero Environmental Accidents,” moving forward as a leading company for environmental management.

Environmental Management System

Goal	Zero Environmental Accidents	
Main Tasks of 2019	Clean Optimization of Environmental Facilities / Reduction of Costs	<ul style="list-style-type: none">• Minimization of water pollutants• Improvement of waste management• Emissions trading and reduction of GHG
	Correct Increase in Responsiveness to Changes of the Environment Act	<ul style="list-style-type: none">• Compliance with chemical management• Preparation for the execution of the Framework Act on Resources Circulation• Improvement of processes for preventing leakage of cutting oil• Monitoring of regulations and advanced response
	Competitive Advancement of Environmental Management System	<ul style="list-style-type: none">• Improvement of processes for registering new chemicals• Improvement in maintaining the Green Company designation• Improvement in maintaining the ISO14001 certification

Response to Climate Change

Countermeasures of companies are expected with the rising threat of the increase in global temperature caused by greenhouse gas (GHG) emissions of manufacturing activities. As environmental regulations, such as policies for GHG reduction are strengthened, Mando manages GHG emission by participating in the management by objective (MBO) model and the emission trading scheme (ETS). We also actively respond to climate change through practice of green management such as the reduction of energy use, ISO 14001 certification.

Efficient Use of Energy

Improvement of Energy Efficiency

Mando’s offices endeavor to save energy by improving overall energy efficiency. The Wonju Plant initiated the establishment of a low-cost, high-efficient utility by optimizing the air supply pressure during work hours and switching the water heating technique from a centralized heating system to an individual heating

system. The Iksan Plant invested KRW 15 million to supply supplementary heating using heat waves, resulting in reductions of GHG by 140t CO₂ and energy by 288MWh. The working environment has improved as well by installing air conditioners/heaters. The Pyeongtaek Plant maximized its energy efficiency by switching to high-efficiency power supply.

Energy Consumption Within the Organization (Unit: TJ)

Category	2017	2018	2019
Fuel	162.32	170.498	148.964
Electricity	2,102.009	2,059.185	1,958.496
Steam	32.032	28.665	26.349
Total	2,296	2,258	2,131

Reduction of Energy Usage During Non-Operating Hours

The manufacturing industry, which requires a lot of energy consumption, needs to efficiently manage its energy use. In order to reduce the amount of wasted energy during non-operating hours, Mando’s Iksan Plant subdivided the air and steam supply cut-off facilities into processes and lines to prevent the unnecessary consumption of energy unrelated to work. The Wonju Plant blocked the idling of facilities and got rid of the air valve of the standby production line to become a “Zero Waste Plant.”

Reduction of Energy Costs through ESS

The Pyeongtaek and Iksan Plants are greatly reducing their energy costs by utilizing the energy storage system (ESS) for the effective use of energy. The cost of daytime energy use (KRW 191/kWh) is more expensive than that of nighttime use (KRW 56/kWh). For this reason, Mando has been storing the relatively economic nighttime energy for 6 hours utilizing the ESS, through which the stored energy was then used during operating hours in the daytime, saving a yearly amount of KRW 439 million in electricity costs.

Support for SMEs in the Form of Energy Saving Technologies

In order to assist small- and medium-sized enterprises (SMEs) in reducing their energy use, the Wonju Plant, together with Korea Energy Agency, has been supporting two partners by giving annual inspection of their energy-consuming facilities. They provide technical support for improving the causes of energy overuse and hold seminars for reporting their energy diagnosis. Wonju Regional Agency for Environment, Green Company (Mando), and other partners have signed a two-year environmental technology mentoring agreement to help companies with poor environmental management establish a new system by providing a compliance checklist and technical support. Likewise, Mando contributes to saving the environment through technical support of SMEs and hosts open discussions on the effect. Moreover, the Iksan Plant provides technical support two times a year to six of its partners for the reduction of total hydrocarbon (THC), reflecting business improvements by sharing the strengths and weaknesses of each partner company.

Systematic Management of Environmental Performance

Disclosure of Information through the Environmental Information System

Mando strives to enhance the motivation for environmental management and activate communication with citizens on environmental topics. For this reason, we update our information about environment every June on the Environmental Information System for accreditation by the Korea Environmental Industry and Technology Institute (KEITI) and publication for the citizens in March of the following year. We have been reporting information on the amount of generated waste, amount of used water and energy, number of investments for reducing environmental contamination, etc., and will continue to update our environmental performances.

Designation as a Green Company

Green Company refers to a business that contributes to improving the environment by prominently reducing the amount of pollutants and the use of resources and energy. In 2019, Mando's Brake Plant rearranged its operations according to the updated standards in order to reacquire the Green Company designation. Being recognized for contributing to the environment by taking a preemptive approach to deduction factors in the evaluation, we have been re-designated as a Green Company.

GHG Emission and Emission Trading Scheme(ETS) (Unit: tCO₂-eq)			
Category	2017	2018	2019
Total emissions	112,303	110,202	103,521
Scope 1 (Direct emission)	8,608.4	9,007.1	7,911.5
Scope 2 (Indirect emission)	103,695.4	101,194.9	95,612.1
Scope 3	0	0	0
Surplus ETS	57,375	37,563	46,367
ETS sales	21,938	0	0



▲ Receiving commendation from the Minister of Trade, Infrastructure and Energy at the Global Green Management Excellence Awards

Maintenance of Environmental Management System (ISO 14001)

Certification

Mando has received and maintained the International Environmental Management System Certification, or ISO 14001, for the plants in Pyeongtaek, Wonju, and Iksan by systematically evaluating, managing, and improving environmental factors and risks. In 2019, we implemented the remedial recommendations proposed by the ISO 14001 by establishing a monitoring process for waste disposal and supplementing evaluation criteria for revising the risk assessment process.

Green Company and Global Green Management Excellence Awards

Mando's Wonju and Iksan Plants received commendations from the Minister of Environment and the Minister of Trade, Infrastructure and Energy at the 2019 Global Green Management Excellence Awards for their green management efforts, such as recycling and reduction of GHG emissions through energy-saving activities. The Global Green Management Excellence Awards has been the most honorable environment award ceremony since its opening in 2006, which makes it even more significant that we were recognized for our eco-friendly plant establishments and acquisition of competitiveness as a green business. We plan to continue recognizing sustainable green management as the key element of our business and work toward reducing the energy use, developing eco-friendly products, and enhancing green management levels.

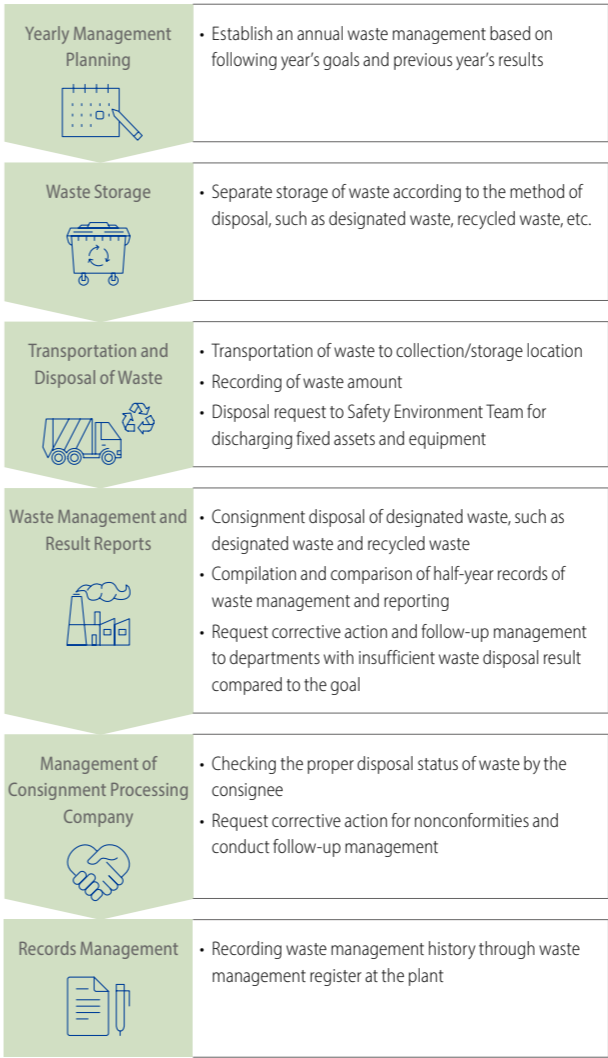
Reduction of Environmental Pollution

Imprudent use of resources and production leads to the generation of hazardous waste in the ecosystem, such as water and air. Controlling and minimizing the amount of such generation is surely the company' responsibility. In an effort to minimize the amount of wastewater, waste, and air pollutants that are generated whilst manufacturing and to manage them safely, Mando strives to minimize the environmental impact throughout the entire production process.

Waste Management Process

Mando conforms to the waste management process in order to reduce waste and recycle through effective and systematic waste management. The waste management process refers to cooperating with the related departments and thereby monitoring and controlling the whole process, from the discharge of waste to its transportation and disposal.

Waste Management Process



Minimization of Waste

Wastewater and Waste Management

Mando cleanly disposes of waste generated from plants through combustion facilities and recycling. Wastewater generated during manufacturing are first treated at the plants' wastewater treatment facilities, and then flowed to public wastewater treatment plant. Moreover, we conduct regular wastewater quality analysis for a stricter quality control than that enforced by law.

Total Waste Generated (Unit: kg)			
Category	2017	2018	2019
Designated waste	1,794,210	1,765,890	1,542,950
General waste	16,253,845	15,809,920	15,332,540

*Based on domestic manufacturing plants

Recycling of Waste (Unit: kg, %)			
Category	2017	2018	2019
Recycled waste	16,586,555	16,267,220	15,681,680
Percentage of waste recycled	92	93	93

Total Wastewater and Water Pollutants Generated (Unit: m³, kg)			
Category	2017	2018	2019
Amount of wastewater generated	273,504	272,198	240,857
Amount of water pollutants ¹⁾	8,672	8,071	8,176

Operation of Wastewater Recycling Facilities

In the endeavor to efficiently enhance the recycling rate of wastewater, Mando operates wastewater recycling facilities. In the Wonju Plant, there are 30 wastewater recycling facilities in the factory area and 31 in the office area for segregation of wastewater by designated wastewater and recycling wastewater. The officer in charge inspects the facilities weekly and shares the recycling and reduction records monthly to promote recycling activities. The Pyeongtaek Plant also operates a waste recycling facility and carries out recycling within the waste disposal site.

Promotion of Waste Recycling

Mando maximizes recycling to reduce the amount of generated waste and environmental impact caused by burying and incinerating waste. The Pyeongtaek Plant reduced incinerated waste by 100 tons compared to the previous year through recycling. The Wonju Plant recycled 95% of waste foundry sand that used to be buried underground for use as an ingredient in the cement manufacturing process and dramatically reduced the negative impact on the environment.

1) Chemical Oxygen Demand (COD), Suspended Solids (SS)

Reuse and Reduced Usage of Cutting Oil

Cutting oil used for processing metals is classified as designated waste that affects the environment. In an effort to reduce the amount of cutting oil waste, Mando is operating an evaporation facility that boosts the efficiency of the evaporation temperature and vacuum differential pressure, reducing cutting oil waste by 152 tons in 2019 compared to previous year. Also, to protect regions exposed to the risk of spills of cutting oil waste, we carry out continuous management, and have additionally installed repaired cutting oil supplying pipes as well as emergency prevention equipment.

Reduction of Air Pollutants Emissions

Rearrangement of Air Pollutant Emission Facilities

With the intention to contribute to the protection of the ecosystem through the management of air pollutants, Mando relocated the dust collectors through a precise analysis of air pollutant components when changing production process LAY-OUT to improve product logistics at Wonju plant. And through this, wet scrubber and ventilation facilities were separated. The plant also achieved 40% reduction of pollutants by removing two out of five contamination facilities. In exchange for the removed facilities, we invested on oil mist collectors, which are ventilation systems, and thereby contributed to a 43% year-over-year drop in VOCs emissions.

Air Pollutants Emission (Unit: kg)			
Category	2017	2018	2019
NOx	842.19	206.89	0
SOx	85.69	80.53	0
Dust	15,413.7	12,507.24	11,503.64
VOCs	4,507.77	8,456.51	4,824.18



▲ Workshop and Presentation for Reduction of Fine Dust from Non-exhaust System in Transportation Field

R&D for Response to the Regulation on Brake Wear Particle Emission

To preemptively respond to the projected regulation on brake wear particle emission in 2025, Mando formed a consortium overseen by the Ministry of Trade, Infrastructure and Energy in April 2019 and proceeded with two projects of the 5-year national project on “Reduction of fine dust from non-exhaust system in transportation field.” The first project on “the development of brake pad and disc for reducing fine dust” is handled by the Material Development Team and is currently in the product development stage. As of December 2019, studies of the assessment method for brake wear particles and basic research on benchmarking brake pads and discs of advanced companies are taking place. The second task, or “developing the original ceramic filter technology to capture fine-dust from brakes,” is at a basic research stage for studying and analyzing the shape of filters and aerodynamic fluid conducted by the Brake BU R&D center. These two tasks’ research results will constantly be updated and shared to foster mutual support and create synergy.

We will focus on basic design concept research until 2020, build a mock-up sample, and eventually produce a prototype for commercialization by 2023. To make this happen, we will make continuous validations and improvements, and cooperate with domestic and overseas businesses. Through this, we will contribute to improving the environment and people’s quality of life by reducing brake wear particle emissions by 30%.

Safe Management of Chemicals

For the safe use and management of chemicals, Mando manages its chemicals according to the provisions of the Occupational Safety and Health Act and the Hazardous Substances Management Act. In compliance with the Occupational Safety and Health Act, the material safety data sheets (MSDS¹⁾) of all chemicals used in the workplaces are posted, and information on new chemicals is added regularly. When there is a need to use hazardous substances as classified by law, we inspect the environmental conditions of the workplace twice a year, and workers receive a special medical checkup once a year. Moreover, all hazardous materials are used according to the provisions as stated in the Hazardous Substances Management Act and we comply with reporting the use, conducting external impact assessments, installing safety facilities, and training workers.



1) Material Safety Data Sheet: An information sheet on how to safely use and manage chemicals

Environmental Protection Activities at Mando’s Global Sites

Special Page

Waste issues arising from manufacturing plants are now emerging as a major environmental issue that needs to be addressed worldwide. As a result, Mando’s global corporations in the United States, China, and Brazil, etc., are promoting various activities to find ways for reducing waste generation and supply products in a sustainable manner. Among them, the best practices from Mando Georgia plant and Mando Corporations Poland (MCP) in 2019 have especially contributed to minimizing environmental impact.

The casting plant in Georgia, USA, has improved manufacturing processes and contributed to creating economic value as well as environmental protection. We have specially manufactured reusable plastic trays to replace plywood and cardboard sheets that are less durable and have limited reuse. The plastic tray has the strength of securing the contour of each sand core²⁾ to prevent damage when moving and could be used repeatedly due to its durability. This has prevented sand cores getting damaged during transport on the sheets. As a result, we reduced core and casting defects by 50%, which would yield to annual savings of \$23,525. Furthermore, a digital weight measurement system and ultrasonic sensors were introduced to the plant in March 2019, allowing the exact ratio of sand and resins to be measured and mixed in casting and core production. This has helped reducing product defects and waste generation due to inconsistent mix ratios. By means of such efficient use of resources, we estimate to save about \$94,000 in waste disposal costs.

In Europe, MCP raises awareness of environmental protection by presenting quarterly information on environmental awareness and providing waste segregation training for in-house restaurants, cleaning and security companies. As the European Union passed a regulation banning the use of disposable plastic products from 2021, we are actively participating in responding to pollution caused by disposable plastics. We gave all employees reusable bottles, which helped them to naturally play a role in realizing a sustainable society by participating in environmental protection activities in their daily lives.



2) sand core: item that forms the internal shape of a casting by combining silica sand with resin chemical binders

Social Values

Seeking mutual growth with stakeholders

Mando is growing together with the stakeholders by considering not only the quality and performance of its automotive parts, but also its impact on the overall value chain. Acknowledging social values along with economic values, we strive to be a desirable workplace by creating a happy and safe work environment. We are also establishing a stable supply chain through fair and transparent relationships with partners and are continuing to engage in community participatory contribution activities. We will continuously make efforts in committing to society as a global company.



Training program for partners

1,131 Trainees

Participants of Halla Business School

77 Participants

Implementation and execution of the Kinetic Ergocise Based on Movement Analysis (KEMA)

Acquisition of Industrial Service Medal from Safety and Health Management

2019 Mutual Growth Index of Korea

Acquisition of Most Excellent Grade

Number of volunteer activity participants

1,607 Employees

Total amount of donations to local communities

KRW 474 million

Creation of a Safe Working Environment

In accordance with the fully amended 2020 Occupational Safety and Health Act and strengthened penalties, Mando is focusing on the management of safety regulations of its workplaces along with the safety management of partners and outsourced projects. We prevent direct and indirect loss caused by poor management through the formation of a safe working environment, and we seek to secure stable part supply system to grow as a leading automotive parts company.

Occupational Safety and Health Management System

With the aim of enhancing safety and health levels of its workers, Mando systematically manages industrial accidents in the workplace. We are promoting the certifications of new standards of its domestic (KOSHA 18001) and international certifications (OHSAS 18001) of Korea Occupational Safety & Health Management Agency, which have been converted to the KOSHA-MS¹⁾ and ISO 45001²⁾. We endeavor to decrease the number of industrial accidents to half by 2024 through setting the frequency severity index as the key performance indicator and managing the frequency and severity of accidents for each workplace. We hope to reach the goal of “no disasters, no fires, no accidents” for compliance with the new standards of occupational safety and health management according to the nation’s situation and the company’s conditions.

Occupational Safety and Health Management Work Frame

Vision	Establishment of a safe and sound workplace by preventing risks		
Slogan	No disasters, no fires, no accidents!		
Goal	Disaster reduction by 50% by 2024 (2019 FSI: 0.45; No. of disasters: 12)		
Ideology	Principle	Dynamism	Consistency
Core Values	Work Principle	Work Smart	Work Together
	Act in compliance with laws and principles	Work dynamically based on professionalism	Trust and cooperation through consideration and communication

Occupational Safety and Health		(Unit: %, People)	
Category	2017	2018	2019
Accident rate	0.18	0.09	0.18
Disease rate	0	0	0
Fatalities	0	0	1
Severity rate	0.14	0.12	0.17
Factor of Safety Index (FSI)	0.44	0.30	0.45

*Types of accidents: Collision, stenosis, etc.

1) Korea’s new occupational safety and health management system reflecting the ISO45001
2) International occupational safety and health management system established by the International Organization for Standardization (ISO)
3) An international standard for business continuity management system

Safety Management at Worksites

Strengthening of Accident Prevention by Joint Labor- Management Safety Inspections

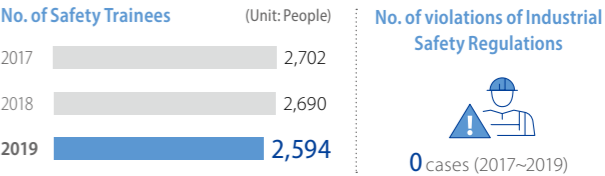
Mando carries out constant joint labor-management safety inspections to prevent unwanted accidents in the workplace. We promote various activities, including work environment measurement, safety inspection, and improvement of hazardous machinery and equipment. Wonju Plant carries out work permits through Hanmaru’s e-approval system as well as preventative programs through prior safety training and risk assessment. We also host joint labor-management resolution meetings to share the changing policies of Ministry of Employment and Labor and actual cases of industrial disasters for the creation of a safety culture.

On-site Safety Patrol System

Mando conducts a safety patrol system to constantly inspect work sites for the prevention of accidents and formation of a safety culture. The voluntarily formed patrols make rounds at the sites from 7 a.m.-9 a.m. and 4 p.m.-6 p.m. daily, in order to remove hazardous factors at the time when the most accidents occur. In 2019, a patrol group composed of 7 safety and health employees at the Pyeongtaek Plant found a hazardous factor while doing their rounds and immediately reported the case to the Continuous Improvement Process (CIP), handled the problem, and checked up on the effects. Wonju Plant conducts safety campaigns along with patrols to remove unsafe factors, such as reminding workers to use helmets when conducting robotic work and not to use their cellular phones while walking on site.

Emergency Response Training

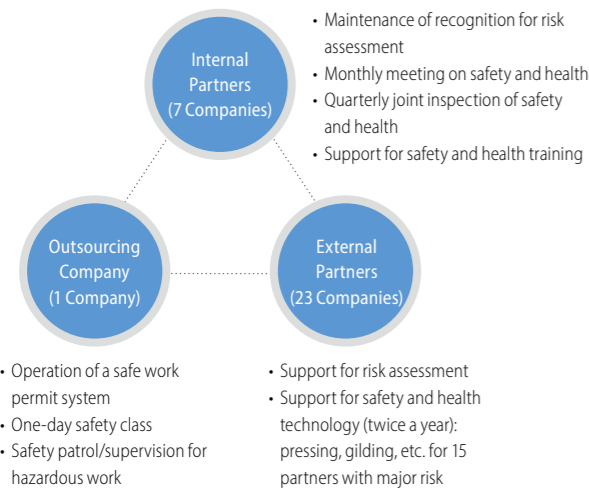
To strengthen Mando’s capabilities of handling damage caused by natural disasters and other crises that induce the suspension of our business operation, we established scenarios for each situation and regularly carry out mock training. In November 2019, Pyeongtaek Plant and Wonju Plant conducted fire safety and drill training as well as training for other mock emergency situations to assess the appropriateness of the Business Continuity Planning (BCP). In the case of Iksan Plant, in June 2019, we conducted training programs for fire prevention in the newly installed energy storage system and response to emergencies for the prevention of environmental pollution. Moreover, we are building our emergency response capabilities by settling the Business Continuity Management System to reach a global level, and to achieve this, we have acquired an ISO 22301³⁾ certification.



Symbiotic Cooperation System for Safety Management of Partners

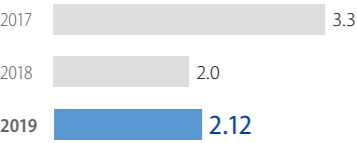
Mando strives to reduce the frequency of industrial disasters by establishing safety management programs not only in its workplaces, but also in those of partners. In 2019, through the symbiotic cooperation system with partners, we conducted workplace assessments and training programs for emergency response and prevention of disasters. We not only supported partners to accommodate to safety programs so that they can further manage the program on their own, but also assisted the internal/external partners and outsourcing companies with risk management. Through these activities, we acquired the most excellent grade, “S grade” in the 2019 Safety and Health Symbiotic Cooperation System of the Korea Occupational Safety and Health Agency.

Details of the Symbiotic Cooperation Programs of Pyeongtaek Plant



Risk Assessment Results for Partners

(Unit: point)



▲ Safety Knowledge Quiz Contest at Mando Suzhou China

Safety Knowledge Quiz Contest

On July 31, 2019, Mando Suzhou China (MSC) held a Safety Knowledge Quiz Contest for the purpose of enhancing the safety awareness of employees. The competition was held under the theme, “Prevent Risks, Reduce Hazards, Stop Accidents,” and over 70 employees gathered for participation. The participants personally chose different problems and learned about safety awareness together while proceeding with ways to increase a sense of safety. The overall effect improved both safety knowledge and awareness of employees.

Safety and Health Management for Employees

Customized Management for High-risk Workers

Work activities that constantly require employees to hold themselves with unnatural posture cause pain in specific body parts and musculoskeletal diseases due to weakened muscles. To address this, Mando established a musculoskeletal disease prevention program to survey regular employees in high-risk workplaces who have been diagnosed with such diseases. In accordance with the results of the survey, we support posture correction and Kinetic Ergocise based on Movement Analysis (KEMA) programs for each high-risk group and reassign employees, if necessary. The number of employees with musculoskeletal diseases was 34 in 2011, which was reduced to 0 in 2019, and jobs with a risk of musculoskeletal disease was reduced by 50%. As a result, at the 52nd National Safety and Health Week co-hosted by the Ministry of Employment and Labor and the Korea Occupational Safety and Health Agency on July 1, 2019, we received the Industrial Service Medal in recognition for our contribution to industrial development by implementing the KEMA and disaster prevention programs.

Comprehensive Health Care for Employees

To provide an environment where employees can stay healthy at work, Mando provides a comprehensive checkup for all the employees over 38 years old. Regular health checkups are offered to employees who are diagnosed to be unhealthy as a result of the comprehensive checkup, and daily health checkups and special visits are offered to those with severe diseases, such as hypertension, diabetes, cerebral/cardiovascular disease, and cancer. Moreover, we provide healthy diet, smoking cessation, and healthy incentive programs for the healthcare of all our employees.



▲ Receiving the Industrial Service Medal at the National Safety and Health Week Ceremony

Expansion of a Happy Corporate Culture

With the belief that the company’s competitiveness lies in its employees’ competency, Mando strives to establish a systematic competency development system and create a working environment where employees can work freely. We work on improving our HR system so that our employees can develop their capabilities and balance their work and personal lives. We pursue open communication and active cooperation among employees and executives, hoping to smoothly adapt to the changes in the management system of the global automotive industry.

Spread of a Culture of Respect among Employees

Establishment of Labor-management Communication Culture

For the maintenance and enhancement of employees’ working conditions, Mando complies with the constitution’s provision that workers shall have the right to form a union. Therefore, we annually communicate with the labor union and conduct quarterly labor-management meetings with the workers’ committee for salary raises and welfare improvement of employees. Additionally, we conduct business planning seminars for the labor union twice a year and quarterly labor-management meetings for labor and management to share goals and mutually understand the management environment. Moreover, the Executive of Mando Labor Union visited Mando Corporation in China to personally experience the management environment in global site. The discussion on the current issues between labor and management was also held at a “labor-management joint workshop,” to create an advanced labor-management culture. Through these activities, we achieved zero labor disputes for seven consecutive years, resolving matters through cooperation and a mutual approach.

Fair Recruitment Culture

Mando aims for a fair recruitment system, providing an equal opportunity to all job applicants by abiding by the laws related to recruitment. Our job application forms do not ask for the applicants’ gender, region, family members, and other information irrelevant to the job position. The interviewers must follow the regulations on fair recruitment and submit a signed agreement. Interviewer training is also conducted to prevent irrelevant and unfair questions that may arise during interviews.

Prevention of Sexual and Workplace Harassment

Mando conducts human rights improvement programs for its employees to raise awareness surrounding human rights and remove the risks of human rights violations. For the prevention of sexual harassment in the workplace, we continue raising awareness surrounding sexual awareness by opening a website for reporting cases of sexual harassment in 2018 and publishing measures to be taken when sexual harassment occurs on a permanent banner on our groupware. Moreover, in compliance with the amended Labor Standards Act, we reflected the provisions on the prevention of workplace harassment in our rules of employment and announced the changes. Specific information on this regulation was delivered to 2,193 employees in 2019 at a training for prevention of harassment in the workplace.

Communications Platform, “Mantong,” for Employees

To create an open communication culture among the CEO and employees, we operate an intranet community called “Mantong.” Employees can submit inquiries about the company system and policies and post their anxieties and opinions anonymously through Mantong. In 2018, we added a mobile version to communicate in real time with employees at work sites, and the hardships that were recognized through this platform were handled and managed by the related divisions. In 2019, an average of 25 posts on various topics such as opinions on the company’s system and policies, ideas for the company culture, inquiries about facilities, etc. were published in Mantong by employees and were then relayed to the related divisions for consideration.

“Open Communication” for a Better Corporate Culture

Mando practices company-wide open communication (OC) activities that encourage employees to personally look for areas of improvement. ‘Open Committee’ members and the executives have a face-to-face discussion in order to collect methods of improving the corporate culture, and later also, actively engage in the improvement activities. In 2019, 176 employees were selected for the 5th Open Committee, which engaged in OC activities focusing on the 7 major tasks for Work Smart. The townhall meeting organized by the leaderships was about time management, meetings, and reporting. Through this meeting, a variety of great ideas for increasing efficiency were drawn, such as the expansion of weekly plans, mandatory use of a flexible work hour system, and sharing of the minutes from meetings. Through finding resolutions for these areas of improvement and sharing the process of change, we are applying our employees’ ideas and actively improving the corporate culture.

Process for Open Communication

Step 1	Step 2	Step 3
OC Workshop	Townhall Meeting	Improvement Activities
Discussions for addressing areas of improvement	Deciding on the subjects for improvement with leaderships	Monitoring of improvements for each area and its process

“Value Board,” a Communication Platform for Executives and Employees

Mando operates the Value Board (VB) in order to deliver creative ideas of young and capable employees to the executives and have them applied to company management. We select 11 exemplary employees among Associate and Senior Associate levels who can address the company’s areas of improvement in a macroscopic perspective with passionate and creative ideas. Then they collect various opinions of work sites to report to the executives. The 11th VB of 2019 collected and reported the ideas for changes in management and areas of improvement in the organizational culture to the executives. As a result, a promotional video of the business unit (BU) head for the early establishment of the BU system was created, the use of the welfare system was actively promoted, and newcomers were provided with Welcome KITS.

Creation of an Optimal Working Environment

Retention Program for Employees

Mando provides various retention programs in relation to giving birth and parenting for employees and family members, in the endeavor to establish a desired work and life balance. To comply with the work and life balance Assistance Act, we implemented programs for reducing the burdens of child raising, such as expanded paternity leave, shortened working hours for parents with young children, and the newly implemented family leave. Moreover, we encourage our employees to take “refresh leaves” of 3-5 days using their leave credits to promote a healthy and active use of time off.

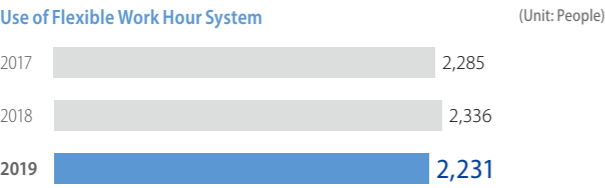
Operation of In-company Daycare Centers

To create a working environment where employees can maintain a work and life balance, Mando Pangyo R&D Center, Pyeongtaek Plant, and Wonju Plant operate in-company daycare centers. We conduct systematic programs in association with educational programs considering the development stages of children. We will do our best to create a workplace in which the workers can find a work and life balance through our daycare centers. We will continue to support a safe nursing atmosphere, hoping to become a happy company with happy families.

Operation of In-company Daycare Centers			
As of December 2019 (Unit: People)			
Category	Pangyo	Pyeongtaek	Wonju
Capacity	80	16	20
No. of children	71	3	14
No. of teachers	20	4	6

Smart Day and Promotion of a Flexible Work Culture

Every Wednesday is “Smart Day” at Mando. Smart Day was created to enhance employee satisfaction by implementing effective and practical measures. Such measures are turning off the lights after working hours to encourage employees leave on time, discouraging after-work gatherings and dine together, and adjusting the bus schedule during rush hour in Pangyo. We also take advantage of flexible working hours by appropriately allocating work hours according to the employees’ amount of work, or allowing the employees to freely choose their work hours flexibly. In 2019, a total of 2,231 employees utilized the flexible work hour systems.



Mando's Flexible Work Hour System



Horizontal Organizational Structure

In response to the changes in industrial trends requiring creativity and flexible thinking processes as well as the characteristics of millennials and Generation Z, Mando implemented a new HR system of a horizontal organizational structure in 2019. As of 2020, the title has been simplified from five levels to three, through which everyone from staff to senior staff or Research Engineer will be referred to as “associates” or “engineers,” and managers to senior managers or senior research engineer as “senior associates” or senior engineers.” The titles of team leaders to higher-level executives will still remain the same.

Operation of the Small Victory System

The Small Victory (SV) System started off in 2009 during the global financial crisis with an intention to overcome hardships by standing together. We select devoted employees who have shown outstanding performance for the past year through recommendations from colleagues and a fair screening process, rewarding them with a certificate and a token of appreciation. An accumulated number of 432 employees have received this recognition since 2009 to the 11th SV System of 2019. We will continue to discover the best practices of SV, promote the system to subsidiaries, and spread a culture of praise and encouragement.

Implementation of Thank you Day

Every last day of each month is Mando’s “Thank you Day,” through which colleagues exchange thank you cards expressing gratitude and complimenting each other. The cards are submitted through an online pop-up window which then is sent to the recipient’s email via Mantong. Thank you Day has been implemented in global site in China, the US, and India, with our intention to spread a trusting and understanding culture among our global site.

Fostering Talents of Halla People

Education Operating System

Mando strives to cultivate employees based on the vision of the Human Resources Development Center, “The cradle of global Halla that awakes the minds and hearts of Halla people.” The Human Resources Development Center provides job training sessions and operates the Halla Business School to enable employees to instill our core values and grow as global leaders.

Human Resources Development Vision System



Capacity-building Programs for Employees

Mando considers human resources its number one asset, providing employees with a training program composed of the four themes, Value, Global, Future, and Job Competency, which allows for customized programs for employees. Job training programs for buying, marketing, financing, HR, and PM are conducted based on the employees’ levels, and our academic training program provides unlimited support to master’s/doctorate degree programs in local and overseas universities to assist our employees in becoming leading professionals.

Completion Status of Mando Education			
(Unit: People)			
Education Category	2017	2018	2019
Value	3,198	3,334	3,209
Global	54	63	30
Future	1,136	1,262	868
Job Competency	10,187	10,374	12,059
Total	14,575	15,033	16,166

Training Hours of Employees & Cost			
(Unit: Hours, KRW 1 mil.)			
Category	2017	2018	2019
Training hours per employee	41	40	43
Total training expenses (including operation costs of the training center)	5,774	6,013	5,258

Establishment of a Model for Global Job Competency Standards

Mando created a job competency model in an effort to secure professionalism of employees and support the fostering of subject-matter experts (SMEs). From April to October 2019, about 120 SMEs of our six functions (R&D, purchasing, manufacturing, quality, financing, sales) gathered to carry out a project to update or build new job competencies. This project created competency models for each duty, a growth guideline for SMEs, and a list of educational resources. The outcomes will be utilized for developing personalized and self-directed learning resources and as basic materials for evaluation of organizational expertise.

Future Planning Program for Resigning Employees

Mando operates a ‘future planning program’ for resigning employees to support them effectively in reaching their future goals, such as re-employment, entrepreneurship, etc. This program offers a variety of curriculums so that resigning employees can design a successful second life. The curriculums include introduction for the process of applying for unemployment benefits and government-supported programs for the establishment of a second career plan, financial planning processes, and tax-saving strategies. In 2019, 96 resigning employees enrolled in the future planning program.

Establishment of an Exclusive Platform for Employees Working Overseas

For the purpose of surveying the educational needs of employees working overseas and helping them acquire useful information through smooth communication with each other, Mando established i:MOOC¹⁾ in 2019, an exclusive platform for internationally assigned employees. We developed this platform after collecting information through a survey on the hardships related to capacity building of overseas employees and the demand for necessary training courses. i:MOOC features informative content, including that on cultures, foreign languages, business management, science, and technology, a platform for global site to post their own online courses, and a communication platform for employees by country. This platform was created with the intention to overcome the difficulty of assembling the employees assigned all over the world, enhance open communication, and increase accessibility to education for developing long-term global capabilities.

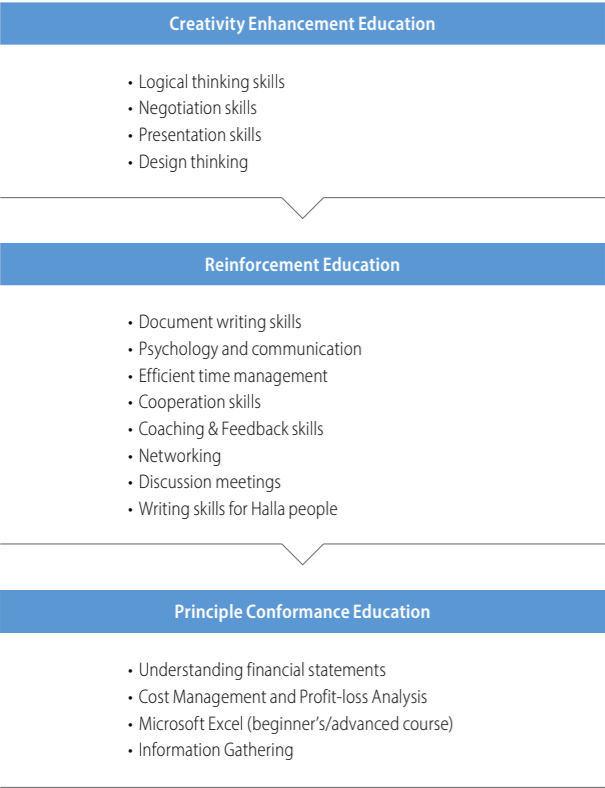


1) MOOC: Massive Open Online Course

Work Smart Program

For the enhancement of the working performance of all Mando employees, we made it mandatory for our employees to complete at least one course of the Work Smart Program each year. The Halla Human Resources Development Center operates a total of 18 courses, and a total of 1,866 employees attended 97 training sessions in 2019.

Work Smart Curriculum



▲ 2019 Work Smart

Halla Business School Program

Mando operates the Halla Business School (HBS) in hopes of strategically and systematically nurture future managers who will lead the sustainable future of Mando. We offer 8-month intensive training courses targeted for senior managers, team leaders, and managing directors, based on the MBA curriculum. The HBS curriculum encompasses a wide range of topics such as strategy, financial accounting, marketing, and HR. In 2019, a total of 77 employees finished the HBS training course.

HBS (Halla Business School Curriculum)



▲ 2019 Halla Business School

Mutual Growth with Partners

In the midst of a fierce competition in the global market, companies must seek opportunities for development by pursuing mutual growth with partners. For this reason, Mando is enhancing the technical competitiveness of partners by providing technical support and risk management related to violating subcontractor's law. Such enhancements eradicate unfair power imbalances in business culture and resolve the difficulties of partners through a regular communication channel as part of an effort to create trusting relationships.

Strengthening Market Competitiveness of Partners

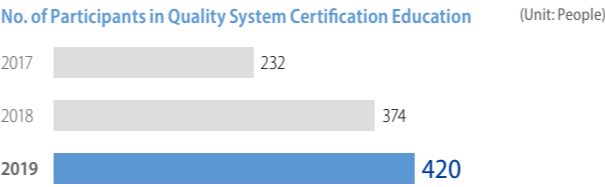
Mando's Royalty-free Patents

For the mutual growth of partners, Mando supports complimentary use of its patents and has agreed to the non-exclusive license¹⁾ in hopes that partners quickly secure technical competitiveness. We supported a total of 282 patents and a total of KRW 128 million, actively engaging in the spread of technology patents.

(Units: Cases, KRW 1,000)		
Category	No. of Cases	Support Cost
Royalty-free patent	262	120,584
Non-exclusive license	20	8,292.6
Total	282	128,876.6

Support for Quality System Certifications

Operating a Supplier Assessment Team engaged in the duties related to the quality system of partners, Mando maintains partners' quality system certifications and assists in their improvements. We provide training sessions on the general system of the facilities and plant operation, certification qualifications, and evaluation standards for the acquisition of the quality system certification which is especially critical in the automotive parts industry. Through this program, a total of 20 partners newly acquired the certification in 2019. After acquiring the certification, we continue to manage the entire quality system process to improve the levels.

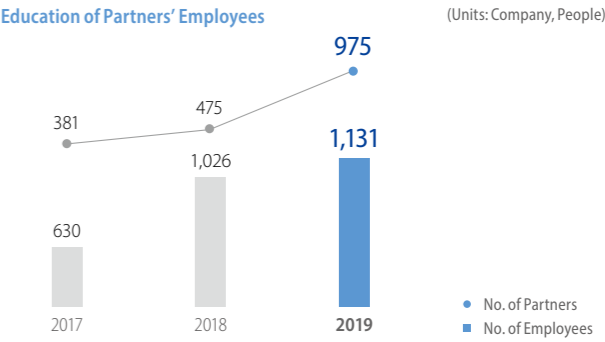


Progress of Quality System Certification Support for Partners

Quality System Certification	Support in 2019
Quality system certification of partners	• 420 trainees • KRW 57 million spent
Quality system certification of tier-2 and tier-3	• New acquisition of 4 among 92 companies
Hyundai/Kia Quality system certification	• New acquisition of 16 among 171 companies
GM Quality system certification	• 67 companies
Renault Samsung Quality system certification	• 13 companies

Education for Partners' Employees

Mando conducts competency training for employees of partners in an effort to raise their market competitiveness. For employees in charge of quality, we offer "Quality School" that provides specialized courses on quality, and other courses on manufacturing engineering, advanced product quality planning, and free trade agreements. In 2019, 1,131 employees completed training at 975 partners more than twice the previous year.



Financial Assistance for Partners

Mando supports low-interest loans to partners that need financial assistance for overseas expansion and facility installation. There are three types of financial programs, including direct support, mutual cooperation funds, and guarantee funds, through which a total of KRW 79.17 billion was offered in the form of support in 2019.

Financial Assistance for Partners			
As of the end of 2019			
Category	Direct Support	Mutual Cooperation Funds	Guarantee Funds
Content	Mando directly providing financial support to partners	Mando creating deposits and funds from financial institutions for supporting partners with loans and interests	Mando providing guaranteed support to partners by utilizing the guarantee fund from Korea credit guarantee fund and Korea technology finance corporation
Amount offered in the form of support	KRW 36.16 billion	KRW 27.48 billion	KRW 15.53 billion

1) The right to implement the patented invention according to a contract with the patentee or the exclusive licensee or within the scope of authority delegated by law

Supply Chain CSR Management

Assessment for New Partners

For a long-term mutual relationship with our partners, Mando regards not only the financial factors, such as quality or credit, but also the non-financial factors, including the environment and safety, when selecting a new partner. In 2019, we checked on 92% of our new 13 partners whether they had programs on anti-corruption and ethics, certification of ISO 14001 and OHSAS 18001, environment/safety managers and related training sessions. Also, based on the results of quality evaluation, we deliver to the partners the areas of improvement and supervise whether they have been considered or not. We also have included an item on safety in our supply contract to ensure a thorough management of the supply chain.

Onsite Due Diligence for the Safety of Partners

In order to create a safe working environment that could prevent major accidents of partners and promote stable supply and demand of parts, Mando Pyeongtaek Plant conducted a due diligence for safety in the 15 workplaces with the most risk factors, including pressing and gilding, among those of 70 tier-1 partners. The plant inspected the safety on hazardous machineries and management on fire safety, coming up with 143 points of improvement and plans on how to manage them. The other partners that were excluded from the due diligence received a detailed checklist on safety and health management system, health management of workers, and the laws and regulations on safety and health standards, so that they can independently inspect themselves. Pyeongtaek Plant also plans to conduct an assessment on environment safety on 10 partners in 2020, to enhance the safety management capacity of our partners.



▲ 2020 Partners' Day

Enhancement of Open Communication with Partners

“Activities to Become Friendly” and “Partners’ Day,”

Channels of Communication for Partners

Mando operates various communication channels to establish a trusting relationship with partners and directly share ideas. Among these channels, “Activities to Become Friendly” sends employees from our Mutual Growth Team to partners in order to promote mutual growth activities and listen to their hardships. At the annual Partners’ Day, we present the major business policies and visions to the CEOs of partners and host an awards ceremony to recognize the outstanding employees and partners. In 2019, 15 partners were recognized with this award, strengthening continued partnerships.

Mando Cooperative Association: CEO Seminar

The Mando Cooperative Association was held for the 33rd time in 2019. The association was created for the gathering of partners, aiming for continued business and an increase of mutual benefits through mutual cooperation. One of the major events of the MCA is the CEO Seminar held annually in October for benchmarking outstanding companies, listening to inspiring lectures offered by important figures, studying the global automotive market, etc. In 2019, the program under the theme “Work together, Live together” was held with Chairman Mong-Won Chung and other CEOs of partners to discuss the need for mutual growth.

“Partnership Building Course” for Future Leaders

In May 2019, Mando held “Partnership Building Course for Future Leaders,” for the second generation of executive officers of tier-1 partners for two days. This program is held annually in hopes of strengthening partnerships and future-oriented relationships between Mando and the partners. On the first day of the event, a lecture on organizational culture, economy, and business as well as a meeting hosted by Chairman Mong-Won Chung were held for the 15 participants. On the second day, a special lecture on mind refinement and a meeting with the senior executive officers of the Mando Cooperative Association were held to enhance the participants’ leadership and job capacities.



▲ 2019 Partnership Building Course for Future Leaders

Establishment of a Respectful Culture with Partners

Raising Awareness on Technology Protection of Partners

To protect and prevent the improper use of the technologies of partners, Mando not only announces the related subcontracting raw and the process of technology protection through its intranet but also conducts an in-house training course for its employees. This training course touches on the timing and process of signing technical data requests with partners at once. We also conduct a survey to find out whether there has been unlawful actions or extortions, or the leak or professionals, in the whole signing process.

Settlement of a Fair-Trade Culture

With the purpose of preventing unfair trade actions with partners and strengthening a mutual competitiveness, Mando implemented the four major practices for compliance with the subcontracting law. The information is shared on our intranet, in hopes of spreading a fair-trade culture. Also, we supervise the compliance with subcontracting law, and in 2019, we conducted a training on subcontracting laws instructed by a lawyer for the prevention of the risks of law violations.

4 Major Practices for Fair-trade

	Operation guideline for a desirable contract signing for a mutual cooperation between conglomerates and SMEs
	Operation guideline for a fair selection of partners
	Operation guideline for proper document issuance and preservation for subcontracting transactions
	Operation guideline for Installation of an internal deliberate committee for subcontracting transactions.

Training on Prevention of Human Rights Violation

Mando conducted an internal training on improving the human rights of the employees of our partners, in an effort to prevent the negative issues that can be caused by violation of human rights and power imbalance. In 2019, 153 employees completed this training, and we will continue these mutual growth courses to strengthen the mutual cooperative relationship with our partners.

Awarding of Excellent Corporate for Mutual Growth Index for 2 Consecutive Years

Mando was awarded with a trophy and qualified as “Excellent” at the 2019 Mutual Growth Index Awards, for two consecutive years since 2018. Since the establishment of a Mutual Growth team in 2013, we have been developing and operating various mutual growth programs, such as financial funds, technology support, strengthening of technology competitiveness, and establishment of a management infrastructure for our partners. By developing our mutual growth programs, we will continue to strengthen our mutual cooperative relationship with more than 170 of our partners.

Mutual Growth Index

(Unit: Level)



▲ 2019 Korea Mutual Growth Awards

Domestic and Overseas Social Contribution Activities

Mando contributes to resolving social issues through various social contribution activities that enhance the corporation’s likeability as well as relationship with the public and local communities. The social contribution activities that were usually concentrated on supporting vulnerable social groups have diversified in various fields of education, culture and arts, and support for entrepreneurship. Therefore, we will try to secure sustainability in the existing social contribution programs and further expand the scope of activities through cooperation with various NGOs and public organizations.

Social Contribution Strategies

Mando operates social contribution programs for our neighbors and society with warm heart and open mind. The company’s common social contribution activities are led by our headquarters. And domestic and global site such as Korea, the US, Europe, and China operate selective social contribution activities tailored to each specific country and region. We hope to integrate the names of social contribution activities and thereby create a unique identity for our social contribution programs. Also, by securing sustainability and efficiently spending the activity costs, we aim to increase employee participation by over 30%.

Social Contribution Activities in Local Communities

Mando Community Service Group

The Mando Community Service Group was established in 2005 by Mando employees and their families to perform systematic and effective volunteer work, which used to be performed on an individual level. Every year, about 15,311 individuals from each business unit participate in various volunteer activities, including food distribution, meal-box delivery service, coal briquette delivery, and visits to facilities for disabled children. We plan to gradually increase the number of participants.



▲ 2019 Blood Donation of Love Campaign

Employee-led Donations

Mando carries out various donation activities through an app and the establishment of funds to support the health and lives of children from low-income households in local communities. In particular, the “Walk Together” project aids with the rehabilitation of severely disabled children through which the number of steps taken by employees are converted into a fund. In 2019, a total of KRW 30 million was collected through the active participation of employees in this program. With continued participation, about 900 employees collected and donated a total of KRW 140 million to the Child Fund Korea in the same year.

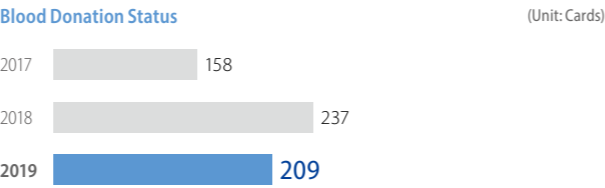
Employee Participation in Volunteer Activity		(Unit: People, Hours)		
Category	2017	2018	2019	
No. of employees in volunteer activity	1,573	1,652	1,607	
Hours of volunteer activity by employees	11,022.7	11,062	9,952.2	

Support for Ice Hockey and the Goal of Love Fund

Ever since the founding of “Mando Winia,” the former name of the current Anyang Halla Ice Hockey Team, in 1994, we have continued to actively sponsor the national ice hockey team of Korea. In 2020, CEO Mong-Won Chung was inducted into the Ice Hockey Hall of Fame of the International Ice Hockey Federation. This was the result of his great reputation and contributions to not only Korean ice hockey but also to the overall Asia League Ice Hockey. Korean ice hockey received a lot of attention in 2018 at Pyeongchang Winter Olympic Games for its participation as the team of the hosting country and for unifying with North Korea as a single team. Moreover, we also operate the “Goal of Love Fund” through which we make donations based on the number of goals scored by the Anyang Halla Ice Hockey Team and its performance in the league, thus assisting the children from low-income households in the city of Anyang.

“Blood Donation of Love Campaign” for Children with Leukemia

Since 2013, Mando has been conducting the Blood Donation of Love Campaign through which blood donation cards are given to Mando families and young patients with leukemia in local communities. At the 10th Blood Donation of Love held at the headquarters in Pangyo in 2019, a total of 209 blood donation cards were collected through the active participation of employees. These cards were then used for helping children with leukemia or the spouses and children of our employees. Moreover, we encourage the participation of employees by granting four hours of volunteer work in exchange for one blood donation card.



Designing Hope for Teenagers

Seed School and Halla Biscuit Camp

Mando participates in “Seed School,” a career education program for teenagers run by the Korea Education Corps. We developed programs to empower teenagers in the blind spots of social welfare to fulfill their dreams and hopes through the development of their talents and exploration of their egos. This curriculum is conducted through a one-on-one mentoring system with college students to maximize the effects as career education. In 2019, we sponsored the operation of Seed School for 36 students from two middle schools in the neighborhoods of the Seongnam and Wonju Plants. Furthermore, we have been hosting “Halla Biscuit Camp,” a one-year program of Seed School compressed into a three-day camp for students from regions that do not support afterschool activities. In 2019, 55 teenagers from all over the country, including Pyeongtaek, Sokcho, and Goseong, were invited to the camp to share and elaborate their dreams with the help of mentors,

Scholarship for Local Teenagers in the Regions Surrounding

Mando’s Business Divisions

As part of the joint labor-management social contribution activities in local communities, we have been offering scholarships to teenagers in Pyeongtaek, Wonju, and Iksan, where our domestic plants are located, since 2014. In 2019, we supported 40 teenagers by region with a total of KRW 120 million. In July of the same year, beneficiaries were invited to the Halla Human Resource Development (HRD) Center to participate in various programs, including a briefing on the company, a tour of Ungok Pavilion, and special lectures by invited instructors. Through the invitation program, we provided the beneficiaries with the opportunity to find their dreams and visions, and had time to build courage and hope for them to grow further.

Share Culture, Share Love

Since 2010, Mando has implemented the “Share Culture, Share Love” program that offers opportunities to children of the underprivileged to participate in various cultural experiences. In 2019, the Wonju Plant operated an outing with children with developmental disabilities, while the Pyeongtaek Plant conducted cultural experience events for children in need through the sponsorship of the Jeong-Hwan Bang Foundation.



▲ 2019 Invitation Program for Mando Scholarship Beneficiaries

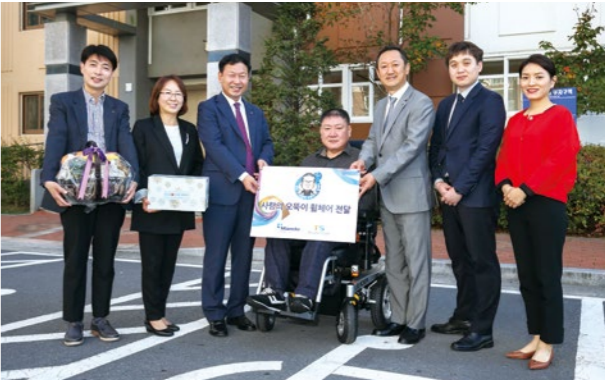
Contribution Activities Based on Business Features

“Roly-poly Love Wheelchair” Program Support

This year marks the 9th “Roly-poly Love Wheelchair” program that has been supporting families of car accident victims that suffer from physical disabilities since 2012. This program intends to take over the service spirit of Mando’s founder, striving for sustainable social contribution programs that support and look after the socially underprivileged. The 38 selected beneficiaries who submitted their request applications from June to August of 2019 received a total of KRW 100 million worth of wheelchairs. A total of 419 beneficiaries have received a total of KRW 640 million worth of wheelchairs since the first wheelchair donation in 2012 that started off with 37 beneficiaries. Moreover, in 2019, we collaborated with the Korea Transportation Safety Authority for expanding the mobility rights of the socially underprivileged through events in which a wheelchair user having a trial ride in a newly developed vehicle with wheelchair boarding devices.



▲ 2019 Outing with Children with Developmental Disabilities



▲ Handover of the Roly-poly Love Wheelchair in 2019

Mando Automotive Entrepreneurship Camp for Kids

With the hope of fostering leaders of the future automotive industry, Mando hosted the "Automotive Entrepreneurship Camp for Kids" in May 2019. Kids Camp is a social contribution program that develops creativity and problem-solving skills by allowing children to find their own problems in life and solve them by car. The children had time to imagine cars in the future, such as autonomous driving vehicle, and eco-friendly vehicle. The camp also provided meaningful lectures to parents who participated in the event to broaden their awareness of their children's future work and career path.

Donations to Local Communities (Unit: KRW 1 million)			
Category	2017	2018	2019
Roly-poly Love Wheelchair	38	98	56
Sponsorship for Seed School and Halla Biscuit Camp	80	135	110
Scholarship fund for teenagers	120	120	120
Walk Together Sponsorship ¹⁾	38	46	30
Sponsorship for Child Fund Korea	146	142	140
Goal of Love Fund	36	26	18
Total	458	567	474

Global Social Contribution Activities

Donations for Local US Communities

Mando America Corporation (MCA) initiates various donation programs, engaging in social contribution activities for local communities. Some of the programs include regular capacity training sessions in Korea for schoolteachers of Auburn, Alabama, and monetary donations for THINC College & Career Academy for the fostering of outstanding students. Likewise, we provided funds of about KRW 200 million for the cancer treatment campaign of East Alabama Medical Center located in Opelika, Alabama and engaged in other social contribution activities, such as career consulting, blood donation campaigns, and planting trees.



▲ 2019 Mando Automotive Entrepreneurship Camp for Kids

1) Total amount of donations by Mando and its employees

Blood Donation Camp in India

Mando India Limited (MAIL) conducts a blood donation camp annually co-organized with the Voluntary Health Services Blood Bank. In 2019 campaign, over 400 employees participated out of which 209 employees were eligible donors who donated their blood.

Charitable Practices in Poland

Mando Corporation Poland (MCP) sponsors social responsibility projects organized by the local community each year and arranges volunteer activities for its employees and other NGOs. One of the major activities is supporting physical and medication therapy for the recovery of car accident victims. In 2019, MCP offered support in the form of KRW 9 million for two car accident victims, supported a government scout student camp, and assisted children in orphanages, hospitals, and schools.

Support for Brazilian Children in Need

Mando Corporation Brazil (MCB) visits impoverished regions every month to support children in need. We donated toys, snacks, and food, striving for the happy lives and a promising future of children regardless of their financial backgrounds or social status. In 2019, we delivered happiness and hope to approximately 130 children every month.

Social Contribution Activities in Mexico

Mando Corporation Mexico (MCM) conducted the "School Visits, Sowing the Future" program in hopes of encouraging students of impoverished regions to dream for a better future and work towards their dreams. In 2019, MCM visited seven educational institutions and met with 185 students to inspire them to achieve their dreams and goals. We showed them our promotional video, gave a tour of our production line, and held a communication forum. Other social contribution activities include planting trees, saving energy, and supporting children with leukemia.

Mando China Awarded with 2019 CSR Excellence Award for 4 Consecutive Years

Mando China Holdings (MCH) has received the CSR Excellence Award for Korean companies in China for four consecutive years since 2016, receiving recognition as an excellent company for its social contribution. In the "CSR Excellence Award for Korean companies and CSR Forum" supported by the Korea Chamber of Commerce in China and the Korea Trade-Investment Promotion Agency (KOTRA), MCH was awarded in the Creative Innovation category. And this large-scale event in 2019 was held with participation of over 170 individuals, including the Korean Ambassador to China, Ha-Sung Jang, employees of member companies, and journalists of Korea and China.

This award ceremony can be viewed as our realized success in expanding into the world with mutual and sharing activities based on our core value of "Work Together." MCH engages in social contribution programs for supporting people in need, such as the donation of scholarships. Mando Beijing China (MBC) held the "2019 Mando Scholarship Ceremony" in August 2019 before the Education Committee of Miyun District and development authorities. We have been selecting 60 outstanding students among the university freshmen of Miyun for the purpose of supporting the future leaders of Miyun since 2011, providing a scholarship of KRW 1 million to each beneficiary. Over KRW 500 million have been offered in the form of support to an accumulated number of over 450 students over the past 9 years.

Moreover, Mando Suzhou China (MSC) has been donating to Yangjiang School for 7 years in an effort to improve the poor education facilities. A total of KRW 5 million in scholarships, study materials, food, daily necessities, and education facilities are donated to about 950 students every October. MSC was also recognized at the "2019 Labor-Management Relations Excellent Company Award of Suzhou" for the company's donation of an accumulated amount of KRW 260 million and other volunteer activities since 2008. We will continue engaging in global social contribution activities to contribute to local communities.



Appendix

Data Center	75
GRI Content Index	80
Independent Assurance Statement	84
Membership of Associations	86
2019 List of Awards	86

Data Center

Summary of Consolidated Financial Data

Financial Statement				
Category	Unit	2017	2018	2019
Assets	KRW 1 billion	4,451	4,437	4,596
Cash and cash equivalents	KRW 1 billion	119	118	205
Liabilities	KRW 1 billion	3,039	2,956	3,010
Debt	KRW 1 billion	1,339	1,385	1,561.7
Net debt	KRW 1 billion	1,220	1,268	1,356.4
Equities	KRW 1 billion	1,412	1,482	1,586
Capital	KRW 1 billion	47	47	47
Debt ratio	%	215.2	199.5	189.8
Net debt to equity ratio	%	86.4	85.5	85.5
Profit and Loss Statement				
Category	Unit	2017	2018	2019
Sales	KRW 1 billion	5,685	5,665	5,982
Cost of sales	KRW 1 billion	5,012	4,940	5,148
Operating profit	KRW 1 billion	84	197	219
	%	1.5	3.5	3.7
EBITDA	KRW 1 billion	467	469	519
	%	8.2	8.3	8.7
Net profit	KRW 1 billion	18	113	118
	%	0.3	2.0	2.0
Net profit of governance	KRW 1 billion	5	106	111
Basic earnings per share	KRW 1 billion	102	2,257	2,360
Total dividend	KRW 1 billion	9	23	26
Dividend payout ratio	%	195.8	22.2	22.3
* Refer to 45p of 2019 Mando Business Report for the list of entities included in the financial statement.				

Economic Data

R&D				
Category	Unit	2017	2018	2019
R&D head count	People	2,040	2,115	2,319
R&D investment	KRW 1 billion	302	315	361
Percentage of sales	%	5.3	5.6	6.0
IP Applied and Registered				
Category	Unit	2017	2018	2019
Applied	Cases	924	807	695
Registered	Cases	435	326	372

Sales					
Category		Unit	2017	2018	2019
by Region	Korea	KRW 1 billion	3,095	3,108	3,323
	China	KRW 1 billion	1,643	1,496	1,331
	Americas	KRW 1 billion	985	987	1,235
	Others	KRW 1 billion	615	682	798
Total sales		KRW trillion	5.69	5.67	5.98

Percentage of Sales					
Category		Unit	2017	2018	2019
by Customer	HKMC	%	56.3	58.1	59.0
	North America OEM	%	17.5	17.3	18.7
	Chinese local OEM	%	15.0	14.0	10.7
	European, others	%	11.2	10.6	11.6
by Product	Brake	%	44.1	42.6	40.1
	Steering	%	30.3	29.4	30.4
	Suspension	%	19.1	18.6	17.3
	ADAS	%	6.4	9.2	12.1
	Others	%	0.1	0.2	0.1

Anti-corruption				
Category	Unit	2017	2018	2019
No. of confirmed incidents of corruption	Cases	0	0	0
No. of confirmed incidents in which employees were dismissed or disciplined for corruption	Cases	0	0	0
No. of confirmed incidents when contracts with business partners were terminated or not renewed due to violations related to corruption	Cases	0	0	0

Environmental Data

GHG Emission and Emission Trading Scheme(ETS)				
Category	Unit	2017	2018	2019
Total emissions	tCO ₂ -eq	112,303	110,202	103,521
Scope 1 (Direct emission)	tCO ₂ -eq	8,608.433	9,007.097	7,911.469
Scope 2 (Indirect emission)	tCO ₂ -eq	103,695.43	101,194.85	95,612.096
Scope3	tCO ₂ -eq	0	0	0
Surplus ETS	tCO ₂ -eq	57,375	37,563	46,367
ETS sales	tCO ₂ -eq	21,938	0	0

Violations of Environmental Regulations		
Category	Unit	2019
No. of violations of environmental regulations	Cases	0
Fines	KRW 1,000	0



Waste Generation

Category		Unit	2017	2018	2019
Designated waste	Pyeongtaek	kg	828,970	904,200	805,500
	Wonju	kg	822,000	706,000	602,000
	Iksan	kg	143,240	149,690	135,450
	Pangyo	kg	-	6,000	0
	Subtotal	kg	1,794,210	1,765,890	1,542,950
General waste	Pyeongtaek	kg	212,990	167,970	186,840
	Wonju	kg	15,459,000	15,095,000	14,542,000
	Iksan	kg	581,855	542,450	599,700
	Pangyo	kg	-	4,500	4,000
	Subtotal	kg	16,253,845	15,809,920	15,332,540
Total		kg	18,048,055	17,575,810	16,875,490

Waste Treatment

Category		Unit	2017	2018	2019
Recycling	Pyeongtaek	kg	654,450	797,560	893,180
	Wonju	kg	15,611,810	14,979,000	14,402,320
	Iksan	kg	320,295	438,660	315,680
	Pangyo	kg	-	52,000	70,500
	Subtotal	kg	16,286,555	15,280,220	15,681,680
Landfill	Pyeongtaek	kg	37,670	25,160	16,420
	Wonju	kg	35,080	39,000	36,000
	Iksan	kg	311,860	180,870	337,920
	Pangyo	kg	-	0	0
	Subtotal	kg	391,610	245,030	290,340
Incineration	Pyeongtaek	kg	276,950	177,840	111,100
	Wonju	kg	604,090	746,000	378,500
	Iksan	kg	92,940	72,610	81,090
	Pangyo	kg	-	0	0
	Subtotal	kg	973,980	996,450	570,690
Others	Pyeongtaek	kg	72,890	71,610	25,640
	Wonju	kg	29,970	37,000	35,690
	Iksan	kg	0	-	0
	Pangyo	kg	-	4,500	4,000
	Subtotal	kg	102,860	113,110	65,330
Total		kg	18,048,005	17,621,810	16,708,040

Recycling of Waste

Category	Unit	2017	2018	2019
Recycled waste	kg	16,586,555	16,267,220	15,681,680
Percentage of waste recycled	%	92	93	93

Wastewater Discharge

Category		Unit	2017	2018	2019
Pyeongtaek		m³	132,834	141,510	113,234
Wonju		m³	30,401	28,583	26,687
Iksan		m³	110,269	102,105	100,936
Total		m³	273,504	272,198	240,857

Water Pollutant

Category		Unit	2017	2018	2019
COD	Pyeongtaek	kg	895	910	665
	Wonju	kg	1,580	2,860	1,350
	Iksan	kg	1,654	1,531	1,514
	Total	kg	4,129	5,301	3,529
BOD	Pyeongtaek	kg	413	504	442
	Wonju	kg	300	490	360
	Iksan	kg	551	510	504
	Total	kg	1,264	1,504	1,306
SS	Pyeongtaek	kg	282	260	193
	Wonju	kg	3,710	2,000	3,950
	Iksan	kg	551	510	504
	Total	kg	4,543	2,770	4,647

Water Consumption

Category		Unit	2017	2018	2019
Service water		m³	394,381	364,711	339,233
Groundwater		m³	146,060	156,503	136,356
Surface water (lakes, rivers, etc.)		m³	0	0	0
Rainwater collected and stored directly by the organization		m³	0	0	0
Wastewater from other organization		m³	0	0	0
Others		m³	204,532	100,503	61,969
Total		m³	744,973	621,717	537,558

Water Reused

Category		Unit	2017	2018	2019
Reused water		ton	0	0	0

Energy Consumption within the Organization

Category		Unit	2017	2018	2019
Fuel		TJ	162.32	170.498	148.964
Electricity		TJ	2,102.009	2,059.185	1,958.496
Steam		TJ	32.032	28.665	26.349
Total		TJ	2,296	2,258	2,131
Reduction rate compared to the previous year		%	4.8	1.7	5.5

Raw Material Used

Category		Unit	2017	2018	2019
Non-renewable materials that are used to produce and package the organization's primary products and services		ton	67,131	67,284	58,134
Renewable materials that are used to produce and package the organization's primary products and services		ton	44,725	41,390	39,398
Recycled input materials		ton	8,275	8,020	7,719
Total		ton	120,131	116,694	105,251

Air Pollutants Emissions

Category		Unit	2017	2018	2019
NOx	Pyeongtaek	kg	42	31	0
	Wonju	kg	669.01	175.89	0
	Iksan	kg	131.18	0	0
	Total	kg	842.19	206.89	0
SOx	Pyeongtaek	kg	0	0	0
	Wonju	kg	85.69	80.53	0
	Iksan	kg	0	0	0
	Total	kg	85.69	80.53	0
Dust	Pyeongtaek	kg	0	0	0
	Wonju	kg	13,917	11,587	10,395
	Iksan	kg	1,496.70	920.24	1,086.64
	Total	kg	15,413.7	12,507.24	11,503.64
VOCs	Pyeongtaek	kg	0	0	0
	Wonju	kg	3,523	6,178	2,945
	Iksan	kg	984.77	2,278.51	1,879.18
	Total	kg	4,507.77	8,456.51	4,824.18

Eco-friendly Products and Services

Category		Unit	2017	2018	2019
Amount of green purchasing		KRW 1 million	1,476	1,585	203
Sales		KRW 1 million	0	0	0

Hazardous Chemicals Used

Category		Unit	2017	2018	2019
Hazardous chemicals ¹⁾ used	Pyeongtaek	kg	12,365	9,055	75
	Wonju	kg	117,120	5,005	3,475
	Iksan	kg	24,390	0	0
	Total	kg	153,875	14,060	3,550

Social Data

Employees and Other Workers

Category		Unit	2019
Regular employees			
Gender	Korea	Male	People 3,936
		Female	189
	Overseas	Male	6,409
		Female	1,527
Region	Pangyo	People	1,389
	Pyeongtaek		1,120
	Wonju		1,046
	Iksan		458
	Others in Korea		112
	China		2,639
	U.S.A		1,241
	India		2,713
	Germany		151
	Turkey		2
	Poland		669
	Japan		3
	Indonesia		5
	Brazil		131
	Mexico		381
	Russia		1
Non-regular employee			
Gender	Korea	Male	People 66
		Female	45
	Overseas	Male	137
		Female	33
Region	Pangyo	People	85
	Pyeongtaek		8
	Wonju		8
	Iksan		6
	Others in Korea		4
	China		18
	U.S.A		62
	India		8
	Germany		9
	Turkey		0
	Poland		32
	Japan		0
	Indonesia		0
	Brazil		4
	Mexico		37
	Malaysia		0
	Russia		0
Dispatched employees			
Gender	Korea	Male	People 22
		Female	45
	Overseas	Male	0
		Female	0



Employment and Retirement¹⁾

Category		Unit	2017	2018	2019
No. of new hires		People	235	204	115
No. of turnover and retirement	Male	People	57	80	68
	Female	People	7	16	5

Employee Diversity

Category		Unit	2017	2018	2019
Female managers ²⁾	No. of female managers	People	34	45	56
	No. of female executives	People	1	0	0
	Ratio of female managers	%	3	3	4
Veterans		People	91	90	88

Employee Welfare³⁾

Category		Unit	2017	2018	2019
No. of employees on maternity leave		People	14	13	18
No. of employees entitled to parental leave	Male	People	1,144	1,087	1,004
	Female	People	40	40	34
No. of employees on parental leaves	Male	People	3	9	10
	Female	People	14	12	14
No. of employees that returned to work (ratio)	Male	People (%)	3(100)	7(78)	N/A ⁴⁾
	Female	People (%)	13(93)	12(100)	N/A ⁴⁾
No. of employees using flexible work hour system		People	2,285	2,336	2,231

Employee Education

Category		Unit	2017	2018	2019
Training hours per employee		Hours	41	40	43
Total training expenses (including operation costs of the training center)		KRW 1 million	5,774	6,013	5,258
No. of employees who completed Mando Education		People	14,575	15,033	16,166

Current Status of Labor Union Registration

Category		Unit	2019
No. of employees who have joined the labor union		People	1,978
Ratio of employees who have joined the labor union (No. of members/No. of employees*100)		%	46.4

Occupational Safety and Health⁵⁾

Category		Unit	2017	2018	2019
Accident rate		%	0.18	0.09	0.18
Disease rate		%	0	0	0
Fatalities		People	0	0	1
Severity rate		%	0.14	0.12	0.17
Factor of Safety Index (FSI)		-	0.44	0.30	0.45
No. of safety trainees		People	2,702	2,690	2,594
No. of violations and amount of fines regarding industrial safety regulations		Cases KRW	0 0	0 0	0 0

Social Contribution

Category		Unit	2017	2018	2019
No. of employees in volunteer activity		People	1,573	1,652	1,607
Hours of volunteer activity by employees		Hours	11,022.7	11,062	9,952.2
Donations to local communities		KRW 1 million	458	567	474

Ethics and Human Rights Management

Category		Unit	2017	2018	2019
Ethics training	No. of employees (ratio)	People(%)	259(6)	231(5)	178(4)
Human rights management training	No. of participants in sexual harassment training	People	2,280	2,311	2,282
	Training hours of sexual harassment training	Hours	4,560	2,311	4,564

Compliance with Social and Economic Regulations

Category		Unit	2019
Violations of customer privacy		Cases	0
		KRW	0
Violations of the Act on Fair Trade		Cases	0
		KRW	0

No. of Complaints Concerning Breaches of Customer Privacy

Category		Unit	2017	2018	2019
Complaints received from outside parties and substantiated by the organization		Cases	0	0	0
No. of identified leaks, thefts, or losses of customer data		Cases	0	0	0

Sustainability Data of Global Site

China^{*}

Category		Unit	2017	2018	2019
Energy consumption		TJ	401,718	416,336	387,68
Water consumption		m³	1,484,351	641,385	527,975
Waste	General waste	kg	583,728	566,735	558,626
	Hazardous waste	kg	773,780	671,860	567,460
Occupational safety and health	Injury rate [*]	%	0.18	0.17	0.48
	Disease rate	%	0	0	0
	Fatalities	People	0	0	0
	Lost day rate ^{**}	%	8	8	17

* Combined data from the sites of Beijing, Suzhou, Ningbo, Tianjin and Chongqing in China
** $\sqrt{[(\text{No. of workers injured}/\text{Yearly number of working hours} \times 1,000,000) \times (\text{No. of lost working hours}/\text{Yearly number of working hours} \times 1,000)]}$
*** No. of absentees/No. of attendances

U.S.A^{*}

Category		Unit	2017	2018	2019
Energy consumption		TJ	-	417,281	271,658
Water consumption		m³	-	70,138	57,452
Waste	General waste	kg	-	14,503,375.99	12,303,252.25
	Hazardous waste	kg	-	-	5,980
Occupational safety and health	TCR ^{**} per OSHA	%	-	-	2.85
	DART ^{***} per OSHA	-	-	-	1.99
	Fatalities	People	0	0	0
	Lost day rate	%	-	-	-

* Combined data from the sites of Alabama and Georgia(G1, G2) in the U.S.A
** Total Case Incidence Rate: No. of recordable incidents*200,000/No. of working hours
*** Days Away Restrictions and Transfers: No. of DART incidents*200,000/No. of working hours

Mexico

Category		Unit	2017	2018	2019
Energy consumption		TJ	11.009	17,9109	25.0945
Water consumption		m³	3,286	9,324	15,442.8
Waste	General waste	kg	12,500	19,300	42,000
	Hazardous waste	kg	15,000	24,000	36,000
Occupational safety and health	Injury rate [*]	%	-	0.45	0.19
	Disease rate	%	-	0	0
	Fatalities	People	0	0	0
	Lost day rate ^{**}	%	-	3.57	0.96

* No. of incidents*200,000/No. of working hours
** No. of lost working hours*200,000/No. of working hours

Brazil

Category		Unit	2017	2018	2019
Energy consumption		TJ	15.793	18.509	20.015
Water consumption		m³	3,454	4,022	4,672
Waste	General waste	kg	657,150	618,000	848,716
	Hazardous waste	kg	52,000	15,500	75,760
Occupational safety and health	Injury rate [*]	%	0	0	0
	Disease rate	%	0	0	0
	Fatalities	People	0	0	0
	Lost day rate ^{**}	%	0	0	0

* (No. of incidents/No. of employees)*100
** (No. of lost working hours/No. of working hours)*100

Poland

Category		Unit	2017	2018	2019
Energy consumption		TJ	41.17	46.94	57.09
Water consumption		m³	11,236	10,725	14,193
Waste	General waste	kg	1,653	11,914	18,013
	Hazardous waste	kg	366	459	680
Occupational safety and health	Injury rate [*]	%	7.65	13.40	7.47
	Disease rate	%	-	-	-
	Fatalities	People	0	0	0
	Lost day rate ^{**}	%	17.14	19.88	26.22

* (No. of incidents/No. of employees)*1,000
** (No. of lost working hours*200,000)/No. of working hours

India

Category		Unit	2017	2018	2019
Energy consumption		TJ	18.51	21.48	30.61
Water consumption		m³	65,760	83,016	92,688
Waste	General waste	kg	-	-	127,900
	Hazardous waste	kg	6,400	51,450	66,470
Occupational safety and health	Injury rate [*]	%	0.04	0.06	0.28
	Disease rate	%	-	-	-
	Fatalities	People	0	0	0
	Lost day rate ^{**}	%	1.8	4.04	23.48

* No. of incidents/No. of working hours*200,000
** No. of lost working hours/No. of working hours*100,000

1) Based on domestic workplaces
2) Manager-level or above
3) Based on regular employment
4) The number corresponding to the reporting year will be calculated next year with the number of people expected to return.
5) Types of accidents: Collision, stenosis, etc



GRI Content Index

GRI 102: General Disclosures

GRI Standard	Disclosure		Page in report	Assurance	ISO 26000
Organizational profile	102-1	Name of organization	• 6p	●	6.3.10/6.4.1-6.4.2/ 6.4.3/6.4.4/6.4.5/ 6.8.5/7.8
	102-2	Activities, brands, products, and services	• 10-11p, 16-17p	●	
	102-3	Location of headquarters	• 6p	●	
	102-4	Location of operations	• 12-13p	●	
	102-5	Ownership and legal form	• 6p	●	
	102-6	Markets served	• 12-13p, 40-41p	●	
	102-7	Scale of the organization	• 6p, 12-13p	●	
	102-8	Information on employees and other workers	• 77-78p	●	
	102-9	Supply chain	• 41p	●	
	102-10	Significant changes to the organization and its supply chain	• No significant change	●	
	102-11	Precautionary principle or approach	• 55-56p	●	
Strategy	102-12	External initiatives	• UN SDGs_35p	●	
	102-13	Membership of associations	• 86p	●	
	102-14	Statement from senior decision-maker	• 4-5p	●	4.7/6.2/7.4.2
Ethics and integrity	102-16	Values, principles, standards, and norms of behavior	• 8-9p	●	4.4/6.6.3
Governance	102-18	Governance structure	• 26-27p	●	6.2/7.4.3/7.7.5
Stakeholder engagement	102-40	List of stakeholder groups	• 32p	●	5.3
	102-41	Collective bargaining agreements	• 100%	●	
	102-42	Identifying and selecting stakeholders	• 32p	●	
	102-43	Approach to stakeholder engagement	• 18-23p, 32-33p, 36-37p	●	
	102-44	Key topics and concerns raised	• 36p	●	
Reporting practice	102-45	Entities included in the consolidated financial statements	• 75p • 3-4p of 2019 Mando Business Report	●	5.2/7.3.2/ 7.3.3/7.3.4
	102-46	Defining report content and topic Boundaries	• About this report, 83p	●	
	102-47	List of material topics	• 36p	●	
	102-48	Restatements of information	• Not applicable	●	
	102-49	Changes in reporting	• 36p	●	
	102-50	Reporting period	• About this report	●	7.5.3/7.6.2
	102-51	Date of most recent report	• About this report	●	
	102-52	Reporting cycle	• About this report	●	
	102-53	Contact point for questions regarding the report	• About this report	●	
	102-54	Claims of reporting in accordance with the GRI Standards	• About this report	●	
	102-55	GRI Content Index	• 80-82p	●	
	102-56	External assurance	• 84-85p	●	

Topic-specific Disclosures

GRI Standard	Disclosure		Page in report	Assurance	ISO 26000
Topic 1: Reinforcement of investment and technology development					
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its Boundary	• 42-43p, 48p, 53p	●	-
	103-2	The management approach and its components			
	103-3	Evaluation of the management approach			
-	-	R&D investment and head count	• 34p, 43p, 75p	●	
		IP applied and registered	• 34p, 43p, 75p	●	
Topic 2: Establishment of a cooperative labor-management relationship through active communication					
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its Boundary	• 61p, 63p	●	6.3.3/6.3.4/6.3.5/
	103-2	The management approach and its components			6.3.8/6.3.10/
	103-3	Evaluation of the management approach			6.4.5/6.6.6
Labor/Management Relations	402-1	Minimum notice periods regarding operational changes	• 81p	●	
		Content of changes in management	Notification period		
		Division, merger or cession of company	3 months in advance		
		Relocation to a newly built plant (basic plan for welfare)	12 months prior to the relocation		
		*Source: Mando Collective Agreement			
Topic 3: Improvement of customer satisfaction					
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its Boundary	• 42p, 50-52p	●	6.7.1-6.7.2/
	103-2	The management approach and its components			6.7.4/6.7.5/6.8.8
	103-3	Evaluation of the management approach			
Customer Health and Safety	416-1	Assessment of the health and safety impacts of product	• 52p (Mando vehicle test sites)	●	
Topic 4: Creation of a safe working environment					
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its Boundary	• 60-62p, 68p	●	6.4.6/6.8.8
	103-2	The management approach and its components			
	103-3	Evaluation of the management approach			
Occupational Health and Safety	403-2	Types of injury and rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities	• 34p, 61p, 78p	●	
	403-3	Workers with high incidence or high risk of diseases	• 61-62p	●	
Topic 5: Designing of eco-friendly products					
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its Boundary	• 54p, 57-58p	●	-
	103-2	The management approach and its components			
	103-3	Evaluation of the management approach			
-	-	Conducting a national project on "Reduction of Non-exhaust Emissions from Transportation"	• 58p	●	
Topic 6: Discovery of new business					
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its Boundary	• 42p, 44-46p	●	-
	103-2	The management approach and its components			
	103-3	Evaluation of the management approach			
-	-	Operation of WG Campus	• 44-46p	●	
Topic 7: Fostering of talents					
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its Boundary	• 60p, 65-66p	●	6.4.7/6.8.5
	103-2	The management approach and its components			
	103-3	Evaluation of the management approach			
Training and Education	404-1	Average hours of training per year per employee	• 34p, 65p, 78p	●	
	404-2	Programs for upgrading employee skills and transition assistance programs	• 65-66p	●	
Topic 8: Expansion of overseas markets					
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its Boundary	• 42-43p, 46-47p	●	-
	103-2	The management approach and its components			
	103-3	Evaluation of the management approach			
-	-	Sales by region	• 47p, 75p	●	
		Global Technology Exchange at Mando MISV	• 46p	●	
		Participating in Motor Shows and hosting Tech Shows	• 47p	●	



GRI Standard	Disclosure		Page in report	Assurance	ISO 26000
Topic 9: Response to climate change					
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its Boundary	• 54-56p	●	6.5.4/6.5.5
	103-2	The management approach and its components			
	103-3	Evaluation of the management approach			
Energy	302-1	Energy consumption within the organization	• 34p, 55p, 76p	●	
Emissions	305-1	Direct (Scope 1) GHG emissions	• 34p, 56p, 75p	●	
		Energy indirect (Scope 2) GHG emissions	• 34p, 56p, 75p	●	
Topic 10: Strengthening of information security of customers and products					
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its Boundary	• 29p	●	6.7.1-6.7.2/6.7.7
	103-2	The management approach and its components			
	103-3	Evaluation of the management approach			
Customer Privacy	418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	• 78p	●	
Topic 11: Elimination of any corruption					
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its Boundary	• 28p	●	4.6/6.7.1-6.7.2/6.7.6/ 6.6.1-6.6.2/6.6.3
	103-2	The management approach and its components			
	103-3	Evaluation of the management approach			
Anti-corruption	205-2	Communication and training about anti-corruption policies and procedures	• 28p, 75p, 78p	●	
Socioeconomic Compliance	419-1	Non-compliance with laws and regulations in the social and economic area	• No Violations	●	
Topic 12: Strengthening of competitiveness and mutual cooperation with partners					
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its Boundary	• 50p, 60p, 67-69p	●	-
	103-2	The management approach and its components			
	103-3	Evaluation of the management approach			
-	-	Number and financial amount of patent support for partners	• 67p	●	
		Financial support for partners	• 67p	●	
Topic 13: Creation of a flexible corporate culture					
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its Boundary	• 60p, 63-64p	●	6.2.3/6.3.7/6.3.10/6.4.3
	103-2	The management approach and its components			
	103-3	Evaluation of the management approach			
Diversity and Equal Opportunity	405-1	Diversity of governance bodies and employees	• 77-78p	●	
-	-	Horizontal organizational structure	• 64p	●	
		Promoting communication between executives and employees	• 65-66p	●	
Topic 14: Supply chain CSR management					
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its Boundary	• 68p	●	6.3.5/6.4.3/6.6.6/7.3.1
	103-2	The management approach and its components			
	103-3	Evaluation of the management approach			
Supplier Environmental Assessment	308-1	New suppliers that were screened using environmental criteria	• 34p, 68p	●	
Supplier Social Assessment	414-1	New suppliers that were screened using social criteria	• 34p, 68p	●	
Topic 15: Strengthening of work and life balance					
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its Boundary	• 63-64p	●	6.4.4/6.8.7
	103-2	The management approach and its components			
	103-3	Evaluation of the management approach			
Employment	401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	• 64p	●	
	401-3	Parental leave	• 34p, 78p	●	

Boundaries of Topics and Reports

- Topic boundaries: Worksites generating the impact of material topics
- Report boundaries: Worksites that report outcome and activities of material topics to 2019 Mando Sustainability Report

Rank	Material Topic	Pangyo	Wonju	Pyeongtaek	Iksan	Asia	Europe	North America	South America
1	Reinforcement of investment and technology development	●●	●●	●●	●●	●	●	●●	
2	Establishment of a cooperative labor-management relationship through active communication	●●	●●	●●	●●	●	●	●	●
3	Improvement of customer satisfaction	●●	●●	●●	●●	●●	●●	●●	
4	Creation of a safe working environment	●●	●●	●●	●●	●●	●●	●●	●●
5	Designing of eco-friendly products	●●		●●					
6	Discovery of new business	●●						●●	
7	Fostering of talents	●●	●●	●●	●●	●●	●●	●●	●●
8	Expansion of overseas markets	●●				●●	●●	●●	●
9	Response to climate change	●	●●	●●	●●	●●	●●	●●	●●
10	Strengthening of information security of customers and products	●●	●●	●●	●●	●●	●●	●●	●
11	Elimination of any corruption	●●	●●	●●	●●	●	●	●	●
12	Strengthening of competitiveness and mutual cooperation with partners	●●	●●	●●	●●	●	●	●	●
13	Creation of a flexible corporate culture	●●	●●	●●	●●	●	●	●	●
14	Supply chain CSR management	●●	●●	●●	●●	●	●	●	●
15	Strengthening of work and life balance	●●	●●	●●	●●	●	●	●	●

Independent Assurance Statement



LR Independent Assurance Statement

Relating to Mando Corporation's Sustainability Report for the 2019 calendar year

This Assurance Statement has been prepared for Mando Corporation in accordance with our contract but is intended for the readers of this Report.

Terms of engagement

Lloyd's Register Quality Assurance Limited (LR) was commissioned by Mando Corporation (Mando) to provide independent assurance on its '2019 Mando Sustainability Report' ("the report") against the assurance criteria below to a "moderate level of materiality" using "accountability's AA1000AS (2008)" where the scope was a Type 2 engagement.

Our assurance engagement covered Mando's operations and activities in Korea and specifically the following requirements:

- Evaluating adherence to AA1000 AccountAbility Principles of Inclusivity, Materiality and Responsiveness
- Confirming that the Report is in accordance with:
 - GRI Standards¹⁾: Core option
- Evaluating the accuracy and reliability of data and information for only the selected indicators listed below:
 - GRI 200 (Economic): GRI 205-2
 - GRI 300 (Environmental): GRI 302-1, GRI 305-1, GRI 305-2, GRI 308-1
 - GRI 400 (Social): GRI 401-2, GRI 401-3, GRI 402-1, GRI 403-2, GRI 403-3, GRI 404-1, GRI 404-2, GRI 405-1, GRI 414-1, GRI 416-1, GRI 418-1, GRI 419-1

Our assurance engagement excluded the data and information of Mando's suppliers, contractors and any third-parties mentioned in the report.

LR's responsibility is only to Mando. LR disclaims any liability or responsibility to others as explained in the end footnote. Mando's responsibility is for collecting, aggregating, analysing and presenting all the data and information within the report and for maintaining effective internal controls over the systems from which the report is derived. Ultimately, the report has been approved by, and remains the responsibility of Mando.

LR's Opinion

Based on LR's approach nothing has come to our attention that would cause us to believe that Mando has not, in all material respects:

- Met the requirements above
- Disclosed accurate and reliable performance data and information as all errors or omissions identified during the assurance engagement were corrected
- Covered all the issues that are important to the stakeholders and readers of this report.

The opinion expressed is formed on the basis of a moderate level of assurance and at the materiality of the professional judgement of the verifier.

Note: The extent of evidence-gathering for a moderate assurance engagement is less than for a high assurance engagement. Moderate assurance engagements focus on aggregated data rather than physically checking source data at sites. Consequently, the level of assurance obtained in a moderate assurance engagement is substantially lower than the assurance that would have been obtained had a high assurance engagement been performed.

LR's approach

LR's assurance engagements are carried out in accordance with our verification procedure. The following tasks though were undertaken as part of the evidence gathering process for this assurance engagement:

- Assessing Mando's approach to stakeholder engagement to confirm that issues raised by stakeholders were captured correctly. We did this through reviewing documents and associated records.

- Reviewing Mando's process for identifying and determining material issues to confirm that the right issues were included in their Report. We did this by benchmarking reports written by Mando and its peers to ensure that sector specific issues were included for comparability. We also tested the filters used in determining material issues to evaluate whether Mando makes informed business decisions that may create opportunities that contribute towards sustainable development.
- Auditing Mando's data management systems to confirm that there were no significant errors, omissions or mis-statements in the report. We did this by reviewing the effectiveness of data handling procedures, instructions and systems, including those for internal verification. We also spoke with those key people responsible for compiling the data and drafting the report.
- Reviewing supporting evidence made available by visiting their IR & Communication team at 21 Pangyo-ro, 255beon-gil Bundang-gu, Seongnam-si, Gyeonggi 13486 in Republic of Korea.
- Checking that the GRI Content Index allows stakeholders to access sustainability indicators.

Observations

Further observations and findings, made during the assurance engagement, are:

- Stakeholder inclusivity:
We are not aware of any key stakeholder groups that have been excluded from Mando's stakeholder engagement process.
- Materiality:
We are not aware of any material issues concerning Mando's sustainability performance that have been excluded from the report. It should be noted that Mando has established extensive criteria for determining which issue/aspect is material and that these criteria are not biased to the company's management.
- Responsiveness:
Mando reported not only the interested issues from its stakeholders but also by reported the related UN Sustainable Development Goals. Also, Mando has the response system to correspond with queries of its stakeholders.
- Reliability:
Mando has reliable data management systems for the indicators related to this assurance scope in the Report.

LR's standards, competence and independence

LR implements and maintains a comprehensive management system that meets accreditation requirements for ISO/IEC 17021 Conformity assessment – Requirements for bodies providing audit and certification of management systems that are at least as demanding as the requirements of the International Standard on Quality Control 1 and comply with the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants.

LR ensures the selection of appropriately qualified individuals based on their qualifications, training and experience. The outcome of all verification and certification assessments is then internally reviewed by senior management to ensure that the approach applied is rigorous and transparent.

This verification engagement is the only work undertaken by LR for Mando and as such does not compromise our independence or impartiality.

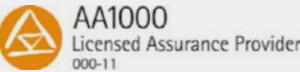
Hee-Jeong Yim LR Lead Verifier

Dated: 8th May 2020

On behalf of Lloyd's Register Quality Assurance Limited

17th Floor, Sinsong Building, 67 Yeouinaru-ro, Yeongdeungpo-gu, Seoul, Korea

LR reference: SEO00000437



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1) <https://www.globalreporting.org>

Membership of Associations

No.	Name of organization	Purpose
1	AUTOSAR Association Partnership	Acquisition of information on new technology trends in the automotive industry and response to competitors
2	The International Wireless Industry Consortium (IWPC)	Academy activities and acquisition of radar technologies
3	The Korean Society of Automotive Engineers (KSAE)	Developing Technology through automotive industry networking and academic symposiums
4	Korea Industrial Technology Association (KOITA)	Acquisition of information on R&D technology and strategy
5	The Korean Institute of Electrical Engineers (KIEE)	Acquisition of academic and technological information in relation to electrical engineering
6	The Institute of Electronics and Information Engineers	Acquisition of technological information in relation to electronics, information, and communications
7	The Korean Institute of Power Electronics (KIPE)	Participation in academic symposiums and acquisition of power electronics technology
8	Institute of Control, Robotics and Systems Engineering	Technological development for grasping trends of controls, robots, and systems
9	NAFEMS	Acquisition of CAE international standard and technological trends
10	Korea International Trade Association (KITA)	Recommendations for policies and acquisition of trade information, such as export and duties
11	Korea Enterprises Federation (KEF)	Recommendations for policies and cooperation for the establishment of a labor-management system
12	Korea Auto Vehicle Safety Association (KASA)	Revision and response to risks in relation to amendments in the safety policies for automobiles
13	Korea Intellectual Property Association (KIPA)	Response to changes in the IP environment and dispute risks through acquisition of corporate IP information
14	Korea Electronics Association (KEA)	Striving for IP competitiveness in new technological fields through acquisition of electronics/ICT technology patent information
15	Green Company Council	Prevention of environmental risks through networking of a green company
16	Korea Environmental Engineers Council	Prevention of environmental risks through information exchange among manager in charge
17	Korea Fire Safety Institute (KFSI)	Acquisition of fire safety information and job competency training for fire safety managers
18	Korean Nurses Association	Acquisition of information on industrial health hazards, risk information and improve health service performance
19	Korea Electric Engineers Association	Stable operation of electric facilities and strengthening of the competencies of electric safety managers
20	Korea Industrial Safety Association	Acquisition of information on safety issues and strengthening of the competencies of industrial safety managers
21	Korea Environmental Preservation Association (KEPA)	Acquisition of information on environmental issues and management of mandatory training for environmental specialists
22	Korea Chemicals Management Association (KCMA)	Acquisition of information on chemical management and legal action against the use of hazardous chemicals
23	Corporate Environment Council	Prevention of environmental risks through acquisition of environmental issues
24	Safety and Health Association	Strengthening disaster prevention programs through networking on safety and health duties
25	Emergency Planning Council under the Ministry of Trade, Industry and Energy	Cooperation with training in relation to emergency readiness duties as required by MOTIE

2019 List of Awards

Region	Period	Description
Korea	2019.05	Awarded with "Industrial Service Medal" and "Presidential Award" at the 54th Invention Day Ceremony
Korea	2019.07	Received the commendation from Minister of Trade, Industry and Energy at the Global Green Management Excellence Awards
Korea	2019.07	Awarded with "Industrial Service Medal" in 2019 for prevention of industrial disasters
Korea	2019.11	Received the commendation from Minister of Trade, Industry and Energy at the 2019 Corporate IP Management Awards
Korea	2019.11	Acquired the title of the "Company of the Year" for enhanced shareholder value at the 2019 Newsis Korea Stocks and IR Awards
Korea	2019.12	"Excellent" in Mutual Growth Index assessment
China	2019.12	Mando China Awarded with 2019 CSR Excellence Award



Mando Sustainability Report 2019

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