

POWERTRAIN SYSTEMS

Balancing the joy of life with vehicles with superior environmental performance—Providing solutions that help overcome this seemingly contradictory task

We will reduce the environmental burden of vehicles to the greatest extent possible and respond to the diversification of fuel and various environmental regulations, which are becoming stricter by the year. We will also work to supply high-quality systems and components. By doing so, we will strive to create and deliver new value in order to contribute to society as a whole.



Hisashi Iida
Head of Business Group

Business Strengths

R&D Capabilities That Have Led Development of World-First Products and Advanced Powertrains

DENSO has mass-produced a number of world-first products, such as common rail systems and a product that directly injects fuel in diesel internal combustion engines, while pursuing greater environmental performance in vehicles. Our core technologies and development capabilities also contribute to the expansion of options for carbon-neutral powertrains, such as hydrogen and biofuel engines.

Highly Reliable Manufacturing Technologies That Facilitate Safe Driving of Vehicles

To enable the high-performance driving of vehicles, DENSO has refined its highly reliable manufacturing technologies that are integrated from materials preparation to molding and sintering, as well as its technologies for high-speed assembly and highly complex and precise processing at the micron level. DENSO aims to sharpen its technological edge further by fusing together cutting-edge AI and digital technologies with robots and its accumulated skills and manufacturing knowledge.

Personnel, Masters of Powertrains, Form Organically Coordinating Organizational Capabilities

In order to create vehicles with automakers that can satisfy tough environmental regulations and withstand harsh operating environments, professionals with a wide range of core technologies and skill sets work together from a vehicle perspective, while deploying advanced organizational capabilities to leverage specializations in all areas, from systems to components.

Business Strategy for 2022

DENSO is streamlining businesses nearing their final stages in the internal combustion engine domain, and creating new energy businesses.

Growth Strategy	To realize a green society, DENSO is accelerating and strengthening activities (in carbon-neutral fuels, etc.) to commercialize businesses in the new energy domain. <ul style="list-style-type: none"> DENSO is increasing choices for carbon-neutral powertrains compatible with new energy sources (hydrogen, bio-fuels, synthetic fuels, etc.) in order to create carbon-neutral vehicles. DENSO contributes to the proliferation of carbon-neutral vehicles by coordinating with energy companies in the infrastructure and aftermarket service fields.
Strategy for Businesses Nearing Final Stages	Amid the global trend in electrification, progress on electrification differs in each region and country, in a reflection of the energy mix and how vehicles are used. To realize a sustainable mobility society and provide to customers safe and secure products for internal combustion engines, DENSO is envisioning scenarios and drawing up plans for businesses nearing their final stages in the internal combustion engine domain. <ul style="list-style-type: none"> With the aim of maintaining and improving the competitiveness of internal combustion engine products as an industry, DENSO is thinking beyond corporate boundaries and examining the transfer of businesses to ideal partners.* <small>* On January 17, 2022, DENSO signed an agreement to transfer its fuel pump module business to Aisan Industry Co., Ltd.</small> <ul style="list-style-type: none"> Amid significant changes in markets, DENSO is optimizing its production structure by realigning global production bases and creating flexible production lines able to manufacture multiple products depending on the volume of demand.
R&D	Despite uncertainties about how energy will be used in the future, in order to accelerate the commercialization of new energy businesses, DENSO has drawn up a medium- to long-term energy vision and top-level strategies to guide the optimal allocation of resources and to consolidate and integrate related organizations. The Company is focusing on the development of products that solve issues related to new energy, such as using hydrogen resources.
Monozukuri	DENSO is combining its accumulated on-site knowledge and the latest digital technologies to outline concepts for production lines able to stay competitive in a bid to realize production lines that are able to flexibly manufacture multiple products in accordance with changes in demand.
Hitozukuri	In order to smoothly match human resources to growth domains and shift power, we are visualizing specializations in a diverse range of core technologies and skill sets, while pivoting from product-based to skills-based career formation. Moreover, we are defining the areas where our refined skills can be leveraged inside and outside the Powertrain Systems Group. We aim to create organizations that are full of optimism and excitement for the future.

Outcome of Green and Peace of Mind Strategy

Objectives	Results
Set policy for streamlining businesses nearing their final stages in the internal combustion engine domain, and begin coordinating with industry players and stakeholders	DENSO is working with its customers to transition away from older products with high environmental impact and adopt higher-grade models. We have started to realign and consolidate global operations in the internal combustion engine domain with the aim of building an efficient production structure while eyeing the maturing business domain for internal combustion engines and its eventual contraction.
Create business concepts in new energy domains	DENSO has created concepts for businesses and products for new energy sources (hydrogen, biofuels, synthetic fuels, etc.), and it has launched projects to develop and commercialize new businesses in each domain through internal and external collaboration.

Efforts toward Quality

We have positioned the restoration of our quality as our top priority issue and are working to build a corporate structure that prevents quality-related issues in the market. To that end, in specialized divisions, we have gathered together human resources who can handle quality in a comprehensive manner, covering everything from systems to components. These divisions engage in efforts that span from investigating the true causes of quality-related issues to reproducing problems to determine a resolution. To respond to tightening regulations on fuel performance and exhaust gas as well as the increasing complexity of environmental stress, these divisions will accelerate and improve the accuracy of quality verification measures through digital engineering and model-based development and virtual vehicle evaluations.

Specific Initiatives to Achieve Strategic Aims

Aiming to Solve Environmental and Social Issues by Advancing Technologies and Skills Inherited from Our Predecessors

The replacement of internal combustion engine vehicles with BEVs will accelerate in the movement toward a carbon-neutral environment and society. Even in 2040, however, worldwide demand for internal combustion engine vehicles will probably be at the same level as in 2000. We have a responsibility to continue delivering to our customers high-quality products for internal combustion engines in an affordable and reliable manner. The type of energy used differs by region, depending on geopolitics and energy security, so it is necessary to increase choices for mobility solutions.

With this in mind, DENSO is engaging in the three following activities.

- As part of a scenario for businesses nearing their final stages, DENSO has started to create plans for fulfilling its responsibility to supply products for internal combustion engines along with the rest of the industry, while maintaining a business foundation and putting into place a system for ensuring safe quality products through "Reborn21." We will continue to shift toward growth domains with the resources (personnel and cash) freed up from businesses nearing their final stages while reforming work processes under the banner of "green" and "peace of mind."
- While collaborating and coordinating with partners in co-creation, DENSO is rapidly internalizing the core technologies needed to solve issues concerning the environment and greater society, and is breathing life into new businesses that will increase choices for becoming carbon neutral.
- DENSO is redefining the skills of human resources and the nature of work in the future, and is training professionals to fulfill its principles. We conduct a thorough vetting process and carefully interview each and every person before sending them off to work. We strive to create bright work environments where everyone is passionate about their work, and both young and veteran employees can refine their technologies and skills in businesses nearing their final stages, while everyone works together to make dreams a reality.

Resolving Social Issues through Our Businesses

Relevant SDGs



Promoting Eco Factory Activities on a Path to Carbon Neutrality

To realize carbon-neutral manufacturing, DENSO has updated its injector plant within the Zenmyo Plant. This update has created a plant able to more efficiently manufacture products in a pleasant atmosphere, while cutting energy consumption by 50%.

- A Just-in-Time (JIT) system that thoroughly conserves energy
 Instead of the previous air-conditioning system for entire buildings, the Company has created a system that air-conditions the necessary areas at the necessary times in the necessary amounts. Natural skylights and solar panels on the roof of the plant have cut energy usage for manufacturing in half.

- Improvement in productivity (+20%) by consolidating production lines and doing away with partitions within the plant
 By switching to optimized area-based air-conditioning and controlling the airflow throughout the plant, the Company was able to get rid of traditional clean rooms. Productivity was greatly improved as a result of consolidating production lines and work.



Zenmyo Plant