

Mitigation and Adaptation to Climate Change

Basic Approach

In 2020, the Oji Group formulated its Environmental Vision 2050 centered on the goal of net-zero carbon, while also positioning the Environmental Action Program 2030 as a stepping stone toward achieving its medium-term targets. In a bid to achieve our target of reducing greenhouse gas (GHG) emissions by 70% compared with FY2018 levels, we are working to reduce actual emissions by reducing coal consumption and other emission sources, and increasing the net increment in carbon stocks by forests.

Business Model Targeting Decarbonization

The Oji Group engages in a wide array of business activities, including the manufacture of pulp and paper. In light of the substantial amounts of heat (steam) and electricity consumed, these activities accordingly lead to the emission of GHGs commensurate with this energy use. By working to reduce GHG emissions from energy use and promoting CO₂ absorption by forests, we are contributing to climate change mitigation.

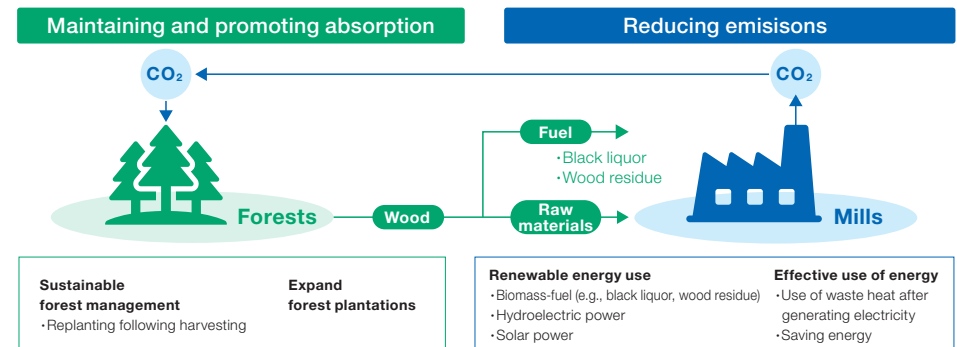
Pulp and paper mills generate steam and electricity from black liquor produced in the wood pulp manufacturing process and waste wood unsuitable for use in pulp raw materials. The CO₂ emitted during combustion is offset by the CO₂ absorbed by trees during growth. In addition, the waste heat (steam) after generating electricity is reused in the manufacturing process in an effort to promote the effective use of energy. Moreover, we have been using the electricity generated by the Chitose No. 1 Hydroelectric Power Plant in Hokkaido since 1910 and, in recent years, solar power systems on factory roofs. Over and above in-house consumption at mills, we also expand the renewable energy generation business using biomass, hydroelectric, and solar power, and are considering wind power generation projects on company-owned sites.

In addition to practicing sustainable forest management through replanting following harvesting, as well as the planting of elite trees with high growth rates, every effort is made to maintain and promote the CO₂ absorption functions of forests.

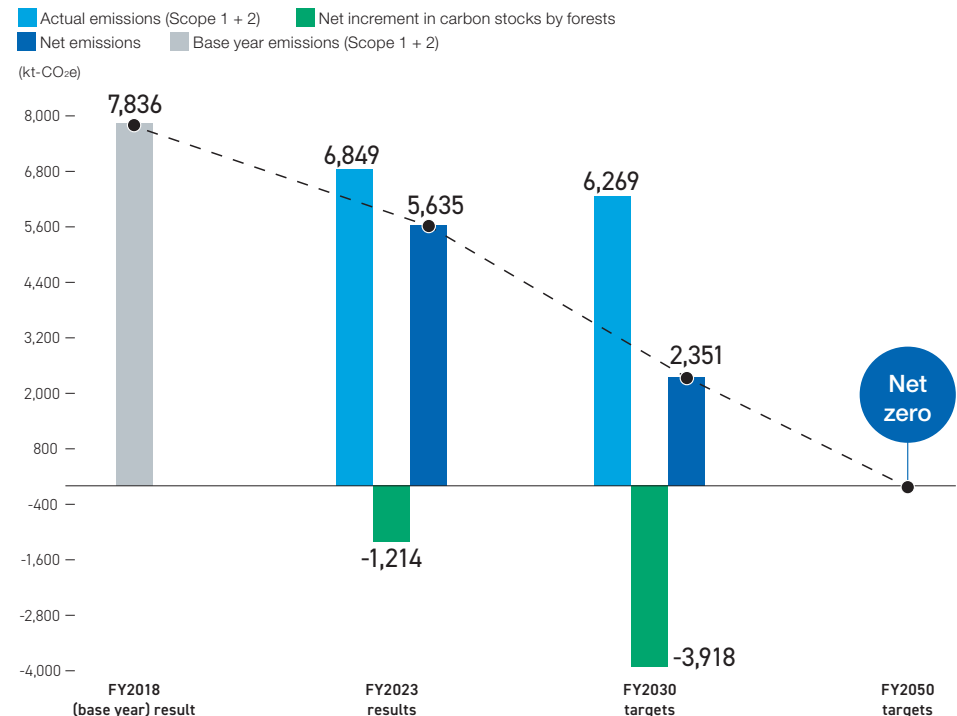
GHG Emissions Reduction Target and Emissions Results

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

In FY2023, net GHG emissions were reduced by 28.1% compared with FY2018 levels, to 5,635 kt-CO₂e.



GHG emissions



Mitigation and Adaptation to Climate Change

Climate-related Information Disclosure Based on the TCFD Recommendations

Sustainable Forest Management

Nature-related Information Disclosure Based on the TNFD Recommendations

Circular Use of Resources

Responsible Raw Materials Procurement

Respect for Human Rights

Ensuring Workplace Safety and Health

Roadmap for GHG Emissions Reduction

To achieve the FY2030 target for emissions reduction, we are focused on reducing actual emissions and increasing the net increment in carbon stocks by forests.

Of the 16 boilers in Japan that were burning coal as of FY2018, we will terminate operations at all eight coal-only-fired boilers by FY2030, excluding backup boilers, and switch to gas fuels in a transition phase toward decarbonization. Operations were discontinued at two boilers by FY2023. Plans are in place to discontinue the use of two additional boilers, one each at the Sobue Mill and the Saga Mill of Oji Materia by FY2027. We are also considering reducing coal consumption by changing the composition of fuels at coal co-fired boilers.

Further reducing the use of fossil fuels including gas is essential to achieving net-zero carbon emissions from FY2030. To this end, we are considering the use of alternative fuels, including hydrogen, ammonia, and e-methane (synthetic methane).

Moreover, to increase the net increment of carbon stocks, we are advancing efforts to acquire overseas forest plantations. Making the most of the tree breeding and forest plantation technologies nurtured over our considerable history, we are engaging in the cultivation of elite fast-growing trees best suited to each region. Moving forward, we are promoting CO₂ absorption while expanding forests with a high net increment of carbon stocks.

Topics

Commenced a joint study on the manufacture of e-methane

In conjunction with TOKYO GAS CO., LTD., and Tokyo Gas Engineering Solutions Corporation, we launched a joint study on the manufacture of e-methane at the Oji Paper Tomakomai Mill.

This joint study will examine the domestic production and use of e-methane by investigating the reaction of green hydrogen, produced using electricity from existing hydroelectric facilities and future solar power generation facilities, with CO₂ derived from carbon neutral fuel generated and recovered in the pulp manufacturing process.

Roadmap for GHG Emissions Reduction toward FY2030

	Category	Sub-category	GHG reduction (kt-CO ₂ e)	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									
	Increase the percentage of renewable energy use	Reduce coal consumption	1,007	12.9%	Reduced 5.0% on average from FY2019 to FY2023									
		Install private solar power systems, etc.	360	4.5%	• Shut down one coal-only-fired boiler (FY2023) • Shut down one boiler (FY2027) • To shut down 2 boilers (FY2027) • To shut down 4 boilers (FY2030) Technical research and testing to change the fuel composition → Studies and decisions on facilities → Implementation Installation planning → Investment decisions → Installation Install solar power systems on factory roofs and idle land									
Subtotal			1,567	20.0%	Reduction of 988 kt-CO ₂ e (12.6%)									
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 → 275,000 ha* → 400,000 ha									
		Plant fast-growing trees			Search for sites, land surveys → Assessment of business feasibility → Consideration of acquisition, decision Continue forest tree breeding (breed improvement) and elite trees' plantation Net increment in carbon stocks by forests: 1,214 kt-CO ₂ e (15.5%)									
Total			5,485	70.0%										

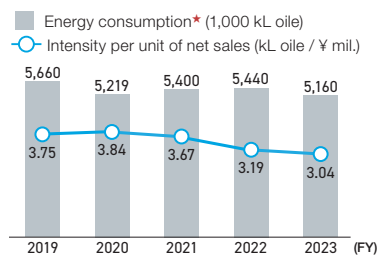
* Area as of the end of FY2023. This does not include the 20,000 ha of production forest acquired in Uruguay in FY2024.

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 FY2023, the actual GHG emissions (Scope 1 + 2) were reduced by 12.6% compared with FY2018 levels, to 6,849 kt-CO₂e.

Improve Energy Efficiency

In FY2023, our major domestic companies made energy conservation investments of ¥0.93 billion, thereby reducing energy consumption by 47 thousand kL (in crude oil equivalent). Across the entire Group, energy consumption intensity was reduced by 5.0% per year on average from FY2019 to FY2023.

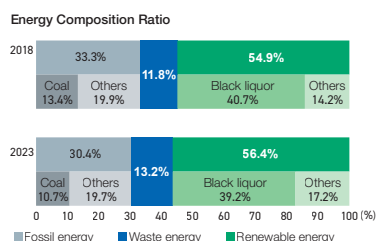


★ A star mark indicates that the FY2023 figure for energy consumption has been assured by KPMG AZSA Sustainability Co., Ltd. For the calculation method, see [P.98](#)

Increase the Percentage of Renewable Energy Use

Utilizing black liquor, a by-product of the pulp production process, and other biomass fuels, the Oji Group has increased the percentage of renewable energy use. To further improve energy efficiency, we are using private hydroelectric power plants while promoting the introduction of solar power generation systems.

In FY2023, the percentage of renewable energy use was 56.4%.



Reduce Coal Consumption

We shut down coal boilers at the Oji Materia Nayoro Mill and the Oji F-Tex Ebetsu Mill in FY2021 and FY2023, respectively. As a result, coal consumption decreased by 25.6% in FY2023 compared with FY2018 levels. We will continue to promote reductions, and through capital investments of approximately ¥100 billion, we project a downturn in GHG emissions of roughly 1,000 kt-CO₂e.

Topics

Indirect reduction of GHG emissions by the Renewable Energy Power Generation Business

In FY2023, we sold 1,631 GWh of electricity generated by biomass, hydropower, and solar power through the feed-in tariff (FIT) system for renewable energy. This is equivalent to a reduction of 714 kt-CO₂e in electricity consumer emissions*.

* Calculation method [\(P.98\)](#)

Expansion of Net Increment in Carbon Stocks by Forests

We are expanding the net increment in carbon stocks by forests by expanding plantations and planting fast-growing trees. In the 600,000 ha^{*1} of forests owned and managed by the Oji Group in Japan and overseas, actual carbon stocks reached 124,560 kt-CO₂ at the end of FY2023, and the annual average net increment in carbon stocks by forests from FY2019 to FY2023 was 1,214 kt-CO₂^{*2}. The amount of O₂ released during the same period averaged 883 kt per year^{*3}.

*1 This does not include the 35,000 ha of forest acquired in Uruguay in FY2024.

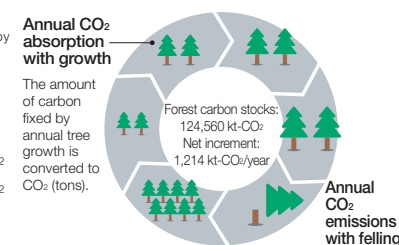
*2 The figures of carbon stocks and net increment in carbon stocks exclude those by CENIBRA's forests planted by third parties and forests less than two years after plantation.

*3 Calculation assuming that the same amount of O₂ as CO₂ absorbed (in moles) is released.

Source: [National Institute for Environmental Studies \(in Japanese only\)](#)

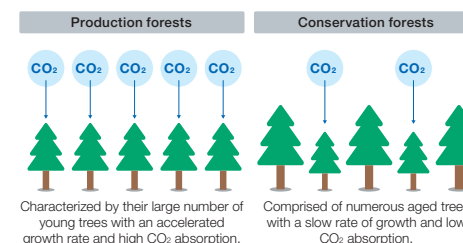
Forest carbon stocks: The CO₂ stocks in Oji Forests

Net increment in carbon stocks by forests: The amount of CO₂ absorbed by the trees in Oji Forests minus the amount of CO₂ stored in the trees felled which are subtracted as emissions.



Expand Forest Plantations

Recognizing that the amount of CO₂ absorbed by trees is proportional to the amount of growth, production forests with abundant trees in a growth phase absorb more CO₂ compared to conservation forests where trees have matured. The Oji Group is expanding its overseas production forests and increasing the number of trees in a growth phase in a bid to increase the net increment in carbon stocks.



We expanded the area of overseas production forests from 237,000 ha as of the end of FY2018 to 275,000 ha^{*4} as of the end of FY2023. 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.

*4 This does not include the 20,000 ha of production forest acquired in Uruguay in FY2024.

Plant Fast-growing Trees

CENIBRA in Brazil and KTH in Indonesia have long been breeding forest trees. In selecting and planting high-quality varieties, distinguished by their high growth rate and pulp productivity obtained through artificial pollination, efforts are being made to increase the amount of forest growth while facilitating carbon absorption and fixation.

Climate-related Information Disclosure Based on the TCFD Recommendations

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

[▶ Sustainability Report](#)

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-CO₂ (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) and taken into account in investment impact studies.

Targets		FY2023 results
Scope 1 + 2	70% reduction by FY2030 and net zero by FY2050	Net emissions down 28.1% (compared with FY2018)
Scope 3	Reduction of GHG emissions through collaboration with suppliers	Survey of supplier GHG emissions
Coal consumption	Zero coal consumption by FY2050	Coal consumption down 25.6% (compared with FY2018)

Governance and Risk Management

Climate-related issues and countermeasures are discussed by the Sustainability Committee and supervised by the Board of Directors (for details, see [P.29](#)).

The Corporate Sustainability Division examines risks and opportunities on a Group-wide basis, while the Sustainability Committee deliberates on 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).

The Corporate Sustainability Division is in charge of overall management based on the relevant strategies. Progress is reported to the Sustainability Committee. Specifically, we have organized a project team that is working to reduce GHG emissions. Furthermore, issues are referred for discussion to the Group Management Meeting depending on their importance, and integrated into Group-wide risk management.

Strategy

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. Accordingly, we are engaging in a variety of measures, including the reduction of coal consumption and efforts to increase the net increment in carbon stocks by forests and develop wood-derived products as a plastic alternative. While recognizing that the transition to a decarbonized society will have limited impact on our business, we will continue to analyze risks and strengthen our resilience through these initiatives.

Investment toward decarbonization	
Investment in connection with coal consumption reduction	Approx. ¥100 billion
Investment in connection with the acquisition of forest plantations	Approx. ¥100 billion

Financial Impact of Climate-related Risks and Opportunities (2030)		
Example of risks	Cost increase attributable to carbon pricing	¥72.3 billion
Example of opportunities	Increase in sales from the environmentally friendly business (Green innovation)	¥300 billion

Climate-related Risks, Opportunities, Strategies, and Responses (Selection)

Type		Driver (Factor causing an impact on our business)	Awareness of business environment	Impact on our business				Strategies and countermeasures
				1.5°C (2°C) scenario		4°C scenario		
				2030	2050	2030	2050	
Transition risks	Policies, laws, and regulations	Tightened CO ₂ emissions regulations	Increase in energy consumption and credit operating costs due to the introduction of a carbon tax and tightening of regulations on emissions trading	Large*	Small*	Medium	Small*	<ul style="list-style-type: none"> Promote thoroughgoing energy conservation and efficient operation of in-house power generation facilities to reduce fossil fuel consumption and electricity purchases 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
Physical risks	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	<ul style="list-style-type: none"> 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 surveys and research on the impacts of temperature and precipitation on the growth of trees, and select tree species suitable to specific areas
Opportunities	Products and services	<ul style="list-style-type: none"> Changes in consumer preferences Development of new products and services through R&D and innovation 	Increase in demand for low-carbon and environmentally friendly products due to increased awareness of decarbonization and the environment	Large*	Large*	Large*	Large*	<ul style="list-style-type: none"> Enhance the alternate use of biomass plastics and the development of paper materials as an alternative to plastic packaging, and expand sales opportunities

* Impact amount: Small: less than ¥10 billion, Medium: not less than ¥10 billion but less than ¥50 billion, Large: not less than ¥50 billion
Notes: Impact levels without an asterisk (*) represent qualitative assessment.

Sustainable Forest Management

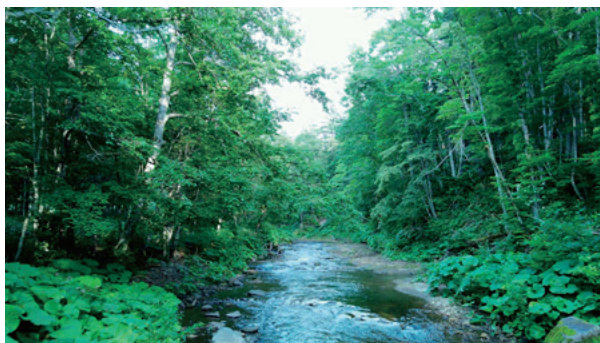
Basic Approach

For more than a century, the Oji Group has continued to engage in sustainable forest management guided by the teachings of Ginjiro Fujiwara, then president of the former Oji Paper, who advocated that “those who use trees are responsible for planting them.”

Forests that have been properly cultivated and managed, through the accumulation of forestation techniques and expertise both domestically and overseas, provide considerable returns and benefits through such multifaceted functions as biodiversity conservation, water resource cultivation, and recreation.

Making the most of the forests that it has inherited over the years, the Oji Group is developing businesses that deliver a host of products and services to society.

▶ [\(The Oji Group Sustainable Forest Management Policy\)](#)



Biei company-owned forest

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

The Oji Group owns and manages extensive forests in Japan and overseas, amounting to 635,000 ha. The portfolio comprises 472,000 ha of production forests primarily for producing forest products that take into consideration the environment, and about 163,000 ha of conservation forests that principally serve a public utility function, including the conservation of biodiversity and watershed.

In addition to the use of wood from production forests as raw materials for paper manufacturing, materials for lumber and plywood, and fuels for biomass power generation, expectations surrounding use in the development of new materials derived from wood components continue to mount.

To maintain the stable supply of wood raw materials as a resource, the Oji Group spends approximately ¥16.3 billion annually for ongoing

sustainable forest management while maintaining the public utility function of forests.



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

Conservation Forests

Of the 635,000 ha of forests owned and managed by the Group, approximately 26%, or 163,000 ha, are conservation forests, which are managed while taking into consideration the environment and ecosystems. In Japan, approximately 11,000 ha out of 188,000 ha of company-owned forests are conservation forests designated for conserving biodiversity, maintaining landscapes around recreational facilities (conservation for forest utilization), preventing soil runoff and collapse (land conservation), serving a water source cultivation function such as storing water resources, mitigating floods, and water purification (water conservation), and other purposes. As one forest can have multiple functions, the cumulative total area of environmental conservation functions is 17,000 ha.

Oji Group's forests by country

(1,000 ha)

Country	Business Company	Established	Production Forest Area	Conservation Forest Area	Total Area
Brazil	CENIBRA	1973	143	107	250
Indonesia	KTH	1998	63	19	82
New Zealand	Pan Pac	1971	35	5	40
	SPFL	1992	10	3	13
	Oji FS	2014	7	1	8
Uruguay	OUFC	2024	20	15	35
2 companies in Vietnam			11	1	12
2 companies in Australia			6	1	7
Overseas subtotal			295	152	447
Japan			177	11	188
Group total			472	163	635

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

Conservation forests in Japan by function

(ha)

Conservation Forest Functions	Forest Area* ¹ (actual area)	Function Area* ² (cumulative total)
Biodiversity conservation	9,741	9,785
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	17,417

*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 forest areas with that function regardless of the main function category.

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Respect for Human Rights

Ensuring Workplace Safety and Health

Renewable Forest Resources

Production Forests

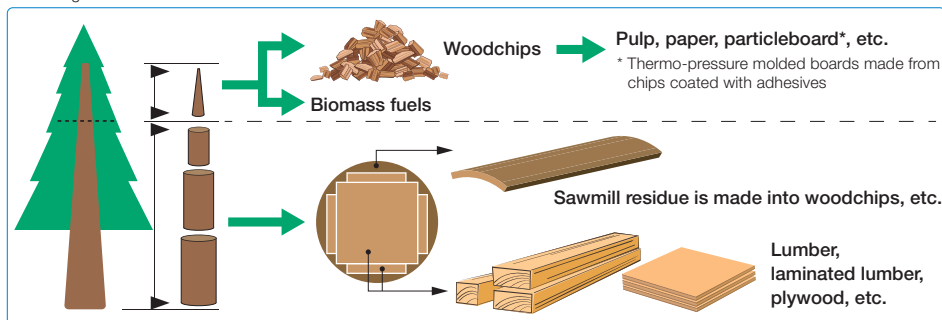
The Oji Group is engaged in the forest plantation business worldwide. We develop and select tree species that are suitable for the local climate and land conditions, and improve cultivation methods by formulating optimal plans for each region. Through these measures, we enhance forest productivity, produce high-quality timber and improve profitability through stable supply.

Through a cycle of planting, cultivating, harvesting, and replanting, forests are constantly growing and can be used for a variety of products, including lumber on a continuous basis. Moreover, we are maintaining economic efficiency while promoting the thoroughgoing cascading use of harvested wood for a variety of applications, including lumber, plywood, woodchips for the manufacture of paper, and wood biomass fuel.

Maintaining forests as production forests serves multiple purposes beyond just timber use. It offers various ecosystem benefits (ecosystem services), such as providing opportunities for residents to harvest and use forest products, and serving as migration routes for wildlife. In this way, the Oji Group practices forest management that considers the environment, society, and the economy. Through these efforts, the Oji Group, as a comprehensive forestry business group, promotes the sustainable use of lumber.



Cascading use of forest resources



Social Contributions Environmentally and Economically Friendly to Local Communities

Collaboration with local communities, including indigenous peoples, is a prerequisite for sustainable forest management. In this vein, cooperating with local stakeholders and communication are critical to serving the interests and meeting the needs of each region. Moreover, contributions to local employment and economic growth are important elements of sustainable forest management.

As an example of an economic contribution, our overseas forest plantation companies have created approximately 13,000 jobs locally. Another such example is our technical training primarily on planting and forest management provided to owners of small-scale forests. Furthermore, we cooperate with local governments, NGOs, and civic groups in each region to create and share environmental and social value. These activities include biodiversity conservation programs in environmental conservation forests, vocational and educational support in local communities, and assistance in areas that have poor access to medical services.



Donation of a pharmaceutical storage facility to the healthcare center of a local village by Quy Nhon Plantation Forest Company Vietnam Ltd. (QPFL)

Support for traditional land use and cultural activities of residents and indigenous peoples

The Oji Group respects the traditional use of land as well as the culture of local residents and indigenous peoples.

Based in Brazil, CENIBRA supports the traditional culture of making handicrafts from the leaves of the Indaiá palm, which grows wild in eucalyptus plantations. While this traditional technique of making hats was originally passed down from generation to generation among local residents, its value has remained relatively unknown for roughly 300 years.



Traditional artisans belonging to the Indaiá Cultural Association

In addition to recognizing the importance of the local culture, CENIBRA has designated this wild growth Indaiá land as a certified forest of high conservation value since 2005. Working together with various parties, including the Indaiá Cultural Association and local universities, the company has supported efforts to formulate a sustainable production management plan of Indaiá and to diversify the lineup of handicrafts beyond simply hats. As a result, handicrafts can now be purchased via the Internet from anywhere in the world. This is helping to increase the incomes of the artisans, which are mainly women, and to pass on this traditional culture while enhancing value.



Traditional crafts made from Indaiá palm

Nature-related Information Disclosure Based on the TNFD Recommendations

The Oji Group is committed to disclosing nature-related information as recommended by the Taskforce on Nature-related Financial Disclosures (TNFD).

[▶ TNFD Report](#)

Facing Challenges at Oji Forests Toward the Next 150 years

Looking at the global environment, climate change and biodiversity loss are currently major problems. There is a need for “nature-positive management,” by which our corporate business activities and capital flows move in a direction that enriches rather than exploits nature.

Nature-positive management requires first making the value of nature visible and then taking steps to increase that value. To make that value visible, we have begun developing technologies and methodologies with start-ups and academia with the aim of establishing the Oji Model in the future, a method for measuring and quantitatively evaluating natural value such as biodiversity and water of the Oji Forest. We will maximize the value of natural capital (capital formed by nature, such as forests, soil, water, atmosphere, and biological resources) and exert influence on the creation of global standards.

As climate change and changes in natural capital have mutual effects, the Oji Group aims to become both nature positive and carbon neutral by achieving its purpose through the above initiatives. For the next 150 years and beyond, we will take action to move toward an era of natural capital accounting that recognizes the economic value of natural capital.

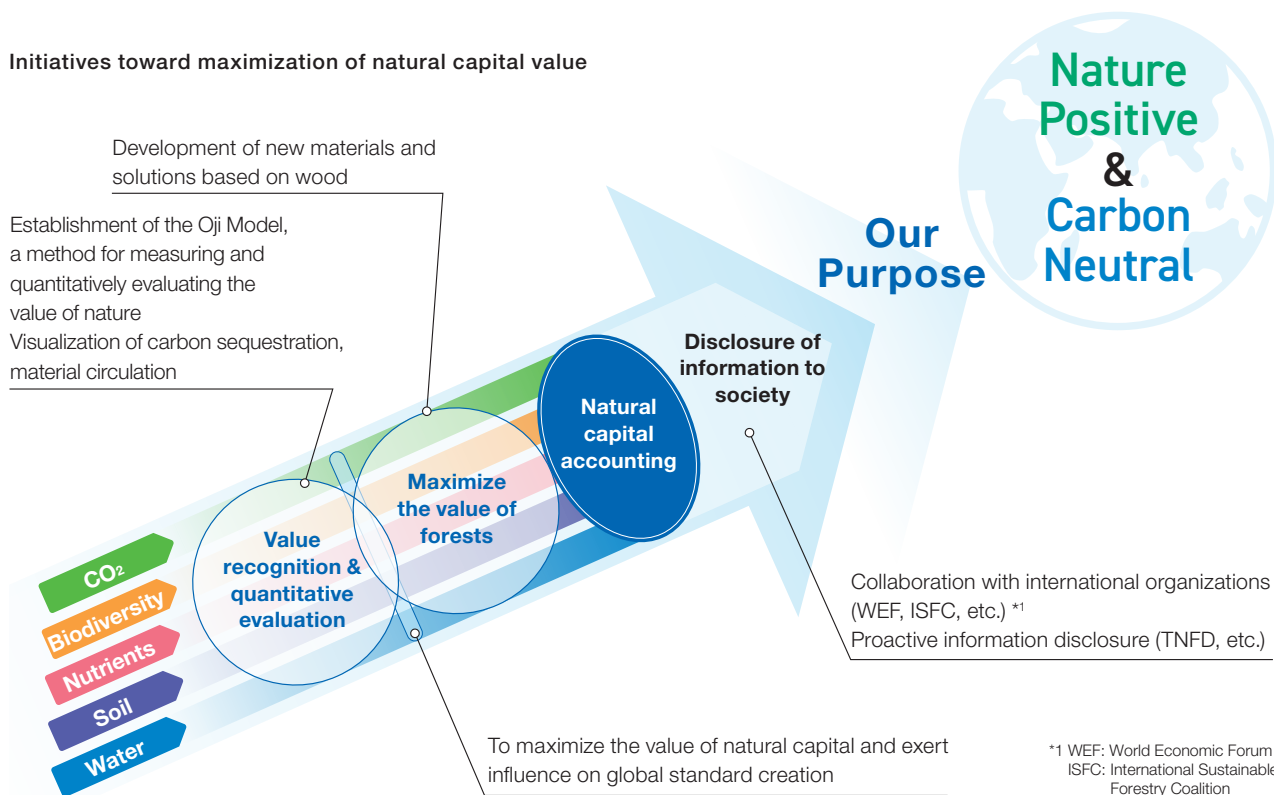
Governance

In the Oji Group, the Sustainability Committee deliberates nature-related dependencies, impacts, risks, and opportunities within its operations and value chain, and the responses to them, as well as its commitment to respecting the human rights of all stakeholders, including indigenous peoples, local communities, and affected stakeholders, and stakeholder engagement. These discussions are monitored and supervised by the Board of Directors.

[▶ P.29](#)

[▶ Oji Group Human Rights Policy](#)

Initiatives toward maximization of natural capital value



*1 WEF: World Economic Forum
ISFC: International Sustainable Forestry Coalition

Interface with Nature

The Oji Group recognizes the dependencies and impacts that its business activities have on nature and the responsibility we have to properly manage them. To achieve sustainable management and social life, we are promoting efforts to avoid and reduce negative impacts and restore and regenerate natural ecosystems.

Identifying Priority Sectors and Locations

We used the TNFD-recommended tool “ENCORE” to identify sectors that have a significant relationship with nature. The results showed that the dependencies and impacts on many ecosystem services are high in the forestry sector and that the water-related dependencies and impacts are high in the manufacturing sector.

For forestry bases, we conducted surveys of natural conditions using publicly available datasets (see table below) and identified forests at CENIBRA (Brazil) and forests in Japan as priority locations for evaluation. For manufacturing sites, we conducted water risk surveys using publicly available datasets and identified 21 business sites located in areas with high water risk as priority locations for evaluation.

Results of assessments on the state of nature in forestry base areas

Bases			State of Nature				
Company	Country	Area (thousands of ha)	Biodiversity importance	Proximity to biodiversity significance area	Biodiversity intactness*1	Forest cover loss*2	Water risk
CENIBRA	Brazil	250	High	High	High	Low	Low
KTH	Indonesia	82	Medium	Low	High	High	Low
APFL	Australia	5	High	Low	High	Medium	Low
GPFL	Australia	3	Medium	Low	High	Low	Medium
Pan Pac, Oji FS	New Zealand	48	Medium	Medium	High	Medium	Low
SPFL	New Zealand	13	Low	Medium	High	Low	Low
QPFL	Vietnam	10	Medium	Low	High	Medium	Medium
—	Japan	188	High	High	High	Low	Medium

*1 Biodiversity intactness indicates the extent to which species and populations are being maintained in the surrounding area. The higher the value, the less change there is, and the healthier their conditions.

*2 Forest cover loss indicates the change in forest cover in the surrounding area since 2000. The higher the value, the more forest cover has been lost.

Note: The forest of OUGC is not included in this assessment as it was newly acquired in July 2024

Economic Value Assessment of Oji Forests

The Oji Group has been creating its domestic forests for many years, dating back to the 1930s. One of our core competencies, sustainable forest management, involves not only maintaining a sustainable timber production cycle—forest planting → silviculture → harvest → forest planting—but also fulfilling other multifaceted roles, including absorbing and fixing CO₂, conserving biodiversity, cultivating water resources, and landslide disaster prevention.

We estimated the economic value of forest functions using the Forestry Agency evaluation method*3 and found that the annual economic impact was 550 billion yen. Maintaining a focus on the future introduction of natural capital accounting, in years ahead we will reflect regional characteristics, improve our accuracy, and add value from new perspectives by collaborating with academia and start-ups.

*3 Calculation based on the methodology used in the Forestry Agency of Japan’s 2000 Valuation of the Public Benefit Functions of Forests (calculated by multiplying the Forestry Agency’s estimated national valuation by the ratio of Oji Holdings’ forest area to the national forest area). Some calculation units and evaluation methods were updated where possible (water resource cultivation function, biodiversity conservation function (wildlife conservation function) and air quality conservation function).

Economic value assessments of Oji Forests (Domestic Forest)

(¥ billion / year)

Public benefit functions of forests	Value	Function details
Water resource cultivation function	204	The soil in forests stores rainfall, equalizes the amount of water flowing into rivers, prevents floods and droughts, and through this process, purifies water quality.
Soil erosion prevention function	212	The understory vegetation and fallen leaves and branches in forests play a role in controlling soil erosion.
Landslide prevention function	63	Forests prevent landslides due to their expansive root systems.
Health and rest functions	17	Forests play a role in providing people with relaxation and leisure time.
Wildlife conservation function (biodiversity conservation)	43	Forests have a role as habitats for wild birds and animals.
Air quality conservation function (CO ₂ absorption)	11	Forests absorb CO ₂ and emit oxygen during the course of their growth. (The amount of CO ₂ absorbed is calculated by replacing it with the price of purchasing carbon credits.)
Total	550	

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CENIBRA (Minas Gerais, Brazil)

CENIBRA is mainly engaged in forestry and pulp production. CENIBRA manages approximately 250,000 ha of forest within an ecosystem known as the Atlantic Forest. Regarding CENIBRA's forestry activities, nature-related dependencies, impacts, risks, and opportunities were identified and assessed, and metrics and targets were set.

Identifying and Assessing Dependencies and Impacts

CENIBRA's forestry activities depend on many ecosystem services, such as timber and water supply, soil quality, and climate regulation. The activities also have impact drivers on nature, such as GHG emissions and absorption, and land use. We have assessed the magnitude of each dependency and impact.

Identifying and Assessing Risks and Opportunities

Based on our dependencies and impacts on nature and their extent as well as on the state of nature in the region, we identified and assessed risks and opportunities, as shown in the table on the right. Two exploratory scenarios were used to prepare for future uncertainties. Our response actions include preventing fire, establishing ecological corridors, and reintroducing endangered species.

Metrics and Targets

Based on the risk and opportunity assessment results, we organized future countermeasures and set the targets shown in the table on the right. These targets were considered and set in accordance with the LEAP approach, implemented by Oji Holdings with the assistance of KPMG AZSA LLC. Furthermore, following discussions by the Oji Group Board of Directors, these issues are incorporated into the KPIs for material issues and managed accordingly.

Risks and Opportunities (Excerpts)

Category	Risks	Financial effects	Countermeasures	2025	Scenario 1 ^{*1}		Scenario 2 ^{*1}	
					2030	2050	2030	2050
					Magnitude: High (Red), Medium (Orange), Low (Blue) Likelihood: High (Grey), Medium (Light Grey), Low (White)			
Physical	Higher temperatures and increasing number of extremely hot days	Increased costs and decreased sales caused by declining lumber productivity	Climate change mitigation	●	●●	●●	●●	●●●
	Increased frequency of flooding	Operational restrictions due to submerged trees and soil runoff	Installing reservoirs, subsoiling	●●●	●●●	●●●	●●●	●●●
	Increasing fire weather and frequency of forest fires	Increased reforestation and fire prevention costs	Climate change mitigation, fire prevention	●●●	●●●	●●●	●●●	●●●
	Soil compaction and declining soil fertility	Increased costs and reduced sales due to declining lumber productivity, and increased fertilizer and pesticide costs	Appropriate fertilizer selection, subsoiling	●	●	●●	●●	●●●
	Significant loss of biodiversity due to inappropriate land management	Reduced access to ecosystem services, liability for the loss of biodiversity	Avoiding deforestation, establishing conservation forests, preserving water sources	●	●●	●●	●●●	●●●
Transition	Increasingly stringent reporting requirements for nature-related risks and impacts	Increased monitoring costs and fines for delayed responses	Acquisition of various certifications, development of monitoring technologies	●●●	●●●	●●●	●●	●●
	The spread of negative perceptions regarding tree felling	Declining demand due to deteriorating reputation	Disclosure of monitoring with satellite imagery analysis of forest	●●	●●●	●●	●●	●●

Opportunities	Financial effects	Countermeasures	2025	Scenario 1 ^{*1}		Scenario 2 ^{*1}	
				2030	2050	2030	2050
				Magnitude: High (Red), Medium (Orange), Low (Blue) Likelihood: High (Grey), Medium (Light Grey), Low (White)			
More efficient use of wood and water resources	Reduces costs, improves resilience to resource scarcity, and reduces negative impacts from land and resource use	Developing applications for lumber, recycling resources	●●●	●●●	●●●	●●●	●●●
Ecosystem preservation and recovery activities	Improves quality and reputation of various ecosystem services	Establishing conservation forests, forest restoration, establishing ecological corridors, reintroducing endangered species	●●●	●●●	●●●	●●●	●●●
Water conservation activities, water quality and provision management	Reduces risk of potential water shortages and improves reputation	Water conservation	●●●	●●●	●●●	●●●	●●●
Increasing demand for renewable resources and certified products	Increases sales	Developing products, acquiring various certifications, responding to new regulations	●●●	●●●	●●●	●●●	●●●
Participation in initiatives, collaboration with stakeholders, and contributions to local communities	Enhances reputation, expands opportunities for collaborations	Promoting social contribution activities, implementing communications activities with local communities	●●	●●●	●●●	●●	●●

*1 See the TNFD Report for details.

Metrics and Targets

Metrics	Targets
Area of natural forest restored on owned land ^{*2}	At least 3,000 ha between 2024–2033
Number of native tree species planted on owned land ^{*3}	At least 500,000 seedlings between 2024–2033
Area of ecological corridors formed outside owned land ^{*4}	At least 3,500 ha between 2024–2033

*2 The area where planting and other activities were carried out to restore natural forests lost due to windthrow, fire, etc.

*3 The number of trees planted within the natural forests owned.

*4 The area enclosed by fences to promote the revegetation of degraded lands between fragmented natural forests and to allow wildlife to move freely, in collaboration with landowners.

Domestic

Having been working on forestation in Japan for many years, we own 188,000 ha of company forests encompassing approximately 650 locations, from Hokkaido to Kyushu.

Of those, plantations account for 41%, or 77,000 ha. While making use of forest resources (regeneration cutting and replanting to rejuvenate the forest), we are also continuously engaged in thinning and other cultivation work (to enhance resources for subsequent generations).

There is a forest management division in each region that undertakes sustainable forest management so that a balance can be achieved between enhancing and utilizing forest resources and the full utilization of diverse forest functions, such as biodiversity conservation and water resource cultivation.

Measuring the State of Nature

First Step: Quantifying Diverse Forest Functions

To fulfill its responsibilities as the owner of vast forests, the Oji Group is committed to taking the lead in maximizing the multifaceted contributory performance functions of those forests. The first step in that is to quantify forest functions.

With regard to biodiversity, the importance of biodiversity in each company-owned forest was scored based on the overlap with key biodiversity areas for conservation (KBAs), the number of vegetation types obtained from Ministry of the Environment vegetation data, the biota estimated by a species distribution model*1, and the coverage rate of endangered species in each area.

With regard to water resource cultivation, we utilized the National Land Information Platform to evaluate the cultivation volume of each company-owned forest.

*1 KBA: An area of key importance for conservation of biodiversity. KBAs are selected worldwide based on the concept of "criticality" (habitat of globally threatened species) and "non-substitutability" (particular location where survival of a species depends).

Quantifying Biodiversity

(1) Map Showing Biodiversity Importance

The map below shows the results of a comprehensive assessment of the importance of biodiversity of all company-owned forests.

The closer the score is to 1.0 (red), the greater the importance of the forest. As there is a possibility that the dependencies and impacts on nature associated with their business activities will be high, including on areas surrounding company-owned forests, we plan to identify and analyze these as important areas.



Earthstar Geographics | Esri, TomTom, Garmin, FAO, NOAA, USGS

(2) Estimated Species Richness

It is estimated that there are more than 3,000 species of organisms inhabiting all domestic company-owned forests in total*2, of which approximately 1,400 are endangered species. To estimate the latter, we used the endangered species in Class I and II (groups with the highest risk of extinction) from the Japanese Red List for each prefecture.

Taxon	Estimated species richness	Of which, endangered species
Amphibians	51	25
Birds	294	97
Seed plants	2,667	1,273
Total	3,012	1,395

*2 The types of organisms that inhabit an area were estimated based on a species distribution model (a method for estimating the spatial distribution of species using a dataset of environmental factors that influence distribution). This was applied to 3,776 native bird, amphibian, and seed plant species. The model has a spatial resolution of one kilometer and takes into account various environmental factors such as climatic variables, geology, vegetation, land cover, and topography. Environmental suitability, which indicates the suitability of each location for the habitation of a given species, is obtained as a value between 0 and 1. Values of 0.7 or higher were considered to indicate high probability of habitation.

Water Resource Cultivation Assessment

In forests, fallen leaves and other organic matter are decomposed by earthworms and microorganisms to form humus. The humus forms a sponge-like structure that stores water and allows clean water to slowly flow out. This is called the water resource cultivation function.

We calculated the daily cultivation volume and economic value of all company-owned forests, the results of which are shown below. In the Economic Value Assessment of Oji Forest on page 67, the water resource conservation function was evaluated based on the costs that would be required to replace it with facilities such as irrigation dams and flood control dams.

- (1) Cultivation volume*3 **Approximately 5.1 million m³ per day**
Equivalent to the amount of water used by approximately 16.9 million people per day*4.
- (2) Economic value*5 **Approximately 204 billion yen per year**

*3 Storage volume (amount of water seeping down from the ground surface)

*4 Calculated as 300 L of water used per person per day in each household.

*5 Calculation based on methodology used in the Forestry Agency of Japan's 2000 Valuation of the Public Benefit Functions of Forests.

Future Initiatives

Aiming to Maximize the Value of Forests

Having started with Sarufutsu Forest in Hokkaido, which scored high in the biodiversity and water resource cultivation survey, we plan to select several important areas in Honshu and the south and proceed with quantification by utilizing the latest field monitoring technologies, such as AI, sensors, and drones, and partnerships with academia. In recent years, companies have been required to assess and disclose their impact on nature, as well as the dependencies, risks, and opportunities associated with their business activities. As a first step, the Oji Group will move forward with state of nature evaluations, and in the future, we will work to establish the Oji Model for assessing the value of nature with the aim of becoming a nature-positive company.

Manufacturing Operations in Water Risk Areas

Water Risk Assessment

The depletion of water resources and damage from floods caused by climate change in recent years pose significant risks not only to the continuity of businesses but also to industries and people’s health in the communities where businesses operate. To better understand the water risks involved in its business operations, the Oji Group refers to assessments made by the World Resources Institute (WRI), a global environmental research organization.

An analysis of water risk at all 308 business sites was carried out using the WRI’s AQUEDUCT water risk assessment tool. The results showed that there were 21 sites located in areas with high water risk (Baseline Water Stress: High and Extremely High). Fact-finding surveys were conducted at these 21 high-risk business sites to investigate the actual water risks and their financial impacts.

Water Risk Assessment*1

	FY2023										
	Number of business sites*2	Water intake (Thousands of m ³)		Water consumption (Thousands of m ³)*3		Production volume (Thousands of tons)		Sales (¥ billion)		Assets (¥ billion)	
Low (<10%) or No data	70	342,312	49%	7,908	35%	6,594	44%				
Low to medium (10%–20%)	122	215,140	31%	4,529	20%	4,484	30%				
Medium to high (20%–40%)	95	135,898	20%	9,754	43%	3,607	24%				
High (40%–80%)	4	1,254	0%	266	1%	103	1%	71.6*4	4%*4	90.8*4	4%*4
Extremely high (>80%)	17	217	0%	88	0%	209	1%				
Total	308	694,820	100%	22,545	100%	14,998	100%	1,696.3*5	100%	2,442.5*5	100%

*1 WRI’s AQUEDUCT (4.0) Water Risk Atlas - Baseline Water Stress (5-level evaluation): Indicates the degree of potential competition with other users of water, with higher values indicating more intense competition and higher risk. ⇒ <https://www.wri.org/aqueduct>

*2 Excludes main offices, sales offices, and other business sites not involved in product manufacturing.

*3 Water consumption is the amount of water intake minus the amount of water discharged.

*4 Subtotals of sales and assets of companies that have business sites located in areas with high water risk (High and Extremely High), and the ratio of each against the total sales and assets of the entire Group.

*5 Total sales of 1,696.3 billion yen and total assets of 2,442.5 billion yen are for the entire Group, including companies excluded from the water risk assessment.

Water Risk Fact-finding Survey

For those business sites evaluated as high risk, we conduct annual interviews to ascertain the impact of water shortages and flooding on operations, the frequency of their occurrence, and to hear examples of the countermeasures being implemented.

The results of the interviews conducted in fiscal 2023 showed that no issues with production or operations were identified at any business site, and no potential water risks were observed. However, business sites reported proactive environmental protection actions, such as implementing voluntary initiatives to reduce water usage, engaging with stakeholders to reduce water consumption, and participating in water resource conservation activities led by public institutions.

(High-risk business site initiatives)

- Monitoring water consumption and conducting educational activities on reducing water consumption and water pollution
- Engaging with industrial water suppliers to formulate water usage reduction plans

- Providing data on water consumption, wastewater volume, and water quality management to municipal governments and national government agencies
- Utilizing rainwater and Group-owned well water
- Upgrading boiler cooling tower equipment and installing reverse osmosis membrane treatment equipment
- Expanding the installation of drainage weir boards
- Participating in water resource conservation activities led by public institutions

Financial Impacts

In terms of total water intake and water consumption, these high-risk sites accounted for less than 1% and 2% of the Group, respectively, and for 2% of total production. To analyze the potential financial impact of water risks, we also considered scenarios in which these facilities were forced to suspend operations due to water shortages. However, as the sales and assets of these sites account for only about 4% of the Group’s total, the financial impact was consequently estimated to be low.

Publication of the TNFD Report

Following engagement with investors such as Nature Action 100 and other stakeholders on nature and biodiversity issues, and the publication of the TNFD recommendations in September 2023, Oji Holdings announced its intention to disclose nature-related Oji Group information in line with the TNFD recommendations and registered as an early adopter in January 2024.

Having proceeded with preparations for evaluation and disclosure in line with the TNFD recommendations, we published our first TNFD Report in September 2024. For more information on nature-related dependencies, impacts, risks, and opportunities, our responses to them as well as the TNFD-recommended disclosure indicators, please see the TNFD Report on our website.

[▶ TNFD Report](#)

Circular Use of Resources – Water –

Basic Approach

As a core business of the Oji Group, the Paper and Pulp Business generally consumes high volumes of water. Moreover, the water used during its production processes contains high amounts of dissolved organic compounds.

The Group recognizes that water is a limited resource, and places a priority on protecting aquatic life. Therefore, we see it as our mission to reduce water intake and significantly lower the pollution load in wastewater before returning it to water areas, and engage in such efforts under targets raised for each measure. Moreover, we engage with other water users as a valuable opportunity, and make every effort to build relationships of coexistence and co-prosperity.

Targets

Water Intake Reduction

Reduce water intake intensity for FY2030 by at least 6% compared with FY2018

Purify Wastewater

Reduce BOD, COD, and SS emission intensity for FY2030 by 15% compared with FY2018

Water Intake Reduction

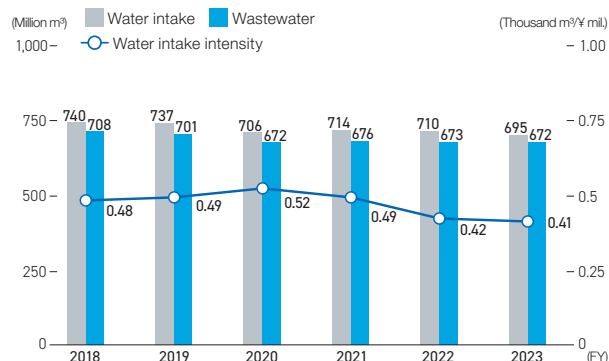
To achieve the target for the reduction of water intake intensity, Oji Paper, Oji Materia, Oji F-TEX, and Oji Nepia, for which the water intake accounts for approximately 80% of that of the entire Group, have formulated specific reduction plans for 2030 and are working on the reduction. The Sustainability Committee Secretariat receives quarterly reports from each company on actual reductions, while the Committee makes biannual reports to Directors.

The Oji Group's total water intake for FY2023 stood at 695 million m³, total water drainage at 672 million m³, and water

consumption at 23 million m³. Moreover, at 0.41 thousand m³/¥ million, we achieved our target for water intake intensity*¹.

*¹ Target value for FY2023: 0.47 (thousand m³/¥ mil.)

Water Intake*, wastewater*, and water intake intensity



* A star mark indicates that FY2023 figures have been assured by KPMG AZSA Sustainability Co., Ltd.

Oji Materia Osaka Mill has adopted and implemented the “Best Available Techniques” recommended by the European Commission for environmental protection purposes. By doing so, the mill has reduced the water use intensity (m³/ton) during paperboard production to the single-digit range, achieving industry-leading high water usage efficiency.

Purify Wastewater

Each Group mill manages wastewater quality using voluntary management values that are stricter than the regulatory values stipulated by laws and ordinances, ensuring compliance with regulatory values. We are committed to purify the wastewater. For example, in FY2023, we reduced COD (chemical oxygen demand) in wastewater by at least 51% compared to the emissions that would have been allowed under the regulatory values.

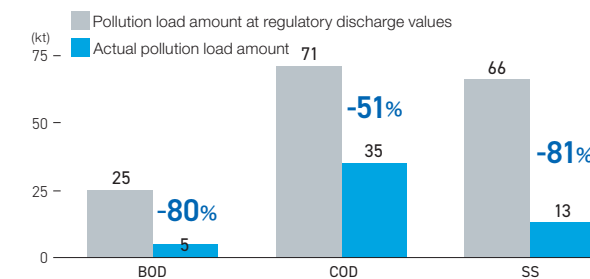
The BOD, COD, and SS emission intensities for the Oji Group in FY2023 stood at 3.0, 20.4, and 7.5 kg/¥ million, respectively,

thereby achieving the target values*² in each case.

Expenses and total investments involved in wastewater treatment and other water-related activities for the entire Group were 7,834 million yen and 797 million yen, respectively.

*² FY2023 target values: BOD 4.7, COD 21.0, SS 9.9 (kg /¥ million)

Pollution load amount in wastewater (BOD•COD*•SS)



* A star mark indicates that FY2023 figure for actual pollution load amount of COD has been assured by KPMG AZSA Sustainability Co., Ltd.

BOD (Biochemical oxygen demand)
The amount of oxygen consumed when organic matter is broken down by aerobic microorganisms. The most widely used indicator of pollution. When BOD is high, foul odors, etc. begin to be produced.

COD (Chemical oxygen demand)
The amount of oxygen required as calculated from the amount of oxidant that is consumed when organic matter is oxidized.

SS (Suspended solids)
Particulates suspended in water

Engagement with Other Water Users

Oji Paper's Tomioka Mill and Yonago Mill participate in the Irrigation Associations and other similar groups in their respective regions. For example, during times of water shortages in the summer, they cooperate in water intake restrictions based on the water level at dams to prioritize agricultural water use in their regions. In addition, Oji F-TEX's Shibakawa Mill has signed a memorandum of understanding regarding water use with the local Fisheries Cooperative and cooperates in protecting the local environment and aquatic life.

Circular Use of Resources – Plastic –

Basic Approach

Contributing to the Transition to a Circular Economy

Although the Oji Group does not use large amounts of plastics in our manufacturing processes, these processes still generate a certain amount of waste plastic from contaminants contained in the recovered paper used as a raw material. The Group therefore promotes the recycling of waste plastic (including thermal recycling) in an effort to reduce the amount of waste plastic that is left unrecycled*1.

*1 Unrecycled: Disposed without being reused or recycled in some other way (e.g., landfill, incineration without energy recovery)

Moreover, the Group has raised the target of achieving “negative emissions of plastic” by selling more renewable eco-friendly paper products than the amount of waste plastic left unrecycled. Through this effort, we reduce the amount of plastic used in society as a whole, as well as contribute to the de-plasticization society and to the transition to a circular economy.

Expanding Sales of Renewable Eco-friendly Paper Products

As one of the Group’s core businesses, in the packaging materials field we are promoting expanded sales of renewable eco-friendly paper products through the shift from plastic to paper packaging, for example. By replacing plastic products with renewable eco-friendly paper products, the Oji Group reduces the amount of plastic used by our customers and throughout society as a whole. Moreover, by replacing plastic products derived from fossil fuels, which are subject to material, chemical, and thermal recycling, with renewable eco-friendly paper products that use paper made from biomass resources and have a high material recycling rate, we can contribute to the transition to a circular economy. In FY2023, the Oji Group sold 3,297 tons of renewable eco-friendly paper products. We aim to expand sales of renewable eco-friendly paper products to 5,000 tons by FY2030.

▶ For renewable eco-friendly paper product development examples [P.39](#)

▶ For renewable eco-friendly paper product adoption examples [P.57](#)

FY2023 results	Sales volume of renewable eco-friendly paper products 3,297 tons	Amount of unrecycled waste plastic*2 1,215 tons	Negative plastic emissions Achievement
FY2030 targets	At least 5,000 tons	0 tons	Achievement

*2 Total for 10 Oji Group companies in Japan (Oji Paper Co., Ltd., Oji Materia Co., Ltd., Oji F-TeX Co., Ltd., Oji Nepia Co., Ltd., Oji Imaging Media Co., Ltd., Oji Container Co., Ltd., Morishigyo Co., Ltd., Oji Tac Co., Ltd., Chuetsu Co., Ltd., and New Tac Kasei Co., Ltd)

Waste Plastic Recycling Initiatives

More than 90% of the waste plastic generated by the Oji Group is derived from plastic mixed with recovered paper, the raw material for paper and paperboard. The Group therefore promotes the effective use of waste plastic at each of our manufacturing sites in Japan. In FY2023, we recycled 72,419 tons of waste plastic, while 1,215 tons of waste plastic remained unrecycled. The Oji Group has set a target for unrecycled waste plastic of 0 tons (100% recycling rate) by FY2030 in an effort to help achieve a circular economy.

▶ For data regarding waste plastic at major manufacturing sites in Japan [Waste Reduction](#)

Topics In-house plastic reduction initiatives

Affiliated companies of the Oji Group use plastic, such as packaging, and are therefore working with packaging companies and materials manufacturers as part of initiatives to reduce the use of plastic. For example, Oji Nepia now sells kitchen towels and toilet rolls in paper packaging, replacing the previously used plastic packaging. Similarly, Grand Hotel New Oji has switched to offering the amenities provided to guests in biomass-based materials instead of plastic, and replaced the plastic cutlery provided to restaurant diners with wooden cutlery.

▶ For details of initiatives of Oji Nepia [Oji Nepia Web site \(in Japanese only\)](#)

▶ For details of initiatives of Grand Hotel New Oji [Grand Hotel New Oji Web site \(in Japanese only\)](#)

Circular Use of Resources – Recovered Paper –

Basic Approach

The Oji Group produces newsprint, printing paper, paperboard, and other products at mills across Japan, and for more than 60% of the raw material we use recovered paper. We promote the circular use of resources and contribute to maintaining a healthy paper recycling system by actively utilizing various types of recovered paper.



Mills Using Recovered Paper

- Paperboard mill
- Newsprint/Paper mill



Targets

Under the Environmental Action Program 2030, we aim to achieve a recovered paper utilization ratio of 70% or higher in Japan.

Initiatives for the Expanded Use of Recovered Paper

Domestic

To date, the Oji Group has actively worked to expand the use of recovered paper with a focus on recycling confidential documents. We have also newly established a recycling system to recycle used paper cups and liquid containers such as milk cartons that have conventionally been difficult to recycle, and are promoting their reuse at our mills.



Confidential document recycling facility (Oji Materia Edogawa Mill)



Kneading pulper, dissolving equipment for difficult-to-recycling paper (Oji Materia Fuji Mill)

Overseas

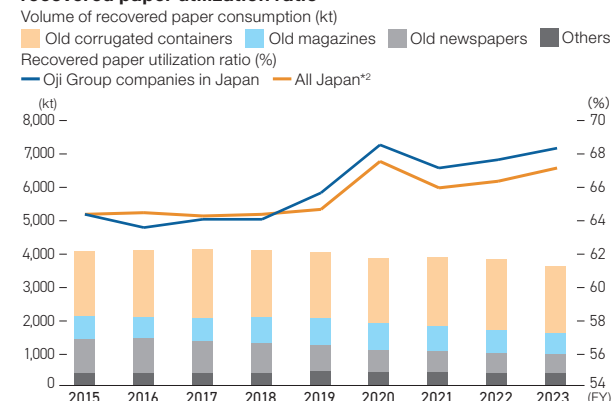
Oji's containerboard mills in New Zealand and Malaysia also recycle recovered paper to contribute to a recycling society.

Oji Fibre Solutions (Oji FS) is the only containerboard manufacturer in New Zealand, and in 2023, its total consumption of recovered paper reached 177,000 tons—that nation's largest amount. In Malaysia, GSPP manufactures containerboard made almost entirely from recovered paper. In 2023, it used 695,000 tons of recovered paper, of which it procured 46% locally in Malaysia and imported 54% from overseas.

Current Recovered Paper Utilization Ratio

The Oji Group's consumption of recovered paper is the largest in Japan, amounting to 3.58 million tons annually. This accounts for 24% of the 14.85 million tons of total recovered paper consumed in Japan. The Group uses various types of recovered paper in a wide range of products. The recovered paper utilization ratio has continued to increase year by year, achieving a record high of 68.3% in FY2023. The ratio for containerboard, in particular, is much higher, at 98.3%.

Volume of recovered paper used and recovered paper utilization ratio^{*1}



^{*1} Recovered paper utilization ratio = Volume of recovered paper consumed ÷ Total volume of fiber raw materials consumed (total consumption of recovered paper, wood pulp, and others)
^{*2} Source for all Japan: Paper Recycling Promotion Center

Challenges

With the decline of sales of newspapers, magazines, and other forms of paper media, the generation of recovered paper has declined each year, even as the overseas demand for recovered paper remains strong. We therefore see it as our mission to improve paper utilization technology in a way that enables the stable consumption of recovered paper that was unable to be used previously, and that maintains a domestic circulation in which paper recovered in Japan is recycled in Japan. To fulfill this mission, we will work with recovered paper wholesalers and other recycling companies to promote the use of recovered paper as a domestic resource.

Responsible Raw Materials Procurement

Basic Approach

Compliance with laws and regulations as well as the fulfillment of its social responsibility are essential not only for the Company itself but also for the entire supply chain in order to enhance corporate value. Along with the rapid progress of globalization, attention is being paid to addressing social issues, and in particular, taking into consideration sustainability in the procurement of raw materials is required.

The Oji Group promotes responsible raw material procurement through ongoing dialogue with its suppliers, with the aim of contributing to a sustainable society.

Sustainability Promotion (Governance) Structure

Supply chain risks (environmental risks, human rights risks, etc.) and matters related to countermeasures are discussed by the Sustainability Promotion Committee and monitored and supervised by the Board of Directors.

[▶ P.29](#)

Oji Group Sustainability Action Guidelines for Supply Chains (Revised: February 26, 2024)

The Oji Group is upgrading and expanding its sustainability procurement activities that take into consideration environmental and social factors when procuring raw materials. We engage in activities in accordance with the following two policy guidelines.

- 1) [Oji Group Sustainability Action Guidelines for Supply Chains](#)
- 2) [Wood Raw Material Procurement Guidelines](#)

These guidelines are designed to help promote responsible and sustainable procurement by ensuring that new suppliers

are conversant with the Group’s policies before entering into transactions. Moreover, we work to ensure that all suppliers are fully informed when guidelines are revised. These guidelines include such internationally important principles as (1) Compliance with laws and social norms, fair trade, and the prevention of corruption (anti-corruption); (2) Environmental considerations (e.g., coping with climate change, reducing environmental impact, conserving biodiversity); (3) Consideration for society (e.g., respect for human rights, ensuring an appropriate working environment); and (4) Communication with society.

Furthermore, in February 2024, we made some revisions to the content and requested suppliers to understand and practice the new guidelines, as we progress toward collaboration.

Supplier Sustainability Surveys

Purpose and significance of the survey

Since fiscal 2020, the Oji Group has been conducting a sustainability survey of major suppliers selected on the basis of transaction value and product categories, with the aim of gaining a better understanding of the actual situation in the supply chain and strengthening risk management.

This survey complies with the guidelines of the United Nations Global Compact (UNGC), and is an important initiative for both the Oji Group and its suppliers to contribute to a sustainable society and fulfill their social responsibilities. The results of this survey will be used as a basis for making decisions when conducting supplier screening in the future.

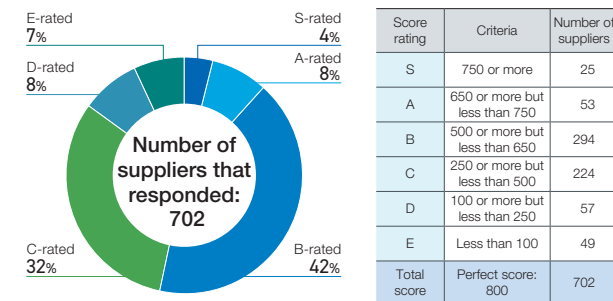
Summary of survey results (FY2020–2023)

The sustainability survey conducted by the Oji Group in FY2023 targeted 203 companies and responses were received from 150.

In total, 702 out of 955 companies responded from FY2020 to FY2023, for a response rate of approximately 74%. The overall average score for the eight ESG-related items was 475 (out of

a total score of 800), for a score ratio of 59%. The item with the highest average score was “Labor” with 67 points, and the item with the lowest average score was “Corporate Governance” with 53 points. In the FY2023 survey, 19 companies were ranked D and 16 were ranked E.

Breakdown of supplier ratings



Rating based on the total score of eight items

Eight items from an ESG perspective
 ① Corporate governance ② Human rights ③ Labor ④ Environment ⑤ Quality and safety
 ⑥ Basic attitude toward the supply chain ⑦ Harmonious coexistence with local communities ⑧ Information security/protection and fair corporate activities

Follow-up and future initiatives

Based on the response results of the Supplier Sustainability Survey, the Oji Group provides guidance (follow-up) to encourage compliance and implementation of the items listed in the Oji Group Supply Chain Sustainability Action Guidelines, and strives for continuous improvement.

We will continue to evaluate suppliers who significantly fall below the average score while aiming to improve the response rate. In addition, for preferred and key suppliers, we plan to gradually implement human rights due diligence/environmental due diligence as part of our assessment process.

Other Initiatives

Conduct human rights due diligence

The Oji Group conducted a risk assessment of its suppliers in accordance with the “Reference Material on Practical Approaches for Business Enterprises to Respect Human Rights in Responsible Supply Chains” issued by the Ministry of Economy, Trade and Industry of Japan. In identifying human rights risks, the assessment was conducted from the following four perspectives.

- Sector and business area risks
- Risks associated with products and services
- Regional risks
- Company-specific risks

This assessment identified 62 suppliers as high risk, and we prioritized these companies for human rights due diligence.

For details of the implementation, please visit the following public information website of Oji Holdings.

[▶ Respect for Human Rights](#)

Sustainability survey on wood pulp contained in purchased base paper (procured from base paper manufacturers) (FY2022–2024)

In FY2022, we conducted a survey on the legality of wood pulp contained in purchased base paper (procured by base paper manufacturers), which had not previously been the subject of a survey. Of the 531 brands excluding customer-designated base paper, while the origin of materials was unknown for five brands, we have been promoting a switch from FY2023. By May 2024, all purchased base paper had been switched to base paper with 100% of the wood used verified as legal.

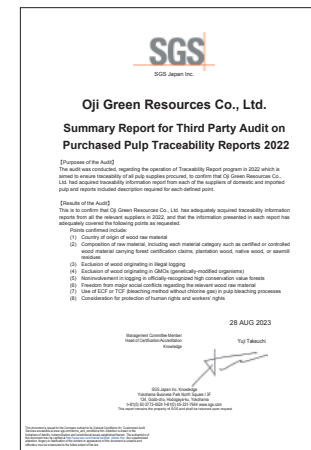
Survey target		Number of brands	Ratio	Notes
Base paper purchased		531	100%	Excluding customer-specified base paper
Breakdown	Base paper for which the legality of the wood used has been verified	531	100%	Forest certification, etc. acquired
	Base paper for which the origin of the wood used has not been identified	0	-	Switch completed
Other		39	-	Customer-specified base paper

Confirmation of traceability of wood raw materials

The Oji Group specifies items to confirm the origin of wood, forest management methods, illegally logged wood, mixture of wood with high conservation values, and human rights violations based on the Wood Raw Material Procurement Guidelines, and procures only raw materials that are produced in properly managed forests. It is possible to trace the source of wood throughout the entire process from the forests of origin, woodchip mill to paper manufacturing and pulp mill.

In FY2022, the Group procured 4,622 kBDT (bone dry tons) of woodchips in Japan and overseas and 183 kADT (air dry tons) of market pulp, obtained traceability reports from all suppliers, and obtained confirmation by a third-party organization that the procurement was in accordance with the Wood Raw Material Procurement Guidelines.

[▶ Wood Raw Material Procurement Guidelines \(revised in 2023\)](#)

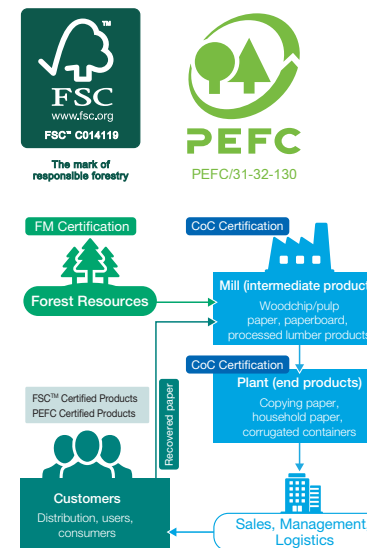


Making use of forest certification systems

The Oji Group manufactures products certified by FSC™ (FSC™C014119, etc.) and PEFC (JIA-PEFC-COC-0808, etc.) by making use of forest certification systems that support sustainable forest management.

These products use woodchips that conform to the requirements of the systems. We have obtained FM certification*1 for our overseas plantation forest operations and CoC certification*2 for our production, processing, and distribution operations within the Group. By acquiring certification throughout the entire process from forests to processing mills and distribution, we supply a wide range of forest-certified products, from intermediate to finished products such as copy paper and household paper.

In addition, we have the Forest Certification System Implementation Committee within the Group to ensure the proper operation and effective use of forest certification systems.



*1 FM certification: Confirmation of forest management
 *2 CoC certification: Confirmation of management on processing and distribution of produced wood

Respect for Human Rights

The Oji Group's Approach to Human Rights

The Oji Group recognizes respect for human rights as one of its key sustainability material issues.

At the same time, respect for human rights is positioned as a bedrock of the Oji Group Human Resource Philosophy. This Philosophy is shared not only by employees but also across the entire supply chain with specific initiatives implemented in a bid to prevent human rights issues.

As far as our supply chain is concerned, we call on business partners to respect human rights, protect workers' rights, ensure workplace safety and health, and take other necessary measures in accordance with the Oji Group Sustainability Action Guidelines for Supply Chains. In addition, supplier sustainability surveys are conducted regularly targeting suppliers in Japan and overseas.

Oji Group Human Rights Policy

In the belief that the responsibility to respect human rights is an important element of the global code of conduct, we formulated the Oji Group Human Rights Policy in order to further promote and implement initiatives that help ensure respect for human rights in 2020. The policy is based on the United Nations Guiding Principles on Business and Human Rights (UNGPs), and clearly stipulates the implementation of human rights due diligence, remedies, and dialogue.

In light of the recent emphasis on ensuring respect for human rights by corporations, as exemplified by the promotion of new human rights rules for global corporations in Europe and elsewhere, we have partially revised this policy in February 2024. In specific terms, we codified our support and respect for the international norms stipulated under the OECD Guidelines for Multinational Enterprises on Responsible Business Conduct and the United Nations' Declaration on the Rights of Indigenous Peoples as well as international human rights, including indigenous peoples' right to "free, prior, and informed consent,"

and engage in dialogue and consultation with rights holders. In revising the policy, we received input from Nishimura & Asahi. Looking ahead, we will work to disseminate the content of the policy both within and outside the Group, deepen awareness of human rights, and reduce the risk of human rights violations throughout the entire value chain.

▶ [Oji Group Human Rights Policy](#)

▶ [Specific Initiatives on the Rights of Indigenous Peoples](#)

Promoting Respect for the Human Rights Structure

Matters that are material to fulfilling our commitment to respect human rights are deliberated by the Sustainability Committee and monitored and supervised by the Board of Directors.

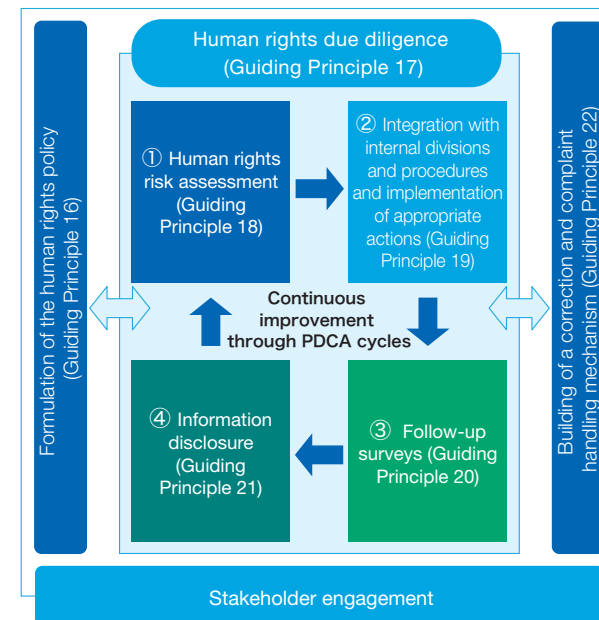
▶ [P.29](#)

Implementing Human Rights Due Diligence in Accordance with the UNGPs

The UNGPs call for companies not to infringe (have a negative impact on) human rights in the conduct of their business activities and to conduct human rights due diligence to identify, prevent, mitigate, address, and account for the potential for negative impacts (human rights risks).

Suppliers for the FY2023 assessment were determined by assuming the scope of high-risk operations and then screening them based on scores from METI data. The rationality and legitimacy of this selection method was confirmed by a third-party organization.

Cycle for human rights due diligence



Establishing a Grievance Mechanism

The Oji Group will put in place a grievance mechanism to provide remedies in accordance with the UNGPs. We already operate the Corporate Ethics Helpline for consultation and reporting that is open to all officers and employees of the Oji Group, and have established a reporting system through our website to handle reports from outside stakeholders. Throughout these consultation and reporting processes, we will ensure the anonymity of those seeking consultation or making reports, protect the confidentiality of the information shared, and take measures so that those involved are not subjected to disadvantageous treatment.

▶ [Respect for Human Rights](#)

Mitigation and Adaptation
to Climate ChangeClimate-related Information Disclosure
Based on the TCFD RecommendationsSustainable Forest
ManagementNature-related Information Disclosure
Based on the TNFD RecommendationsCircular Use of
ResourcesResponsible Raw
Materials Procurement**Respect for
Human Rights**Ensuring Workplace
Safety and Health

FY2023 Human Rights Due Diligence

Target

- 62 suppliers (response rate 80.6%)
- As a result of the discussions, the target industries for this fiscal year were determined to be wood chips, wood fuel, starch/corn, wood products, PKS, and hemp.
- The target companies were selected based on the scores of “Human Rights Risk by Product” and “Human Rights Risk by Region” from the “Practical Reference Materials for Respecting Human Rights in Responsible Supply Chains, etc.” by the Ministry of Economy, Trade and Industry of Japan.

Results

- No materialized serious human rights risks were identified.
- 3 suppliers that were found to be deficient in the following key human rights items were asked to make improvements, and we received a written confirmation of implementation.

<Improvement request items>

Dissemination of human rights policy, Clarification of human rights promotion system, Remedial measures, Prohibition of child labor and forced labor, Fair wages, Freedom of association, Workplace health and safety

Human rights assessment in conflict-affected areas

- We exchanged opinions with local management companies regarding the implementation of human rights assessments for suppliers in conflict-affected areas in Southeast Asia.
- With reference to opinions from a third-party organization, we conducted assessments through Group companies in the region in FY2023. We will continue to gather information and closely monitor developments in the region concerned.

▶ [2023 Human rights due diligence results](#)

▶ [2022 Human rights due diligence results](#)

Initiatives for FY2024

Interviews with regions and industries with low response rates

- We will exchange opinions with the departments in charge of

regions and industries with low assessment response rates, and employ this feedback as a reference for FY2024’s human rights impact assessments.

Conducting human rights impact assessments

- While an exhaustive survey failed to identify any human rights risks of a significant nature, we will conduct human rights impact assessments taking into account such factors as severity and likelihood of occurrence across all of the Group business activities.

Interviews with migrant workers at overseas sites (Functional Materials COMPANY)

- In Malaysia, where the percentage of migrant workers is high and there is a significant number of production sites, the Functional Materials COMPANY confirmed the working environment of two Group companies in January 2024.
- There were no issues with respect to employment, wages, working hours, communication, and living conditions. As far as workplace safety is concerned, certain deficiencies were identified in the quality of native language operating manuals. As a result, we are promoting progressive improvements.
- In the future, we will consider a variety of initiatives, including the sharing of good practices and case studies throughout the Group as well as interviews with migrant workers by third-party organizations while promoting dialogue with related departments.

Understanding Working Environments of non-Japanese Workers in Japan

We verified the status of employment of non-Japanese workers (including technical interns and temporary employees) and compliance with relevant laws and regulations.

Target

- 3 companies (newly consolidated companies in Japan in FY2023; survey of 92 domestic consolidated companies in FY2022 already conducted)

Results

- We found no issues in terms of legal compliance and treatment.

Human Rights Education

Raising awareness of human rights among employees is essential to promoting initiatives that enhance respect for human rights. The Oji Group conducts education on human rights, including Diversity Management Web Training on a continuous basis in an effort to promote initiatives based on the United Nations Guiding Principles on Business and Human Rights.

In the leadup to implementing human rights assessments in FY2023, we conducted pre-training for procurement-related departments for the departments responsible for procurement that serve as points of contact for suppliers.

[Implemented Programs]

FY2023 (Number of participants: 2,547)

- Human rights initiatives directly related to corporate value
- The basics of business- and human rights-related risk management—What is required of the corporate sector today?

FY2022 (Number of participants: 2,566)

- Wishing happiness to all—Human Rights from an International Perspective
- Gray-area power harassment prevented through assertive countermeasures

Stakeholder Engagement

- We participated in the Human Rights Due Diligence Subcommittee and ESG Subcommittee of the Global Compact Network Japan (GCNJ) and exchanged information with experts from other companies and NPOs.
- In addition, one person in charge participated in and completed the first phase (October 2023–February 2024) of the “Program for the Development of In-house Experts for Respect for International Human Rights and Labor Standards,” jointly sponsored by the ILO Office in Japan and GCNJ.

▶ [Respect for Human Rights](#)

Ensuring Workplace Safety and Health

Basic Approach

Alongside compliance and the environment, safety forms the foundation of the Oji Group’s corporate value and must be given absolute top priority. In accordance with the spirit of the Oji Group Corporate Code of Conduct and the Oji Group Behavior Standard, which set the criteria for the activities of all Oji Group executives and employees, we stipulate basic matters in the Group Safety and Health Management Regulations and work to ensure that personnel are familiarized with them. Having built safety and health management structures, we are also working to ensure that all employees in Japan and overseas can work in safe environments and with a sense of security.

▶ [Oji Group Corporate Code of Conduct \(Excerpt\)](#)

- Developing a Rewarding Work Environment with Consideration for Safety and Health

▶ [Oji Group Behavior Standard \(Excerpt\)](#)

- Ensuring Safety and Health in the Workplace
- Compliance with Company Rules
- Open Working Environment

Thoroughly instilled with sound common sense, the sensibilities to immorality, and the courage to take action, all our officers and employees are committed to compliance, safety, and the environment.

Oji Group Main Principles for Safety

- ① Do not touch a rotating object. Make sure to stop the machinery/equipment (turn off a source power supply/lockout and tagout).
- ② Do not stand beneath hoisted cargo.
- ③ Wear and use a safety belt during work at heights.
- ④ In places where cargo handling operations are conducted using forklifts and similar equipment, pause for a while in order to signal your presence to the operators.

Management Structure

▶ [Oji Group Safety and Health Management Rules](#)

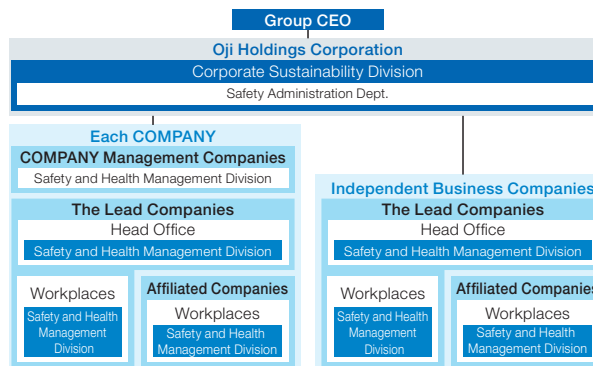
Having clarified the system of responsibilities relating to safety and health in the Oji Group, we stipulate fundamental matters in the Group Safety and Health Management Rules with the aim of preventing occupational workplace accidents and maintaining and promoting the good health not only of our employees but also affiliates and business operators who enter the Group’s premises on a temporary basis.

Basic matters

Every year, we formulate a Occupational Group Safety and Health Promotion Plan (P.79), and Group employees, personnel from affiliates, and business operators who enter the Group’s premises on a temporary basis work together to promote activities aimed at eliminating industrial accidents.

The Oji Group’s safety and health management structure

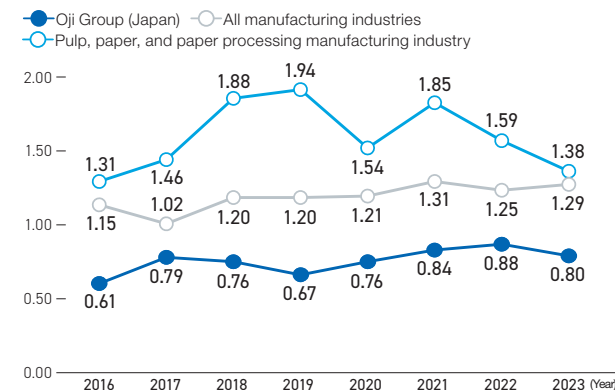
Having the responsibility and possessing the authority, the heads of workplaces in Japan and overseas serve as the safety and health managers, exercising the overall management of safety and health operations and establishing the safety and health management structure. Having put in place occupational safety and health management systems, we conduct appropriate risk assessments and safety audits. We are also developing activities aimed at safety and health, through which both management and labor work together as one.



FY2023 initiatives and occurrences of occupational accidents

Having adopted “Always Follow the Rules and Ensure that Others Follow the Rules to Prevent Fatal and Serious Accidents” as our fiscal 2023 slogan, we worked on key measures, such as full compliance with the main principles for safety and related rules, promoting improved machinery/equipment safety, and the revitalization of safety activities. Nevertheless, precious lives are being lost in accidents that should never have happened. A total of 68 accidents took place in 2023 (the same number as in 2022), including one fatal accident in Japan, two fatal accidents overseas, and one fatal to way to work accident overseas.

Lost time injury frequency rate (Safety performance)*



* A star mark indicates that 2023 figures for Oji Group (Japan) has been assured by a third party. There was an error in the figures for fiscal 2022, so they have been revised. See P.98 for the calculation method.

There were 34 accidents that resulted in lost work hours due to non-compliance with safety rules. The CEO issued a strong instruction to make “Always Follow the Rules and Ensure that Others Follow the Rules to Prevent Fatal and Serious Accidents” the most important measure.

- 27 cases of ignoring the main principles for safety and related rules (27 in 2022)
- Four fatal/serious work-related accidents/accidents that resulted in lost work hours, all involving forklifts (three in 2022)

Sustainability Material Issues and KPIs

Sustainability material issues	Components	Key performance indicators (KPIs)	Current value
Ensuring Workplace Safety and Health	● Promote well-being of employees	● Zero fatal and serious work-related accidents (each fiscal year)	● Two accidents (from January 1 to December 31, 2023)
	● Prevent occupational accidents	● Lost time injury frequency rate*: 50% reduction compared with FY2018 (0.89)	● 1.20 (from January 1 to December 31, 2023)

* Whole Group (Japan/ Overseas)

Safety and Health Training Programs

Each Oji Group company has established job class-specific safety and health training programs that are appropriate for its conditions. Under the programs, Group companies provide safety and health training that is appropriate for each job class and job, not to mention training prescribed in the Occupational Safety and Health Act.

▶ [Safety and health education and training](#)

2024 Occupational Safety and Health Promotion Plan

We will continue to base our slogan on observing and making others observe the main principles for safety and safety rules while promoting improved machinery/equipment safety. Promoting measures to prevent accidents resulting from contact with forklifts and heavy machinery in particular, we will develop and deploy initiatives to reduce the number of accidents resulting in lost work hours to achieve our goal of zero fatal and serious work-related accidents.

1. Basic Policies: The Oji Group will promote activities with the target of zero work-related accidents across the entire Group with safety as its absolute top priority.
2. Slogan: Always Follow the Main Principles for Safety and the Safety Rules and Ensure that Others Follow Them to Prevent Fatal and Serious Accidents
3. Key Targets: Targets of the entire Oji Group: To achieve zero fatal and serious work-related accidents
4. Key Measures: 1) Full compliance with the main principles for safety and related rules
2) Improvement of safety of machinery/equipment (with a special focus on measures to prevent collisions with forklifts and heavy machinery)
3) Promotion of measures to prevent lower back pain
4) Management of physical and mental health, and improvement and maintenance of the workplace environment

Ensuring Safety and Health as Top Priorities That Underpin the Foundation of Corporate Value

Conducting safety patrols

In light of the frequent occurrence of industrial accidents during loading and unloading operations within the Oji Group, the Oji Holdings Group Technology Division and the Oji Holdings Safety Administration Department accompanied Oji Holdings management team members (the Chairman and Executive Vice President) on inspection patrols and began safety-focused inspections, starting with the Oji Container Group, to prevent similar accidents from occurring.



Hands-on risk training using hazard simulation VR devices

Since 2020, we have gradually been conducting hands-on risk training sessions using VR at workplaces in Japan and overseas. Many participants remarked about the highly immersive VR video. One said, "In the disaster experience scene, I reflexively flinched or tried to run. The video let me experience accidents in a way not otherwise possible. I realized how scary accidents are and got a renewed sense of the importance of following rules." Having produced original, experience-based content, including case studies that have occurred in the Oji Group, we exercised ingenuity in using 14 content scenarios so that students can learn not only in environments that are close to their day-to-day operations but also from fresh perspectives.

The Group CEO Safety Award

In fiscal 2023, nine workplaces that met the Group CEO Safety Award criteria received an award for their excellent safety performance.

COMPANY	Award-winning workplaces (that have achieved zero accidents for five to 22 years, depending on the size of the workplace)
Industrial Materials COMPANY	<ul style="list-style-type: none"> ● Fukushima Processing Center, Hokuyo Shiko ● NIHON SEIKA HOSO Co., Ltd. ● Nagasaki Danboru CO., Ltd. ● HONSHU RHEEM CO., LTD. ● Kofu Office, Yamanashi Mori Shigyo Co., Ltd. ● Tokai Sales Office, Oji Interpack Co., Ltd. ● GS Paperboard & Packaging Sdn. Bhd. Packaging Plant 2 (Malaysia)
Functional Materials COMPANY	<ul style="list-style-type: none"> ● Shiga Plant, Chuetsu Co., Ltd. ● Oji Paper (Thailand) Ltd. (Thailand)

▶ [The Group CEO Safety Commendation Award Criteria \(in Japanese only\)](#)