

OUR APPROACH

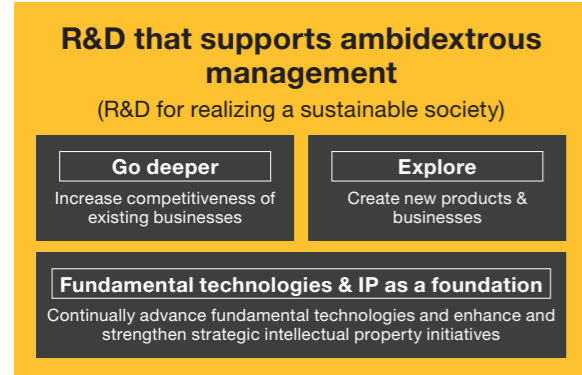
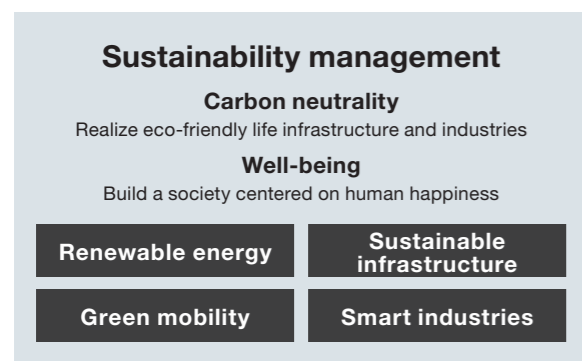
Research and Development

Research and Development Policy

Our basic policy in Medium-term Management Plan 2024 is research and development that supports ambidextrous management. As such, we are working to build up the competitiveness of existing businesses and develop new products and businesses. In recent years, the challenges facing society have grown increasingly serious and complex. They include global climate change and the resulting intensification of natural disasters, and the decrease and aging of Japan's working population. There have also been big changes in how people live and work. One example is the use of information communication to monitor our lives more closely and advocacy for achieving zero emissions to ensure eco-friendly lifestyles.

To develop the capacity to transform ourselves and foresee the future in a changing business environment, and to get closer to our ideal of R&D, which is to constantly create new value, we must deepen development capabilities that support ambidextrous management. This means both building up the competitiveness of existing businesses and creating new products and businesses. To firm up the foundation for this, we must continuously evolve the fundamental technologies that support our products and technologies, and expand and strengthen strategic intellectual property initiatives that support business and R&D.

Basic R&D Policy under Medium-term Management Plan 2024



Outcomes of Initiatives in FY2023

Following our FY2023 basic policy of research and development that supports sustainability management, we endeavored to build up the competitiveness of existing businesses and create new products and businesses. To build up the competitiveness of existing businesses, we emphasize development aimed at expanding our lineup of eco-friendly products and development to keep up with the electrification of vehicles. On the first point, a representative eco-friendly product is vacuum technology that avoids the use of SF₆ gas with its high global warming potential. In particular, we have focused on developing fundamental technologies for products built for high voltages (123/145 kV and up). There is strong demand for these in the North American market, where growing environmental awareness is leading to tougher regulations.

The second point is the electrification of vehicles. We have been developing 800 V high-voltage EV drive units to provide quick charging, which will grow more common going forward. In addition, we aim to make next-generation EV drive units smaller and more efficient by using silicon carbide (SiC).



Engineers developing an EV drive unit

R&D for Carbon Neutrality and Well-Being

In the effort to create new businesses, we are creating themes that could become the next pillars of the Meiden Group. As part of this, we are constantly soliciting new R&D themes internally that contribute to carbon neutrality and well-being. Some of the R&D themes already initiated are getting close to commercialization. One of them is an ultra-concentration/high-purity ozone water generator using a pure ozone generator that is one of Meidensha's feature products. Pure ozone water is excellent for cleaning and benign to the environment because it self-decomposes into oxygen and water. Applications include cleaning, surface modification, and other uses in the semiconductor and other industrial fields.

We will continue our contribution to social sustainability through research and development that facilitates carbon neutrality and well-being.



A 145 kV vacuum circuit breaker that uses no SF₆ gas

Initiatives in 2024 and Beyond

Development of "Oriented Research"

Our medium- to long-term research and development is aimed at systematically creating themes that could become pillars of new businesses for the Meiden Group, and at the same time, pursue "oriented research" in which we backcast from the vision of the society we want to see in the future, debate what technologies the Meiden Group needs to have, and then implement them.

In the future, technological advances and changing values will transform traditional social systems. This may result in the creation of new markets and the ability to expand into areas that were once physically off-limits to us. Scenario planning and materiality in Meiden Group R&D are some of the tools that will help us to sort out these changes. Through this process, we will find areas where we can use our technological strengths and focus on acquiring core technologies.

Focus Themes Going Forward

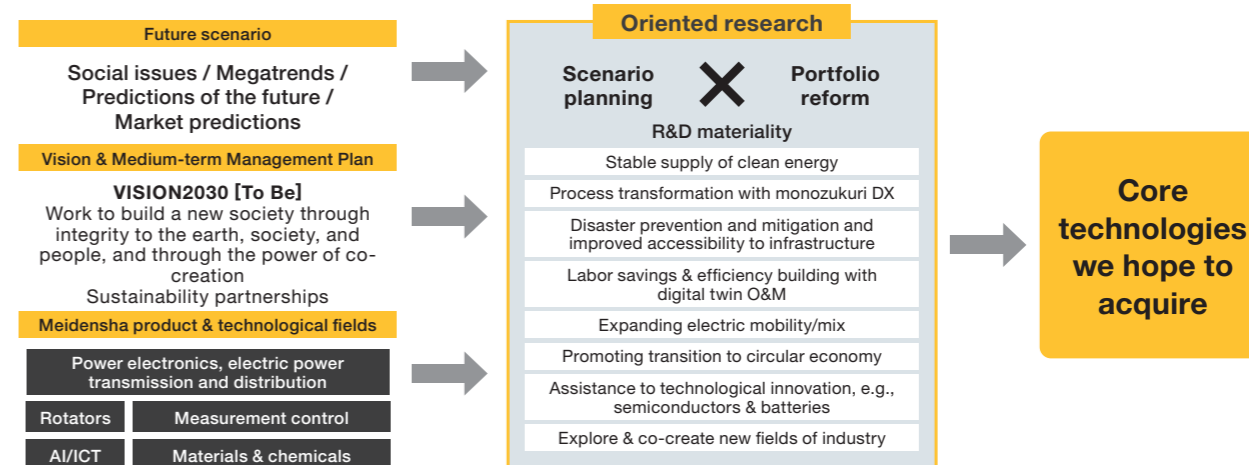
We will continue conducting research and development that contributes to carbon neutrality and well-being. In the area of carbon neutrality, we will focus on expanding our lineup of products using vacuum technology and not using SF₆ gas with its high global warming potential. Another focus will be developing high-voltage, high-capacity products, a category for which demand is especially growing. In response to the electrification of vehicles, we will work to make EV drive units smaller and more efficient. We will also work to increase the capacity of battery charge and discharge test equipment, which is becoming increasingly necessary with vehicle electrification.

In the area of well-being, we will improve the quality of vacuum capacitors for semiconductor production equipment, thus contributing to a stable supply of semiconductors, and expand our lineup of pulse power supplies.

Additionally, to increase the added value of our products and services, we will develop cloud-based fundamental technologies, expand our services for selling both services and physical goods, and transform our business model.

We will also use generative AI technology as part of research and development to ensure more efficient and speedy development.

Writing Scenarios for 2030–2040 and Exploring and Strengthening Core Technologies



TOPICS

First Delivery of Catenary Eye, Cloud-Ready Overhead Line Inspection System Realization of Combined Solution Offering Both Products and Services

In March 2024, we delivered Meiden Overhead Catenary System (OCS) inspection system to Kintetsu Railway Co., Ltd. The overhead line inspection system for the railroad sector is now compatible with cloud analysis services. The product uses camera images to accurately measure and analyze height, displacement, and wear of railroad overhead lines. This data is needed for the maintenance that supports safe operation.

Now that the product is cloud-compatible, measurement data collected on-site is uploaded to the cloud for analysis. This eliminates the need for dedicated hardware and allows analysis results to be viewed from any location. Going forward, instead of just selling individual measuring devices, our aim is to provide new value that can facilitate maintenance DX of overhead line facilities. We will work continually to improve the customer experience and further expand combined solutions offering both products and services.

