

FOOD VALUE CHAIN

Combining technologies and ideas to provide new value and contribute to a society where all people can live safely and with peace of mind

Food is essential to human life. Together with our business partners, while observing the entire food value chain, we will provide solutions that deliver food safety and security to each region of the world, anytime, anywhere, and to anyone, forever.



Hidehiro Yokoo
Head of Food Value Chain Business Development Division

Business Strengths

Greenhouses That Ensure Reliable Harvests While Dealing with Labor Shortages and Climate Change

By applying our *Monozukuri* technologies gained with automobiles to agricultural production, we are supporting technologies that condition environments for reliably harvesting agricultural products. We introduce automation technologies to create environments where people can move around easily, and globally supply solutions for greenhouses in a highly productive way that sustains growth.

High-Quality, Versatile Chillers for Vehicles That Help Deal with Driver Shortages and Delivery Diversification



Since the launch of operations for automotive chillers in 1972, DENSO has sold more than 200,000 chiller units, focusing on high-quality, high-efficiency *Monozukuri*. In addition to chillers for trucks, which come in many variations, we offer compact mobile chillers that can be nimbly used for deliveries by regular drivers in passenger cars for small-lot deliveries that have diversified in recent years.

New Distribution DX Solutions for Changing Needs in Food Distribution

Utilizing the QR code and RFID technologies we accumulated with automobiles, we are digitizing diverse information related to food in order to visualize food distribution information from production to sale, in response to consumer needs for safe and secure food. We also offer a straight-through food distribution platform that facilitates supply-demand optimization in inefficient distribution operations and rightsizes inventories.

Business Strategy for 2022

Together with our internal and external partners, we are starting to truly expand business, creating a structure for global business development and the provision of solutions that resolve social issues.

Growth Strategy	<p>While eyeing a sustainable society able to produce and transport food needed around the world, DENSO is creating optimal and advanced solutions with its proprietary technologies to resolve social issues in the food value chain.</p> <p>In the agricultural production business, along with greenhouse business partner Certhon Build B.V., DENSO is developing business in innovative greenhouses that leverage its automation technologies, while adapting to social needs in each region. In Japan, we are stepping up efforts to stimulate local industry with greenhouses able to reliably produce agricultural products with workers of all skill levels.</p> <p>In logistics-related business, working with partners, DENSO is creating new solutions that leverage its strengths in chiller technologies for newly emerging types of logistics for small-lot deliveries that require temperature management, an area where demand is likely to expand along with the e-commerce market.</p> <p>Utilizing DX in food distribution, we aim to create a distribution system that increases the efficiency of supply chains while ensuring traceability to safely and securely deliver food to consumers. Working with our partners, we are testing prototypes in actual markets while moving to introduce the system in the future.</p>	 <p>Collaboration with Certhon Build B.V.</p>
R&D	<p>Aiming for smart agriculture, AgriD Inc. (established in 2018 with Asai Nursery, Inc.) is advancing verification testing of production systems and automation technologies for creating a new model for agricultural production where people work alongside machines.</p>	 <p>AgriD Inc.</p>

Outcome of Green and Peace of Mind Strategy

Objectives	Results
Win orders for greenhouses in Japan	Proposed solutions combining optimal products tailored to customer needs and obtained orders from agricultural producers
Commence trials of compact mobile chillers for markets other than parcel delivery	Won orders from food companies
Commence market trials of QR traceability system	Finished market trials with partners for increasing distribution efficiency

Efforts toward Quality

We will realize optimized levels of quality and service in the field of horticultural facilities, drawing on the quality control methods that we have cultivated for many years in our automotive businesses. In addition, with the aim of ensuring the stable supply of safe food throughout the entire food value chain, we will collaborate with other companies within all processes from food production through to distribution and consumption to establish the necessary quality control methods for maximizing the value we offer to customers.

Specific Initiatives to Achieve Strategic Aims Contributing to Regional Revitalization with Local Governments for Carbon-Neutral Agriculture

In Date City, Hokkaido, in a bid to revitalize the region through agriculture, DENSO constructed a newly developed multi-wing interconnected greenhouse for training workers and verification testing of a smart farm that uses IT. The greenhouse features an innovative forced-air ventilation system that creates uniform, stable agricultural conditions within the greenhouse, and DX functions enable the rapid training of new farmworkers. Plans call for using natural energy in the greenhouse, such as wood pellets made from local resources. We plan to begin construction on the greenhouse in summer 2022 and start verification testing with vegetable production in the city from fiscal 2024.

DENSO will contribute to the revitalization of the region by advancing agriculture initiatives in Date City, Hokkaido while training new workers in the community.

Contributing to Regional Revitalization with Local Private Companies in Agriculture

Village Development Inc. is a real estate company in Aichi Prefecture that began growing mini tomatoes in September 2022 with DENSO's *Profarm T-cube* forced-air ventilation greenhouse. It is seeking to hire new farmworkers in the region with plans to sell the harvested mini tomatoes at farm-to-table markets in local communities. By using DENSO's *Profarm T-cube*, airflow inside the greenhouse can be controlled better than a conventional greenhouse, creating uniform and stable agricultural conditions within the greenhouse. With *Profarm T-cube*, we are helping companies enter the agricultural business.



Profarm T-cube

DENSO will continue to contribute to regional revitalization by expanding the agricultural business further with Village Development.

Resolving Social Issues through Our Businesses

Relevant SDGs



Contributing with Systems to Improve Local Agricultural Brands with Local Governments

DENSO is working to improve the recognition of local agricultural brands, namely, short-necked asari clams farmed in Kumamoto Prefecture. DENSO participates in Kumamoto Prefecture's newly launched public-private organization, the Locally Farmed Asari Value Chain Improvement Council, and is working on verification testing of innovative systems built for providing local production guarantees and traceability in production channels for asari clams.

Kumamoto Prefecture issues local production certificates for asari clams caught by local fishermen, and consumers can use QR codes to verify this certification, which facilitates the dissemination of information on locally produced foods in a proper manner. DENSO contributes to food safety and security by supporting the creation of traceability systems from production to sale.



DENSO's QR codes scanned for information on source of local production



Local production certificate issued by Kumamoto Prefecture