

# DENSO

## Sustainability Bonds Report

### (USD-denominated Straight Bonds Due 2026)

June 2022  
DENSO CORPORATION

DENSO is contributing to SDGs  
through its corporate activities



# 1. DENSO Group Long-term Policy 2030

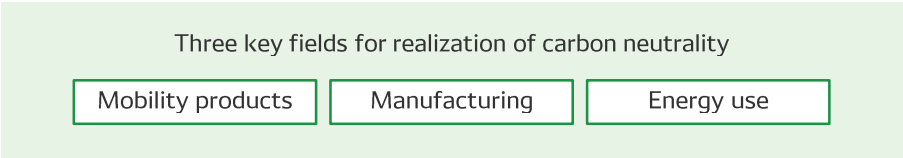
As pressing social issues emerge, such as global warming, aging societies and an increase in traffic accidents, DENSO has formulated the DENSO Group Long-term Policy 2030 and has been promoting activities to contribute to ensuring a society filled with smiling faces through the provision of new value inspired by the Company's initiatives, in addition to maximizing the values of "Green" and "Peace of Mind." DENSO will realize the Long-term Policy 2030 to respond to significant changes in the industrial structure and the business environment, with a view to further enhancing its corporate value.



## Environmental Initiatives

### Aiming to Achieve Carbon Neutrality by 2035

In pursuit of a sustainable society, DENSO has been promoting "environmental management" to reduce environmental impacts and create economic value through environmental protection activities. By further promoting the environmental initiatives we have been engaged in so far, we aim to realize carbon neutrality in our business activities by 2035.



### Initiatives for Enhancement of Mobility Products

#### Business Transfer to Transform the Business Portfolio

DENSO has decided to transfer the type III alternator business to Chengdu Huachuan Electric Parts Co., Ltd. Chengdu Huachuan Electric Parts is engaged in manufacture and sale of automotive parts mainly for customers in China, Europe, the U.S., and the Asia-Pacific region. DENSO entered into a technical assistance agreement with Chengdu Huachuan Electric Parts in 1996 and has since been providing support, including technological guidance and parts supply. While fulfilling our responsibility to supply customers by promoting collaboration with partners in the mature products field, we intend to accelerate strengthening of the priority fields.

#### Global Supply Structure for Electrification Products

In readiness for worldwide expansion of the electrification market, DENSO began production of inverters at TDE (Tianjin) in 2015 and DMTN (North America) in 2019. In 2021, in response to anticipated rapid expansion of the China market, we opened a new electrification plant at TDS (Tianjin) that has started production of inverters (with production of motor generators scheduled to start in 2023). Plans call for opening of plants in the southern region of China, Europe and ASEAN to establish a global production structure covering five core regions in the world.



DENSO MANUFACTURING TENNESSEE, INC. (DMTN)



TIANJIN DENSO ENGINE ELECTRICAL PRODUCTS CO., LTD. (TDS)

## Initiatives in Monozukuri

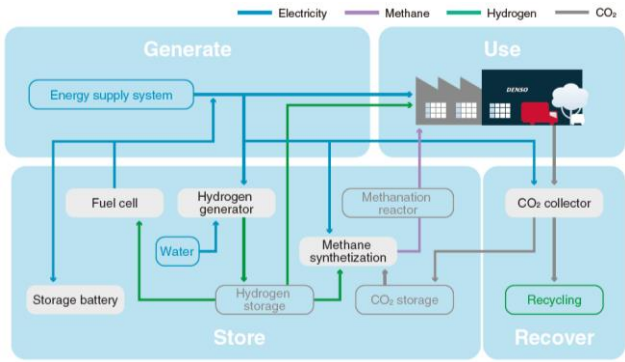
In fiscal year 2021, we realized 100% renewable energy at the Anjo Plant (electricity and gas), six sites in Europe and one site in Asia (electricity) by utilizing certificates and credits. Going forward, starting with the four model plants in Japan (Anjo, Hirose, Nishio and Fukushima), where field tests are underway, we intend to introduce the energy circulation system (case 1), factory-IoT (case 2), digitization (case 3) and energy-saving technologies to 130 plants worldwide with the aim of making all our plants carbon neutral.

### Case

1

### Energy Circulation System

In order to achieve carbon neutrality in Monozukuri using renewable electricity, we need technology to “store” renewable electricity, which fluctuates depending on the weather and time of day, in the form of electricity, hydrogen, and fuel. We also need technology to “recover” CO<sub>2</sub>, which is inevitably generated in the manufacturing process, as resources and energy that can be recycled and reused.

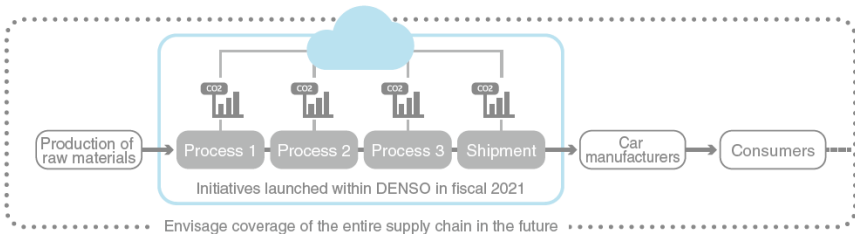


### Case

2

### Visualizing and Reducing CO<sub>2</sub> Emissions through Factory-IoT

Through “visualization” of CO<sub>2</sub> emissions, which involves measuring energy consumption in each manufacturing process, converting it using a unit equivalent to CO<sub>2</sub> emissions, and clarifying CO<sub>2</sub> emissions of each facility and process alongside production information, it will be possible to analyze the impact of equipment stoppages and quality losses on CO<sub>2</sub> emissions. Continuing to implement this cycle of analysis and improvement will enable us to boost utilization rates and minimize energy loss.



### Case

3

### Widespread Digitization of Factories

We are promoting digitization of factories in a bid to save energy by reducing paper consumption, processes, travel time, and fuel. Factory digitization will contribute to the enhancement of operational efficiency and accuracy, as well as workstyle reforms.



## Peace of Mind Initiatives

### Aiming to Become a Leading Company that Provides “Peace of Mind” to Society

We aim to provide peace of mind to society through our business activities. By contributing to the resolution of social issues, such as traffic accidents, air pollution, infectious diseases, natural disasters, and aging populations, we will promote initiatives to become a leading company that provides peace of mind to society.

Three pillars of DENSO's contributions to “peace of mind”

Zero traffic fatalities

Comfortable space

Support for workers

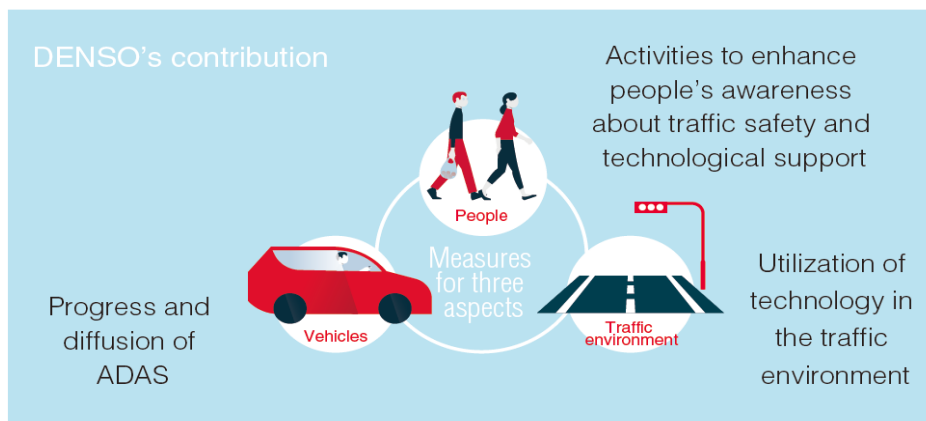
### Initiatives to Eliminate Traffic Fatalities

In order to eliminate traffic fatalities, in addition to our own initiatives, it is important to collaborate with all parties concerned, namely relevant government organizations, vehicle manufacturers and industries, so that measures are implemented for three aspects: people, vehicles, and the traffic environment. DENSO will contribute to initiatives to realize a society of zero traffic fatalities through technology.

#### DENSO's Goals for Technological Progress and Diffusion







- Enhance advanced driver assistance systems (ADAS) to prevent/reduce all types of traffic accidents
- Develop technology to avert hazards through AI-based HMI\* that predicts the risk of traffic accidents and prompts the driver to take appropriate action
- Expand and popularize the lineup of attractively priced ADAS products and retrofit products

\*HMI: Human Machine Interface



## 2. Framework

DENSO has issued Sustainability Bonds to contribute to a sustainable society by providing new value in the fields of “Green” and “Peace of Mind” under the DENSO Group Long-term Policy 2030. DENSO will accelerate initiatives under the Long-term Policy by using net proceeds of Sustainability Bonds for projects with a positive environmental impact and social benefits. The details of DENSO’s Green Social and Sustainability Bond Framework are as below.

	Electrification	“Monozukuri” (Manufacturing)	Advanced Safety and Automated Driving
	Eligible Green Project = “Green”		Eligible Social Project = “Peace of Mind”
Objectives of the project, target and benefit	Electrification of mobility products that contribute to minimizing environmental impact of mobility by electrification of vehicles <ul style="list-style-type: none"> <li>• Achieve sales of one trillion yen in electrification by 2025</li> </ul>	Carbon Neutrality in Manufacturing <ul style="list-style-type: none"> <li>• Achieve carbon neutrality for electricity (use credits for gas) by 2025</li> <li>• Achieve full carbon neutrality for manufacturing by 2035</li> </ul>	Pursue the goal to create a safe mobility society without traffic accident <ul style="list-style-type: none"> <li>• All around in-vehicle sensors, strengthening map functions and V2X (vehicle technology to communicate with infrastructure or between vehicles) and DSM (Driver Status Monitor)</li> <li>• Achieve ADAS Sales 500 billion yen by 2025</li> </ul>
Use of proceeds	Finance, in whole or in part, new or existing electrification businesses, research and development and capital expenditure <ul style="list-style-type: none"> <li>• Research and Development: Technology development that contributes to improving performance such as energy efficiency and electric mileage of vehicle with Inverters, Motor Generators, Battery ECUs, etc., which are essential for driving system of electric vehicles</li> <li>• Capital expenditure: CAPEX to expand the production of the core products described above</li> </ul>	Finance, in whole or in part, new projects in “Monozukuri (Manufacturing)” <ul style="list-style-type: none"> <li>• Introduction of renewable energy such as solar power generation facilities</li> <li>• Expenditures related to the purchase of renewable energy power etc.(including expenditures of the purchase of renewable energy through PPA / Renewable Energy Certificate)</li> </ul>	Finance, in whole or in part, new or existing Advanced Safety and Automated Driving business <ul style="list-style-type: none"> <li>• Scope of Business: Electronic systems, services, and platforms relating to mobility, including but not limited to millimeter wave radar, image sensors, driver status monitors, airbag systems, and other areas</li> <li>• Research and Development: Technologies to improve the performance of millimeter wave radar and image sensors, both of which are the core products of Advanced Safety and Automated Driving</li> <li>• Capital expenditure: CAPEX to expand the production of the core products described above</li> </ul>
Promoted Sustainable Development Goals (SDGs)	<div>       </div>		

### 3. Allocation Report

DENSO has committed to disclosing Allocation Reports on an annual basis until the net proceeds of any Green, Social, and Sustainability Bond issuances are fully allocated to projects meeting relevant eligibility criteria.

Allocation of net proceeds, and projects to which the net proceeds have been allocated, as of March 31 2022 are as below.

	Electrification	"Monozukuri (Manufacturing)"	Advanced Safety and Automated Driving
	Eligible Green Project		Eligible Social Project
Issued amount	500 million dollars		
Allocation			
Allocated amount	74 million dollars	3 million dollars	173 million dollars
Allocated percentage	31%		69%
Unallocated amount	250 million dollars		
Case studies of eligible projects to which proceeds have been allocated	<ul style="list-style-type: none"> <li>Technology development that contributes to improving energy efficiency and electric mileage of battery electric vehicles (BEVs), fuel cell electric vehicles (FCEVs) and air mobility (e-VTOL), such as specially designed inverters, motor generators, battery ECUs, and thermal management systems</li> <li>CAPEX to expand the production of the core products described above</li> </ul>	<ul style="list-style-type: none"> <li>Purchase of 37,348 MWh of renewable energy used in the Anjo Plant</li> <li>Expenditures related to the installation of photovoltaic equipment (e.g. in Asia) for the realization of carbon-neutral factories</li> </ul> <p>Note: Purchase of renewable energy and associated certification in the first half of fiscal year 2021 is not included</p>	<ul style="list-style-type: none"> <li>Technology development to improve the performance of millimeter wave radars and image sensors (such as increasing detection range, widening field of view, etc.), both of which are core products of Advanced Safety and Automated Driving</li> <li>CAPEX to expand the production of the core products described above</li> </ul>

- The proceeds were allocated for research and development and capital expenditures commenced after the issuance of the bond
- For unallocated proceeds, the equivalent amounts were managed as cash and cash equivalents



## 4. Impact Report

DENSO has committed to disclosing the following performance indicators related to eligible projects until the applicable Sustainability Bonds are redeemed, subject to data availability and confidentiality.

The below information is output/impact indicators as at March 31, 2022.

<b>Electrification</b>	Eligible Green Project	Percentage of sales increase in electrification (year-on-year) <b>+163.8%</b>
Objective and benefits	Contribute to the electrification sector by offering systems/products	
<b>Monozukuri</b>	Eligible Green Project	Reduction of CO2 emissions in "Monozukuri" (manufacturing) <b>16,918 t-CO2</b>
Objective and benefits	Reduction of CO2 emissions by introducing renewable energy and green energy	

### Initiatives for the Expansion of Electrification Businesses

#### DENSO Products Electrify Toyota and Subaru's New All-Electric bZ4X and SOLTERRA

DENSO has developed products that help the battery electric vehicle (BEV) go farther, charge faster, optimize battery use, and most importantly, perform better.

Newly-developed DENSO products featured on the bZ4X and SOLTERRA include;

- Current Sensor, which detects the flow of charging and discharging battery electricity
- Electricity Supply Unit (ESU), which integrates the functions of battery charging, electrical power conversion, and electrical power distribution
- Heat Pump System, which extracts heat from the air and uses it as a heat source for the vehicle climate control system

On top of that, DENSO's inverters are used in Blue Nexus Corporation's eAxe, which is adopted on bZ4X.

In BEVs, the battery is their sole energy source. Minimizing the amount of energy needed and efficiently recovering energy in order to use all of the energy generated helps to make BEV more practical. To efficiently manage energy throughout the BEV, DENSO is developing technologies that help monitor the vehicle's status and efficiently control energy use.

LINK: [DENSO Products Electrify Toyota and Subaru's New All-Electric bZ4X and SOLTERRA](#)

LINK: [BluE Nexus's First eAxe Adopted on Toyota's bZ4X](#)



ESU



Highly Efficient Heat Pump System

## Advanced Safety and Automated Driving

## Eligible Social Project

### Objective and benefits

Realize Safe Mobility Society without Accidents

- Develop products to cover all types of accidents
- Expand sales of core products and variation of retrofit products

Percentage of sales increase in Advanced Safety and Automated Driving (year-on-year)

**+8.5%**

## Status of Implementation of Safety Features Necessary for Advanced Safety and Automated Driving

Safety Technology System	Targeted Safety Feature	Types of Accidents	Achieved as of Sep 2021	Achieved as of Mar 2022
Autonomous emergency braking	Car-to-car	Rear-end collision	●	●
		Reversing	●	●
		Intersection (left turn across path/opposite direction, straight crossing path)		●
		Head-on collision		●
		Lane change (blind spot assistance)	●	●
	Car-to-pedestrian	Rear-end collision/crossing	●	●
		Intersection (crossing after turning)		●
		Reversing		●
	Car-to-bicycle	Rear-end collision/crossing	●	●
		Intersection (crossing after turning)		●
		Reversing		
	Car-to-motorcycle	Rear-end collision		●
		Reversing		
		Intersection (left turn across path/opposite direction, straight crossing path)		●
		Head-on collision		●
		Lane change (blind spot assistance)	●	●
Clash avoidance (low speed)	Vehicle/obstacles, etc.	Pedal error	●	●
Driver assistance/ automated driving (highway)	Vehicle/lane		●	●
	Road curvature			●
Driver assistance/ automated driving (general road)	Vehicle/lane/ pedestrian			●
	Virtual lane guidance (map utilization)			
	Traffic signal			●
	Road sign (speed limit, etc.)		●	●
Parking assist system	Parking assist		●	●
Driver monitoring	Face direction/drowsiness		●	●

This chart on safety features pertain to automobiles; DENSO is contributing to equipping vehicles with these safety features.

## Initiatives Toward a Society with Zero Traffic Fatalities

### DENSO Develops Global Safety Package 3 to Improve Vehicle Sensing

DENSO has developed Global Safety Package 3 to improve its active safety and driver assistance performance while reducing product size and cost.

This product is used for active safety systems in the Hino Ranger, the Lexus NX, and the Toyota Noah and Voxy, which were released in August 2021, October 2021, and January 2022, respectively.

LINK: [DENSO Develops Global Safety Package 3 to Improve Vehicle Sensing](#)



Millimeter-wave radar



Vision sensor