

Medium- to long-term business opportunities and risks anticipated by the Group

- Shift to a carbon neutral society
- Increased consumer awareness of health and hygiene
- Population increase and economic growth in developing countries
- Growth of e-commerce

Manufactured capital
Production facilities and sites to create diverse products

Global environment

Profit returns and contributions to stakeholders

Nippon Paper Group Integrated Report 2023

7

- Progress of digital transformation
- Declining population in Japan
- Increase in natural disasters
- Trends in environmental laws and regulations
- Slowdown in global economy
- Rising geopolitical risks

2 Respond to rapid changes in the social landscape such as GHG reduction and environmental issues









Leisure facilities
management

**Building a
circulation-
oriented society
that maximizes
use of wood
resources**

Contribute to better living and cultural progress everywhere the Group does business

Important Management Resources

 <div>Intellectual Capital</div> <div>Technologies developed from using wood resources</div>	<div>Research and development expenses (FY2023/3)</div> <div>Patents held* (as of March 31, 2023)</div>	<div>¥5.8 billion</div> <div>1,832</div> <div><small>* Applies to Nippon Paper Industries, Nippon Paper Papyrus, NP Trading, Nippon Paper Crecia, Flowric, Nippon Paper Lumber, Sakurai and Akita Jujo Chemical</small></div>
 <div>Natural Capital</div> <div>Wood resources procured from Japan and overseas</div>	<div>Managed forest area (as of December 31, 2022)</div>	<div>Approx. 160,000 hectares</div> <div><small>[Domestic Company-owned forests] Approx. 90,000 hectares, approx. 400 locations [Overseas plantation areas] Approx. 70,000 hectares</small></div>
 <div>Social and Relationship Capital</div> <div>Collaboration with a wide array of partners</div>	<div>[Initiative examples]</div> <div><ul style="list-style-type: none">Agreed to trilateral consideration of the first commercial production of cellulosic bioethanol from woody biomass in Japan and its development into bio-chemical products with Sumitomo Corporation and Green Earth Institute Co., Ltd. in February 2023.Demonstrated the sorting and collection of used paper cups for recycling at the International Media Center for the G7 Hiroshima Summit together with TOKAN KOGYO CO., LTD. in May 2023.Participated in a project subsidized by the New Energy and Industrial Technology Development Organization (NEDO) to develop CNF-related technologies together with UBE Corporation.Participated in the GX League from FY2024/3 to promote green transformation (GX) toward realization of carbon neutrality.</div>	
 <div>Human Capital</div> <div>Diverse human resources who create value</div>	<div>Number of employees (consolidated) (as of March 31, 2023)</div>	<div>15,959</div>
 <div>Financial Capital</div> <div>Financial base supporting business</div>	<div>Consolidated total assets (as of March 31, 2023)</div> <div>EBITDA (FY2023/3)</div>	<div>¥1,666.5 billion</div> <div>¥42.8 billion</div>
 <div>Manufactured Capital</div> <div>Production facilities and sites to create diverse products</div>	<div>Number of Group companies (as of March 31, 2023)</div>	<div>160</div> <div><small>[Domestic affiliated companies] 115 [Overseas affiliated companies] 45</small></div>

Nippon Paper Group has over the course of many years of business activities accumulated management resources, its source for creating value. These management resources, as the driving force behind value creation, will generate new value through the Three Circulations business model that realizes carbon neutrality. This value will flow back as management resources, and increased management resources will lead to further value creation.

The Group has expanded its research domains based on the technologies for extracting cellulose, the raw material for paper, from wood, as well as papermaking and coating technologies that it has developed through its research and development to date. The Group's technology and expertise in creating diverse biomass products from renewable wood resources is a major strength and an important management resource guiding it to competitive advantage.

Focus is being placed on patent applications in growing fields and new business fields, and the number of overseas patent applications is also increasing as business expands globally.

Expansion of intellectual capital

P.34-37 Early Positive Contribution from New Businesses and Innovative Materials

The wood resources that are the business foundation of the Group are procured from sustainably managed forests. The Group works together with suppliers to build a sustainable supply chain for the stable and continuous procurement of wood resources. As for company-owned forests, the Group leverages technologies and know-how accumulated through the plantation business and strives to improve forest productivity and to secure plantation areas centering on the Asian region.

Expansion of natural capital

P.38-41 Response to Climate Change

P.56-57 Procurement, Forest Management

The Group has, through its many years of business development, built partnerships with a diverse range of stakeholders spanning industries, the public sector and academia, including business partners, customers and suppliers, governments and public administrations and universities and research institutes. It will further strengthen these relationships to expand business, create new business opportunities, and develop markets.

Expansion of social and relationship capital

P.34-37 Early Positive Contribution from New Businesses and Innovative Materials

P.58-59 Environmental Management

■ Deepening relationships with partners to expand business in global markets

In the Liquid Packaging Carton Business, the Group forged a capital and business alliance agreement with Shikoku Kakoki Co., Ltd. and acquired a portion of shares in Elopak ASA. In 2022, the Group deepened the relationship by concluding a license agreement with Elopak for the Oceania region. Since then, it has established a local subsidiary and is working to expand business into global markets (→P.63).

The Group's strength is the fusion of human resources from different backgrounds after mergers and integrations. The Group has approx.16,000 employees in Japan and overseas, and by improving employee engagement, it promotes creation of organizations in which diverse human resources can maximize their capabilities.

Expansion of human capital

P.30-33 Human Resource Strategy

The Group is making environmental investments to reduce GHG emissions and conducting strategic investment in growth fields to strengthen earnings toward achieving the Medium-Term Business Plan 2025 and realizing 2030VISION. We are moving forward with investments of ¥90.0 billion for the three fiscal years from FY2024/3 to FY2026/3.

To strengthen the financial position, we will improve cash flows by ensuring a stable EBITDA of ¥100.0 billion. In addition, we aim to improve the net debt/equity ratio and achieve ROE of 5.0% or higher by selling cross-shareholdings and idle assets, and reducing interest-bearing debt to shrink the balance sheet.

For details, please refer to Message from the Executive Officer Responsible for Finance (P.26) ▶▶▶

The Group has production sites in Japan and overseas and collaborates with Group companies and conducts efficient production activities. This achieves a stable supply of products and cost reductions, strengthening competitiveness. We will promote transformation of the business structure by utilizing facilities and sites of the Graphic Paper Business to expand growing and new businesses.

■ Effective utilization of production sites

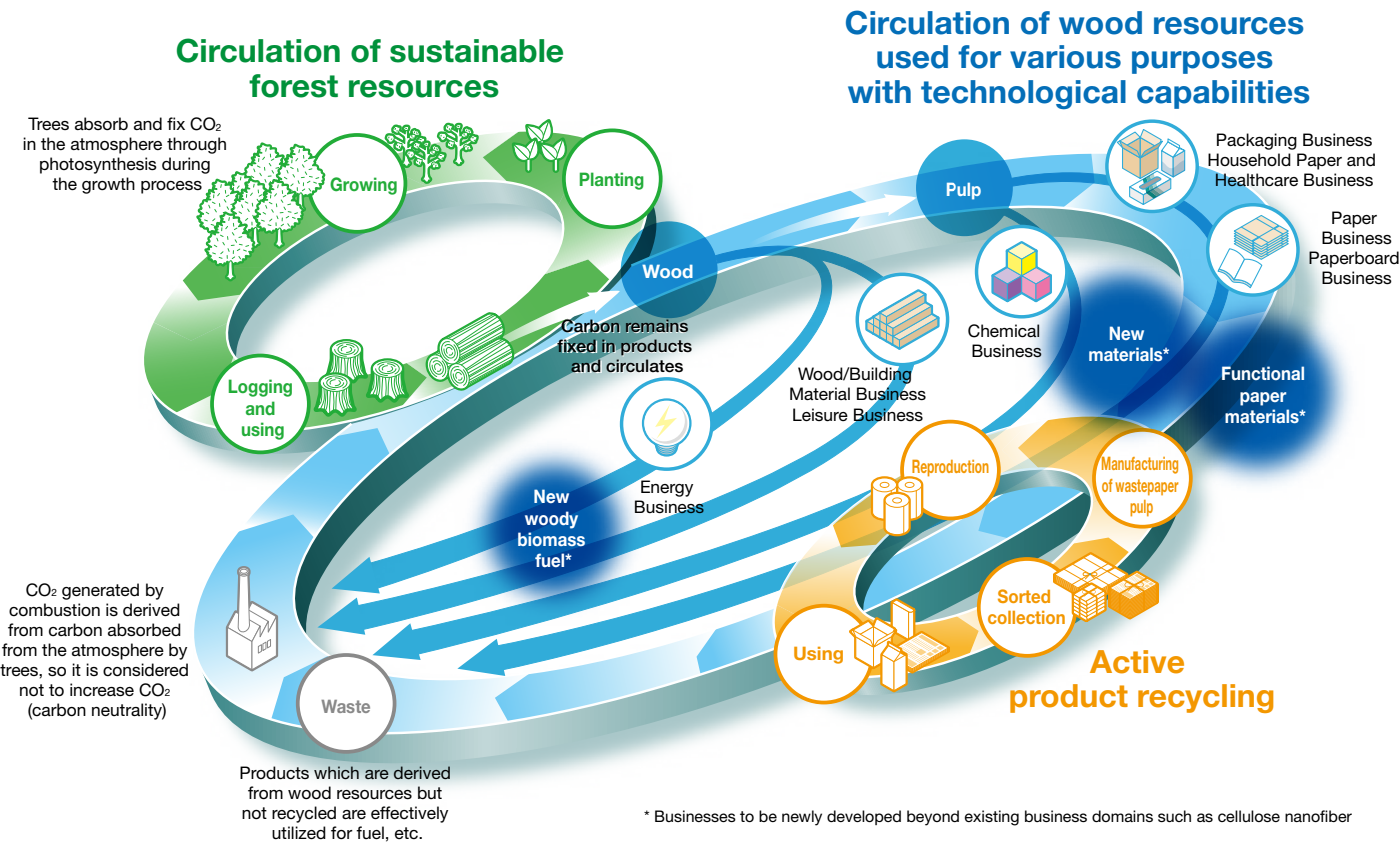
Utilizing the infrastructure of the Shiraoi Mill (Yufutsu), a former paper production site, we constructed a 75 MW biomass power generation facility jointly with Sojitz Corporation and started commercial operations in February 2023 as Yufutsu Energy Center, LLC.

For details, please refer to Yufutsu Energy Center (on the Nippon Paper Group website <only in Japanese>)

Value Created by the Three Circulations

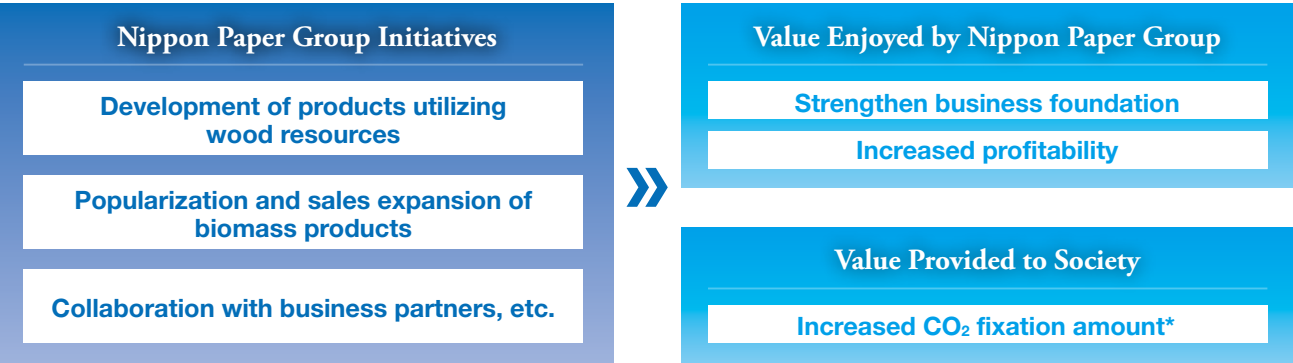
Nippon Paper Group will achieve a carbon neutral business model through the Three Circulations as a comprehensive biomass company shaping the future with trees and achieve sustainable growth of Nippon Paper Group and build a circulation-oriented society that maximizes use of wood resources.

Nippon Paper Group’s Business Development as a Comprehensive Biomass Company “Three Circulations”



Circulation of Wood Resources
—Contributing to building a carbon neutral society by expanding sales of biomass products—

The Group develops business that utilizes renewable wood resources at many stages, based on the accumulation of a wide range of technologies, including pulping, and know-how. It will strive to boost profitability while contributing to the creation of a carbon neutral society by expanding the provision of products and services generated from wood resources.



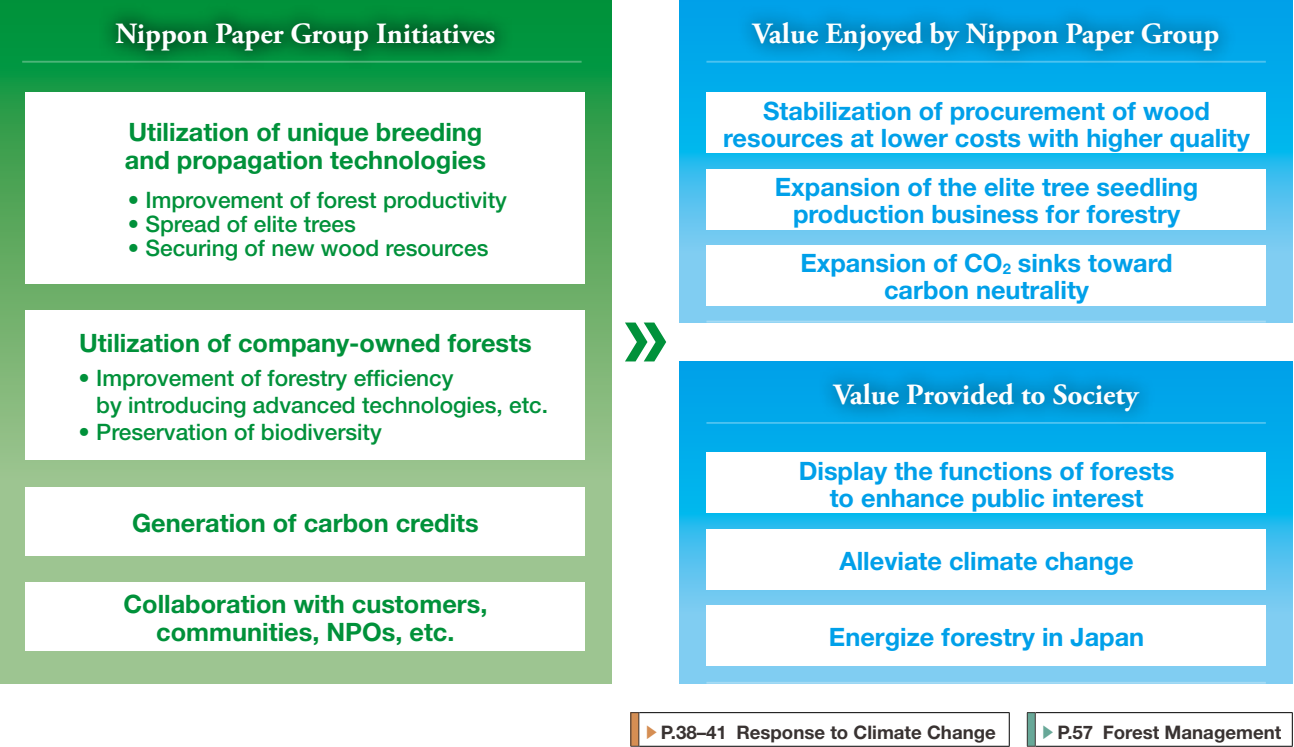
* Replacing fossil-derived products with biomass products utilizing wood resources will increase the CO₂ fixation amount for society overall.

P.34–37 Early Positive Contribution from New Businesses and Innovative Materials

P.62–65 Strategy by Business

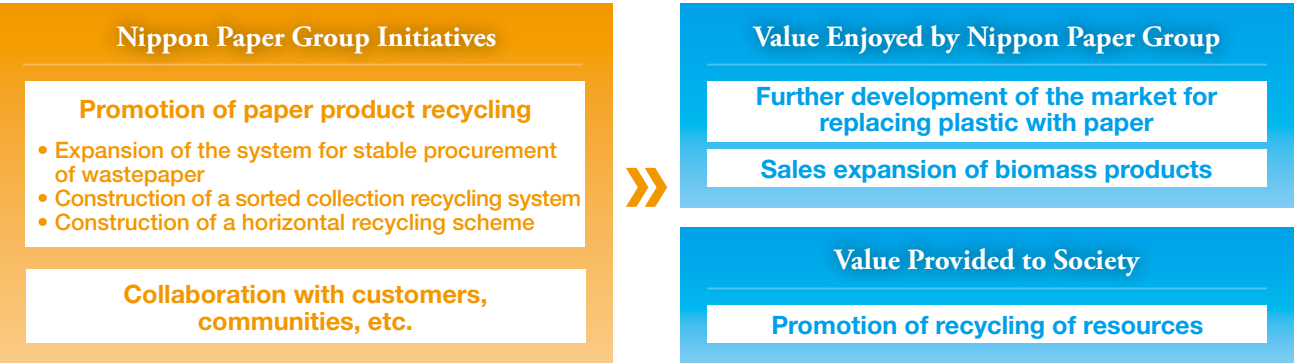
Circulation of Forest Resources
—Maximization of forest value through sustainable forest management—

For the Group, which provides a variety of products that utilize wood resources, forests not only have value as a source of raw materials, but also provide important value to society and the environment, such as public functions. The Group will continue to create diverse value by appropriately managing the approximately 160,000 hectares of forests it owns in Japan and overseas while utilizing the unique technologies and knowledge it has cultivated until now.



Active Product Recycling
—Building a circulation-oriented society through recycling—


















For many years, the Group has actively used wastepaper as raw material for paper production. Furthermore, by simultaneously addressing customer needs for replacing plastic with paper and the recycling of paper products, the Group intends to increase demand for biomass products, which in turn will expand the market for replacing plastic with paper. For that reason, the Group will construct a sorted collection recycling system and horizontal recycling scheme, and aim to expand sales of biomass products.



P.58–59 Environmental Management

Important Issues (Materiality) to Realize the Group Mission

Nippon Paper Group has clearly identified material issues in order to meet the four requirements of its Vision included in the Group Mission, as it addresses changes in the surrounding environment and is also promoting sustainability management in which it pursues social and environmental sustainability alongside corporate growth.

Mission			
Nippon Paper Group aims to contribute to better living and cultural progress everywhere it does business.			
	A corporate group that meets the following requirements and is sustainably needed by society	Nippon Paper Group's Materiality	Reasons for Selection and Contributions to SDGs
Vision	1 Drive social sustainability through our business	Achieve the following through the value chain: <ul style="list-style-type: none">● Response to climate change● Utilization of sustainable forest resources● Preservation of biodiversity● Reduction of environmental burden● Promotion of resource circulation● Respect for human rights	Through business activities based on forest resources, which are natural capital, the Group will work to consider the environment and society throughout the entire value chain, thereby achieving sustainable growth as a "comprehensive biomass company shaping the future with trees." <div></div>
	2 Delight our customers	<ul style="list-style-type: none">● Response to changes in the social environment (consideration for the environment, healthcare, etc.)● Stable supply of products, enhanced safety	Understanding changes in society and customer needs, and continuing to provide the products that people want will contribute to better living and cultural progress everywhere. The Group aims to be customers' company of choice by ensuring product safety and quality, and by providing a stable supply. <div></div>
	3 Instill pride in employees	<ul style="list-style-type: none">● Realization of diverse work styles● Active participation of diverse human resources● Promotion of occupational safety and health	All business activities are supported by people. Through workplace creation where diverse human resources can work cheerfully and with pride, it maximizes the ability to create value and leads to corporate growth. <div></div>
	4 Give back to society	In addition to business growth achieved through activities 1 to 3 above, the Group will realize the following: <ul style="list-style-type: none">● Promotion of business structure transformation● Enhancement of corporate governance● Coexistence with local communities and society● Communication with stakeholders	To realize the Group Mission generating stable profits is a prerequisite, and to do that, stronger corporate governance is indispensable. Along with boosting the transformation of the business structure, through stakeholder dialogue Nippon Paper Group aims to become a corporate group that is needed by society. <div></div>

Formulation Process

(Implemented in FY2022/3)

STEP 5

Decide to make materiality

Promotion of sustainability management is clearly stated in the 2030VISION and based on the Group Mission, the Board of Directors deliberated and decided four specific requirements of the Vision.

STEP 4

Confirm external opinions and dialogue with experts

A CSR consulting company joined to confirm the appropriateness of the processes in Steps 1, 2 and 3 in addition to the issues that the Company believes need to be addressed to realize the Group Mission. Furthermore, the Company conducted dialogue with experts familiar with sustainability and received advice from a materiality viewpoint.

STEP 3

Verification through guidelines, etc.

Cross-checking frameworks, standards, guidelines, etc. concerning the appropriate disclosure of ESG information, the Company verified whether the issues it believes should be addressed to realize the Group Mission are initiatives that contribute to solving social issues, and confirmed that there were no deficiencies.

STEP 2

Cross-checking with existing material issues

Nippon Paper Industries CSR Division cross-checked the selected issues for relevance and continuity with previous materiality to solve social issues. As a result, it was learned that the issues selected in Step 1 corresponded to existing material issues.

STEP 1

Select issues that should be addressed to realize the Group Mission

Internal discussions were carried out on the initiatives needed to realize each of the four requirements of the Vision in the Group Mission. The themes identified in the discussions were organized as materiality.

Confirmation of Progress on Materiality and the 2030VISION

Nippon Paper Group sets key performance indicators (KPI) (targets to achieve by FY2031/3) under various themes responding to materiality and the 2030VISION and measures their progress.

For results from FY2022/3, the Group summarized the progress of each target, verified efforts and confirmed management's execution toward achieving the 2030VISION, and as a result added the promotion of business structure transformation as materiality. In a Management Executive Committee meeting held in June 2022, this was shared with all executive officers and general managers. Individual explanations were also made to outside directors and outside Audit & Supervisory Board Members.

Similar verification was also carried out for FY2023/3 results. A discussion on materiality was conducted in the Group Management Strategy Committee meeting held in June 2023 to further deepen debate within the entire Group. As a result, while moving ahead on initiatives for FY2024/3, materiality remained unchanged and the corresponding KPI was reviewed.

Going forward, deeper discussion will be held throughout the Group on important management themes.

Important Issues (Materiality) to Realize the Group Mission

Progress of Initiative Themes for Materiality and the 2030VISION

Vision	Materiality (Important Management Issues)	2030VISION		Key Performance Indicators (KPI) to Achieve by FY2031/3 <small>Scope... ■ Nippon Paper Group ■ Nippon Paper Industries</small>		Main Progress and Initiative Status in FY2023/3	Integrated Report 2023 Related Pages	Contributions to SDGs
		Basic Policies	Themes					
1 Drive social sustainability through our business	Response to climate change	Respond to the rapidly changing social landscape, including GHG emissions reduction and environmental issues	GHG reductions	<div>Reduction of GHG emissions through energy saving measures and fuel conversion<ul style="list-style-type: none">Reduce GHG emissions (Scope 1 + Scope 2) by 54% compared with FY2014/3Use non-fossil fuels in 60% or more of total energy usedImprove total energy intensity in production and logistics by 1% year on year</div>		<div>• GHG emissions (Scope 1 + Scope 2) Reduction by 30% compared with FY2014/3</div> <div>• Ratio of non-fossil fuels usage 42% of total energy usage</div> <div>• Nippon Paper Industries total energy intensity in production (compared with 2021): Paper Business −1.4%, Paperboard Business +2.1%, Logistics +1.3%</div>	<div>▶ P.38–39</div> <div>▶ P.58–59</div>	
				<div>Response to climate change initiatives</div>		<div>• Participated in the FY2024/3 GX League</div>	<div>▶ P.38–41</div>	
	Utilization of sustainable forest resources Preservation of biodiversity		Pursuit of a green strategy (maximize value of forest resources)	<div>Preserve forest resources and construct a business model that revitalizes forestry through utilization of company-owned forests in Japan<ul style="list-style-type: none">Expand elite tree seedling production business for forestry Construction of a production system for 10.0 million elite tree seedlings/year for forestryInitiatives to create J-credits</div>		<div>• Opened closed seed plantations in Shizuoka Prefecture, Tottori Prefecture and Hiroshima Prefecture, and a scion plantation in Oita Prefecture</div> <div>• Acquired J-credit certification for the Kazaki company-owned forest</div>	<div>▶ P.40–41</div>	
				<div>Improvement of forest productivity and expansion of CO₂ fixation amount by using breeding and proliferation technologies<ul style="list-style-type: none">Improve CO₂ fixation efficiency in overseas plantation areas by 30% compared with 2013Secure plantation areas, mainly in Asia</div>		<div>• Conducted ongoing R&D on selection of elite plants, etc.</div>	<div>▶ P.40–41</div>	
				<div>Acquisition and maintenance of forestry certification for all company-owned forests in Japan and overseas</div>		<div>• Maintained 100% forest certification acquisition rate for domestic and overseas in company-owned forests of Nippon Paper Industries and overseas plantation subsidiaries</div>	<div>▶ P.57</div>	
				<div>Display public interest functions through appropriate management of company-owned forests in Japan<ul style="list-style-type: none">Display public interest functions through preservation of water resources and other resources</div>		<div>• Continued forest preservation and maintenance management work in the watershed area of the Sugemuma company-owned forest, Gunma Prefecture based on a memorandum of understanding with Coca-Cola Bottlers Japan Inc.</div>	<div>▶ P.57</div>	
				<div>Preservation of biodiversity</div>		<div>• Updated an agreement with the Okinawa District Forest Office for the preservation of biodiversity in the Iriomote Island National Forest</div>	<div>▶ P.57</div>	
	Reduction of environmental burden		Reduction of environmental burden	<div>Reduction of environmental burden generated in the manufacturing process<ul style="list-style-type: none">Reduce air pollutants by 15% and water pollutants by 15% compared with FY2019/3Keep final disposal volume of industrial waste materials at domestic production sites at 2% or lower</div>		<div>• Reduced at production sites in Japan (compared with FY2019/3): SOx 31%, NOx 30%, dust 22%, COD/BOD 31%, SS 8%</div> <div>• Final disposal volume of industrial waste materials: 1.6%</div>	<div>▶ P.58–59</div>	
	Promotion of resource circulation		Promotion of recycling	<div>Promotion of recycling of resources<ul style="list-style-type: none">Expand the system for stable procurement of wastepaperBuild a sorted collection recycling system, utilize 12,000 tonnes/year of unused, difficult-to-treat wastepaperBuild a horizontal recycling scheme for paper containers used for food and beverages</div>		<div>• Started operation of recycling facilities at Fuji Mill for paper containers used for food and beverages</div> <div>• Started collection and recycling of paper cups used for in-flight services in collaboration with Japan Airlines Co., Ltd.</div> <div>• Started collection and recycling of release paper (difficult-to-treat wastepaper)</div>	<div>▶ P.58–59</div>	
	Respect for human rights		Respect for human rights	<div>Implementation of human rights due diligence</div>		<div>• Established Nippon Paper Group Human Rights Policy, revised Principles and Basic Policies Concerning Raw Materials Procurement</div> <div>• Conducted assessments of human rights risks in the value chain and identified priority issues in the Paper and Paperboard Business and in part of the Daily-Life Products Business</div>	<div>▶ P.54–55</div>	
2 Delight our customers	Response to changes in the social environment	Stable supply of products, enhanced safety	Pursuit of a green strategy (expand biomass products)	<div>Expansion of biomass products<ul style="list-style-type: none">Respond to demand to move away from plastic and reduced plastic use (Expand products for trend to replace plastic with paper)</div>		<div>• Expanded adoption of School POP® (strawless paper cartons) (FY2024/3 forecast: 15 prefectures, over 200 municipalities)</div> <div>• Expanded adoption of SHIELDPLUS®, Lamina®</div>	<div>▶ P.63</div>	
	Stable supply of products, enhanced safety		Stable supply of products Product safety and quality control	<div>Engagement in stable production, response to natural disasters (strengthen BCP)</div> <div>Improvement of a product safety management structure</div>		<div>• Promote building a framework to prepare for natural disasters and production troubles</div> <div>• Carry out priority investment in power and recovery and fiberlines for mills for the purpose of operational stability</div> <div>• Established and started operating product risk management regulations at each Group company based on the minimum standard related to product safety and quality assurance</div>	<div>▶ P.52–53</div> <div>▶ P.53</div>	
3 Instill pride in employees	Realization of diverse work styles	Active participation of diverse human resources	Enhancement of ease of working and job satisfaction Maximization of utilization of human resources	<div>Enhancement of employee engagement, including promotion of diversity<ul style="list-style-type: none">Total working hours of 1,850 hours/year or lowerRetention rate after 10 years of employment in FY2031/3 of 80% or higherRatio of female career-track employees to be 40% or higher by FY2026/3</div>		<div>• Total working hours: 1,884 hours/year</div> <div>• Retention rate of employees who joined the Company in FY2013/3: 63.4%</div> <div>• Ratio of female employees among new graduates in career-track recruits FY2024/3: 48.8%</div>	<div>▶ P.30–33</div>	
	Promotion of occupational safety and health			<div>Assurance of safety and hygiene for working people<ul style="list-style-type: none">Serious disaster cases of 0/year</div>		<div>• Serious disaster cases: 0</div>	<div>▶ P.33</div>	
4 Give back to society	Promotion of business structure transformation	Reallocate management resources to growing businesses	Expansion of growing businesses	<div>Net sales target of ¥1,300.0 billion, of which Daily-Life Products Business has 50% or more<ul style="list-style-type: none">Investment of approximately 80% of the strategic investment budget of ¥350.0 billion in growing businesses</div>		<div>• Daily-Life Products Business net sales: ¥440.1 billion (Accounting for 38% of overall net sales)</div> <div>• Strategic investment in FY2022/3–FY2023/3: ¥85.9 billion (of which 94% was allocated to growing businesses)</div>	<div>▶ P.60–61</div>	
			Early positive contribution from new businesses and innovative materials	<div>Expansion of new uses of cellulose and commercialization of innovative materials Net sales target of ¥65.0 billion for new businesses (including expansion of biomass products)<ul style="list-style-type: none">Commercialization of CNF by establishing a mass-production structure and establishing manufacturing technologiesPromote and expand sales of cattle feed ("Genki MoriMori®")Launch new businesses using pulp manufacture facilities</div>		<div>• Started collaboration with Yamaha Motor Co., Ltd. for development of applications for CNF-reinforced resin</div> <div>• Expanded adoption of cattle feed</div> <div>• Started collaboration on development of biocomposite with Mitsui Chemicals, Inc.</div> <div>• Concluded a basic agreement to collaborate ahead of entry into the wood resources-derived bioethanol business with Sumitomo Corporation and Green Earth Institute Co., Ltd.</div>	<div>▶ P.34–37</div>	
			Reformation of structure of foundation businesses	<div>Stronger competitiveness of the Paper and Paperboard Business<ul style="list-style-type: none">Concentrate graphic paper production sites to about three locations</div>		<div>• (Paper) Decided to halt the N1 paper machine and withdraw from the Paper Business at the Akita Mill</div> <div>• (Paperboard) Strengthened cost competitiveness of containerboard (Fuji Mill) and special paperboard (Soka Mill, Ashikaga Mill)</div>	<div>▶ P.60–61</div> <div>▶ P.62</div>	
			Expansion in overseas markets	<div>Overseas sales ratio of 30% or more</div>		<div>• Overseas sales ratio: 29%</div> <div>• Established a manufacturing and sales subsidiary of CMC for LiB in Hungary</div> <div>• Plan to start operations of Opal's new corrugated box plant in the state of Victoria, Australia, in FY2024/3</div>	<div>▶ P.63–64</div>	
	Enhancement of corporate governance	Stronger functions of the Board of Directors		<div>Improvement of effectiveness of the Board of Directors</div>		<div>• Reported on important projects to the Board of Directors, etc., strengthened follow-up</div>	<div>▶ P.44–47</div>	
	Coexistence with local communities and society Communication with stakeholders	Assurance of transparency in corporate management		<div>Public and fair disclosure of Company information</div>		<div>• Environmental risk communication: 14 cases (production sites in Japan)</div> <div>• Meetings between outside directors and institutional investors: 1 time</div>	<div>▶ P.49–51</div>	

Message from the Executive Officer Responsible for Finance



Achieving the Medium-Term Business Plan 2025, strengthening profitability and the ability to generate cash, and improving our financial position

Tomoyasu Itakura

Director, Executive Officer,
and General Manager,
Financial Division
Nippon Paper Industries Co., Ltd.

Looking back at FY2023/3, supply chains were disrupted on a global scale due to Russia's invasion of Ukraine, which resulted in tremendous surges in prices for raw materials and fuel, particularly coal prices. In response to this unprecedented situation that was far more significant than anticipated, the entire Group shared a sense of crisis. We established three priority tasks, those being "Accelerate reduction of coal consumption," "Structural reform of the Paper Business," and "Improve the profitability of Opal," and carried out various measures that will be explained later with a sense of urgency.

In FY2023/3 results, due in part to the fact that the results of the measures did not fully materialize within the fiscal year, we posted the first full-year operating loss since becoming a listed company. However, we anticipate a return to profitability of ¥24.0 billion in FY2024/3, when the results will fully appear ([Fig. 1]). I believe that we have returned to the Medium-Term Business Plan 2025's track, and were able to draw a path

toward achieving our target of ¥40.0 billion in operating income at an early stage.

Promoting Cost Reduction,
Including Reduction of Coal Consumption

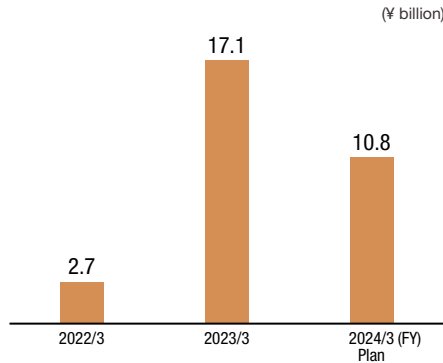
We reevaluated our production structure for graphic paper, which continues to see dwindling demand in FY2023/3, and

[Fig. 1] Result Highlights (¥ billion)

	FY2022/3 Results	FY2023/3 Results	FY2024/3 Plan
Net sales	1,045.1	1,152.6	1,230.0
Operating income	12.1	(26.9)	24.0
Ordinary income	14.5	(24.5)	18.0
Net income*	2.0	(50.4)	15.0

* Profit attributable to owners of parent

[Fig. 2] Trends in Cost Reductions
(Total of Paper and Paperboard Business
and Daily-Life Products Business)



halted the N6 paper machine at the Ishinomaki Mill and the N1 paper machine at the Akita Mill. With regard to cost reduction, we launched a project to reduce coal consumption, and undertook Company-wide efforts such as stopping new purchases of Russian-produced coal, energy saving measures, and fuel conversion and maximization of the usage of black liquor. As a result, we reduced coal consumption by 360,000 tonnes and cut coal-related costs by approximately ¥8.0 billion year on year. In addition, we further reduced fixed costs by reorganizing our production structure and improved costs by stabilizing operations. These efforts are expected to result in cost reductions of more than ¥30.0 billion over a span of three years from FY2022/3 to FY2024/3 ([Fig. 2]).

However, it was difficult to absorb the impact of surging prices for raw materials and fuel solely through self-help efforts, so in FY2023/3 we conducted multiple price revisions over a wide range of Group products. As a result, net sales in FY2023/3 increased in all segments for a total of ¥1,152.6 billion. By segment, the percentage of net sales from businesses other than the Paper and Paperboard Business, such as the Daily-Life Products Business, surpassed 50% for the first time. The movement of the business structure transformation that we are pursuing under the Medium-Term Business Plan 2025 is appearing in net sales, and I feel confident about this.

On the other hand, operating income decreased significantly in the Paper and Paperboard Business, Daily-Life Products Business, and Energy Business as the business environment continued to be severe due to factors including surging prices of raw materials and fuel and depreciation of the yen. Despite higher profits in the Wood Products and Construction-Related Business, we ended up with the unfortunate result of an overall loss of ¥26.9 billion.

In addition, although we actively pursued sales of cross-shareholdings and recorded gain on sales of investment securities under extraordinary income, in extraordinary losses, we also recorded impairment loss due to the decision to stop the N1 paper machine at the Akita Mill and other facilities, expenses brought on by voluntary retirement and loss on Opal's withdrawal from the Graphic Paper Business. As a result, we recorded a net loss of ¥50.4 billion.

[Fig. 3] Reevaluation of Financial Targets in the Medium-Term Business Plan 2025

	MTBP 2025 Targets (original)	MTBP 2025 Targets
Net sales	FY2026/3 ¥1,100.0 billion	FY2026/3 ¥1,200.0 billion or more
Operating income	¥40.0 billion or more at an early stage	¥40.0 billion or more at an early stage
EBITDA	Stably ¥100.0 billion	Stably ¥100.0 billion
Net debt/equity ratio*	FY2026/3 1.5–1.6 times	FY2026/3 1.7–1.8 times
ROE	FY2026/3 5.0% or more	FY2026/3 5.0% or more

* • Adjusted net debt/equity ratio = (Net interest-bearing debt – Equity-type debt) / (Shareholders' equity + Equity-type debt)
• Equity-type debt: The amount of debt financed by hybrid loans that has been recognized as equity credit by ratings agencies (50% of the financed amount)

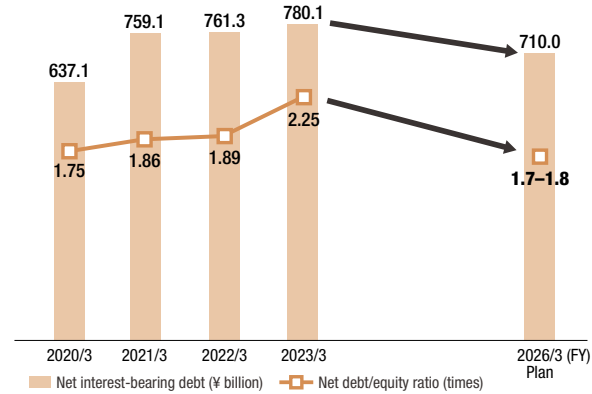
Rebuilding the Opal Business

In order to achieve the Medium-Term Business Plan 2025, in FY2024/3 we are working on improving profitability of the Daily-Life Products Business, strengthening competitiveness of the Graphic Paper Business, accelerating reduction of GHG emissions, and improving our financial position as priority issues based on a basic strategy of acceleration of the business structure transformation. With regard to the Daily-Life Products Business, we are focused on the expansion of net sales and the recovery of the operating income margin, for which rebuilding the Opal business will be particularly critical.

After completing our purchase of the Opal business in FY2021/3, we suffered a loss for two consecutive years due to the spread of COVID-19 and the impact of logistics turmoil, but declared that we would achieve profitability in FY2023/3 by enacting price revisions and cost reductions. However, in November 2022, the supply of wood, a key raw material of graphic paper, suddenly came to a halt in Australia, so we decided to shut down related facilities at the Maryvale Mill and withdraw from the Graphic Paper Business. In addition, prices for raw materials and fuel and logistics costs surged even higher, so we were unable to realize positive results.

We expect to post a significant loss in the first half of FY2024/3 due to the phased rationalization of personnel as a result of the suspension of graphic paper production, but will promptly complete withdrawal from the Graphic Paper Business, including the rationalization of personnel, by the end of 2023 and capture demand for corrugated boxes in Australia, where positive growth is expected. Going forward, we will construct a highly efficient operating system at the Maryvale Mill as a mill specializing in base paper for packaging. Furthermore, alongside a new corrugated box plant that began operating in August 2023, we will also strive to strengthen competitiveness and increase earnings by taking advantage of our integrated package production system from raw material procurement to processing. Through these measures, we plan to rebuild the Opal business and return it to profitability on a single-month basis in the second half of FY2024/3 and generate stable earnings in FY2025/3 and beyond.

[Fig. 4] Compression of Net Interest-Bearing Debt and Improvements to Net Debt/Equity Ratio

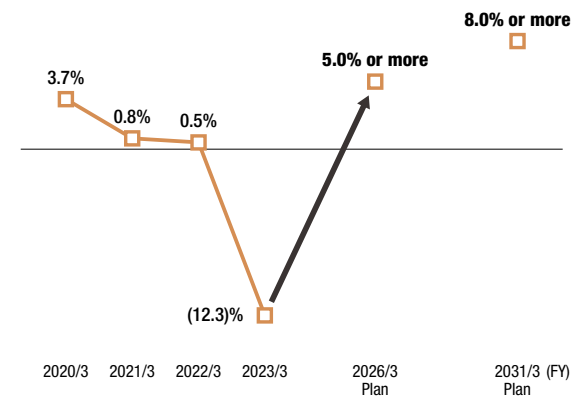


Reevaluating the Financial Targets of the Medium-Term Business Plan 2025

In addition to the fact that FY2024/3 is the halfway point of the Medium-Term Business Plan 2025, many of the assumptions, including the prices of raw materials and fuel, have changed significantly since the plan was formulated, so we have redrawn the roadmap to FY2026/3 ([Fig. 3]).

Net sales in FY2023/3 totaled ¥1,152.6 billion, surpassing the net sales target of ¥1,100.0 billion in FY2026/3 set forth in the Medium-Term Business Plan 2025. From FY2024/3 onward, net sales are expected to grow due in part to the aforementioned new corrugated box plant at Opal, and the installation of the No. 3 paper machine at Crecia-Kasuga and the launch of the Crecia Miyagi Mill in the Household Paper and Healthcare Business, so we revised the net sales target of the Medium-Term Business Plan 2025 to ¥1,200.0 billion or more.

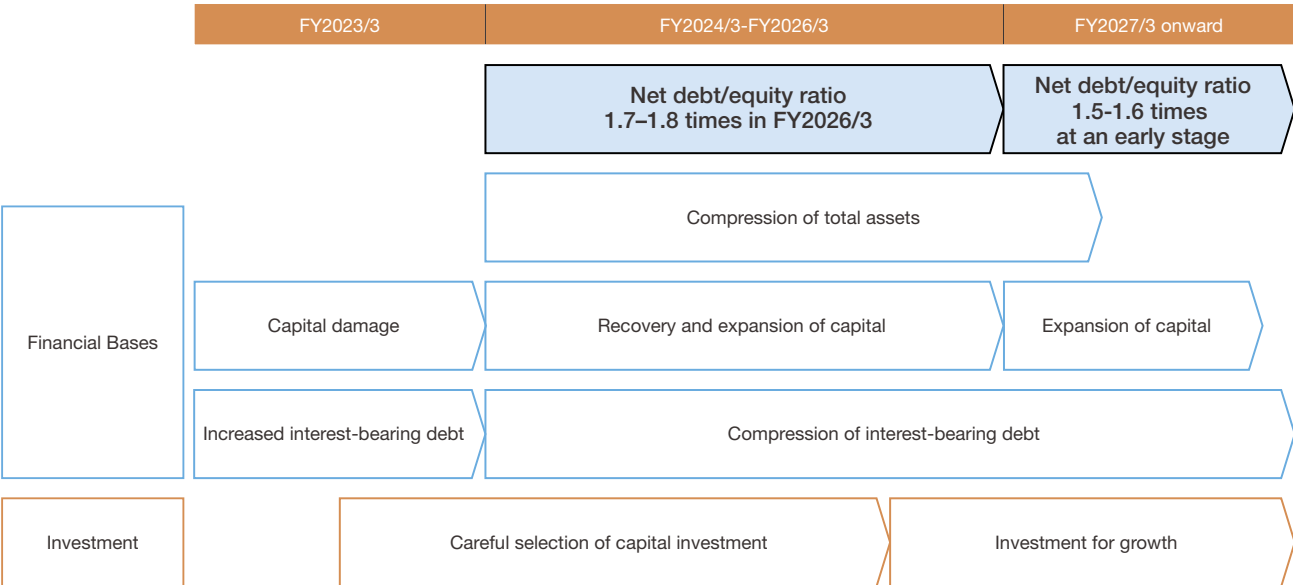
[Fig. 5] Improvements to ROE



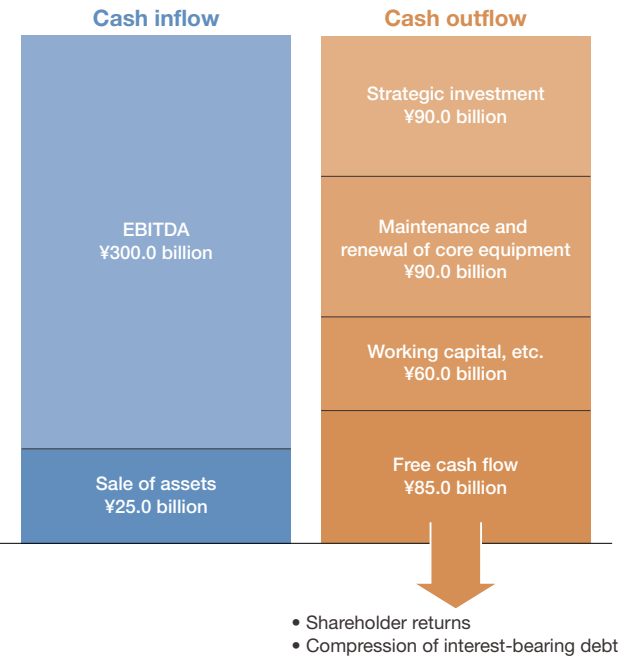
In Medium-Term Business Plan 2025, we have established a goal of achieving operating income of ¥40.0 billion or more at an early stage. Our thinking that if we achieve this operating income, EBITDA will reach ¥100.0 billion remains the same as before. The timing of achieving operating income of ¥40.0 billion will be slightly different from what we initially envisioned, but the path back to the track of the Medium-Term Business Plan 2025 is within view. Our targets of operating income of ¥40.0 billion or more at an early stage and stably reaching EBITDA of ¥100.0 billion remain unchanged.

However, in FY2023/3, we recorded a loss of over ¥50.0 billion, and net interest-bearing debt increased to ¥780.1 billion ([Fig. 4]). This caused financial discipline to deteriorate, and the net debt/equity ratio increased to 2.25 times. Going forward, as we approach FY2026/3, we will strive to improve the net debt/equity ratio by compressing interest-bearing debt and restoring capital starting from FY2023/3 as a baseline. Since it

[Fig. 6] Overview of Capital Strategy



[Fig. 7] FY2024/3-FY2026/3 Cash Flows



has become difficult to achieve the original target of 1.5-1.6 times, we have revised the target to 1.7-1.8 times and aim to reduce net interest-bearing debt to ¥710.0 billion.

Our target for ROE remains unchanged at 5.0% or more ([Fig. 5]). We believe that this is an achievable figure even with the newly envisioned path. Beyond that, we will continue to promote initiatives that emphasize profitability in order to reach our goal of 8.0% or more in the 2030VISION.

Additionally, in the 2030VISION, we set a target of reducing GHG emissions by 45% from FY2014/3 by FY2031/3. However, based on the prospect that our reduction target can be achieved ahead of schedule through preexisting initiatives, we decided to raise the target value from a reduction of 45% to 54%.

Improvements to Financial Position

As previously mentioned, we have set forth improving our financial position as a priority task for FY2024/3 to FY2026/3 ([Fig. 6]). From the perspective of our financial base, we will focus on three key areas: compression of total assets, recovery and expansion of capital, and reduction of increased interest-bearing debt. In terms of investment, while we naturally recognize the need to invest for growth, we intend to proceed with capital investment after careful selection over the next one to two years. Based on these policies, we have projected cash flows for the next three years ([Fig. 7]).

With regard to cash inflows, we will achieve a minimum EBITDA of ¥300.0 billion over the three-year period from FY2024/3 to FY2026/3 by achieving operating income of ¥40.0 billion at an early stage and securing stable EBITDA of ¥100.0 billion. Additionally, we will generate approximately ¥25.0 billion in cash over the three-year period through the sale of assets, including strategic cross-shareholdings.

With regard to cash outflows, we prioritize environmental investments that will help to reduce GHG emissions among strategic investments. Other investments will be carefully selected and projects will be scaled back, postponed, or compressed, including the use of subsidies. For equipment maintenance and renewal, we will maintain stable operations by prioritizing investment in core equipment such as power and recovery and fiberlines. We also intend to address investments related to future growth and environmental measures with a view toward the 2030VISION, which is further beyond the Medium-Term Business Plan 2025. In addition, we forecast approximately ¥20.0 billion annually for working capital, tax expenses and interest expenses, for a total of ¥60.0 billion over three years.

Free cash flow from FY2024/3 to FY2026/3 is expected to reach approximately ¥85.0 billion. Among that amount, we intend to appropriate ¥70.0 billion for compressing interest-bearing debt.

Improvements to financial conditions will not simply end with the Medium-Term Business Plan 2025. From there, we will continue to strengthen our ability to generate cash flows, increase capital, and compress total assets and interest-bearing debt. On top of this, we intend to draw up a solid scenario that will lead to the achievement of the 2030VISION backed by solid figures.

To Our Shareholders, Investors, and Stakeholders

The basic strategy aimed at achieving the targets of the Medium-Term Business Plan 2025 is acceleration of business structure transformation. I would like to emphasize once again that carrying this out with a sense of urgency will help to achieve the 2030VISION beyond the Medium-Term Business Plan 2025. Nippon Paper Group possesses many interesting materials that may potentially drive growth, such as cellulose nanofibers (CNF) and bioethanol, which is used as feedstock in Sustainable Aircraft Fuel (SAF).

During the remaining three years of the Medium-Term Business Plan 2025, I will work to present to our stakeholders a vision of our Group's growth, and recognize that it is my mission as the officer in charge of finance to ensure that we are on the right path to achieve this goal while giving due consideration to financial discipline.

Human Resource Strategy

Nippon Paper Industries aims for the growth of both employees and the Company through the three pillars of “human resource development,” “personnel allocation,” and “securing and retaining personnel.”

Basic Stance

Nippon Paper Industries has set the principle of instilling pride in employees as a requirement of its Vision for the Group Mission. Pride is fostered by enjoying a sense of social contribution gained through the promotion of business activities, improving individual skills and realizing personal growth through careers, and motivation to work in the workplace and a sense of fulfillment in compensation and treatment. Working cheerfully means that employees work positively without fear of drastic changes in the external environment. To fulfill this

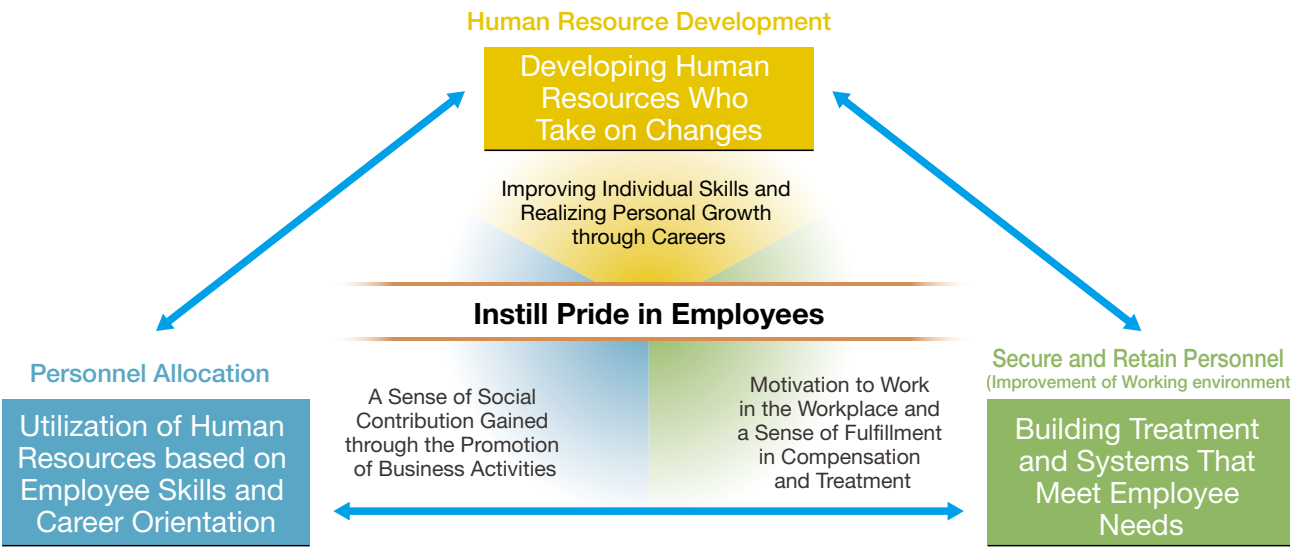
requirement, it will be necessary to improve engagement. The Company defines engagement as “a relationship in which both employees and the Company can grow together.” In order to work on accelerating the transformation of the business structure, which is the basic strategy of the Medium-Term Business Plan 2025, and realize the 2030VISION, the Company has adopted a three-pillared human resource strategy. It will improve engagement by taking various measures based on this human resource strategy.

Three-Pillar Approach to the Human Resource Strategy

The Company’s human resource strategy consists of three pillars: human resource development, personnel allocation, and securing and retaining personnel (improvement of internal environment). It will focus on developing, securing, and retaining human resources, as well as promoting the utilization of human resources, including shifting human resources to growing businesses, to encourage the growth of both employees and the Company. While all three pillars are significant and contain elements that are interlinked and cyclic, as the current basic strategy of the Medium-Term Business Plan 2025 is to accelerate the

transformation of the business structure, the most important issue is the development of human resources who take on changes under the pillar of human resource development. The declining working population and mobility of human resources in today’s society make it difficult to secure human resources. In this situation, the Company will further expand the job responsibilities of talented human resources who have accumulated advanced skills in existing businesses, and accelerate their re-training and reallocation as human resources who can adapt to the launch of new businesses and the mass production of new products.

Three-Pillar Approach to the Human Resource Strategy



Human Resource Development

The Company is working to develop human resources who take on change as an investment in human capital to promote transformation of the business structure and yield results. The Company will take various measures to nurture employees who will be the source of expanding profitability of growing

businesses and reinforcing competitiveness of foundation businesses, while also enabling employees themselves to improve their individual skills and realize personal growth through their careers.

Introduction of In-House Side Jobs System

The Company introduced an In-House Side Jobs System in FY2023/3 to achieve the following four goals: (1) Boosting employee motivation, (2) Fostering a corporate culture of taking on challenges and enhancement of organizational capabilities, (3) Accelerating the creation of innovations and promotion of various issues, and (4) Developing next-generation human resources with wide-ranging perspectives and mindsets. This system will allow employees to try out the work of another department they are interested in (side occupation)

while remaining in their own department (main occupation). In FY2023/3, 28 employees used this system and enthusiastically worked on coming up with new ideas at their side occupations by participating in projects related to new businesses. Employees who participated in the system said that they were able to gain a new perspective that was different from their main occupation and learn about work procedures, and they got to see their own department objectively from their side occupation.

Selective Education

The Company offers a training course for middle management and training course for line leaders to select young and mid-career employees and train them to be candidates for management positions at mills and business sites that support foundation businesses. The training course for middle management is a system that supports young employees who wish to go on to university, for the purpose of cultivating the next generation of

leaders in its mills and business sites. The training course for line leaders is a system to select and educate experienced mid-career technicians with excellent skills at an early stage. For those in management positions, in addition to the assessment training which has traditionally been held at times of appointment and promotion, the Company selected a class of mill managers and conducted business skill training in July 2023.

New Career Development Support

The Company supports the autonomous development of its employees by implementing hierarchical training, optional training, and a professional qualification incentive system. In FY2024/3, it is conducting a new type of training for the career design and career advancement of young employees. To secure further global human resources, the Company will strengthen the development of human resources who take on the challenge of overseas business, such as expanding the scope of the overseas company dispatch

course (trainee system), which was aimed at young technical career-track employees, to all career-track employees. The Company will also provide recurrent education to supplement knowledge and thinking for management executive candidates who are taking on challenges in fields different from their previous careers. Through these initiatives, the Company will continue to support the growth of its employees toward new career development.



Training of newly graduated career-track employees in FY2024/3 (Group companies joint training)

Main Education and Training System (Nippon Paper Industries)

OFF-JT	Hierarchical Training (Training for new employees, training for new supervisors, promotion and appointment training, elective training, etc.)
	Optional training (Distance learning, group training, a professional qualification incentive system, etc.)
	Overseas site dispatch system, training course for middle management, assessor training, and other
On-the-job training, rotation	

Personnel Allocation

In allocating personnel, the Company places importance on the utilization of human resources based on employee skills and career orientation. In addition to shifting human resources to new businesses and growing fields, it also reallocates human

capital, including those who support existing businesses. In this way, the Company will work to ensure that its employees feel a sense of social contribution gained through the promotion of business activities.

Reallocation from Graphics Paper to Growing Businesses

In order to promote transformation of the business structure, the Company has been reallocating personnel engaged in the Graphic Paper Business to new and growing businesses. To date, the Company has reallocated personnel to growing fields (power generation and household paper) in the Hokkaido and Fuji regions to quickly launch businesses and stabilize operations.

The Company is planning to start up a new household paper facility at the Ishinomaki Mill. Personnel who were previously engaged in operating the Ishinomaki Mill's N6 paper machine, which was shut down in 2022, will be reallocated to the facility. In preparation for an early launch, they are currently undergoing training at Nippon Paper Crecia's mill to acquire operational skills.

Proactive Appointment of Local Human Resources to Mill Executives

In order to secure core human resources for existing businesses, the Company will train talented local human resources working at mills and other facilities (→P.31 Selective Education) and actively promote them to management positions at mills. In addition to the technical exchange meetings between mills that have been held in the past, the Company is also working to increase educational opportunities to further improve local human resources.

Area Assignment for Career-Track Employees

In order to promote the utilization of human resources based on career orientation, the Company has begun considering the introduction of a Regional Career-Track Employment System from October 2024 in its action plan (April 2023–March 2025) based on the Act on Advancement of Measures to Support Raising Next-Generation Children.

Securing and Retaining Personnel (Improvement of Working Environment)

The Company is promoting organizational development that enables diverse work styles and allows diverse human resources to maximize their potential. The Company is promoting the creation of treatment and systems that meet employee needs and working to enable employees to feel motivation to work in the workplace and a sense of fulfillment in compensation and treatment.

Building Treatment and Systems for Securing Human Resources

In order to promote diversity and respond to changes in the environment, such as a pandemic, the Company is improving the working environment and reviewing work systems to

promote diverse work styles. The Company is striving to reduce total working hours by reconsidering work styles and improving operational efficiency.

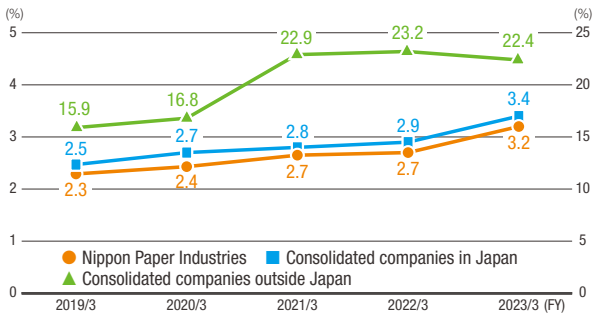
Systems Introduced/Revised (Nippon Paper Industries)

FY2022/3	FY2023/3	FY2024/3
<ul style="list-style-type: none">Elimination of the core time (the time during which employees must be at work) of the flextime systemIntroduction of a system to work from home (permanent system)Introduction of a system for taking annual paid leave in hourly increments	<ul style="list-style-type: none">Expansion of the scope of expired annual paid leave to absence from work related to fertility treatment and pregnancy and intermittent absence from work associated with treatment of a diseaseExtension of a period of application of childcare support measures, etc.Revision of the salary increase rule for those who have taken childcare leave or nursing care leaveIncrease in the number of days of annual paid leave granted upon joining the Company by 2 days (from 14 days to 16 days)	<ul style="list-style-type: none">Increase in the number of days of annual paid leave granted to employees who have worked for less than 5 years to a uniform 20 days per year

Active Roles for Diverse Personnel

The Company aims to maximize the potential of its diverse human resources. In terms of women's advancement, it is working to create an environment conducive to achieving the goals set forth in the Action Plan for the Advancement of Women. The Company recruited very few female employees in the past, so improving the ratio of female employees in management will take time, but the number of female employees recruited as career-track employees and the number of workplaces where female employees are assigned are both on the increase.

Ratio of Female Employees in Management



Indicators Related to Human Resource Development and Internal Environment Improvement

Indicators	Targets	Progress in FY2023/3
Retention rate after 10 years of employment	80% or higher (by FY2031/3)	Retention rate of employees who joined the Company in 2012 63.4%
Ratio of female career-track hires	40% or higher (by FY2026/3)	Ratio of female employees among new graduates in career-track hires in FY2024/3 48.8%
Total working hours per year	1,850 hours/year or lower (by FY3031/3)	1,884 hours/year
Ratio of annual paid leave taken	70% or higher	78.4%
Ratio of diversity promotion system usage*	70% or higher	93.2%

* Ratio of head office employees who have used systems that promote diversity (flextime system, system for taking annual paid leave in hourly increments, and system to work from home) during the current fiscal year

Occupational Safety and Health

Nippon Paper Group
ESG Databook 2023

Basic Stance

In order to instill pride in employees, it is necessary to ensure the safety and health of employees at each of the Group's locations and to maintain sound management. The Group formulated a Philosophy and Basic Policy on Safety and Health Measures and constructed a system for occupational safety and health under which all employees and members of management are united. It maintains the health of employees, realizes a comfortable and friendly working environment and helps to prevent disasters.

The Nippon Paper Group Safety and Disaster Prevention

Committee, which is chaired by the General Manager of the Technical & Engineering Division, supervises occupational safety and health and disaster prevention activities and reports on these to the Risk Management Committee. The Group has established a communication system between the mills and the head office as well as the departments within the head office in the case of a disaster. The Group has also established and operates a system to report necessary information to the Nippon Paper Group Safety and Disaster Prevention Committee and top management.

Initiatives for Preventing Work-Related Accidents

Guided by its mission of ensuring that nobody is injured within the premises of its mills, the Group works closely with labor unions and partner companies to prevent work-related accidents. Top management conveys this mission to employees through lectures during the new-year period, visits to mills, in-house newsletters, and other means.

Moreover, the Group implements its own system (NPSS*) for continuously pursuing occupational safety and health management activities at the organizational level. By doing

so, the Group strives to improve safety and health levels through the prevention of occupational accidents, promotion of workers' health, and creation of comfortable work environments.

Additionally, in 2020, the Company established a medium-term management plan centered on safety initiatives (2020–2025) as part of efforts to construct a foundation for preventing work-related accidents.

* Nippon Paper Occupational Safety and Health Management System

Early Positive Contribution from New Businesses and Innovative Materials

Leveraging its technological capabilities to develop new cellulose applications, Nippon Paper Group will accelerate the transformation of the business structure and contribute to the creation of a circulation-oriented society.

Basic Stance

As a comprehensive biomass company, Nippon Paper Group develops business that utilizes renewable wood resources at many stages. It has set “reallocate management resources to growing businesses” as a basic policy of its 2030VISION and

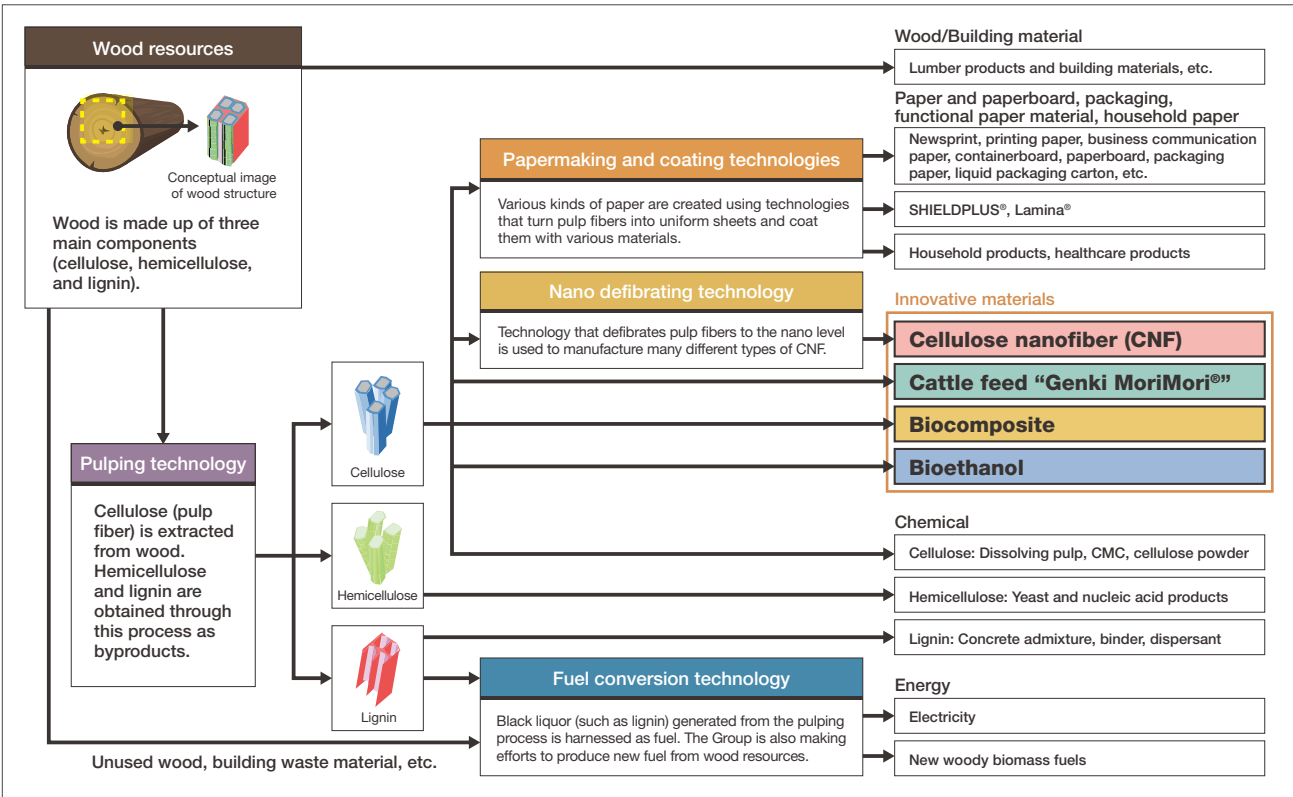
aims for an early positive contribution from new businesses and innovative materials by maximizing the use of its accumulated technologies and know-how and strengthening cooperation both within and outside the Company.

Development of Products and Innovative Materials Utilizing Wood Resources

Trees are a renewable resource that absorb and fix CO₂ through photosynthesis as they grow. Products made from wood resources can be recycled by extracting wood fiber after they are used. Non-recyclable products can be utilized effectively for fuel, and the CO₂ emitted during their combustion is considered to be carbon neutral, since it is derived from the carbon absorbed by trees from the atmosphere and does not result in an increase in CO₂. In addition, the biodegradability

and other properties of wood help it play a variety of roles in creating a circulation-oriented society. The Group is developing a variety of biomass products using wood resources as raw materials. In particular, we are focusing on expanding our businesses in cellulose nanofibers (CNF), cattle feed, bio-composites, and bioethanol, which are new materials that utilize technologies cultivated in the manufacture of paper and chemical products.

Products Generated from Technology that Maximize Use of Wood Resources



Responding to Challenges for 2030

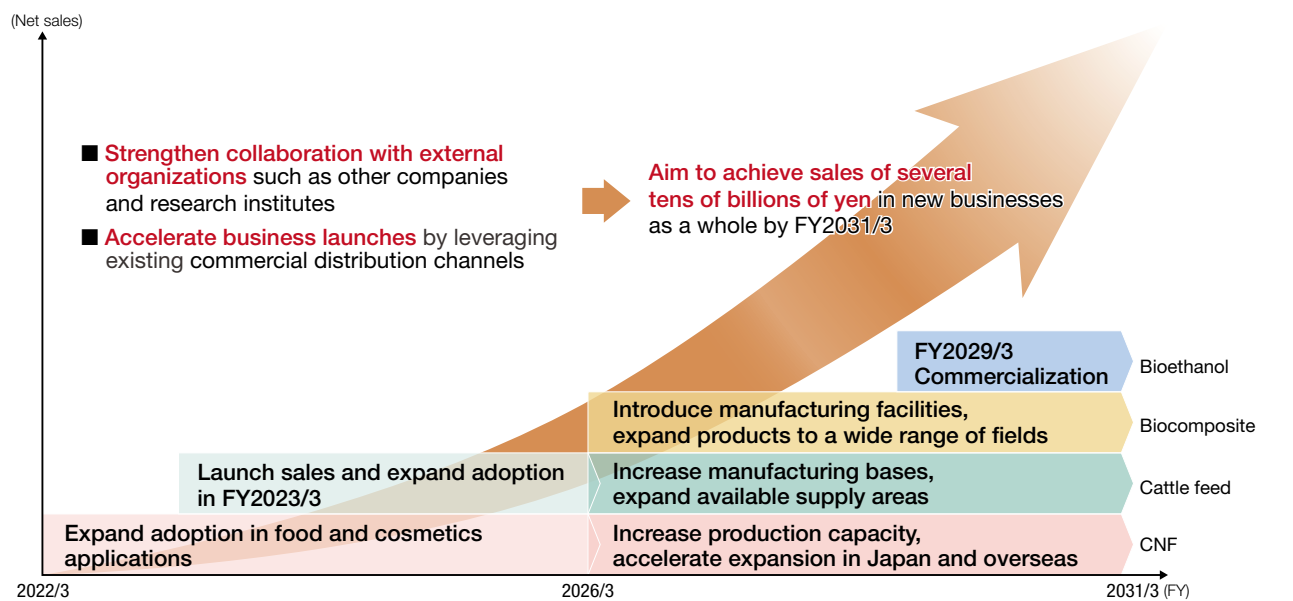
The Biomass Material Business Division, established by Nippon Paper Industries in 2021, is working towards the realization of the 2030VISION by leading the improvement of internal and external collaboration. In this context, it analyzed

the business environment for CNF, cattle feed, biocomposite, and bioethanol, and identified challenges to respond to by 2030. The Group will leverage its strengths to address these challenges.

	Nippon Paper Group's Strengths	Progress as of FY2023/3	Challenges and Responses toward 2030	
			Challenges	Responses
CNF	<ul style="list-style-type: none">Diverse CNF production technologiesDevelopment into diverse applications utilizing the Group's commercial distribution channelsJoint research with external parties	<ul style="list-style-type: none">Significant increase in adoption, mainly for food and cosmetics applicationsExpanded adoption of CNF-reinforced resinPromoting efforts to introduce natural rubbers containing CNFContinued development of CNF-based electricity storage body	<ul style="list-style-type: none">Production capacity to meet increased demandProduct storage method and transportation efficiencyExpansion of customersDevelopment of new applications	<ul style="list-style-type: none">Consideration of increasing production capacityDevelopment of new technologies, such as pulverizationExpansion of sales lineup including natural rubbers containing CNFOverseas expansion, including utilization of the Group's commercial distribution channelsStrengthening of collaboration with universities and other research institutions
Cattle feed	<ul style="list-style-type: none">Nationwide procurement network for domestic woodPulp manufacturing facilities and know-how	<ul style="list-style-type: none">Full-fledged production at the Iwanuma MillIncreased adoption by feed-producing facilities and livestock farmers	<ul style="list-style-type: none">Available supply area limited to eastern JapanDifferentiation from existing feed	<ul style="list-style-type: none">Consideration of expansion of manufacturing baseAccumulation of evidence of improved functionality
Biocomposite	<ul style="list-style-type: none">Pulverization technology	<ul style="list-style-type: none">Commenced joint study with Mitsui Chemicals, Inc.Promoted the development of materials that have a large effect on plastic reduction due to high blending of cellulose	<ul style="list-style-type: none">Improvement of functionalityAcceleration of developmentSecuring a promising market	<ul style="list-style-type: none">Collaboration with the resin industryExpansion into a wide range of fields including daily goods, containers, building materials, home appliances, and automotive components
Bioethanol	<ul style="list-style-type: none">Feedstock procurement capabilities optimal for mass production of cellulosic bioethanolManufacturing facilities and know-how that allow for mass production of pulp	<ul style="list-style-type: none">Started joint study with Sumitomo Corporation and Green Earth Institute Co., Ltd.Began developing cellulosic bioethanol derived from domestic woody biomass	<ul style="list-style-type: none">Establishment of technology for mass productionDevelopment of various applications and markets centered on SAF*Promotion of low LCA	<ul style="list-style-type: none">Efforts toward practical application by leveraging the strengths of the three companiesParticipation in a working group of the "Public-Private Council for the Promotion of Sustainable Aviation Fuel"

* SAF: Sustainable Aviation Fuel. A fuel that can be used in the same way as conventional fuel and reduces CO₂ emissions

Roadmap for New Businesses and Innovative Materials



Current Status and Future Strategies for Early Positive Contribution

CNF (Cellulose Nanofiber)

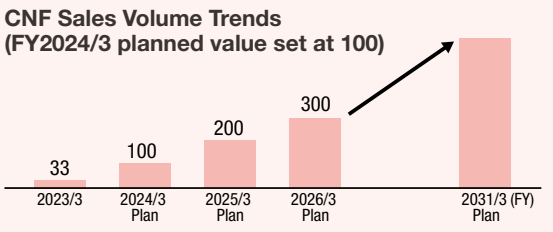
The CNF cellenpia® series is a new material created using technology that breaks down the fiber of cellulose extracted from wood resources to the nano-level. The Company's strength is its technology to develop a wide variety of CNFs and can be applied to a wide range of fields.

The number of applications in FY2023/3 increased by 60% over the previous year, and the mass production facilities at the Gotsu Mill, which mainly produces CNF for food and cosmetics, is on track to reach full capacity. In order to respond to further increase in demand in this field, it will consider expansion of production capacity and other efforts.



cellenpia® ELAS
(CNF compounded rubber masterbatch)

For industrial applications, the Company has identified promising fields including as recycled fiber modification and paper yarn. It intends to expand business not only



in Japan but also overseas by utilizing its commercial distribution channels. In addition, CNF has low-concentration water dispersion, which makes storage and transportation efficiency difficult. To solve these issues, it is developing new technologies such as pulverization.

In the future, the Company will expand its lineup of materials containing CNF, such as masterbatches for CNF compounded rubber. In addition, it has confirmed that the storage capacity of CNF power storage devices, which is being developed in collaborative research with Tohoku University, has improved more than 10 times that of the initial development stage, and it is aiming to exhibit a prototype at Expo 2025 in Osaka, Kansai.

Cattle Feed “Genki MoriMori®”

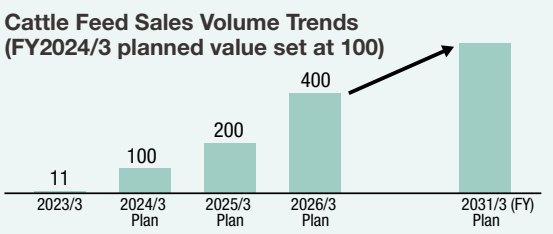
Cattle feed “Genki MoriMori®” is a new feed made from domestic wood. Utilizing pulping technology, lignin is removed from wood to leave only cellulose fiber for production.

In the domestic dairy and livestock industries, supply concerns have become apparent due to soaring prices of imported feed and logistics disruptions. Since Genki MoriMori® is mainly made from domestic wood, it is less susceptible to price fluctuation risks and supply concerns caused by overseas situations. In addition, the Group has built a nationwide procurement network for domestic wood,



Genki MoriMori®

enabling a stable supply throughout the year. Inedible wood resources can be converted into edible resources through dairy and livestock production,



which helps promote food self-sufficiency rate of livestock products.

It has accumulated evidence on the functionality of cellulose (improvement of dairy and livestock performance such as health maintenance, increased milk yield, improvement in breeding, and weight gain), and in FY2023/3, it started full-scale production and sales at the Iwanuma Mill. In the future, it will consider effective uses such as differentiation from existing feeds and mixing with existing feeds, and accumulate more evidence. The Company is also considering increasing its manufacturing base to expand business to other regions.

Biocomposite (Composite Material of Cellulose Powder and Resin)

Biocomposite is new composite materials made primarily from cellulose powder derived from wood resources, and have moldability similar to resin.

In 2019, the Japanese government formulated the “Resource Circulation Strategy for Plastics” to address the issues of marine plastic waste and climate change. The “Roadmap for Bioplastics Introduction,” which was subsequently formulated in 2021 with the aim of introducing sustainable bioplastics, states that about 2.0 million tonnes of biomass plastics will be introduced by 2030. Biocomposites, in which cellulose powder is kneaded with resin, are expected to contribute to the reduction of plastic usage and GHG emissions.

The Company has the manufacturing technology to provide a stable supply of high-quality cellulose powder. Viewing the functionality improvement of biocomposites and the acceleration of their development as a challenge it must tackle, the Company is working to develop materials in collaboration with the resin industry.



Cellulose powder to be kneaded with resin

In the future, it intends to speed up its efforts to develop the market through the supply of samples and other means, and it will expand biocomposite applications to a wide range of fields, including daily goods, containers, building materials, home appliances, and automotive components.

Bioethanol

Bioethanol is ethanol obtained from biomass and can be used as feedstock for SAF and chemicals. Producing ethanol from wood resources can help solve various social issues, such as improving energy self-sufficiency and energy security.

In February 2023, the Company concluded an MOU on collaboration with Sumitomo Corporation and Green Earth Institute Co., Ltd. (GEI) to begin trilateral consideration of the first commercial production of Cellulosic bioethanol from wood resources. The Company has distinctive technology and experience in utilizing large amounts of wood resources to produce several tens of thousands of kiloliters of bioethanol per year, and the Sumitomo Corporation Group has knowledge and skills of development and deployment of carbon-free energy sources such as hydrogen, ammonia, and next-generation biomass raw materials and fuel*, as well as for its promotion of green chemical*2 use. GEI has the technology to produce chemicals from biomass using microorganisms.

To achieve early commercialization, the three companies will work together and leverage their strengths to establish efficient mass production technologies, making the fact that Cellulosic bioethanol is a low LCA material a



Bioethanol production process (from left to right: wood chips, pulp, saccharification and fermentation culture medium, bioethanol)

significant value. In 2023, the Company was selected as a pilot operator for the “Authentication Task Group” within the “SAF Distribution Working Group” of the “Public-Private Council for Promoting the Introduction of SAF.” Going forward, it will promote the commercialization of cellulosic bioethanol business. It aims to start operations for Japan’s first commercial wood resource-derived cellulosic bioethanol plant using domestic wood resources at one of its mills in FY2028/3. The plant is planned to have an annual production capacity of tens of thousands of kiloliters.

*1 Next-generation biomass fuels: Bioethanol, biojet, biogas, etc. produced from biomass (organic resources derived from renewable organisms, excluding fossil resources).

*2 Green chemicals: Chemicals with low environmental impact made from renewable resources instead of fossil fuels.

Response to Climate Change

In addition to the various impacts of climate change caused by the progression of global warming, Nippon Paper Group considers global trends based on the Paris Agreement and the policies of the Japanese government to be important factors affecting its management, and is working to reduce risks and take advantage of opportunities.

Basic Stance

Climate change is a social issue the world is confronting and the Nippon Paper Group's basic policy under 2030VISION is to “respond to the rapidly changing social landscape including greenhouse gas (GHG) emissions reduction and environmental issues” as the Group moves forward on measures to mitigate and adapt to climate change, centering on GHG reduction.

Based on the Task Force on Climate-related Financial Disclosures (TCFD) recommendations that the Group endorsed in 2021, the Group is conducting multiple scenario

analyses assuming a rise in temperature, setting indicators and targets, and working on countermeasures to reduce risks and seize opportunities that leverage its strengths. The Board of Directors of Nippon Paper Industries receives reports from the Risk Management Committee (→P.52) and the executive officer in charge of GHG emissions reduction and promotion of environmental management on these activities and supervising operations.

Scenario Analysis and Strategy

For the scenario analyses, compared to pre-industrial levels, two scenarios were used of the average global temperature rising 1.5°C and the other in which it rises by 4°C as of 2030 and 2050 and centered on the Group's business activities. Based on the results of the analyses, the Group will respond to

climate change issues by focusing on areas that are high risk or great opportunity under the 1.5°C scenario, “reduction of GHG emissions,” “utilization of forest resources” and “expansion of biomass products” (→P.34–37).

Risks and Opportunities as of 2030 (Some excerpts are shown below)

Type of Risk			Phenomena with Impact on Financial Plans	Financial Impact	
				1.5°C Scenario	4°C Scenario
Transition risk	Regulatory	Introduction of carbon pricing, etc.	• Rising carbon prices	High*	Low*
			• Increasing capital investment expenses for fuel conversion and energy saving	High	Low
Physical risk	Acute	Increase of catastrophic disasters	• Stoppage in the delivery of supplies and products as logistics networks are cut off	Medium–High	High
	Chronic	Rising temperatures and change of rainfall patterns, etc.	• Production stoppage due to damage at production sites		
			• Increased price of forest resources and other plant-based materials due to frequent forest fires and a decline in plant growth	Medium	High

* Carbon price impact Low: Less than ¥10.0 billion; Medium: ¥10.0 billion to ¥50.0 billion; High: ¥50.0 billion or more (qualitative evaluation except for carbon price)
Carbon pricing adopts IEA's Net Zero Mission scenario

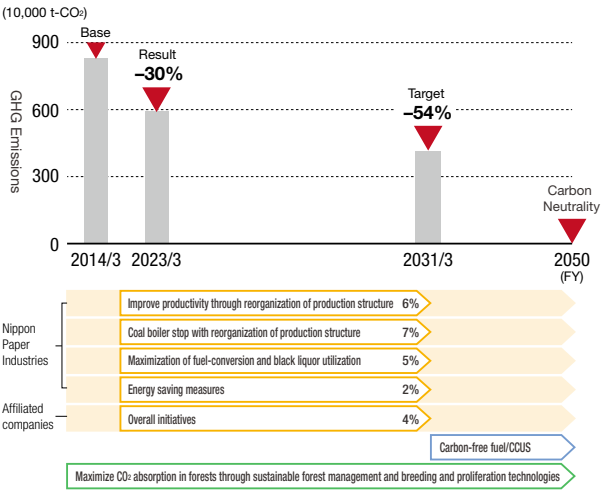
Type of Opportunity	Phenomena with Impact on Financial Plans	The Group's Strengths	Market Growth	
			1.5°C Scenario	4°C Scenario
Introduction of carbon pricing, etc.	• Storage batteries will spread and demand for raw materials for storage batteries will increase	• CMC technologies and production facilities • CNF technologies and production facilities	Significant expansion	Expansion
	• Demand for cellulose nanofiber (CNF) will increase due to the need to reduce the weight of automobiles			
	• Demand for forest absorption credits will increase	• Company-owned forests in Japan • Forest management, breeding and proliferation technologies	Significant expansion	Stable
Changes in market needs	• Demand for chemical raw materials using wood-derived CO ₂ will increase	• Biomass-derived CO ₂ supply infrastructure (recovery boilers) • Chemical CO ₂ fixation and utilization technology	Significant expansion	Stable
	• Demand for biomass materials and lignin products will increase as the need for paperizing increases due to decarbonization	• Woody biomass material development technology • Technologies to extract and utilize lignin • Technology for recycling unused wastepaper	Significant expansion	Expansion
	• Demand for domestic lumber will increase • Demand for elite tree seedlings will increase due to increased reforestation area in Japan	• Company-owned forests in Japan • Forest management, breeding and proliferation technologies	Expansion	Significant expansion
	• Demand for sustainable aviation fuel will increase	• Technology to produce pulp/cellulose	Expansion	Expansion

Reduce GHG Emissions

Reducing GHG emissions is a pressing matter for the Group in response to climate change issues as the paper pulp industry is an energy-intensive industry that consumes significant energy and is highly vulnerable to the transition risks associated with the introduction of carbon pricing and energy policies. The Group is working to reduce GHG emissions through fuel conversion, energy saving, and reorganization of production structures, and since these initiatives are progressing steadily, the reduction scenario of 2030VISION was brought forward in May 2023 and the FY2031/3 target revised to a 54% reduction* in GHG emissions (Scope 1+2) compared to FY2014/3. Going forward, the Group will build an operations framework to realize fuel conversion and energy saving, and move forward on restructuring of the Paper Business in an integrated manner.

* Emissions related to production except for the Energy Business field

Plan for Shift to Carbon Neutrality

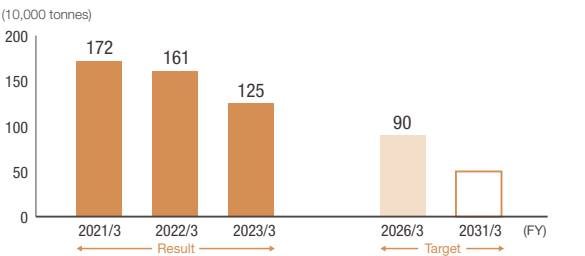


Fuel Conversion Initiatives

Since the second half of FY2022/3, prices of raw materials have increased globally, and the price of coal in particular has surged, directly affecting the Group's earnings. The Group is working to maximize production efficiency by reorganizing the Paper Business production structure and moving ahead on operations limiting the use of coal, such as fuel conversion, by utilizing the know-how it has accumulated until now in boiler technology using wood resources and waste materials as fuel. In FY2023/3, the Group launched a coal reduction project, and as a result of focusing on reduced coal consumption, had coal consumption of

1.25 million tonnes, 360,000 tonnes less than in FY2022/3.

Coal Consumption*



* Nippon Paper Industries (amount consumed internally)

Initiatives to Reduce Coal Consumption

Initiatives	Issues	Countermeasures
• Fuel conversion (transfer to biomass, waste and purchased electricity) • Coal boiler power limitation, utilized schedule of maintenance outages	Address change in operating methods accompanying fuel conversion, facility modifications	Utilize accumulated boiler technology know-how
	Stable procurement of fuels other than coal	Utilize the Group's internal collection network and maximize the use of black liquor

Energy Saving Initiatives

Energy saving is an incredibly important measure in energy-intensive industries. The Group has set a target of improving total energy intensity in manufacturing by one percentage point or more compared to the previous fiscal year.

The Group has created a database of construction for energy conservation measures, and is working on energy

conservation measures from the perspectives of both facilities and operational management. Moreover, in paper production mills, large volumes of water are used in the production process to maintain quality, which results in energy loss. The Group always takes on the challenge of introducing new technologies with the aim to simultaneously save water and energy, as well as maintain quality.

Utilization of Forest Resources

Forests are vulnerable to the impact of climate change, which also makes this a risk factor for the Group, which develops products and services that maximize the use of wood resources. As a result of the scenario analysis, it is predicted that the growth rate will decrease due to temperature rise, the occurrence of forest fires will increase, the procurement cost will increase due to the increase in demand for biomass raw

materials, and stable procurement will become difficult. On the other hand, the revitalization of the carbon credit market is a significant opportunity for the Group, which manages many forests. The Group will respond to climate change issues through the utilization of forest resources using its accumulated proprietary technologies and know-how.

Stable Procurement of Woody Materials from Overseas

In the Group's overseas plantation business, from the standpoint of hedging risks, the Group believes not only in expanding area, but also increasing the amount of accumulation per area. The Group is moving forward on improving productivity in plantation areas and in securing new wood

resources. Improving productivity not only enables stable supply of raw materials and contributes to keeping costs down, but also leads to more efficient and greater CO₂ absorption, contributing to mitigate climate change.

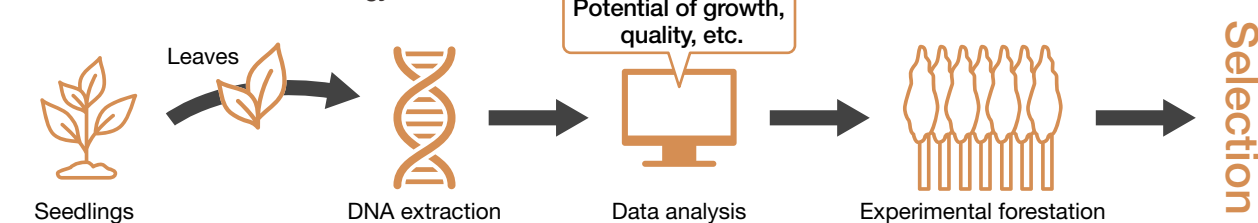
Improvement of Productivity

The Group has developed DNA marker selection technology to select eucalyptus plantation trees based on DNA information, enabling it to obtain superior trees with outstanding growth and quality at an early stage. Production of seedlings of varieties chosen through this technology started from FY2023/3. Furthermore, the Group will raise forest productivity through the plantation management know-how accumulated over many years in its forestry business.



Growth of tree varieties selected through DNA markers (AMCEL)

DNA Marker Selection Technology



Securing of New Forest Resources

The Group will leverage its productivity improvement technologies and expand the forests in which the Group can secure resources, centered on the Asian region. In 2022, the Group concluded a strategic partnership with Marubeni Corporation, which owns an expansive plantation areas in Indonesia. The aim is to increase forest growing stock by providing technical guidance to PT. Musi Hutan Persada (MHP), Marubeni's Indonesian forestry business company.



Stable Procurement of Woody Materials from Japan

Under the 1.5°C scenario analysis, demand for domestic wood is forecast to increase as it becomes difficult to obtain woody materials from overseas and due to rising wood demand for biomass fuel and other uses. Meanwhile, the domestic forestry industry already confronts many issues, including a labor shortage and the increased costs of taking

measures against wild animals. For the Group, where domestic wood accounts for about 35% of the woody raw materials it procures, continuing to be able to utilize domestic wood in the future maintains the domestic supply chain and supports revitalization of the plantation business in Japan utilizing its unique technologies and company-owned forests.

Expansion of the Elite Tree* Seedlings Production Business for Forestry and Utilization of Company-owned Forests

The plantation business in Japan is dealing with the issue of a low reforestation rate due to an insufficient supply of seedlings and a labor shortage, high afforestation costs, and risks associated with long rotation period. The Group collaborates with the Forestry Agency, local governments and seedling companies in the elite tree seedling production business. As elite trees grow quickly after planting, afforestation costs are forecast to decrease by reducing the number of undercuttings and shortening the rotation period, thereby helping to solve the issues faced by the plantation business in Japan.

Moreover, the Group is planting elite trees in reforestation areas in company-owned forests as a model for the regeneration of the plantation business in Japan.

In FY2023/3, the Group newly established seed orchards or scion plantation for elite trees of cedar and cypress in the four prefectures of Tottori Prefecture, Hiroshima Prefecture, Shizuoka Prefecture and Oita Prefecture in addition to the existing facilities in Kumamoto Prefecture. The Group plans to accelerate expansion of the elite tree seedling production business nationwide and aims to build a production system of 10.0 million bottles by FY2031/3.



A container of seedlings for elite cedar trees



Elite cedar trees planted in Kitayama company-owned forests, Shizuoka Prefecture

* Strains of trees such as cedar, cypress, etc. that have excellent characteristics such as 1.5 times or greater growth or CO₂ absorption, and half or less the amount of pollen production

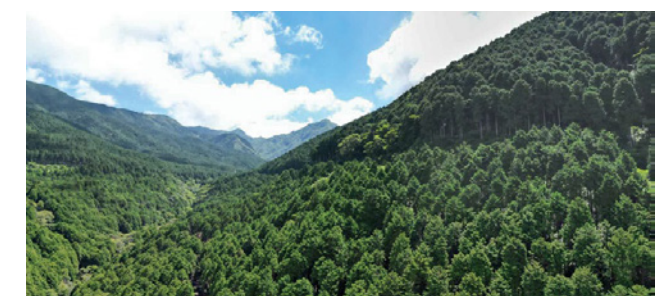
Generate Carbon Credits

As the world aims to achieve a carbon neutral society, the market for carbon credits is expected to expand as demand increases and the outlook is that demand for forest absorption credits will also rise in conjunction with this. From 2020 to 2022, the net absorption (absorption volume – logged volume) of company-owned forests in Japan and overseas plantation areas was 780,000 tonnes-CO₂, and the total amount of fixed

CO₂ at the end of 2022 was 31.0 million tonnes-CO₂. Apart from that, the amount of fixed CO₂ in the forests in the environmental protection zones established in its overseas plantation business is estimated at 10.0 million tonnes-CO₂, and the Group is investigating and examining these values and functions. The Group is taking part in the GX League from 2024/3 onward to maximize utilization of the lively carbon credit market.

Acquisition of J-Credit Certification through Aerial Surveying

The Group is promoting utilization of J-credits by closely monitoring revisions and other changes in forest management methods and working closely together with other associated parties. In FY2023/3, Kazaki company-owned forest in Shizuoka Prefecture acquired new J-credit certification. This was the first case in Japan of certification being obtained based on aerial surveying data, and utilizing publicly disclosed data from local governments can drastically reduce monitoring costs.



Kazaki company-owned forest, Shizuoka Prefecture