

Corporate Value Creation Process

“Contributing to a better world by creating value together with a vision for the future”

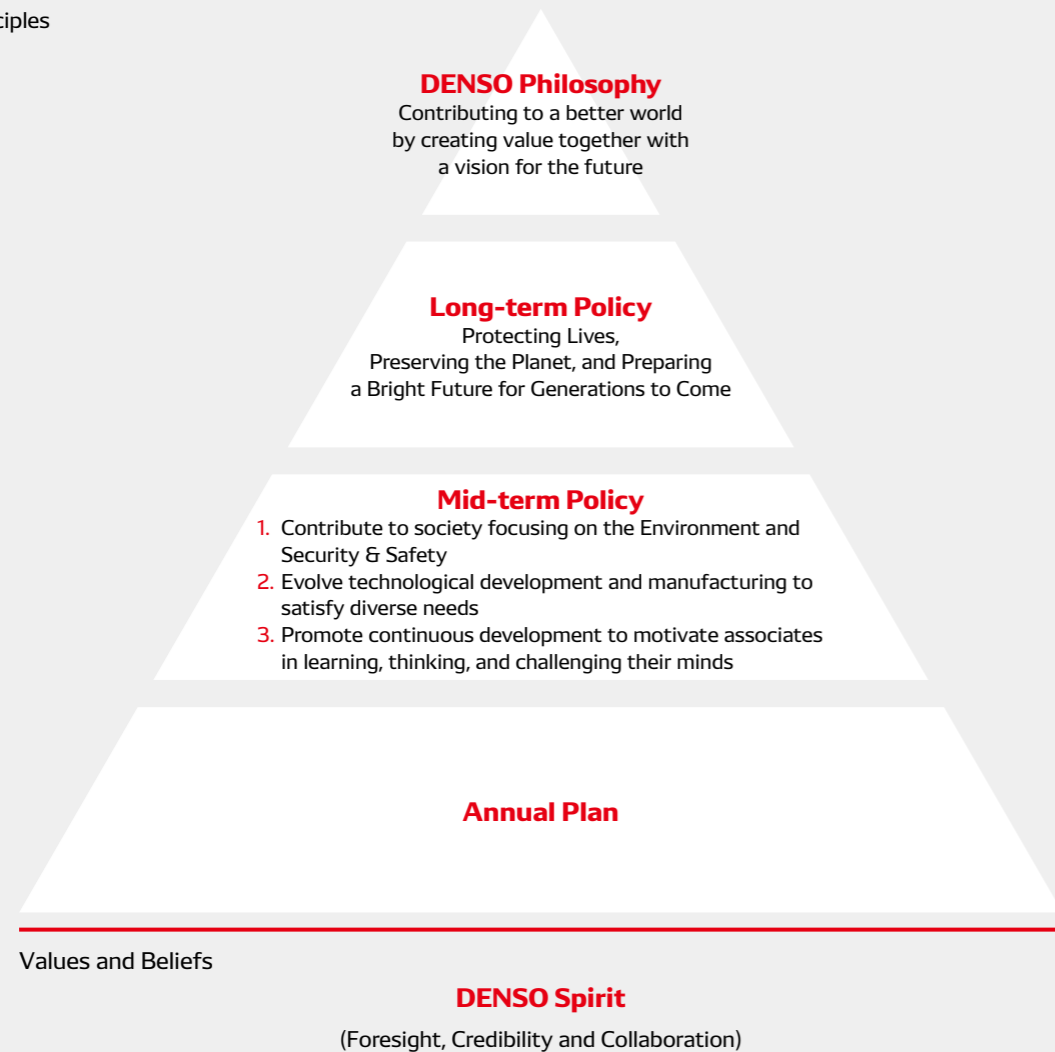
To continue as a company that has earned the trust and meets the expectations of people all over the world, DENSO helps to deliver the convenience and joy of cars to people all over the world while aiming to realize its Long-term Policy of “preserving the Earth’s environment” and “creating a society that ensures security and safety.” For that reason, DENSO has been sharing among all its employees the DENSO Spirit passed down since its establishment and contributing to the creation of a better society by leveraging its strengths in unique R&D, *Monozukuri* and *Hitozukuri* (human resource development).

Assuredly leading to the creation of corporate value, this “Business to Society” viewpoint has been underpinning DENSO’s growth.

Management Principles and Code of Conduct

DENSO has positioned three elements under the framework shown below: its Long-term Policy, which tackles issues in critical operational fields heading toward 2020 based on the DENSO Philosophy that outlines the Company’s corporate stance and mission; its Mid-term Policy that shows the strategies designed to achieve the Long-term Policy; and the DENSO Spirit that forms a day-to-day code of conduct.

Basic Principles



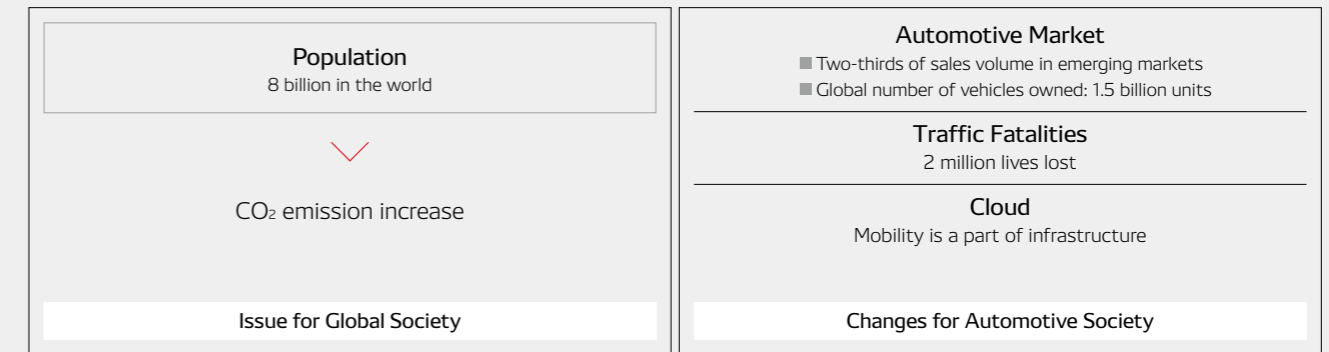
Long-term Policy

Slogan

Protecting Lives, Preserving the Planet, and Preparing a Bright Future for Generations to Come

In light of difficult times expected caused by severe environmental changes, DENSO formulated the DENSO Group Long-term Policy 2020 in 2013 while keeping in mind its strong motivation to contribute to society and taking aggressive action on its own accord to remain a company that has earned the trust and meets the expectations of people all over the world.

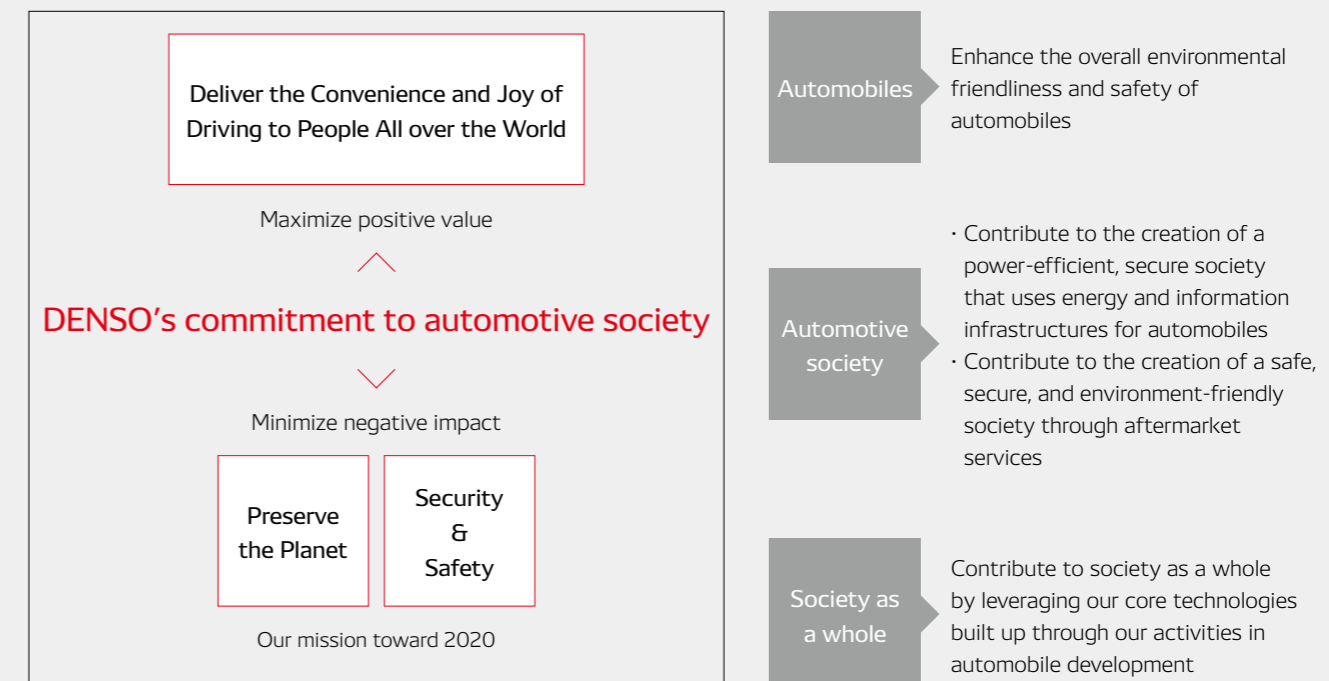
2025 Business Environment



2025 Society of the Future



Value Delivered to Society

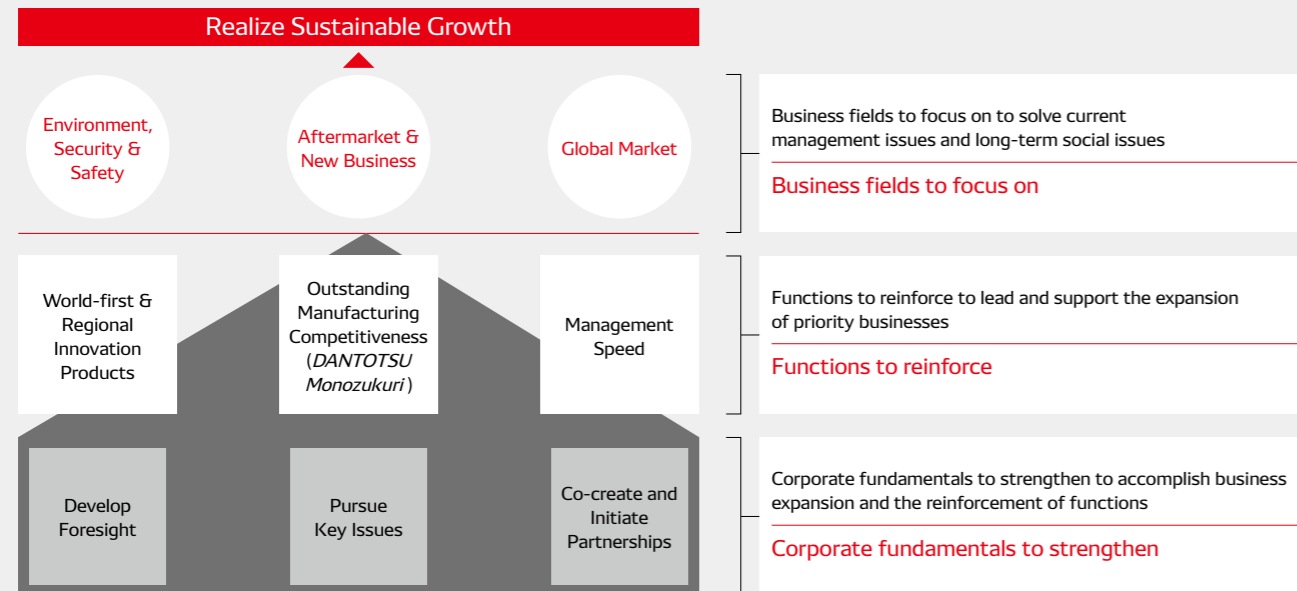


Mid-term Policy

Business fields to focus on

Environment, Security & Safety, Aftermarket & New Business, and Global Market

DENSO Group Mid-term Policy describes the key business fields to focus on, the functions to reinforce, and the corporate fundamentals to strengthen through fiscal 2019 in order to achieve the goals of Long-term Policy 2020.



Strategy for Mid-term Policy

Themes to Promote	Direction
Business fields to focus on Environment, Security & Safety Create system products that address social issues and help reduce the environmental footprint and traffic accidents	<ul style="list-style-type: none"> Strengthen technological developments toward greater fuel saving, air purification, energy diversification (improve fuel efficiency, electrification, fuel economy, etc.), and system proposal capabilities Strengthen technological developments in vehicle control, human machine interface (HMI), and information and communications systems toward the evolution of advanced driving support Strengthen new product design and development in automobiles and social systems and related areas
Aftermarket & New Business Expand aftermarket & new business markets to create new customer value from a societal needs and end-user perspective	<ul style="list-style-type: none"> Propose products that maintain a societal needs and end-user viewpoint and that create customer value Improve speed from product planning to sales through initiatives that prioritize the front line (customers, markets) and through active collaboration with partners
Global Market Reinforce the relationship of mutual trust and raise DENSO's presence in each region so that people around the world can enjoy driving and the convenience of vehicles	<ul style="list-style-type: none"> Predict customers' essential expectations, continually provide value linked to customer brand improvements Provide multifaceted value added—for example, in terms of quality, value, delivery and service—compatible with the needs of each region to become more region-centric
Functions to reinforce World-first & Regional Innovation Products Take on the challenge of advanced technological development that creates the world-first and regional innovation products by realizing regional strengths and community-based wisdom	<ul style="list-style-type: none"> Accelerate advanced technology research and reinforce efforts in social science By predicting the trend in regional needs, enhance the ability to design product concepts and develop advanced technologies
Outstanding Manufacturing Competitiveness Enhance <i>Monozukuri</i> capabilities and the global expansion of <i>DANTOTSU</i> through enhanced competitiveness to realize a regional No. 1 production structure, the <i>DANTOTSU</i> plant	<ul style="list-style-type: none"> Reinforce simultaneous development of products and <i>Monozukuri</i> for product evolution (high difficulty level, systems) and expansion of overseas production Establish strong <i>Monozukuri</i> capabilities by One DENSO and realize regional No. 1 production supply structure and the <i>DANTOTSU</i> plant
Management Speed Accelerate management speed by promoting global collaboration and changing our way of working to improve the speed of business operations	<ul style="list-style-type: none"> Collaborate with diverse people Implement global next-generation information systems and change our way of working to improve speed of business operations

DENSO Spirit

What is DENSO Spirit

A spirit of foresight, credibility and collaboration

The DENSO Spirit expresses values and beliefs shared by our employees around the world that have driven us to contribute to the automotive industry and society as a whole since our establishment in 1949.

Foresight

Providing surprises and impressions in a way that only DENSO can

Vision

Anticipate change

Creativity

Create new value

Challenge

Overcome difficulties

Credibility

Providing quality and reliability beyond customer expectations

Quality First

Ensure the best quality for our customers

On-site Verification

Grasp the facts firmly

Kaizen, Continuous Improvement

Strive to reach higher levels

Collaboration

Achieving the highest results by working as a team

Communication

Understand one another completely

Teamwork

Do your best as a team

Human Development

Develop yourself and the next generation

COLUMN

Boldly Taking on New Challenges No Matter What the Circumstances

In 1950, soon after its establishment, DENSO released 50 "Denso Go" electric vehicles to the market. With the exception of the batteries and chassis, the core components for these vehicles were manufactured entirely in-house. Fighting to survive during a difficult time when automobile demand had fallen off, we developed *Denso Go* through ongoing R&D driven by the deep desire of employees to contribute to society by providing useful products on the back of our electric component-related technologies and equipment. While *Denso Go* went out of production approximately a year after it was launched due to the government's lifting of the ban on gasoline control and surging lead prices, the spirit of challenge and technical legacy that emerged during that time led to the creation of the Electric Vehicle Equipment Department in 1970, 20 years after *Denso Go* was launched.

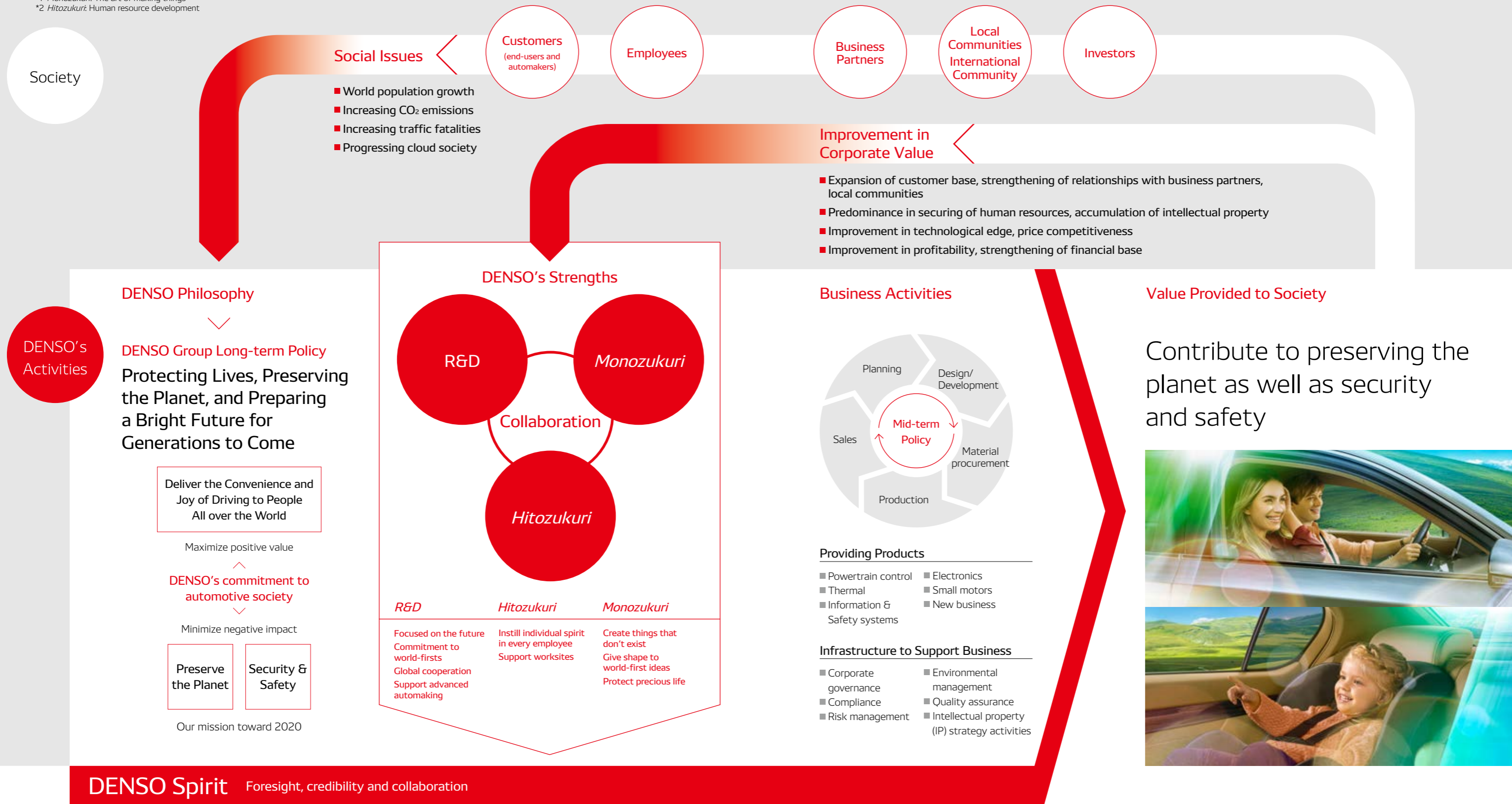


Value Creation Model

Guided by the basic principles of its management policy and code of conduct, DENSO is leveraging the strengths of its R&D, *Monozukuri**1 and *Hitozukuri**2 nurtured over a lengthy period since its founding, to drive its business forward.

By addressing a variety of social challenges, helping to preserve the global environment, and contributing to the security and safety of society, DENSO is also taking steps to enhance its corporate value. Through these means, the Company is further reinforcing its inherent strengths while ensuring that its efforts lead to sustainable growth. Here, we would like to provide details of our thoughts and the processes implemented.

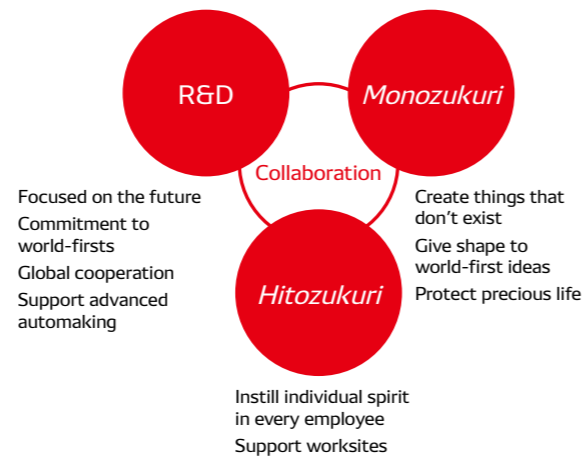
*1 *Monozukuri*: The art of making things
*2 *Hitozukuri*: Human resource development



DENSO's Activities

Strengths That the Company Has Nurtured Since Its Founding

As identified under its Value Creation Model, DENSO's strengths lie in the R&D, *Monozukuri*, and *Hitozukuri* that it has continued to nurture since its founding. Each of these strengths mutually supports the other, helping to drive the activities of the Company forward. These strengths also help realize DENSO's Long-term Policy, which is supported by the pillars of environmental preservation, security, and safety and provide the engine that delivers new value to society. Here, we provide details of the secrets behind our strengths and activities that help bolster our competitive advantage.



R&D, *Monozukuri*

Research and Development (R&D)

In research and development—the starting point for new value creation—we are taking steps to further strengthen planning and R&D in order to accurately perceive society's needs and produce competitive products. DENSO has been promoting roadmaps that show the path for advancing to each successive period: short term (five years), medium term (10 years), and long term (11 years or more). The roadmaps will incorporate changes in regulations and the needs of the global community and will decide the R&D themes to be started and terminated after they are shared with each division, the Engineering Research & Development Center, and the Production Innovation Center.

In addition, to strengthen the global development network, we maintain technical centers at seven regions throughout the world and incorporate technical proposals tailored to local needs.

DENSO considers R&D expenditure at around 9% of revenue to be an appropriate level, and in fiscal 2016, the year ended March 31, 2016, R&D expenditure came to ¥399.3 billion and is expected to be ¥415.0 billion in fiscal 2017.

The Key to Our Strength

Basic Research Focused on the Future

At the Basic Research Laboratories established in 1991 and responsible for long-term R&D, equipped with state-of-the-art facilities, we conduct research and development of future technologies looking five to 20 years ahead. We perform basic research in a wide range of fields, from semiconductor materials to oil-producing microalgae, which has led to commercialization over the near term.



Commitment to World-Firsts

Based on its mission of "contributing to people's well-being through new value creation," DENSO is committed to creating world-first products that are connected to the environment, security and safety. DENSO has created various world-first products including the common rail system, which dramatically increases diesel engine performance, and short-range LiDAR, which prevents rear-end collisions and has been commercialized for compact vehicles.



Global R&D Structure

With technical centers based throughout the world (Japan, the United States, Germany, China, Thailand, India, Brazil), DENSO transcends the internal and external boundaries of the Company and collaborates with automakers, research institutions, universities, and other organizations to develop advanced technologies and products that meet the needs of each region.



Monozukuri

Since its inception, DENSO's *Monozukuri* has thoroughly integrated in-house technologies. Through *Monozukuri* positive steps are taken to design and manufacture equipment, production lines, materials and processing methods. This enables us to provide society with the world's most advanced groundbreaking technologies and products conceived by our R&D.

We have strived to develop speedy and efficient production lines and compact unique facilities, as well as streamline distribution and inspection with our own production technology, and we have built a *DANTOTSU** plant that performs *Monozukuri* at a *DANTOTSU* price. This has enabled us to also ensure high efficiency and high quality and offer competitiveness and added value to our products.

* *DANTOTSU*: A *DANTOTSU* plant is one that undertakes *Monozukuri* at a *DANTOTSU* (outstanding) cost. A *DANTOTSU* plant is at such a high level that it cannot be compared to other plants.

The Key to Our Strength

Material Technology to Create Things That Don't Exist

To pursue product performance and quality, if we don't have suitable general purpose materials, we create them. This is part of our commitment to DENSO's *Monozukuri*. Materials that DENSO's material engineers have jointly developed with material manufacturers help us to achieve world-first products and world-best performance.



Partnerships That Support Advanced Automaking

DENSO provides technologies and products to the world's automakers. As the best partner with the best solutions, DENSO meets a wide range of end-user needs with technologies and know-how accumulated through the development of new technologies in every field.



Production Technology That Gives Shape to World-First Ideas

DENSO leverages a world-class micro-processing and assembly line that improves production efficiency and quality. DENSO also supports world-first products and the world's highest level of product performance and quality from a *Monozukuri* perspective by designing and manufacturing its own equipment and production lines.



Quality Assurance That Helps Protect Precious Lives

In order to make automobiles that can be driven with peace of mind, DENSO, as a parts manufacturer, has owned a test course from early on. Having evaluation equipment comparable to that of automakers, such as a low-temperature wind tunnel testing room and an electromagnetic wave dark room, DENSO repeatedly runs tests that simulate the driving environments of any part of the world and strives to maintain high quality and trust in its products.



Roadmaps



Concurrent Engineering

At DENSO, we believe that new product development comprises both R&D and *Monozukuri*. As with any new technology, if it cannot be turned into reality it cannot be developed into a product. Because R&D and *Monozukuri* jointly contribute knowledge and provide positive influence, we can produce new products of a higher dimension.

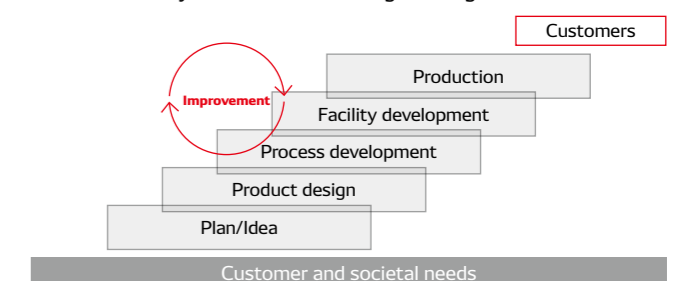
The Key to Our Strength

The Two Prongs of R&D and *Monozukuri*

We have been working on concurrent engineering to closely coordinate between the product development department, which is engaged in everything from development to mass production, and the manufacturing technology department. Thus, by thinking about the technology and process that achieves new products, we can develop products with a higher degree of perfection in a shorter period of time. To turn this into reality, engineers and technicians will work together to achieve

commercialization. Concurrent engineering is now becoming mainstream in the world of *Monozukuri*, but at DENSO, since the 1970s we have engaged in concurrent engineering as next-generation product research. This is a method that DENSO has continued with great commitment.

The DENSO-style of Concurrent Engineering



Hitozukuri

“The best products are made by the best human resources.”

DENSO has positioned human resources as its most important management resource. Accordingly, the Company has focused on the training and skill development of employees based on the idea that human resource development supports R&D and *Monozukuri*.

The Key to Our Strength

The DENSO Spirit Instilled in Every Employee

Documented in 2004, the DENSO Spirit* approach of “foresight,” “credibility” and “collaboration” has been handed down as implicit knowledge since the Company’s founding. In order to function as our code of conduct, which serves as the driving force and source of our competitive advantage, the crux of the DENSO Spirit has been translated into 17 languages to help contribute to the advancement of an automotive society and to people worldwide.

Based on the DENSO Spirit, “DENSO’s Work Procedures,” which summarize the basic approach, tools, and process for conducting daily work, and “On the Job Development,” which summarizes the approach and process for training employees at DENSO, have been deployed worldwide as a global educational curriculum. The DENSO Spirit is not merely a slogan—it has been instilled in all employee behavior and is practiced in day-to-day business.

* Please see page 15 for more information on the DENSO Spirit.

Human Resources in *Monozukuri* That Support Production Worksites

Believing that the development of advanced engineers and technicians who enable innovative product development and production is the key to corporate growth, DENSO operates the DENSO Industrial School (offering industrial high school and specialized vocational high school courses), which carries on the tradition of the technical training schools established in 1954.

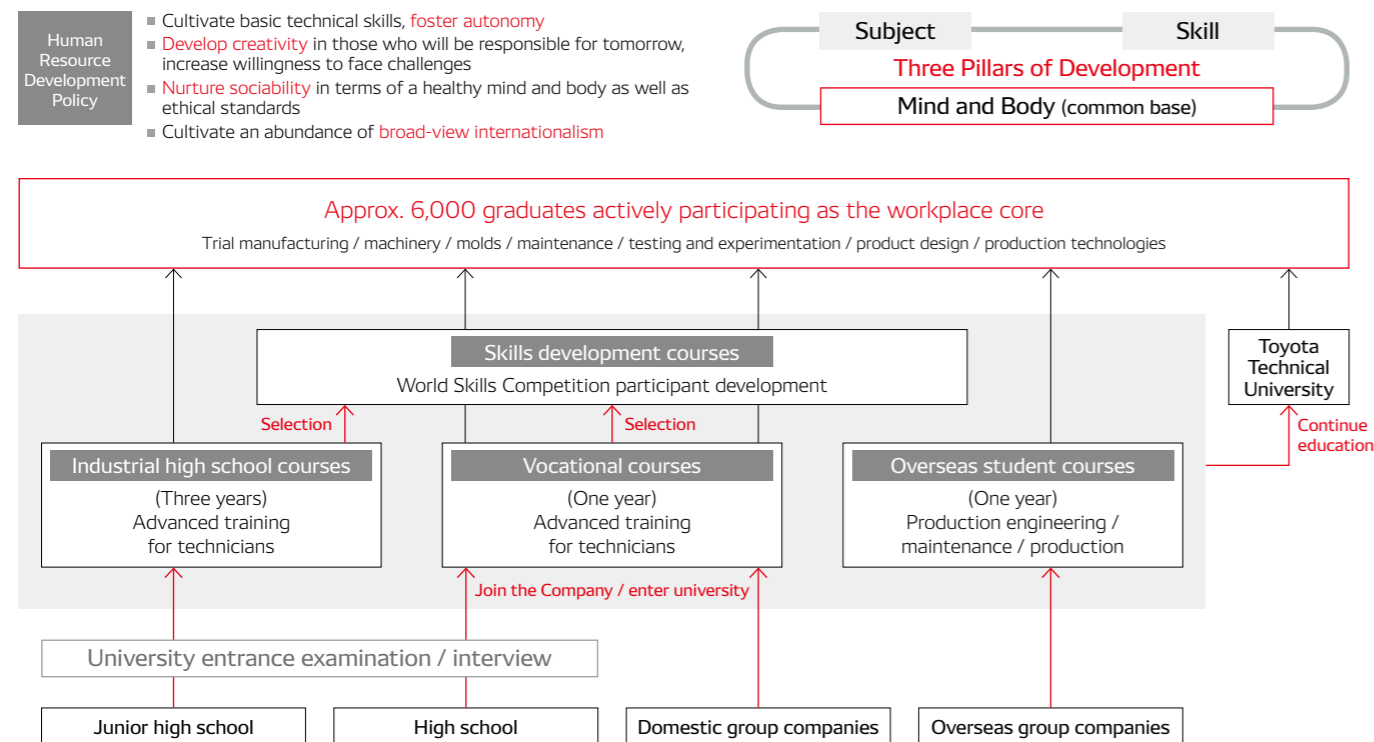
The school has produced many World Skills Competition medalists from among its young technicians who compete at the world’s highest level. Participation in the Skills Competition is not for the purpose of achieving an excellent score. The true purpose is to refine one’s skills through training, leverage those skills in *Monozukuri* at the workplace, and develop the next generation of youth.

The DENSO Industrial School has produced 6,000 graduates and 300 medalists who support DENSO’s *Monozukuri*.



Development Policy and System Diagram

Development of autonomous creative human resources who can flexibly respond to changes in the times and the environment and form the core of the future workplace



TOPICS

Monozukuri

DENSO’s Factory IoT Activities

To increase its competitiveness in continuously expanding global markets, DENSO has begun the full-scale launch of its own IoT that connects the world’s factories via network. By sharing and fully leveraging all information on goods, things, and people (wisdom) within the DENSO Group, we are stimulating the further development of DENSO’s *Monozukuri*.

To that end, we are now working to introduce a co-creative IoT system. In this initiative, improvements carried out day-to-day are immediately turned into computerized data and delivered in a timely manner to people who perform associated work that transcends departmental and national boundaries. As a result, the improvement cycle continues, high-quality, swift *Monozukuri* through global coordination is achieved, and product competitiveness and added value continue to expand.



Hitozukuri

Medals Won at the World Skills Competition

At the World Skills Competition held in São Paulo, Brazil, 16 people representing 10 occupational categories participated from Japan, Thailand, Indonesia, and Vietnam.

The DENSO Group won gold medals in the three occupational categories of the Manufacturing Team Challenge and Mobile Robot (Japanese representative) and CNC Lathe (Thai representative). Representatives from Japan and Thailand won their fourth consecutive competition (gold medals). Every effort is being made to pass on technologies and skills on a global basis and to enhance the competitiveness of the Group’s *Monozukuri* capabilities.

Number of gold medals won
31
World Skills Competition

Accumulated Medals Won at All World Skills Competitions

	Gold	Silver	Bronze
Number of medals won	31	16	14



Special Feature: Value Created from DENSO's Strengths – COA HVAC

The world's first new car air-conditioning unit that can be installed across manufacturers, car models, and powertrains.

COA HVAC

DENSO works diligently to manufacture cars that allow people to drive and ride in comfort while consistently making efforts to improve the environmental and safety performance of cars. DENSO's COA HVAC is a prime example of the Company's endeavors and its efforts to make full use of its inherent strengths. Drawing on the steps taken to launch COA HVAC, we provide details of the Company's unique value creation mechanism.

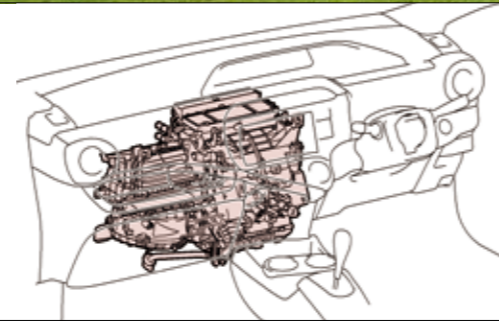
Glossary

What is HVAC?

HVAC is the acronym for "Heating Ventilation and Air-Conditioning," a major component of car air-conditioners that controls temperature, air volume, and outlet locations in order to maintain a comfortable temperature in the vehicle interior.

What is COA?

"CO" refers to the first two letters of the words "Common," "Compact," and "Collaboration" (between departments within the Company and joint development with Group companies). "A" refers to the first letter of the word "air-conditioner." "COA" also includes the idea of the "CORE" of the thermal business.



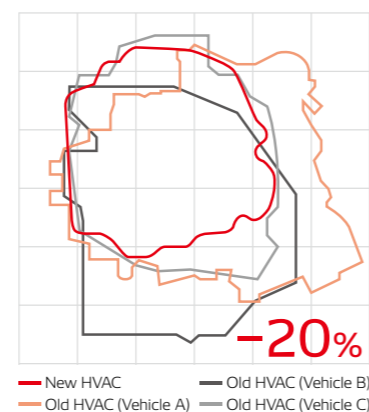
Development Background

Improvement of environmental performance and comfort, a challenge that automotive society currently faces, as well as a Company theme, is the basis of development. The societal need for greater fuel economy, which significantly affects environmental performance, is further increasing. At the same time, if we can ensure a higher degree of design freedom, a comfortable interior, and eliminate noise, we can make more competitive products. The Company is working to create smaller, lighter, and higher performance air-conditioning units (HVACs) that currently take up a considerable amount of space in vehicles' instrument panels, and curtail costs through standardization with the idea that they could be installed in even more vehicles. In other words, one HVAC unit would be compatible with a wide range of vehicles including compact cars, SUVs, luxury cars, hybrid cars, and idling-stop vehicles across automakers, car models, and powertrains. In past HVAC development, an enormous variety existed because they were specially designed for each car model. By overturning that major premise, however, we tackled the challenge of developing a general-purpose HVAC while meeting the needs of many customers.

R&D That Confronts the Impossible Commitment to World-Firsts

In order to make an HVAC that can be used in everything from compact cars to large vehicles, it must be based on a size that fits in a compact car. Therefore, we made changes in the installation space for HVACs of the last 10 years of major Japanese, U.S., and European manufacturers and clarified specifications for performance and function. From there we derived future trends and created an HVAC to cover them. A particularly important change was the reduction in the area visible from the side. We were able to achieve a 20% reduction in the side area by miniaturizing such new functional components as the blower fan and servomotor module and applying a sliding door system to the air mix section. Furthermore, we standardized the parts so that the HVAC unit could be installed in vehicles of various shapes and performance by replacing only some of the parts.

Side Area View: Size Comparison



Innovative *Monozukuri*:

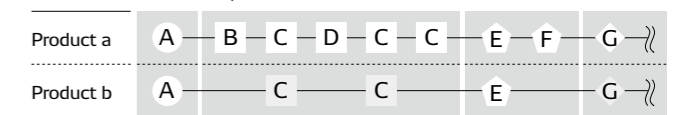
Production Technology That Gives Shape to World-First Ideas

In order to take advantage of HVAC features aimed at complete standardization, we sought to create a process concept that would become a highly efficient compact global standard. To achieve this, we adopted a Process Degree of Coincidence Index.* Because conventional HVACs are specially designed for each vehicle model, part types are vast and the production process is also fragmented. Therefore, even if the HVAC were produced with differing specifications, standardized parts would run in the same order, and as such, we devised a method to raise the process degree of coincidence. As a result, the process degree of coincidence was doubled and a significant production improvement was achieved.

* Process degree of coincidence =
Number of processes that coincide ÷ Maximum number of processes × 100

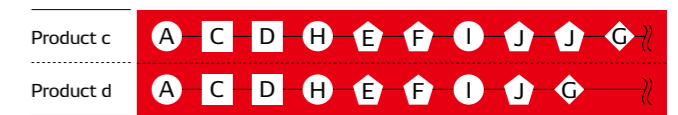
Image of Doubled Process Degree of Coincidence

Conventional HVAC line process formation



Product process was fragmented by product

New HVAC line process formation



Manufacturing process nearly coincides irrespective of product

Process degree of coincidence was doubled

DENSO's Strength

R&D

Partnerships that support advanced automaking

Monozukuri

Rigorous standardization

Concurrent Engineering

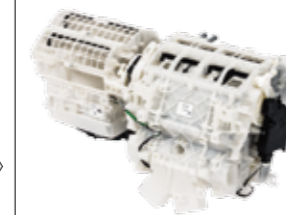
Collaboration system that transcends the boundaries of each division and Group company

DENSO Spirit

Foresight, Credibility and Collaboration

Input

COA HVAC



- Standardization, unit size reductions, reduced power consumption, and improved comfort
- Standardization of processes that promote high efficiency and automation

Outcome

Value to Society

Relationships of trust with customers

Achieve comfortable car interiors

Consideration of the environmental impact of fuel economy improvement

Globally fair and stable product supply

Energy efficiency through low cost and productivity improvement

Concurrent Engineering

Concurrent engineering, which transcends development and manufacturing departments, was essential to the creation of the COA HVAC. Up until completion, we ran into a number of challenges and obstacles and those that could not be resolved by the development department alone we repeatedly discussed, using things in the training camp and worksite outside the Company, and we solved them one by one with the cooperation of Group companies. In the production process as well, in the concurrent engineering activities, in order to make an easy-to-build product configuration significant changes were made to the *Monozukuri* system, such as approving the manufacturing department's request that it be involved from the design phase of each part.

Manifestation of the DENSO Spirit

Initially, everyone thought that this project would be "impossible," but the goals of making a world-first HVAC and transforming *Monozukuri* were shared beyond the development, manufacturing departments, and Group companies. The COA HVAC was completed by mobilizing the collective wisdom and strength of everyone involved.



Team involved in the development of HVAC

DENSO's History of Corporate Value Creation

DENSO has maintained the corporate mission of addressing shifts in societal needs while helping to solve social issues. Beginning with the manufacture of such electrical components as alternators and starters, the Company has continued to substantially expand the scope of business activities and accordingly achieved a dramatic increase in sales. In this manner, DENSO has successfully linked the creation of value for society with the creation of corporate value. Here, we provide details of the Company's growth trajectory that is grounded in efforts to consistently create both social and corporate value over the more than 60 years since DENSO's founding.

Value Provided to Society

Environment



Smaller inverters that utilize cooling on both sides



ISS (idle-stop system) tandem solenoid starter that can immediately start up even when engine speed decreases



Motor generators that utilize a unique winding configuration



i-ART injectors for optimal fuel injection



Radiator tank made from plant-derived resin



Smaller and lighter air-conditioning units that can be installed across manufacturers, car models, and powertrains



Heat-pump water heaters using natural refrigerant (CO₂)

Security & Safety



Millimeter-wave radar that lessens damage at time of collision

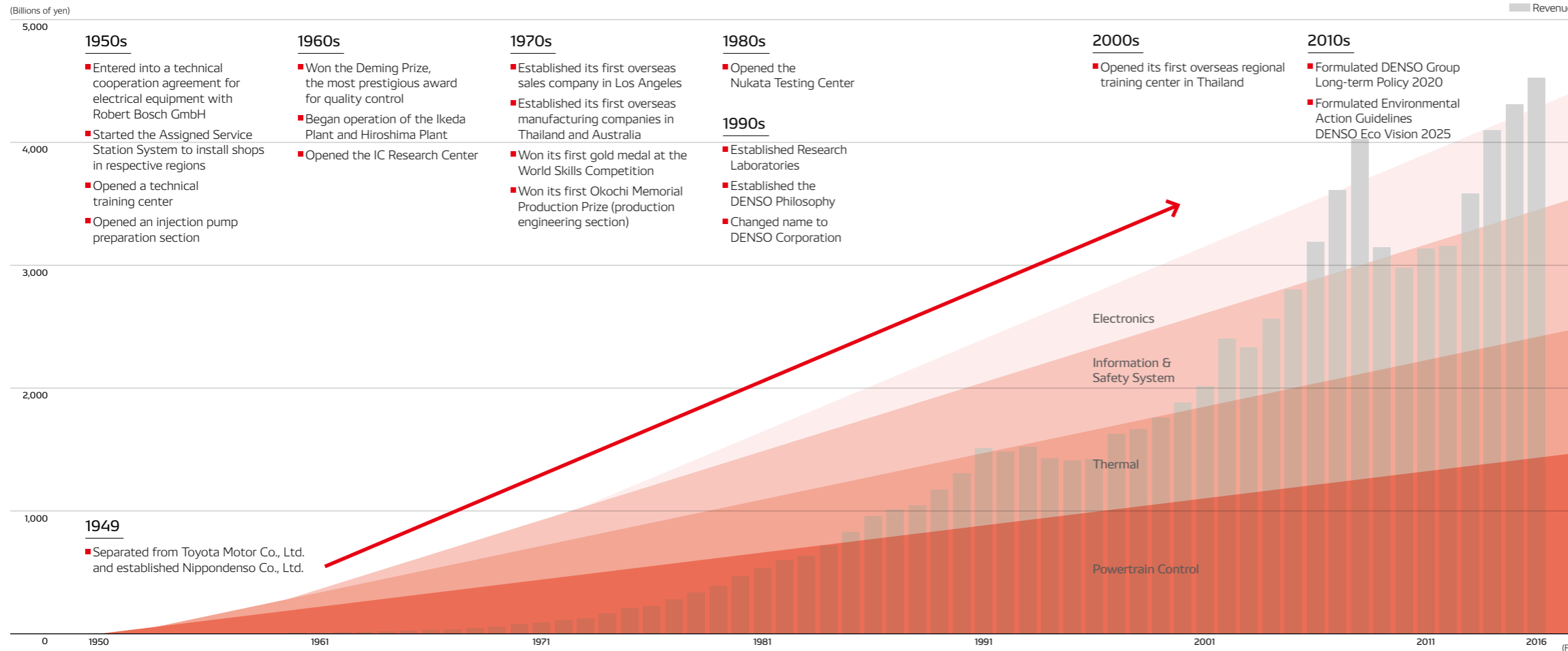


Pedestrian collision detection sensors that accurately detect along the entire bumper

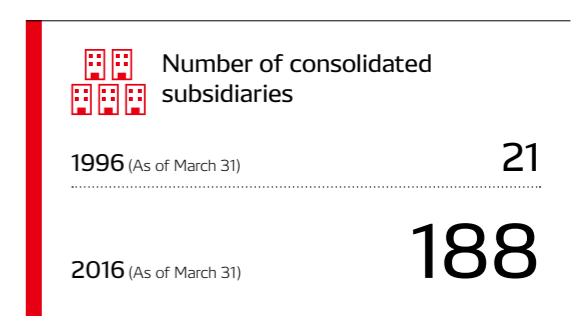
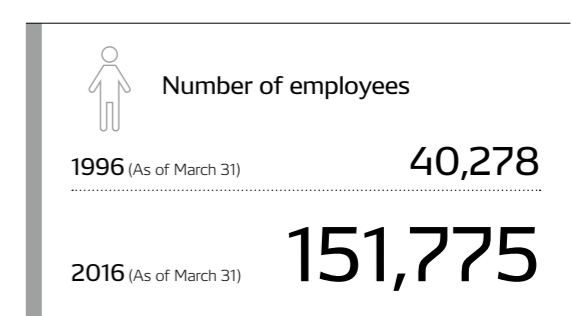
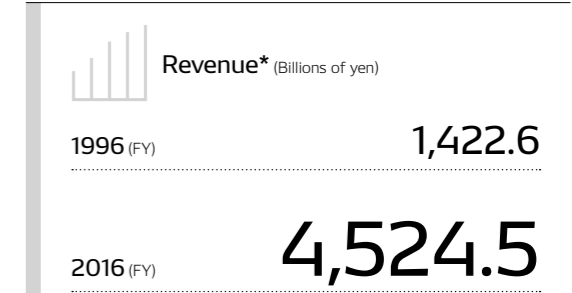


Driver status monitoring systems that detect driver abnormalities such as falling asleep at the wheel

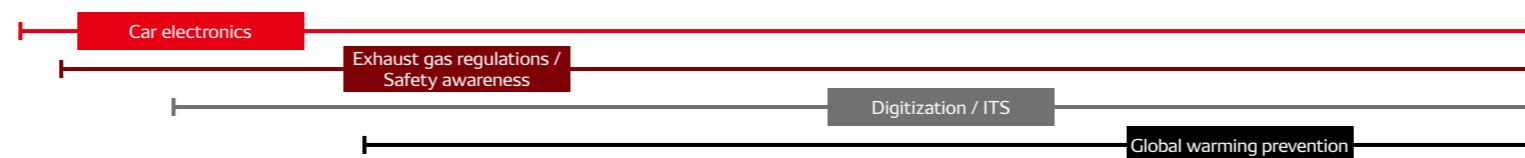
Corporate Value Creation



20 Years of Growth in Figures



Changing Societal Needs



* Fiscal years 1951 to 1978 show non-consolidated revenue, while fiscal years 1979 and after show consolidated revenue. In addition, from fiscal 2014, the financial statements have been prepared based on International Financial Reporting Standards (IFRS). (Japanese accounting standards were employed up to and including fiscal 2013.)