DENSO's Value Creation Story

DENSO Integrated Report 2024 DENSO's Value Creation Story

Past, Present, and Future

DENSO's innovations start from a focus on the future and what makes people happy. Our mission is to resolve social issues from the perspective of sustainability. Based on this mission, we have continued to realize growth while leading changes in the mobility domain to increase our areas of contribution and repeatedly pursuing innovations and new creations. During this 75-year journey, we have cultivated strengths and capital that will continue to be the source of our value creation well into the future by boldly transforming our business portfolio. To ensure that we can leverage these strengths and be an essential company a century from now, we will increase our areas of contribution further still.

Revenue

Fiscal 1951 to fiscal 1978 show non-consolidated revenue, while fiscal 1979 and thereafter 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.)

Market capitalization*

* Before adjustment for treasury stock

1050

History of Creating Value to Address Social Issues and Ambitious Initiatives for the Coming Era

1950s Postwar Reconstruction and Motorization

Taking on the challenge of resolving social ssues using cutting-edge technologies from the time of our founding

 Developed the DENSO-GO electric vehicle Developed Japan's first car and bus air-conditioning systems

1960s and 1970s Popularization of Private Cars and Emergence of Social Issues

Taking measures ahead of exhaust gas gulations and laying foundations for eace of mind" products

Developed exhaust gas-controlling products compliant with the world's strictest regulations Began development of semiconductors in anticipa tion of the coming era

1980s Increasingly Severe Environmental and Safety Issues

Accelerating the commercialization of safety systems for preventing traffic accidents causing fatalities

 Gradually realized the practical application of safety systems, including airbag sensing systems Commenced the mass production of vacuum sen sors, which represented the world's first in-vehicle emiconductor sensor

1991	2001	

1990s and 2000s Global Warming and Spread of Digital and Information Technologies

Contributing to eco-friendly lifestyles with

core technologies

- Developed the QR Code[®], which increases efficiency
- at manufacturing sites · Developed the world's first electronic control-type common rail system

 Developed the world's first inverter with dual-side coolina

2010s ICT Advancement and SDG Adoption

Entering into a once-in-a-century paradiom shift

Developed Global Safety Package, the first generation of our advanced safety system Began providing services in the agriculture and factory automation fields, moving beyond the framework of mobility

Four Ideals of the DENSO Creed

Established at the time of the Company's founding, the DENSO Creed sets forth a clear commitment to pursuing innovation in anticipation of changing times and to addressing social issues through quality products and services. This commitment is also the starting point of our sustainability management, which we are currently implementing.

Be trustworthy and responsible.

The trust that our predecessors worked earnestly to build over the years underpins the DENSO of today. We will therefore maintain this trust and seek to build it up further so that we can pass it on to the next generation. By doing so, we will meet the expectations of society and fulfill our responsibility to ensure DENSO's future.

Cherish modesty, sincerity, and cooperation.

We work to refine not our appearance or job title but the essence of who we are as a part of DENSO, and we work in collaboration to perform our duties with sincerity. The sincere and cooperative relationships we have with each other as employees will bring forth inspiration and help us build long-lasting relationships with our customers and business partners.

Be pioneering, innovative, and creative.

By consistently leading the times with our research and creativity and continuing to refine our technologies and know-how, we will swiftly create new value that truly benefits society, thereby paving a new way forward.

Provide quality products and services.

We will earnestly approach each issue facing this ever-changing society and continue to bring hope and happiness to all people while aiming to provide our customers and society with products and services of the very best quality.

Tradition of Sustainability Management

The DENSO Creed calls on us to "provide quality products and services," expressing the essence of our approach to sustainability management, which focuses on benefiting society by utilizing businesses to pursue ambitious initiatives that address social issues. Today, our mission is to continue our legacy by putting into practice the commitment that our predecessors established when drafting the creed and by passing on this commitment to the next generation.

In advancing sustainability management, DENSO has incorporated future social issues into its Long-term Policy for 2030 and as an integral part of its material issues (Materiality), and the Company is addressing these social issues through business activities. Centered on our management philosophy of green and peace of mind, we are taking on the challenge of resolving complex social issues. By doing so, we will provide society with new value that inspires diverse stakeholders.



Establishment of the DENSO Heritage Center

the DENSO Heritage Center, we have established permanent exhibits that introduce the Company's history since its founding and showcase events that have occurred pertaining to quality and safety. We also feature various special exhibits. In the two years since the Heritage Center's establishment, more than 7.500 DENSO employees from Japan and overseas have visited the location, using it as a foundation to implement sustainability management on an individual basis.



Escalation of Social Issues

iming to provide new value in the domains f green and peace of mind

- Developed Global Safety Package 3, the third generation of our advanced safety syster Developed our first inverter to use SiC power
- semiconductors
- Commenced verification test for the widespread utilization of hydrogen



In December 2021, we established the "Heritage Center" with the aim of enabling all employees to return to DENSO's origins, which are represented by the DENSO Creed and the principles of quality and safety, and to provide them with an opportunity to consider what unique aspect of DENSO that they themselves want to pass on to the next generation. At

History of Innovation and Creation

Just as it did when DENSO was founded, the commitment set out in the DENSO Creed is our starting point to this day. Amid a rapidly changing external operating environment, we must boldly take on unprecedented challenges, such as promoting initiatives toward CASE* and realizing carbon neutrality. Taking the baton that was passed to us by our predecessors, who consistently took on the challenge of resolving the social issues of the times, we will steadily move forward toward our aim of bringing happiness to people and society as a whole.

* CASE: Connected, autonomous, shared & service, and electric

1930s to 1950s: Taking on the challenge of resolving social issues using cutting-edge technologies from the time of our founding

External Environment	Postwar Reconstruction and Motorization
Social Needs	International Standards of Technology and Quality

1935: Taking on the Challenge of Producing **Electrical Equipment In-House**

An automobile department was established within Toyoda Automatic Loom Works, Ltd. (currently Toyota Industries Corporation). In 1935, the executive director of Toyoda Automatic Loom Works, Kiichiro Tovoda, instructed Ryuichi Suzuki (who would later become a member of the Board at DENSO) to take on the challenge of producing electrical equipment in-house. However, developing such equipment proved

Team in Charge of Electrical

Equipment Development At the time, a team of approximately 30 engineers and technicians devoted them Ives to the in-house development of electrical equipment, often going without sleeping and eating.

challenging due to the unreliable quality of electrical equipment at the time. In fact, Mr. Toyoda stated to Mr. Suzuki that this task seemed to be far harder than he had imagined, and he asked Mr. Suzuki whether they should quit at that juncture. Mr. Suzuki pleaded to Mr. Toyoda to allow him to continue his efforts for one more month in order to realize in-house production. Sometime after doing so, the enthusiasm and persistence of Mr. Suzuki and the young engineers on his team led to the official adoption of electrical equipment in Toyoda vehicles.

1949: Birth of NIPPONDENSO

With the Japanese economy in an extremely difficult state due to the promotion of the Dodge Line by the General Headquarters of the Supreme Commander for the Allied Powers, the electrical equipment department split off from Toyota



Motor Co., Ltd., and was established as NIPPONDENSO CO., LTD. The company's first president, Torao Hayashi, aimed to rapidly expand the company not just in Japan but also overseas. For that reason, he expressed the company's determination to become independent by choosing the name NIPPONDENSO ("Nippon" meaning Japan), rather than KARIYADENSO, AICHIDENSO, or TOKAIDENSO, which are names of the local area where the company was founded.

1953: Start of Technical Cooperation with Robert Bosch GmbH

In the early 1950s, a technological gap clearly existed between NIPPONDENSO and Western companies. Consequently, we urgently needed to achieve world-class technologies and quality. At this juncture, we encountered



German-based company Robert Bosch GmbH, which was an order of magnitude larger than us. Thanks to the mediation of Dr. Tokushichi Mishima, who was the inventor of MKM steel, and the determination of our management, we concluded a technical alliance with Robert Bosch. By learning from our new partner, we established the foundations of internationally competitive technologies and quality



Specific Initiatives

• Beginning in the 1950s, we catered to the needs of customers, especially Toyota Motor Corporation. At the same time, we established and grew a business field centered on mechanical parts and realized the provision of products supported by internationally competitive technologies and quality

Green Value and Peace of Mind Value Provided

Developed and mass-produced the DENSO-GO electric vehicle in 1950, when it was difficult to obtain gasoline. Many of DENSO-GO's electronic components were designed and manufactured in-house, and approximately 50 of these vehicles were sold.

Developed Japan's first car and bus air-conditioning systems. Although there was a concern that such systems would impede driving performance, these systems were able to overcome that notion and quickly grew in popularity due to their high level of convenience and comfort.



DENSO-GO

1960s and 1970s





• Received the Deming Prize, the most prestigious award for quality control

• Established the IC Research Center in 1968 in anticipation of a shift to the electronic control of automotive components; began developing semiconductors; and manufactured the automotive industry's first semiconductors. Accumulated a large amount of knowledge on semiconductor and IC specifications by conducting thorough analysis





Electronic fuel injection system

Received the Deming Prize

Green Value and Peace of Mind Value Provided

 Achieved the practical application of electronic fuel injection systems ahead of regulations on exhaust gas. After doing so, we continued to develop products that respond to environmental regulations, one after the other.

Participated in the Comprehensive Automobile Traffic Control System (CACS) project initiated by the Ministry of International Trade and Industry (currently the Ministry of Economy, Trade and Industry). This project would later help us develop car navigation systems and connected driving products.

In 1969, an explosion accident occurred at the die-casting factory of the Anjo Plant in which six employees lost their lives, making it the biggest disaster at DENSO since its founding. In October of the same year in the wake of the incident, we created the new "Safe DENSO" slogan to redouble our resolve to ensure that another such accident would never happen again. Additionally, to ensure that we would never forget this accident and always remain aware of safety, we established September 8, the date the disaster occurred, as "Safety Day." We are also currently rolling out special safety training activities on a global basis.

1980s



Specific Initiatives

- Established manufacturing companies and technical centers overseas to realize regionally optimized product development, manufacture, and supply capabilities
- Helped address pollution, global warming, and other environmental issues by acting as a trailblazer in the creation of eco-friendly products
- Launched a project for the practical application of robots. Furthermore. the development of such technologies as barcode readers and RFID.* which we pursued in a similar manner as we did with robots, helped establish the foundation of our current factory automation (FA) business
- * RFID (radio frequency identification): A non-contact system that reads data from RF tags using electromagnetic waves



DENSO (MALAYSIA) SDN. BHD. at the In-vehicle test in Europe time of its establishment in 1980



Green Value and Peace of Mind Value Provided

- Developed the world's first electronic control-type diesel pumps, which impressed the world with their ability to control exhaust gas, reduce fuel consumption, and realize high output
- Commenced the mass production of vacuum sensors, which represented the world's first in-vehicle semiconductor sensor. With this technology, we led the way ahead of other companies by equipping semiconductors with sensors and thereby adding value.
- Gradually realized the practical application of safety systems, including antilock brake systems, airbag sensing systems, and forward collision warning systems, leveraging the research that we had been conducting since the 1960s
- Opened the Nukata Testing Center, a one million square meter test course comparable in scale to those of auto manufacturers. Through this center. we continued to advance our testing facilities on a daily basis to ensure product performance and quality that exceed customer expectations



A natural environment test course that can replicate driving conditions at night or in the rain

1990s



External	Collapse of the Bubble Economy and Acceleration of
Environment	International Debate on Global Warming

Compact Euel-Efficient Vehicles and Social Environmentally Friendly Lifestyles Needs





Spread of Digital and Information Technologies and External Creation of International Frameworks and Regulations for Environment Global Warming Prevention Diversification of Powertrain Technologies and

Social Introduction of Products for Hybrid Electric Vehicles (HEVs) Needs and Other Electric Vehicles

Specific Initiatives

• Established the Fundamental Research Center (currently the Advanced

Research and Innovation Center), which has created a large number of

innovative technologies that have led to the development of world-first

· Commenced Excellent Factory (EF) activities. We began to expand activ-

ities on a global basis to improve our factories, led by personnel on the front lines of production. These EF activities represent the origins of

• Utilized core technologies to develop products that contributed to eco-

DENSO's activities focused on quality improvements.

Specific Initiatives

- Established DENSO Training Academy Thailand, our first overseas regional training center. This center helped us build a structure for educating engineers and technicians on a global basis.
- Formulated Eco Vision 2005 environmental management policy. Leveraged outstanding environmental technologies to accelerate the reduction of CO₂ emissions from business activities
- Marketed products for CASE vehicles to promote the introduction of electric vehicles and the popularization of safety products

Green Value and Peace of Mind Value Provided

Focused on the development of car air-conditioning systems that use natural refrigerant to curb the destruction of the ozone layer caused by conventional refrigerant

Developed the world's first electronic control-type common rail system. Pioneered the way with common rail systems that would later dominate the market

and world-best products

friendly lifestyles

energy savings

Developed the world's first iridium spark plug using an iridium alloy center electrode, making for an ultra-fine electrode that also extends product lifespan Commercialized household heat pump water supply systems that contribute to



lridium spark plug

• Developed the QR Code® with large capacity and high-speed readability that is compatible with high-mix, low-volume production at plants



OR Code®



Developed the world's first inverter with dual-side cooling, DENSO's technological capabilities, which help meet the needs for high output and compact sizes, were acknowledged through the development of these inverters, leading to a rapid increase in their production volume.



Structure for cooling both sides of the inverter

Developed the world's first plant-derived resin (castor oil tree) radiator tank, serving as an eco-friendly product that helps reduce CO₂ emissions throughout the product life cycle

- Developed "Night View," the world's first nighttime driving support system with a pedestrian detection function that uses near infrared rays
- Developed the world's first forward-looking radar sensor using millimeter waves. Able to operate even in rainy and foggy environments, these sensors helped enhance the safety of automobiles.



2010s to 2020s

Conversion to CASE Vehicles / Contribution to the Resolution Social of Social Issues through Our Business Needs

Specific Initiatives

• Established technical centers in seven regions across the globe. Through these centers, we have set up a structure to create competitive products that can promptly meet diversifying local needs.

- Established the Electrification Innovation Center (EIC), which promotes efforts to strengthen the development and production of products powered by electricity, and Global R&D Tokyo–Haneda, which conducts the development of automated driving and other technologies. By doing so, we have accelerated our R&D activities in the domains of green and peace of mind.
- Developed high-performance advanced safety systems and improved the safety performance of existing vehicles through the provision of retrofitted products

Green Value and Peace of Mind Value Provided

 Developed motor generators adopting a proprietary winding structure. These motor generators realize highly efficient, eco-friendly power generation and driving.

· Saw cumulative production of inverters, which are our mainstay product in the environment field, reach 20 million units worldwide in 2021 Developed our first inverter to use silicon carbide (SiC) semiconductors. These inverters help improve the energy efficiency and extend the driving distance of BEVs.



Inverter production site

 Developed Profarm T-cube, an environmental control device for agricultural greenhouses, with the aim of supporting agriculture in Japan and avoiding future food crises

- Developed Global Safety Package, an advanced safety system using a monocular camera and millimeter-wave radar sensor
- Developed Global Safety Package 3, which helps improve safety performance by recognizing the environment surrounding the vehicle

2030s and Beyond



Specific Initiatives

- Declared intention to realize 100% carbon-neutral Monozukuri and eliminate traffic accident fatalities by fiscal 2036. Worked to expand businesses and resolve social issues in line with management philosophy of green and peace of mind
- Commenced verification tests for the use of hydrogen, a form of clean energy that does not burden the environment, thereby accelerating efforts to realize a hydrogen-based society



Our Vision for the Future: Long-term Policy for 2030

DENSO's Value Creation Process

Maximizing the Value of Green and Peace of Mind to Continue to Grow with Society

DENSO puts sustainability management into practice by taking the resolution of social issues as a starting point and then utilizing accumulated strengths and capital to implement business activities and advance value creation processes. By having each employee respect and faithfully practice our management philosophy, which serves as a mindset for resolving social issues and pursuing new developments, we aim to enhance our corporate value while contributing to a sustainable society.

Tradition of Sustainability Management P.26–27

Primary Value Provided and Indicators for Such Value

Principal social value we offer and related indicators

Green

Carbon-neutral Monozukuri

2025: Realize carbon-neutral plants

- through the utilization of carbon credits
- 2035: Realize carbon-neutral plants
- without the use of carbon credits

Peace of Mind

Contribution to the elimination of traffic accident fatalities Percentage of fatal accidents covered by DENSO safety products 2025: 56%; 2035: 100%



The DENSO Creed, which embodies the spirit of our founding; the DENSO Philosophy, which clarifies the spirit of the DENSO Creed in accordance with social changes; and the DENSO Spirit, which serves as an action guideline for values that we share on a global basis, form the foundation of our value creation.





that could negatively impact our value creation.

Efforts to Maximize the Value of "Green" (TCFD) P.70–73 Risk Management and Compliance P.110–113 Undertaking Initiatives toward Respecting Human Rights D.P.76

Our Cultivated Strengths

Over its 75-year history, DENSO has cultivated various unique strengths. Since the founding of the Company, these strengths have been augmented and passed down as the DENSO Spirit, which is encapsulated in the actions of all DENSO employees around the world. These strengths have resonated with all employees and driven DENSO's growth over the years. Amid the constantly changing business environment, DENSO will remain committed to refining these strengths as the unshakable driving force behind value creation that is uniquely DENSO.



Robust Business Foundations

DENSO's business activities are supported by robust foundations built over many years, giving the Company an advantage that cannot be easily replicated. The driving force behind all our business activities is the expertise of our approximately 160,000 employees across the globe as well as our relationships with diverse stakeholders, including customers, suppliers, and business partners. By evolving and increasing such relationships and expertise, we will realize further growth.

Roots of Our Strengths

- 1949 Split from Toyota Motor Co., Ltd. and established NIPPONDENSO CO., LTD. as an independent company, with the aim of becoming a company active on a global scale, amid worsening economic conditions
- Established the Technical Training Center. This center fostered the principles of "Monozukuri is Hitozukuri (Our performance relies on 1954 our people)" and "Engineering and technique go hand in hand." These principles continue to be passed down within the Company. Deepened cooperation with suppliers by establishing the DENSO Cooperative Association (currently DENSO HISHOKAI), which 1959
- currently accounts for annual procurement of ¥4.0 trillion from approximately 7,540 suppliers
- Opened a Chicago sales office and a Los Angeles branch office. Anticipated trade liberalization and other global trends through the 1966 establishment of this first overseas sales office
- 2020 Opened the Hirose Plant, which together with the Electrification Innovation Center, housed within the plant, established outstanding development and production capabilities and became the core of our electrification domain

The Key to Our Strengths

nan Capital Human resources that support value creation

> Number of employees worldwide: Approximately 160.000 (35 countries and regions)



cial Capita

(fiscal 2024 year-end): 60.9%

Suppliers (fiscal 2024): Approx. 7,540 across the globe

Social and Relationship Capital

Robust supply structure

DENSO split from Toyota Motor Co., Ltd., and was established as an independent company amid worsening economic conditions. Since that time, our employees have been making achievements under challenging operating environments, passing on an unbreakable spirit for developing technologies and promoting Monozukuri activities that offer social value from one generation to the next. Throughout our history, we have continued to develop talent that will lead the future of DENSO. At the moment, our roughly 160,000 employees around the world are making tireless efforts to ascertain the needs and trends in each region in a timely and accurate manner and apply that knowledge to our R&D and Monozukuri activities. Over the course of 75 years engaging in our business activities, we have built strong trust-based relationships with a broad range of customers,

pursued technologies that cater to customer needs, and deepened our insight together with our customers. We have also established a stable supply structure as a direct response to customer needs. Underpinned by a robust financial foundation enabling us to tackle new pursuits, we are realizing unprecedented new value by combining the knowledge we have refined across the globe with the strengths of our diverse business partners.

Further Enhancing Growing with Our Suppliers, Earning the Trust of Society, and Following the Path Our Strengths to the Stable Procurement of Semiconductors

At the start of the 2020s, people's consumption behavior began to change, triggered by the global spread of COVID-19. Demand for semiconductors also surged, resulting in a severe semiconductor shortage in the automotive industry. Amid these challenges, we began to see the stark contrast between the unique business practices of the automotive industry and those of other industries, including practices such as small-quantity, high-mix orders for products with long life cycles and short lead times with unpredictable order quantities.

To address this contrast, DENSO is working to transform its procurement structure into one that truly appeals to suppliers. While closely sharing information with our customers, we will actively select and adopt recommended components based on the perspective of QCD.* By doing so, we aim to reduce the risk of discontinued production (end-of-life products) while also enhancing the ability of our suppliers to offer a sustainable supply. Also, while actively communicating long-term trends and sharing information with suppliers and customers, we will promote examinations for transitioning production in response to requests for the discontinuation of production by suppliers, as soon as there is any indication of such requests. In this way, we will help establish a sound business environment together with our suppliers. By working with our suppliers to build a supply structure that earns the trust of society, we will ensure a stable supply and bolster our competitiveness.

* QCD: Quality, Cost, and Delivery. QCD is an indicator used to evaluate production management in the manufacturing industry.



Advanced R&D

DENSO has contributed to the development of the mobility society by creating an array of competitive products that accurately cater to social needs. Amid diversifying values and increasingly complex social issues, we aim to extend the scope of our contribution with mobility as our starting point. To this end, we have defined priority fields in accordance with our green and peace of mind principles. Moreover, we are planning technologies and strengthening R&D capabilities with an eye on the future. We will continue creating new value through internal and external collaborative initiatives that transcend organizational boundaries and include global research institutions and universities.

Roots of Our Strengths

- production base with the aim of becoming a comprehensive manufacturer of automotive parts that can keep pace with global companies
- 1985 Established Nippondenso America, Inc., with which we jointly created our first overseas technical center. Through this center, we built an optimized structure for the development, production, and supply of local products.
- 1991 Established the Fundamental Research Center (currently the Advanced Research and Innovation Center), which conducts R&D on future technologies that cover a wide range of fields
- 2014 Completed the establishment of technical centers in seven regions across the globe. Through these centers, we have set up a structure to create competitive products that can promptly meet diversifying local needs.
- Established the Electrification Innovation Center (EIC), which strengthens our capabilities in the development and production of electric 2020 vehicle components. Accelerated R&D activities in the green and peace of mind domains
- Received IEEE Corporate Innovation Award in recognition of our development of the QR Code® and our contribution to its global 2022 popularization

structure

The Key to Our Strengths

ectual Capita changing times

Commitment to creation in anticipation of the

Number of world-first products: Over 180 Number of new patent registrations in the automotive industry (fiscal 2024): Japan, 3: United States, 9

Number of global R&D bases: 13 in seven regions around the world

We have established "contributing to a better world by creating value together with a vision for the future" as the DENSO Philosophy. By keenly ascertaining social changes, we have been engaging in product development with a commitment to world-firsts. We have created over 180 world-first products since our establishment, and to this day we remain committed to developing new technologies and products that address complex social issues.

In 1991, we established the Fundamental Research Center (currently the Advanced Research and Innovation Center), where we have pio-To further sharpen our competitive edge into the future, we invested ¥550.9 billion in R&D expenditure in fiscal 2024. By promoting better efficiency through a digital transformation, including the use of AI, we will continue to strengthen our R&D activities centered on the focus

neered advanced technologies in such fields as semiconductors, electronic materials, Al, and ergonomics that have helped us remain competitive today. In 2014, we completed the establishment of technical centers in seven regions across the globe, in addition to laboratories in Israel, Silicon Valley, and other epicenters of innovation. By doing so, we established a structure that enables us to promptly incorporate diversified regional needs into our development process to create and deliver competitive products to our customers. Through industry-governmentacademia partnerships and collaborations with business partners, we are creating innovative technologies that help resolve social issues. fields of green and peace of mind.

Further Enhancing Developing Quantum-Inspired Technology with World-Class Performance Our Strengths to Resolve Large-scale, Complex Social Issues

Quantum computers are garnering attention as a next-generation computing technology. However, more time is required for resolving issues related to the practical application of these computers on their own. For this reason, we have been focusing on harnessing the usefulness of guantum computers through a hybrid approach with conventional computers, and we are actively engaged in R&D activities to realize the practical application of their advanced technological capabilities. As part of these efforts, we developed DENSO Mk-D, a proprietary quantum-inspired technology created based on the frameworks of quantum technology. It was the development of DENSO Mk-D that first demonstrated globally that a realworld problem with as many as five million variables could be efficiently solved, surpassing the previously recognized one million-variable limits of quantum-inspired technology.

As such, there are high expectations that this technology can be applied to resolve social issues with substantial variables, such as optimizing logistics and easing traffic congestion. DENSO utilized the quantum-inspired technology DENSO Mk-D to optimize truck delivery schedules, using actual data from logistics centers for the basis of optimization calculations. The logistics process involves numerous constraints, such as the number of trucks used per day, delivery routes, driver rest times, loading times, and delivery time restrictions. At a speed of more than 500 times faster than conventional technologies, DENSO Mk-D calculated that the delivery schedule could be reduced from the usual 77 trucks per day to 58 trucks. This represents approximately a 25% reduction in the number of trucks. Looking ahead, we will continue to advance our R&D activities with a focus on applying our technologies to not only logistics but also a wide range of social issues that cannot be resolved via conventional mathematical optimization technologies.

1953 Commenced a technical cooperation agreement with Robert Bosch GmbH. Under this agreement, we established a technological and



Fiscal 2024 R&D expenditure: ¥550.9 billion



Three-pronged Solutions for Systems

DENSO has always optimized its business portfolio ahead of the times to provide society with valuable products and services that meet customer needs. For example, we expanded from our founding business in the mechanical parts field to foray into the electronics and software fields. While expanding, we enhanced our capabilities in each field and, as a result, we are now able to go beyond the manufacture of stand-alone components to offer optimal whole-system solutions that combine mechanical parts, electronics, and software. These system solution capabilities provide us with a competitive edge unique to a comprehensive manufacturer such as DENSO, as they could not be acquired easily by a company working solely in one specific business domain.

Roots of Our Strengths

- 1968 Created the IC Research Center to establish a structure for the production of semiconductors completely in-house in anticipation of the shift to the electronic control of automotive parts in the future
- Became the first in the world to mass-produce an electronic fuel injection system (common rail system), a precursor to current system 1995 solutions, which are aligned with overall vehicle specifications as a matter of course
- 2007 Mass-produced an inverter with dual-side cooling. Combined our proprietary technologies from the mechanical parts, electronics, and software fields to develop a differentiated system, which was highly acclaimed by the market

2008 Launched the DENSO Project Companywide initiative. Adapted to stricter environmental regulations by enhancing the ability to provide optimal vehicle solutions that straddle technology fields

Began recurrent education program for software engineers. Met the growing need for software development and supported employees 2021 in transfer to growth fields

The Key to Our Strengths





Number of alliances: Stakes in more than 90 companies (total since 2010)



Comprehensive components manufacturer: Seven core businesses

In addition to the mechanical parts field, in which we have been engaged since our earliest days, we have been involved in the electronics and software fields for more than half a century. DENSO has contributed to the development of mobility by combining its technologies in the fields of mechanical parts, electronics, and software to create next-generation inverters and advanced safety systems. Combining our expertise in each business domain, we are able to gain a timely and accurate understanding of the needs and future outlook of our customers as well as end-users. This in turn allows us to engage in planning and offer proposals from the early stage of vehicle development. In certain cases, we collaborate directly with customers to create vehicles together.

Our professional personnel in the fields of mechanics, electronics, and software work to gain expertise on advanced technologies around the world through partnerships that transcend organizational boundaries to include research institutions and universities and incorporate such expertise into our products. Our personnel also rigorously conduct product evaluation and testing under actual vehicle use conditions, considering factors such as temperature and how the vehicle is used. We handle a wide range of components and have a deep understanding of the requirements needed for vehicle development. For this reason, we are able to develop technologies and products that, when installed in vehicles, truly meet the needs of users—a strength that other companies active in only one domain cannot offer.

We will draw on this one-of-a-kind competitive edge as a means to realize genuine added value for mobility in an era where the role and importance of software in vehicles is increasing. By doing so, we will achieve further differentiation from other companies.



Further Enhancing Our Strengths Accelerating R&D for In-Vehicle Applications of High-Performance Digital Semiconductors, Together with Business Partners

Approximately 1,000 semiconductors are used per vehicle. Among these are high-performance digital semiconductors (SoCs: System on a Chip), which are required for autonomous driving technology. These semiconductors require advanced technologies in order to achieve their advanced processing capabilities

In December 2023, DENSO CORPORATION and MIRISE Technologies Corporation, a Group company that conducts R&D on in-vehicle semiconductors, established Advanced SoC Research for Automotive (ASRA), together with auto manufacturers and semiconductor-related companies. Through ASRA, we are promoting R&D on automotive SoCs that make use of technology enabling different types of semiconductors, known as chiplets, to be combined freely in a similar manner as LEGO® blocks. With this effort, we aim to achieve the practical application of such advanced technology while also pursuing the high level of safety and reliability needed for automobiles. By promoting industry-government-academia collaboration both inside and outside Japan and accumulating technological capabilities and experience in the automotive, electronic components, and semiconductor fields, together with business partners, we will further enhance our competitiveness as a world-leading R&D organization.



Highly Efficient, High-Quality Monozukuri

Since its inception, DENSO has consistently emphasized the creation and utilization of in-house technologies. We design and manufacture equipment, production lines, materials, and processing methods. This emphasis on in-house Monozukuri (manufacturing) has enabled us to provide society with products that give concrete form to the leading-edge technologies conceived by our R&D team. Having our own production technologies has also allowed us to develop high-speed, efficient production lines and compact facilities as well as streamline distribution and inspection. By digitalizing know-how and utilizing it as explicit knowledge, we are adding even more competitiveness and value to our products.

Roots of Our Strengths

- 1961 Received the Deming Prize, the most prestigious award for quality control. Winning this prize laid the foundations for the "Quality First" approach and corporate culture that we still adopt to this day.
- 1972 Established our first overseas production company. Since then, we have accelerated the establishment of additional overseas production companies and conducted production activities that meet the needs of each region.
- 1979 Received the Okochi Memorial Production Prize. This prize was received in recognition of our highly accurate, high-guality Monozukuri that was realized through our comprehensive in-house manufacturing of production lines and equipment.
- 1984 Launched a project for the practical application of robots. Furthermore, the development of such technologies as barcode readers and RFID,*1 which we pursued in a similar manner as robots, helped establish the foundation of our current factory automation (FA) business. Commenced Excellent Factory (EF) activities. Through plant improvement led by frontline production personnel, globally developed a 1997
- kaizen (improvement) culture, which is the source of our ambitious improvement activities
- 2019 Began operating Factory-IoT (F-IoT), which networks plants worldwide to enable the accumulation, analysis, and utilization of various data. Took advantage of digital technologies to accelerate long-standing improvement activities
- *1 RFID (radio frequency identification): A non-contact system that reads data from RF tags using electromagnetic waves

The Key to Our Strengths

Manufacturing Capital Industry-leading Monozukuri foundation



Number of plants with F-IoT: Approx. 130 Amount of capital expenditures (fiscal 2024): ¥394.6 billion

Ratio of renewable energy use globally (fiscal 2024): 36.8% Energy conservation grand prize award: Received for 14 consecutive years

DENSO boasts micro-processing accurate to 1/1000mm and assembly lines that increase both production efficiency and quality. Our research on leading-edge production, elemental, processing, and measurement technologies as well as our development of production lines and systems that incorporate these technologies underpin products with world-leading performance and quality. Furthermore, we have connected our roughly 130 plants across the globe to a network allowing us to analyze a broad range of data obtained from personnel and equipment on the production front lines. In this way, we have greatly enhanced our competitiveness. By promptly detecting and addressing signs of equipment malfunctions, establishing the know-how of our talented personnel at each individual production site as explicit knowledge for global use, and bolstering productivity through data-driven energy conservation activities, we are working to further enhance our Monozukuri foundation. With the aim of achieving carbon-neutral Monozukuri by 2035, we are leading the industry with efforts to reduce environmental burden not just within the Group but across the entire supply chain.

Our cutting-edge Monozukuri activities are underpinned by our advanced Monozukuri personnel. The DENSO Industrial School, a technical training school created based on the concept of "Monozukuri is Hitozukuri (Our performance relies on our people)" and dedicated to strengthen both our technologies and capabilities, celebrated its 70th anniversary in 2024. Throughout its history, the school has fostered students with exceptional skills that are globally recognized, including students that have won gold medals at the WorldSkills Competition.

Further Enhancing Supporting a Circular Economy in the Automotive Industry and Taking on the Challenge Our Strengths of Expanding Recycled Material Use across the Industry

To realize a sustainable society, it is necessary to transition to a circular economy across various industries. In the automotive industry, promoting the expanded use of recycled materials has become a pressing issue. However, with the current method for processing end-of-life vehicles, which involves first crushing them and then sorting and extracting recyclable materials, it is difficult to obtain recycled materials with a high level of purity. Moreover, there has not been sufficient collaboration between companies that manufacture automobiles through processed resources and companies that collect, resell, and reprocess end-of-life vehicles, and this has kept the average rate of closed-loop recycling*2 in the automotive industry relatively low. This also has contributed to the lack of progress with efforts to utilize recycled materials as materials for automotive components. To remedy this situation, DENSO sought out partners across various industries, including dismantling service providers for end-of-life vehicles, material manufacturers, automotive components manufacturers, and universities and research institutions, and jointly commenced a technological verification test in March 2024 for an automated precision dismantling process, a groundbreaking method that enables extraction of highly pure recycled materials from end-of-life vehicles. This verification test has been chosen as an industry-government-academia collaborative project that aims to expand the use of recycled materials in automobiles, and is supported by Japan's Ministry of the Environment. Through the verification test,

we will take a new step forward in realizing a circular economy in the automotive industry. *2 Closed-loop recycling: A recycling process in which materials from a used product are used to create the same kind of product

Initiatives to achieve carbon-neutral



iman Canital Advanced Monozukuri personnel

Cultivation of technical talent over the past 70 years

DENSO Integrated Report 2024 DENSO's Value Creation Story

Our Accumulated Capitals

The capitals that we have accumulated throughout our history of growth as a company now support our business activities and provide us with a source for enhancing our corporate value in the future. To that end, we will reinforce our human, manufacturing, intellectual, natural, and social and relationship capitals, developing them into unique strengths, which in turn will help us grow our financial capital and drive growth moving forward. Through this cycle of strengthening our capitals, we will continue to achieve sustainable growth while offering genuine value aimed at realizing a sustainable society.



Correspondence of Financial and Non-Financial Capitals to Business Growth and Social Issue Resolution

		1				
Conitals	Inpute	heitistisse to Stress others Carrieds	Business Growth			Output
Capitals	Inputs	Initiatives to Strengthen Capitals	Creation of New Value	Profit Growth	Reduction in Capital Cost	- Output
Financial Capital	Fiscal 2024 Total assets: ¥9,093.4 billion Revenue: ¥7,144.7 billion Operating profit: ¥380.6 billion	Reinforce profit structure Reduce low-profit assets Improve capital structure Engage in dialogue with markets	 Bold investment in new and growing fields through well-focused investment Development of next-generation technologies through swift R&D, including collaboration with partners Promotion of non-automotive fields (energy, FA, and food & agriculture [AgTech]) 	Improvement in ROIC through business portfolio reweighting Growth in profits based on realization of growth in the CASE vehicle field Curbing of fixed costs through disciplined investment management Improvement of asset efficiency based on reduction of cross-shareholdings and reduction of cash on hand	 Improvement of capital structure through utilization of borrowings and augmentation of shareholder returns Reduction in cost of shareholders' equity through stepped-up investor relations activities 	Financial ROE: 12% level
Human Capital	Fiscal 2024 Total number of global employees: Approx. 160,000 Year-on-year increase in human capital investment: Fiscal 2024: ¥29.0 billion Fiscal 2025: ¥35.0 billion (forecast)	 Initiatives to improve employee engagement (support for employee career realization and creation of open workplaces) Transformation of talent portfolio (acquisition, development, and optimal placement of personnel) 	Realization of a circular economy through energy recycling systems and resource reuse	 Increase in profits through deployment of personnel to growth fields Optimal resource utilization through deployment of personnel to the most suitable in-house positions Increased efficiency and profits through the development of personnel who can utilize advanced IT digital tools 	 Increase in highly productive personnel through the utilization of evaluation and compensation systems based on roles and performance Enhanced productivity due to improved employee engagement 	Operating margin: 12 Revenue: ¥7,500.0 b (fiscal 2031) DOE: 3.3% or higher, stable improvement of Revenue in the electr ¥1,700.0 billion Revenue in the ADAS ¥1,000.0 billion (fisc
Manufacturing Capital	Fiscal 2024 Capital expenditures: ¥394.6 billion Global number of production bases: 127 bases in 25 countries	Establishment of global production and supply capabilities Realization of DENSO-style digital-twin plants Achievement of circular economy in the <i>Monozukuri</i> industry Transformation of logistics (optimization of entire supply chain, automation) Development of <i>Monozukuri</i> personnel	 Realization of a circular economy through energy recycling systems and resource reuse Development of <i>Monozukuri</i> personnel who can create innovative value 	 Pursuit of sales growth and profits through global production and supply capabilities High quality and production efficiency that are enabled by digital-twin plants Productivity improvement based on data analysis Cost reduction through disciplined investment decisions Contribution to energy and resource savings 	 Reduction of supply risk through the building of a resilient supply network Stable manufacturing through optimization of the entire supply chain Realization of safe Monozukuri worksites free of accidents and disasters 	Scale of semiconduct ¥700.0 billion Scale of software bus ¥800.0 billion (fiscal Revenue in the energ agriculture (AgTech) o ¥300.0 billion (fiscal Non-Financial
Intellectual Capital	Fiscal 2024 R&D expenditure: ¥550.9 billion Number of patents held (Japan and overseas): Approx. 39,000 Fiscal 2024–Fiscal 2031 Software development personnel: Increase of 6,000 personnel	Reinforced recruiting and development of software engineers Creation of intangible value through software development Augmentation of semiconductor development and enhanced efficiency of software development Acceleration of advanced research Promotion of exchange through collaboration with business partners and industry–government–academia collaboration	 Creation of world-best and world-first products through leading-edge technology research Spurring of innovation through the exchange of insights on advanced and fundamental technologies in the fields of academia and science 	 Acquisition of competitive advantages for CASE vehicles and semiconductors through investment in and deployment of personnel to growth fields Improvement in the efficiency of software development through automation, etc. 	 Establishment and maintenance of competitive advantages through an increase in the creation of patents that can be utilized by other companies Optimization of IP policy, governance, and resources from a Companywide perspective Reinforcement of information security 	Provision of value of green and peace of m CO ₂ emissions from Monozukuri activities Carbon neutral (fisca Percentage of fatal a covered by DENSO s 100% (fiscal 2036) Organization that dra
Natural Capital	Fiscal 2023–Fiscal 2026 Planned investment in efforts to reduce CO ₂ emissions: ¥100.0 billion	 Thorough energy-saving activities in all facets of our operations Introduction of renewable energy based on economic rationality Efficient utilization of natural capital through recycling, among other measures Minimization of environmental impact based on the reduction of waste and emissions 	Creation of innovative energy-saving technologies, such as hydrogen production and utilization, through the application of automotive technologies	 Monozukuri that is both carbon neutral and profitable Development and popularization of electric vehicle components in response to increasingly stringent environmental regulations 	 Environmental impact reduction activities that lower the cost of countermeasures for future physical risks related to the environment Reduction of resource depletion risks through the effective use of resources 	and encourages new Employee engagemen Ratio of positive resp (non-consolidated): 7 Number of women in positions (non-consol Business fields: 200 Technical fields: 200 Trust of society
Social and Relationship Capital	Fiscal 2024 Suppliers: Approx. 7,540 Dialogues with investors and analysts: Approx. 1,750 Total since fiscal 2011 Number of business alliances: 90	Enhancement of dialogue with all stakeholders Building of an unshakable corporate foundation	Creation of new value through collaboration with business partners	 Offering of products and solutions that inspire customers and greater society Achievement of supply stability through reinforcement of relationships with suppliers and reduction of production costs through risk management 	 Elimination of information asymmetry with shareholders and investors through the provision of timely, appropriate information Promotion of sustainable procurement (human rights, environment, etc.) across the entire supply chain Thorough adherence to laws and regulations and maintenance of appropriate competitive environment 	Compliance: Serious of and regulations: 0 Information security:

Tradition of Sustainability Management

Since its founding, DENSO has taken on ambitious initiatives to address social issues through its businesses. In other words, we practice sustainability management and continuously provide society with new green value and peace of mind value. Our consistent approach to business is ingrained in the spirit of the DENSO Creed, which calls on us to "provide quality products and services "

To continue in the spirit of our creed and keep practicing sustainability management even as times change, we have established the DENSO Group Sustainability Policy and incorporated social issues into the Long-term Policy for 2030 and as an integral part of our material issues (Materiality 1932-33). We are currently tackling these social issues through our business activities. This section provides an overview of our structure for promoting sustainability management implementation as well as specific related initiatives.



Promotion Structure for Sustainability Management

The executive vice president and representative member of the Board supervises the Corporate Strategy Division, which is responsible for promoting Companywide sustainability management. This division is involved in such efforts as drafting policies and action plans related to sustainability, providing follow-up support for the sustainability activities of each division, and engaging in internal and external communication. Furthermore, matters such as the direction of sustainability management and the status of Companywide sustainability activities are

reported to and deliberated on by the Company's formal committees (such as the Management Deliberation Meeting) and overseen by the Board of Directors. In addition, the divisions in charge of individual sustainability themes promote activities to address these themes in collaboration with relevant divisions and after deliberation on said themes by each expert committee.

Also, to promote and entrench a culture of sustainability and disseminate related information, each DENSO CORPORATION division, domestic Group company, and overseas regional headquarters appoints one sustainability leader, who is tasked with ensuring the penetration of a culture of sustainability throughout workplaces.

Promotion Structure and Division for DENSO's Sustainability Management



*1 Strategies deliberated on by the Management Strategy Meeting and the Management Deliberation Meeting (Corporate Governance, P99) *2 With committees in charge of these themes, such as the Quality Assurance Meeting and the

Companywide Safety, Health, and Environment Committee serving as the secretariat, initia tives to address these themes are deliberated on by the Company's formal committees.

Please see this URL to view the DENSO Group Sustainability Policy. https://www.denso.com/global/en/-/media/global/about-us/ sustainability/management/management-doc-sustainabilit policy-en.pdf



TOPIC

The DENSO Group is further accelerating the implementation of sustainability management by advancing the following initiatives.

Evolving Sustainability Management (Initiatives from a Companywide Perspective)

Ongoing: Establishing sustainability KPIs and following up on them as company goals; incorporating sustainability KPI achievement levels into evaluation indicators for officer remuneration P.103–104

New: assess our level of impact on society and the kinds of expectations that stakeholders have of DENSO. * Materiality chosen to not only evaluate how social issues impact a company's business but also how a company's business impacts society.

Promoting the Understanding of Each Employee

Group companies and regional headquarters educate and communicate information to employees in effective ways that reflect the culture of their respective region or company so that each individual can communicate in their own words how they will contribute to the sustainability of society through their work.

Case 1: My Efforts toward the SDGs—Contributions You Can Make on Your Own

At the Kota Plant, we have been working to promote employee understanding of sustainability management at a workplace level through efforts such as the Outstanding People Caravan, an event where department heads, plant managers, and sustainability leaders come together to share examples of personal actions toward the SDGs. Over 350 members of the plant's semiconductor manufacturing division have participated in this event, recording their goals regarding how they would like to contribute to the sustainability of society through their own work and actions under the theme "My Efforts toward the SDGs." These goals are displayed throughout the plant. In this way, the Outstanding People Caravan provides opportunities for employees to not only reflect on their own actions but also make new realizations by learning the declarations of their colleagues in the workplace.

Case 2: Promoting Understanding of Carbon Neutrality in China

To promote an understanding of carbon neutrality in China, reflecting the level of interest in carbon neutrality around the world, we offer educational activities and tests via e-learning platforms. In addition to global policies and strategies, we share regional Chinese policies with employees so that they can more closely relate to the concept of carbon neutrality and engage in relevant activities. We also introduce specific examples of production companies in China that are engaged in such activities. For example, at Tianjin DENSO Electronics Co., Ltd., a Chinese production company, we have rolled out an initiative using a smartphone app with the aim of encouraging all employees to participate in and have fun with activities related to the SDGs and carbon neutrality on an ongoing basis. Over 90% of employees have accessed this app. The app not only features examples of how to better conserve energy but also enables employees to post their own examples of the initiatives in which they are engaging. To date, there have been over 350 posts by employees, demonstrating the motivation of employees to take action.

Case 3: Promoting an Understanding of Sustainability Management Utilizing the Integrated Report

Leveraging our integrated report, we are promoting efforts to deepen employee understanding of our sustainability management. For employees reading an integrated report for the first time, we have created a reading guide that summarizes the key points of such a report. We also post the report on our company intranet, hold reading sessions among employees interested in the report, and conduct visiting lectures for departments that request them. In these ways, we have promoted activities to deepen employee understanding of our corporate strategies and sustainability management through the use of the integrated report. Employees who have participated in such

activities have provided a good deal of positive feedback, including comments such as "I was able to gain an understanding of how my daily work relates to corporate strategies and social contribution, which has boosted my motivation," and "I want to use the integrated report to communicate a general overview of DENSO to our business partners and new employees.



We are currently examining updates to the material issues we established in fiscal 2019 based on the concept of double materiality.* In our evaluation process, we have been soliciting the opinions of internal and external stakeholders, including customers, suppliers, investors, experts, employees, and members of the Board to



