

# Using Business to Contribute to a Carbon-free Society

## Promoting the introduction of eco-friendly products - Industry's first ester-insulated transformer to obtain SuMPO EPD environmental labeling program certification -

An ester oil transformer developed by Meidensha acquired certification in SuMPO EPD, an environmental labeling program operated by the third-party organization Sustainable Management Promotion Organization (SuMPO). This is the first ester oil transformer in the industry to obtain this certification.

As an environmental product declaration (EPD) in accordance with the ISO 14025 standard, SuMPO EPD is a disclosure framework based on international standards for a product's environmental impact. We received this certification for the multifaceted evaluations on the environmental impact of this ester oil transformer throughout its entire lifecycle, using information on GHG emissions, resource circulation, and its impact on air and water systems.

Our ester oil transformer reduces environmental burdens by replacing the mineral oil traditionally used as the insulating coolant with plant-based ester oils such as palm, canola, or soybean oil. Visualizing greenhouse gas emissions contributes

to increasing the accuracy of customer Scope 3 emissions calculations and identifying areas for improvement towards decreasing emission levels throughout the supply chain. The Meiden Group will continue to develop and release eco-friendly products and contribute to achieving a sustainable society.



The SuMPO EPD certified ester oil transformer

## Using our technological strengths to expand the use of wind power

Meidensha launched its Wind Power Generation Business in 2003. At first, the business sold wind turbines built overseas and manufactured generators and other equipment, but it now focuses primarily on O&M (operations and maintenance) for approximately 80 wind turbines. Also, the subsidiary M Winds Co., Ltd. has launched a wind power sales business and operates three wind farms across Chiba, Akita, and Ishikawa Prefectures that generate a total of 51 MW of power. In 2024, we signed a O&M consultancy agreement with the German company Deutsche Windtechnik. Through this agreement we will receive technical resources and expertise on multi-brand responses for onshore wind farms and with the goal of creating a complete maintenance and continuity service system for Japan that does not rely on overseas manufacturers.

On the technical innovation side, we developed original receptors\* to protect fan blades and other equipment from lightning strikes and began demonstration projects for domestic offshore wind farms. These lightning protection receptors are made from a composite alloy of heat resistant solid solution particles and copper and significantly inhibit receptor wear from lightning strikes, thereby reducing the risk of damage to blades. This improves power generation volumes and reduces maintenance costs, helping to address issues specific to offshore wind power.

\*Receptor: Installed on the tip of the blade, this component attracts and receives lightning, thereby protecting the blade and related equipment. This configuration diverts the lightning current through a down-conductor inside the blade, then through the nacelle and tower to dislodge it into the ground.

By combining knowhow accumulated through operations, international partnerships, and our unique technological developments, the Meiden Group significantly supports the diffusion of wind power generation required to achieve a carbon-free society.



Hachiryu Wind Farm (Akita Prefecture)



Rod receptors

Tip receptors

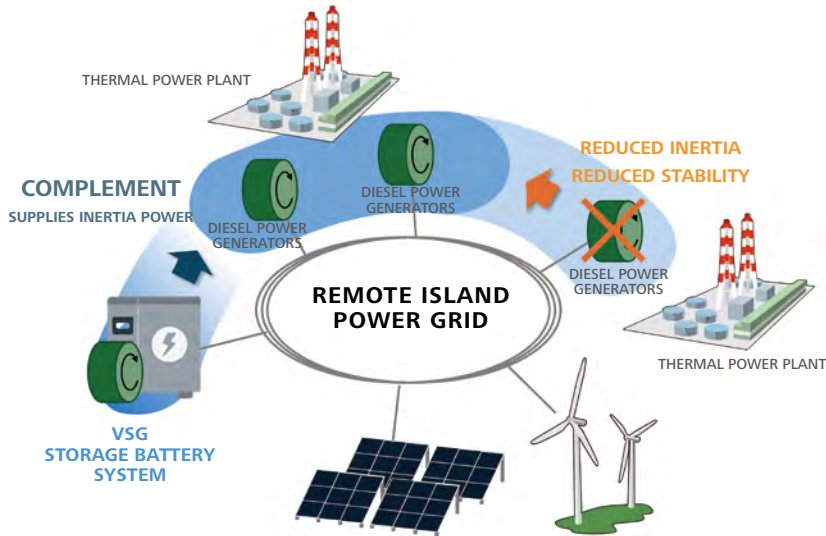
## Deployment of a power storage system business to support the diffusion of renewable energy

As photovoltaic and wind power generation is introduced at an ever faster pace around the world, demand for power storage systems that support stable power supplies grows. The spread of renewable energy requires securing the ability to adjust supply and so the power storage market is expected to grow significantly in the future as renewable energy becomes more widespread.

Meidensha provides storage battery systems optimized to any need by combining lithium-ion, NAS, lead, redox flow, and various other battery types. Optimized control via an energy management system (EMS) achieves scheduled operations for storage battery charge/discharge, load-following control, backflow prevention, and more to create the best control for photovoltaic and storage batteries.

As a company with a wealth of operational experience running approximately 200 sites since 1996, we provide a full

range of services for systems, from planning to maintenance. We saw a carryover of demand for our momentary voltage sag compensator as a product that protects equipment against damage caused by recent increases in lightning conditions. In FY2023, we worked with Tokyo Electric Power Company Holdings, Inc. on the joint development of inverters for battery energy storage systems with virtual synchronous generator functions (VSG-PCS), becoming the first domestic manufacturer to bring such a product to market. This product provides inertia and synchronizing power that compares to conventional synchronous generators and is expected to counterbalance reduced stability in power grids they expand the ratio of power derived from renewable energy sources. It will contribute to stabilizing power grids and realizing a carbon-free society in view of the opportunities presented by this growing market.



# Using Business to Contribute to a Circular Society

## Achieving the targeted circular society with technology that decomposes harmful PFAS

Meidensha worked with Chuo University, the Institute of Science Tokyo, and Kanazawa University to "develop a PFAS self-concentrating rotating disk plasma decomposition and detection system" in the NEDO (New Energy and Industrial Technology Development Organization) cutting-edge research program.

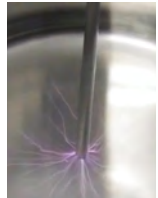
Per- and polyfluoroalkyl substances (PFAS) are widely used in the semiconductor and communications fields, but they do not decompose easily in nature and are harmful substances that can contaminate water sources. Conventional processing technologies face issues with post-processing residual matter and high energy use.

This research aims to develop groundbreaking decomposition equipment using plasma technology and completely detoxify PFAS. We are tasked with utilizing the technology of the pure ozonated water generators and pulse power supplies we have acquired as well as developing the pre-processing technologies and plasma power generators.

An important focal point is the goal of achieving a chemical recycling process that recovers fluoride after PFAS decomposes. This will enable the detoxification of a harmful substance while creating circular use of a critical resource, thereby contributing greatly to the creation of a circular society. We have scheduled a 3-year period for researching the essential technologies beginning in FY2025 and aim for its practical application in the field.



Right: Ultra-high concentration and high-purity pure ozonated water generator  
Left: Pure ozone generator



Pulse plasma