(Key Sustainability Issues) Reducing Energy Consumption and Greenhouse Gas Emissions

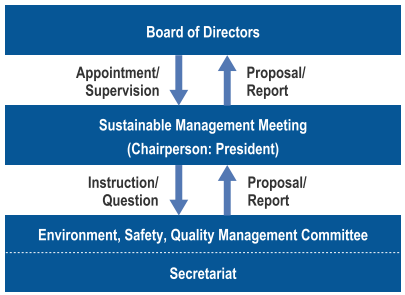
Policy and Basic Approach

Recent years have seen abnormal weather patterns across the globe, damage to the natural environment, and a sense of crisis towards climate change. Against this backdrop did the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP27) lead to accelerated efforts to decarbonize, while the Japanese government declared a green growth strategy based on the Paris Agreement to make the country carbon neutral by 2050. Endorsing this strategy, the Nippon Kayaku Group, in 2020, revised its FY2030 Medium-Term Environmental Targets from pursuing a 2°C warming scenario to a 1.5°C warming scenario. Looking further into the future, our Group has set as its ultimate goal the achievement of carbon neutrality by FY2050.
Our climate change responses have included energy-saving measures and production process optimization, the introduction of low-emission power sources such as solar panels, and the switchover to low-emission-factor renewable sources of electricity. Consequently, we will not only be able to devise ways of greatly reducing greenhouse gas emissions but deliver products geared towards a decarbonized society. We will also, through supplier engagement, aim for decarbonization across the entire value chain.

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

We are expanding multiple business operations on a global scale, with each business area bringing its own risks and opportunities. To identify the risks to business presented by climate change, we have, in line with TCFD proposals, assessed risks across the entire Group and examined opportunities in each business area. The time periods in which risks will manifest themselves are categorized as below.

	Period	Reason for adoption
Short-term	The 4-year period spanning FY2022 to FY2025	The same period as that covered by our **KAYAKU Vision 2025** (**KV25**) Medium-term Business Plan
Medium-term	Up to FY2030	To align with FY2030 Targets fixed in the Nippon Kayaku Group's Medium-term Environmental Targets
Long-term	Up to FY2050	To align with Japan's NDC (Nationally Determined Contribution) Target Year

◆ Climate-related Risks

Our 2°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 2°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	Moderate	• 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	• Factoring in flood risks when establishing new factories, considering site conditions, facility structure and layout
	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 automazation of high-temperature processes

Opportunities for each business field if moving towards a decarbonized economy in a 2°C target scenario

Business field	Business environment		Opportunity	Opportunities appearing	Financial impact*
Safety Systems	Tougher regulations for greenhouse gas emissions in every country and region	• Increased demand for yet further energy-saving properties in electrical goods • Sales of automotives 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	• Opportunities currently being explored within all our business activities	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

We have specified Reducing Energy Consumption and Greenhouse Gas Emissions as a Climate-related Key Sustainability Issue. (For more on the methods behind specifying such issues, please click here).
Our M-CFT Climate Change Response Team has come to play a core role under our governance system comprised of the Board of Directors, the Sustainable Management Meeting, and the Environment, Safety and Quality Management Committee. Established together with the launch of **KV25**, this team both specifies and assesses climate change risks, and implements specific plans to proactively promote energy-saving and green investments.

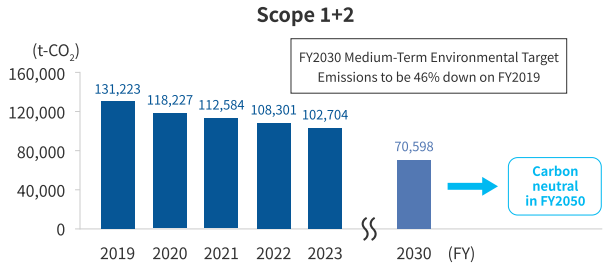
Metrics and Targets

As our original climate change risk indicator, we selected the target of shaving at least 32.5% off FY2019 Scope 1+2 greenhouse gas emission levels by FY2030. However, the April 2024 revision of our Medium-Term Environmental Objectives to a 1.5°C warming scenario saw us raise that FY2030 target to a 46% reduction on FY2019 levels. Achieving that goal requires aiming for a 4.2% reduction in emissions each year from FY2025 onwards. Reaching Scope 1+2 carbon neutrality by FY2050, meanwhile, involves conducting preliminary investigations on switching to green energy sources such as hydrogen and ammonia.
Moreover, in order to set future targets which also include Scope 3, we have implemented improvements to our Scope 3 calculation and aggregation method with a view to calculating the emissions (carbon footprint) of each individual product. Our aggregate calculations for Scope 1+2+3 from FY2022 onwards are currently undergoing third-party verification. We will therefore make concerted efforts to link up with suppliers and reduce the environmental burden across the entire supply chain to ensure Scope 3 reductions are delivered.

◆ Reducing Greenhouse Gas Emissions

The Paris Agreement adopted by COP21 in 2015 called for average global temperatures to rise no more than 2°C above pre-industrial levels, for efforts to be made to hold those rises down to 1.5°C, and for every country to pledge to reduce CO_2 emissions at national level. In line with this Agreement did the Nippon Kayaku Group initially gear its Medium-Term Environmental Objectives towards the 2°C scenario, then revise them in April 2024 towards the 1.5°C scenario. This has caused the entire Group to work on reducing greenhouse gas emissions in order to reach a target of “at least a 46% reduction on FY2019 levels of Scope 1+2 emissions by FY2030.” We are thus implementing energy-saving measures and optimizing our production processes, as well as working towards introducing low-emission power sources, such as solar panels, and switching over to low-emission-factor electricity from renewable energy sources. The trends in our Scope 1+2 indicators for Medium-Term Environmental Targets can be seen below, with year-on-year reductions evident.

Scope 1: Direct greenhouse gas 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 companies (the electricity we purchase, etc.)



◆ Disclosure of Scope 3 Data related to Total Supply Chain CO_2 Emissions

Recent years have seen marked movements towards grasping, managing and externally disclosing CO_2 emissions indirectly produced by companies across their entire supply chain. Nippon Kayaku has responded by adding Scope 3 supply chain CO_2-emission calculations to its previous aggregations and management of Scope 1 and Scope 2 data.

We began in FY2017 with Scope 3 calculations for Nippon Kayaku in non-consolidated form, but commenced factoring in domestic and overseas group companies from FY2019 onwards. In future do we plan to continue aggregating and managing Scope 3 data based on the Ministry of the Environment’s Basic Guidelines for the Calculation of Greenhouse Gas Emissions throughout the Supply Chain, and systematically advance initiatives to reduce total supply chain CO_2 emissions.

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.)

Category		Emissions (thousand ton-CO_2/year)				
		2019	2020	2021	2022	2023
1	Purchased products and services	243.6	237.3	294.5	275	241.8
2	Capital goods	42.7	42.9	26.8	29.6	33.4
3	Fuel- and energy-related activities not included in Scope 1 or 2	22.4	21.2	22.3	21	20.5
4	Transportation and distribution (upstream)	19.0	17.6	22.3	19.7	16.6
5	Waste generated in operations	26.5	28.8	31.8	16.2	10.8
6	Business travel	0.8	0.8	0.8	0.8	0.8
7	Employee commuting	2.5	2.4	2.4	2.4	2.4
8	Leased assets (upstream)	Included in Scope 1 or Scope 2				
9	Transportation and distribution (downstream)	1.0	1.0	1.6	1.5	1.2
10/11	Processing/usage of sold products	-	-	-	-	-
12	End-of-life treatment of sold products	15.4	23.2	26.4	23	17.6
13	Leased assets (downstream)	0.4	0.4	0.4	0.4	0.4
14/15	Franchise/investments	-	-	-	-	-
Total of Scope 3		**374.3**	**375.6**	**429.3**	**389.6**	**345.5**
Scope 1		36.2	35.3	37.5	35.5	30.2
Scope 2		94.7	82.5	74.7	72.6	72.5
Total of Scope 1+2+3		**505.2**	**493.4**	**541.5**	**497.7**	**448.7**

Calculation method: As a rule, the amount of CO_2 emitted is calculated based on the General Guidelines on Supply Chain GHG Emission Accounting issued by the Ministry of the Environment and the Ministry of Economy, Trade and Industry, and the emission coefficient listed by the IDEA Research Laboratory at the National Institute of Advanced Industrial Science and Technology’s Research Institute of Science for Safety and Sustainability.

› 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

In its drive to shave 46% off FY2019 levels of Scope 1+2 greenhouse gas emissions by FY2030 and achieve carbon neutrality by 2050, the Nippon Kayaku Group is promoting energy-saving and resource-conservation measures at each of its production sites. By way of further initiatives towards meeting these targets, we have introduced Material Flow Cost Accounting (hereafter: MFCA) and solar power generation.

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 CO_2 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 will continue to lower environmental burdens and manufacturing costs through use of MFCA processes, and aim to roll out MFCA across the entire Group.

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 greenhouse gas 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 greenhouse gas emissions by 731t-CO_2 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 Greenhouse Gas Emission Reductions

Indicators	Covering	Unit	2022	2023
MFCA	Non-Consolidated	t-CO_2	60.2	40
Solar power	Non-Consolidated	t-CO_2	-	658

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 FY2022.

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 Environmental Conservation Committee 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.