Mitigation and Adaptation to Climate Change

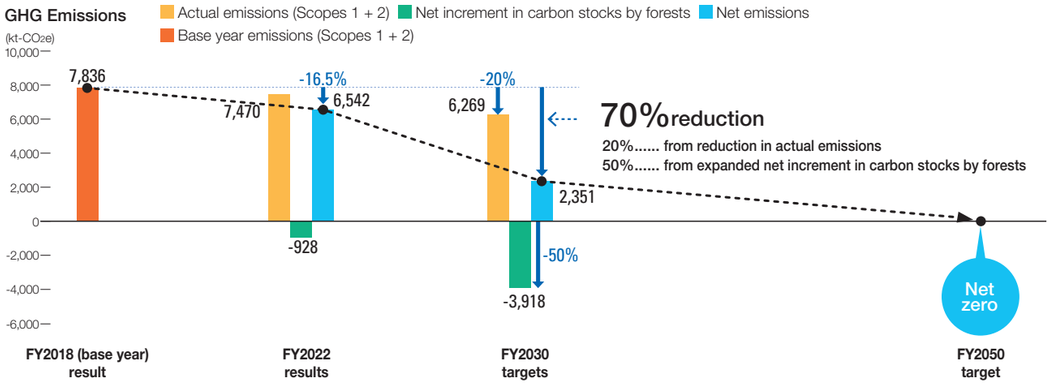
Basic Approach

The Oji Group established Environmental Charter in 1997 with the basic philosophy of rolling out its corporate activities in harmony with the environment from a wide global perspective and contributing to the realization of a truly affluent, sustainable society. As our vision toward mitigating climate change based on the Charter, in 2020 we formulated our Environmental Vision 2050 centered around the goal of net-zero carbon, and we also set a milestone target to achieve that goal in our Environmental Action Program 2030 of reducing our greenhouse gas (GHG) emissions by at least 70% compared to FY2018 levels. To achieve the target, we focus on reducing actual emissions by reducing coal consumption and other emission sources, and increasing the net increment in carbon stocks by forests.

GHG Emissions Reduction Target and Emissions Results

Our goal is to reduce net emissions (actual emissions minus net increment in carbon stocks) by at least 70% compared to the FY2018 levels by FY2030. Of this, 20% is to be achieved by reducing actual emissions (total of Scope 1 and Scope 2), and 50% is to be achieved by increasing the net increment in carbon stocks by forests.

In FY2022, the net GHG emissions were reduced by 16.5% compared to the FY2018 levels, to 6,542 kt-CO_2e.



Roadmap for GHG Emissions Reduction toward FY2030

	Category	Sub-category	GHG reduction (kt-CO_2e)	GHG reduction rate	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Reduction in actual emissions	Improve energy efficiency	Maintain energy conservation	200	2.6%	Reduce energy consumption intensity by 1.0% or more per year, averaged over five years									
					Reduced by 3.8% on average between FY2018 and 2022									
	Increase the percentage of renewable energy use	Reduce coal consumption	1,007	12.9%	● Shut down 1 boiler ○ To shut down 1 boiler								To shut down 6 boilers	
					Technical research and test for changing the fuel composition					Studies and decisions on facility			Implementation	
		Install private solar power systems, etc.	360	4.5%	Installation planning					Investment decisions			Installation	
					Install solar power systems on factory roofs and idle land									
Subtotal			**1,567**	**20.0%**		Reduction of 366 kt-CO_2e (4.7%)								
Expansion of net increment in carbon stocks by forests	Invest in forest conservation and plantation	Expand forest plantations	3,918	50.0%	Overseas production forests 256,000 ha	279,000 ha								400,000 ha
					Search for sites, land surveys					Assessment of business feasibility			Consideration of acquisition, decision	
		Plant fast-growing trees			KTH to be a consolidated subsidiary									
					Continue forest tree breeding (breed improvement) and elite trees' plantation									
					Net increment in carbon stocks by forests: 928 kt-CO_2e (11.8%)									
Total			**5,485**	**70.0%**										

Participation in the GX League

Oji Holdings joined the GX League which began full-scale activities in May 2023. The League is a forum for companies endeavoring for carbon neutrality to discuss and carry out a transformation of the entire socio-economic systems (green transformation) in cooperation with the Japanese Government, universities, and financial institutions.

Reducing Actual Emissions

We are working to improve energy efficiency and increase the percentage of renewable energy use to reduce GHG emissions through our business activities. In FY2022, the actual GHG emissions were reduced by 4.7% compared to the FY2018 levels, to 7,470 kt-CO_2e.

Improve Energy Efficiency

We are working to improve our energy efficiency with a target reduction in energy consumption intensity of at least 1% per year, averaged over five years. Our mills and plants regularly hold energy conservation meetings, attended by personnel from energy management and manufacturing divisions to discuss facility renovations and change of operation methods.

In FY2022, our domestic business companies made energy conservation investments of 1.6 billion yen, thereby reducing energy consumption corresponding to approximately 1% of the total energy consumption across the Group (crude oil conversion 47 thousand kL). Energy consumption intensity was reduced by 3.8% per year on the average between FY2018 and FY2022.

Increase the Percentage of Renewable Energy Use

The Oji Group has increased the percentage of renewable energy use by utilizing black liquor (byproduct from its global pulp production operations), wood residue, and bark as fuels. Aiming to further improve energy efficiency, we are working to reduce coal consumption while introducing solar power generation systems.

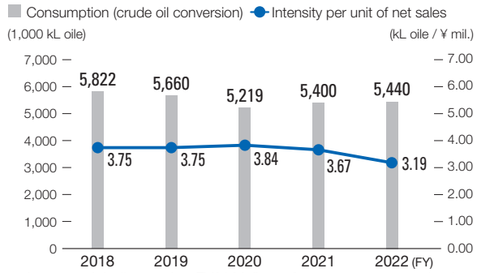
In FY2022, the percentage of renewable energy use was 54.7%.

Reduce Coal Consumption

Of the 16 boilers in Japan that were burning coal as of FY2018, we will disuse eight coal-only-fired boilers by FY2030 which do not include backup boilers, and switch to gas fuels in a transition phase toward decarbonization. We shut down a coal boiler at Oji Materia Nayoro Mill in FY2021 as part of restructuring of production systems, and also shut down a coal boiler at Oji F-Tex Ebetsu Mill in FY2023. We are also considering reducing coal consumption by changing the composition of fuels at coal co-fired boilers. With the investment of about 100 billion yen, we expect to reduce GHG emissions by about 1,000 kt-CO_2e.

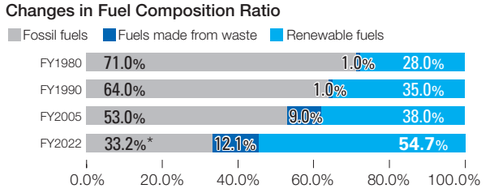
As achieving net-zero carbon emissions will require further reduction of the use of fossil fuels including gas, in the future, we will also consider using hydrogen, ammonia, and synthetic methane (e-methane) as fuels.

Energy Consumption★ and Intensity



★ A star mark indicates that FY2022 figure for energy consumption has been assured by KPMG AZSA Sustainability Co., Ltd.
For the calculation method, see page 111.

Changes in Fuel Composition Ratio



*Breakdown: Coal 11.4%, gas 8.7%, oil 7.3%, and purchased energy 5.8%

Installation of Solar Power Systems

We have been installing solar power systems on factory roofs and idle land. A new warehouse built in August 2022 at Oji Nepia Edogawa Factory uses electricity generated from solar power. At Oji Container Tochigi Plant, a solar power generation facility scheduled to start operation in September 2023 will supply all of the power used by the plant during the daytime.

Solar power generation facility at Tochigi Plant, Oji Container

Topics Efforts for a Shift to Black Pellets Fuel

At the boiler #6 of Oji Paper Tomakomai Mill, where waste-derived fuels (RPF, waste tires, sludge, etc.) and coal are co-fired, a demonstration test for a shift from coal to black pellets to reduce CO_2 emissions is underway.

Three tests were conducted in FY2022 to collect basic data on the fuel such as transportability and combustibility. Now we will draw up a plan for a long-run test in view of stable regular operation, to identify issues and consider whether boiler retrofitting is needed.

Black pellets (biomass-fuel wood pellets that are semi-carbonized)

Topics

Renewable Energy Power Generation Business

We sell electricity generated by biomass, hydropower, and solar power, indirectly contributing to the reduction of GHG emissions by electricity consumers. In FY2022, we sold 1,103 GWh of electricity through the feed-in tariff (FIT) system for renewable energy under which electric utilities purchase electricity from renewable energy at a fixed price. This is equivalent to a reduction of 480 kt-CO_2e in electricity consumer emissions*.

* Calculated by multiplying the amount of electricity sold by the national average emission factor used to calculate emissions from electricity use under the Mandatory Greenhouse Gas Accounting and Reporting System.

Reducing Emissions from Wood Chip Carriers

Most of the wood chips used as raw material for paper are transported by ship from overseas plantations. With international efforts underway to reduce GHG emissions from ships, Oji Group's chip carriers now navigate at lower speeds to reduce GHG emissions by increasing fuel efficiency. In addition, newer vessels built in recent years generate lower GHG emissions than conventional types, contributing to GHG emissions reduction.

Woodchip carrier GT SELENE (built in 2022)

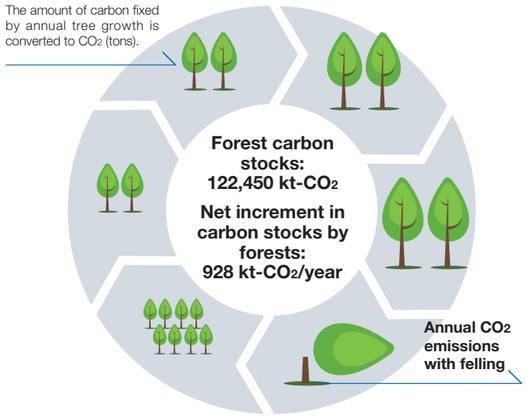
Expansion of Net Increment in Carbon Stocks by Forests

The Oji Group owns a total of 603,000 ha of forests (comprising 455,000 ha of production forests and 148,000 ha of conservation forests) in Japan and overseas and practices sustainable forest management taking into consideration the environment, society, and economy. The actual carbon stocks of these forests reached 122,450 kt-CO_2 at the end of FY2022, and the annual average net increment in carbon stocks by forests between FY2018 and FY2022 was 928 kt-CO_2*1. The amount of O_2 released during the same period averaged 675 kt per year*2. To achieve our Environmental Action Program 2030, we aim to increase the net increment in carbon stocks by forests to 4,000 kt-CO_2 by expanding plantations and planting fast-growing trees.

*1 The figures of carbon stocks and net increment in carbon stocks exclude those by CENIBRA's forests planted by third parties and forests less than two years after plantation.
*2 Calculation assuming that the same amount of O_2 as CO_2 absorbed (in moles) is released.
Source: National Institute for Environmental Studies
https://www.nies.go.jp/kanko/news/25/25-3/25-3-04.html (Japanese only)

The net increment in carbon stocks by forests is calculated by the gain-loss method (except for CENIBRA). CENIBRA calculates the figure by the stock difference method which is more accurate. CENIBRA has obtained assurance for the net increment in carbon stocks by forests in FY2021 and FY2022 from a third party organization.

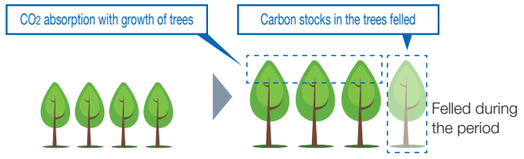
Annual CO_2 absorption with growth



Forest carbon stocks : The CO_2 stocks in Oji Forests as of end of FY2022.
Net increment in carbon stocks by forests : The amount of CO_2 absorbed by the trees in Oji Forests minus the amount of CO_2 stored in the trees felled which are subtracted as emissions. Annual average between FY2018 and FY2022.

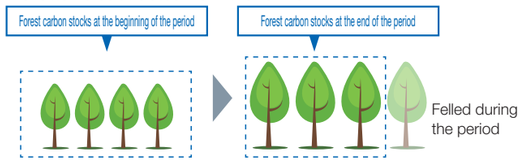
Gain-loss Method

The amount of CO_2 absorbed with growth of trees and the amount of carbon stocks by the trees felled during the period are calculated and the latter is subtracted from the former.



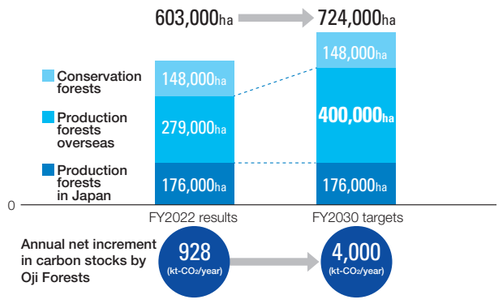
Stock Difference Method

The forest carbon stocks at the end of a period and the forest carbon stocks at the beginning of the period are calculated and the latter is subtracted from the former.



Expand Forest Plantations

With KTH in Indonesia becoming a consolidated subsidiary in FY2022, the net increment in carbon stocks by Oji Forests has increased. We are considering acquiring more sites for forest plantation primarily in South America, Oceania, and Southeast Asia, where we have been operating our forest plantation business. Our target is to expand the area of our overseas production forests to 400,000 ha by FY2030, at an estimated acquisition cost of about 100 billion yen.



Plant Fast-growing Trees

In our overseas forest plantation business, we plant fast-growing trees, including hardwoods such as eucalyptus and acacia as well as softwoods such as radiata pine. We harvest and replant trees in a shorter cycle than general forestry practices, for example, in a 6-to-10-year cycle for eucalyptus and acacia and in an approximately 30-year cycle for radiata pine.

In addition, CENIBRA, Brazil, has long been breeding forest trees. More than 10 types of high-quality varieties with high growth rate and pulp productivity were selected from among more than 20 thousand trees obtained through artificial pollination efforts. KTH, Indonesia, also continues to breed forest trees. Planting high-quality tree species developed by each business increases the growth rate of forest trees, facilitating carbon absorption and fixation.

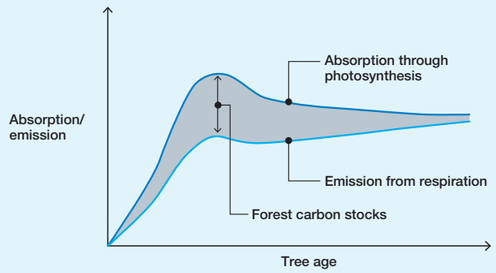

Artificial pollination of eucalyptus


Tree nursery, CENIBRA

Topics Challenges for Japanese Forestry and Action to Mitigate Climate Changes

About two-thirds of Japan's land area is covered by forests, of which plantations account for about 40%. Most of these plantations were planted in the years after World War II to the period of rapid economic growth. Now that half of these trees are over 50 years old and are ready to be fully utilized (time to harvest).

Because respiration relative to carbon absorption is greater in a mature forest than in a young forest in the growing phase, the net carbon absorption capacity decreases as a plantation matures. For this reason, felling and replanting trees in plantations is considered desirable not only for circular resource use, but also for mitigating climate change. However, the rate of carbon fixation (approximately equal to carbon dioxide absorption) by forests has been declining due to the gradual decrease of young forests in the growing phase, as the circular use of forests has been impeded by such problems as declining number of forestry workers, the underdeveloped forest road networks, and slow progress of replanting and cultivation due to falling timber prices.



In Oji Forests in Japan, we intend to fell and replant approximately 400 to 500 ha of plantations every year. We will continue to work to overcome challenges for forestry in cooperation with the government, local communities, and other companies to help the circular use of plantations to increase carbon absorption.

Mitigation and Adaptation to Climate Change

TCFD

The Oji Group announced its support for the Task Force on Climate-related Financial Disclosures (TCFD) in December 2020, and is working on climate-related information disclosure recommended by the TCFD.

TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

The TCFD is a task force established by the Financial Stability Board (FSB) at the request of G20 Finance Ministers and Central Bank Governors Meeting. In June 2017, the TCFD released its recommendations that encourage companies to disclose the financial implications of climate-related risks and opportunities to help investors make appropriate investment decisions.

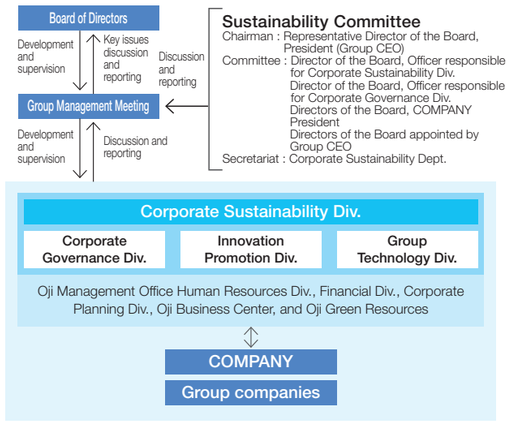
Governance

Recognizing efforts for sustainability including addressing climate change issues as one of the important management challenges, the Oji Group established the Sustainability Committee and the Corporate Sustainability Division in April 2022.

The Sustainability Committee, chaired by the Representative Director of the Board, President of Oji Holdings Corporation (Group CEO) and consisting of Directors of Oji Holdings Corporation (including Presidents of all COMPANIES), discusses the Group's risks associated with sustainability and measures against those risks biannually. Matters discussed at the Committee are referred for discussion and reported to the Group Management Meeting depending on the importance, and after deliberation by the Meeting, the Board of Directors makes a decision on execution of matters. In FY2022, the Group CEO appointed a female Independent Outside Director as a new member of the Committee.

The Corporate Sustainability Division carries forward matters determined by the Sustainability Committee as a division which oversees and manages the Group's efforts for sustainability.

Sustainability Promotion Structure



Climate-related Risks, Opportunities, Strategies, and Responses

Type		Driver (Factor causing an impact on our business)	Awareness of business environment	Impact on our business: 1.5°C (2°C) scenario 2030	1.5°C (2°C) scenario 2050	4°C scenario 2030	4°C scenario 2050
Transition risks	Policies, laws and regulations	Fluctuation of fossil fuel-derived energy prices	Increase in costs related to procurement using fossil fuel-derived energy and electricity due to changing energy mix	Small	Small	Small	Small
		Tightened CO_2 emissions regulations	Increase in energy consumption and credit operating costs due to the introduction of carbon tax and tightening of regulations on emissions trading	Large*	Small*	Medium*	Small*
	Markets	Increasing stakeholders' interest in low-carbon products and services	Increase in boycott activities toward products and services created using energy derived from fossil fuels due to increased awareness of decarbonization among consumers	Small	Small	Small	Small
	Reputation	Negative feedback from stakeholders	• Decline in demand for paper products because of the impression that unnecessary tree felling facilitates global warming • Lower evaluation and difficulty in obtaining financing due to a failure to respond to investors' request	Medium	Medium	Small	Small
Physical risks	Acute	Increasing severity of extreme weather events	Business stagnation such as facilities affected by and supply chain disruptions caused by a large scale natural disaster	Small	Small	Small	Small
	Chronic	Changes in precipitation and weather patterns, and rising average temperatures	Increase in procurement costs primarily as a result of deterioration of growth conditions for trees, key raw materials for our products	Small	Small	Large	Large
Opportunities	Resource efficiency	Effective resource utilization Reduction in water use and consumption	Increase in demand for advanced water treatment technology and water management due to flooding, drought, precipitation fluctuations, and higher demand for clean water in water stress areas	Small	Small	Medium	Medium
	Energy sources	Use of low emission sources of energy	Increase in demand for renewable energy toward realization of a decarbonized society	Small	Medium	Small	Small
	Products and services	• Changes in consumer preferences • Development of new products and service through R&D and innovation	Increase in demand for low-carbon and environmentally-friendly products due to increased awareness of decarbonization and environment	Large*	Large*	Large*	Large*
	Markets	Use of incentives	• Expansion of support for forest preservation activities under the forest usage and forestry promotion policy • Possibility that carbon credit trading associated with forest absorption after 2050 will increase the value of company-owned forests, and that requests for forest management/assistance in management (providing know how) may increase	Small	Medium	Small	Small

* Impact amount Small: less than 10 billion yen Medium: not less than 10 billion yen but less than 50 billion yen Large: not less than 50 billion yen
Impact levels without asterisk mark (*) represent qualitative assessment.

Strategy

Climate-related risks and opportunities for us have been analyzed as shown below. We recognize the importance of transition risks due to policies and regulations such as carbon taxes in the medium term toward 2030, physical risks such as changes in precipitation and weather patterns in the long term toward 2050, and opportunities for increased demand for low-carbon products in the medium to long term.

To meet challenges for transition to a decarbonized society, we have set our GHG emissions reduction targets and are working to reduce coal consumption, increase the net increment in carbon stocks by forests, and develop wood-derived products as a plastic alternative. While continuing our present efforts, we believe, will limit the impact on our business from the transition to a decarbonized society, we will continue to analyze risks and strengthen our resilience*1.

*1 The concept of climate resilience involves organizations developing adaptive capacity to respond to climate change to better manage the associated risks and seize opportunities, including the ability to respond to transition risks and physical risks. (Source: TCFD recommendations)

Risk Management

The Corporate Sustainability Division examines risks on a Group wide basis with assistance from external experts, and the Sustainability Committee analyzes them while discussing their importance and priority. Impacts on our business, strategy, and finances are assessed quantitatively and qualitatively, using scenarios for 1.5°C (2°C) and 4°C for the medium term (2030) and the long term (2050)*2.

The Corporate Sustainability Division is in charge of overall management of responses to climate-related risks based on the strategy across the Group, and the Sustainability Committee manages the progress. Specifically, for the reduction of GHG emissions, we have organized a project team and are working to reduce coal consumption and expand the net increment in carbon stocks by forests. Furthermore, climate-related risks are referred for discussion and reported to the Group Management Meeting depending on the importance, and integrated into company-wide risk management.

*2 Transition risks were analyzed based on two scenarios: IEA's 2°C Scenario (IEA 2DS) showing a pathway to possibly limit the warming to 2°C, and the Net Zero Emissions by 2050 Scenario (NZE 2050) to achieve net zero CO_2 emissions by 2050. Physical risks were analyzed based on the RCP1.9, RCP2.6, and RCP8.5 scenarios. In RCP8.5, the average global temperature is projected to rise by more than 4°C and natural disasters are expected to become more frequent.

Indicators and Targets

We have set the following targets based on the 1.5°C target in the Paris Agreement. The carbon price of 140 USD/t-CO_2 (2030 level in developed countries) from the Net Zero Emissions (NZE) scenario of the International Energy Agency (IEA) is used as the internal carbon pricing (ICP) for risk analysis and evaluation items for investment decisions.

		FY2022 results
Scopes 1 + 2	70% reduction by FY2030 and net zero by FY2050 (including the net increment in carbon stocks by forests)	16.5% down (compared to FY2018) Reduction in actual emissions 4.7% Net increment in carbon stocks by forests 11.8%
Scope 3	Reduction of GHG emissions through collaboration with suppliers	We conducted a fact-finding survey of GHG emissions in a supplier sustainability survey
Coal consumption	Zero coal consumption by FY2050	17.1% down (compared to FY2018)

Strategies and countermeasures
• Pursue thorough-going energy conservation and efficient operation of in-house power generation facilities to reduce fossil fuel consumption and electricity purchase to optimize overall energy costs • Enhance the operation of renewable energy sources such as hydro and biomass energy toward net zero carbon emissions in FY2050
• Convert to renewable energy and other fuels that emit less CO_2, and enhance energy conservation measures • Further promote resource-circulation, environmentally friendly business initiatives such as forest recycling and recovered paper recycling
• Continuously disseminate information on the status of sustainable forest management initiatives to stakeholders • Promote the acquisition of forest certification, announcement of procurement policies, such as no illegal logging, and ensuring traceability of suppliers • Implement environmental education to communicate environmentally-friendly business activities in collaboration with environmental NGOs, etc. • Be registered as Type I or Type II Registered Wood-related Business Entity as defined in the Clean Wood Act • Conduct due diligence to prove the legality and verify the legality in connection with the procurement of wood raw materials and biomass fuels
• Formulate and regularly review a BCP, and enhance BCM • Keep abreast of and monitor the status of key raw materials • Enhance our relationship with suppliers, and stabilize procurement by diversifying suppliers
• Enhance stable procurement through procurement from multiple sources in North America, South America, Oceania, etc. • Expand and promote effective utilization of company-owned forests • Conduct survey and research on impacts of temperature and precipitation on growth of trees, and select tree species suitable to the area
• Further expand the water treatment business primarily by promoting the expanded service for the production of water for daily use • Propose innovative technology leading to the effective utilization of water resources
• Promote the power generation business such as wind power generation and micro hydroelectric power generation
• Enhance the alternate use of biomass plastics made from biomass and the development of paper materials as an alternative to plastic packaging, and expand sales opportunities
• Plan and implement the management of company-owned forests in line with national and local governments policies • Maintain and improve productivity of planted trees by conducting research and technology development tailored to the relevant areas

Investment toward Decarbonization

Investment in connection with coal reduction
Approx. 100 billion yen

Investment in connection with acquisition of forest plantations
Approx. 100 billion yen

Financial Impact of Climate-related Risks and Opportunities (2030)

Example of opportunities

Green innovation
Increase in sales from the environmentally friendly business
300 billion yen

Example of risks

Burden of carbon tax
60.6 billion yen*

* Calculated by multiplying CO_2 emissions from fossil fuel use by the carbon price

Sustainable Forest Management and Biodiversity Conservation

Sustainable Forest Management

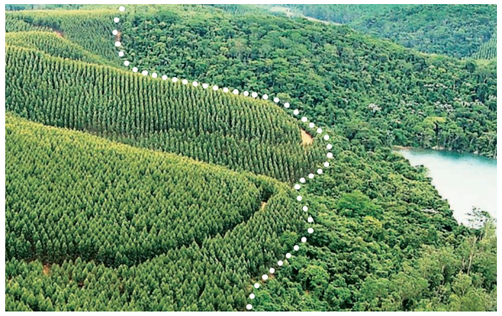
Basic Approach

The appropriate cultivation and management of forests not only produces renewable forest resources; it also helps to enhance the multi-faceted functions of forests, including absorbing and fixing CO_2, conserving biodiversity, cultivating water resources, and preserving soil. To meet such environmental challenges as dealing with global warming and conserving biodiversity, our purpose is to fully leverage the functions of forests that are the precious assets of the Oji Group in pursuing our business activities. We believe that continuing to "grow forests and utilize forests" will produce exceedingly important value, both for the environment and for society.

Overview of the Oji Group's Forests (Oji Forests)

The Oji Group owns and manages extensive forests in Japan and overseas, amounting to 603,000 ha. The portfolio comprises 455,000 ha of production forests primarily for producing forest products in consideration of environment, and about 148,000 ha of conservation forests principally for preserving biodiversity and basins.

Wood from production forests is expected to be used as raw materials for paper manufacturing and fuels for biomass power generation, and for new materials derived from wood components under development. In order to maintain stable supply of these wood raw materials, the Oji Group spends approximately 14.2 billion yen annually for ongoing sustainable forest management. In addition, our Environmental Action Program 2030 states a goal of expanding overseas production forest area to 400,000 ha.



CENIBRA in Brazil: Production forest (left) and conservation forest (right)

Conservation Forests

Of the 603,000 ha of forests owned and managed by the Group in Japan and overseas, approximately 25%, i.e., 148,000 ha are conservation forests, which are managed with consideration for the environment and ecosystems. Specifically, of the forests managed by CENIBRA, Brazil, conservation forests account for as much as about 42%.

In Japan, 12,000 ha out of 188,000 ha of company-owned forests are conservation forests designated for preserving biodiversity, maintaining landscapes around recreational facilities (conservation for forest utilization), preventing soil runoff and collapse (land conservation), preserving water sources, and protecting scientifically valuable forests. Since one forest may have multiple functions, the cumulative total area of environmental conservation functions is 17,000 ha.

We will continue to maintain and properly manage conservation forests that contribute to the conservation and promotion of biodiversity.

Oji Group's Forests by Country

Country	Business company	Established	Production forests (1,000 ha)	Conservation forests (1,000 ha)	Total (1,000 ha)
Brazil	CENIBRA	1973	144	106	250
New Zealand	Pan Pac	1971	36	5	41
	SPFL	1992	10	3	13
	Oji FS	2014	7	1	8
Indonesia	KTH	1998	63	19	82
Vietnam	QPFL	1995	9	1	10
Other (3 companies in Vietnam and Australia)		—	10	1	11
Overseas subtotal			279	136	415
Company-owned forests in Japan	—	—	176	12	188
Group total			**455**	**148**	**603**

Production forests : forests primarily for producing forest products in consideration of environmental conservation.
Conservation forests : forests primarily for environmental conservation, including protecting biodiversity and basins.

Conservation Forests in Japan by Function

Conservation forest functions	Forest area*1 (actual area) (ha)	Function area*2 (cumulative total) (ha)
Biodiversity conservation	9,742	9,495
Conservation for forest utilization	710	4,357
Land conservation	818	2,735
Water conservation	275	532
Conservation for scientific research	8	8
Total	**11,552**	**17,127**

*1 Each conservation forest is categorized by its main function, and forest areas are aggregated by category.
*2 Each function area shows the cumulative total of the areas of forests with that function regardless of their main functions' categories.

Topics Earned the Highest "A" Score in the CDP Forests Category (Timber Products)

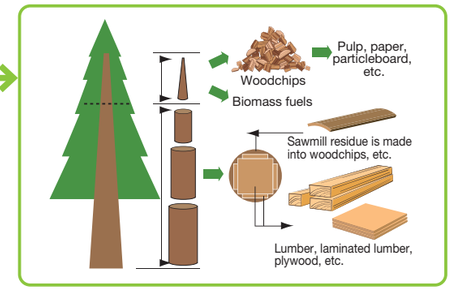
Oji Holdings was added to the "A list" of top-scoring companies selected by CDP, an international non-profit organization for the first time in 2022, which recognized its leadership in transparency and performance in corporate sustainability concerning forests (timber products).

As a Forests A List company, we are leaders in corporate transparency and action on deforestation.

Renewable Forest Resources

Forests are a renewable resource that can be planted, grown, harvested, and re-planted. To make cascading use of trees (thorough use of every part of trees), the Oji Group utilizes the harvested wood for lumber, plywood, woodchips for paper manufacture, wood biomass fuel, etc.

The Oji Group promotes the effective utilization of wood as a comprehensive forestry business group.



Cascading use of forest resources

The lumber, laminated lumber, and the raw materials for plywood come from the thick trunk part of forest plantation trees. The sawmill residue from the production of lumber, and the tips of those trunks which cannot be used for lumber, are thoroughly utilized as woodchips for paper manufacturing or biomass fuel.

Social Contributions That Are Environmentally and Economically Friendly to Local Communities

Sustainable forest management requires a mutual understanding between forest plantation companies and the local communities, grown through considering environmental, social, and economic effects for the community. To give an example of economic contribution, our overseas forest plantation companies have created approximately 15,000 jobs locally. Another such example is our technical training primarily on planting and forest management provided to owners of small-scale forests. Further, we cooperate with local governments, NGOs, and civic groups in each region to create and share environmental and social benefits. Their activities include biodiversity conservation programs in environmentally protected forests, vocational and educational support in local communities, and assistance in areas that have poor access to medical services.

CENIBRA supports beekeeping

Oji Fibre Solutions supports an educational program of Graeme Dingle Foundation

Topics Establishment of Oji Forest Value-Creation & Promotion Department

The Oji Group established the Oji Forest Value-Creation & Promotion Department in October 2022 to utilize diverse functions of the forests it owns and manages toward achieving its Purpose. The Oji Forest Value-Creation & Promotion Department seeks to utilize forest resources to create new businesses and expand research areas, while conducting various surveys, searching for partners, and sourcing investment opportunities to solve social issues and increase corporate value.

Forests' Multi-functionality and Ecological Services

Sustainable Forest Management and Biodiversity Conservation

Biodiversity Conservation

Basic Approach

The Oji Group has declared to seek “Harmony with Nature and Society” in its Management Philosophy and has set the goal of conserving biodiversity and reducing our impact on the environment under its Environmental Vision 2050 and Environmental Action Program 2030. To that end, the Group works for forest management with consideration for ecosystems, protection and nurturing of rare plants and animals, research and development of biodegradable and biomass materials for ecosystem maintenance, and purification of wastewater and exhaust gases.

With regard to forests, in particular, as well as the need of sustainable forest management for the continuation of our business as a company that use forest resources, we recognize the importance of conservation and promotion of biodiversity as a social responsibility of a company that owns and manages vast forests. We maintain natural forests’ ecosystems rich in biodiversity, and properly manage our plantations to help the formation of multilayered vegetation and healthy ecosystems.

In Japan and overseas, we work with governments, environmental NPOs, academic researchers, and local community to protect and nurture endangered species and maintain and restore ecosystems.

Initiatives for Protection and Nurturing of Rare Animals and Plants

The 30by30 Alliance for Biodiversity

We have joined the 30by30 Alliance for Biodiversity, which was voluntarily launched by companies, local governments, and organizations in April 2022 under the initiative of the Ministry of the Environment in Japan, towards the international goal of protecting at least 30% of land and sea by 2030. The Alliance members provide support for registering their owned or controlled lands as OECM* and expanding protected areas, and provide support.

* Other Effective area-based Conservation Measures. Areas where biodiversity is being conserved through efforts by the private sector, such as corporate forests and satoyama.

The Oji Group has been working in collaboration with the Ecosystem Trust Society since August 2016 in activities to protect fairy pitta’s growing environment in the Koyagauchi company-owned forest in Kochi Prefecture. For this company-owned forest, we have already applied for screening for certification under a “trial scheme to certify conserved areas*” conducted by the Ministry of the Environment in FY2022. We aim to obtain OECM certification through final certification under the Ministry’s scheme.

* A national scheme to certify areas where biodiversity is being conserved through efforts by the private sector or other parties. The certified areas, other than protected areas, will be registered as OECM on an international database.

Fairy pitta in the Koyagauchi company-owned forest. Listed as an Endangered IB on the Ministry of the Environment Red List.
Photo provided by the Ecosystem Trust Society

Conservation Activity for Kiwi (Pan Pac, New Zealand)

Pan Pac conducts activities for protecting kiwi, a rare bird species, in cooperation with the Ministry for the Environment of New Zealand, citizen volunteers, and other parties. For these activities, the company has designated land of an area of approximately 40 ha as a kiwi sanctuary for protecting kiwi chicks. Chicks and eggs in the surrounding area are captured and collected, and chicks that are captured or hatched from the collected eggs are nurtured in the sanctuary before being returned to the wild.

In June 2019, Pan Pac was named Community Corporate Sponsor of the Year at a national kiwi conference held by “Kiwis for kiwi,” a kiwi protection organization.

Kiwi

Monitoring of Biodiversity Indicators (CENIBRA, Brazil)

In collaboration with external research institutions, universities, NGOs, and other organizations, CENIBRA monitors plants and animals and water resources, and conducts various ecosystem protection and conservation activities.

Monitoring results up until 2021 confirm that endangered 31 species of birds and 17 species of mammals are inhabited in CENIBRA’s conservation forest. CENIBRA is engaged in activities for breeding mutum (crax blumenbachii), an endangered bird species, and several other species, and returning them to nature, and is implementing a Green Corridor Program to link separated habitat areas.

Green Corridor Program

*1 Expanding forest areas by restoring waste lands to connect neighboring natural forests.
*2 Plantations also serve to protect protected forests from erosion from the surrounding area.

Buffy-headed marmoset (CR)

Mutum (VU)

† IUCN Red List Categories: Critically Endangered (CR), Vulnerable (VU)

Itou Conservation Activities in Sarufutsu (Sarufutsu Company-owned Forest in Hokkaido)

In 2009, the Oji Group established the Sarufutsu Itou Conservation Council with a local NPO, administrative bodies, researchers, and others for the purpose of protecting the Japanese huchen called itou, or the sea-run taimen (Hucho perryi), an endangered species that lives in the river zone of the Sarufutsu forest in Sarufutsu village, Hokkaido. An area of 2,600 ha including the river zone was designated a conservation area. Activities include the removal of artifacts that obstruct the itou from migrating upstream, and surveys on spawning beds and the number of individuals migrating upriver.

Nuptial-colored itou (male) Photo by Yo Chirai
(Listed as an Endangered IB on the Ministry of the Environment Red List)

Alpine Plant Community Restoration Activities (Samani Company-owned Forest in Hokkaido)

The alpine plant community on Mt. Apoi is home to many endemic plants with place names such as “Apoi,” “Samani,” and “Hidaka,” and was designated a national special natural monument in 1952. While the local government and people continue to work together to maintain trails to prevent trampling, patrol the area to prevent illegal digging, and conduct restoration experiments, the Oji Group provides support such as offering a site for restoring alpine plants.

Samani yukiwari blooming on the trail side

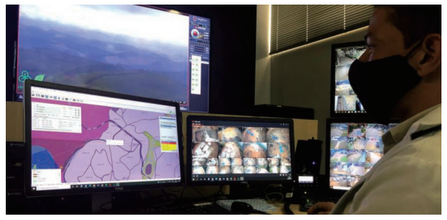
Apoi-azumagiku blooming in a test site

Initiatives for Maintenance and Restoration of Ecosystems

Protection against Forest Fires (CENIBRA, Brazil)

CENIBRA has introduced an innovative forest fire prevention and fighting system using artificial intelligence (AI) for their 250,000 ha forests. The company has installed 38 watchtowers equipped with 360 degrees rotating cameras in the forests. When the AI detects smoke and fires, the monitoring room notifies fire crews nearest to the site of the incidents. They start firefighting immediately. The AI-equipped cameras are more efficient than human eyes and can locate the accurate fire site within one to two minutes. CENIBRA has reduced forest fire risks significantly.

Fire watchtower



Fire monitoring in the monitoring room

Firefighting training by firefighters

Efforts to Preserve and Restore Natural Forest (Pan Pac, New Zealand)

The forest land located just north of Pan Pac’s Whirinaki Mill with a total area of 298 ha includes about 23% (68 ha) of well-established indigenous (native) forest.

Pan Pac partnered with a government organization to place the forest reserve into a conservation covenant. The reserve area comprises tree species unique to the Hawke’s Bay region, and given the forest’s age and previous protection from animal livestock and pests, the native tree population holds particular ecological and cultural importance. Pan Pac will be working with specialists to harvest rare seeds to assist in local and national programs of native forest regeneration. The company also hopes to welcome schools to the area for educational visits.

In June 2021, Pan Pac received funding approval through the government’s “Jobs for Nature Fund.” The money will be used to fence the reserve area and plant an additional 12 ha of native plants on bare land areas to speed up restoration.

A view of the reserve