History of Innovation and Creation

Just as it did when DENSO was founded, the commitment set out in the DENSO Creed is the Company's starting point to this day. With our second founding well underway, we must boldly take on unprecedented challenges, such as promoting initiatives toward CASE* and realizing carbon neutrality. By once again reflecting on the desire embodied in the DENSO Creed and returning to our starting point as a company, 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 Toyoda, 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 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.

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

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 to help mitigate global gasoline shortages
●	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.

● Green ● Peace of mind

1960s and 1970s

External Environment	Popularization of Private Cars during the Period of Rapid Economic Growth Together with the Emergence of Traffic Accidents, Air Pollution, and Numerous Other Social Problems
Social Needs	High-Mix, Variable-Volume Production Capabilities and Development of Environmental and Safety Technologies

Specific Initiatives

- 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.
- Received the Okochi Memorial Production Prize in recognition of the high-precision, high-quality *Monozukuri* enabled by our integrated in-house production system
- 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
- Established Nippon Soken Inc. through a joint investment with 10 other automotive component manufacturers with the aim of researching technologies to address exhaust gas

Green Value and Peace of Mind Value Provided

●	Achieved the practical application of electronic fuel injection (EFI) systems ahead of regulations on exhaust gas. After doing so, we continued to develop products that respond to environmental regulations, one after the other.
●	Developed O_2 sensors as an important tool for controlling exhaust gas. Vehicles equipped with DENSO systems comprising EFI, O_2 sensors, and a three-way catalyst were able to comply with Japan's Showa 53 (1978) exhaust gas regulations, which were said to be the world's strictest regulations at that time. The number of cars equipped with these systems began to rapidly increase.
●	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). The technologies cultivated through our participation in this project would later help us develop car navigation systems and connected driving products.

Electronic fuel injection system

Received the Deming Prize

1980s

External Environment	Globalization and Trade Friction
Social Needs	Overseas Production and Higher-Performance Vehicles

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 social issues by acting as a trailblazer in the creation of products compliant with environmental regulations
- 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.
- Focused efforts on progressing in electronic control-type systems and other software fields
- Commercialized a series of safety system products that helped improve the safety performance of vehicles

* RFID (radio frequency identification): A non-contact system that reads data from RF tags using electromagnetic waves

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 anti-lock brake systems, airbag sensing systems, and forward collision warning systems

DENSO (MALAYSIA) SDN. BHD. at the time of its establishment in 1980

In-vehicle test in Europe

1990s

External Environment	Collapse of the Bubble Economy and Acceleration of International Debate on Global Warming
Social Needs	Compact, Fuel-Efficient Vehicles and Environmentally Friendly Lifestyles

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 and world-best products
- Commenced Excellent Factory (EF) activities. We began to expand activities on a global basis to improve our factories, led by personnel on the front lines of production. These EF activities represent the origins of DENSO's ambitious activities focused on quality improvements.
- Utilized core technologies to develop products that contributed to eco-friendly lifestyles
- Developed the QR Code® with large capacity and high-speed readability that is compatible with high-mix, low-volume production at plants

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
● ●	Commercialized household heat pump water supply systems that contribute to energy savings. Also, developed water filters, QR Codes®, and other products that make people's lives more comfortable

Advanced Research and Innovation Center

QR Code®

2000s

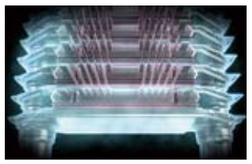
External Environment	Spread of Digital and Information Technologies and Creation of International Frameworks and Regulations for Global Warming Prevention
Social Needs	Diversification of Powertrain Technologies and Introduction of Products for Hybrid Electric Vehicles (HEVs) and Other Electric Vehicles

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. Leveraged outstanding environmental technologies to accelerate the reduction of CO_2 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

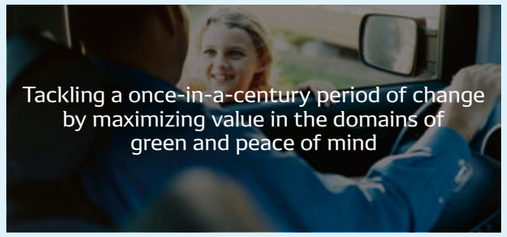
●	Developed the world's first inverter with dual-side cooling. DENSO's technological capabilities were acknowledged through the development of these inverters, leading to a rapid increase in their production volume.
●	Developed the world's first forward-looking radar sensor using millimeter waves. Able to operate even in rainy and foggy environments, these sensors helped enhance the safety of automobiles.



Structure for cooling both sides of the inverter

● Green ● Peace of mind

2010s to 2020s



External Environment	ICT Advancement and SDG Adoption, and an Escalation of Social Issues
Social Needs	Conversion to CASE Vehicles

Specific Initiatives

- 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.
- Formulating comprehensive strategies in the domains of green and peace of mind
- 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
- Began providing services in the agriculture and factory automation fields
- Strengthening our development structure and global production structure for products powered by electricity, including at the Hirose Plant and the EIC. Through these efforts, we aim to realize an annual production of 12 million inverters by 2025.

Green Value and Peace of Mind Value Provided

●	Developed motor generators. 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 Global Safety Package, an advanced safety system using a monocular camera and millimeter-wave radar sensor. Equipped with this safety system, the Toyota Prius received the top five-star rating in the European New Car Assessment Programme (Euro NCAP).
●	Developed Global Safety Package 3, which helps improve safety performance by recognizing the environment surrounding the vehicle. We are expanding the scenarios in which to use accident prevention, safety, and driver support products. We are also commencing efforts to expand the global sales of such products based on the concept of realizing compactness and low cost.
●	Developed retrofitted acceleration control devices for when drivers accidentally step on the gas pedal, thereby enhancing the safety performance of vehicles already sold and on the road

2030s ~

External Environment	Global Warming, Resource Shortages, and Escalation of Such Social Issues as an Aging Society
Social Needs	Recycling-Based Society Centered on Renewable Energy

Specific Initiatives

- Expand businesses and address social issues in the fields of mobility, industry, and society with a view to realizing a carbon-neutral society and eliminating traffic accident fatalities by 2035
- Accelerate the development of technologies and partnerships with regard to five essential elements (the free movement of people, the flow of goods, energy utilization, minimization of resource requirements, and the flow of data) with the aims of realizing high-value mobility and manufacturing that contributes to peace of mind, supporting the continuation of society's activities, and catering to diverse values and views of well-being

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