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Stakeholders

Environment



Masanobu Kosaka

Executive Officer Officer in Charge of Sustainability Promotion Department

Message

Contributing to Climate Change and Global Environmental Conservation

At Denka, sustainability is at the core of our management, and from the perspective of environmental, social, and governance (ESG), we see our mission as helping to conserve the global environment and achieve sustainable development of society. More specifically, we aim to achieve carbon neutrality by fiscal 2050, conserve the environment, and promote cyclic use of resources, and efforts to achieve these goals are clearly set out in our management plan, "Mission 2030." We announced our policy of achieving carbon neutrality by fiscal 2050 in fiscal 2020, and also set a new interim reduction target of a 60% (from emission levels in FY2013) by fiscal 2030 in fiscal 2023. To reach these goals, we will strongly promote measures such as the development and adoption of technology in processes that directly relate to emissions, promotion of energy conservation, and broader use of renewable energy. As one such initiative, we have begun considering adoption of new technology for producing acetylene in order to reduce non-energy derived CO₂ emissions. Denka has also adopted the goals of reducing waste, conserving natural resources, and contributing to a circular economy. To reduce waste, we are working to optimize manufacturing processes, recycle materials, and design products for longer service life. In the area of

natural resource conservation, we have begun to conduct surveys for biodiversity in accordance with the Taskforce on Nature-related Financial Disclosures (TNFD), which has announced new guidelines. As a contribution to the circular economy, we are working to chemically recycle polystyrene. This recycling technique involves chemically breaking down used polystyrene, returning it to the raw material state, and then polymerizing again. This allows us to produce recycled products with quality and properties on a par with new products. The demonstration equipment was completed in March 2024. This will allow us to participate in a platform bringing together citizens, corporations, and government, and we have started building a system for recovering used polystyrene. In addition to these activities, we are actively participating in international frameworks, such as the signatory to the United Nations Global Compact, announcing our support of the Task Force on Climate-Related Financial Disclosure (TCFD), and participating in the GX League. Thus, we are bolstering our efforts to achieve sustainability from a global perspective. Through a diverse range of initiatives, Denka will show its corporate stance aimed at the realization of a sustainable society, and paving path towards the future with our stakeholders.

FY2024 Environmental Policy



We will pursue sustainability, contribute to global environment conservation, and improve corporate value.

1 With the aim of creating the sustainable business value described in "Mission 2030," we will work to realize carbon neutrality by 2050, promote recycling of resources, and conserve the environment while minimizing environmental impact.





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ESG

Denka

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).



Regarding Scope 3 emissions

Scope 3 emissions in FY2023 were about 44% of total emissions (Scope 1+2+3). To actively promote increasing carbon neutrality of the entire supply chain, we will examine reduction of Scope 3 emissions from this fiscal year forward.

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 $\pm 10,000/t$ -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-governmentacademia collaboration, by a group of companies that will lead the transformation of the entire economic and social system. We are participating in the GX League as a company which has

made a carbon neutral declaration, and we will work to achieve carbon neutrality through activities such as voluntary emissions trading.



Introduction of innovative technologies and measures to reduce CO₂ emissions

With a target of net zero CO_2 emissions in 2050, we are jointly commercializing an innovative technology to produce acetylene from methane using a plasma process. This is being done together with Transform Materials, a US venture company. This technology does more than just reduce CO_2 derived from limestone. By effectively utilizing the hydrogen produced as a by-product we can make a major contribution to Denka's carbon neutrality (contribution to CO_2 reduction: approximately 300,000 tons/year). We are aiming for early implementation and realization through joint research with Transform Materials. Conceptual diagram of acetylene production technology from methane

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Initiatives for Environmentally Conscious Products and Technologies

Carbon Negative Concrete "CUCO" Project

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.

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



Silicon Nitride Powder

Molded items using silicon nitride powder are lightweight, with outstanding high-temperature strength and fracture toughness. They are garnering attention for their excellent characteristics such as resistance to abrasion, corrosion, and heat shock. Heat dissipation technology is essential for xEVs and electric rail, where numerous heats generating electronic components are packed together.

Silicon nitride is also used in bearing balls for wind power generation. Ceramic bearings have a high heat-resistant temperature, the ability to withstand high loads and high rotation speeds, and no rusting like steel bearings, and thus are contributing to the dissemination of offshore wind power.



Denka Spherical Alumina

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Spherical alumina (heat-radiating filler), developed by leveraging Denka's unique "spheroidization" technology based on high-temperature melting, enables superior filling in various resins and rubbers. This is effective for dissipating heat produced from sources like automotive lithium ion batteries, and reducing energy losses due to electrical resistance. An extensive lineup of products with different particle sizes enables closely-packed filling, so excellent heat dissipation characteristics are obtained, and the technology contributes to reduction of environmental impacts.



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

In the 109 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.

Hydroelectric

Biomass

1%

Waste heat

1%

39%

Breakdown of

Energy Consumption

by Source

FY2023 Results

1 Future Outlook for Our Renewable Energy Generation Capacity

In order to achieve carbon neutrality by 2050, we are promoting efforts toward early attainment and going beyond our goal of "maximum renewable energy generation output: 150 MW" indicated in the non-financial KPIs of "Mission 2030." 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.

ower generation canacity MW)

Purchased

Thermal

23%

energy

36%

Future Out	look for Our	Renewable			
Energy Generation Canacity					

		(· • · · · · · · · · · · · · · · · · · ·			
	FY2005	FY2023	FY2030		
Hydroelectric	111	140	141		
Solar, etc.	3	6	13		
Total	114	146	154		

* 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 plants Japan **17**_{plants} * Includes co-owned plants Power generation capacity **1400,2900**_{kW} * As of August 2023, including Denka's ownership of output from 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.



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

4 Solar Power Generation Initiatives

Solar power generation facilities are currently operating at the Shibukawa and Isesaki Plants in Gunma Prefecture, and aside from these we are introducing facilities using PPA* at our Chiba Plant and our plant in

Vietnam. 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.



DENKA Solar Power Shibukawa

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.



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Governance

Denka's response to the problem of climate change over the medium- to long-term is overseen by the Officer in Charge of Sustainability Promotion, under the supervision of the Board of Directors. Non-finance matters deemed particularly important— including the formulation of targets and basic policies, priority measures, and the determination and evaluation of management indicators—are discussed by the Sustainability Committee (convened five times a year), with the Board of Directors making final decisions.

A working group has also been established for comprehensive management and implementation of environmental policy. At monthly meetings, the officer in charge serves as leader. Discussion includes practical issues, and responses to those issues are promoted. Important matters are reported to the Board of Directors.

Risk management

Risks related to climate change is managed as a priority risk in Denka's risk management system.

Climate Change-related Risks and Opportunities Based on Scenario Analysis

Metrics and Targets

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

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Strategy

Reduction rate of CO₂ emissions (Scope 1+2)... 2030: 60% (of FY2013 levels), 2050: 100% Maximum renewable power generation output... 2030: 150 MW (133 MW in FY2021)

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. Throughanalysation, we will quantitatively ascertain business risks and opportunities for the Denka Group, and will incorporate these into our management plan and business strategies.

Risks Opportunities

Sconario		Pick/opportunity event	Apr	proach to calculating impact	Impa	ict	Applicable Division	Main related	Countermoseuroe
Scenario	TOPD classification	Riskopportunity event	Approach to calculating impact		Medium term (2030)	Long term (2050)	Applicable Division	business sites	Countermeasures
	Laws/regulations taxes	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			
1•5°C	Technology	Increased costs due to carbon reduction in manufacturing processes	Setting the environmental inv "Mission 2030"	restment up to 2030 in the management plan	¥85 billion	-	All divisions	Omi Plant, Omuta Plant	 Reduction of CO₂ by more than 300,000 tons per year by switching manufacturing process to a "low-carbon acetylene chain" (methane to acetylene) Pursuit of further profit through steps such as R&D to utilize by-product hydrogen
		Growth in demand for products that contribute to decarbonization (silicon nitride, acetylene black, spherical alumina)	Calculation of increase in sales due to market growth rate, using sales results from FY2022 as a reference point		¥19 billion	-	Electronics & Innovative Products	Omuta Plant	Augmentation of production facilities in line with increased demand
	Products/services	Growth in demand for products that contribute to solving the food crisis (biostimulant market)	Calculation of increase in sal from FY2022 as a reference	es based on market growth rate, using sales results point	¥0.1 to 1 billion	-	Elastomer & Infrastructure Solutions Division	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 Division	Omi Plant	 Introduction of new products and expansion of sales R&D on products with even higher functionality
	Markets	Increased raw material and fuel costs due to rising naphtha prices	Calculation of cost increase amount for FY2022 as a refe	ase due to price inflation rate, taking the fuel purchase a reference point (IEA WEO) ¥-4 to 6 billion ¥-5 to 12 billion Polymer Solutions Division Chiba Plant Products incorpor	 Promotion of recycling resources through chemical recycling of used polystyrene, and development/sale of biomass-derived raw material products incorporating things 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
3-4°C	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
	Products/services	Growth in demand for products (test reagents) that contribute to 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 Division	Gosen Site	Strengthening R&D and introducing new technology Augmentation of production facilities in line with increased demand

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Initiatives for Biodiversity and the Taskforce on **Nature-Related Financial Disclosures (TNFD)**



Taskforce on Nature-related Financial Disclosures

The Denka Group has set forth "Reduction of environmental burden and the preservation/protection of biodiversity" in our ESG Basic Policy, and are working hard to understand the environmental impact of our business activities, and to avoid, mitigate, and compensate for risks, while promoting activities cognizant of preserving and improving biodiversity in the areas near our business sites. As part of these efforts, we began assembling information in accordance with the disclosure framework of the Taskforce on Nature-Related Financial Disclosures (TNFD), an international initiative for nature-related information disclosure, and carrying out survey activities, analysis, and evaluation necessary for disclosure in September 2022.

Based on the understanding, gleaned through preliminary surveys, that the characteristics of natural capital vary by region, we are conducting surveys and analysis via the "LEAP approach"* recommended by TNFD for nine production and research sites in Japan. By FY2024, we will evaluate all nine sites, and use this to drive concrete actions for addressing issues relating to biodiversity.

* 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

Latent dependencies and impacts on natural capital

By using the nature-related risk analysis tool "ENCORE"* recommended by TNFD, we have analyzed latent dependencies and impacts on natural capital for five domestic business sites where we carried out surveys from September 2022 to March 2024. At the Omi Plant, we identified potential risks in the nature category for species, water, and habitats.

* ENCORE (https://encorenature.org/en): A tool for focusing in by sector or sub-industry, and checking dependencies and impacts on nature for each production process





Dependency

Our domestic plants and the surrounding natural environment (ecosystems)

Our business sites are scattered across Japan, and the surrounding natural environment varies. We are conducting surveys on the points of contact with the natural environment at each business site and evaluations for biodiversity.



Relationship between Domestic Business Sites (Plants) and Natural Capital, Priority Regions, etc.

We assembled environment data and evaluated site environments for five domestic business sites. The results are set out in the table at right. For the five sites, we identified ecosystem integrity relating to natural capital for which our business activities have high impact and dependency, and priority regions and key conservation targets in line with their materiality. To examine the potential for sustainable use of hydroelectric power, we carried out a survey for the Omi Plant to check the situation of the forest distributed in the catchment area. We also conducted a survey of the natural environment of the Tomi Plant green space. We have checked for the presence of the important plant species Calanthe puberula, the important bird species Certhia familiaris, and other species which contribute to biodiversity. Going forward, we will expand our surveys and evaluations based on the LEAP approach to other business sites, and identify priorities to be addressed.

Natural capital with high impact/ dependency	Priority region and main conservation target (target with issues relating to the natural environment, where the site has assets or activities)
Water	Catchment area of intake weir for hydroelectric power generation (water conservation forest)
Species	Interval with intake weir for hydroelectric power generation from Hime River estuary (fish)
Habitat	Tomi Plant green space
Species	Miyajima Marshlands and surrounding agricultural land (greater white-fronted geese visit during migration)
Species	Agricultural land near plant (overwintering swans)
Water	Intake of plant water (Tone River)
Species	Various organisms constituting the river ecosystem of the Tone River
Habitat	Coastal area of Ariake Sea, including plant and related facilities
	Natural capital with high impact/ dependency Water Species Species Species Water Species Habitat



Survey to check siting environment



Catchment area



Calanthe puberula (orchid family)