Holistic Environmental Management Information Disclosure Based on the TCFD and TNFD Recommendations, etc.

In this part (→P.13~P.31), we explain how the Kirin Group analyzes and assesses the impacts of climate change and issues related to natural capital and containers and packaging, and promotes transition strategies such as mitigation and adaptation, in order to appropriately and continuously create value. The Kirin Group recognizes the need for a holistic approach to important environmental material themes such as biological resources, water resources, containers and packaging, and climate change, and strives to provide a holistic explanation to the extent possible because there is a risk of trade-offs in resolving individual issues.

When preparing the information in this section, we have complied with the TCFD recommendations (June 2018), the new TCFD guidance (October 2021), and the TNFD recommendations v1.0 (September 2023). In addition, we have referred to the S1 and S2 standards published by the International Sustainability Standards Board (ISSB) in parts.

The general requirements of the TCFD, TNFD, and other frameworks are as follows.

		Content
Material information to be disclosed		●"Management issues for sustainable growth (Group Materiality Matrix (GMM)" identified in accordance with the "identification of materiality" ●Four material environmental themes identified in the GMM: "biological resources," "water resources," "containers and packaging," and "climate change" ●In climate change, the risks and opportunities that were subject to scenario analysis, and the results of the assessment of resilience ●In natural capital, material issues identified individually by the LEAP approach proposed by the TNFD
Scope of disclosure	Climate change	●The impact on and from the regions in which business sites are located and the upstream and downstream portions of the value chain for Kirin Brewery, Kirin Beverage, Mercian, Lion, Kyowa Kirin, Kyowa Hakko Bio, Koiwai Dairy Products, and all businesses for which we have set targets in accordance with SBT standards
	Natural capital	●The scope of disclosure and impact determined based on our analysis and assessment of risks and opportunities related to natural capital based on effects, dependencies, and impacts, and identification of material issues in accordance with v1.0 of the TNFD guidance, mainly for Kirin Brewery, Kirin Beverage, Mercian, Lion, Kyowa Kirin, Kyowa Hakko Bio, and Koiwai Dairy Products (however, since there are limited methods for obtaining direct information and there are still many issues related to the tools provided, the information we are able to disclose is limited)
	Containers and packaging	●Kirin Brewery, Kirin Beverage, Mercian, Lion, Kyowa Kirin, Kyowa Hakko Bio, and Koiwai Dairy Products ●Although not included in this disclosure, we intend to add information obtained through the "Kirin Supply Chain Environmental Program," which we launched in April 2024 to capture direct environmental data from suppliers, in due course
Location for related issues	Climate change	●Kirin sites emitting GHGs, upstream and downstream of the value chain ●Kirin sites, regions in the upstream and downstream of the value chain, transport routes, etc. affected by droughts, floods, natural disasters, and other events caused by climate change
	Natural capital	●Raw materials covered by the "Action Plan for the Sustainable Use of Biological Resources (→P.97)" and their suppliers ●Priority locations identified through risk and opportunity analysis assessments in accordance with TNFD guidance v1.0
	Containers and packaging	●All processes until the product is delivered to the customer ●Processes such as the collection and recycling of used containers, as well as sites where used containers are disposed of improperly and areas affected by that pollution
Holistic disclosure of other sustainability-related matters		●The Kirin Group's important material themes of biological resources, water resources, containers and packaging, and climate change are interrelated, and there is a risk of trade-offs in resolving individual issues. Accordingly, we have adopted a holistic approach that aims to resolve issues in a holistic manner ●In the same report, we disclosed information in accordance with the individual disclosure guidance of the TCFD and TNFD, including matters concerning interrelatedness and trade-offs
Target period		●Periods when risk materializes: we have generally defined the short term as from the present to 2024 (the period of the Medium-Term Business Plan), the medium term as from 2025 to 2030 (the period of KV2027 and the SDGs target period), and the long term as 2031 to 2050 (the target year for the Kirin Group's Environmental Vision 2050) ●These time horizons are not necessarily consistent with the sources of information used for risk assessment or scenario analysis. In such cases, we have used the time horizons set for those specific references
Engagement		●The Kirin Group refers to regulations covering indigenous peoples and local community stakeholders, such as the FSC and Rainforest Alliance certifications. ●For regions where we can adopt a landscape approach, we have not simply analyzed and assessed disclosure data that we have obtained, but have also actually visited the regions and engaged with people from the local community.

Governance

Supervisory structure

In the Kirin Group, the Board of Directors deliberates and resolves on basic policies for CSV, including environment-related issues, medium- and long-term strategies, annual plans, and important non-financial targets and KPIs, including environmental targets. The board also monitors the execution of the Group's environmental operations and important risks, including climate change, natural capital, and the circular economy, on a quarterly basis through monitoring the progress of non-financial targets.

Executive structure

In the Kirin Group, the Group Executive Committee deliberates and makes resolutions concerning the setting and revision of important targets, as well as investment plans, related to climate and environmental issues as a whole, such as natural capital and the circular economy. The Group Executive Committee receives reports from operating companies and divisions on the status of achievement of targets and risks, and supervises these operating companies and divisions. The senior executive officer in charge of CSV strategy oversees environmental issues such as climate change, natural capital, and a circular economy.

The Kirin Group has established the Group CSV Committee (meets three times a year). The committee is an advisory body to the CEO and COO that discusses environmental and other CSV issues across the Kirin Group. The committee is co-chaired by the CEO and COO of Kirin Holdings, with its members being the CEOs of major Kirin Group companies and senior executive officers of Kirin Holdings. With the participation of outside experts from a multi-stakeholder perspective, as necessary, this committee engages in in-depth discussions on matters such as current and future sustainability issues, the degree of dependence, and the degree of impact, as well as risks and opportunities associated with these issues. The committee then reports its decisions to the Board.

The Kirin Group has established the Group Environmental Meeting (meets twice a year) under the Group CSV Committee. This meeting has the officer in charge of CSV strategy as the chair and the relevant senior executive officers and department heads as members. The meeting mainly monitors progress related to roadmaps set for climate change issues and environmental issues such as natural capital and the circular economy, as well as exchanging opinions on related policies, strategies, and plans. At meetings of the Group CSV Committee and the Board, there are agenda items and reports concerning the results of deliberations by the Group Environmental Meeting, as necessary.

Through the establishment and operation of the Group Environmental Meeting, we have strengthened our initiatives targeting sustainability-related issues, as required by Japan's Corporate Governance Code following revisions in 2021. Environmental management, including responding to climate change, is part of our CSV management system.

The Kirin Group has established the Group Risk and Compliance Committee (meets twice a year and as necessary). This committee consists of executive officers from Kirin Holdings, and makes resolutions concerning Group-wide risk management policies and the identification of important risks, and reports the results to the Board of Directors as necessary. This committee also controls environmental risk management activities.

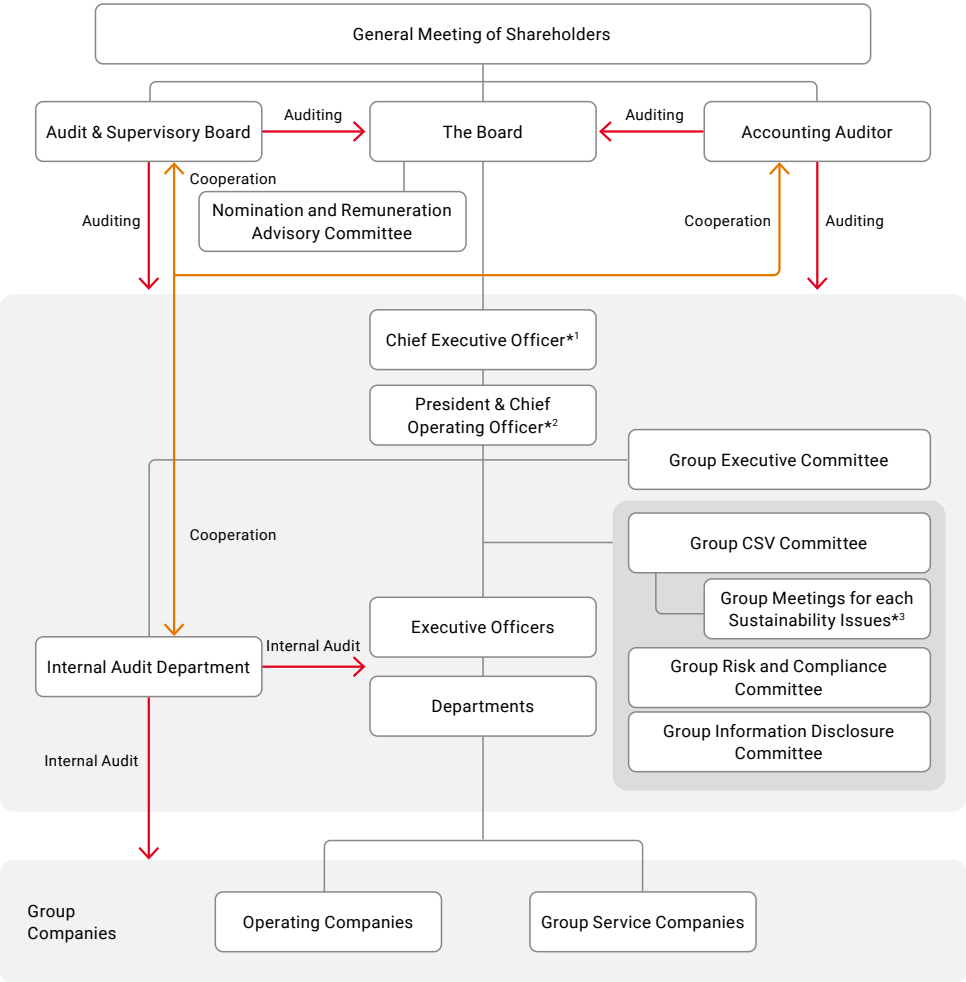
Starting from the 2022 Medium-Term Business Plan, performance-linked remuneration for senior executive officers reflects the target achievement rate for non-financial indicators, as an incentive to promote the medium- to long-term business plan. With regard to climate change, we have set a mid-term target of a "23% reduction in GHG emissions by 2024" to achieve our "SBT for 1.5°C" target. Additionally, in relation to both climate change and natural capital, we have set targets for the efficiency of water use at production sites and breweries with high levels of water stress, and in relation to the circular economy, we have set a target of "38% usage of recycled resins in PET bottles in Japan," as KPIs linked to remuneration.

We incorporate other environmental targets into our CSV Commitment, our non- financial KPI targets, and reflect them in management plans by setting them as performance indicators for each operating company. The status of achievement of the CSV Commitment serves as a metric for assessing the performance of the CEOs of group companies.

	Roles and authorities	Members	Frequency	Achievements
The Board	●Supervision of execution of environmental operations within the Group ●Resolutions related to medium- and long-term strategies and fiscal year plans ●Resolutions related to important non-financial targets and KPIs, including those concerning the environment ●Monitoring the degree of dependence and impact on natural capital, as well as environmental risks and opportunities	●Chair: non-executive director ●Non-executive 7, Executive 5	4 times a year + as needed (monthly for risk monitoring)	●Quarterly monitoring of important risks and the execution of business operations, including environmental ●Resolutions concerning plans for fiscal 2024, including environmental targets, KPIs, and important risks
Group Executive Committee	●Deliberation of environmental policies, medium- and long-term strategies, and fiscal year plans ●Resolutions related to general non-financial targets and KPIs, including those concerning the environment ●Deliberation of the degree of dependence and impact on natural capital, as well as environmental risks and opportunities ●Supervision of the environmental operations of operating companies and divisions	●Convened and chaired by the CEO, Kirin Holdings Company, Limited. ●Executive officers of Kirin Holdings	Approximately 30 times a year	●Quarterly monitoring of the execution of environmental operations by operating companies ●Deliberation of plans for fiscal 2024, including environmental targets and KPIs, and important risks
Group CSV Committee	●Discussion of CSV policies, strategies, plans, targets, KPIs, and materiality across the Kirin Group, including those related to the environment	●Chair: CEO of Kirin Holdings ●Executive officers of Kirin Holdings ●CEOs of the Group's major operating companies in Japan and overseas	Three times a year	●Discussion of non-financial disclosure policies, strategies, and plans, including those related to the environment ●Reviews of ESG assessments and deliberation of enhancements
Group Environmental Meeting (Working Group on the Environment under the Group CSV Meeting)	●Formulation of policies, strategies, plans, targets and draft KPIs for the four environmental issues (climate change, water, containers and packaging, and biological resources)	●Chair: Executive officer in charge of CSV of Kirin Holdings ●Executive officer in charge of SCM strategy, General Manager of CSV Strategy Department, General Manager of Corporate Strategy Department, General Manager of Finance Department, General Manager of Procurement Department, General Manager of Corporate Communication Department, General Manager of IR Section, General Manager of Research & Development Division, and General Manager of Technology Development Department*1	Twice a year	●Formulation of draft plans for fiscal 2024 concerning the four environmental issues
Group Risk and Compliance Committee	●Deliberation of fiscal year policies concerning group risk management, including risks related to the environment, and important risks for the Kirin Group ●Monitoring risk and compliance projects and responding to sudden incidents	●Chair: Executive officer in charge of risk management of Kirin Holdings ●Executive officers of Kirin Holdings	Twice a year + as needed	●Deliberation of basic policies for plans for fiscal 2024 and important risks for the Kirin Group

*1 Kirin Brewery technical manager. Other affiliations not specified belong to Kirin Holdings.

Status of Governance for Environmental Issues



*1 Chief Executive Officer (CEO): The Executive Officer responsible for overseeing the overall management of the Group
*2 Chief Operating Officer (COO): The Executive Officer responsible for overseeing the business operations of the Group
*3 Group Environmental Meeting, Group Business and Human Rights Meeting, Group Health and Safety Meeting, etc.

Skills and competencies

The company appoints persons who possess the required experience, advanced insight, and a high level of expertise in order to ensure that directors of the board, audit and supervisory board members, and executive officers effectively engage in Group decision-making and perform supervision and execution aimed at achieving CSV, which is at the core of the company's management. See below for a skill map of senior management.

https://www.kirinholdings.com/en/purpose/governance/provisions/

Incorporating non-financial KPIs in performance-linked remuneration

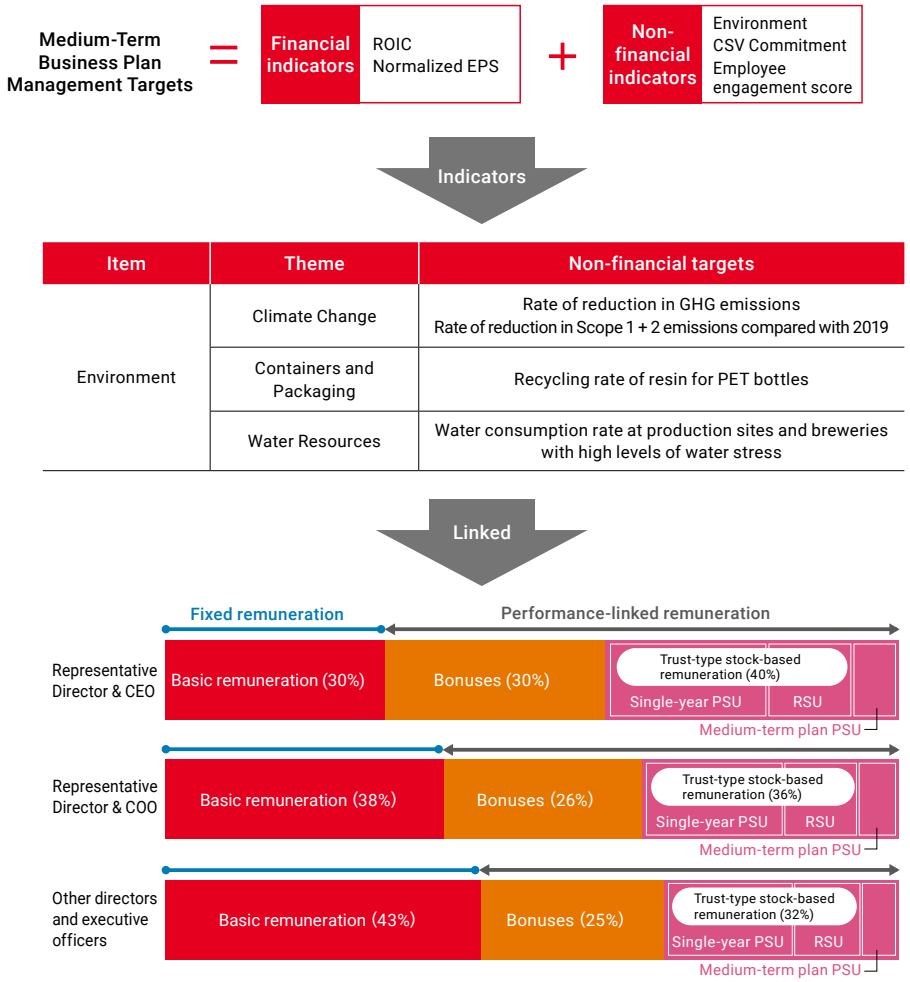
Please refer to the following for information about the relationship between executive remuneration and non-financial indicators in our Medium-Term Business Plan.

https://www.kirinholdings.com/en/purpose/governance/conpensation/

For the period from 2022 to 2024, our CSV Commitments, which is incorporated into the management plans of the Kirin Group, is shown below.

https://www.kirinholdings.com/en/impact/csv_management/commitment/

Structure of executive remuneration



Item	Theme	Non-financial targets
Environment	Climate Change	Rate of reduction in GHG emissions Rate of reduction in Scope 1 + 2 emissions compared with 2019
	Containers and Packaging	Recycling rate of resin for PET bottles
	Water Resources	Water consumption rate at production sites and breweries with high levels of water stress

Strategy

Results of financial impact assessment

We assessed the financial and asset impacts of climate change, natural capital, and containers and packaging. We have summarized the interrelated impacts of climate change, natural capital, and containers and packaging.
We assume that it is unlikely that fuel for boilers and trucks will be replaced with hydrogen and electricity before the service life of equipment is reached as a result of laws and regulations. For reference, we disclose the "residual value of related facilities."
Estimates of the financial impact related to climate change and natural capital are limited, and we cannot determine risk from financial impact estimates alone. Accordingly, we have combined these estimates with qualitative analysis and assessments from scenario analysis for reflection in our strategies. For detailed analysis results and estimate methodology, as well as specific environmental risks and opportunities, business impact, and strategic resilience analysis, see "Holistic Analysis of Risks and Opportunities, Business Impact, and Strategies in Environmental Management." →P.68

Estimated financial and asset impact

Environmental themes	Risk types	Business risks / social issues	Financial impacts
Climate change	Physical risk*1	Decline in yields of agricultural products*2	2℃ scenario: Approx. 1.3 billion yen to 3.4 billion yen (2050) 4℃ scenario: Approx. 3.6 billion yen to 13.7 billion yen (2050)
	Transitional risk*1	Financial impact of energy due to carbon pricing	1.5℃ scenario: Approx. 10.2 billion yen (2030) 2℃ scenario: Approx. 9.4 billion yen (2030) 4℃ scenario: Approx. 5.1 billion yen (2030)
		Financial impact of agricultural products due to carbon pricing*2	RCP2.6/SSP1: Approx. 0.9 billion yen to 4.4 billion yen (2050) RCP8.5/SSP3: Approx. 2.4 billion yen to 8.8 billion yen (2050)
Climate change and natural capital	Physical risk	Disruptions to operations owing to floods	Wind and flood damage simulation results: Approx. 1 billion yen Actual data from past disasters (1 billion yen to 5 billion yen)
		Disruptions to operations owing to droughts	Approx. 0.03 billion yen to 0.6 billion yen
Natural capital and containers and packaging	Physical risk	Negative impact of PET bottles	Approx. 1.1 billion yen
	Transitional risks	Procurement of certified products	Approx. 0.06 billion yen
Climate change	Business opportunity	Increase in infectious diseases	Market for immunity and health supplements: Approx. 28,961.4 million US dollars (2030)
		Increase in heatstroke	Market for non-alcoholic beverages that prevent heatstroke: Approx. 94 billion yen to 188 billion yen (2100, 4℃ scenario)
Natural capital	Business opportunity	Reducing food waste	Approx. 0.9 billion yen
		Financial impact from the reduction of chemical fertilizers and pesticides for coffee farms in Vietnam*3	0.11 billion yen

Environmental themes	Risk types	Business risks / social issues	Financial impacts
Climate change	Transitional risks	Exposure of production sites to floods	Approx. 1.0 billion yen to 5.0 billion yen
		Residual value of related facilities due to strengthening of energy-saving legislation	Approx. 0.11 billion yen

* The calculation method for each financial impact is as follows.
- Reduced yields of agricultural products due to climate change: Estimated from standard prices for beer by country as shown in the results of research using the economic models of Xie et al., and the research results of Hasegawa et al., as presented in the IPCC "Special Report on Climate Change and Land (SRCCL)."
- Energy prices due to carbon pricing: Estimated from Current Policies Scenario and Sustainable Development Scenario in Annex A of the IEA "World Energy Outlook 2019," and the IPCC Special Report on Global Warming of 1.5℃, etc.
- Carbon pricing and prices of agricultural products: Estimated from the research results of Hasegawa et al., as presented in the IPCC "Special Report on Climate Change and Land (SRCCL)."
- Flood risk: The sum of the results of estimations for 200-year disasters for 20 locations in Japan using the wind and flood damage model flood simulation. In addition, the actual amount of damage caused by past disasters in the cases of Lion's Castlemaine Perkins Brewery (approx. 1 billion yen) and Kirin Brewery's Sendai Plant (approx. 5 billion yen).
- Drought risk: Hypothetical situation where production is affected by a drought for a certain period of time
- Negative impact of PET bottles: Estimated the financial impact in the event of a negative influence on natural capital from improperly disposed of used PET bottles that leak into the ocean from available statistics based on the company's own production volume ratios.
- Risk from transition to certified products: Estimation of expenses from switching to tea and coffee procured from certified sustainable farms to the extent currently possible.
- Infectious diseases: Estimated from WHO "Quantitative risk assessment of the effects of climate change on selected causes of death, 2030s and 2050s" and "Dengue and severe dengue," January 10 2022.
- Heatstroke: Estimated from a S-8 2014 Report by Project Team of Comprehensive Study on Impact Assessment and Adaptation for Climate Change.
- Food waste reduction: Estimated from the cost reduction effect if the target is achieved (Kirin Brewery, Kirin Beverage, Mercian, Koiwai Dairy).
- Reduction in agricultural chemicals and fertilizers: Estimated reduction in costs associated with the reduction of chemical fertilizers and pesticides for coffee farms in Vietnam
- Flood exposure: Estimated from wind and flood damage model flood simulations and actual data
- Residual value of related facilities due to strengthening of energy-saving legislation: Residual value of boilers and trucks (for both of which, we have assumed that it is very unlikely that we will discontinue the use of before the end of their service lives are reached if fuel conversion is required by laws and regulations. We have determined that there will be no financial impact, but for reference purposes, we disclose the residual value)

Resilience Assessment

Scenario analysis related to climate change and resilience assessment using the LEAP approach for natural capital are as follows.

Scenario analysis related to climate change

Physical risk

We verified water risk, water stress, and other information for manufacturing sites (plants and breweries) using the latest data (Aqueduct 4.0), and found that the overall level of risk is rising. Additionally, in relation to agricultural products, we believe that if we do not take sufficient measures to address climate change, it will be impossible to avoid a significant impact on the yields of key agricultural raw materials, as well as water risk and water stress by 2050 (2100 in some cases).

At present, the Kirin Group is focusing on initiatives such as the diversification of suppliers, support for the acquisition of sustainable farm certification, and the development of mass plant propagation technology, and we believe that we are resilient to physical risks to some extent. Even if the Kirin Group achieves our "SBT 1.5° C" target and the "SBT Net-Zero" target, however, it is becoming increasingly likely that it will be difficult to completely avoid the effects of global warming. Therefore, we intend to consider appropriate adaptation measures and include them in transition plans.

Transitional risks

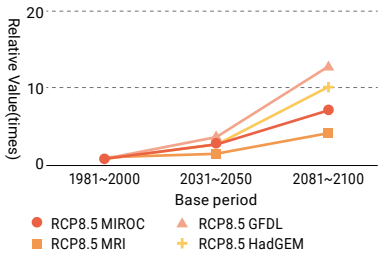
With regard to the financial impact of carbon pricing on energy costs, we estimate that achieving the "SBT 1.5° C" target early will reduce energy costs by approximately 4.7 billion yen (2° C scenario) in 2030. If, however, we do not achieve net-zero by 2050, the impact of carbon pricing on energy prices could be at a level that we cannot ignore. We also estimate that the financial impact of carbon pricing on agricultural prices will be similar to the financial impact of agricultural prices due to the physical effects of climate change.

*1 This is not a financial impact assessment that takes into account both carbon pricing and global warming impacts.

Business opportunity

In response to the impact of climate change on society, we believe there are business opportunities related mainly to the spread of infectious diseases and heatstroke in the "Health & Well-being domain," which we have identified as a key area in our Long-Term Management Vision for 2027.

Excess deaths related to heat stress in Japan



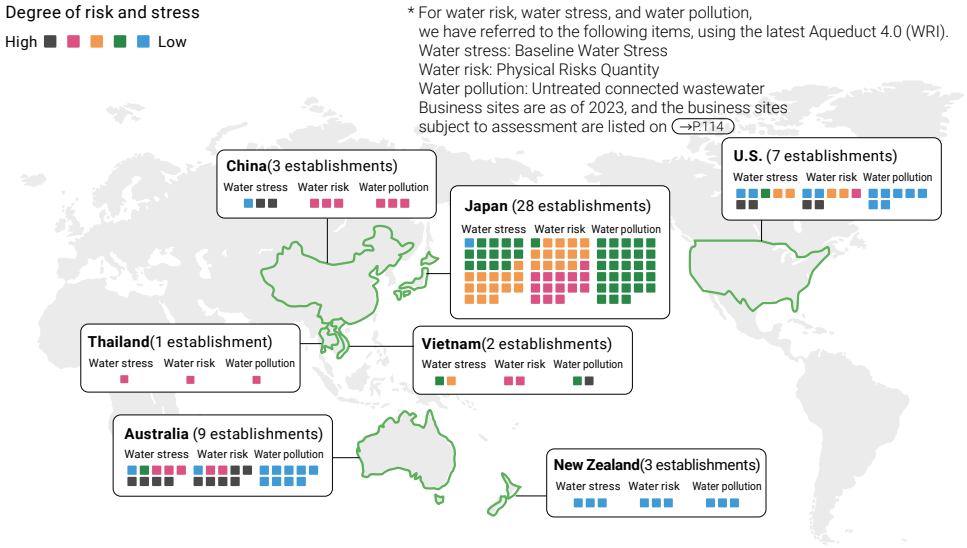
Forecast population exposed to risk of dengue fever under the 4℃ scenario

(Upper: Ten thousand persons; Lower: Difference from not taking GDP into consideration)

	2030		2050	
Region	Without GDP consideration	With GDP consideration	Without GDP consideration	With GDP consideration
Asia-Pacific high-income countries	81	56 (▲31%)	92	69 (▲25%)
East Asia	31,093	37,559 (+21%)	28,574	21,679 (▲24%)
Southeast Asia	71,335	71,338 (0%)	75,666	75,669 (0%)

Created by Kirin based on A-PLAT Projections for the Future: S-8 Research Results, published in 2016, Chart of Excess Deaths Related to Heat Stress
https://adaptation-platform.nies.go.jp/map/national/index.html

Water risk and stress at production sites



Impact of climate change on yields of key agricultural products and water stress in agricultural production areas around 2050

Materiality analysis of natural capital

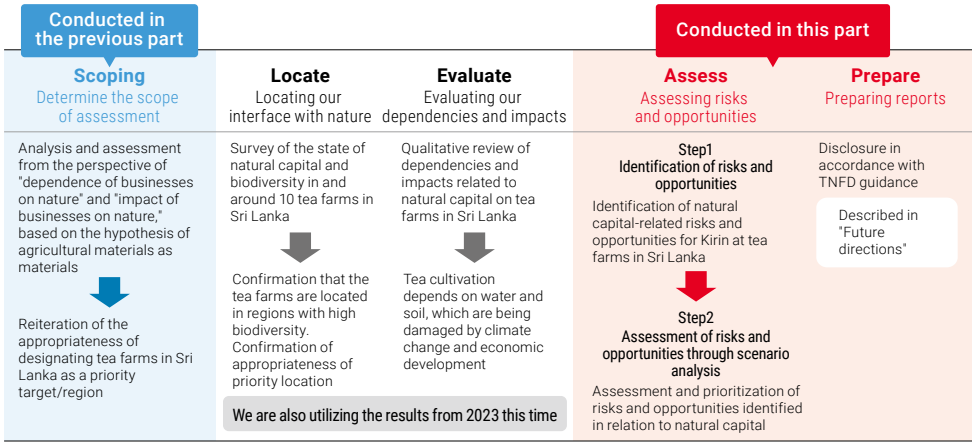
Based on v1.0 of the TNFD recommendations and the updated LEAP approach, the Kirin Group reassessed issues and assessments related to natural capital.

In the scoping phase of the LEAP approach, we conducted a comprehensive assessment of the level of dependency and impact, and we are prioritizing coffee beans, hops, tea leaves, and soybeans as a result. We selected tea farms in Sri Lanka as a field where we can perform concrete activities, and analyzed and assessed risks and opportunities using the LEAP approach. The results show that Sri Lanka's natural capital is affected in various ways, not only by climate change, but also by economic development.

The Kirin Group has identified that there is high possibility of reducing risks associated with natural capital in Sri Lanka by supporting the acquisition of certification, which we have been doing since 2013, and by implementing the "Regenerative Tea Scorecard (referred to below as the "Scorecard")" in order to promote regenerative agriculture, which we began in 2023.

The analysis and assessment procedures are as follows.

Analysis and assessment procedures



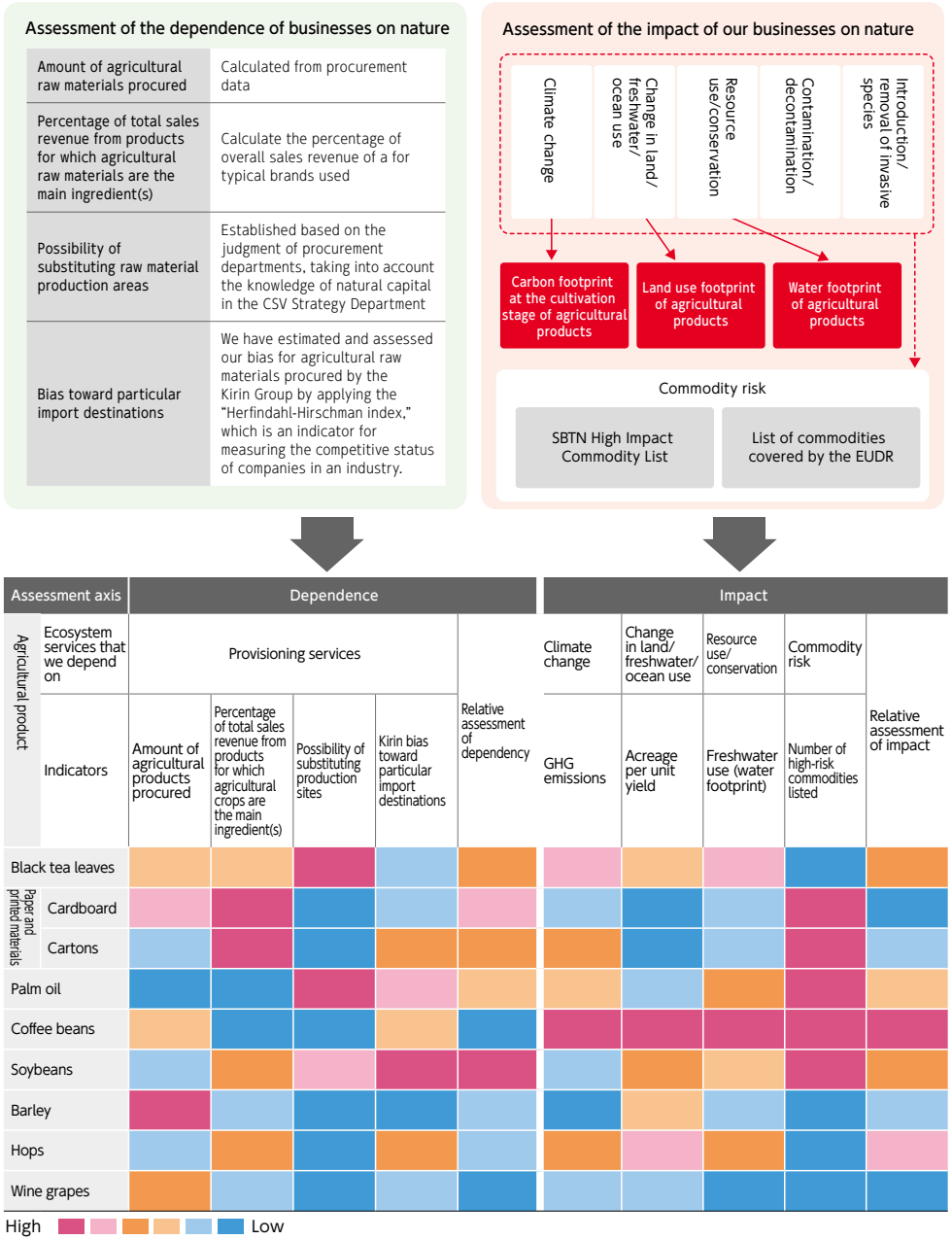
Scoping implementation

Based on an overview of the business domains and value chain of the Kirin Group as a whole, we have established the hypothesis that there is a high degree of dependence and impact on nature at the stage of procuring agricultural raw materials. For this reason, we analyzed and assessed "black tea leaves, paper/printed materials, palm oil, coffee beans, and soybeans" which are covered by the "Kirin Group Action Plan for Sustainable Use of Biological Resources," as well as "barley, hops, and wine grapes," of which we procure large amounts, on the two axes of "impact of our businesses on nature" and "nature-related dependencies of our businesses." We then used the LEAP approach for scoping of the agricultural products to be analyzed in detail.

For the "nature-related dependencies of our businesses," in order to assess our dependence on "provisioning services" for agricultural raw materials, as indicated in the TNFD recommendations, we used the following original assessment indicators: "procurement volume," "impact on Group sales revenue," "possibility of substituting raw material production areas," and "bias toward particular import destinations."

Concerning the "impact of our businesses on nature," we assessed the following indicators: "carbon footprint at the cultivation stage," "land use footprint," and "water footprint," for which data is available on a per-crop basis, and which are among the impact factors listed by IPBES*1 that the TNFD recommendations state should be considered. We also confirmed whether agricultural products are listed as high risk by the SBTN and the European Regulation on Deforestation Free Products (EUDR).

Heat map of impact and dependency analysis and assessment results*2



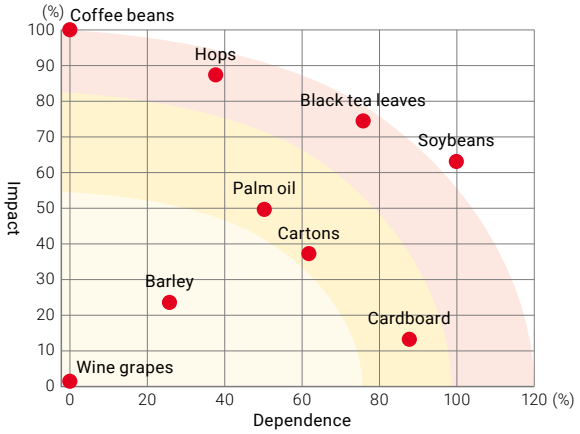
*1 IPBES: An intergovernmental organization that scientifically assesses trends related to biodiversity and ecosystem services and strengthens links between science and policy

*2 For GHGs, we used the ClimateHub database; for land use, we used data for 2022 disclosed by the FAO; for freshwater, we used Mekonnen-Hoeskstra (2011)

Materiality analysis and assessment results in scoping

We conducted analysis and assessment of the "impact of our businesses on nature" and the "nature-related dependencies of our businesses." The horizontal axis indicates dependency, and the vertical axis indicates impact. Based on this "materiality analysis of main raw materials," we are prioritizing four raw materials: coffee beans, hops, tea leaves, and soybeans. Although we have not yet fully considered some factors, such as the weighting of assessment items, we believe that the results are consistent with knowledge gained from our initiatives targeting natural capital over many years and are credible.

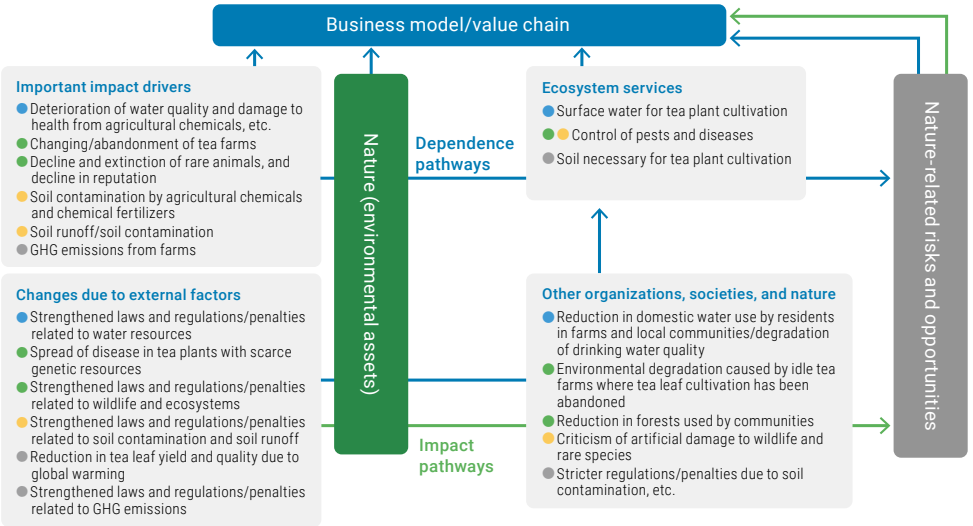
Materiality analysis of main raw materials



Analysis and assessment of risks and opportunities based on the LEAP approach

We analyzed and evaluated our dependence and impact, and risks and opportunities for tea leaves from Sri Lanka, which we have designated as a priority target and priority location in the scoping described in the preceding paragraph. For the Locate and Evaluate stages, we used data from when we conducted these processes and disclosed them in our environmental report in 2023.

Relationship between dependency and impact pathways



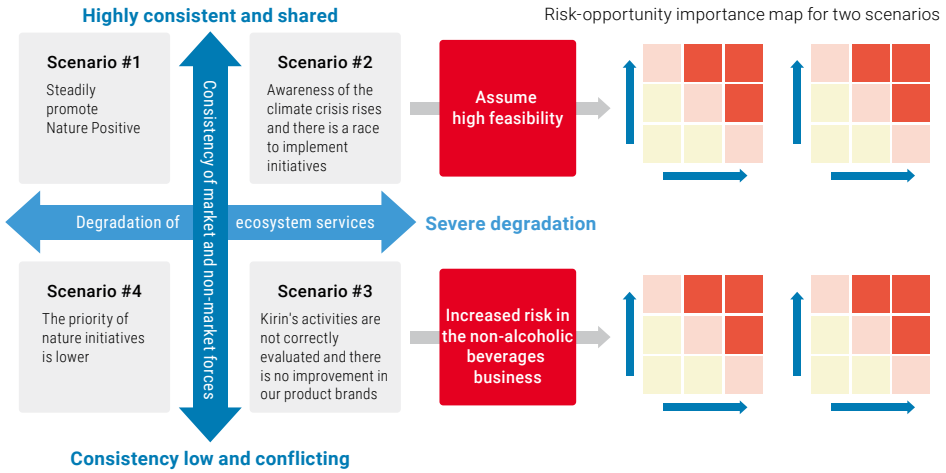
* Impact drivers and external factors are color-coded for each of the four environmental assets (water resources, land ecosystems, land, and air). In fact, we have analyzed and assessed each risk and opportunity in detail, but we have only provided the key points here.

Assess (assess risks and opportunities)

Based on lists of important impact drivers and ecosystem services compiled during the Evaluate phase, we created a diagram showing the relationships between dependency and impact pathways for each of the four environmental assets: water resources, land ecosystems, land, and air. We also identified external factors and external stakeholders for each important natural capital and determined risks and opportunities.

We then conducted scenario analysis. We put "ecosystem services" on the horizontal axis of the scenario, with the status quo level of natural capital on the right and the degradation of natural capital on the left. On the vertical axis, we put "market forces," with the state of strict regulation and high awareness among consumers and investors at the top, and the state of loose regulation and low interest among consumers and investors on the bottom. Within this framework, we selected "nature degradation" scenarios #2 and #3 as the most realistic scenarios. Based on the risks and opportunities identified at the previous stage, as well as the magnitude of the financial impact, we created risk maps and conducted assessments.

And based on the "important implications" obtained in this way, we have summarized our future directions (Prepare: preparing reports) as follows.



Future directions (Prepare: preparing reports)

In response to important implications gained from the Assess stage, we have summarized our future activities at Sri Lankan tea farms as follows.

We plan to incorporate these activities into our medium- to long-term roadmap in the future.

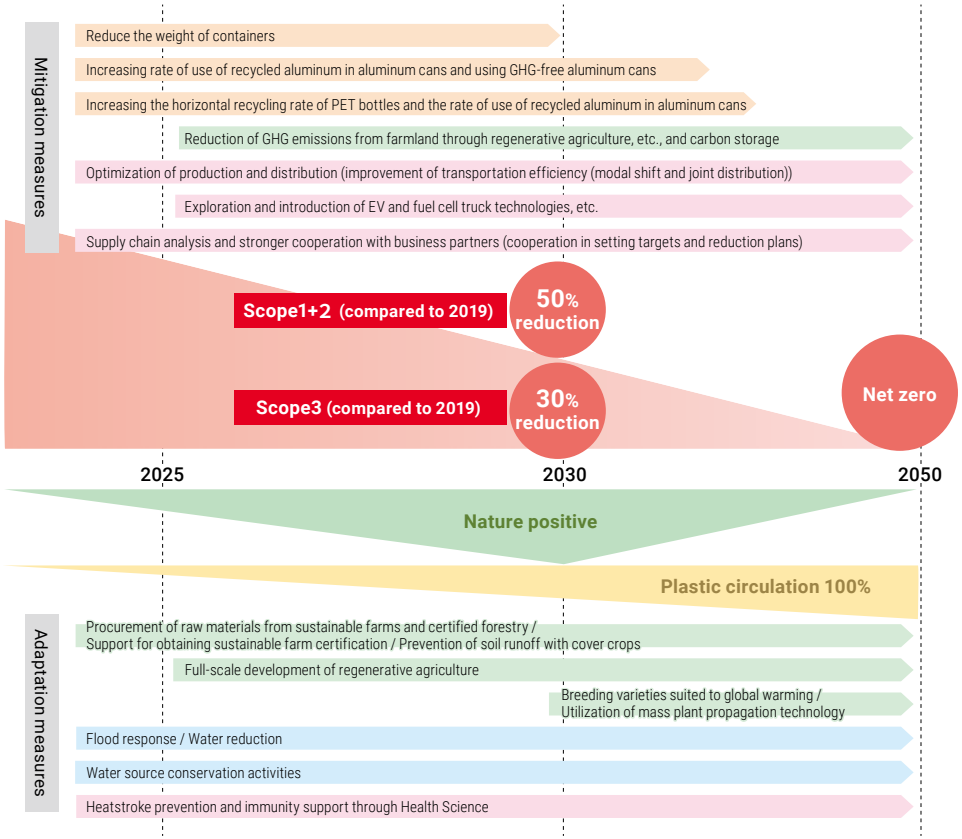
Important implications gained from risk and opportunity assessment

Summary of assessment of physicals risks	Opportunities, scenario #2, and scenario #3
Physical risks and opportunities	●Natural disasters due to climate change, fall in yields, and decline in tea leaf quality ●Erosion of topsoil due to land use changes associated with economic development ●Low genetic diversity and potential for the spread of disease in tea plants ●Improvements to farm resilience with certification training
Policy and regulatory risks	●Stronger regulations are unlikely because the aggressive shift to excessive organic farming significantly impacted agriculture
Market and valuation risks (consumers)	●It is unlikely that there will be an expansion in ethical consumption in Japan anytime soon ●Future generations are highly interested in sustainability
Market and valuation risks (investors)	●Investors are highly interested in Nature Positive and regenerative agriculture
Liability risk (community)	●The likelihood of facing penalties for legal violations is assumed to be low

●In addition to certification training, we are also using the "scorecard" to spread regenerative agriculture at tea farms
●Improvements to soil moisture retention at tea farms through weed management, as well as water source conservation activities on farms
●As necessary, expand the landscape approach adopted in Sri Lanka to those production areas

Transition Plans

We have formulated holistic business transition plans which aim to simultaneously realize a decarbonized society, Nature Positive, and Circular Economy, ensuring business continuity.
Our transition plans from the perspective of climate change mitigation and adaptation are shown in the figure below.



Investment plans and financing plans

Investment and financing plans for "Scope 1+2 GHG emissions reduction" and "expansion of the use of recycled PET resin" are as follows.

	Investment plans	Financing plans
Scope 1+2 GHG emissions reduction	●Plan to reduce GHG emissions on a profit - and - loss neutral basis by balancing energy cost reductions by saving energy and transition costs (e.g. CAPEX of projects and cost premium of renewables). ●In order to promote environmental investments, we will use the Net Present Value (NPV) as an indicator for environmental investments aimed mainly at reducing GHG emissions, and we have also introduced ICP (Internal Carbon Pricing) as a method for making investment decisions ●Plan to consider strategies for 2030 and beyond, based on the assumption that there will be infrastructure and technological innovation	●In 2020, we issued a green bond (10 billion yen) to finance the procurement of recycled PET resin and the installation of a heat pump system at plants ●In December 2022, we became the first food and beverage company in Japan to develop a framework that complies with transition finance-related guidelines, etc., and to have obtained a second party opinion from an independent third party in order to promote transition initiatives on the finance side ●In January 2023, we became the first food and beverage company in Japan to raise funds with a transition-linked loan (50 billion yen), which is aimed at financing energy conservation and renewable energy-related projects that contribute to reducing Scope 1 and Scope 2 emissions
Expansion of the use of recycled PET resin	●Enhance manufacturing facilities for small PET bottles at the Kirin Beverage Shonan Plant (investment of approximately 10 billion yen) ●Plan to formulate investment roadmaps with a view to developing practical applications for chemical recycling	

We make investment decisions based on annual plans to address issues related to containers and packaging other than expanding the use of recycled PET resin.
The cost for Nature Positive-related measures is around 20 million yen per year. This is the total amount, which is broken down into current support for obtaining certification for tea farms in Sri Lanka, development and pilot testing of the Scorecard for regenerative agriculture, and joint research with NARO, including carbon storage at Mariko Vineyard. We anticipate that it will still take several years to fully implement regenerative agriculture, and that additional costs will be required. Further expenses for research and implementation will also be necessary for our next targets, such as soybeans, hops, and barley.
The main targets for the reduction of Scope 3 emissions are containers and packaging and agricultural raw materials. We envisage that regenerative agriculture will be a key adaptation and mitigation measure for climate change related to agricultural raw materials. In light of this background, when considering “Scope 3 transition plans” in the future, we plan to consider transition strategies related to "Nature Positive" and “Circular Economy,” and thus formulate holistic plans that also incorporate investments and costs.

Plan to transition to a decarbonized society

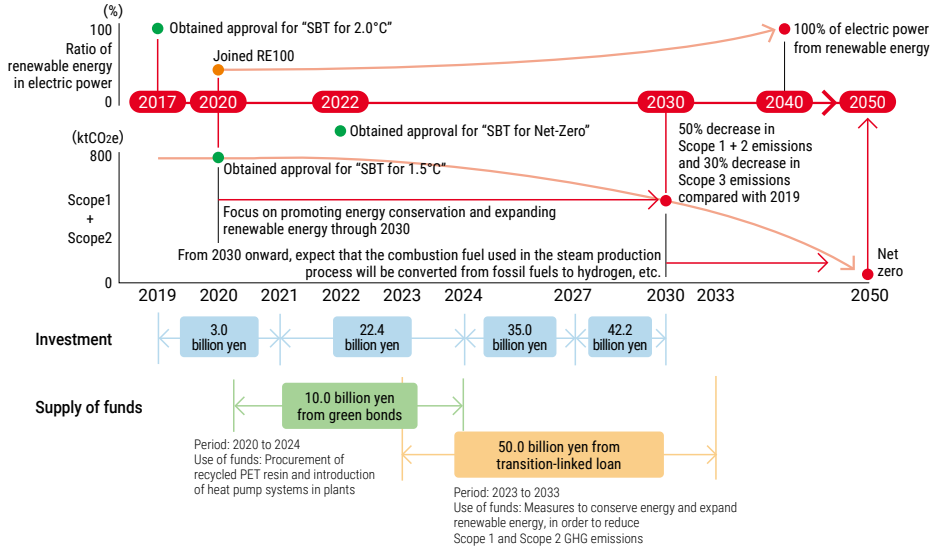
The Kirin Group is working to reduce GHG emissions based on a roadmap consistent with the "SBT 1.5° C" target for 2030 and the "SBT Net-Zero" target for 2050. We plan to create concrete measures, not only to reduce GHG emissions, but also to mitigate and adapt to climate change.

Scope 1+2 emissions reduction

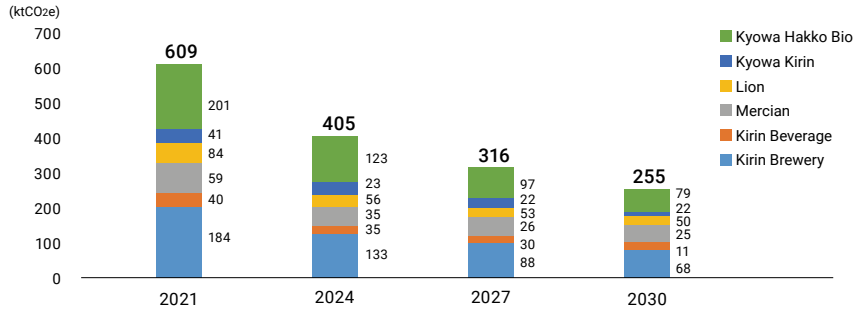
Our roadmap for reducing Scope 1 and Scope 2 emissions by 2030, as well as our investment and financing plans, is shown on the right. We will take a three-pronged approach to reducing Scope 1 and Scope 2 emissions, namely: "promotion of energy conservation," "expansion of renewable energy," and "energy transition," and will also develop ways to optimize production and logistics, etc. Our actions in each area are as follows.

	Action
Promotion of energy conservation	●Kirin Brewery introduced heat pump systems at the wastewater treatment facilities of six plants in 2019 ●At Shinshu Beverage, we reuse waste heat, which is difficult to use directly in rinsing processes for bottles and caps, through a heat pump unit ●At the Kirin Brewery Okayama Plant, we reuse waste heat in hot water sterilization equipment for cans and heat in the air
Expansion of renewable energy	●At Kirin Brewery, we have installed large-scale solar power generation facilities at all nine plants (PPA model at eight plants excluding the Yokohama Brewery) ●Mercian introduced solar power generation using a PPA model at the Fujisawa Plant ●Kyowa Kirin introduced a large-scale solar power generation facility (1.47MW) using a PPA model at the Ube Plant ●Kyowa Hakko Bio introduced solar power generation using a PPA model at the Hofu Plant ●Lion acquired carbon neutral certification in Australia, as well as Toitū carbon zero certification in New Zealand ●Lion installed solar power generation facilities at Castlemaine Perkins Brewery and Little Creatures Geelong
Energy transition	●Completed the transition of fuel to natural gas at all Kirin Brewery and Kirin Beverage plants, as well as the Mercian Yatsushiro plant ●Lion plans to install an electric boiler at a brewery in New Zealand. The company plans to expand its use of electric power generated from renewable energy

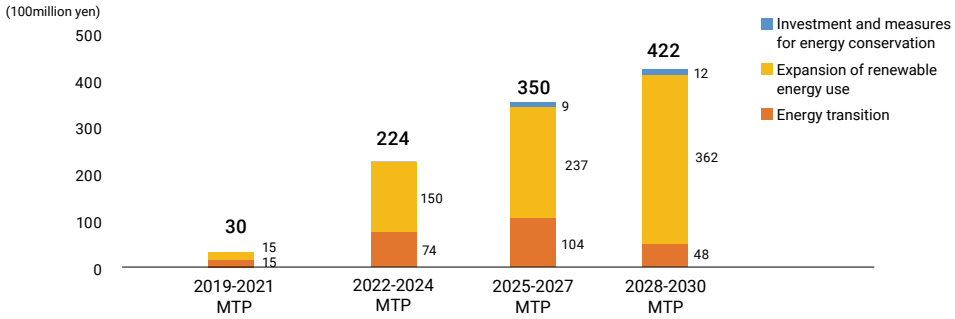
Roadmap to Net-Zero



Reduction of Scope 1 and Scope 2 emissions



Investment



Scope 3 emissions reduction

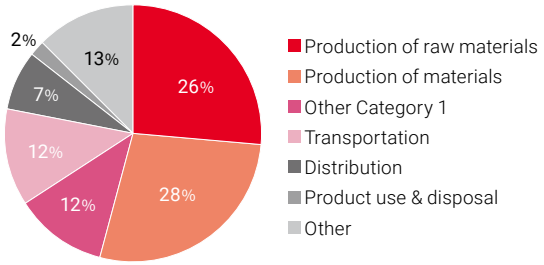
Of the categories in the "Scope 3 Standard" of the GHG Protocol, Category 1 (purchased goods and services) emissions from "containers and packaging" and "agricultural raw materials" account for approximately 70% of the Kirin Group's Scope 3 emissions. Category 4 (upstream transportation and distribution) emissions from "transportation" make up approximately 10% of the total. These two categories are the main targets of the Kirin Group's efforts to reduce Scope 3 emissions.

We will continue working to reduce Scope 3 emissions through the two approaches of the "reduction of our own independent emissions" and "encouragement of reduction at suppliers." Transportation and containers and packaging are the targets for reducing our own independent emissions. We will leverage the Institute for Packaging Innovation, which develops containers and packaging in-house, and which is the only institute of its scale for a food and beverage company in the world.

We encourage suppliers to reduce GHG emissions from the production of containers and packaging and their materials, and GHG emissions during the production of agricultural raw materials. We have determined that regenerative agriculture is effective way to reduce GHG emissions from agricultural products. Our key actions are as follows.

	Action
Containers and packaging (28% of Scope 3 emissions)	●In addition to reducing the weight of cans, we will also increase the rate of CAN to CAN recycling, reducing the use of virgin materials and increasing the rate of use of recycled materials as much as possible ●For aluminum cans, in response to the start of the development of practical applications for GHG-free aluminum refined using renewable energy, we will research GHG-free aluminum ●For PET bottles, in order to increase the PET to PET horizontal recycling rate, we will increase the use of mechanically and chemically recycled materials, while also reducing GHG emissions from the manufacturing process ●We will contribute to the reduction of GHG emissions from transportation by reducing the weight of containers and packaging
Agricultural raw materials (26% of Scope 3 emissions)	●Initiation of joint research on the accurate measurement of GHG emissions from soil at Mariko Vineyard and carbon storage using biochar from pruning debris ●New Belgium Brewing (U.S.) has begun procuring barley through regenerative agriculture
Transportation (12% of Scope 3 emissions)	●Optimization of production and distribution, joint distribution, and modal shift ●Consideration of conversion to fuel cell trucks and EV trucks

Proportion of Scope 3 emissions

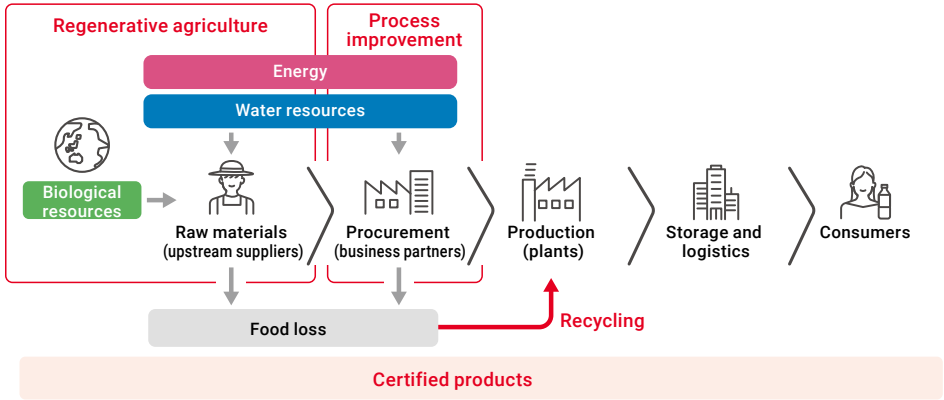


* Emissions other than the above (emissions from the manufacture and transportation of capital goods, fuel, etc., waste from business operations, travel and commuting of employees, etc.)

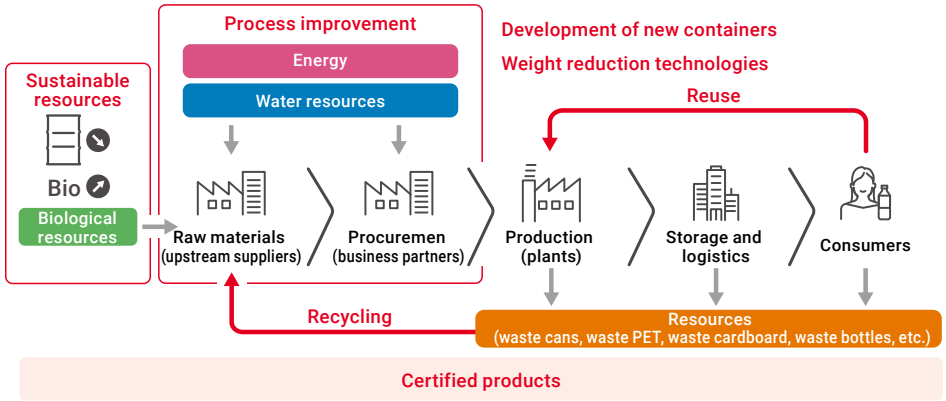
As part of our efforts to resolve issues related to Scope 3 emissions, we launched the "Kirin Supply Chain Environmental Program" to deepen cooperation with suppliers that account for large amounts of emissions, in areas such as containers and packaging, agricultural raw materials, and manufacturing contractors. Under science-based approach, we will call for the mutual disclosure of emissions data and the setting of targets in accordance with SBTi standards, provide support for the establishment of targets, and jointly formulate and implement highly feasible measures to reduce GHG emissions.

We have positioned Mariko Vineyard in Japan and tea farms in Sri Lanka as model cases to accumulate knowledge on climate change mitigation and adaptation through regenerative agriculture. This knowledge gained will be applied to other agricultural products and production areas.

Approach to reducing GHG emissions from agricultural raw materials



Approach to reducing GHG emissions from containers and packaging



Plan to transition to Nature Positive

We will organize our transition to Nature Positive using the AR3T framework for natural capital proposed by the SBTN (SBTs for Nature).

	Action
Avoid	●Achieve and maintain 100% use of FSC-certified paper and expand this initiative globally ●Achieve and maintain 100% RSPO certified credits for palm oil as primary and secondary raw materials (excluding palm kernel oil), and avoid procurement from countries and regions at risk of deforestation ●Continue development of applications for bag-type culture vessel technology that enables mass plant propagation with minimal water ●Education on wildlife conservation for young people living on farms in Sri Lanka
Reduce	●Support the acquisition of Rainforest Alliance certification by tea farms in Sri Lanka and coffee farms in Vietnam ●Reducing food loss and waste ●Introduction and continued operation of advanced water treatment using reverse osmosis membranes at breweries in Australia, where there is a high level of water stress
Restore & regenerate	●Utilization of derelict farm land as Japan Wine vineyards. Restore ecosystems through hedgerow-style cultivation ●Conserve water sources on farms in Sri Lanka ●Water source conservation activities at production sites in Japan
Transform	●Participate in the development of guidance for the disclosure of financial information related to natural capital, such as the TNFD and SBTs for Nature ●Contribute to the expansion of the supply of FSC-certified paper by establishing a consortium for sustainable paper use with other companies and NGOs ●Establish the Rainforest Alliance Consortium and contribute to raising awareness of sustainable agriculture

On March 29, 2024, the Ministry of the Environment, the Ministry of Agriculture, Forestry and Fisheries, the Ministry of Economy, Trade and Industry, and the Ministry of Land, Infrastructure, Transport and Tourism jointly announced the "Transition Strategies toward Nature Positive Economy," reflecting discussions by the Ministry of the Environment's "Study Group on Nature Positive Economies," in which the Kirin Group participated. One of the three points of view presented in this report is the "necessity of transition to Nature Positive management and contribution to the conservation of natural capital and value creation."

Projects in Sri Lanka and at vineyards in Japan are examples of "Nature Positive through business," in which we will restore and maintain "secondary nature" through business activities, and we believe that these examples fall under the "contribution to the conservation of natural capital and value creation" in the Ministry of the Environment's transition strategies.

In accordance with the results of materiality analysis (→P.18) at the product level for agricultural raw materials, we plan to consider our roadmap for soybeans, hops, and other products listed in the future.

We have adopted a landscape approach, which is "a method for sustainably solving issues based on a comprehensive treatment of various human activities and the natural environment in raw material production areas," to address issues related to "indigenous peoples, local communities, and affected stakeholders," which the TNFD requires to be disclosed. Currently, we have only put this method into practice in Sri Lanka and vineyards in Japan, but through the "Kirin Supply Chain Environmental Program," which we launched in 2024, we intend to expand the regions where to which this method applies.

In freshwater areas, we are researching water stress and impact (water intake) in relation to water volumes in the basins of production sites and prioritizing the areas, in accordance with SBTs for Nature guidance V1.0 issued in May 2023.

Priority of manufacturing sites for each indicator: Water stress

Country	Manufacturing sites	Water stress	Water intake	Biodiversity risk
USA	Biokyowa	★★★★☆	★★★★★	★★☆
Thailand	Thai Kyowa Biotechnologies	★★★★☆	★★★☆☆	★☆☆
Japan	Kyowa Pharma Chemical	★★★☆☆	★★★★☆	★★☆
Japan	Kirin Brewery Toride	★★★☆☆	★★★☆☆	★☆☆
Japan	Kirin Brewery Yokohama	★★★☆☆	★★★☆☆	★☆☆
Japan	Kirin Distillery Gotemba	★★★☆☆	★★★☆☆	★☆☆
Japan	Kyowa Kirin Fuji	★★★☆☆	★★★☆☆	★☆☆
Australia	Lion Tooheys Brewery	★★★★☆	★★☆☆☆	★★☆
Japan	Kirin Brewery Nagoya	★★★☆☆	★★★☆☆	★★☆
China	Shanghai Kyowa Amino Acid	★★★★☆	★★☆☆☆	★☆☆
Japan	Kirin Beverage Shonan	★★★☆☆	★★☆☆☆	★★☆
Australia	Lion Castlemaine Perkins Brewery	★★★★☆	★★☆☆☆	★★☆
China	Kirin Brewery (Zhuhai)	★★★☆☆	★★☆☆☆	★★☆
USA	New Belgium Brewing Fort Collins	★★★★★	★☆☆☆☆	★☆☆

* We assess water stress using three indicators for available water resources (Aqueduct Baseline Water Stress, Water Risk Filter Baseline Water Depletion, and Blue Water Scarcity)
* Water intake refers to the percentage of the total intake for 14 sites with high water stress
* We assess biodiversity using scores for indexes calculated based on the IUCN Red List for basins at production sites (START (Species Threat Abatement and Restoration) and STARR), as well as the presence of biodiversity elements triggering KBA criteria inhabiting water within a 50km radius of basins at production sites, including fish, amphibians, turtles, crustaceans, and dragonflies

Plan to Transition to Circular Economy

Containers and Packaging

We will adopt a 3R+Renewable approach for promoting a transition to the circular economy for containers and packaging. Our main actions are as follows.

	Action
Reduce	●Utilize the "Institute for Packaging Innovation" to promote weight reduction for containers and packaging. Specifically, we developed and deployed the lightest returnable beer bottle produced in Japan and reduced the weight of cans and PET bottles.
Reuse	●We will continue to reuse returnable beer bottles
Recycle	●We collect old beer bottles and one-way bottles, turn them into cullet, and reuse them as bottles ●Expand the use of aluminum cans with a high percentage of recycled metal. ●We collect empty containers from vending machines and voluntarily collect and reuse aluminum cans in cooperation with can manufacturers. ●Lion has developed a "Sustainable Packaging Strategy," and will assume key roles such as collection coordinator in states where Container Deposit Schemes are in place in Australia. ●Based on the "Kirin Group Plastic Policy," our medium-term target is to achieve a rate of recycled resin use in 50% of PET bottles in Japan by 2027. ●In terms of "R100 PET bottles," we will gradually expand the adoption of products that use 100% recycled PET resin from mechanical recycling, the current mainstream method. ●We will also actively promote "bottle-to-bottle" horizontal recycling, in which used PET bottles are collected and recycled into new PET bottles. ●Looking ahead to future supply and demand for recycled PET resin, we will formulate and promote a roadmap for 2050, taking into account the status of progress on the development of practical applications for chemical recycling.
Renewable	●We will promote the reduction of one-way plastics and their replacement with alternative materials.

In the EU, the transition to a circular economy is positioned as part of growth strategies, and "design" is expected to play an important role in promoting this transition. Internally, the Kirin Group has the Institute for Packaging Innovation, which focuses on developing containers and packaging and solving related problems. Taking advantage of this strength, we are able to solve social issues through design related to the environment for containers and packaging. In addition to contributing to reducing GHG emissions in transportation by measures such as reducing the weight of containers and packaging, we will also contribute to the circular economy by creating practical applications for chemical recycling and building a society that recycles plastics throughout society.

Food loss and waste

The Kirin Group position issues related to food loss and waste, as issues for not only Nature Positive but also the circular economy. In order to reduce product waste losses, we are promoting manufacturing optimization by improving demand forecasts. In addition, we are promoting effective utilization methods, such as the donation of unavoidable surplus inventory to local governments, food banks, and other organizations. We are continuing to effectively use by-products generated in manufacturing processes (e.g., spent grains) as feed and compost.

We have separately provided information concerning plans for transition to a decarbonized society, Nature Positive, and a circular economy, but in reality, we will implement these plans as a single unified plan that takes into account their interconnectedness. Our specific activities and their results for each of the aforementioned transition plans are shown below.

Our specific activities and their results in relation to natural capital, in accordance with the SBTN's AR3T framework, are summarized below.

Climate change strategies and progress

	Increase in resilience (adaptation)			Minimization of impact on natural capital (mitigation)			Business opportunity	
Material agenda	Water resources		Biological resources		Containers and Packaging	Climate change		
Response strategy	●Sharing flood knowledge ●Equipment and facility measures against flooding ●Sharing drought knowledge ●Development and deployment of water usage reduction technology ●Conservation of water sources		●Procurement of materials from sustainable farms and forestry and support for obtaining certification ●Prevention of soil runoff with cover crops ●Breeding varieties suited to global warming ●Utilization of mass plant propagation technology	●Reduction of GHG emissions from farmland through regenerative agriculture and carbon storage ●Use of biogas	●Creation of more lightweight containers ●Increase rate of use of recycled aluminum in aluminum cans ●Consider the use of GHG-free aluminum cans ●Increase the horizontal recycling rate of PET bottles	●Promotion of energy conservation ●Expansion of renewable energy ●Energy transition ●Production optimization ●Improvement of transportation efficiency (modal shift and joint distribution) ●Exploration and introduction of EV and fuel cell truck technologies, etc.	●Provision of products to address infectious diseases	●Provision of non-alcoholic beverages that prevent heatstroke
Progress	●Contribution to the TNFD pilot program, including the world-leading LEAP trial disclosure (2022) and scenario analysis trial (2023) ●Participation in the pilot test of Corporate Engagement Program in SBTN for Nature (from 2021)	●Started surveys of high-risk business sites for insurance coverage, utilizing the results of simulations of natural disasters and floods (since 2022) ●Implemented flood prevention measures and equipment measures at pharmaceutical plants that must ensure a stable supply of products	●Establishment of mass plant propagation technology for hops ●Coinciding with pilot testing of scorecards for tea farms in Sri Lanka, cover crops preserve soil moisture and prevent soil runoff in heavy rainfall	●Began a joint study on controlling GHG emissions from soil and carbon storage with biochar at Mariko Vineyard ●Continued use of biogas from anaerobic wastewater treatment	●Began activities as the Japan representative of the Alliance to End Plastic Waste ●Increased use of R100 PET bottles made with 100% recycled resin ●Practical applications for chemical recycling	●Introduced large-scale solar power generation facilities at nine Kirin Brewery plants (through 2023, including eight breweries and plants with PPA model purchasing), Mercian Fujisawa Plant (2023), Kyowa Kirin Ube Plant (2023), Kyowa Hakko Bio Yamaguchi Production Center, and Lion Castlemaine Perkins (2019) Achieved 100% of procured electricity from renewable energy sources at all Kirin Brewery plants and operating sites (2024), Kyowa Kirin Takasaki Plant, Ube Plant, and research laboratories, all Lion plants in Australia and New Zealand (2023), and all Château Mercian wineries (2022). Became the first global food and beverage company to obtain approval for an SBT Net-Zero (2022) ●Launched the Kirin Supply Chain Environmental Program to strengthen cooperation with major suppliers (2024)	●Enhancement of product lineup ●Supply of materials to partner companies	●Raising awareness of heatstroke

Strategies and progress related to natural capital (AR3T-compliant disclosure)

Material agenda	Water resources	Biological resources
Avoid	●Continue development of applications for water-bag type culture vessel technology	●Achieved and maintained 100% FSC-certified paper in the Japan Non-alcoholic Beverages Businesses ●Achieved and maintained RSPO100% for operations in Japan (excluding palm kernel oil)
Reduce	●Appropriate water conservation in accordance with the level of water stress ●Introduction and continued operation of advanced water treatment using reverse osmosis membranes at Lion, which faces a high level of water stress	●Implementation of the training to support the acquisition of Rainforest Alliance certification by tea farms in Sri Lanka, development and pilot testing of the scorecard ●Continuing support for coffee farms in Vietnam to acquire Rainforest Alliance certification ●Reducing food waste in the alcoholic and non-alcoholic beverages businesses in Japan
Restore & Regenerate	●Conservation of water sources on tea farms in Sri Lanka and provision of education to local residents ●Continued water source conservation activities at production sites in Japan that began in 1999	●Restore ecosystems through the conversion of derelict farm land into hedgerow-style vineyards ●Conducted education on conserving wildlife, including the black panther, for young people in areas around farms in Sri Lanka
Transform	●As a participant in the Corporate Engagement Program of SBTs for Nature, we are contributing to the development of a framework for scientific target setting related to natural capital	●World-leading disclosure using the LEAP approach, participation in joint scenario analysis in response to request from the TNFD ●Contribute to the expansion of the supply of FSC-certified paper by establishing a consortium for sustainable paper use with other companies and NGOs ●Contribution, including establishing the Rainforest Alliance Consortium to raise awareness of sustainable agriculture

Risk and Impact Management

In the section on governance, we have described our measures to address significant physical and transitional risks related to climate change detected in scenario analysis (→P.14~P.15). Senior management deploys mitigation and adaptation strategies and manages targets under the supervision of the Board. The same applies to overall risks related to sustainability, including the degree of dependence and impact on natural capital and the creation of a circular economy. In this section, we describe our monitoring system for important risks and our response to the acute risks posed by climate change.

Risk management system

The Kirin Group has established the "Group Risk and Compliance Committee," which consists of officers at the level of senior executive officer or higher from Kirin Holdings. This committee oversees all aspects of risk management activities, including the collection of information related to risk, the formulation of Group risk policies, risk mitigation initiatives, information sharing at times of crisis and consideration of countermeasures, and instructions and support for Group companies. Risks and opportunities related to sustainability include environmental issues such as climate change, natural capital, and the circular economy; social issues such as human rights, local communities, indigenous peoples, small-scale farmers, and gender; and the mutual relationships between such issues and regulatory responses (under our risk management system, "opportunities" are included in the management of "risks").

The Board deliberates basic policies concerning important risks for the Group and risk management developed by the Group Risk and Compliance Committee and receives quarterly reports on risk monitoring. Both the Board and the Group Risk and Compliance Committee receive risk status reports from the Secretariat on a monthly basis. Group companies use similar processes as those determined by the Board of Kirin Holdings to conduct risk management, based on basic policies for important risks and risk management, including the aforementioned sustainability-related risks and opportunities. Kirin Holdings monitors important risks for each Group company for each functional division.

*1 Please see "Identification of Materiality" (→P.8) for details concerning the identification of materiality for risks and opportunities related to environmental issues, including climate change.
*2 Details of our "risk management system" are disclosed below.
(https://www.kirinholdings.com/en/purpose/governance/risk_management/)
*3 The Kirin Group revised the "Kirin Group Human Rights Policy" on November 8, 2023, in order to advance our human rights initiatives toward global, high-level industry standards.
https://www.kirinholdings.com/en/impact/community/2_1/policies/

Management of risks related to sustainability

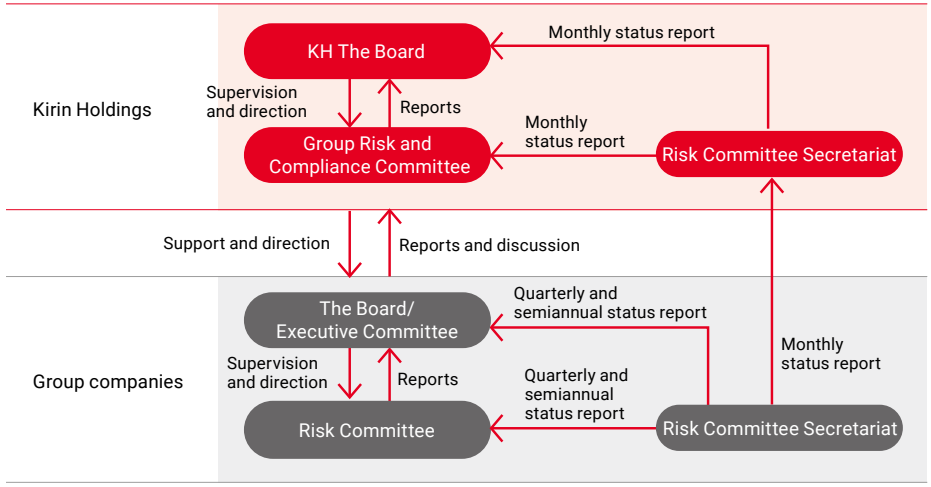
The management of risks related to sustainability includes torrential rains, floods, droughts, and wildfires, which are physical and acute risks related to climate change, and which are becoming more frequent and severe. When such climate disasters occur, the Group or the relevant company's Risk and Compliance Committee discusses the matter, and countermeasures are promptly implemented. When we expect the impact to be significant, we respond based on all-hazard mode*4 business continuity plans (BCPs). The Board of Kirin Holdings receives reports on the status of crises expected to have a significant impact as appropriate and issues necessary instructions. After a response to an individual crisis has been completed, we review the risks involved and the progress of measures to respond, and share our experience within the Group in the form of revisions to response manuals and BCPs, contributing to a sustained strengthening of management resilience. For example, we utilized knowledge gained from dealing with the 2011 flood in Queensland, Australia, to speed up the reopening of the brewery following the 2022 flood in that area. We also leverage this knowledge to strengthen our plants and breweries' ability to respond to floods that occur every year in Japan. Furthermore, we leveraged our experience of torrential rain in western Japan in 2018 to protect logistics functions during Typhoon Hagibis in the following year, 2019.

*4 An all-hazard BCP is a business continuity plan that focuses on countermeasures against the loss of management resources, such as when employees and facilities are affected by disasters, and the suspension of head office functions, rather than our approach to individual crisis events

Improving risk response capabilities

For physical and transition risks such as climate change, which will have an extremely large impact on our businesses if they occur, even though the probability of occurrence is uncertain, we have adopted a new approach to identify and examine important risks by setting scenarios and using them to analyze and assess risks. In scenario analysis, we utilize various research papers, science-based risk assessment tools such as Aqueduct, etc. We have already begun assessing the identification of dependencies, impacts, risks, and opportunities related to natural capital, both directly and in the upstream and downstream value chains, on a trial basis, in accordance with the TNFD guidance, and we intend to incorporate it as a regular process in the coming years. The Group Environmental Meeting and the Group CSV Committee share and discuss risks and opportunities identified through these processes, then they are not only submitted and reported to the Board, but the Group Risk and Compliance Committee Secretariat also receives reports on such risks, and manages them together with other risks. Additionally, we share internal examples of sustainability-related risks, such as responses to climate disasters, within the Group in order to strengthen resilience across the Group as a whole.

Risk management system

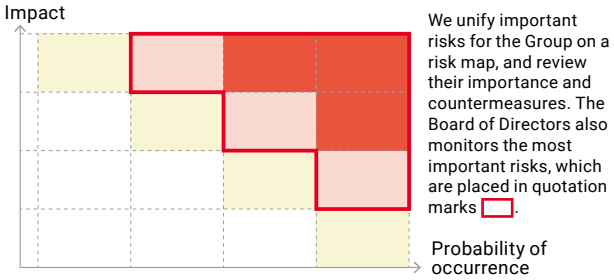


*5 The risks described above include opportunities.

Impact measurement

The Kirin Group measures the impact of important risks based on their financial impact and probability of occurrence. We manage these risks in a unified manner on a risk map, and the Board monitors and takes measures to address high-impact risks.

Risk matrix



Significant Risks and Opportunities

As described, we have analyzed and assessed sustainability-related risks related to the interconnectedness of climate change, natural capital, the circular economy, and social issues using scenario analysis and other methods. We have summarized significant risks and opportunities identified as a result in the table below. For physical risks, we have mainly analyzed risks related to major agricultural raw materials and water resources in relation to businesses ranging from food and beverages to pharmaceuticals, particularly the alcoholic and non-alcoholic beverages businesses. For transitional risks, we have analyzed energy and agricultural products, which account for a large share of procurement costs.

For natural capital, we have narrowed the scope of analysis by considering location, dependency, and the impact on nature and our businesses. In the case of containers and packaging, we set the scope of analysis after comprehensively taking into consideration resource recycling and related impacts on climate change and natural capital.

In terms of business opportunities, we have analyzed areas such as health, which is a key area for value creation through our businesses, and an area where we think we can contribute to social issues caused by climate change.

Risk/opportunity	Classification	Category	Main risk	Impact	Impact			Severity			Countermeasures
					S	M	L	S	M	L	
Physical risk	Chronic risks	Climate change and natural capital	Declining yields of agricultural products and procurement costs Changes in the state of nature	・Procurement costs due to reduced agricultural yields (2 ° C scenario: approximately 1.3 billion yen to 3.4 billion yen in 2050, 4° C scenario: approximately 3.6 billion yen to 13.7 billion yen)		●	●			■	・Utilization of brewing technology that does not depend on barley ・Utilization of mass plant propagation technology ・Support for the acquisition of certification by sustainable farms ・Prevention of global warming by reducing GHG emissions
		Containers and packaging and natural capital	Damage to natural capital by improper disposal of used containers	・Negative impact on life in river basins and oceans ・Expenses associated with measures to address ocean pollution (approximately 1.1 billion yen)	●	●			■		・Increase in horizontal recycling of plastic ・3R and beautification awareness activities
	Acute risks	Climate change and natural capital	Disruptions to operations owing to floods	・Historical examples of actual flood damage (approximately 1.0 billion yen to 5.0 billion yen) ・Exposure to 200-year disasters (total of 20 locations in Japan: approximately 1.0 billion yen)	●	●	●		■		・Sharing of knowledge concerning responses to flood and capital investment ・Appropriate insurance coverage
		Climate change and natural capital	Impact on shipping & delivery owing to floods	・Risk of flooding at shipping ports for raw materials	●	●	●		■		・Sharing of knowledge on responses to floods ・Diversification of suppliers
		Climate change and natural capital	Disruptions to operations owing to droughts	・Impact from decline in production owing to droughts (approximately 30 million yen to 600 million yen)	●	●	●	■			・Advanced technologies for water use reduction ・Sharing of knowledge concerning responses to droughts
		Climate change and natural capital	Impact on agricultural products owing to floods and droughts	・High water stress in most production areas ・Increase in natural disasters in production areas	●	●	●			■	・Responses to water stress in areas producing agricultural raw materials ・Prevention of soil runoff at areas producing agricultural raw materials
		Climate change and natural capital	Impact of diseases and air pollution on agricultural products	・Declining quality of agricultural products due to smoke and air pollution ・Spread of disease	●	●		■			・Research measures from a long-term perspective
Transitional risks	Policy	Climate change	Carbon pricing and energy procurement costs	・Energy procurement costs (2° C scenario: approximately 9.4 billion yen in 2030, 4° C scenario: approximately 5.1 billion yen in 2030, 1.5° C scenario: approximately 10.2 billion yen in 2030.)		●	●		■		・Profit and loss neutral reduction of GHG emissions in brewing and manufacturing ・GHG emission reductions through logistics optimization
		Climate change	Financial impact on the procurement of agricultural products due to carbon pricing	・Procurement costs due to reduced agricultural yields (2 ° C scenario: approximately 0.9 billion yen to 4.4 billion yen in 2050, 4° C scenario: approximately 2.4 billion yen to 8.8 billion yen in 2050.)	●	●			■		・Utilization of mass plant propagation technology ・Support for the acquisition of certification by sustainable farms
		Climate change	Impact on assets	・Difficulty in recovering investment in facilities and equipment due to legal restrictions, etc. ・Damage to facilities and equipment due to flooding, etc.		●	●	■			・Understand technological trends in facilities, equipment, etc., and reflect them in capital investment plans ・Understand risks related to water and reflect them in BCPs
		Climate change	Cost of regulatory response	・Increase in human resources ・Increase in cost of response		●	●	■			・Development of infrastructure for the disclosure of information ・Enhancements to the sustainability of raw material production areas ・Nature Positive through businesses
		Natural capital	Incompatibility with rapid agricultural policy transitions	・Chain collapse of agricultural infrastructure caused by extreme bans on agricultural chemicals and fertilizers without preparation	●	●	●		■		・Support for training farmers in sustainable agriculture ・Appropriate engagement with experts and policymakers
	Technology	Climate change, natural capital, containers and packagin	Research and development capabilities	・Possibility that research contributing to decarbonization will not be put to practical use at the expected timing	●	●	●		■		・In-house packaging development technology ・Research and development on climate change and natural capital
		Climate change	Engineering capabilities	・Introduction of facilities and equipment at appropriate times and prices	●	●	●	■			・Strengthen engineering functions ・Understand technological trends and flexibly introduce technology, facilities, and equipment

Risk/opportunity	Classification	Category	Main risk	Impact	Impact			Severity			Countermeasures
					S	M	L	S	M	L	
Transitional risks	Markets	Climate change, containers and packagin	Social resistance to fossil-derived raw materials	・Growing negative impression of PET bottles	●	●		■			・Plastic resource recycling
		Climate change and natural capital	Concerns surrounding the destruction of forests	・Decrease in confidence in the amount of GHGs absorbed and stored through forests, etc.	●	●		■			・Promotion of sustainable forestry and agriculture
		Climate change	High energy prices	・Possibility that natural gas and oil prices do not fall							・Steady implementation of the roadmap for the "SBT 1.5° C" target
	Reputation	Climate change, natural capital, containers and packagin	Opportunity loss due to ethical consumption	・Decline in the assessment of our brand	●	●	●	■			・Appropriate communication to consumers
		Climate change and natural capital	Concerns about renewable energy facilities	・Opposition to installation from regions where power plants are constructed	●	●	●	■			・Introduction of renewable energy that does not have a negative impact on the environment or local communities
		Climate change, natural capital, containers and packagin	Loss of trust from long-term investors	・Loss of trust due to lack of adequate disclosure ・Increase in cost of capital	●	●	●		■		・Appropriate disclosure in line with the TCFD and TNFD frameworks
		Natural capital	Responsibility for pollution of the natural environment	・Compensation, fines, administrative dispositions, and loss of social trust	●	●	●	■			・Improvements to environmental management systems
Systemic risk	Stability of food and social systems	Natural capital	Uncontrolled expansion of conversion into crops for biofuel	・Reduction of agricultural land for food	●	●	●	■			・No use of inappropriate biofuels converted from farmland for food
		Natural capital	Ecosystem damage due to the abandonment of farmland	・Decline in ecosystem services	●	●	●	■			・Engagement with agricultural production areas and provision of training
		Natural capital	Ecosystem collapse	・Loss of ecosystem resources on agricultural land due to years of use of agricultural chemicals	●	●	●		■		・Ecosystem restoration activities focusing on hedgerow-style cultivation
Business opportunity	Markets	Climate change and natural capital	Expansion of heat stroke due to global warming	・Concerns related to increases in the number of infections and regions affected ・ Northward movement of the habitat of the Aedes albopictus	●	●	●		■		・Contribution in Health Science domain
		Climate change	Increase in heatstroke caused by global warming	・The National Institute for Environmental Studies expects the number of excess deaths related to heat to increase between 4 and 10 times under the 4℃ scenario	●	●	●	■			・Contribution with products to address heatstroke
	Products and services	Climate change	Products that contribute to decarbonization	・Possibility that products will be required that contribute to decarbonization or the shift to a low-carbon society		●	●	■			・Carbon-free products, etc.
	Resource efficiency	Climate change	Loss of sustainability of logistics	・Decline in product supply capabilities	●	●	●	■			・Stable transport and reduction of GHG emissions through more efficient deliveries
		Climate change	Reduction of container raw materials and stable procurement [climate change, containers and packaging, short to long term]	・Demands for the 3Rs and reduction in costs from the move to lightweight containers	●	●	●	■			・Container weight reduction and improvement of rate of recycled PET resin use
	Energy sources	Climate change	Demand gap and spike in prices of fossil fuels	・Increase in energy costs	●	●	●		■		・Achievement of an optimal energy mix
		Climate change	Stable procurement of renewable energy	・Increase in demand and tight supply and demand for renewable energy	●	●	●	■			・Use of renewable energy with a focus on additionality
	Resilience	Climate change, natural capital, containers and packagin	Strengthening the supply chain	・nsuring the stability of the procurement of agricultural raw materials and reduction of Scope 3 GHG emissions	●	●	●		■		・Strengthen engagement with production areas and suppliers

Metrics and Targets

Progress on medium-term GHG emissions reduction target approved by SBT (2023) (unit : tCO_2e)

■ Scope1+2

		Total
Scope1+Scope2		565,552
	Scope1	353,404
	Scope2	212,148
Reduction rate (compared to 2019 base year)		-31%

■ Scope3

			Total
Scope3			3,375,967
Upstream	1	Purchased goods and services	2,252,662
	2	Capital goods	211,742
	3	Fuel and energy-related emissions not included in Scopes 1 and 2	142,062
	4	Transportation and distribution (upstream)	415,350
	5	Waste generated in operations	28,800
	6	Business travel	5,684
	7	Employee commuting	8,774
	8	Leased assets (upstream)	0
Downstream	9	Transportation and distribution (downstream)	246,338
	10	Processing of sold products	0
	11	Use of sold products	9,459
	12	End-of-life treatment of sold products	55,095
	13	Leased assets (downstream)	0
	14	Franchises	0
	15	Investments	0
Reduction rate (compared to 2019 base year)			-10%

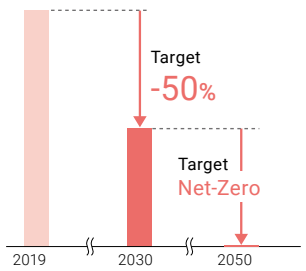
Impact for the Circular Economy (2023)

■ Reduction in impact

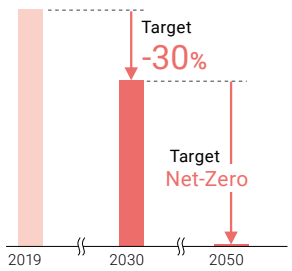
		Total
Reduction in resources (KB, KBC)	Aluminum cans	22,477t
	Glass bottles	696t
	PET bottles	5,259t
	Cardboard cartons for products	5,814t
	6-can packs	3,876t
Returnable glass bottles (KB)	Collection rate	96%

Target

Total emissions targets for Scope 1 and Scope 2*1



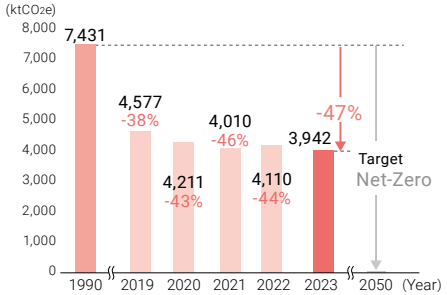
Scope 3 emissions target*1



*1 In December 2020, we upgraded our previous "SBT for 2°C" target, and received approval for our "SBT for 1.5°C" target.

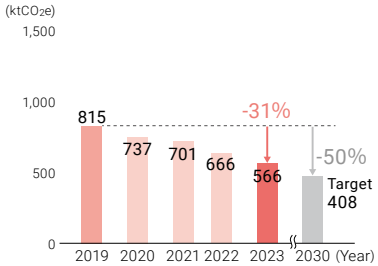
Progress

GHG emissions across the whole value chain

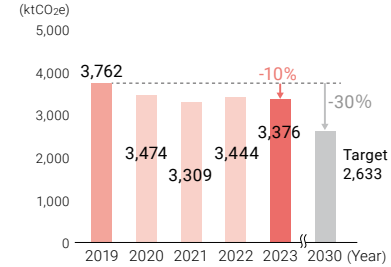


Progress toward medium-term GHG emissions reduction targets

Total emissions for Scope 1 and Scope 2

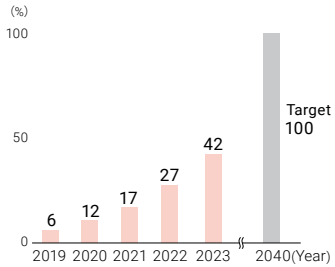


Scope 3 emissions



Progress toward the target for increased use of renewable energy

Ratio of renewable energy in plant purchased electric power



Measurement index number	Key factors of changes in nature	Indicator	Details of the measurement index
–	Climate change	GHG emissions	Published under "Metrics and Targets" "Progress on medium-term GHG emissions reduction target approved by SBT" in this report
C1.0	Change in land/ freshwater/ocean use	Total spatial footprint	For agricultural products subject to materiality analysis, the FAO indicates the following acreage per unit yield (ha/t/year). ●Black tea leaves: 0.177 ●Cardboard: 0.0186 ●Cartons: 0.0186 ●Palm oil: 0.0706 ●Coffee beans: 1.132 ●Soybeans: 0.3835 ●Barley: 0.3044 ●Hops: 0.6497 ●Wine grapes: 0.0898 * The land use area for Japanese projects calculated using ESCHER in 2014 is 228,126 ha.
C1.1		Scope of land use change	Rainforest: 42,592ha(Area of tea farms in Sri Lanka that have obtained Rainforest Alliance certification with the support of the Kirin Group) Temperate monsoon: 50ha (area of self-managed vineyards in Japan)
		Land areas that have voluntarily conserved or restored ecosystems	42,592ha (Area of tea farms in Sri Lanka that have obtained Rainforest Alliance certification with the support of the Kirin Group) Approximately 25ha (Area of micro watersheds on Sri Lanka tea farms conserved with the support of the Kirin Group. Internal size of the above certified farms) Approximately 50ha (area of self-managed vineyards in Japan)
		Land managed in a sustainable manner	Land managed in a sustainable manner 29ha (area of Mariko Vineyard certified as a SEPLS site)
C2.0	Contamination/ decontamination	Total amount of pollutants released into soil by type	No release of pollutants into soil at plants/breweries. Vineyards for Japan Wine and Sri Lankan tea farms (suppliers) use agricultural chemicals listed on white lists within standards.
C2.1		Wastewater drainage	Published under "Water Resources," "Trend in wastewater volume by destination (entire Group)," and "Reduction of Waste and Prevention of Pollution," "Wastewater quality (entire Group)" in the "ESG Databook."
C2.2		Waste generation and treatment	Waste: Published under "Reduction of Waste and Prevention of Pollution," "Volume of waste generated (entire Group)" in the "ESG Databook." Reduction rate of product waste loss: Published under "Food Waste Reduction and Recycling" in this report.
C2.3		Plastic pollution	5,259t (We have determined that most of our plastic usage is PET resin for bottles, and we have disclosed the amount of PET bottles used)
C2.4		Total air pollutants other than greenhouse gases	Published under "Trend in emissions of air pollutants," "Trends in emissions of NOx and SOx (entire Group)" and "Trends in emissions of VOCs (Japan, Kyowa Kirin Group and Kyowa Hakko Bio Group)" in the "ESG Databook."
C3.0	Resource use/ resource replenishment	Water intake and consumption from water-scarce regions	Published under "Water Resources," "Trend in water use volumes (by region)" in the "ESG Databook."
C3.1		Amount of high-risk natural primary products procured from land	Published under "Biological Resources," "Usage of palm oil in primary and secondary raw materials" in the "ESG Databook."
C4.0		Braceholder indicator (measures against invasive species)	We have not performed calculations because it is a breakholder indicator and detailed criteria are unclear
C5.0	Status of nature	Breakholder indicator (status of the ecosystem)	We have not performed calculations because it is a breakholder indicator and detailed criteria are unclear
		Breakholder indicator (species extinction risk)	We have not performed calculations because it is a breakholder indicator and detailed criteria are unclear
C7.0	Risk	Assets, liabilities, revenues, and extraordinary amounts assessed as vulnerable to nature-related transition risks	●1.5℃ scenario: Approx. 10.2 billion yen (2030) ●2℃ scenario: 9.4 billion yen (2030) ●4℃ scenario: 5.1 billion yen (2030) (Financial impact on agricultural products due to carbon pricing)
C7.1		Assets, liabilities, revenues, and extraordinary amounts assessed as vulnerable to nature-related physical risks	●2℃ scenario: 1.3 billion yen to 3.4 billion yen (2050) ●4℃ scenario: 3.6 billion yen to 13.7 billion yen (2050) (Financial impact of reduced agricultural yields due to climate change)
C7.2		Fines incurred during the fiscal year due to negative impacts related to nature.Fines, details and amounts of lawsuits filed	None
C7.3		Amount of capital expenditures or investments targeting nature-related opportunities, by type of opportunity, with reference to the green investment taxonomies of governments or regulatory authorities, where relevant, or third-party industry or NGO taxonomies	Approx. 150 million yen (expenditure on support for the acquisition of certification for tea farms in Sri Lanka, ecological surveys in Japan Wine vineyards, etc.)
C7.4		Growth and percentage of revenue from products and services that have a viable positive impact on nature, and explanation of those impacts	We expect that this would cover products such as Kirin Gogo-no-Kocha made with tea leaves from certified farms and Japan Wine made with grapes grown in hedgerow-style vineyards that contribute to Nature Positive, but we have not estimated the financial impact.

External Evaluation

The Kirin Group conducts transparent information disclosure to its investors and other stakeholders.
As such, we have been selected for and rated by the following global indices.

CDP "water security" category "A-List" (eight consecutive years)

"Gold Award" in the "Environmentally Sustainable Company Category" for the first two years, and "Special Award" the fourth year

* Declined in FY2021 due to receiving the award for two consecutive years

CDP Supplier Engagement Rating "Leader Board" (six consecutive years)

"SDGs Strategy and Economic Value Award" at the Fourth Nikkei SDGs Management Grand Prix (four consecutive years)

The "Kirin Group Environmental Report 2020" won the "Climate Change Reporting Grand Prize (Minister of the Environment Award)" in the 24th Environmental Communication Award

Development of Lightweight PET Bottle "the 46th Kinoshita Prize for packaging technology"

*1 The picture of the product is the one that was available at the time of the award.

New Thin Film Deposition Technology for PET bottles WorldStar Award and Kinoshita Prize

The middle-sized bottle also received WorldStar Packaging Awards

Kirin School Challenge won the Encouragement Award in the Career Education Awards

Judge's Special Award in the 6th Ikimono Nigiwai Corporate Initiatives Contest

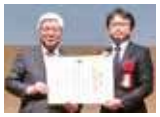
Minister of Land, Infrastructure, Transport and Tourism Award under the Excellent Green Logistics Commendation Program

Ranked No. 1 in WWF Japan's "Ranking for Corporate Measures Against Global Warming in the Food Sector"

Kirin Namacha Decaffeinated Tea Drink won WorldStar Packaging Awards

Fuji-Sankei Group Award in the 26th Global Environment Awards

Kirin School Challenge won the Judges Committee Encourage Award at the FY2017 Corporate Awards for Youth Experience Activities



Yokohama Plant won the Green Cities Awards and Green Social Contribution Award

Logistics Environmental Grand Prize at the 18th Logistics Environmental Award

King of Beasts Award in WWF Japan's "Business & Diversity Katte-ni Award"

Selected for the following indices

MSCI ESG RATINGS AA

2023 CONSTITUENT MSCI JAPAN ESG SELECT LEADERS INDEX

FTSE Blossom Japan Index

FTSE4Good

FTSE Blossom Japan Sector Relative Index

2023 Sompo Sustainability Index