
Environmental Management

Policy and Basic Approach

The Nippon Kayaku Group has defined contributing to conservation of the Earth's environment as a key management issue, and drives forward environmental management as the core of its Sustainability Strategy laid down in the Long-Term Management Plan: Evolution2035. Our basic approach is based on the principles of Responsible Care, seeing us appropriately recognize and evaluate the environmental risks at various stages of business activity, and continuously work on improvements.

We also observe environmental laws and regulations, and signed protocols, both inside and outside Japan, and engage in environmental risk reduction and preventative anti-pollution measures stemming from product development, manufacturing processes and business activities.

Furthermore, we are mapping out our path to reducing environmental burdens through climate change measures, promotion of energy-saving and resource-conserving practices, and waste reduction, and have established contributing towards realizing a sustainable society as a basic policy.

➤ [Our Declaration on the Environment, Health, Safety and Quality](#)

➤ [Responsible Care Targets](#)

System

➤ [Responsible Care Promotion System](#)

Environmental Management System

ISO14001 Certification

Our current efforts to retain our certification status for ISO14001, the internationally recognized environmental management standard, see us consider the environment during the development and manufacture of products and the provision of services. Having first gained ISO14001 Certification for Environmental Management Systems in 1998, we have now achieved certification for all seven of our domestic plants and seven overseas Group companies. We will continue, going forward, to explore new ISO14001 certification options for Group companies, including for those based overseas.

➤ [ISO14001 Certification](#)

Environmental Audit

In line with ISO14001 requirements, the Nippon Kayaku Group conducts internal environmental audits. These enable us to confirm the status of activities with respect to environmentally-related legislation and regulations, and help us map out how to promote and improve our groupwide environmental conservation activities.

➤ [Responsible Care Audit](#)

Targets and Results

Indicator	FY2028 Target	FY2035 Target	Scope
GHG emission amounts (Scope1+2) *Compared to FY2019	36% reduction	64% reduction	Consolidated
Major Environmental Accidents	0 cases	0 cases	Consolidated
Environmental Law Violations	0 cases	0 cases	Consolidated
Recycling Rate	82% or higher	85% or higher	Non-consolidated
Zero-emissions Rate	0.8% or less	0.6% or less	Non-consolidated
VOC Emission Amounts Compared to FY2024	1% per-unit reduction	3% per-unit reduction	Consolidated
Waste Amounts Compared to FY2024	1% per-unit reduction	3% per-unit reduction	Consolidated

➤ [FY2025 Sustainability Targets and Results](#)

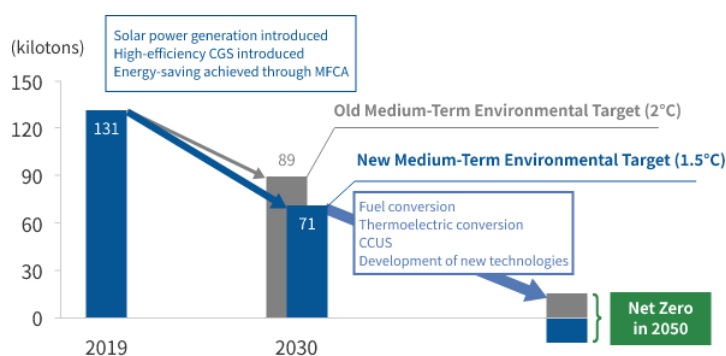
Medium-term Environmental Targets and Results

Since FY2021, the Nippon Kayaku Group has fixed new Medium-Term Environmental Targets as it advances its environmental conservation activities. In the climate change field, we initially conformed to the 2°C Standard, and the target of achieving FY2030 greenhouse gas emissions (Scope 1 + 2) at least 32.5% lower than those of FY2019. Since then, based on the increasing severity of environmental issues and international movements towards carbon neutrality, we have adopted the 1.5°C Standard as our new tougher emissions target, aiming for at least a 46% reduction on FY2019 levels by FY2030, and carbon neutrality by FY2050. In tandem have we signed up to the Task Force on Climate-Related Financial Disclosures (TCFD) recommendations in March 2022, and moved forward with information disclosures pertaining not only to progress on emission reductions but also climate change risks and opportunities.

In the field of chemical emissions, we have fixed output-unit-based targets for volatile organic compound (VOC) emissions as we work on reducing environmental burdens. While it is the case that absolute quantities of VOC emissions have shown an upward trend due to increased production quantities and product lineup changes, we are nevertheless pressing ahead with improvements to output-unit emissions.

The field of waste reduction, meanwhile, has seen us adopt FY2024 as the standard for our output-unit reduction targets, and aim for a 1% per-output-unit reduction by FY2028. We have also fixed targets for recycling and zero-emission rates; at least 82% for the former and 0.8% or less for the latter.

FY2025 saw us achieve reductions in total waste generated due to improved utilization rates and changes to product line composition. On recycling and zero-emission rates, we continue to promote recycling at every business site, and have delivered further improvements on top of achievement of targets.



Trends in Medium-term Environmental Target Results

Area	Covering	Items	Target Figures	2021	2022	2023	2024	2025
Climate change prevention ^{*1}	Consolidated	GHG, Scope 1+2 ^{*2} emissions	FY 2030 Targets No more than 70.6 kilotons (Over 46% down on FY2019) (Reference: FY2024 standards) No more than 111.8 kilotons	112.5 kilotons (14.2% reduction)	108.3 kilotons (17.5% reduction)	102.7 kilotons (21.7% reduction)	111.1 kilotons (15.3% reduction)	90.1 kilotons (31.4% reduction)
Reductions in amounts of chemical compounds produced	Non-Consolidated	VOC ^{*3} (Quantities of Volatile Organic Compounds produced)	(Results Report)	52.1 tons	38.7 tons	32.9 tons	57.3 tons	45.3 tons
		COD ^{*4} emissions	(Results Report)	124.2 tons	171.8 tons	210.9 tons	222.2 tons	173.6 tons
Industrial waste reduction	Non-Consolidated	Waste quantities	(Results Report)	28,424 tons	27,621 tons	20,974 tons	28,225 tons	24,014 tons
		Recycling rates (excluding container reuse)	No less than 80%	82.3%	85.0%	83.8%	86.5%	85.2%
		Rate of zero emissions ^{*5}	No more than 1%	1.0%	0.8%	0.7%	0.6%	0.4%

*1 Medium-term Environmental Target for FY2030: A reduction of at least 46% on FY2019 levels (from 131.2 kilotons to no more than 70.6 kilotons)

*2 Scope 1: GHG emissions directly produced by our company itself (through fuel combustion, manufacturing process emissions, etc.)

Scope 2: Emissions our company indirectly produces through the use of electricity, heat and steam supplied by other companies

*3 The total of VOCs (Volatile Organic Compounds) includes not only those that must be reported under government ordinances (the PRTR Law) but also those specified by the Japan Chemical Industry Association.

*4 COD (Chemical Oxygen Demand): A leading water quality index based on chemical oxygen demand and the amounts of oxygen necessary for oxidizing materials in water.

*5 Rates of zero emissions: Defined as the ratio of internal to external Nippon Kayaku waste disposed of at landfill sites.

➤ [ESG Aggregate Data](#)

Initiatives

Use of LCAs (Life-Cycle Assessments)

We are also working to maintain and improve the environment, health and safety at every step of the product life cycle, from the research and development stage right the way through production, distribution, sale, recycling and disposal. We are trialing the design of a process which allows us to visualize the value of every Group product or service by assessing and analyzing environmental impacts and potential environmental contributions at every stage of the life cycle. Part of these activities involves promoting calculation of the carbon footprint (CFP) of every Nippon Kayaku product, which allows us to not only grasp its environmental impact but improve the accuracy of our LCA calculations for customer products. We are presently proceeding with such calculations for certain product lines, and are looking at how to systematize this process to enable emissions calculations to be made for every company product.

Development of Environmentally-conscious Technology and Products

➤ [The Products and Technologies Creating a Sustainable Future](#)

Environmental Education

Through our online Sustainability Training for all Group directors and employees (including contract and part-time employees) and temp staff, we are presenting opportunities to learn about the environment.

➤ [Sustainability Training](#)

Furthermore, as we strive towards strengthening environmental response capacity in line with individual business practices, we have set up academic training which contributes towards reducing environmental burdens, observation of laws and stable operations, based upon the particular characteristics of each business.

➤ [Anti-pollution \(Training\)](#)

Environmental Communication

Since publishing its CSR Report in 2013, the Nippon Kayaku Group has continually disclosed information pertaining to the environment. Since FY2021, we have integrated these actions into our website in order to enhance the information disclosed. Going forward, we will continue to talk to our stakeholders, and move information disclosures into line with international standards so as to further expand the types of contents disclosed. Furthermore, we will continue to proactively disclose information to stakeholders via Climate Disclosure Project (CDP) surveys concerning climate change, water security and supply chains, and through Environment, Social and Governance (ESG) institution surveys.

Cases of Environmentally-related Violations and Accidents

The Nippon Kayaku Group is actively working on preventing violations of environmental regulations and accidents, and has prepared a swift policy response system for such eventualities. Across the entire Nippon Kayaku Group, FY2025 thankfully saw zero major accidents or legal/regulatory violations impacting upon the environment, as well as zero instances of related punishments or fines.

There were, however, three cases of minor environmental accidents (CFC leakage, pit overflows, noise pollution). Each instance saw us promptly contact the relevant authorities, and implement appropriate initial responses and corrective measures based on internal company regulations. Our subsequent site inspections and root cause investigations enabled us to confirm that impact on the environment was minor. The chief reasons behind such incidents were determined as equipment deterioration and insufficient prior checks. We are now moving forward with efforts to strengthen our information sharing and management systems to ensure no repeat of such cases.

Indicators	Scope	Unit	2021	2022	2023	2024	2025
Number of violations of environmental laws and regulations	consolidated	cases	0	0	0	0	0
Among the above, number of water-resource-related legal violations (water quality, water quantity etc.)			0	0	0	0	0
Total number of environmental accidents	consolidated	cases	0	0	0	0	3
Number of major environmental accidents*	consolidated	cases	0	0	0	0	0
Violations of laws and regulations; fines issued for environmental accidents; punishment costs	consolidated	yen	0	0	0	0	0

* Environmental accidents such as leaks of toxic substances triggering neighborhood evacuation orders, media coverage and improvement orders.

Environmental Accounting

For the purpose of effectively driving forward environmental conservation efforts, Nippon Kayaku is publishing the aggregate costs of conserving the environment incurred during business activities.

➤ [ESG Aggregate Data\(Environmental Accounting\)](#)

Climate Change

Policy and Basic Approach

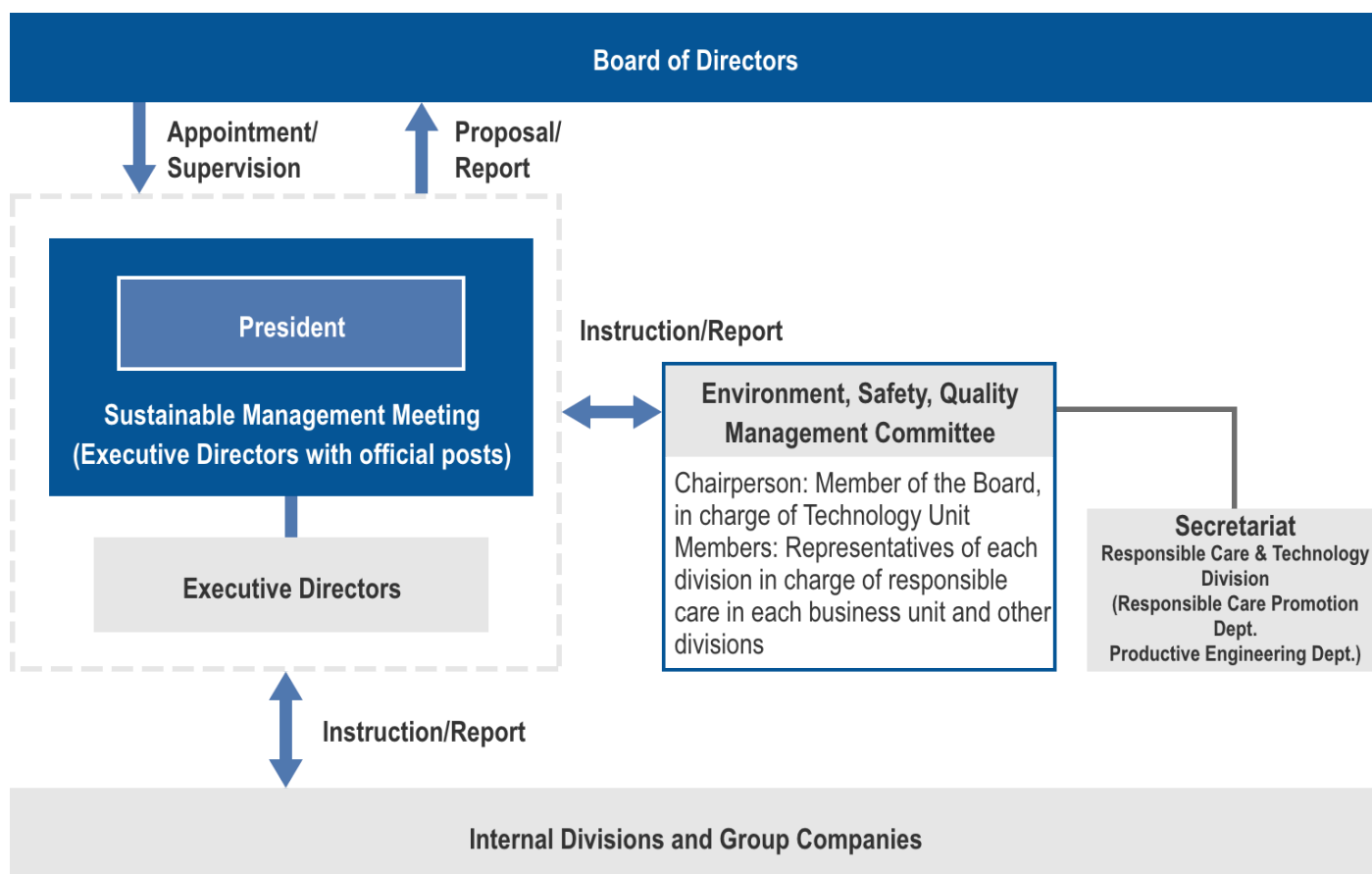
Recent years have witnessed the emergence of abnormal climates across the world alongside environmental damage, causing a heightened sense of crises with regard to climate change. The 27th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP27) presented the chance to further accelerate international decarbonization efforts. As one strand of its Green Growth Strategy based on The Paris Agreement, the Japanese government has declared its intent to reach carbon neutrality by the year 2050. In endorsing this policy movement has the Nippon Kayaku Group also set its own ultimate target of becoming carbon neutral by 2050, with its intermediate FY2030 Medium-Term Environmental Targets, initially fixed in 2020, now revised from the 2°C to the 1.5°C global warming target. For its own response to climate change, our Group plans significant reductions in GHG emissions via thorough promotion of energy saving, manufacturing process optimization, the introduction of low-emission solar-powered generators, and switchovers to renewable-energy-sourced low-emission-factor electric power. We will also contribute to decarbonization across our value chain through providing products aiding the realization of a decarbonized society and strengthened supplier engagement.

Information Disclosure based on TCFD Proposals

Governance

The Sustainable Management Meeting, chaired by our President, is tasked with discussing Nippon Kayaku Group business plans which incorporate future climate change responses, and summarizing and evaluating the status of environmental activities. Discussion, summary and evaluation results are reported to the Board of Directors, which assumes the supervisory and directorial role in this system.

We have also organized an Environment, Safety and Quality Management Committee to serve as an advisory body to the Sustainable Management Meeting. Its remit is to take a crosscutting organizational approach towards coordinating the advancement of our climate change measures and to hold yet deeper discussions on climate change issues.



Strategies

The Nippon Kayaku Group is developing several businesses on a global scale, with each field entailing various risks and opportunities. In order to grasp the effect brought by climate change upon each business, we have, in line with TCFD recommendations, evaluated the climate-related risks across our entire group and identified opportunities in each business field. For each evaluation we have referred to multiple scenarios, analyzing both the transition risks and physical risks. Furthermore, our Long-term Management Plan Evolution2035 divides the periods in which risks might emerge into short-, medium- and long-term, thereby organizing the various impacts along a time axis. Based on the results of this analysis shall our Group strive to reduce risks and create opportunities through improving energy efficiency, expanding use of renewable energy, strengthening our supply chain, and developing both products and technologies contributing to decarbonization.

	Period	Reason for adoption
Short-term	The 3-year period spanning FY2026 to FY2028	Phase 1 of the Long-term Management Plan: Evolution2035
Medium-term	Up to FY2035	Aligned with the final year of the Long-term Management Plan: Evolution2035
Long-term	Up to FY2050	To align with Japan's NDC (Nationally Determined Contribution) Target Year

◆ Climate-related Risks

Our 1.5°C and 4°C warming scenarios for climate-related business risks are based on the IPCC's Representative Concentration Pathways (RCP Scenarios 2.6 and 8.5), as well as the IEA's Sustainable Development Scenario (SDS) and Stated Policies Scenario (STEPS).

◆ The risks of switching to a decarbonized economy in a 1.5°C target scenario

Category	Principal risks	Risks appearing	Financial impact	Principal measures adopted
Policies and legal regulations	Rise in operating costs due to tougher emissions regulations	Short to long-term	Moderate	- Introduction of decentralized power sources at each business site, such as solar power generation and high-efficiency co-generation - Thorough energy-saving activities and material loss reduction through use of MFCA
	Price hikes for electricity and LNG	Short to long-term	Moderate	
	Rises in raw material prices due to tougher emissions regulations	Short to long-term	Large	Engaging with suppliers to promote reductions in their emissions
Market and rumored developments	Increased costs due to environmental information disclosure requirements and LCA calculations etc.	Medium to long-term	Small	Rationalizing calculation methods and introducing LCA calculations for industrial waste produced by each business site

◆ Physical impact risks of a 4°C target scenario

Category	Principal risks	Risks appearing	Financial impact	Principal measures adopted
Acute and chronic physical risks	Cost increases from flood damage associated with typhoons, heavy rainfall and high tides	Short to long-term	Moderate	Based on the results of flood simulations, quantify financial impact and implement flood countermeasures
	Water-shortage impacts on business operations	Medium to long-term	Small	Strengthening water-saving measures in the production process, and exploring ways to reuse and recycle water
	Reduced productivity due to rising temperatures	Medium to long-term	Small	Working condition improvements such as stronger air conditioning; promoting automation of high-temperature processes

◆ Opportunities for each business field if moving towards a decarbonized economy in a 1.5°C target scenario

Business field	Business environment		Opportunity	Opportunities appearing	Financial impact*
Safety Systems	Tougher regulations for GHG emissions in every country and region	- Increased demand for yet further energy-saving properties in electrical goods - Sales of automobiles with internal-combustion engines to be heavily restricted depending on the region	- Advancements in moves towards smaller and lighter automotive safety components with more diversified shapes, in response to more electric vehicles and automobile transformations - Expansion of safety components for unmanned aerial vehicles such as drones	Short to long-term	Large
Polatechno			- Expanded use of safety display device components, such as sensors and HUDs, in response to more electric vehicles and automobile transformations - Expanded use of polarizing plates which help reduce power consumption of display devices	Short to long-term	Moderate
Functional Materials		- Advancement of social changes such as moves to towards smart cities - Increased demand for yet further energy-saving properties in electrical goods - Increased demand for storage batteries that can handle large output variations geared towards the ever-expanding field of renewable energy - Expanded global demand for relatively low-emission movement and delivery processes	- Expansion of semiconductor-related goods amid moves towards smart cities and digital transformation - Expanded use of functional materials which help reduce power consumption of display devices - Expanded use of low-emission materials and advancement of the switchover to biomass materials - Expanded use of resin materials to help achieve lighter mobility bodies for vehicles	Short to long-term	Large
Color Materials			- Expanded use of ink for digital-on-demand printing which renders low-carbon printing possible - Expanded use of dyes for dimming glass and film used to control incoming light-rays	Short to long-term	Large
Catalysts			- Expanded use of catalysts in the production of green energies such as hydrogen - Expanded use of catalysts for the promotion of biomass materials	Medium to long-term	Large
Pharmaceuticals		Limited direct impacts	Reducing GHG emissions by reviewing packaging formats	Short to long-term	Small
Agrochemicals			- Expanded use of biostimulants to maintain and improve agricultural productivity amid the rising temperatures expected even if the 2°C target is met. - Application of existing pesticides to newly problematic pests	Medium to long-term	Small

* Financial impact: Large (2 billion yen or more), Moderate (0.5 to 2 billion yen), Small (0 to 0.5 billion yen)

Risk Management

Our Group has positioned Climate Change Response as one of its Key Sustainability Issues. Under [the Governance System](#) constructed by the Board of Directors, Sustainable Management Meeting and the Environment, Safety, Quality Management Committee, we are identifying, evaluating and managing climate change risks, chiefly through the Responsible Care and Technology Division. Identified risks will trigger the fixing and implementation of response measures as we plan not only to reduce risks but deliver continuous improvements through monitoring of response situations.

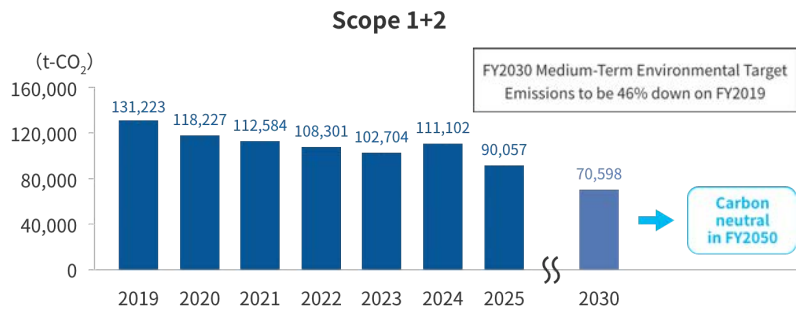
Metrics and Targets

Indicator	FY2028 Target	FY2035 Target	Scope
GHG emission amounts (Scope1+2) *Compared to FY2019	36% reduction	64% reduction	Consolidated

The Paris Agreement adopted at COP21 in 2015 contains the international target of limiting the rise in average global temperature to under 2°C, and making further steps to hold it down to 1.5°C, above pre-industrial levels. Taking that onboard, the Nippon Kayaku Group reassessed its Medium-term Environmental Targets in April 2024, raising them from the 2°C to the 1.5°C global warming target. Specifically, we are targeting for FY2030 Scope 1 and Scope 2 emissions to be at least 46% lower than those of FY2019. This therefore sees us aiming for 4.2% annual emission reductions on FY2019 levels from FY2025 onwards. Furthermore, with a view to achieving carbon neutrality by 2050, we have been working on emission reductions across our entire supply chain (Scope 3), conducting a survey on technological trends related to use of alternative fuels such as hydrogen and ammonia, and pressing ahead with incorporating technologies aimed at green energy switchovers, starting with renewables. For FY2025, despite production increases, we were able to confirm an emission-limiting-effect from the introduction of an integrated energy service for multiple sites and our initiatives to expand solar power generation.

Scope 1: Direct GHG emissions from sources either owned or managed by our own company (e.g. fuel use, production process emissions etc.)

Scope 2: Our company’s indirect emissions stemming from electricity, heat and steam supplied by other com



◆ Disclosure of Scope 3 Data related to Total Supply Chain GHG Emissions

Recent years have seen us ascertain and manage our indirectly-created supply chain GHG emissions, and commence movements towards relevant external information disclosures. We are thus advancing with Scope 3 supply-chain-related emission calculations in addition to the Scope 1 and Scope 2 which have formed the basis of data aggregation and management until now. Whereas FY2017 saw us move forward with Scope 3 calculations for our non-consolidated business, FY2019 saw us commence rolling this out to domestic and overseas group companies. Moving forward, the Nippon Kayaku Group will continue to aggregate data and manage emissions based on the “Basic Guidelines on Accounting for GHG Emissions Throughout the Supply Chain” issued by Japan’s Ministry of the Environment, and thereby plan systematic advancement of initiatives to reduce GHG emissions across the entire supply chain.

Scope 3: Indirectly-produced emissions not covered by Scope 2 (through raw material procurement, employee commutes, business trips, waste processing subcontractors, product use and disposal etc.)

Scope3

Category		Scope	Unit	2021	2022	2023	2024	2025
1	Purchased goods and services	consolidated	t-CO ₂ e	294,500	275,000	241,800	259,600	228,100
2	Capital goods	consolidated	t-CO ₂ e	26,800	29,600	33,400	55,900	45,800
3	Fuel- and energy-related activities (Not included in Scope 1 or Scope 2)	consolidated	t-CO ₂ e	22,300	21,000	20,500	22,700	23,900
4	Upstream transportation and distribution	consolidated	t-CO ₂ e	22,300	19,700	16,600	18,000	16,700
5	Waste generated in operations	consolidated	t-CO ₂ e	31,800	16,200	10,800	14,700	14,200
6	Business travel	consolidated	t-CO ₂ e	800	800	800	800	800
7	Employee commuting	consolidated	t-CO ₂ e	2,400	2,400	2,400	2,500	2,600
8	Upstream leased assets	consolidated	t-CO ₂ e	Included in Scope 1, 2, therefore not separately calculated				
9	Downstream transportation and distribution	consolidated	t-CO ₂ e	1,600	1,500	1,200	1,400	1,200
10/11	Processing of sold goods and Use of sold goods	consolidated	t-CO ₂ e	-	-	-	-	-
12	End-of-life treatment of sold products	consolidated	t-CO ₂ e	26,400	23,000	17,600	17,300	17,600
13	Downstream leased assets	consolidated	t-CO ₂ e	400	400	400	400	400
14/15	Franchise and Investments	consolidated	t-CO ₂ e	-	-	-	-	-
Total*1		consolidated	t-CO₂e	429,300	389,600	345,000	393,300	351,300

*1 As figures have been rounded off, the totals in some columns do not exactly match the sum of each item above.

Calculation Method: As a general rule, CO₂ emission amounts are calculated with reference to emission factors published in the “Basic Guidelines for Supply Chain Greenhouse Gas Emission Calculations” provided by ministries of Environment and Economy, Trade and Industry, as well as by the IDEA Lab Safety Science Research Section of the National Institute of Advanced Industrial Science and Technology.

➤ [Environmental Management](#)

➤ [Environment-related Data](#)

◆ Flood Risks

Although flood risks have been highlighted as one of the physical risks of climate change, our calculations for the related financial impact assessments were in qualitative form only. Hence, in order to provide quantitative data for FY2023, we made use of Climate Vision, a highly accurate flood simulation system provided by Gaia Vision Inc. This allowed us to grasp damage scenarios from once-in-100-year and once-in-1000-year floods, and conclude, that of all our domestic and overseas manufacturing sites, five are at risk of flooding. We have calculated the flood risks for each based on methods advocated by the Ministry of Land, Infrastructure, Transport and Tourism, and concluded that in the instance of once-in-100-year floods under a 4°C warming scenario, the manufacturing base with the largest financial risks would suffer damage equating to 13 billion yen. Based on these financial risk assessments, we shall move forward by pursuing further improvements to assessment accuracy and exploring ways of strengthening specific flood prevention measures.

Initiatives

With a view to achieving its Medium-term Environmental Target of FY2030 GHG emissions being at least 46% lower than those of FY2019, and carbon neutrality by 2050, the Nippon Kayaku Group is advancing both energy- and resource-saving initiatives at each manufacturing site.

Material Flow Cost Accounting (MFCA)

MFCA is a method which allows firms to devise ways of continually lowering the environmental burden of their production activities by extracting and clarifying energy loss and material loss within the manufacturing process. Nippon Kayaku is also advancing the introduction of MFCA with a view to reducing environmental burdens and manufacturing costs through lowering amounts of waste produced and CO₂ emissions.

Our Fukuyama Plant, which serves as our manufacturing base for consumer inkjet printer dyes, introduced MFCA in the latter half of 2018. Based on MFCA results, and having verified the benefits in lab studies and on actual machines, the plant confirmed the benefits of recovering solvents from waste solvents via distillation, and switched to a flow whereby recovered solvent could be reused in future production. The result saw reductions in both externally incinerated waste and amounts of solvent purchased, not only lowering the environmental burden but yielding significant cost benefits as well.

We have since expanded MFCA to our Tokyo and Asa Plants (2019), our Kashima Plant (2020), and our Joetsu Plant (2021), and completed our roll-out to all manufacturing bases by FY2023. We are now utilizing the MFCA method to press on with further reductions in environmental burdens and manufacturing costs, commencing introductions at select business sites while aiming for a phased roll-out to the group as a whole.



Distillation Recovery Facility

Solar Power Generation

As part of our switchover to low-emission power sources and low-emission-factor renewable energy sources, Nippon Kayaku has introduced solar panels with a view to significantly lowering GHG emissions.

March 2023 saw the advent of a Solar Power Purchasing Agreement (PPA) Model onsite service at our Fukuyama Plant. The PPA model involves Nippon Kayaku loaning land or roof space to third parties for the installation of solar panels, then purchasing the energy produced over the long term. It is hoped this allows us to not only utilize renewable energy sources but save on electricity costs too. The Fukuyama Plant alone seeks to cut GHG emissions by 731t-CO₂ through use of the solar energy generated onsite. We are now looking to roll this model out to other manufacturing bases, as well as install solar panels that are in our own possession.



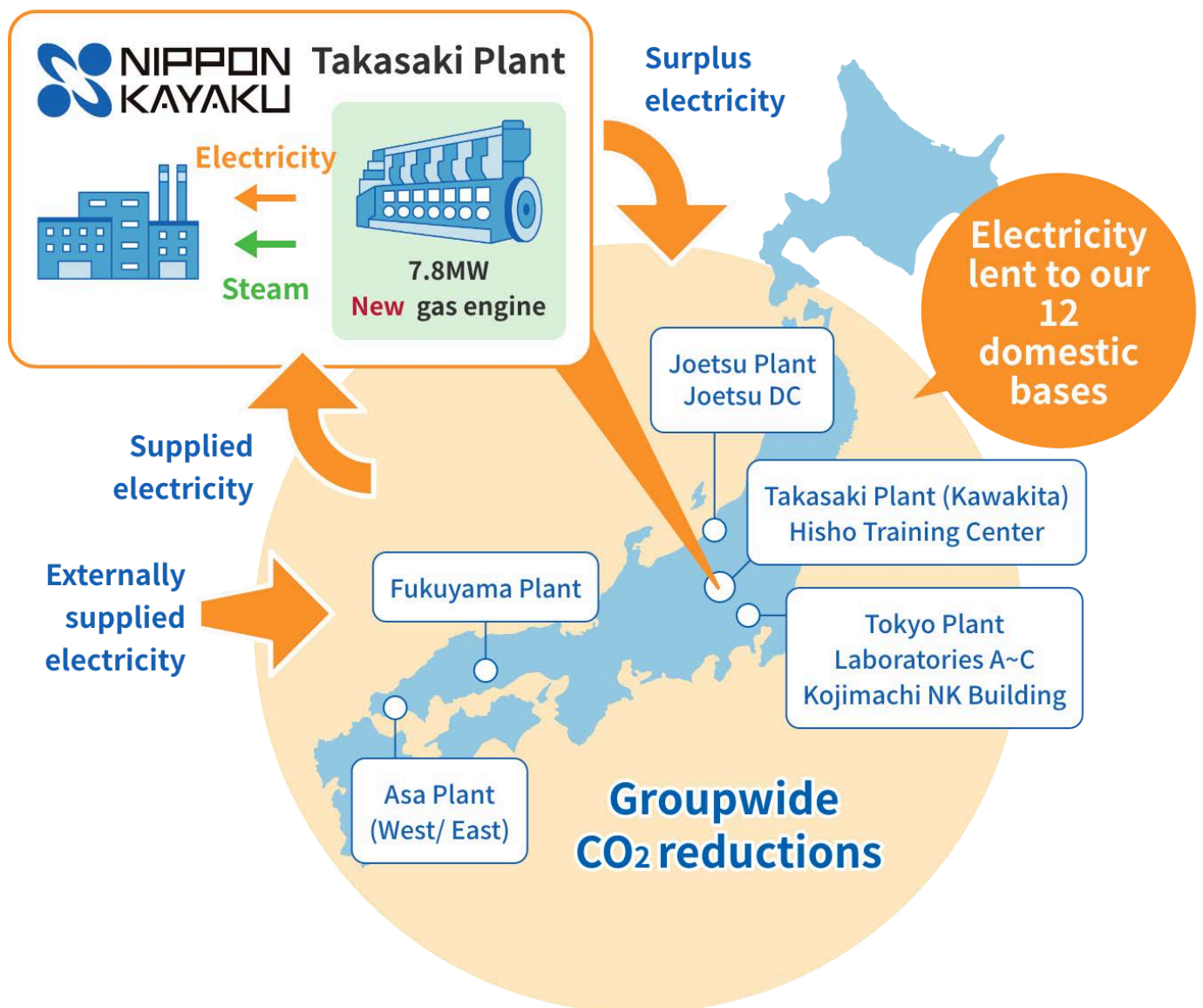
Amounts Contributed to GHG Emission Reductions

Indicators	Covering	Unit	2022	2023	2024	2025
MFCA	Non-Consolidated	t-CO ₂	60.2	40	77.7	136
Solar power	Non-Consolidated	t-CO ₂	-	658	683	2,395

Introduction of a Bundled Energy Network Service for Multiple Sites

April 2025 saw the Nippon Kayaku Group commence the first Bundled Energy Network System geared towards the fields of medicine and science at 12 of its domestic business sites. A new large-scale gas co-generation system was installed at our Takasaki Plant, not only supplying electricity and heat but also allowing for surplus energy to be lent to 12 business sites across Japan. This system generates enough power for around 17,000 homes^{*1}, and its capacity to lend electricity to other business sites has significantly decreased our Group's overall CO₂ emissions. Furthermore, its Blackout Start (BOS) function^{*2} allows for the continuation of electricity and heat supplies to the Takasaki Plant even in times of blackout, thereby contributing to increased business resilience. Overall, this initiative is set to deliver a 45% reduction in CO₂ emissions (compared with FY2023) across all 12 business sites combined, and 18% drop in energy used by the Takasaki Plant (compared with FY2021). The system, which makes use of gas supplied by the city, ensures that heat produced at the time of power generation can be effectively used, thereby ensuring no energy is wasted. As the Takasaki Plant makes use of significant amounts of heat at the time of production, the presence of an onsite power generation system ensures that no heat produced is wasted, and makes a large contribution towards achieving yet higher energy efficiency levels and the transition to carbon neutrality. Henceforth, the Nippon Kayaku Group will continue to pursue CO₂ emission reductions and, through delivering products which contribute to the realization of a decarbonized society, aim for decarbonization across the entire value chain.

Electricity supplies even in blackouts: Strengthened BCP





Exterior View of the newly-installed Gas Co-generation System



Takasaki Plant

*1 Calculated based on Ministry of Environment data from FY2022 which puts the amount of annual electricity consumed by the average household at 3950kWh Ministry of Environment

data:<https://www.env.go.jp/earth/ondanka/kateico2tokei/energy/detail/01/>

*2 When a blackout (of power systems) kicks in, the system staves off a power cut by generating its own power without the aid of any external power-source.

*3 Covers electricity and gas at the Takasaki Plant and other plants to which power has been lent; emission factors used reflect the adjustments of 2023. Reductions made due to the power system's low CO₂ menu and credits are also included.

Internal Carbon Evaluation

The establishment of our own medium-to-long term internal CO₂ evaluation allows us to not only promote CO₂ reductions across every business unit, but examine and prepare for the introduction of an internal system which encourages decarbonization investments and measures.

Responding to and Upholding Public Regulations

At all domestic and overseas business sites, Nippon Kayaku can be seen upholding and appropriately responding to laws, regulations and measures pertaining to climate change and reducing energy consumption. In Japan, for example, we follow both the Act on Promotion of Global Warming Countermeasures and the Act on Rationalizing Energy Use (the “Energy-Saving Law”). Listed as a specified business under the latter, Nippon Kayaku is thereby dutybound to pursue a 1% reduction in its energy consumption rate. Through setting annual targets at every business site and rolling out various energy-saving policies, we are currently delivering reduced rates of energy consumption. Under the Energy-Saving Law's evaluation system, which classes companies in terms of performance, we received an S-class evaluation (signifying targets achieved) for FY2025.

Involvement with Industrial Groups

Nippon Kayaku is a member of The Japan Chemical Industry Association (JCIA), on whose Audit Board our President serves. The JCIA is participating in The Japan Business Federation's Carbon Neutral Action Plan (formerly the Low-Carbon Society Implementation Plan), which Nippon Kayaku has approved and will itself join from 2030.

So that our company position on climate change policies is consistent with that of the industrial association, we join seminars held by the industry and by government departments such as the Ministry of Economy, Trade and Industry, the Ministry of the Environment, and the Ministry of Health, Labor and Welfare. This allows us to gather information, hold committee posts in each organization which enable us to join climate-change-related discussions, then share any information gleaned internally. We also assess whether our company's position aligns with the contents of a seminar. In instances where that is not the case, our Responsible Care & Technology Division will discuss, and our Environment, Safety and Quality Management Committee, chaired by our Technology Unit In-charge, will make the relevant adjustments. Through such a process can we align our own climate change strategies with industrial association activities.

CDP Disclosure (Climate Change)

Since 2020, the Nippon Kayaku Group has provided responses to the CDP, an information disclosure program for the climate-change-related risks faced by businesses. Our responses to the 2025 CDP saw our Climate Change Report graded A and our Water Security Report graded A-.

➤ [External Evaluations and Awards](#)

Management of Chemical Substances

Policy and Basic Approach

The Nippon Kayaku Group, in line with the GFC (Global Framework on Chemicals) international chemical substances management framework, is aiming to minimize the health effects on humans involved in the production and usage of chemical substances, and any negative environmental impacts. Living conveniently and abundantly while using chemical substances requires that we know the properties of each substance and manage them properly. The management and reduction of environmentally hazardous substances which give rise to concerns over human health and environmental impact is an especially important social responsibility for chemical manufacturers. As such, we are organizationally and systematically engaged in the reduction of hazardous chemical emissions through production process improvements and thorough value-chain-wide management of goods containing hazardous chemicals. Furthermore, to prevent industrial accidents caused while handling chemical substances, we are voluntarily advancing our oversight and safety management procedures through taking, for example, hazardous substance exposure prevention measures based on the strengthened risk management approaches of the revised Industrial Safety and Health Act.

Systems

Under our sustainable management system, Nippon Kayaku has set up an Environment, Safety, Quality Management Committee to promote groupwide Responsible Care activities.

> [Responsible Care Promotion System](#)

With respect to business activities, each business unit, under the direction of its relevant person in charge, draws up its own chemical substance management-related key issues and specific action plans in order to manage chemical substances appropriately.

Audit

With our Responsible Care and Technology Division at the core of the initiative, Nippon Kayaku conducts audits of chemical substance management at each business site and certain group companies. These audits not only serve to confirm management systems and operation status, but also compliance status with respect to laws pertaining to chemical substance manufacture, importing and sales. We conduct inspections of reporting status for new chemical substances and feed these into improvements in the management levels at each business site. Matters of concern extracted from such audits are met with correction and corrective action, as appropriate and follow-up checks as we strive for continual improvement.

> [Responsible Care Audits](#)

Initiatives

With a view to achieving zero accidents or disasters, Nippon Kayaku has set as one of its [annual Responsible Care Targets](#) the promotion of voluntary chemical substance management. To forestall the risks originating from chemical substances, we are mapping out upgrades to our risk assessment process and building a more detailed and effective evaluation system. We are also delivering boosts to site-level management systems and preparing systems which allow for every worker to voluntarily show awareness of, and properly manage, chemical substances. Such initiatives enable us to plan for early detection of latent risk factors and thorough appropriate measures as we aim to strengthen the platform for safe and sustainable business operations.

The flow from Chemical Substance Management to Product Development

◆ Fine Chemicals Business Unit

Under internal regulations do we confirm the presence of prohibited or restricted chemical substances within each process from product development through to manufacture, sale and change. We designate the chemical substances to be either managed or prohibited internally, and in cases of newly-used chemical substances, conduct relevant checks at the selection stage. Meanwhile, changes to raw material or manufacturing laws, expansions in use, reassessments of laws and standards, and the emergence of new scientific observations lead us to conduct our own appropriate use reevaluations. Furthermore, in order to prevent prohibited or managed chemical substances being unintentionally mixed in during the transition from raw material to product, we conduct investigations into our raw material suppliers. Based on these investigation results do we formulate appropriate management and measures in the quest for product and worker safety, and environmental conservation.

Development stage	Main evaluation contents
R&D	• Giving shape to product concepts based on customer needs and market surveys • Setting of targets for product quality and performance; evaluation of technical feasibility • Investigation and confirmation of related domestic and international laws and regulations, patents and environmental safety matters • The safety of raw materials used, possibilities for stable procurement, and initial cost evaluations
Exploration of mass production and production volumes	• Establishment of product specification verification and the manufacturing process • Confirmation of suitability through customer evaluations • Confirmation and risk assessment of raw material and product quality, cost, and productivity through exploration of mass production and production quantities • Confirmation and evaluation of risks across the supply chain from raw materials procurement to provision to customers
Launch to market	• Final confirmation of the final product specification and items agreed with customers • Confirmation of each preparation status for manufacturing, quality assurance, environmental safety and distribution • Final evaluation of definitive costs and profitability • Final confirmation of compatibility with related laws and regulations
Change control	• Quality and supply impact assessment of all changes across the product lifecycle (equipment, machinery, manufacturing method, raw materials, testing methods, product specification) • Planning, implementation and documented information on changes in line with the agreed process, including verification and validation, as applicable • Prior customer contact and approval when the situation demands

Risk Management

◆ Risk Management-based Anti-Exposure Measures

At Nippon Kayaku, when introducing new operations and equipment, or making changes to existing operations or equipment, we initially conduct a risk evaluation via safety inspection and construct safety policies around the ensuing results. We also evaluate the safety of each chemical manufacturing process and response equipment to analyze the causes of hazards. By way of measures to reduce risks in the manufacture and handling of chemical substances, and against the backdrop of the revised Industrial Safety and Health Act of 2016 which mandated risk assessments for workplaces either making or handling chemical substances, we have, through the conducting of safety inspections with respect to either new or altered operations that involve the handling of substances covered by the Act and other hazardous substances, constructed our own internal database on which to base our risk management and risk reduction measures. This database has been updated to include the expanded list of chemical substances subjected to risk management in the revised Industrial Health and Safety Act from 2024 onwards, enabling us to conduct risk management in line with the most current laws, promote it companywide, and centralize oversight. We have also put up GHS picture displays in each chemical-substance-handling workplace so that handlers can recognize the harmful effects of the substances to which they might be exposed.



We are raising awareness among workers of the harmful effects of the chemical substances to which they might be exposed.

Safety in Distribution

The Nippon Kayaku Group is engaged in initiatives to reduce environmental burdens connected to distribution and ensure safety during transportation. As the products we handle contain numerous hazardous materials, we forever place meticulous care on safety during transportation. We therefore carry out periodical drills on distribution accident scenarios, and are strengthening our management system for prevention of leakage and spillage of chemical substances. Our Agrochemicals Group, for example, with the aim of improving safe transportation of its chloropicrin soil fumigant, holds collective annual drills on Distribution Accident Emergency Response and Reporting at all three domestic chloropicrin manufacturers. The drills involve practical application of the chain of processes from the establishment of a Disaster Response HQ to transmission of information and requests for support. All participants join with a degree of healthy tension as we seek to prepare a speedy and precise response to real emergencies.

Reducing Chemicals of Concern

◆ Reducing Emissions of Chemicals of Concern during the Manufacturing Process

So as to reduce emissions of chemical substances that must be registered under Japan's Act on the Assessment of Releases of Specified Chemical Substances in the Environment and the Promotion of Management Improvement (PRTR Act), Nippon Kayaku is moving forward with the installation of exhaust gas treatment apparatus and the switching of raw materials. Our calculations for emission amounts of the chemical substances to be reported under the PRTR Act are as follows.

Indicators		Scope	Unit	2021	2022	2023	2024 ^{*2}	2025
PRTR substance emission amounts	Air	non-consolidated	tons	25.2	38.7	32.9	27.2	18.5
	Water regions	non-consolidated	tons	14.7	51.4	75.0	1.6	1.76
	Soil	non-consolidated	tons	0	0	0	0	0
	Total ^{*1}	non-consolidated	tons	39.9	90.1	107.9	28.8	20.3

*1 As figures have been rounded off, the totals in some columns do not exactly match the sum of each item above.

*2 Since FY2024, only PRTR substances have been published (FY2023 revisions to the law saw changes to the list of substances, with Japan Chemical Industry Association Survey substances excluded)

◆ Initiatives to Reduce, Replace and Eradicate Chemicals of Concern from Products

In order to appropriately respond to accelerating efforts to strengthen regulations across the globe, we are currently operating our own self-designed management structure based on the legislation and international standards relating to each business unit. By striving to reduce Chemicals of Concern in both raw materials and parts all the way from the product design stage, we are making every effort to minimize the risks to people and the environment.

Mobility & Imaging Business Unit

In its efforts to clarify the chemicals whose inclusion in products is banned, or whose presence should at least be grasped, our Safety Systems Group refers to the GADSL^{*} when seeking to strictly manage or reduce the use of Chemicals of Concern in the development, design, procurement, production and distribution phases of the product life cycle. The GADSL^{*} represents the industrial-standard Chemicals of Concern List for leading car makers, parts makers and chemical manufacturers in Japan, the US and Europe, with chemicals categorized as: "Prohibited," "Prohibited depending on use or declarable," and "Declarable based on usage exceeding a given threshold."

* Global Automotive Declarable Substance List

Fine Chemicals Business Unit

Our Fine Chemicals Business Unit defines as "environmentally hazardous substances" those that appear in "Company Regulations for the Management of Chemical Substances in Products" and the "List of Environmentally Hazardous Substances" as threats to the environment and human health, and whose presence in our own products must be carefully managed. Based on the above, we apply proper handling methods to chemicals contained in each business unit's products at every stage of the life cycle: design, development, purchasing, manufacturing, and shipping. The List of Environmentally Hazardous Substances is based on, and appropriately updated according to, domestic and international regulations such as REACH Annex XVII (Restricted Substances), REACH SVHC (Candidate List of Substances of Very High Concern), the RoHS Restricted Substances List, and Japan's "Chemical Substances Control Law: Class 1 Specified Chemicals". It proves of considerable help when gathering information on chemical substances present throughout our supply chain. This business unit, without exception, takes action to reduce, replace or eliminate Chemicals of Concern from its products as specified in Management of Chemical Substances in Products regulations.

Respecting Legislation and Presentation of Information

◆ Responses to Laws and the Various Standards

We comply with laws and regulations governing the assessment and manufacture of chemical substances in Japan and other countries and regions, including the EU, the United Kingdom, the United States, China, South Korea, and Taiwan.

◆ The Domestic and International Registration Laws, Regulations and Systems to which we Responded in FY2025

Country/Region	Chemical Substance Management Law / Regulation
Japan	CSCL (Chemical Substances Control Law) and ISHA (Industrial Safety and Health Act)
European Union (EU)	EU-REACH (Registration, Evaluation, Authorization and Restriction of Chemicals)
United Kingdom (UK)	UK-REACH (UK Registration, Evaluation, Authorization and Restriction of Chemicals)
United States	TSCA (Toxic Substances Control Act)
China	MEE Order No.12 (Measures for the Environmental Management Registration of New Chemical Substances)
South Korea	K-REACH (Act on the Registration and Evaluation of Chemicals)
Taiwan	TCCSCA (Toxic and Concerned Chemical Substances Control Act)
Philippines	RA6969 (Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990)
Australia	Industrial Chemicals Act 2019

* This table covers the Fine Chemicals Business Unit.

Additionally, international laws and regulations pertaining to chemical substances are increasingly moving away from the erstwhile focus on substance toxicity itself and towards a combination of toxicity and exposure amounts. Furthermore, whereas individual countries' chemical substance registration systems have previously tended to target new chemical substances, they now require appropriate evaluation and management of the toxicity and environmental impacts of existing chemical substances too. Presently, the EU's REACH Regulation,^{*1} the UK's UK-REACH Regulation, South Korea's K-Reach Chemical Assessment Law^{*2}, Taiwan's Toxic and Concerned Chemical Substances Control Act all require the registration of both new and existing chemical substances. They also necessitate the gathering and management of all necessary information pertaining to manufacturing and imported amounts, applications, use methods and the supply chain. So as to respond to these added complications and upgrades to chemical substance management, our Fine Chemicals Business Unit has set up a Chemical Substance Management Section in its Quality Assurance Division which: responds to domestic and international chemical substance registration systems; grasps the trends and movements in each country's chemical legislation and regulations, makes policy suggestions, and accordingly informs and instructs relevant managers; and both unifies and supports product SDS and label management.

*1 REACH Regulations: EU regulations on Registration, Evaluation, Authorization and Restriction of Chemicals

*2 Act on the Regulation of Manufacture and Evaluation of Chemical Substances: The law on chemical substance registration and evaluation

◆ Conveyance of Information on Product Hazards via SDS and Labels

Whilst the GHS^{*1} may serve as the international standard for chemical substance classifications and labeling, the systems and standards for Safety Data Sheets (SDS) and labels differ from country to country. In addition, so that hazard information can be clearly conveyed to handlers of chemical substances, the relevant information is required to be submitted in each relevant country's language.

Fine Chemicals Business Unit

Fine Chemicals Business Unit, through reliance on an abundance of translation skills, information pertaining to each country's laws and regulations, and its system for creating SDS with information on physical and hazardous properties, is responding to the demands for SDSs and labels which correspond to the latest laws and standards of each country. In response to ongoing revisions of Japan's Industrial Safety and Health Act and Japanese Industrial Standards, the EU's CLP regulations^{*2} and the USA's HCS^{*3}, we are working towards stable operation of a system which allows for SDSs and labels to be updated efficiently and accurately. So that everyone may use our products safely and securely, we supply all our customers and relevant individuals with SDSs specifying the chemicals used in every single product, and convey all key information along our supply chain. Furthermore, you may use our [enquiry form](#) to demand an SDS whenever you desire.

Life Science Business Unit

So that its customers can appropriately grasp information pertaining to toxicity of Nippon Kayaku products, our Agrobusiness Group has published an SDS [website](#)  as it prepares to make such information viewable and downloadable at all times. It has also developed its own Wrapping Specification Management Regulations so that all information displayed on individual product wrapping, labels and external wrapping conforms to relevant laws and is properly managed. It has furthermore strengthened its inspection and approval process for manufacturing and revisions, as well as implemented unified management via a database. The Group is therefore ensuring a system constantly capable of presenting the latest information, including on switchovers at times of revision and inventory management.

*1 GHS: Globally Harmonized System of Classification and Labelling of Chemicals

*2 CLP: European regulations for the Classification, Labelling and Packaging of Chemicals

*3 HCS: Hazard Communication Standard for the USA

Training

We provide education programs at every plant, and for each workforce layer, aimed at improving safety consciousness. We are currently enriching the education contents on chemical laws and regulations, including the so-called "Three SDS Laws": The Chemical Management Act, The Safety and Health Act, and the Poisonous Substances Act.

➤ [Work Safety & Health ; Health Management>Education and Training](#)

Industrial and International Initiatives

The Nippon Kayaku Group belongs to the Japan Chemical Industry Association and has signed up to Long-range Research Initiatives (LRI) since 1999. In addition to shouldering part of the research funding burden, we also sit on the committee.

The LRI proceeds under the umbrella of the Japanese, American and European chemical industries (The Japan Chemical Industry Association, The American Chemistry Council, and the European Chemistry Industry Council). A voluntary activity conducted by the International Council of Chemical Associations (ICCA), it focuses on increasing the accuracy of risk assessments for internal secretion and endocrine disrupting action, neurotoxicity, chemical carcinogenesis and immunotoxicity, and supports long-term research of the effects of chemical substances on the environment and people's health.

➤ [LRI](#) 

Preventing Pollution

Policy and Basic Approach

The Nippon Kayaku Group is working on preventing pollution and conserving the environment via its Declaration on the Environment, Health and Safety, and Quality. We recognize that increasing environmental value through reducing environmental burdens is a key issue for our Group. With respect to emissions released into the air, water and soil from industrial waste produced, we not only respect national and regional laws but manage such emissions in line with our own yet higher numerical targets. In such ways are we striving to decrease pollution and pollutants.

- > [Our Declaration on the Environment, Health, Safety and Quality](#)
- > [This Year's Nippon Kayaku Group Responsible Care Policy](#)

System

- > [Responsible Care Promotion System](#)

Audit

In order to confirm whether wastewater and waste are being appropriately managed at every business site and Group company, the Nippon Kayaku Group conducts audits in the form of Core Environment, Safety and Health Diagnostic Checks. These Checks allow us to confirm any problems or inadequacies regarding compliance with laws and regulations on wastewater and waste treatment, run our eye over wastewater treatment areas and waste disposal areas, and grasp any problems with the management situation.

- > [Responsible Care Audits](#)

Targets and Results

Indicator	FY2028 Target	FY2035 Target	Scope
VOC Emission Amounts Compared to FY2024	1% per-unit reduction	3% per-unit reduction	Consolidated

- > [FY2025 Sustainability Targets and Results](#)

Initiatives

Reducing VOC and Toxic Air Pollutant Emissions

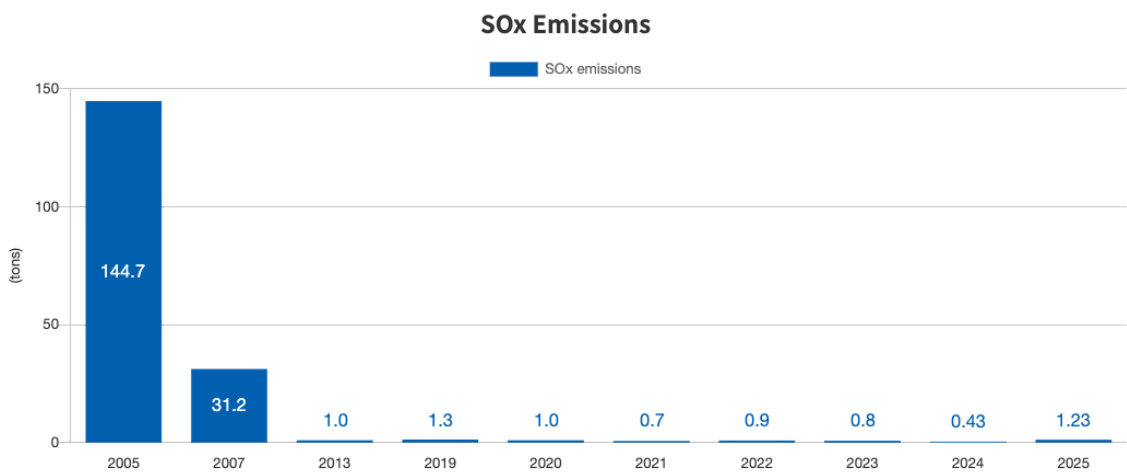
We are not only working to calculate and reduce emissions of VOCs listed in the Air Pollution Control Act, but of VOCs specified by the Japan Chemical Industry Association also. We are also engaged in reducing emissions of toxic air pollutants from 12 substances we have voluntarily agreed to control, including dichloromethane and formaldehyde. Key examples of initiatives we have taken are listed below.

- Exhaust gas processing equipment installed
- Gas absorption equipment installed
- Regenerative combustion equipment installed
- Working practice reform; review of possible substitutes for chemical substances used
- Leakage prevention measures

Reducing Sulfur Oxides (SOx), Nitrogen Oxides (NOx) and Particulate Matter

Below can be found a list of Nippon Kayaku measures taken thus far to keep emission levels of SOx, NOx and particulate matter below even the legal requirements.

- Switchover of combustibles from C-class heavy oil to A-class heavy oil, LPG and natural gas
- Introduction of low NOx boilers and small-sized once-through boilers
- NOx denitrification equipment installed
- Dust collectors installed



Wastewater Management

At every plant do we prepare treatment equipment to deal with manufacturing process wastewater depending on its composition, and hold ourselves to higher standards than those imposed by law and local authority regulations when keeping tabs on water pollution figures. FY2025 saw zero violations of domestic laws and regulations pertaining to wastewater treatment (such as the Water Pollution Control Act) and treatment and cleansing of waste (such as the Waste Management and Public Cleansing Act).

> [Numbers of Environmental Violations](#)

Reduction in Hazardous Substances

Based on Japan’s Waste Management and Public Cleansing Act, we have defined Specially Controlled Industrial Waste as “hazardous waste” and prepared an appropriate management system based on internal regulations. Under such strict management practices are we mapping out a thorough process of proper hazardous waste disposal. We are concurrently moving forward with efforts to reduce the overall presence of hazardous substances via thorough suppression of their initial production and waste sorting. Although amounts of waste produced overseas are limited at present, we have still identified hazardous waste in line with the Basel Convention and each relevant country’s laws, and are managing appropriately.

Education and Training

◆ Head Office

Wastewater Treatment Fundamentals Seminar

With our Technology and Responsible Care Division at the core of the initiative, February 2026 saw us aim to improve understanding of wastewater treatment in general. To this end, we held a seminar for all responsible persons connected with wastewater treatment for each domestic business site's manufacturing line, facilities, technologies and environmental safety. Meeting the standards laid down in the Water Pollution Control Act when releasing factory wastewater into public water areas, and the sewage discharge standards of the Sewerage Act when releasing such wastewater into sewage systems, requires appropriate pre-processing. In our case, the items produced and substances handled differ from site to site, making for diverse wastewater conditions, and necessitating site-appropriate selection of processes which can be stably operated daily. The seminar therefore went over the basics of coagulation treatment and biotreatment; drug infusion amounts; the relationship between treated wastewater quality and pollution amounts produced; operation and management indicators for the active sludge method; responses to load fluctuations and problems such as bulking; and case studies connected to energy-saving and cost-reduction. We will now move forward with continual training for deepening relevant understanding as we work towards thorough compliance and stable operations.

Related Data

➤ [ESG Aggregated Data\(Industrial Waste and Pollutants\)](#)

Effective Use of Resources

Policy and Basic Approach

With its aim of contributing towards a sustainable society through efficient use of limited resources, the Nippon Kayaku Group conducts initiatives mindful of global sustainability across the entire product lifecycle, from the R&D and manufacturing phases to sales and recycling. In addition, waste amounts, recycling rates and zero-emission rates have been fixed as key targets of our Sustainability Action Plan as we move ahead with advances in both waste reduction and efficient resource use.

- [Our Declaration on the Environment, Health, Safety and Quality](#)
- [Nippon Kayaku Group Responsible Care Policy](#)

System

- [Responsible Care Promotion System](#)

Audit

In order to confirm whether wastewater and waste are being appropriately managed at every business site and Group company, the Nippon Kayaku Group conducts audits in the form of Core Environment, Safety and Health Diagnostic Checks. These Checks allow us to confirm any problems or inadequacies regarding compliance with laws and regulations on wastewater and waste treatment, run our eye over wastewater treatment areas and waste disposal areas, and grasp any problems with the management situation.

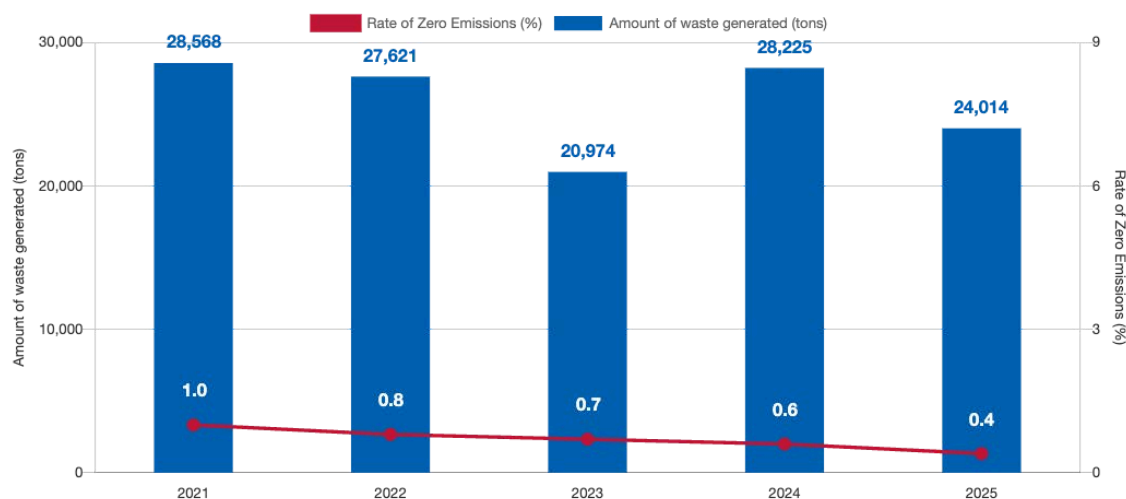
- [Responsible Care Audits](#)

Targets and Results

Indicator	FY2028 Target	FY2035 Target	Scope
Recycling Rate	82% or higher	85% or higher	Non-consolidated
Zero-emissions Rate	0.8% or less	0.6% or less	Non-consolidated
Waste generation *Compared to FY2024	1% per-unit reduction	3% per-unit reduction	Consolidated

- [FY2025 Sustainability Targets and Results](#)

Trends in Waste Generation Amounts and Zero-emission Rates (non-consolidated)

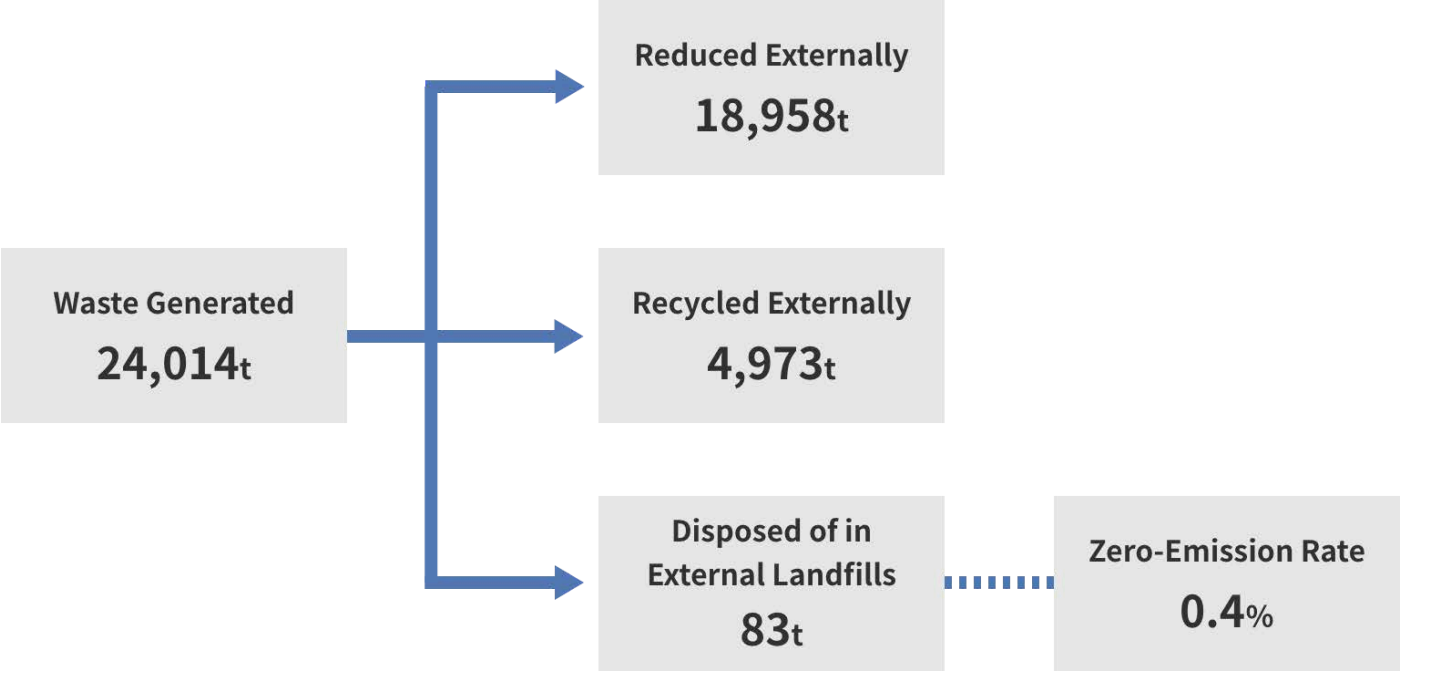


Initiatives

Waste reduction

In order to advance efficient resource use are we engaged in initiatives to hold down waste production at every business site. Through treating generated waste thoroughly and appropriately under our waste management system based on internal regulations, upgrades to waste sorting, and promotion of recycling, are we pressing ahead with resource circulation.

FY2025 Waste Generation and Treatment Flow (Japan)



◆ Responding to the Law on Plastic Resource Recycling

Amid the ever-changing, ever-stricter environment around plastics did Japan introduce a Law related to the Promotion of Recycling of Plastic-related Materials (Law on Plastic Resource Recycling) in April 2022. Under this Law, Nippon Kayaku can be defined as a “heavy waste producer”. Hence, in order to contribute to a sustainable society, we are mindful of the 3Rs (Reduce, Reuse and Recycle) as we drive forward efforts to systematically fix plastic waste targets and reduce the volumes produced.

Plastic Waste Emission Amounts

Indicators	Scope	Unit	2021	2022	2023	2024	2025
Plastic waste emissions	Non-Consolidated	tons	888	885	788	780	770
	Group companies	tons	277	326	326	294	319
	Total	tons	1,593	1,602	1,375	1,074	1,019
Recycling rate	Non-Consolidated	%	80.8	81.8	91	95	98

◆ Business Unit Initiatives

Mobility & Imaging Business Unit

Industrial Waste Management

Kayaku Safety Systems de Mexico (KSM) properly sorts its solid waste into wood, cardboard, nonferrous metals, aluminums and plastics, and is constantly on the lookout for external suppliers who can reuse these materials. The materials are stored in a fixed place for 2 to 3 months before being collected by government-certified suppliers.

The recyclable elements of industrial waste are delivered to various recycling companies so that wood being can be repurposed for wooden pallets, cardboard is also reused, and new materials can be generated from plastic, aluminum and steel.

The end of 2021 brought waste management improvements. Prior to that, we had no proper sorting system, meaning that waste was sent for treatment while containing resources that could yet be effectively used. We have now rectified that by fixing reuse and waste standards for each type of waste, and sorting in line with those standards. This has made sorting decisions easier for workers, thereby increasing efficiency, accuracy, and recyclable amounts of metals, wood and plastic. We have also boosted reusable materials by reassessing plastics formerly designated as waste. Our higher recycling amounts have also produced the secondary benefits of less municipal waste and landfill disposal. Waste sorting not only takes place on the shop floor, but also in such areas as the employee break room, where general waste is sorted.



Recycling amounts

Category		Scope	Unit	2021	2022	2023	2024	2025
Metals		KSM	tons	1	3	9	9.7	24.7
Plastics		KSM	tons	50	73	77	48.1	60.8
Lumber		KSM	tons	10	4	9	10.5	31
Cardboard		KSM	tons	24	23.3	26	36.5	36.4
Municipal waste		KSM	tons	160	165	112	114.4	97.9
Packing material	Trays	KSM	pieces	-	-	-	5,975	26,970
	Polystyrene	KSM	tons	-	-	-	0.3	1.3
	Saving	KSM	JPY 10,000	-	-	-	86.5	390.6

Fine Chemicals Business Unit

Pursuing Zero Emissions through Effective Use of Waste

In addition to cutting volumes of waste produced, Nippon Kayaku promotes exploring the reuse of waste as a future resource. Of the many types of waste generated by the Fukuyama Plant, sludge produced during microbial water treatment comes in particularly large amounts. As the moisture component of sludge makes it difficult to treat, we formerly sent it to landfill after the proper management processes. As a result of our exploration of using this sludge as a resource that could help decrease environmental burdens, it is now being effectively used by one incineration firm as a heat-adjustable fuel (or so-called “reduced fuel”) and by another incineration firm which converts incinerated ash into materials for cement or roadbeds. The Fukuyama Plant is also looking at ways of utilizing other forms of industrial waste, and continues to achieve rates of 0% landfill and 100% recycling.

Going forward, the plant will strive to keep the proportion of industrial waste sent to landfill (the Zero-emissions Rate) at 1% or lower, and maintain recycling rates of 99% or above.

Life Science Business Unit

Pharmaceutical Product Initiatives

Our environmentally-friendly packaging initiatives see us respect domestic and overseas legislation and regulations related to the environment, envisage the risks associated with product development, manufacturing processes and business activities, and advance efforts to reduce environmental burdens, prevent pollution, save energy, mitigate climate change, conserve resources, and reduce waste.

Our pharmaceutical packaging has been certified by the Forest Stewardship Council (FSC) and has acquired an FSC license. We are sequentially switching over our pharmaceuticals packaging boxes, patient brochures and shipping boxes to FSC certified paper, as well as widening the use of eco-friendly (non-VOC) inks. As of May 2026, of our 64 products with 117 items, 36 products with 63 items (56%) of packaging material and 51 of 117 leaflet materials (44%) have been switched over to environmentally-friendlier alternatives. Furthermore, a new initiative, so far rolled out to 11 of 23 product items, has seen us promote a switchover from cup-shaped to pedestal-shaped protective wrapping. We shall henceforth continue with efforts to reduce both plastic use and CO₂ emissions.

Related Data

> [ESG Aggregated Data\(Industrial Waste and Pollutants\)](#)

Water Resource Conservation

Policy and Basic Approach

Water resources are key resources in limited supply, making their sustainable use and conservation an international issue. For the Nippon Kayaku Group, water is not only recognized as an irreplaceable support for our business activities, not least in the manufacture of chemical products, but also as a vital resource to be shared with local communities and ecosystems. With our business now expanded to 12 countries and regions, our Group considers water resource conditions and regional characteristics at each of its sites and works towards both efficient water use and appropriate water management. We are therefore engaged in water use reduction, promotion of recycling, and thorough water quality management so as to lessen environmental burdens and help conserve water resources. We are also preparing systems capable of appropriately responding to physical risks stemming from the effects of drought, flooding and water pollution, as well as external environmental risks, such as tightened water regulations and water price fluctuations, perceived to possibly impact our business. Moving forward, while seeking compatibility between business activities and water resource sustainability, we shall contribute to solving the water issues of society at large.

System

➤ [Responsible Care Promotion System](#)

Initiatives

Grasping Locations of Water-stressed Regions

The Nippon Kayaku Group has grasped the risks related to water resource use. In pursuit of more efficient responses, we have made use of the World Resources Institute (WRI)-developed “Aquaduct” water risk assessment tool to investigate water stress conditions for each region hosting a Group factory. For Kayaku Safety Systems (Huzhou) Co., Ltd., where the water stress level has been deemed “High to Medium” and thus comparatively high, we have fixed a plan for periodical Environment, Health and Safety Audits as we continue to confirm the implementation of appropriate water resource management. Moving forward, we will roll out such confirmatory checks to all other factories in high water-stress regions, and press on with the fixing of plans to reduce future water quantities used.

Water-stress Investigation Results for Nippon Kayaku Group Manufacturing and R&D sites (FY2025)*1

Region / Country Name		Unit	Water amounts used at each water stress				
			High	Medium-high	Medium	Low-medium	Low
Asia	Japan	thousand m ³ (Number of sites)	0	1,451 (2)	20 (3)	8,257 (5)	0
	China	thousand m ³ (Number of sites)	20 (1)	436 (3)	0	0	0
	Malaysia	thousand m ³ (Number of sites)	0	0	0	0	24 (1)
Europe	Czech Republic	thousand m ³ (Number of sites)	0	20 (1)	0	0	0
	Netherlands	thousand m ³ (Number of sites)	0	0	0	0	3 (1)
	United Kingdom	thousand m ³ (Number of sites)	1 (1)	0	0	0	0
North and Central America	United States	thousand m ³ (Number of sites)	65 (1)	0	0	2 (1)	0
	Mexico	thousand m ³ (Number of sites)	8 (1)	0	0	0	0
Total*2		thousand m ³ (Number of sites)	94 (4)	1,907 (6)	20 (3)	8,259 (6)	27 (2)

*1 We are currently using the Aqueduct Water Risk Atlas to investigate these points.

*2 As figures have been rounded off, the totals in some columns do not exactly match the sum of each item above.

Water Management Plan and Reductions

For the Nippon Kayaku Group, water is a key management resource which supports our product manufacturing process. We therefore observe it from the dual compatible standpoints of efficient water resource use and reducing environmental burdens, and are moving forward with relevant initiatives at every business site, including: grasping and monitoring amounts of water used, promoting process improvements and recycling; and thorough wastewater management. Since FY2024, we have also implemented the LEAP analysis based on the thoughts of the Taskforce on Nature-related Financial Disclosures (TNFD) to view water resources from the standpoints of dependency and effect, and identify Materiality Regions as management priorities. We shall therefore move forward with a focus on business sites in high water-stress regions, and upgrade our water resource management through fixing specific targets for water use reductions and efficiency, and better continuous monitoring. Such initiatives will take us towards achieving compatibility between delivering sustainable water resource use and stable business growth.

◆ Business Unit Initiatives

Fukuyama Plant

Initiatives Aimed at Reducing Water Use

At the Fukuyama Plant, wastewater emanating from the dye production process is treated onsite, then released into the Seto Inland Sea. The plant has been producing inkjet printer dyes since the year 2000, and has consequently invested effort into improving wastewater treatment methods, looking into individual processes tailored to production type and examining numerous ways of altering production processes to lower environmental burdens. The fruits of such activities can be seen in the form of phased reductions in contracted industrial water amounts, which fell from 24,000m³ to 23,000m³ per day in FY2015, and to 22,000 m³ per day in FY2018. Thanks to further polishing of its wastewater treatment methods, the plant is now able to produce more on the same amounts of industrial water. It is also working on reducing the amounts of regular water used both production and equipment cleaning.

Kayaku Safety Systems Europe

Introduction of Rainwater-utilizing Equipment

As part of its capital investment activities to promote environmental conservation, Kayaku Safety Systems Europe (KSE) introduced a water storage tank system in 2017 so that rainwater may be used more efficiently. It has installed the equivalent of 750.5 m³ tank. By using both rainwater and the water released by the shop floor air conditioning system for purposes other than drinking, the plant has not only achieved more efficient use of water resources but also lowered its costs. Water reuse is currently of pivotal importance to the Czech Republic, which has seen rainfall decrease under the impact of climate change. The amount of water that KSE has stored up post-FY2020 exceeds the annual drinking amounts of all KSE employees and their families (around 4000 people). This particular project therefore marks a contribution towards a sustainable society.



Indicators	Scope	Unit	2021	2022	2023	2024	2025
Volume of water store (planned)	KSE	m ³	5,040	5,040	5,040	5,040	5,040
Volume of water stored (actual)	KSE	m ³	7,234	6,802	7,786	7,043	6,830
Cost Savings	KSE	JPY 10,000	411	335	428	477	536

Kayaku Safety Systems Mexico

Initiatives Aimed at Reducing Water Use

As part of its commitment to environmental conservation, Kayaku Safety Systems Mexico (KSM) has embarked upon improving its use of water resources to help resolve issues concerning limited usable water in the surrounding region. KSM mainly uses water for cleaning equipment and containers, and for manufacturing processes.

Improvement activities have involved raising standards for the production process and water treatment, and providing education to make employees more water-resource conscious. KSM's activities throughout FY2024 resulted in a 44% (6870-liter) reduction in use of water resources.

Indicators	Scope	Unit	2022	2023	2024	2025
Water Use	KSM	m ³	15,762	12,792	8,892	7,866
Reduction in Water Use *	KSM	m ³	-	2,970	6,870	7,896
Water Use Reduction Rate *	KSM	%	-	19%	44%	50%
Cost Savings	KSM	JPY 10,000	-	63	146	167.9

* Compared with FY2022

CDP Disclosures (Water Security)

Since 2020, the Nippon Kayaku Group has provided responses to the CDP, an information-disclosure program concerning climate change risks to business. Our responses to the 2025 CDP gained us an A grade for our Climate Change Report and an A- grade for our Water Security Report.

➤ [Recognition and Awards](#)

Related Data

➤ [ESG Aggregated Data\(Water\)](#)

Natural Capital and Biodiversity

Policy and Basic Approach

Recent years have seen deteriorating ecosystem services due to loss of natural capital and biodiversity recognized, alongside climate change, as a key issue capable of severely impacting business operations. Against this backdrop did the Kunming-Montreal Global Biodiversity Framework, adopted at the 2022 UN Biodiversity Conference (COP15), include a list of international targets aimed at realizing the global vision of a world living in harmony with nature by 2050. Such a concept is endorsed by the Nippon Kayaku Group, which is using the framework provided by the Taskforce on Nature-related Financial Disclosures (TNFD) to identify and evaluate the dependencies and impacts of its business operations upon nature. We are also continuously analyzing and examining the risks and opportunities presented by the above. We will continue to aim for a sustainable society living in harmony with nature through sustainable raw material sourcing, more efficient use of water resources, and reduced consumption of chemical substances, thereby feeding in to natural capital conservation and improved resilience.

Information Disclosure based on TNFD Proposals

Governance

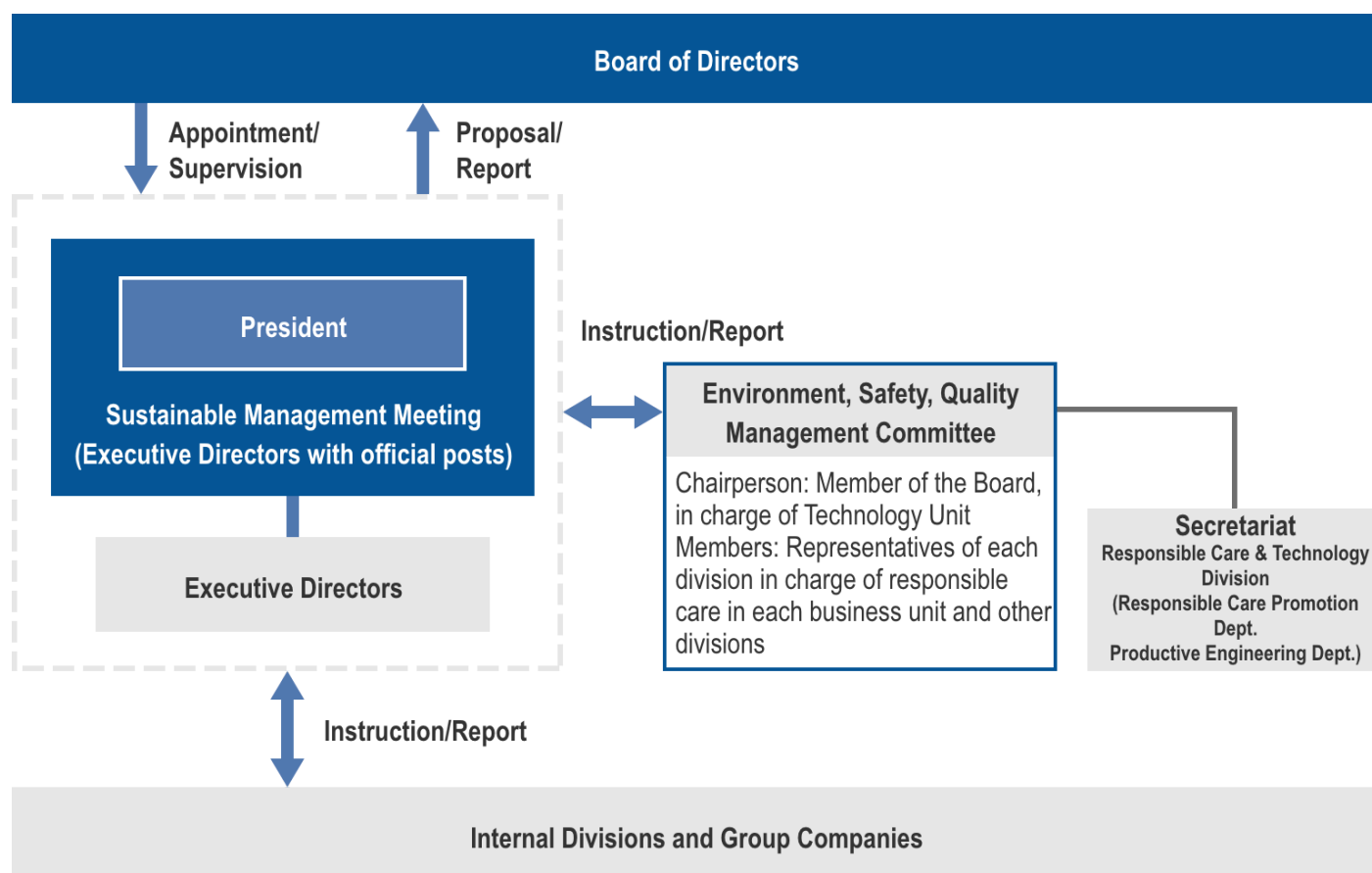
Regarding the environmental aspect of its key sustainability issues, the Nippon Kayaku Group positions the conservation of natural capital, in addition to climate change response, as a material issue. These issues are managed under the same governance, promotion, and monitoring framework as climate change response.

Our natural capital initiatives are discussed, and their status summarized and evaluated, during the business plan review conducted by our Sustainable Management Meeting, which is chaired by our President. The results of such reviews are then relayed to the Board of Directors, which performs a supervisory role. Yet deeper discussions on natural capital and biodiversity issues are held from a cross-cutting groupwide perspective by the Environment, Safety, Quality Management Committee, chaired by our Managing Director in charge of Technology and serving as an advisory body to the Sustainable Management Meeting.

When advancing natural capital initiatives, we place importance on links with stakeholders and showing consideration for the local communities in which our business sites are based. We are also, under the Nippon Kayaku Group Human Rights Policy and Policy on Responsible Mineral Procurement, conducting human rights assessments and Sustainable Procurement Surveys on our suppliers in order to reduce risks connected with environmental harm and human rights violations.

Step-by-step we are advancing our human rights system for all regional stakeholders involved in our business, including indigenous peoples, and looking to expand the scope of our human rights due diligence going forward.

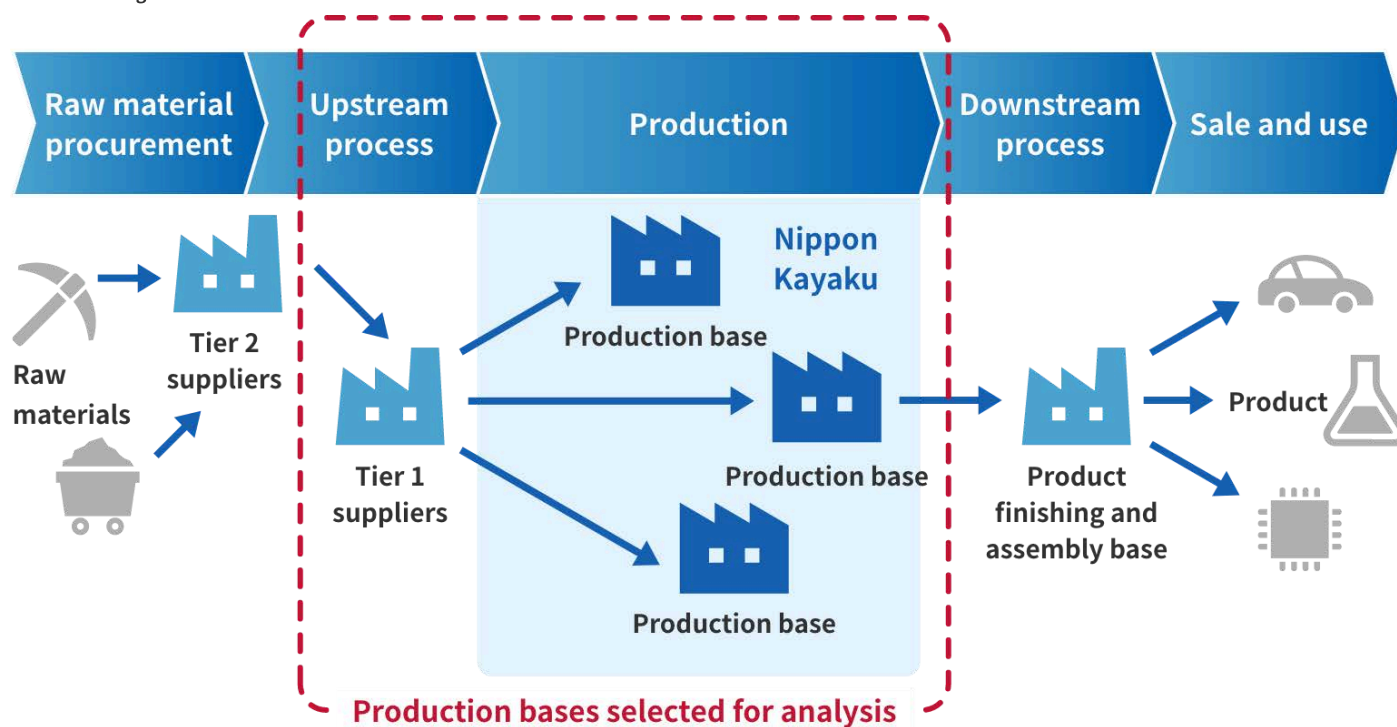
For details on our human rights due diligence, please see [here](#). For details on Sustainable Procurement, please see [here](#).



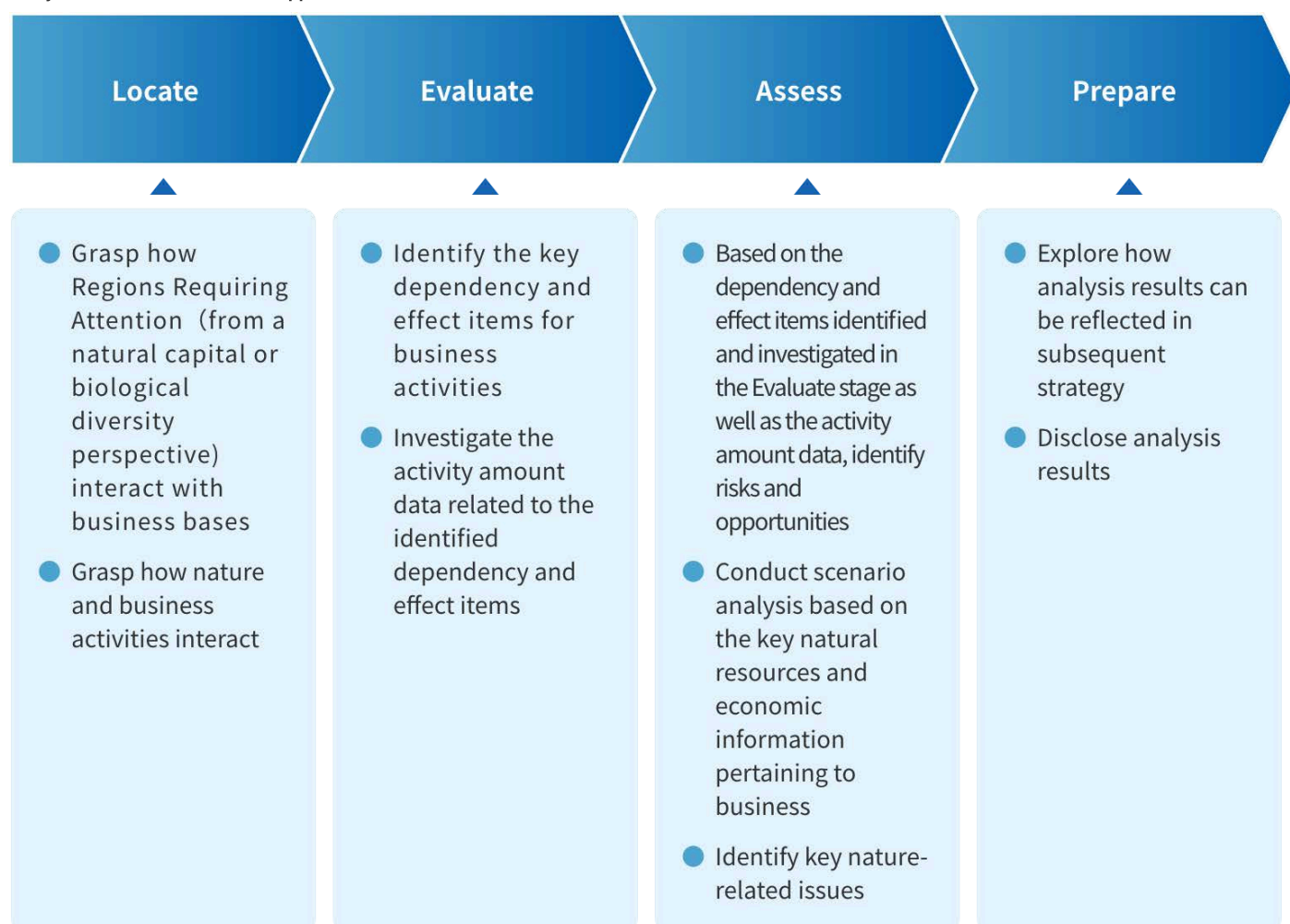
Strategies

In expanding several businesses onto a global scale, the Nippon Kayaku Group feels it essential to ascertain and evaluate the nature-related risks and opportunities facing each business unit. As such, we have utilized the LEAP approach recommended in the TNFD framework to implement our risk and opportunity assessments for natural capital and biodiversity. We have now completed such assessments for all our principal businesses via analysis of our three business units: Mobility & Imaging, Fine Chemicals and Life Science. Our analysis has covered both plants housing direct manufacturing operations and the sites of our main primary suppliers, thereby enabling us to identify risks and opportunities across the entire business process.

Schematic Diagram of the Main Value Chain



Analysis Flow based on the LEAP Approach



◆ Locate: Identification of Regions Requiring Attention

As our relationship with nature means that we greatly depend on the environments around our business bases, we studied these environments from three standpoints: “Key Biodiversity Areas,” “Highly-Sufficient Ecosystem Areas” and “High Water-Risk Areas.” Our research incorporates internationally popular tools such as the Integrated Biodiversity Assessment Tool (IBAT), Global Forest Watch, the GLOBIO Model, and Aqeduct.

List of Regions Posing Risks to Directly-operated Business Bases

Related Units	Business Base Name	Important regions for biological diversity	Regions with high ecosystem sufficiency	Regions with high physical risks
Mobility & Imaging Business Unit	Nippon Kayaku Co., Ltd. Safety Head Plant	Located in a Designated Conservation Area in which biological diversity takes on high importance	-	-
	Kayaku Safety Systems Europe a.s. (KSE)	-	-	-
	Kayaku Safety Systems (Huzhou) Co., Ltd. (KSH)	-	-	Located in a high water stress region
	Kayaku Safety Systems de Mexico, S.A. de C.V. (KSM)	-	-	Located in a high water stress region
	MOXTEK, INC.	-	-	Located in a high water stress region
	WUXI POLATECHNO OPTICS CO.,LTD. (WPLC)	-	-	Located in a high flood-risk region
	RaySpec Ltd.	-	-	Located in a high water stress region
Fine Chemicals Business Unit	Nippon Kayaku Co., Ltd. Asa Plant	-	-	Located in a high flood-risk region
	Nippon Kayaku Co., Ltd. Tokyo Plant	-	-	Located in a high flood-risk region
	KAYAKU CHEMICAL (WUXI) CO.,LTD. (KCW)	-	-	Located in a high flood-risk region
	WUXI ADVANCED KAYAKU CHEMICAL CO., LTD. (WAC)	-	-	Located in a high flood-risk region
Life Science Business Unit	Nippon Kayaku Co., Ltd. Takasaki Plant	Located in a Designated Conservation Area in which biological diversity takes on high importance	-	-
	NIPPON KAYAKU FOOD TECHNO CO.,LTD.	Located in a Designated Conservation Area in which biological diversity takes on high importance	-	-

Our research has revealed that some of our business sites are indeed located in conservation areas, including Key Biodiversity Areas, water stress areas, and flood hazard areas. While establishing a base of thorough compliance with legal standards at every business site, we also recognize the importance of boosting risk management and monitoring activities for the environment and ecosystems surrounding sites in Key Biodiversity Areas. We are also enhancing water resource management at sites in water stress regions, even though their water use is already minimal, and working towards enhanced measures for sites in flood hazard areas based on TCFD scenario analysis. We have also conducted a similar analysis of our 20 biggest suppliers by volume for the Safety Systems and Polatechno groups in our Mobility & Imaging Business Unit, our Fine Chemicals Business Unit, and the Agrochemicals and Pharmaceuticals groups in our Life Science Business Unit. Our audits have enabled us to press for improvements from suppliers in high-climate-risk regions, and promote natural environment considerations across the entire supply chain.

◆ Evaluate: Identification and Assessment of Dependencies and Impacts

For our assessment of how our Group's business activities depend and impact upon natural capital, we made use of ENCORE to construct a heat map of every step of the manufacturing process from the upstream stage. The analysis results can be found in the table below.

Direct Operations

Results of the ENCORE Dependency Item Assessment (Direct Operations)

( horizontal scrolling)

Activity				Dependencies														
				Service supplied		Adjustment and maintenance services												
Value chain	Business		Business Activity	Genetic resources	Water supply	Climate matters for the region as a whole	Rain pattern adjustments	Regional climate matters	Air purification	Soil and sediment preservation	Purification treatment for solid waste	Water purification	Water current adjustments	Flood controls	Storm relief	Noise Reduction	Others (Natural excesses)	Mitigation of Sensory Impact (e.g., Light Pollution)
Direct Operations	Mobility & Imaging Business Unit	Safety Systems Business	Automobile parts manufacturing	-	L	VL	VL	L	VL	M	L	M	M	M	M	VL	L	VL
		Polatechno Business	Manufacture of Optical and Precision Analytical Instruments	-	M	VL	VL	L	VL	L	L	M	M	M	M	VL	L	VL
	Fine Chemicals Business Unit	Functional Materials Business	Chemical manufacturing	-	M	VL	VL	L	VL	M	M	M	M	M	M	VL	L	VL
		Color Materials Business																
		Catalysts Business																
	Life Science Business Unit	Pharmaceuticals Business	Pharmaceutical and Medical Device Manufacturing	H	H	VL	-	L	VL	M	M	VH	H	M	M	VL	L	VL
		Agrochemicals Business	Agrochemical Manufacturing	-	H	VL	M	L	VL	M	M	M	H	M	M	VL	L	VL

Results for the ENCORE Impact Item Assessment (Direct Operations)

( horizontal scrolling)

Activity				Impacts							
				Inputs		Outputs					
Value Chain	Business		Business Activity	Land use	Water use	GHG emissions	Air pollutant emissions	Soil and water pollutant emissions	Nutrient Emissions to Soil and Water	Solid waste	Interference (noise pollution, light etc.)
Direct Operations	Mobility & Imaging Business Unit	Safety Systems Business	Automobile parts manufacturing	L	L	VL	L	M	-	L	M
		Polatechno Business	Manufacture of Optical and Precision Analytical Instruments	L	M	M	H	VH	-	M	M
	Fine Chemicals Business Unit	Functional Materials Business	Chemical manufacturing	L	M	M	M	VH	-	M	VH
		Color Materials Business									
		Catalysts Business									
	Life Science Business Unit	Agrochemicals Business	Agrochemical Manufacturing	L	M	M	M	VH	VH	M	VH
		Pharmaceuticals Business	Pharmaceutical and Medical Device Manufacturing	L	M	M	M	VH	M	M	VH

Our assessment results have reconfirmed the essentiality of water use to operations in all three business units, and our dependency on natural environment water supplies for securing core-operation water resources. Further environmental impacts were confirmed to a certain extent in the form of GHG emissions, environmental pollution (air, water and soil), solid waste emissions, and interference (noise, light pollution etc.). Our findings also indicate that reducing these impacts enables the natural environment's waste assimilation, water purification functions and buffering capacity to support our operations to a certain extent. We were also able to confirm a certain level of dependency on the base maintenance functions (soil and sediment preservation, water current control, flood control, storm mitigation) of the natural environments surrounding manufacturing sites, and how such functions help reduce the risk of natural disasters at these sites. We are also implementing a companywide system of measures and monitoring procedures to ensure that impacts and outputs of every business operation are not only quantitatively grasped but falling within the regulatory limits set by each region.

Upstream Value Chain

Results of the ENCORE Dependencies Item Assessment (Upstream)

(horizontal scrolling)

Activity			Dependencies																
			Service supplied		Adjustment and maintenance services														
Value Chain	Business Activity		Biological resource supply	Water supply	Climate matters for the region as a whole	Rain pattern adjustments	Regional climate matters	Air purification	Soil quality management	Soil and sediment preservation	Purification treatment for solid waste	Water purification	Water current adjustments	Flood controls	Storm relief	Noise reduction	Biological pest control	Others (Natural excesses)	Mitigation of Sensory Impacts (e.g., Light Pollution)
Upstream	Crude Oil and Natural Gas Resources	Crude Oil and Natural Gas Extraction	-	M	H	-	L	VL	-	L	L	VL	M	H	L	VL	-	M	L
		Refined Petroleum Products Manufacturing	-	L	VL	-	L	VL	-	M	L	H	M	M	M	VL	-	L	-
		Plastic Products Manufacturing	-	L	VL	VL	L	VL	-	L	L	M	M	M	M	VL	-	L	VL
	Mineral Resources	Ferrous and Non-Ferrous Metal Mining	VL	H	H	VH	L	VL	-	M	L	VH	H	H	M	VL	-	M	L
		Primary Iron and Steel, Precious Metals, and Non-Ferrous Metals Manufacturing	-	H	VL	M	L	M	-	L	L	M	H	M	M	VL	-	-	VL
		Other Fabricated Metal Products Manufacturing and Metal Processing Services	-	M	VL	-	L	-	-	L	M	M	M	M	M	VL	-	L	VL
	Timber Resources	Logging	VH	M	-	-	-	H	H	VH	M	-	M	M	L	VL	H	-	VL
		Paper and Paper Products Manufacturing	-	M	VL	M	L	VL	-	L	M	-	M	M	M	VL	VL	L	-

Results for the ENCORE Impact Item Assessment (Upstream)

(horizontal scrolling)

Activity			Impacts												
			Inputs						Outputs						
Value Chain	Business Activity		Land use	Freshwater area used	Seabed area used	Water use	Biological resource use	Abiotic resource use	GHG emissions	Air pollutant emissions	Soil and water pollutant emissions	Nutrient Emissions to Soil and Water	Solid waste	Interference (noise pollution, light etc.)	Introduction of Invasive Species
Upstream	Crude Oil and Natural Gas Resources	Crude Oil and Natural Gas Extraction	L	VH	VH	M	-	-	H	H	VH	-	M	VH	L
		Refined Petroleum Products Manufacturing	L	-	-	L	-	-	M	H	VH	-	M	VH	-
		Plastic Products Manufacturing	L	-	-	L	-	-	M	M	VH	-	M	M	-
	Mineral Resources	Ferrous and Non-Ferrous Metal Mining	M	VH	VH	M	-	H	M	H	VH	-	VH	VH	L
		Primary Iron and Steel, Precious Metals, and Non-Ferrous Metals Manufacturing	L	-	-	M	-	-	H	H	VH	M	M	VH	-
		Other Fabricated Metal Products Manufacturing and Metal Processing Services	L	-	-	M	-	-	L	L	VH	-	L	M	-
	Timber Resources	Logging	VH	M	-	M	VH	-	M	VH	M	-	L	H	M
		Paper and Paper Products Manufacturing	L	-	-	M	-	-	M	H	M	-	H	M	-

For the upstream process spanning raw material procurement to processing, we have confirmed the distinctive dependency-impact relationships for each individual material we handle (crude oil and natural gas, minerals, and wood). Throughout our analysis of the initial upstream phases of mining, drilling and lumbering, we found trends of deep dependency on natural environment aspects such as a stable climate and abundant water resources, and significant land use impacts on ecosystems and the natural environment. Moving from there to the manufacturing phase of refining and manufacturing, we found process trends common to all resources in the form of rising environmental impacts stemming from air, soil, water, noise and light pollution.

◆ Assessment: Identification and Evaluation of Risks and Opportunities

When examining nature-related risks and opportunities, in addition to the Regions Requiring Attention and dependency-impact relationships analyzed in the Locate and Evaluate phases, we considered the environmental data for each operation site and identified the following five areas as particularly critical dependency-impact items for Nippon Kayaku Group business operations.

Identified Material Topics	1. Water Resources (Withdrawal)
	2. Environmental Pollution (Air, Water, and Soil)
	3. Resource Circularity & Waste
	4. Local Environmental Disturbance (e.g., Noise and Light Pollution)
	5. Natural Physical Regulation Functions (e.g., Disaster Risk Reduction)

Using these priority areas as our starting point, we identified and evaluated the risks and opportunities brought by nature to our business, as well as the impacts of our business upon nature.

Nature-related Risk Inventory

Category	Related Priority Area	Key Risks in Business Activities	Impact on Nature	Risk Time Horizon	Relevance			Key Mitigation Measures
					Mobility & Imaging Business Unit	Fine Chemicals Business Unit	Life Science Business Unit	
Policy and Legal	2. Environmental Pollution	Increased costs of responding to strengthened emissions regulations for air, water and soil pollutant, and operational restrictions	Improved local environments through strengthened emissions regulations on air, water and soil pollutants	Medium to long-term	Medium	Medium	Medium	- Emissions status for every pollutant measured and disclosed - Combustion facilities renewed at high VOC-producing plants; emissions reductions confirmed - Waste water treatment equipment renewed - Zero emissions into soil of PRTR listed substances
		Tightened regulations for agrochemicals used by our customers lead to restrictions on ingredients and uses, resulting in the added costs of reassessing product designs and introducing alternative technologies		Medium to long-term	-	-	Medium	- Residual and biodegradability impacts are analyzed, and the relevant certifications are gained, at the sales stage - Appropriate use briefings are provided to customers
	3. Resource Circularity & Waste	Increased costs of responding to strengthened regulations on waste emissions	Fewer hazardous substances emitted through reduction of waste	Medium to long-term	Medium	Medium	Medium	- Tracking implemented in pursuit of newly-fixed 1% or less zero-emissions targets - Waste volume measurements per-sales-unit completed for high-waste-producing business sites
	4. Local Environmental Disturbance	Tightened regulations for noise, light and odor pollution, and agreements with local regions, lead to restrictions on operating hours and conditions, lowering efficiency and increasing adaptation costs	Reduced disturbance (noise and light pollution) of the surrounding environment	Medium to long-term	Low	Medium	Low	- Appropriate exhaust equipment is selected from a flowchart - Heat treatment of VOC emissions
Market	1. Water Resources 2. Environmental Pollution 3. Resource Circularity & Waste	Raw material price increases due to demand concentrating around low environmental impact materials	Loss of existing ecosystems due to excessive harvesting of biomass resources and human-driven land conversion	Medium to long-term	High	High	High	Engaging our suppliers with the aim of promoting sustainable procurement
Reputation and Liability	1. Water Resources 2. Environmental Pollution 3. Resource Circularity & Waste 4. Local Environmental Disturbance	Non-environmentally-friendly operations, including in raw material procurement, lead to worsening evaluations and reputational damage, causing customers to remove us from lists of suppliers and perhaps triggering litigation from local authorities	An improved environment through heightened importance of environmental considerations	Medium to long-term	Low	Low	Medium	- Zero use of restricted chemical substances inside Japan and in certain overseas countries - Taking steps to ensure zero procurement of raw materials containing chemical substances appearing in a survey based on Green Procurement Regulations
Acute Physical Risks	5. Natural Physical Regulation Functions	Suspended operations and repair costs incurred at certain business sites due to flooding of nearby rivers and landslides caused by typhoons and heavy rain etc.	Disruption of ecosystems in surrounding regions, including rivers; soil deterioration	Short to long-term	Low	Medium	Low	Quantification of financial impacts, and firming up of flood measures based on flood simulation results

Category	Related Priority Area	Key Risks in Business Activities	Impact on Nature	Risk Time Horizon	Relevance			Key Mitigation Measures
					Mobility & Imaging Business Unit	Fine Chemicals Business Unit	Life Science Business Unit	
Chronic Physical Risks	1. Water Resources	Operational restrictions or suspensions due to water shortages	Declining river flows and groundwater availability may disrupt riverine and surrounding ecosystems, resulting in biodiversity loss	Medium to long-term	Medium	Medium	Medium	• Strengthening of water-saving measures during the production process; examination of water reuse and recycling methods • Water intake efficiency with respect to sales ascertained through water intake measurements • Measures to reduce water use and introduce water storage tanks at water-stress-risk business bases have commenced

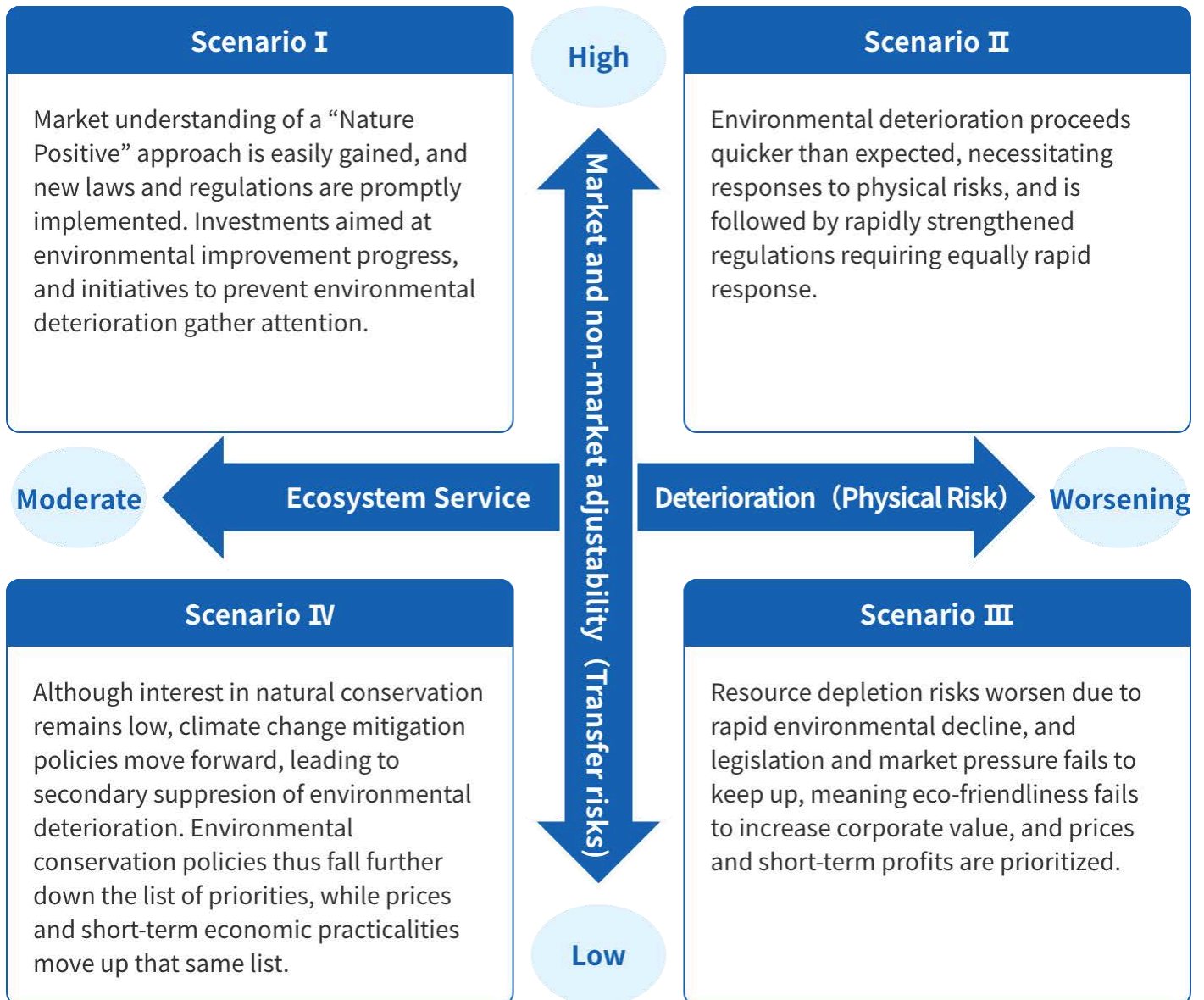
Nature-related Opportunity Inventory

Category	Related Priority Area	Key Opportunities in Business Activities	Impact on Nature	Opportunity Time Horizon	Relevance			Key Mitigation Measures
					Mobility & Imaging Business Unit	Fine Chemicals Business Unit	Life Science Business Unit	
Resource efficiency	1. Water Resources	Production cost savings due to more efficient use of water resources	Water resources in rivers and groundwater will be conserved, helping preserve riverine and surrounding ecosystems.	Short to long-term	Low	Medium	Low	• Water use reduction measures implemented at every plant • Specific targets under examination
	3. Resource Circularity & Waste	Cost savings due to waste recycling and reuse	Avoidance of hazardous substance emissions through sustainable resource use and waste management	Short to long-term	Low	Low	Low	• Measures for recovery of heavily-used solvents generally implemented • Investigating and exploring the merits of other solvent recoveries
Products, services and market	1. Water Resources 2. Environmental Pollution 3. Resource Circularity & Waste	Growing demand for products that contribute to reducing environmental impacts throughout their lifecycle, including manufacturing, use, and end-of-life stages	Improved environment due to reduced environmental impacts	Medium to long-term	High	High	Medium	• Looking at switching over from petroleum-derived to biomass-derived organic materials • Aiming for development of lighter products which use fewer resources and reduce environmental impacts at the point of use
	2. Environmental Pollution	Tightened agrochemical regulations and growing concerns about biodiversity conservation are increasing demand for low-toxicity agrochemicals and creating new business opportunities for environmentally friendly products.	The introduction of low-toxicity agrochemicals and alternative pest control techniques reduces impacts on ecosystems and water quality	Medium to long-term	-	-	Medium	• Development of agrochemicals with extremely low impact on pollinators leads to expanded sales opportunities
Reputation	All of 1-5	Increased corporate value from improved ESG evaluations and reputation due to natural conservation activities during the conduct of business	Improved environment due to promotion of eco-friendly activities	Medium to long-term	Medium	Medium	Medium	• Proactive disclosure of environmental information • Examination of environmentally-related goals

◆ Scenario Analysis

Identified risks and opportunities were considered in terms of the uncertainties and severities outlined in future scenarios based on TNFD guidance. Our analysis was fixed around two axes for Service Deterioration (Physical Risks) and Market and Non-market Adjustability (Transition Risks), and four scenarios.

Scenario Images



Based on these four scenarios, each business site's interactions with nature and environmental data, and the policy directions of regions and national governments, the strategies demanded of the Nippon Kayaku Group can be organized as follows.

Scenario I

Rapid responses to environmental regulations (via product development and process improvement) and promotion of a Nature Positive approach necessitates appropriate information disclosures. Although physical risks are limited, reducing environmental impacts continues to be important for preserving our reputation.

Scenario II

Previous water intake restrictions lead to prioritizing of drought measures and more efficient use of water resources. Tougher monitoring of environmental deterioration necessitates appropriate information disclosures to ensure transparency over external impacts.

Scenario III

Improved resilience in the face of physical risks, such as preparations for drought and more intense meteorological disasters (e.g. flooding), becomes paramount. Vis-a-vis a market which prioritizes short-term profit, we emphasize how such risk measures help stabilize business operations and reduce costs, and aim to create value through balancing risk measures with profit aspirations.

Scenario IV

Assuming that long-term trajectory leads to Scenario 2 or 3, long-term preparations take on added importance. Rapidly responding to heightened concerns over physical risks and environmental conservation requires the collation and disclosure of nature-related information, and advances in environmentally-friendly product development.

◆ Material Regions

Based on the above scenario analysis, the Nippon Kayaku Group is identifying its high-priority nature-related risks and opportunities by breaking down its analysis into five priority areas (water resources, environmental pollution, resource circularity, local environment disturbance, and natural physical regulation functions) and conducting multi-faceted risk evaluations in the following double-axis, five-phase format.

- Severity: Index-based evaluation of compliance and data obtention conditions, and the extent to which we are meeting the highest global standards for environmental management
- Likelihood: Standards-based evaluation of risks assessed with external tools, past responses to risks actually faced, natural capital quantities used and levels of dependency

Through combining the results of likelihood and severity evaluations, we have systematically arranged the potential levels of risk faced by each business site. Sites assessed as having a generally high exposure to risk have had their names and key fields placed in our Nippon Kayaku Group List of Material Regions, comprised as follows:

Material Regions for Directly-operated Business Bases

Related Business	Business Base Name	Material Area
Fine Chemicals Business Unit	Nippon Kayaku Fukuyama Plant	Water Resources
	WUXI ADVANCED KAYAKU CHEMICAL CO., LTD. (WAC)	

For each identified Material Region, we will henceforth promote environmentally-friendly initiatives and fix specific targets according to each area's risk characteristics (e.g. management situations for water stress, pollutants, and noise pollution).

(For the Nippon Kayaku Group's current initiatives on water resource use, please see [here](#)) .

◆ Upcoming Analysis

We will now advance our examination of companywide evaluation results and promote relevant responses. Concurrently, we will look to commence investigation and analysis of mining and drilling sites in the upstream value chain (raw materials and procurement phases), for which no detailed analysis currently exists. In future, we will seek to apply more pressure on suppliers in these matters as we aim to build a due diligence system that covers the entire supply chain.

Management of Risks and Impacts

The Nippon Kayaku Group has identified "Climate Change Response" and "Natural Capital Conservation" as key material issues and is actively working on these themes as integral components of its companywide Responsible Care activities.

(For more on how we identified our Key Sustainability Issues, please see [here](#)).

Our Responsible Care and Technology Division takes the lead in identifying and evaluating our dependencies and effects on natural capital, as well as nature-related risks and opportunities. It conducts investigations and analyses based on the TNFD-recommended LEAP approach, and uses the results to determine our Group's key priority issues. Priority issues are selected via the evaluation process stated above in the Identification of Material Regions strategy item.

The issues are organized along the lines of the LEAP approach and assessed against two criteria: seriousness and frequency. "Seriousness" is evaluated from the size of the figures in the relevant indexes for business sites facing the risks in question, "frequency" is evaluated from the number of bases related to each particular business, and the issues receiving the highest overall scores are selected for prioritization.

Selected issues are then reported to our Environment, Safety, Quality Management Committee which coordinates our responsible care activities. Such reports consist of current policy and status updates, issues, problematic points and response status updates, and form the basis for examination of policy drafts for the next financial year. Our Sustainable Management Meeting then discusses that financial year's policy further before making its final decision.

Based on the new fixed policy for the financial year, each business site and group company rolls out its responsible care activities which include natural-capital related initiatives, the status of which is confirmed and audited through periodical Central Environment, Safety and Health Inspections.

(For further information on our Responsible Care Policy and key issues, relevant systems and audits, please see [here](#)) .

Metrics and Targets

The Nippon Kayaku Group has designated Climate Change Response and Natural Capital Conservation as Materiality issues, and is currently setting relevant targets.

➤ [Environmental Management Targets and Results](#)

➤ [FY2025 Sustainability Targets and Results](#)

Among the indexes either recommended or requested for disclosure within the TNFD guidance, those most closely related to our initiatives are disclosed in our ESG aggregate data. (Please see [here](#) for the ESG aggregate data.)

Moving forward, we will press on with the releases of indexes not yet disclosed and, based on the results of such analyses as the LEAP approach, plan to determine targets centered upon the water-resource-related indexes deemed most important.

In such a way shall we strive to improve transparency around the environmental impacts of business activities, and aim to continuously reduce environmental impact on a groupwide scale.

Initiatives

Water-related Initiatives

➤ [Preventing Pollution](#)

➤ [Water Resource Conservation](#)

◆ Business Site Initiatives

Takasaki Plant

Plant operations in harmony with the natural environment

Following the disposal of the former Tokyo 2nd Army Arsenal Gunpowder Manufacturing Plant into company hands, the site of the current Takasaki Plant restarted operations in April 1946 as a manufacturer of black gunpowder, before subsequently switching to medical manufacturing operations in August 1971. From the off, the plant aimed for “coexistence with nature”, and ultimately secured ISO14001 certification in January 2001.

Surrounded by the natural environments of Gunma Prefectural Park Gunma-no-Mori and the Karasu River, the plant’s slogan reads: “The Takasaki Plant: Continuing to Protect Life and the Environment.” Based on this has the plant fixed its environment policy as: “Each and every person here shall be sufficiently conscious of working in an industry connected to human life, and, based on such consciousness, work towards promoting environmental conservation and plant harmony with the abundant natural environment.”

The plant occupies a vast site of some 560,000m², with the 110,000m² of green land reported under the Factory Location Act remaining virtually in a state of natural vegetation, meaning its original ecosystem remains intact amid this natural cluster of trees within the Takasaki urban landscape. The site’s eastern, southern and northern sides are enclosed by three rivers within the Tonegawa river system: the Class A Karasu River; the Ino River, a tributary; and the Class A Kasu River within the Hirose River tributary. The northern side also abuts Gunma Prefectural Park: Gunma no Mori, which is home to deer, racoon dogs and kingfishers. We will continue to protect this abundant natural environment and ecosystem.

In addition to the Green Zone, our on-premises environmental facilities include a creek. This is part of the facility which used hydropower to drive manufacturing equipment in the days when the site served as a gunpowder factory. The vertical axis water turbine used at the time has also been carefully stored and preserved. The creek temporarily pools the water subjected to activated sludge processing by the onsite wastewater treatment facility. Only after confirming that creek water quality complies with water management standards do we release it into the river, thereby taking every precaution to prevent environmental pollution. Located far away from residential areas within a natural cluster of trees, and close to various rivers, the creek represents a safe place for animals to come, and serves as an annual oasis for migratory birds seeking food from the forests and rivers. Observing the arrival or migratory birds and their northward departures makes for an interesting seasonal employee event.

