



Pursuit of Sustainability/Denka's Environmental Management

Environment

Message from the Responsible Officer

Michio Kawamura

Executive officer
In Charge of
Sustainability
Promotion
Department

Denka is actively advancing initiatives to promote sustainability at the core of its corporate and production activities. In the management plan "Mission 2030," we advocate for business, human resources, and management value creation, and in business value creation, we aim to contribute to a sustainable society. Specifically, we have set KPIs of a 60% reduction in carbon emissions compared to FY2013 by 2030, achieving carbon neutrality by 2050, and a maximum output of 150MW from renewable energy generation.

As one initiative to enhance daily lives in sustainable cities, we have been working on chemical recycling, operating a demonstration facility at the Chiba Plant since 2024 that chemically decomposes polystyrene containers collected from households and recycles them back into raw materials. This is an advanced initiative involving local governments, citizens, and companies working together. Regarding recycling and sustainability, we have obtained "ISCC PLUS" certification for a sustainable recycled raw material supply chain, including our major resin production base in Singapore.

In the field of renewable energy, we have been generating hydroelectric power at the Omi Plant for many years. In addition, in 2024, we completed the introduction of solar power generation as renewable energy at our local plant in Vietnam, and we are also planning to introduce a solar power generation system in Singapore. In addition to these activities, we are identifying and addressing priority issues related to biodiversity in accordance with the Taskforce on Nature-related Financial Disclosures (TNFD) guidelines. Furthermore, we are actively participating in international initiatives such as the GX League, working on sustainability from a global perspective that goes beyond the scope of a single company. Of course, continuous energy conservation, production process optimization, and efficiency improvements are being pursued as our social responsibility as a manufacturer.

Through these various initiatives, Denka will continue to fulfill its role as a "specialist in making the world a better place through the power of chemistry."

FY2025 Environmental Policy

Basic Policy

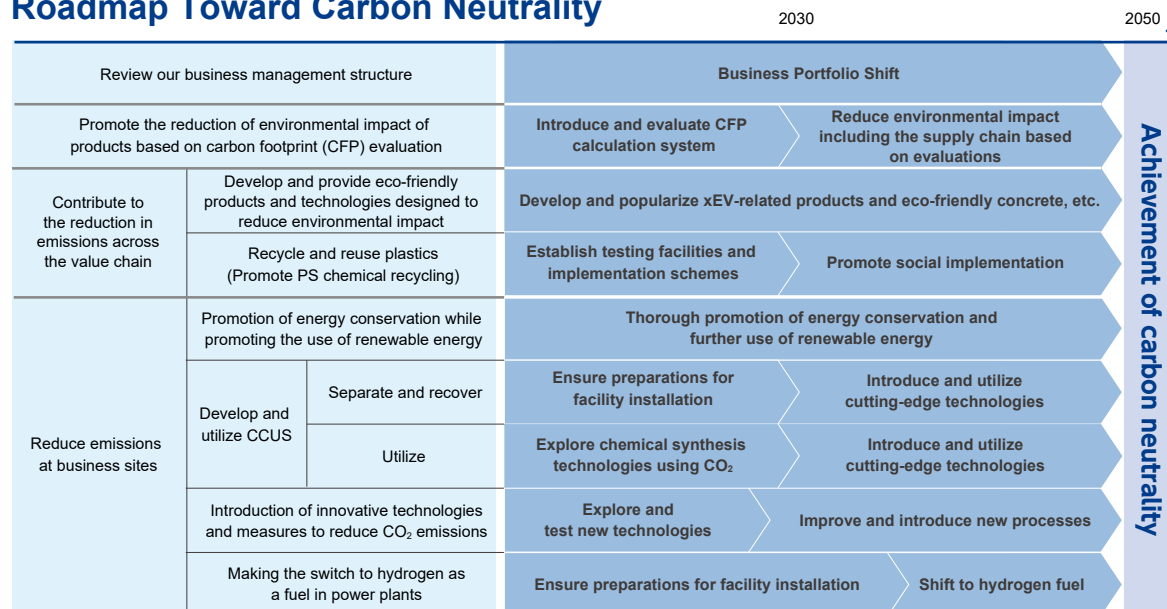
In FY2024, we formulated the "Denka GX Roadmap," which serves as our guideline for achieving carbon neutrality by 2050. We position FY2025 as Denka's "first year of GX," and by working on the following initiatives, we will create environmental value, strengthen product competitiveness, and earn the satisfaction and trust of our stakeholders.

 GX Human Resource Development - Improving employees' literacy regarding sustainability and environmental mindset Related materiality themes - Achievement of carbon neutrality - Sustainable cities and fulfilling daily lives - Environmental conservation and minimization environmental footprint	 Process Innovation, Promotion of Energy Conservation, and Profitability - Promotion of improvement activities that contribute to CO₂ reduction in one's own workplace - Reduction of electricity usage and consideration of new electricity plans (self-consignment, introduction of new renewable energy, etc.) Related materiality themes - Achievement of carbon neutrality - Sustainable cities and fulfilling daily lives	 Appropriate Response to Information Disclosure - New selection as an ESG investment stock - Preparation for GX League emissions trading in 2026 - Development of personnel for carbon footprint calculation and improvement of transparency in environmental information disclosure Related materiality themes - Achievement of carbon neutrality - Sustainable cities and fulfilling daily lives - Environmental conservation and minimization environmental footprint	 Strengthening the Supply Chain - Awareness-raising activities for users regarding increased product costs due to CO₂ reduction in products - Strengthening product competitiveness and designing systems for environmentally friendly products - Improvement of raw material and product transportation and storage, review of packaging materials, and investigation and consideration of switching to low-carbon raw materials Related materiality themes - Achievement of carbon neutrality - Sustainable cities and fulfilling daily lives	 Effective Use of Resources and Promotion of Reduction of Hazardous Substances, Etc. - Continuation of zero-emission waste and further reduction of waste through valorization, etc. - Promoting the appropriate understanding and reduction consideration of hazardous substance emissions, water usage and discharge, etc. - Contribution to a circular economy Related materiality themes - Environmental conservation and minimization environmental footprint
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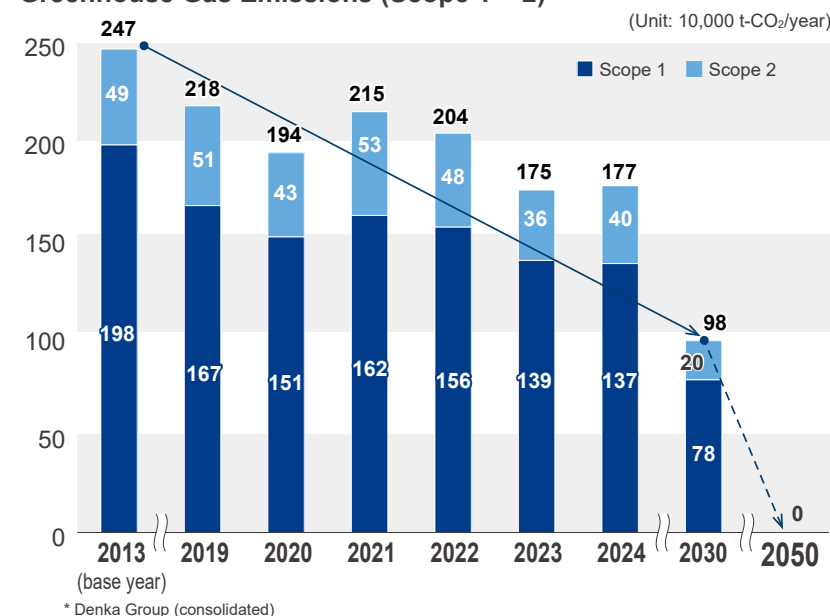
Carbon Neutrality

For CO₂ emissions attributable to our company (Scope 1 and 2), we are aiming for a 60% reduction from FY2013 levels by 2030 and for carbon neutrality by 2050, so we will strive to convert raw materials, fuel, and processes, and to expand our energy conservation and use of renewable energy. We will also actively collaborate with business partners and local governments to reduce CO₂ emissions in the supply chain (Scope 3).

Roadmap Toward Carbon Neutrality



Medium- and Long-term Targets for Reducing Greenhouse Gas Emissions (Scope 1 + 2)



Regarding Scope 3 Emissions

Scope 3 emissions in FY2024 were about 47% of total emissions (Scope 1+2+3).

To promote carbon neutrality throughout the supply chain in an active manner, we are collecting CFP (carbon footprint) and reduction plan information for raw materials from suppliers and setting reduction targets for Scope 3.

We are also steadily reducing Scope 3 emissions by “examining switching to low-carbon raw materials,” “developing and expanding sales of environmentally friendly products that reduce users’ CO₂ emissions” and “reducing waste generated during manufacturing.”

Adoption of Internal Carbon Pricing (Internal Carbon Taxes)

At Denka, we have adopted an internal carbon pricing system for capital investment to further carbon neutrality. For our most recent investments, the price is set to ¥10,000/t-CO₂, and this is used as a standard for determining profit and other figures. Going forward, we will investigate trends by governments and other countries, and review this pricing as appropriate.

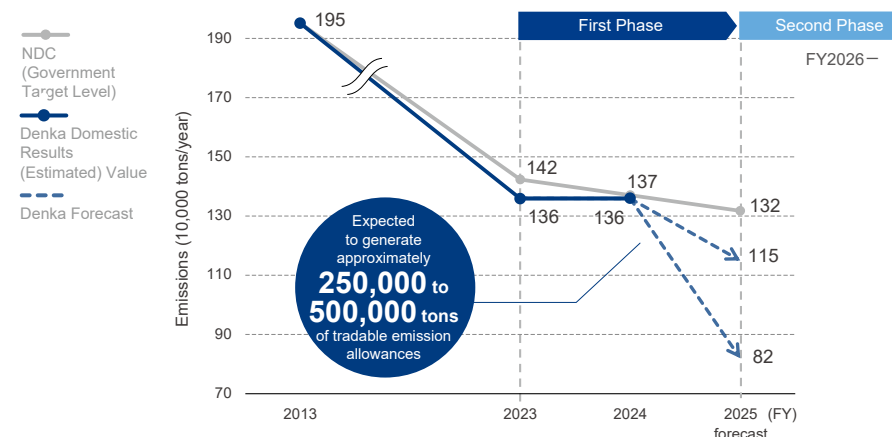
Participation in GX League

The GX League aims to promote discussion and practical action for the creation of new markets, through industry-government-academia collaboration, by a group of companies that will lead the transformation of the entire economic and social system.

As a company that has declared carbon neutrality, we participate in the GX League. In the first phase of emissions trading (FY2023–FY2025), we expect to generate approximately 250,000 to 500,000 tons of tradable emission allowances through CO₂ emission reductions. We are committed to achieving our targets and working toward carbon neutrality through voluntary emissions trading and other initiatives.



Our CO₂ Emissions (Scope 1) and Emission Allowances in the First Phase (FY2023–FY2025)



Initiatives for Environmentally Conscious Products and Technologies

Carbon Negative Concrete “CUCO” Project



CUCO website
<https://www.cuco-2030.jp/>

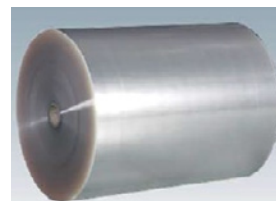
CUCO is a consortium of 55 companies led by Denka, Kajima Corporation, and Takenaka Corporation implementing the “Green Innovation Fund Project/Project for Development of Concrete and Other Manufacturing Technologies Using CO₂,” adopted by the New Energy and Industrial Technology Development Organization (NEDO). Through this project, we aim to realize highly versatile carbon negative concrete, develop construction technologies, establish quality assessment technologies, and promote the use of these technologies around the world. Also, through active CO₂ fixation in concrete—a goal we are pursuing through development of this technology—we will promote the transition from decarbonization to “active carbon” to play our role in the reduction of greenhouse gases.

As a result of the consortium’s joint development, our “LEAF” is used as a component material in the “CUCO-SUICOM Shot,” which was used in part of the structure of the “CUCO-SUICOM Dome (Sustaina Dome)” constructed by Kajima Corporation at the Osaka-Kansai Expo site, as well as in the “CUCO-SUICOM Block” laid as sidewalk blocks at the EXPO Arena. Technologies developed by this consortium are branded as CUCO, and we are working to promote their widespread adoption for social implementation.

Biomass BOPS

BOPS is a biaxially stretched polystyrene resin sheet widely used mainly for food containers, leveraging its transparency, rigidity, and food safety. We have launched “Biomass BOPS,” which allocates biomass-derived raw materials using the mass balance approach*. As part of promoting the circular economy, we have obtained the international “ISCC PLUS Certification,” a system that manages and guarantees products made from sustainable raw materials such as recycled or biomass materials throughout the supply chain. “Biomass BOPS” is our first biomass product using this approach.

* The mass balance approach is a method in which raw materials with certain characteristics are mixed with those without during processing and distribution, and those characteristics are allocated to a portion of the product according to the input amount of the specific raw material.



AlSink

“AlSink” is a composite material made of aluminum and ceramics, featuring a coefficient of thermal expansion similar to ceramic substrates and a thermal conductivity equal to or greater than aluminum nitride (AlN). As a highly reliable heat sink material, it contributes to the enhanced performance and longevity of high-power modules. In addition to applications in power modules for railway inverters, which require high reliability, demand for DC power transmission in the renewable energy sector is rapidly expanding, contributing to the energy shift toward renewable.



Expansion of Renewable Energy Sources and Introduction of Power Generation Technologies with Low Environmental Impact

In the 110 years since our founding, Denka has cultivated technology for creating renewable energy—primarily hydroelectric power generation—and technology for fully exploiting that energy in chemical manufacturing. Going forward, we will continue to focus on initiatives toward further decarbonization for realizing carbon neutrality.

1 Outlook for Our Renewable Energy Generation Capacity

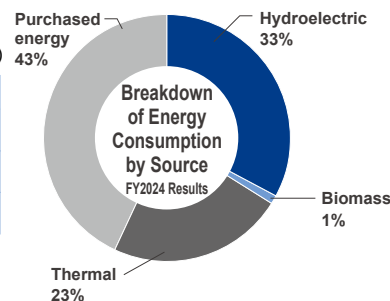
To achieve carbon neutrality by 2050, we are working to achieve early attainment of the “maximum output of renewable energy generation: 150MW” set as a non-financial KPI in our management plan “Mission 2030,” and to further increase this target. At present, we are considering introduction of new solar power generation facilities at business sites, renewal of existing hydroelectric power plants (improvement of power generation efficiency), and, over the medium- to long-term, the possibility of introducing new power sources, such as development of hydroelectric power plants. We will accelerate these efforts going forward.

Outlook for Our Renewable Energy Generation Capacity

(Power generation capacity MW)

	FY2023	FY2024	FY2030
Hydroelectric	140	140	140
Solar, etc.	6	7	10
Total	146	147	150

* The above figures include 50% of the power output from power plants run by Kurobegawa Electric Power Company (a joint venture co-owned by Denka and Hokuriku Electric Power Company).



2 Denka Hydroelectric Power

The Omi Plant is geographically situated amid a web of 17 hydroelectric power plants, including power plants co-owned together with Kurobegawa Electric Power Company, which boast a total maximum output of approximately 140,000 kW, making this one of the largest private-owned power generation networks of its kind in Japan. Hydroelectric power plants generate virtually no greenhouse gases while serving as a renewable energy source with superior energy efficiency. Thus, these power plants are capable of harmoniously coexisting with the natural environment while generating electricity in a sustainable manner. About 1/3rd of our power demand is met with hydroelectric power, and by effectively using this resource, we will contribute to the realization of a sustainable society.

Hydroelectric power

Japan

17 locations * Includes plants owned by joint venture companies

Maximum Output

140,290 kW

* As of March 2025, including Denka's ownership of output from hydroelectric power plants owned by a joint venture



New Omigawa Hydroelectric Power Plant (started operation in 2021)



New Himekawa No.6 Hydroelectric Power Plant (started operation in 2022)

3 Energy Conservation Initiatives

In terms of thermal power plants, we have introduced high-efficiency gas turbine power generation facilities at the Omi Plant (FY2020) and the Chiba Plant (FY2022), and these will contribute to energy conservation and reduction of CO₂ emissions. Looking towards the future, we are also investigating and considering power generation facilities using hydrogen gas single-fuel or mixed-fuel burning technology.



Gas turbine power generation facilities at the Omi Plant, which began operation in 2020



Gas turbine power generation facilities at the Chiba Plant, which began operation in 2022

4 Solar Power Generation Initiatives

In addition to the solar power generation facilities currently operating at the Shibukawa and Isesaki Plants in Gunma Prefecture, solar power generation facilities using PPA* have started operation at our plant in Vietnam (FY2024) and at the Chiba Plant (FY2025).

To increase renewable energy generation capacity, which is tied to the non-financial KPIs in our management plan “Mission 2030,” we are examining the potential for adoption throughout the Group, both inside and outside Japan.

* Power Purchase Agreement (PPA): A system under which a power producer installs and operates a solar power generation facility on our company's site, and supplies the generated power to our company.



Solar Power Generation PPA at Overseas Site (Vietnam)

Information Disclosure Based on the Recommendations of the Task Force on Climate-Related Financial Disclosure (TCFD)

Denka Group announced its support for TCFD in September 2020. Going forward, we will carry out ongoing assessments focused on risk and opportunities arising from climate change and other relevant factors, including changes in government policies, regulations and market conditions as well as technological breakthroughs in the course of across-the-board initiatives aimed at realizing the low-carbon society and decarbonized economy envisioned by the Paris Agreement.



Governance

For details on our sustainability promotion structure, please refer to [▶P31](#)

Metrics and Targets

In our management plan "Mission 2030," we have set non-financial KPIs for achieving carbon neutrality, and are managing our progress.

CO₂ emissions (Scope 1+2) reduction rate... 2030: 60% (compared to FY2013) 2050: 100%

Maximum renewable power generation output...2030: 150 MW

Risk Management

Risks related to climate change is managed as a priority risk in Denka's risk management system. [▶P87](#)

Strategy

We are analyzing scenarios regarding the risks and opportunities of climate change, and we will continue verifying anticipated effects and countermeasures over the medium- to long-term. Through analysis, we will quantitatively ascertain business risks and opportunities for the Denka Group, and will incorporate these into our management plan and business strategies.

Climate Change-related Risks and Opportunities Based on Scenario Analysis

■ Risks ■ Opportunities

Scenario	TCFD classification		Risk/opportunity event	Approach to calculating impact		Impact		Applicable Division	Main related business sites	Countermeasures
						Medium term (2030)	Long term (2050)			
NET ZERO (1.5°C)	Risks	Laws/ regulations	Increased costs due to rising carbon taxes	Calculation of amount of carbon tax based on the carbon price projections of the IEA's WEO, taking GHG emissions in FY2022 as a reference point	Calculation of the cost share if decarbonization measures are not taken	¥43 billion	¥77 billion	All divisions	Omi Plant	・ Expansion of clean energy, support for energy conservation, and introduction of new technology
					Calculation of the cost share if decarbonization measures are taken (reduction of CO ₂ emissions (Scope 1, 2) by 60% by 2030, and 100% by 2050, from FY2013 levels)	¥21 billion	¥0			
	Opportunities	Products/ services	Growth in demand for products that contribute to decarbonization (silicon nitride, acetylene black, spherical alumina)	Calculation of increase in sales based on market growth rate, using sales results from FY2022 as a reference point	¥19 billion	—	Electronics & Innovative Products	Chiba Plant	・ Augmentation of production facilities in line with increased demand	
			Growth in demand for products that contribute to solving the food crisis (biostimulant market)	Calculation of increase in sales based on market growth rate, using sales results from FY2022 as a reference point	¥0.1 to 1 billion	—	Elastomer & Infrastructure Solutions	Denka Azumin Co., Ltd.	・ Introduction of new products and expansion of sales ・ R&D on products with even higher functionality	
			Growth in demand for products which make effective use of CO ₂ (LEAF concrete for CO ₂ capture and fixation)	Calculation of increase in sales based on sales plan	¥0.1 to 2 billion	—	Elastomer & Infrastructure Solutions	Omuta Plant	・ Introduction of new products and expansion of sales ・ R&D on products with even higher functionality	
3~4°C	Risks	Markets	Increased raw material and fuel costs due to rising naphtha prices	Calculation of cost increase due to price inflation rate, taking the fuel purchase amount for FY2022 as a reference point (IEA WEO)	¥~4 to 6 billion	¥~5 to 12 billion	Polymer Solutions	Omi Plant	・ Promotion of recycling resources through chemical recycling of used polystyrene, and development/sale of biomass-derived raw material products such as resins containing eggshell	
			Increased raw material and fuel costs due to rising natural gas prices	Calculation of cost increase due to price inflation rate, taking the fuel purchase amount for FY2022 as a reference point (IEA WEO)	¥~6 to 1 billion	¥~8 to 1 billion	All divisions	Omi Plant, Chiba Plant	・ Reduction in usage through process electrification ・ Energy conservation through optimization of production flow	
		Physical risks	Increased damage to production facilities and suspension of production activities due to intensification of natural disasters	Calculation based on increase in annual rainfall and risk of flood damage at business sites near oceans and rivers	¥1 billion or less	¥1 billion or less	All divisions	Omuta Plant	・ Review and strengthening of facility maintenance measures	
	Opportunities	Products/ services	Growth in demand for products (vaccines and diagnostic reagents) that contribute to the prevention and diagnosis of infectious diseases	Calculation based on market growth rate, using sales results from FY2022 as a reference point	¥17 billion	—	Life Innovation	Gosen Site	・ Strengthening R&D and introducing new technology ・ Augmentation of production facilities in line with increased demand	

Initiatives for Biodiversity and the Task Force on Nature-related Financial Disclosures (TNFD)



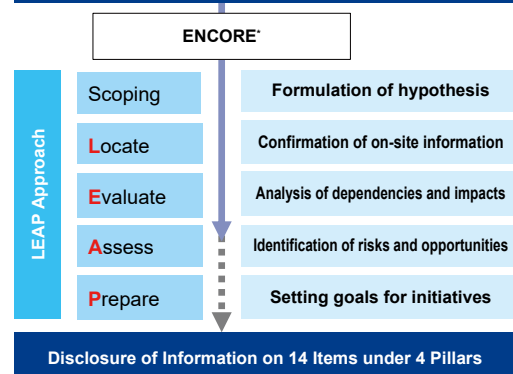
The Denka Group has set forth “Reduce environmental burden and the preservation/protect biodiversity” in our ESG Basic Policy, and are working hard to understand the environmental impact of our business activities, and to avoid, and mitigate risks, while promoting activities cognizant of preserving and improving biodiversity in the surrounding area of the production and research facilities.

As part of these efforts, we have been organizing information, conducting field surveys, analysis, and implementing evaluations in line with the “LEAP Approach” recommended by the Task Force on Nature-related Financial Disclosures (TNFD) since September 2022.

Participation in Initiatives

Denka became a member of the Taskforce on Nature-related Financial Disclosures (TNFD) Forum, an international initiative on biodiversity, in August 2024. We also joined the Keidanren Nature Conservation Council from October 2024, and will contribute to biodiversity through the Biodiversity Declaration Initiative.

Preliminary Natural Environment Survey (9 Domestic Sites)



* LEAP approach: An integrated approach for scientifically evaluating contact points and dependency relationships between business activities and nature, as well as impacts, risks, opportunities, and other nature-related issues

* ENCORE (<https://encorenature.org/en/>): Allows you to filter by sector or sub-industry and check the degree of dependence on and impact on nature.

Achievements to Date and Future initiatives

We have conducted ENCORE analysis and on-site surveys (see column below) to understand the connection between operations at each of the nine domestic sites and the natural environment.

As a result of research and analysis under the Scoping and Locate steps, Omi Plant was selected as a model site for deepening priority initiatives. Based on the results (Evaluate) of organizing the dependencies and impacts related to Omi Plant and their causal relationships, we will identify risks and opportunities and link them to specific countermeasures going forward.

Survey and Analysis of Dependencies and Impacts on Nature in the Sector Where Omi Plant is Located (Scoping~Locate~Evaluate)

In the sector where Omi Plant is located, it was found that there is a strong dependence on ecosystem services related to the categories of “water,” “greenhouse gas,” “pollutants,” “waste,” and “species,” as well as a significant impact on natural capital. Areas where such connections exist between nature and the operations of Omi Plant were identified as “priority areas.”

Among these “priority areas,” we began surveys to confirm the situation of forests distributed in the catchment area of hydroelectric power, which is an important energy source for Omi Plant, and the Omi Plant green space adjacent to a local recreation area.

Dependency/ Impact Categories	Dependency/ Impact	Dependent ecosystem services/ Factors causing impacts
Water	Dependency	Water flow regulation
Water	Dependency	Water supply
Water	Dependency	Water purification
Water	Impact	Water usage
Greenhouse gas	Impact	Greenhouse gas emissions
Pollutants	Impact	Discharge of harmful pollutants into water and soil
Waste	Dependency	Purification of solid waste
Waste	Impact	Generation and release of solid waste
Species	Impact	Disturbance (e.g., noise, light)

For categories of natural capital with strong dependencies and impacts on nature, we are organizing and studying the following relationships with the natural environment to examine issues related to dependencies and impacts that should be prioritized.

- **Factors that cause changes in ecosystem services on which we depend**
- **Impacts of plant operations on natural capital**

During our studies, we also value collaboration with relevant organizations and communication with local natural environment experts, and will link these to specific environmental conservation activities as the Denka Group.



[Column] ~Evaluation of the Location Environment of Nine Domestic Business Sites and Strengthening Relationships with Local Governments~

For the nine domestic business sites, we organized environmental data (such as the presence of areas important for biodiversity around the plants and areas where ecosystem integrity is rapidly declining) and confirmed the connection with the natural environment on-site from the perspective of location and operational activities. In addition, to examine initiatives based in local regions, we are also promoting exchanges of opinions with local governments where the sites are located. In Machida City, where the Denka Innovation Center is located, efforts have begun to explore collaboration for the conservation of rare plants.



Confirming the location environment of the Innovation Center (left) and wild rare species (right)

[Examples of future environmental conservation activities that take into account dependence and impact on nature]

- ① Hydroelectric power prevents the “generation of greenhouse gases” but depends on “water flow regulation services.”
→ **Ensure “water flow regulation services” (maintenance of water sources, health of forests that conserve water sources).**
- ② The operation of the Omi Plant may cause “disturbance to living organisms due to noise and light,” which could force operational environmental considerations or lead to the degradation of ecosystem services.
→ **Consider measures to reduce the impact of noise and light.**
- ③ The “generation and release of solid waste” associated with the operation of the Omi Plant may cause environmental changes in land areas, such as expansion of disposal sites.
→ **In addition to current measures, devise new countermeasures.**