Environmental Report 2025

Joy brings us together

KIRIN

2025.6

Contents

About This Environmental Report

Editorial Policy

Beginning with Fermentation and Biotechnology that the Kirin Group cultured through our founding beer business for over a century, we have a globally unique business portfolio that expands the three domains of Food & Beverages, Pharmaceuticals, and Health Science.

The sales composition of the Kirin Group's fiscal year 2024 financial results was as follows: "Alcoholic Beverages" accounted for 46%, "Non-alcoholic Beverages" for 24%, "Pharmaceuticals" for 21%, and "Health Science" for 7%.

The Kirin Group places CSV (co-creation of social and economic value) at the core of its business operations and aims to achieve sustainable growth through the cycle of value creation. Among these, we have set the environment as one of the social issues we focus on. The editing of this report has taken into account the characteristics of the Kirin Group's business and the positioning of its environmental approaches.

Structure of Corporate Information Disclosure

Information on the corporate activities of the Kirin Group, including this report, discloses a diverse range of information in the interests of shareholders and investors, as well as wide range of stakeholders in various communities, including our customers.

Kirin Holdings CSV (Creating Shared Value) Site
https://www.kirinholdings.com/en/sustainability/

Kirin Holdings Investor Relations Information
https://www.kirinholdings.com/en/investors/

Kirin Holdings The Environment Website
https://www.kirinholdings.com/en/sustainability/stakeholders/engagement/

KIRIN CSV REPORT (Integrated Report)
https://www.kirinholdings.com/en/investors/library/integrated/

Kirin Group Environmental Report
https://www.kirinholdings.com/en/investors/sustainability/env_report/

Lion Sustainability Website
https://lionco.com/force-for-good/

Kyowa Kirin CSV (Creating Shared Value) Site
https://www.kyowakirin.co.jp/csr/

Reporting Period / Boundary

FY 2024 (January 2024 - December 2024)
Where necessary, this report also contains historical data showing trends for the past 3 to 5 years.

Organization Covered by this Report(FY2024)

Business Units	Companies
Alcoholic Beverages Business	Kirin Brewery, Kirin Distillery, SPRING VALLEY BREWERY, Brooklyn Brewery Japan, Eishogen, Kirin Brewery (Zhuhai), Mercian, NIPPON LIQUOR, Wine Curation, Four Roses Distillery, Kirin City, Lion, New Belgium Brewing
Non-alcoholic Beverages Business	Kirin Beverage, Shinshu Beverage, Hokkaido Kirin Beverage, Kirin Maintenance Service, each site of Kirin Beverage Services (Hokkaido, Sendai, Tokyo, Chubu, Kansai), KIRINVIVAX, Tokai Beverage Service, Coca-Cola Beverages Northeast, Interfood, VIETNAM KIRIN BEVERAGE
Pharmaceuticals Business	Kyowa Kirin, Kyowa Kirin Frontier, Kyowa Kirin plus, Kyowa Kirin China Pharmaceutical, Kyowa Kirin (USA)
Health Science Business	Blackmores Limited, Kyowa Hakko Bio, Kyowa Pharma Chemical, Biokyowa, Shanghai Kyowa Amino Acid, Thai Kyowa Biotechnologies, Koiwai Dairy Products Company, Limited
Other Businesses (Including Corporate)	Kirin Holdings, Kirin Business Expert, KIRIN BUSINESS SYSTEM, Kirin Echo, Kirin and Communications, Kirin Engineering, KIRIN GROUP LOGISTICS

FANCL has been a subsidiary since September 2024, but is excluded from this year's reporting on environmental data. However, some of its initiatives are included in this report.

Detailed Environmental Data, Calculation Methodology, and Third-Party Assurance Report

For detailed Environmental Data, Calculation Methodology, and Third-Party Assurance Report, please refer to the ESG Data Book.

- Unless otherwise specified, environmental data is rounded to the nearest appropriate digit.
- ESG Data Book https://www.kirinholdings.com/en/investors/files/pdf/esgdatabook2025.pdf

Referenced Guidelines

- GRI Standards
- Recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD Recommendations 2017)
- Implementing the recommendations of the Task Force on Climate-related Financial Disclosures (the 2021 TCFD Annex)
- TCFD Guidance on Metrics, Targets, and Transition Plans (2021)
- Task Force on Nature-related Financial Disclosures (TNFD) Recommendations v1.0 (2023 Edition)
- IFRS S1 "General Requirements for Disclosure of Sustainability-related Financial Information" and IFRS S2 "Climate-Related Disclosures"
- SASB Alcoholic Beverages Sustainability Accounting Standard Version 2023-12

Please refer to the ESG Data Book for the comparison table.

Statements about outlook in this report, including forecasts, targets, and plans, are based on the current assessments by management at the time of preparation of the report. They contain inherent uncertainty that the outcomes will differ from the statements in this report due to changes in a variety of factors. Statements about risks and opportunities are also included in the report from the perspective of proactive information disclosure, even if they do not necessarily constitute risk factors that would have a material impact on investor decisions. The Kirin Group will, upon identification and acknowledgment of various risks associated with its business, strive to strengthen its risk management structure and to prevent and mitigate those risks, and will make its best efforts to respond to risks that become apparent.

Message from Top Management

Message from the President & COO

The Kirin Group has been engaged in CSV (Creating Shared Value) management, striving to generate both social and economic value through its alcoholic beverages, non-alcoholic beverages, pharmaceuticals, and health science businesses. We have positioned four environmental themes as critical management issues within the "Group Materiality Matrix (GMM)" and have taken an integrated approach. As if to confirm that, recent events have highlighted changes in the relationship between business and the environment, emphasizing the growing importance of strategically addressing environmental issues.

In 2025, discussions on maintaining industrial competitiveness while accelerating progress toward climate goals are intensified. Some financial institutions and authorities have withdrawn from international decarbonization frameworks or ease sustainability regulations. Meanwhile, climate disasters such as large-scale forest fires are occurring frequently. Management must steer environmental management under these highly uncertain circumstances. It is crucial to accelerate climate change adaptation and the transition to a decarbonized society as a strategic issue, while maintaining competitiveness. In September 2024, a brewery in Ashville of New Belgium Brewing, a North American craft beer company under the Kirin Group, was temporarily forced to close due to hurricane damage. The safety and well-being of local employees was given top priority, and through cooperation with partner companies and the local community, operations were able to resume before the end of the year. However, this incident served to remind us that climate change is having an impact on the Group's business.

We recognize the importance of natural capital, which forms the foundation of our business, and aim to positively impact society through our operations while considering environmental trends and regionality. With the goal of "Enrich the Earth with Positive Impact" by 2050, we are committed to advancing specific measures to address environmental issues in an integrated manner.

The "CSV Commitment" is a medium- to long-term action plan that each business undertakes to achieve the "CSV Purpose," which translates the Corporate Philosophy into social raison d'etre. We review and update our goals annually, report progress to the Kirin Holdings Board of Directors quarterly, and link it to executive performance evaluations. Through the execution of the CSV Commitment, which includes environmental initiatives, we create social value across the group, strengthen competitiveness, and drive business growth, thereby deepening our CSV management.

My creed is "Go to the gemba or actual worksites, See the actual things happening, and Know the actual situation", which applies equally to our environmental efforts. Achievements in supporting farmers to obtain the biodiversity certifications, steadily advancing decarbonization roadmaps across supply chains and business sites, launching environmentally friendly products, researching chemical recycling of PET bottles for social implementation at the Institute for Package Innovation and efficiency improvements at the distribution and sales stages—all these site-specific efforts along the value chain contribute to tangible progress. Going forward, I will continue to prioritize the opinions at worksites and strive to realize a sustainable society.

Kirin Holdings Company, Limited
Representative Director of the Board, President & COO
Group Business Execution Control

Takeshi Minakata

Message from Top Management

Message from the Officer in Charge of CSV Strategy

The message delivered at the World Economic Forum Annual Meeting (Davos Conference) — stating that annual global warming in 2024 reached 1.54 degrees Celsius above the pre-industrial average, exposing many regions worldwide to unprecedented catastrophic extreme weather — was shocking to us as we strive towards the 1.5°C target. Additionally, the significant climate disaster impacting the Asheville brewery of our group company, New Belgium Brewing, and the shortage of orange supply from Brazil due to consecutive heatwaves, underscored the impact of global environmental issues on the Kirin Group's business. Our approach to the environmental challenges related to biological resources, water resources, containers and packaging, and climate change, and the creation of positive impacts are more crucial than ever.

"Double Materiality" is a concept that considers not only the impact of the environment and society on the company (financial materiality) but also the impact of the company's activities on the external environment and society (impact materiality) when identifying the issues the company should address. This concept is crucial for future companies from the standpoint of regulatory compliance, building stakeholder relationships, and enhancing long-term corporate value. As a company aiming to be a leading CSV enterprise, the Kirin Group seeks to consider both external and internal impacts and strives for environmental management to reduce negative externalities.

The Kirin Group conducts its business activities using the bounty of nature as raw materials, as well as the power and wisdom of nature, so the conservation and sustainable use of biological resources is one of our materialities. To promote CSV, it is necessary to update risk recognition in line with changing external environments and business portfolios. With the addition of Blackmores and FANCL to the Kirin Group in recent years as part of our growth strategy to strengthen the health sciences domain, we plan to revise the "Kirin Group Action Plan for the Sustainable Use of Biological Resources" in 2025. Specifically, we are considering strategies and goal setting for the sustainable use of palm oil in cosmetics and health foods and fish oil in supplements.

To communicate our purpose, vision, initiatives, and achievements to a wide range of stakeholders, the Kirin Group has actively adopted international disclosure standards when issuing environmental reports. This report references the IFRS S1 and S2, the global baseline of sustainability standards published by the International Sustainability Standards Board (ISSB) in 2023. We support these standards, which aim to enhance the reliability and credibility of corporate disclosures related to sustainability, This report is compiled to ensure consistent understanding of the short-, medium-, and long-term environmental risks and opportunities faceing our group's business, along with our response strategies, initiatives, and outcomes. As a leading company in environmental management, the Kirin Group will continue to fulfill its accountability.

Kirin Holdings Company, Limited
Senior Executive Officer

Hiroshi Fujikawa

Environmental Management

Corporate Data

Corporate Philosophy

KIRIN brings joy to society by crafting food and healthcare products inspired by the blessings of nature and the insights of our customers.

2027 Vision

A global leader in CSV, creating value across our world of Food & Beverages to Pharmaceuticals.

"One KIRIN" Values

Passion
Our determination to continuously provide our customers and society with new value propositions based on innovative ideas, and our enthusiasm to meet goals with pride in the companies we work for and the brands we offer.

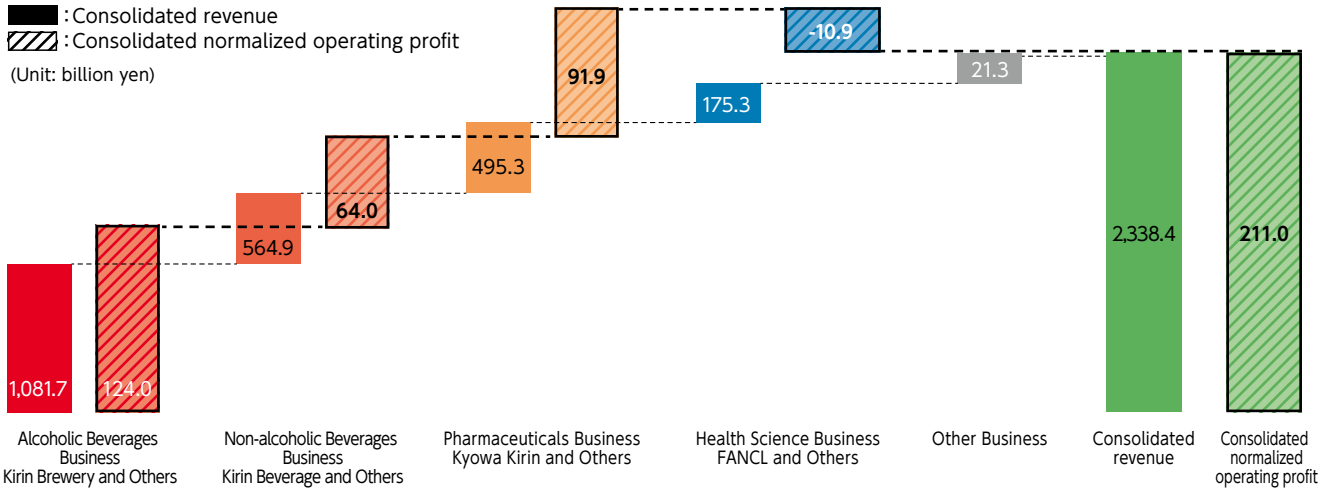
Integrity
Our gratitude to our stakeholders for always helping us move forward, and our promise to remain honest and humble in every business activity to serve them better.

Diversity
Our respect for different perspectives and values that enable constructive discussions, and our belief that the "differences" have the power to change the world and create better solutions.

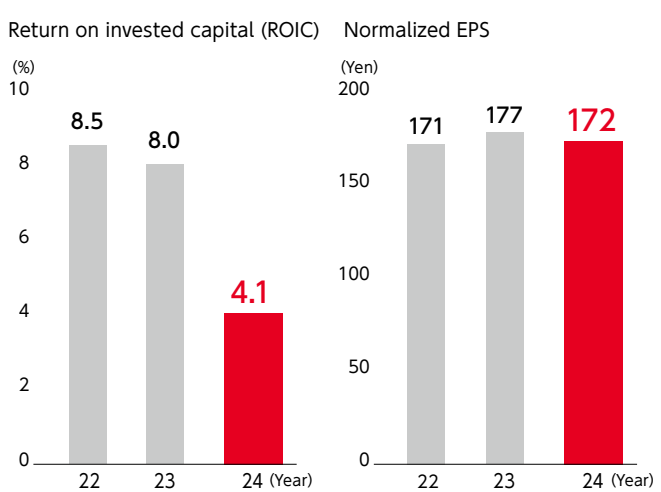
Company Overview

Company Name	Kirin Holdings Company, Limited
Establishment	February 23, 1907 * Kirin Brewery Co., Ltd. changes its name to Kirin Holdings Co., Ltd. and becomes a holding company of the Kirin Group on July 1, 2007
Head Office	NAKANO CENTRAL PARK SOUTH 10-2, Nakano 4-chome, Nakano-ku, Tokyo 164-0001, Japan
Paid-in Capital	102,046 million yen
Number of employees	31,934 * Kirin Holdings Number of employees: As of December 31, 2024

Consolidated revenue／Consolidated normalized operating profit



Financial Key Performance Indicators



Environmental Management

Identification of Materiality

The Kirin Group assessed the materiality of sustainability issues in order to formulate the Kirin Group 2022-2024 Medium-Term Business Plan, which marks the second stage toward realizing the Long-Term Management Vision, the Kirin Group Vision 2027, announced in 2022. Following the flow for identifying materiality, we updated our social environment analysis and, through dialogue with internal and external stakeholders, discussion at the senior management level, and deliberations by the Board, we updated our "Management Issues for Sustainable Growth (Group Materiality Matrix)" with a 10-year outlook. In addition, there is a separate explanation of materiality in the general requirements of the TCFD (Task Force on Climate-related Financial Disclosures)/TNFD (Task Force on Nature-related Financial Disclosures).

In this process, we identify the issues that are most material to the Kirin Group and its stakeholders and consider where the Kirin Group can have positive impacts. As a result, we reconfirmed that the following four important themes related to the environment that we set in the Kirin Group's Environmental Vision 2050 are highly material for the Kirin Group management: "Sustainable use of biological resources," "Sustainable use of water resources," "Sustainable recycling of containers and packaging," and "Overcoming climate change."

The TNFD Guidance (Recommendations of the Task Force on Nature-related Financial Disclosures) v1.0, published in September 2023, recommends an integrated approach to climate and nature related issues. In the 2013 Kirin Group's Environmental Vision 2050, the Kirin Group adopted a holistic approach to address the four environmental issues of biological resources, water resources, containers and packaging, and climate change as "interrelated environmental issues" rather than independent ones. This is a philosophy and concept that the Kirin Group has consistently pursued ever since it shifted its focus to environmental activities with a global perspective. As a leading company that has adopted the holistic approach, the Kirin Group aims to contribute to the dissemination of this philosophy and the resolution of environmental issues.

Flow for the identification of materiality

Identifying management issues
We identified issues based on reporting guidelines such as ISO26000, GRI, and SASB, evaluation items from ESG rating providers such as FTSE, MSCI, and Sustainalytics, and SDG targets.

Conducting internal evaluations
Based on objective information on social issues, such as NGO/NPO reports and media information, we exchanged opinions at the Group Executive Committee regarding the impact of social issues on our business activities and the impact of our business activities on society.

Conducting stakeholder engagement
Based on the results of our internal evaluation, we requested opinions from investors, NGOs, NPOs, and employees (labor unions).

Determining materiality
The results, which reflected the opinions of stakeholders, were then discussed at the Group CSV Committee and then resolved at a Board of Directors meeting.

Management Issues for Sustainable Growth (Group Materiality Matrix) (Updated in 2024)

● Responsibility of Kirin Group Which Runs Alcoholic Beverage Businesses
● Health and well-being ● Community Engagement ● The Environment ● Fundamentals of Corporation

Impact on Stakeholders	small	medium	large
large	● Improvement of access to nutrition	● Initiating new approaches to meet medical needs that go beyond pharmaceuticals ● Support for the prevention of non-communicable diseases ● Sustainable development of communities in raw material production areas and business development regions. ● Sustainable use of biological resources ● Sustainable use of water resources ● Sustainable recycling of containers and packaging ● Overcoming climate change	● Dealing with alcohol-related problems ● Ensuring food safety and security ● Ensuring quality assurance and a stable supply of pharmaceuticals ● Creating and supplying life-changing pharmaceuticals ● Creating bonds and trust for people's well-being ● Respect for human rights
medium	● Ensuring freedom of food choice	● Helping to maintain and improve physical and mental performance ● Ensuring compliance and ethics-oriented business practices	● Support for maintaining the immune system ● Ensuring occupational health and safety ● Having human capital development for value creation ● Promoting diversity, equity and inclusion ● Improving the effectiveness of corporate governance ● Reinforcing risk management ● Protection of personal information
small	● Ensuring tax transparency	● Revitalization of the food-related economy ● Building sustainable logistics ● Countermeasures against cyber attacks	● Implementation of health and productivity management ● Realizing a workplace where employees can work in a lively and active way ● Strengthening group governance

Impact on the Group's business

Environmental Management

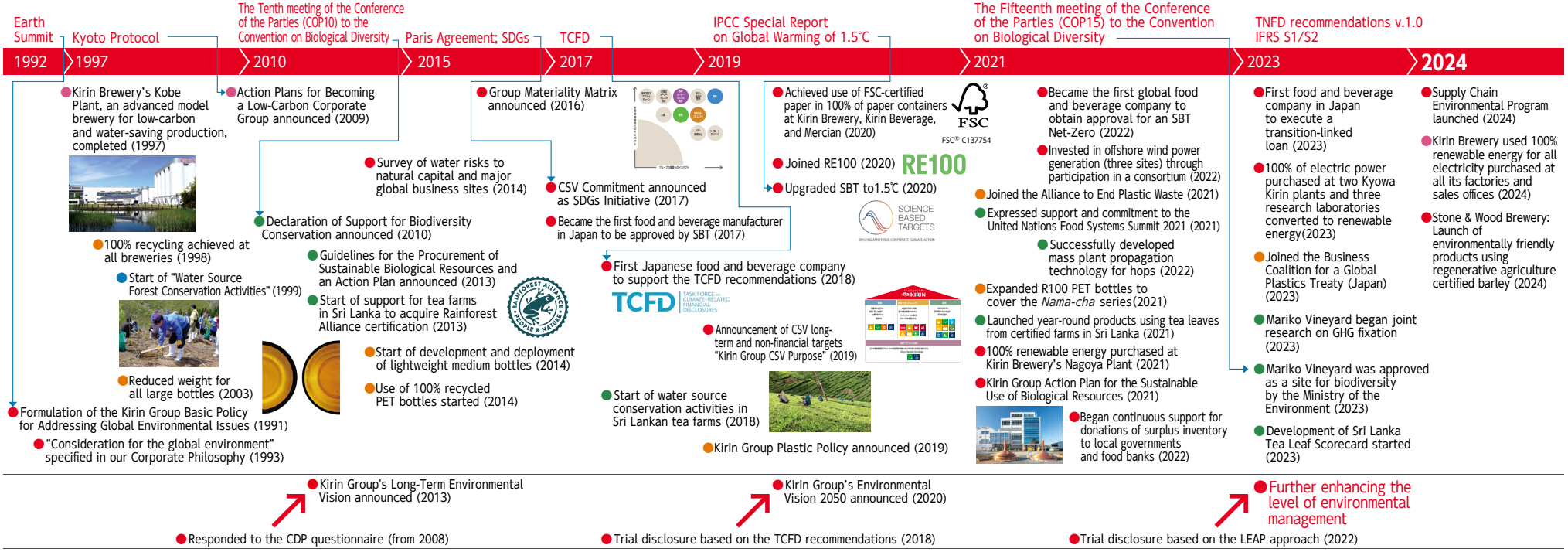
Global Trends and Kirin Group's Actions

The Kirin Group has stayed ahead of global movements and has raised the level of its environmental management by proactively testing new initiatives. In anticipation of the 1992 Earth Summit in Rio de Janeiro, the Kirin Group established its Basic Policy for Addressing Global Environmental Issues in 1991. The following year, in 1993, we revised our management philosophy to state that "we aim to be a corporate group that considers the global environment," and shifted our environmental management focus from pollution control to activities that take the entire planet into consideration. Since then, we have undertaken a number of industry-first initiatives, including making a corporate presentation at the Third Conference of the Parties to the United Nations Framework Convention on Climate Change held in Kyoto in 1997, starting our Water Source Forest Conservation Activities in 1999, making our returnable beer bottles the lightest in Japan in 2003, and making 100% of our paper containers FSC®-certified paper in 2020.

The Kirin Group has adopted an advanced disclosure framework to further raise the level of environmental management. Around 2008, we started responding to questionnaires from CDP (the then Carbon Disclosure Project). At the time in Japan, ESG was not yet considered an important issue, but responding to CDP's questionnaire was seen as an effective way to deepen understanding of global environmental issues. Appropriate responses to CDP led to the Kirin Group having a multi-layered understanding of environmental issues and to the Kirin Group's Environmental Vision 2050, which was announced in 2013. Furthermore, in order to respond to the TCFD guidance published in 2017, the Kirin Group began conducting scenario analysis early on. As a result, the need to approach the environmental themes of "biological resources," "water resources," "containers and packaging," and "climate change" as interrelated issues in an integrated manner rather than as separate issues has spread to everyone from management to employees. This common understanding became the foundation for the improvement of environmental management.

In 2024, "Supply Chain Environmental Program" was launched, extending environmental initiatives beyond our own operations to the entire supply chain. With global ethical consumption expanding, particularly among environmentally conscious younger generations, Stone & Wood Brewery under Lion Australia released environmentally friendly products using sustainable ingredients like barley certified for regenerative agriculture.

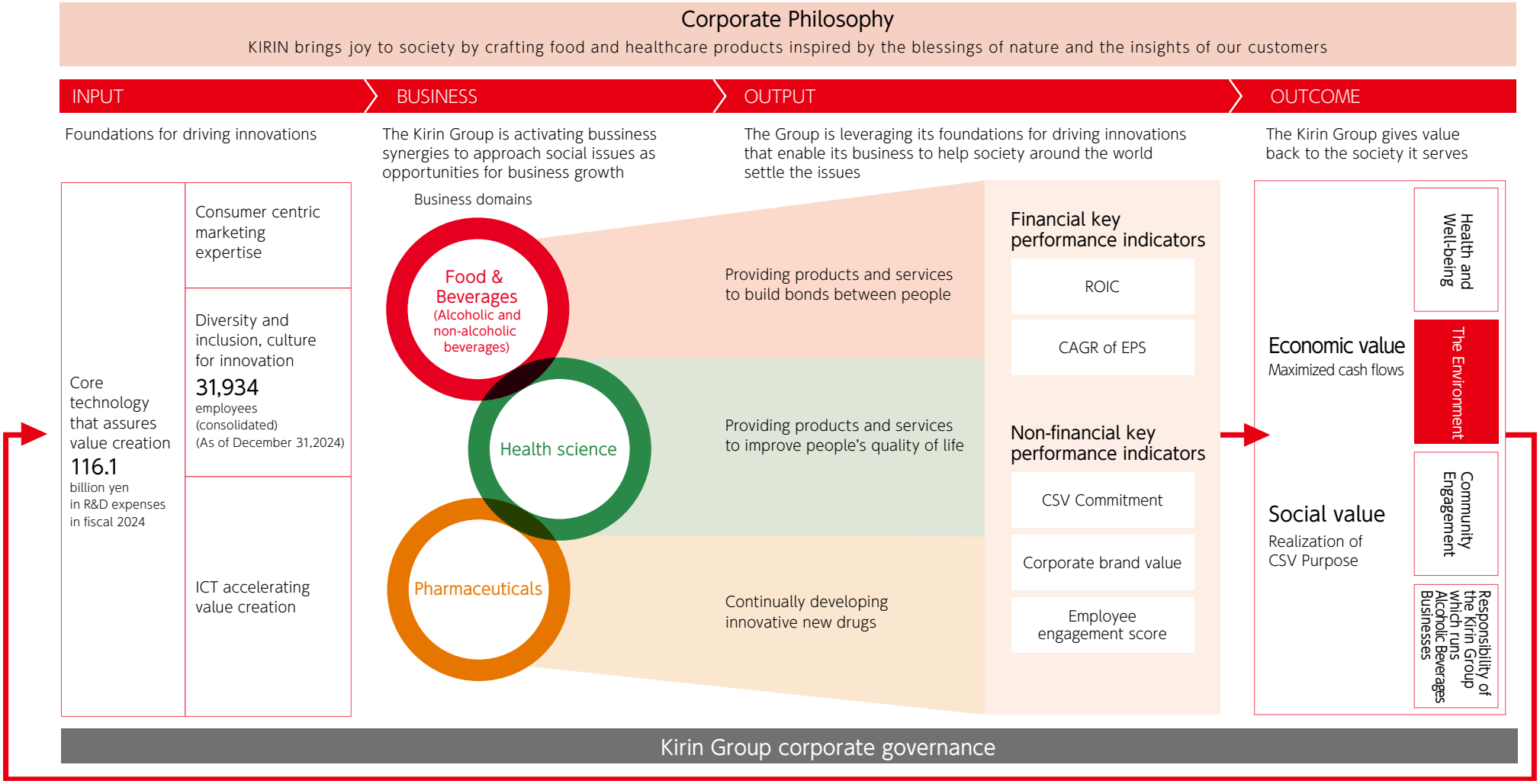
Although pioneering initiatives involve risks, we believe that they enable us to obtain a great deal of feedback, The Kirin Group will lead the way in building a decarbonized society, Nature Positive, and Circular Economy by continuing its pioneering efforts to address global environmental challenges.



Environmental Management

Kirin Group's Value Creation Model

The Kirin Group places CSV (Creating Shared Value) at the core of its management. We will work to solve social issues through our business activities and achieve sustainable growth together with society by simultaneously creating social and economic value over the short, medium and long term. The "value creation model" illustrates a sustainable mechanism for amplifying the two types of value creation by reinvesting the economic value gained in our organization's capabilities. Business development through the three domains of food, pharmaceutical, and health science requires the use of natural capital and the resolution of environmental challenges such as container packaging and climate change. Through the resolution of these issues and the sustainable use of natural capital, our business creates value that gives back to society. In the value creation model, the non-financial goal of the "environment" is shown as an important factor. Under the "Kirin Group's Environmental Value Correlation," we explain how environmental issues relate to the Kirin Group's value creation model. →P.11



Environmental Management

Kirin Group's Environmental Vision 2050

Enrich the Earth with Positive Impact

Society has reached a major turning point against the backdrop of growing global environmental problems, including the climate crisis, the ongoing loss of biodiversity, and plastic pollution of the oceans. Industries such as the Kirin Group, which rely on natural bounty such as water and agricultural products, are susceptible to environmental problems and there is need to address such issues urgently.

Through scenario analysis based on the TCFD recommendations, which has been conducted since 2017, the Kirin Group has grasped the seriousness of the impact that climate change have on agricultural products and water resources. We have learned that in order to pass on a sustainable Earth to future generations, it is not enough to simply minimize negative impacts and achieve neutrality. Furthermore, corporate environmental policies are expected to evolve from being self-contained within a company to having a positive impact on society as a whole.

In order to respond to such societal demands, the Kirin Group has further developed the idea of an "integrated" approach that holistically addresses complex and interrelated environmental issues (biological resources, water resources, containers and packaging, and climate change) into our revised the "Kirin Group's Environmental Vision 2050" and "Positive Impact" approach, which were discussed and resolved by the Board in 2020.

Under this new Vision, together with the young people who will lead the future, we will create a prosperous world for the next generation.

Kirin Group's Environmental Vision 2050

Enrich the Earth with Positive Impact

Important Message
Positive Impact
Going beyond the scope of self-contained efforts and initiatives, we will expand the scope of our efforts to include society as a whole, and build the future together with society, including the young people who will lead future generations.

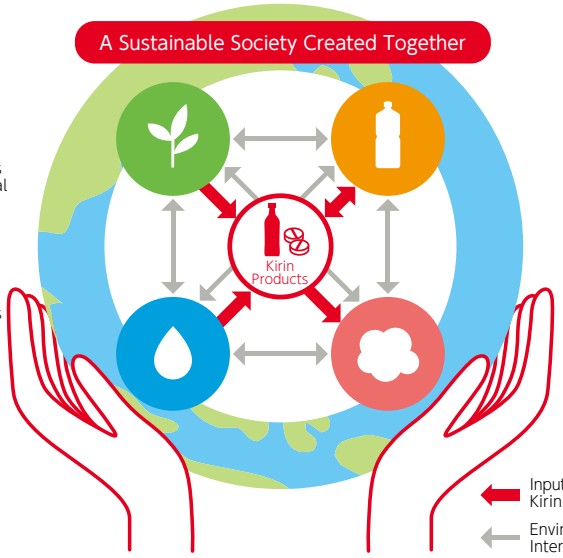
A Sustainable Society Created Together

Biological Resources
A society that values sustainable biological resources.

Water Resources
A society that values sustainable water resources.

Containers and Packaging
A society that circulates containers and packaging in a sustainable way.

Climate Change
A society that has overcome climate change.



Input to and Output from Kirin Group Products
Environmental Interactions

Kirin and its broad range of stakeholders enrich society and the Earth for future generations through positive impact on people and the environment.

Approach
Holistic
Environmental Materiality
Biological Resources | Water Resources | Containers and Packaging | Climate Change
These are interrelated and individual responses will result in trade-offs, so they must be resolved in an integrated manner.

Efforts for Realization

Biological Resources
A society that values sustainable biological resources

Cultivate, expand and procure sustainable agricultural raw materials
- Procure agricultural raw materials that comply with certification schemes, such as FSC®, RSPO and the Rainforest Alliance.
- Cultivate agricultural raw materials that are suited to global warming and expand them to raw material production areas.
- Promote recycling and reduction of product waste, thereby bringing food waste generated by production activities to zero.

Stand by the side of farmers to make raw material production areas sustainable
- Expand support in acquiring sustainable certifications, such as the Rainforest Alliance, and solve environmental issues, etc., in production areas.
- Examine and research contributions to affluent biodiversity by sustainable agriculture and expand the outcomes to raw material production areas.

Water Resources
A society that values sustainable water resources

Bring water, used as a raw material, to a sustainable state
- Continue to reduce the volume of water use in group operational bases.
- Further promote water source forestation activities in Japan.

Solve problems with water in a way that suits the characteristics of basin regions where our business bases are located
- Minimize risk during water-related disasters by reinforcing resilience and efficiency for supply chains.
- Implement water source preservation activities and education programs to preserve water in raw material production areas, thereby solving water issues in the value chain.

Containers and Packaging
A society that circulates containers and packaging in a sustainable way

Develop and disseminate sustainable containers and packaging
- Use sustainable containers and packaging that employ recycled materials and biomass.
- Aim to develop new containers and services.

Build a resource-recycling system to make containers and packaging sustainable
- Take the lead in improving the recycling system in Japan.
- Contribute to collection of resources and establishment of recycling infrastructure in areas where operations are maintained.

Climate Change
A society that has overcome climate change

Realize Net-Zero GHG emission from the entire value chain
- Achieve RE100 at an early stage and source the company's energy from 100% renewable energy.
- Realize Net-Zero GHG emissions in the entire value chain.

Lead to build a decarbonized society
- Build a business model that contributes to a decarbonized society with customers and other stakeholders.
- Support research to mitigate climate change and expand responsible renewable energy to society.

Environmental Management

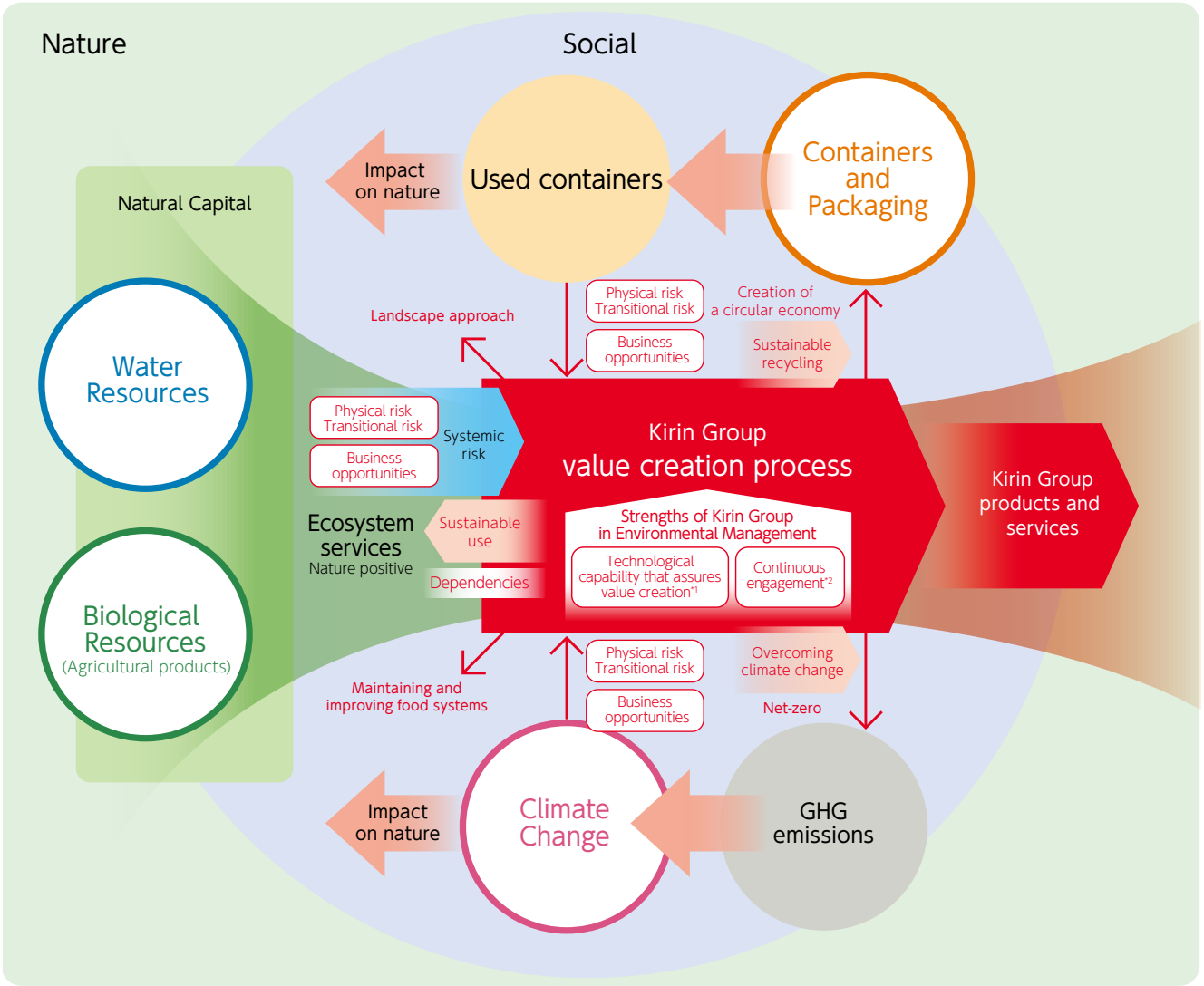
Kirin Group's Environmental Vision 2050

Expanding the Scope of Positive Impact

We have made some revisions to the "Environmental Value Correlation Chart," which shows the Kirin Group's integrated approach, to clarify that we will expand the scope of our positive impacts, which is a key message of our Environmental Vision. What we added was the "Landscape Approach" and the concept of "food systems."

In Sri Lanka, we decided that the procurement of certified tea leaves alone would not ensure the sustainability of our production sites, so we chose to support tea farms in obtaining certification. The Kunming-Montreal Global Biodiversity Framework (GBF) refers to the "Landscape Approach" as a method that comprehensively addresses the diverse human activities and natural environments of raw material production sites and leads to sustainable solutions to problems. The Sri Lankan case is also a solution to the problem through the concept of a "food system," which considers food not as an individual issue such as agriculture, but as a whole system involving food production, processing, distribution, consumption, and waste.

A one-dimensional view that looks only upstream and downstream, with the company at the center, could fail to realize that there are negative trade-offs for others outside the value chain, even if there seems to be a positive impact on the company. Although the landscape approach and the approach treating food as a systems take time and effort, they have a positive impact on raw material producing areas and contribute to stable procurement of raw materials and brand improvement. So, we have decided to clearly recognize and work on them as part of the Kirin Group's integrated approach.



*1 Engineering and R&D capabilities (Kirin Central Research Institute, Institute of Health Sciences, Institute for Packaging Innovation)

*2 Engagements: Contributions to rulemaking and policy recommendations (TCFD, SBTN, TNFD pilot test participation), various organizations (NGO: Rainforest Alliance), FSC Japan, WWF Japan, Earthwatch Japan, etc. Consortiums: Consortium for Sustainable Paper Use, Rainforest Alliance Consortium, Australian Climate Leaders Coalition, etc. Communities: Sri Lanka tea farms, areas around Mercian's own managed fields, etc. Next generation: Kirin School Challenge, Japan Environmental Youth Network, etc.

Environmental Management

Progress (2024)

The four themes of the Environmental Vision is reflected in the "CSV Commitment", a medium- to long-term action plan that each business is working on to achieve the "CSV Purpose." The status of their implementation is monitored on a quarterly basis and reported to the Kirin Holdings Board of Directors. Current progress toward the targets, including qualitative ones, is as follows.

Group Materiality Matrix		Particularly contribute to SDG targets	CSV Commitment							
Medium items	Theme		Approach	Our Achievements	Company/Department	Target Value	Target Year	Latest Achievements (2022)	Latest Achievements (2023)	Latest Achievements (2024)
Sustainable use of biological resources	Tea leaves	2.3 4.6 15.4	We will expand our support for acquiring Rainforest Alliance certification, which will lead to the stable procurement of tea leaves by solving environmental problems in production areas.	Number of farms supported to obtain Sri Lanka RA certification	Kirin Beverage	Farms : 15	Cumulative total 2022-2024	**Farms : 4**	**Farms : 0**	**Farms : 5**
						Small farms :5,350		**Small farms : 9**	**Small farms : 620**	**Small farms : 3,389**
	Paper	15.4	Through the procurement of FSC® certified paper and other means, we will work to ensure the sustainability of raw materials that may otherwise be destroyed by deforestation.	Usage ratio of FSC-certified paper or recycled paper for paper containers and packaging	Kirin Brewery	100%	2024	**100%**	**100%**	**100%**
					Kirin Beverage	100%	2024	**100%**	**100%**	**100%**
					Mercian	100%	2024	**100%**	**100%**	**100%**
					Koiwai Dairy Products	100%	2030	**Implementation of switching of 4 products**	**93%**	**93%**
					Kyowa Hakko Bio	100%	2030	**80%**	**80%**	**80%**
					Kyowa Kirin	100%	2030	**50%**	**74%**	**72%**
					Kirin Holdings Health Science Business Dept.	①Adoption of FSC-certificated paper : 100%	Cumulative total 2022-2024	**①100%**	**①100%**	**①No applicable items**
						②Switch to FSC-certified paper: 4 products		**②2 products**	**②0 product**	**②1 product**
						③Switch to non-metallic packaging materials: 2 products		**③1 product**	**③1 product**	**③0 product**
	Food waste	12.3	We will promote the reduction of product disposal and recycling, which will lead to a reduction in food waste generated by production activities.	Amount of product waste reduction rate	Kirin Brewery	50% (compared to 2015)	2024	**50% or more achieved**	**50% or more achieved**	**50% or more achieved**
					Kirin Beverage	50% or more (compared to 2015)	2030	**50% or more achieved**	**50% or more achieved**	**50% or more achieved**
Sustainable use of water resources		6.4	By reducing the amount of water used in our business activities, we will ensure the sustainability of water resources by conducting water resource preservation activities and other measures.	Improvement of water stewardship	Kirin Brewery	5.6l/l or less	2024	**5.6l/l**	**5.8l/l**	**5.5l/l**
					Mercian *Fujisawa Plant	3.41l/l or less	2024	**3.54l/l**	**3.60l/l**	**3.51l/l**
					Lion *Tooheys Brewery, Castlemaine Perkins Brewery, James Boag, Pride	2.4l/l or less	2025	**3.6l/l**	**3.3l/l**	**3.1l/l**
				Reduction rate of water use volumes	Kirin Beverage *Shonan Plant, Shinshu Beverage	Less than 2023	2024	**1,950,000㎥**	**1,750,655㎥**	**1,873,762㎥**
					Kyowa Hakko Bio	32% (compared to 2015)	2030	**51%**	**63%**	**66%**
					Kyowa Kirin	40% (compared to 2019)	2030	**33%**	**36%**	**34%**

Environmental Management

Progress (2024)

Group Materiality Matrix	Particularly contribute to SDG targets	CSV Commitment							
Medium items		Approach	Our Achievements	Company/Department	Target Value	Target Year	Latest Achievements (2022)	Latest Achievements (2023)	Latest Achievements (2024)
Sustainable recycling of containers and packaging	12.4 14.1	In addition to the use of recycled materials and biomass, and the development of new containers and services, we will help improve the sustainability of the PET resource cycle by building recycling systems and developing resource recovery and recycling infrastructure in the regions where we operate.	Percentage of plastic bottle recycled resin used	Kirin Brewery Kirin Beverage Mercian	50%	2027	8%	28%	36%
			Reduction of one-way plastic volume Reduction of PET volume	Mercian	PET bottles 93t Other plastic bottles 34.5t (compared to 2020)	2024	66t 13.2t	159t 20.5t	148t 24.8t
			Percentage of containers and packaging materials that can be reused, recycled, or composted	Lion	100%	2025	99%	99%	99%
			Percentage of container materials that can be recycled	Lion	50% or more	2025	62%	71%	71%
Overcoming climate change	7.2 13.1	In addition to achieving RE100 at an early stage and making 100% of the energy used by our company come from renewable energy sources, we will expand the use of renewable energy in society and work with stakeholders to build a business model that contributes to a decarbonized society.	GHG (Green House Gas) emission reduction rate: Scope 1+2	Kirin Brewery	55% (compared to 2019) 30% (compared to 2019)	2030 2024	10%	17%	30%
				Kirin Beverage	55% (compared to 2019) 17% (compared to 2019)	2030 2024	11%	16%	14%
				Mercian	55% (compared to 2019) 25% (compared to 2019)	2030 2024	6%	33%	48%
				Lion	55% (compared to 2019) 30% (compared to 2019)	2030 2024	26%	43%	43%
				Kyowa Hakko Bio	55% (compared to 2019) 32% (compared to 2019)	2030 2024	32%	47%	52%
				Kyowa Kirin	55% (compared to 2019) 51% (compared to 2019)	2030 2024	42%	55%	64%
			Ratio of renewable energy to electricity used by the entire Group	Kirin Holdings CSV strategy Dept.	100%	2040	27%	42%	49%
			GHG (Green House Gas) emission reduction rate: Scope 3	Kirin Holdings CSV strategy Dept.	30% (compared to 2019)	2030	8%	10%	10%

* This index is for the paper containers and packaging handled by each business company, and the applicable items are determined by each business company.

Environmental Management

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

In this part →P.14~75, 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 IFRS S1 and IFRS 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.

		Contents
Disclosure Material information		●The four environmental themes “Management Issues for Sustainable Growth (hereafter, GMM)” identified according to the “Identification of materiality” are biological resources, water resources, containers and packaging, and climate change. ●In the case of climate change, the risks, opportunities, and resilience that were included in the scenario analysis were assessed. ●In the case of natural capital, the key issues identified in the LEAP approach advocated by the TNFD were individually identified.
Scope of disclosure	Climate change	●Kirin Brewery, Kirin Beverage, Mercian, Lion, Kyowa Kirin, Kyowa Hakko Bio, Koiwai Dairy Products and all businesses targeted in accordance with the SBT standards have impacts and impacts on their business locations, upstream and downstream of the value chain. ●Although not included in this report, information obtained through Supply Chain Environment Program, which began in April 2024 to capture direct environmental data, will be disclosed in a timely manner.
	Water resources	●Kirin Brewery, Kirin Distillery, Mercian, Kirin Beverage, Shinshu Beverage, Koiwai Dairy Products, Kyowa Kirin, Kyowa Hakko Bio, BioKyowa, Kyowa Kirin US, Kyowa Pharma Chemical, Shanghai Kyowa Amino Acid, THAI KYOWA BIOTECHNOLOGIES. Kirin Brewery (Zhuhai). Interfood, Four Roses Distillery, Lion, New Belgium Brewing.
	Biological resources	●Kirin Brewery, Kirin Beverage, Mercian, Lion, Kyowa Kirin, Kyowa Hakko Bio, and Koiwai Dairy Products are the main targets. In accordance with TNFD recommendations v1.0, the risks and opportunities of natural capital are analyzed and evaluated to identify material issues based on impacts, dependencies, and impacts, and the scope of disclosure and impact determined. (However, since the means to obtain direct information is limited and the tools provided still have many issues, the information disclosed is limited.)
	Containers and packaging	●Kirin Brewery, Kirin Beverage, Mercian, Lion, Kyowa Kirin, Kyowa Hakko Bio, Koiwai Dairy Products.
Location of related issues	Climate change・Water resources	●GHG emitting sites, upstream and downstream of the value chain. ●Sites, upstream and downstream regions of the value chain, transportation routes, etc. that are affected by droughts, floods, and natural disasters due to climate change.
	Biological resources	●Raw materials subject to the “Kirin Group Action Plan for Sustainable Use of Biological Resources. → P.78” and their sources. ●Priority areas identified through risk and opportunity analysis in accordance with TNFD recommendations v1.0.
	Containers and packaging	●All processes until the product is delivered to the customer. ●Processes such as the recovery and recycling of used containers, as well as locations where containers are improperly disposed of and areas affected by the contamination.
Integration of other sustainability-related disclosures		●Since biological resources, water resources, containers and packaging, and climate change, which are important material themes of the Kirin Group, are interrelated and there is a risk of trade-offs in resolving individual issues, we adopted a holistic approach to resolve issues in an integrated manner. ●Conform to the individual disclosure guidance of TCFD and TNFD, and disclose interlinkages and trade-offs in the same report.
Period covered		●Periods when risk materializes: we have generally defined the short term as from the present to 2027 (Medium-term business plan period), the medium term as from 2028 to 2030 (the SDGs target period), and the long term as 2031 to 2050 (the target year for the Kirin Group’s Environmental Vision 2050). ●Since the papers used as sources of information do not necessarily correspond to this time frame, the time frame used in the papers will be used.
Engagement		●See the provisions for indigenous peoples and local community stakeholders in the FSC and Rainforest Alliance certifications adopted by the Kirin Group. ●In areas where a landscape approach can be adopted, instead of simply making decisions based on analysis and evaluation of disclosed data, enter the area and engage with local people.

Governance

Governance

Supervisory structure

In the Kirin Group, the Board of Directors deliberates and resolves on the basic policies of the 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 target achievements 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 of Directors.

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. Key agenda of the Meeting include "Sharing awareness of sustainability-related risks and opportunities and discussing strategies" and "Monitoring of progress related to roadmaps towards achieving the Kirin Group's Environmental Vision 2050 and exchanging opinions on related policies, strategies, and plans." For instance, the committee considers risks and opportunities related to major transactions such as raw material procurement and discusses the transition to regenerative agriculture and its financial impact. The discussions at the meeting are then presented to the Group CSV Committee and the Board of Directors as necessary. This structure strengthens efforts to address sustainability issues as required by the Japan's Corporate Governance Code, revised in 2021. Environmental management, including addressing climate change, is implemented as part of the 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. Regarding KPIs linked to remuneration, we have set a target of reducing GHG emissions by 28% (vs. 2019) in order to achieve the "SBT 1.5℃" for climate change, water usage (2.4 l/l) at manufacturing sites with high water stress as a target related to both climate change and natural capital, and in terms of a circular economy, "40% use of recycled resin for PET bottles in Japan." as target values for 2025.

The CSV Commitment is the mid- to long-term action plan by which each operation addresses toward realizing the "CSV Purpose," which translates our Corporate Philosophy into its social significance, based on the "Group Materiality Matrix." Environmental goals, including those related to climate change, are incorporated into this CSV Commitment as one of our non-financial KPIs. These goals are set as performance indicators for each Group company and reflected in their management plans. Progress on these goals serves as a performance evaluation indicator for the CEOs of the Group companies. From an internal management perspective, we review and update the targets annually, monitor progress quarterly, and report to the Kirin Holdings Board of Directors.

Governance

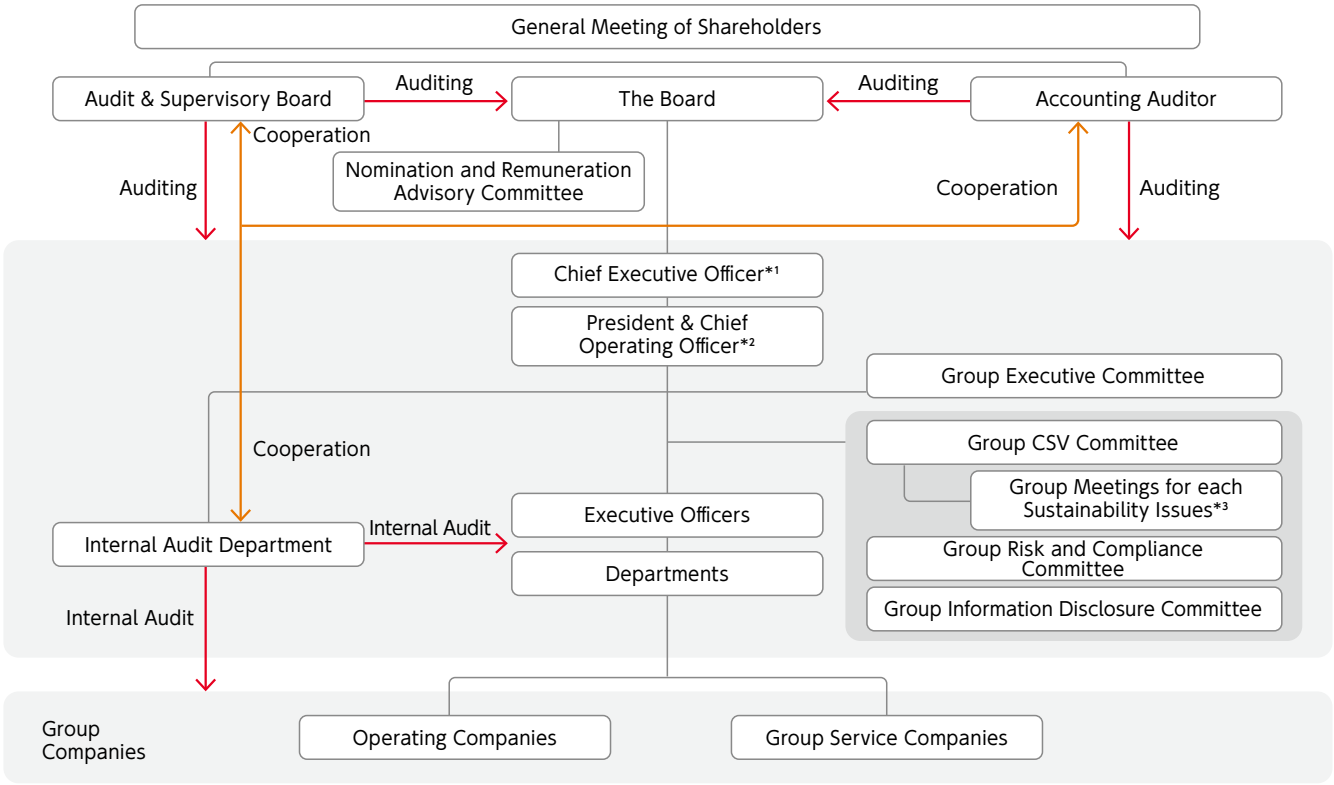
Governance

	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 annual 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 of the Board ●Non-executive 7, Executive 5	4 times a year + as needed (monthly for risk monitoring)	●Quarterly monitoring of important risks, including environmental, and the execution of business operations ●Resolutions concerning plans for fiscal 2025, including environmental targets, KPIs, and important risks
Group Executive Committee	●Deliberation of environmental policies, medium- and long term strategies, and annual 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 the President, 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 2025, 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 ●Confirmation of progress on sustainability-related risks and opportunities, and roadmaps for each environmental issue	●Chair: CEO and COO 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 Committee)	●Sharing awareness of sustainability-related risks and opportunities, and discussing strategies ●Monitoring the progress of roadmaps towards achieving the Kirin Group Environmental Vision 2050, and exchanging opinions on policies, strategies, and plans	●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, Head of Corporate Disclosure Section, General Manager of Research & Development Division, and General Manager of Technology Development Department*1	Twice a year	●Formulation of draft plans for fiscal 2025 concerning the four environmental issues
Group Risk and Compliance Committee	●Deliberation of annual 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 2025 and important risks for the Kirin Group

*1 General Manager of Technical department of Kirin Brewery. Other affiliations not specified belong to Kirin Holdings

Governance
Governance

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

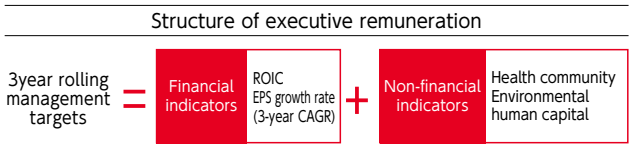
The company appoints persons who possess the required experience, advanced insight, and a high level of expertise in order to ensure that directors of the Board, Audit and Supervisory Board members, and executive officers effectively engage in Group decision-making and perform supervision and execution aimed at achieving CSV, which is at the core of the company's management.
See below for a skill matrix 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/
As of 2025, 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

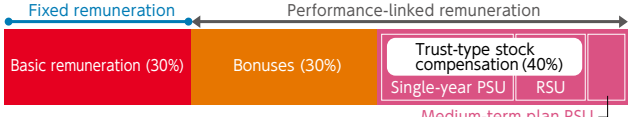


Indicators

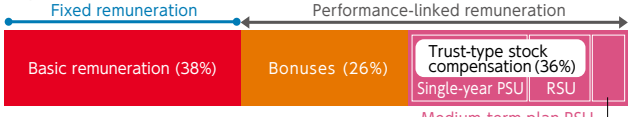
Item	Theme	Non-financial targets
Environment	Climate Change	Rate of reduction in GHG emissions Rate of reduction in Scope 1 + 2 emissions compared with 2019
	Containers and Packaging	Percentage of recycled resin used in PET bottles
	Water Resources	Basic unit of water usage at manufacturing sites with high water stress

Linked

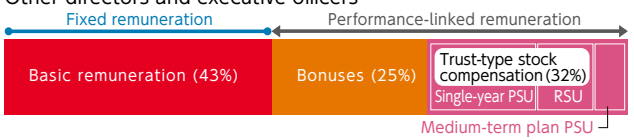
Representative Director & CEO



Representative Director & COO



Other directors and executive officers



●Percentage of management targets in PSU (Performance Share Unit)
ROIC : EPS growth rate : Non-financial indicators=40:40:20

Assessment of Risks and Opportunities

Scenario Analysis Related to Climate Change

Physical risks

We have used the latest global tools to examine water risks and water stress at our production sites (plants and breweries), and have 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, 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 4.6 billion yen (2°C scenario) in 2030. If, however, we do not achieve net-zero by 2050, the impact of carbon pricing on energy costs is estimated to be 15.7 billion yen. We also estimate that the financial impact of carbon pricing on agricultural prices will be in the same range as the financial impact of agricultural prices due to the physical effects of climate change.

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

Business opportunity

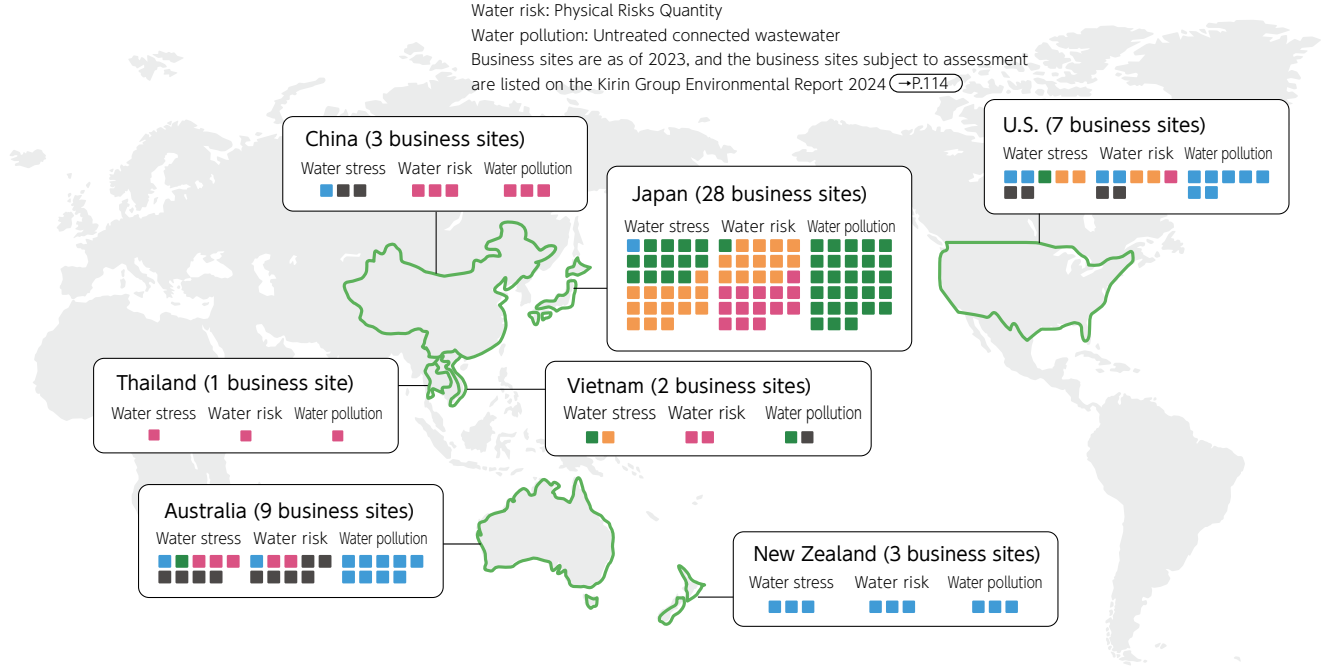
In response to the impact of climate change on society, we believe there are business opportunities related mainly to the spread of infectious diseases and heatstroke in the "Health & Well-being domain," which we have identified as a key area in our Long-Term Management Vision for 2027 (KV2027).

Water stress and risk at production sites

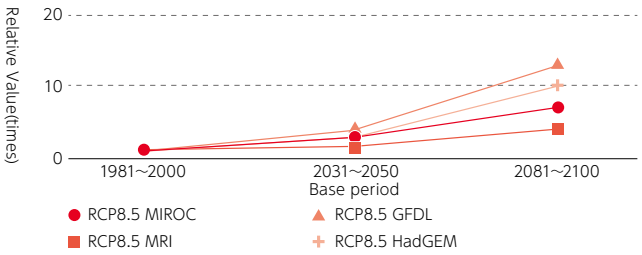
Degree of stress and risk

High ■ ■ ■ ■ ■ Low

* For water risk, water stress, and water pollution, we have referred to the following items, using the latest Aqueduct 4.0 (WRI).
Water stress: Baseline Water Stress
Water risk: Physical Risks Quantity
Water pollution: Untreated connected wastewater
Business sites are as of 2023, and the business sites subject to assessment are listed on the Kirin Group Environmental Report 2024 (→P.114)



Excess deaths related to heat stress in Japan



Created by Kirin Group 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

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

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

Region	2030		2050	
	Without GDP consideration	With GDP consideration	Without GDP consideration	With GDP consideration
Asia-Pacific highincome 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%)

Assessment of Risks and Opportunities

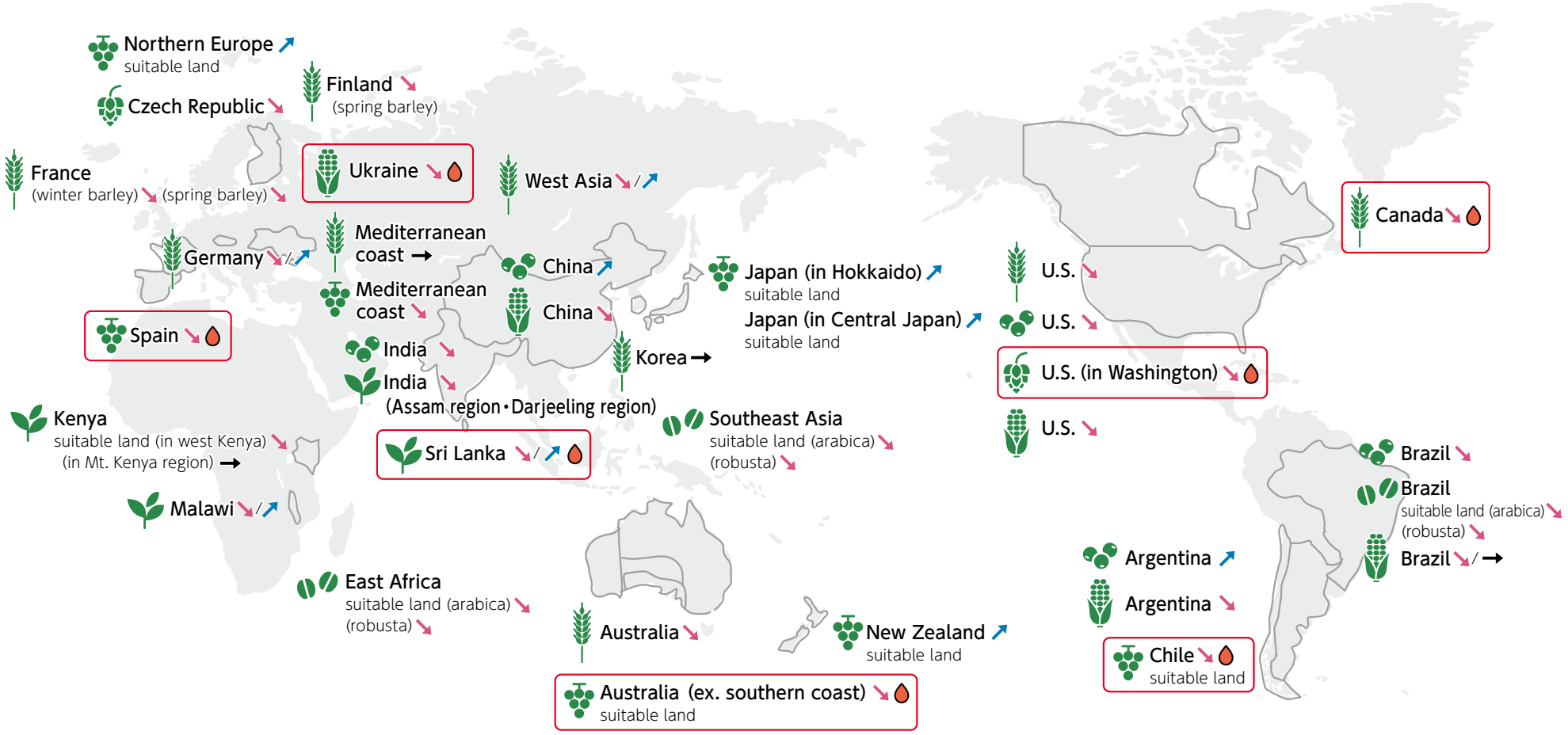
Scenario Analysis Related to Climate Change

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

Key agricultural products Barley, Hops, Tea leaves, Wine grapes, Coffee beans, Corn, Soybeans

Impact on agricultural product yields or areas of suitable land for cultivation (by around 2050, some by 2100) ↗ Increase of 5% or more → Change of less than 5% ↘ Decrease of 5% or more

Agricultural products sourced from regions expected to have "High to Extremely High" water stress (2050)



Assessment of Risks and Opportunities

Assessment of Risks and Opportunities Related to Natural Capital Following the LEAP Approach

In line with the LEAP (Locate, Evaluate, Assess, Prepare) approach outlined in TNFD recommendations v1.0, the Kirin Group is conducting an assessment of risks and opportunities related to natural capital. The analysis and assessment procedures are shown in the following Figure.

Analysis and assessment procedures

Scoping Determine the scope of assessment	**Locate** Locating our interface with nature	**Evaluate** Evaluating our dependencies and impacts	**Assess** Assessing risks and opportunities	**Prepare** Preparing reports
Analysis and assessment from the perspective of "dependence of businesses on nature" and "impact of businesses on nature," based on the hypothesis of agricultural materials as materials ↓ Reiteration of the appropriateness of designating tea farms in Sri Lanka as a priority target/region	Survey of the state of natural capital and biodiversity in and around 10 tea farms in Sri Lanka ↓ Confirmation that the tea farms are located in regions with high biodiversity. Confirmation of appropriateness of priority location	Qualitative review of dependencies and impacts related to natural capital on tea farms in Sri Lanka ↓ Tea cultivation depends on water and soil, which are being damaged by climate change and economic development	**Step1** **Identification of risks and opportunities** Identification of natural capital-related risks and opportunities for Kirin at tea farms in Sri Lanka ↓ **Step2** **Assessment of risks and opportunities through scenario analysis** Assessment and prioritization of risks and opportunities identified in relation to natural capital	Disclosure in accordance with TNFD guidance

Scoping implementation

Based on an overview of the business domains and value chain of the Kirin Group, 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. Accordingly, we analyzed and evaluated 21 raw agricultural products with high procurement volumes, including items covered by the "Kirin Group Action Plan for the Sustainable Use of Biological Resources", 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 agricultural products to be analyzed in detail.

The "Dependence on Nature-related Business" was assessed as the degree of dependence on the "provisioning services" of raw agricultural products, which is indicated as a type of reliance in TNFD's recommendations. We evaluated this using our own indicators such as "procurement amount," "the impact on group sales revenue," "the substitutability of production areas for raw materials," and "the concentration of import source country."

Concerning the "the degree of impact which our businesses have on nature," we assessed the following indicators: "carbon footprint at the cultivation stage," "land use footprint," "water footprint," and "fertilizer usage" for which data is available on a per-crop basis, and which are among the five impact factors listed by IPBES*1 that the TNFD recommendations state should be considered. Additionally, using external databases on risk incidents, we checked whether the target agricultural products are commodities with "reputation risk" on a global scale.

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

Assessment of Risks and Opportunities

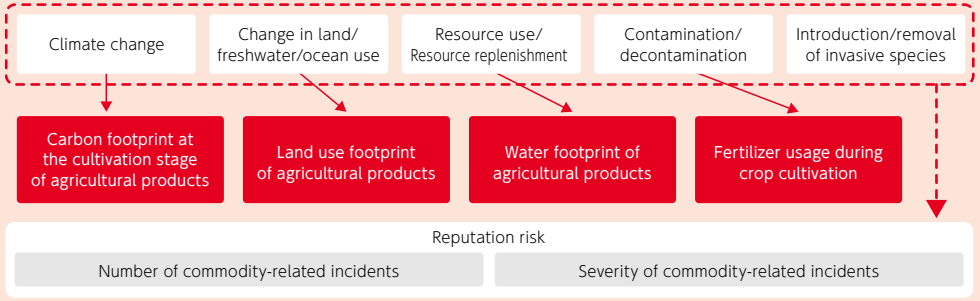
Assessment of Nature-Related Risks and Opportunities Following the LEAP Approach

Assessment procedures and heatmap of dependency and impact assessment results[*1]

Assessment of the nature-related dependencies of businesses

Procurement amount of agricultural raw materials	Calculated from procurement data.
Percentage of total sales revenue from products for which agricultural raw materials are the main ingredient(s)	Calculate the percentage of the revenue of typical brands made from agricultural raw materials in total revenue.
The substitutability of production areas for raw materials	Established based on the judgment of procurement departments, taking into account the knowledge of natural capital in the CSV Strategy Department.
The concentration of import source country	We have estimated and assessed our bias for agricultural raw materials procured by applying the "Herfindahl-Hirschman index," which is an indicator for measuring the competitive status of companies in an industry.

Assessment of nature-related impacts of our businesses



Assessment axes	Dependence					Impact					
Ecosystem services that we depend on	Provisioning services					Climate change	Change in land / freshwater / ocean use	Resource use / Resource replenishment	Pollution	Commodity risk	
Indicators	Amount of agricultural products procured	Percentage of total sales revenue from products for which agricultural crops are the main ingredient(s)	The substitutability of production areas for raw materials	The concentration of import source country	Relative assessment of dependency	GHG emissions	Acreage per unit yield	Freshwater use (water footprint)	Fertilizer usage per unit area	Number of commodity-related incidents × severity	Relative assessment of impact
Raw commodity: Corn											
Barley											
Wheat											
Rice											
Soybeans											
Sugarcane											
Hops											
Black tea leaves											
Green tea leaves											
Oolong tea leaves											
Coffee beans											
Powdered milk							NA				
Raw milk											
Grapefruit											
Lemon											
Orange											
Grapes											
Apple											
Tomato											
Plum											
Palm oil											

High Low

*1 The carbon footprint is based on the ClimateHub database, land use data comes from the FAO's 2022 release, freshwater data is from Mekonnen and Hoekstra (2011), fertilizer use is based on IFASTAT (2018), and reputational risk is assessed using RepRisk.

Assessment of Risks and Opportunities

Assessment of Nature-Related Risks and Opportunities Following the LEAP Approach

Results of materiality analysis assessment in scoping

Based on the results of the assessment of nature-related dependencies and impacts of our businesses, as well as whether the product is listed on the EUDR and/or SBTN High Impact Commodity List, procurement volume, and strategic priority, we have identified priority agricultural products for which we should conduct a more detailed assessment of risks and opportunities in line with the LEAP approach. Starting in 2025, we plan to analyze approximately 10 priority agricultural products following the LEAP approach. As an initial example of this analysis, we highlight our efforts related to Sri Lankan tea plantations, one of the identified priority agricultural products.

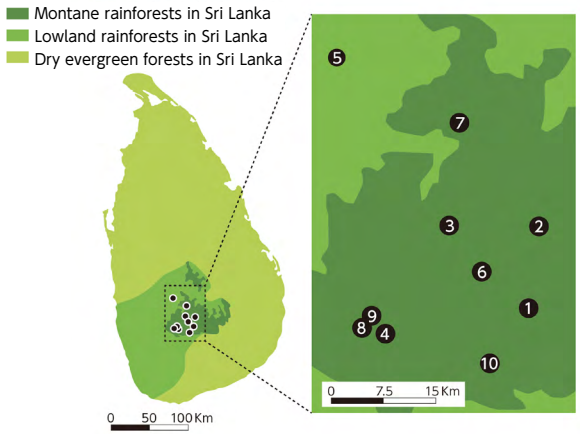
Locate (the interface with nature)

The sustainable procurement of Sri Lankan tea leaves, which enhance the flavor of "Kirin Gogo-no-Kocha," has a significant impact on our business and represents a key focus area from both natural and social environmental perspectives. Consequently, the Kirin Group has identified Sri Lankan tea plantations as priority areas and investigated their ecosystems to identify concerns and determine necessary actions. We analyzed 10 tea plantations, which are suppliers to the Kirin Group, focusing on their biomes, ecosystem integrity, biodiversity significance, and water stress levels. The results revealed that these tea plantations are situated in montane and lowland tropical rainforests, habitats for many endemic species. Despite their proximity to national parks and reserves, there is a notable lack of effective conservation measures in place.

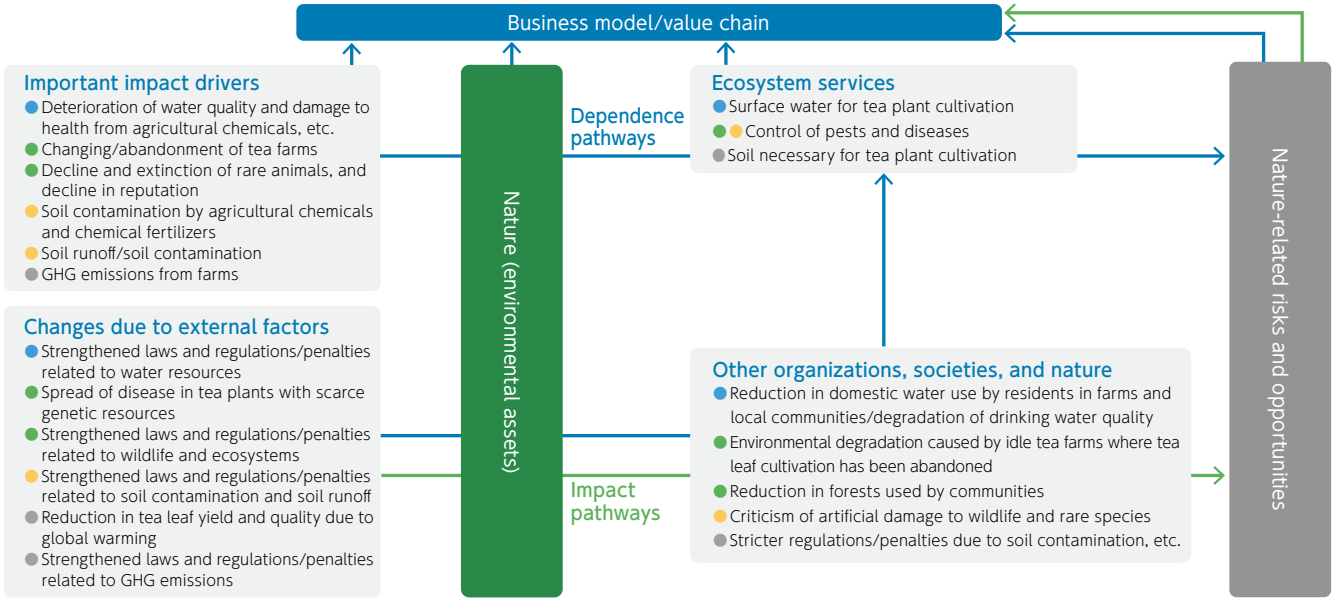
Evaluate (Dependencies & impacts)

We analyzed how business processes and activities at these Sri Lankan tea plantations depend on and impact natural capital. Based on a list of key impact drivers and ecosystem services, we summarized the dependency and impact pathways for each of the four environmental assets (water resources, land ecosystems, land, and atmospheric systems) as shown in the following figure.

Sri Lankan tea plantations



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.

Assessment of Risks and Opportunities

Assessment of Nature-Related Risks and Opportunities Following the LEAP Approach

Assess (Risks & opportunities)

As part of the Evaluate phase, we identified relevant external factors and stakeholders (e.g. policies and regulations, consumers, investors) for each material natural capital item. Based on this, we extracted potential risks and opportunities.

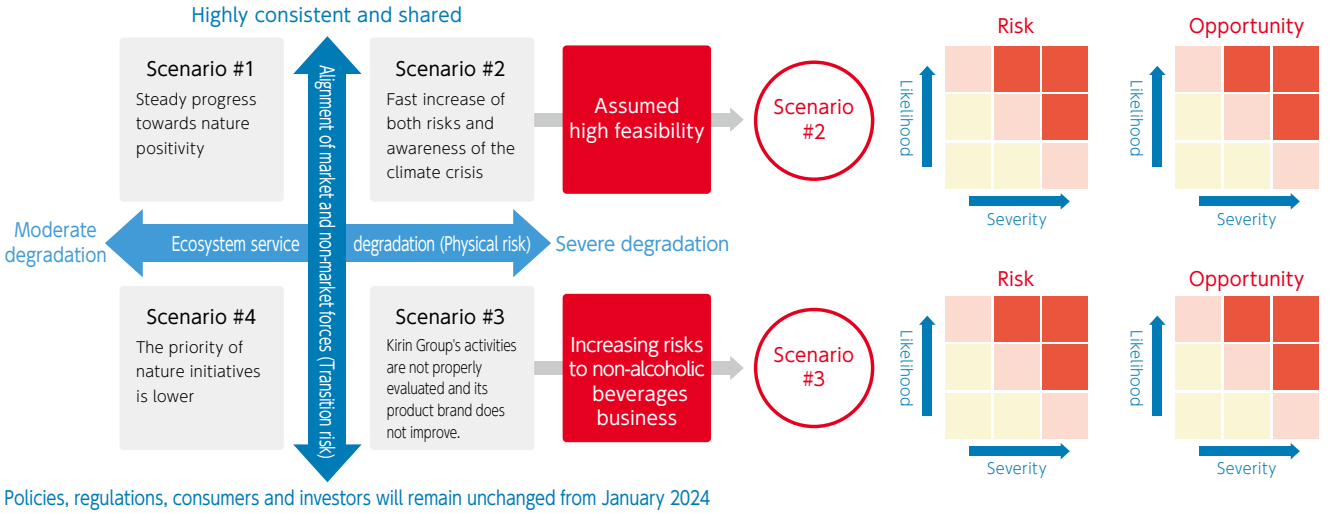
Subsequently, we conducted a scenario analysis. The horizontal axis of the scenarios represents the "degree of ecosystem service degradation," with the left side indicating moderate degradation and the right side indicating severe degradation. The vertical axis represents market principles, with the upper end indicating strong alignment between regulatory measures and market behavior toward nature-positive outcomes, and the lower end reflecting limited regulatory effectiveness and low levels of interest from consumers and investors. Based on these axes, four scenarios were developed. Among these, Scenarios #2 and #3, which assume a more severe degradation of nature, were identified as the most plausible. For each associated risk and opportunity, a risk map was developed and evaluated based on the likelihood of occurrence and severity of impact in terms of financial materiality. The results revealed that Sri Lankan tea plantations face various nature-related risks, including climate change, natural degradation, labor force reduction, increased costs due to economic development, and strengthened regulations. On the other hand, by reducing risks through sustainable agriculture, regenerative agriculture, thorough human rights due diligence on plantations, and fair trade procurement, there are opportunities for stable production and tapping into the ethical consumption market.

Prepare (To respond & report)

From the perspective of risk reduction and opportunity acquisition, the Kirin Group's support for obtaining Rainforest Alliance (RA) certification for plantations since 2013, and the promotion of the "Regenerative Tea Scorecard" introduced in 2024 to practice regenerative agriculture, is considered to be effective. These measures and achievements are detailed in the "Metrix and Targets" section as activity (details on sustainable farm certification support → P.39, details on the Regenerative Tea Scorecard →P.66).

To manage the progress of these initiatives, we are also preparing to set goals that align with science and international targets related to nature.

Overview of nature-related scenario analysis



Financial impact

Financial impact assessment

We assessed the financial impacts of climate change, natural capital, and containers and packaging, and summarized the interrelated impacts. 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.

* The calculation methods for each financial impact are as follows:
*1 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)."
*2 Energy usage in 2024 and 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.
*3 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)."
*4 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).
*5 Drought risk: Hypothetical situation where production is affected by a drought for a certain period of time.
*6 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.
*7 Procurement of Recycled PET Resin: An internal estimate of the incremental cost required to procure the volume of recycled PET resin necessary to meet the targets set forth in the Kirin Group Plastic Policy, based on the unit prices assumed at the time the policy was formulated.
*8 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.
*9 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.
*10 Heatstroke: Estimated from a S-8 2014 Report by Project Team of Comprehensive Study on Impact Assessment and Adaptation for Climate Change.
*11 Food waste reduction: Estimated from the cost reduction effect if the target is achieved (Kirin Brewery, Kirin Beverage, Mercian, Koiwai Dairy Products).
*12 Reduction in agricultural chemicals and fertilizers: Estimated reduction in costs associated with the reduction of chemical fertilizers and pesticides for coffee farms in Vietnam
*13 Flood exposure: Estimated from wind and flood damage model flood simulations and actual data
*14 Residual value of related facilities due to strengthening of energy-saving legislation: Residual value of boilers and trucks (both are assumed to have a very low possibility of being discontinued before the end of their useful life in the event fuel conversion is mandated by law. We have determined that there will be no financial impact, but for reference purposes, we disclose the residual value)

Estimated financial and asset impact

Environmental themes	Risk types	Business risks / social issues	Financial impacts
Climate change	Physical risk	Decline in yields of agricultural products*1	2℃ scenario: 1.2 billion yen to 3.2 billion yen (2050) 4℃ scenario: 3.1 billion yen to 12.2 billion yen (2050)
	Transitional risk	Financial impact of energy due to carbon pricing*2	1.5℃ scenario: 9.8 billion yen (2030) 15.7 billion yen (2050) 2℃ scenario: 9.1 billion yen (2030) 12.5 billion yen (2050) 4℃ scenario: 5.4 billion yen (2030) 5.9 billion yen (2050)
		Financial impact of agricultural products due to carbon pricing*3	RCP2.6/SSP1: 0.9 billion yen to 4.0 billion yen (2050) RCP8.5/SSP3: 2.2 billion yen to 8.0 billion yen (2050)
Climate change and natural capital	Physical risk	Disruptions to operations owing to floods*4	Wind and flood damage simulation results: 1 billion yen Actual data from past disasters (1 billion yen to 5 billion yen)
		Disruptions to operations owing to droughts*5	0 billion yen to 0.6 billion yen
Natural capital and containers and packaging	Physical risk	Negative impact of PET bottles*6	1.1 billion yen
	Transitional risks	Procurement of recycled PET resin*7	2.0 billion yen (2027)
		Procurement of certified products*8	0.1 billion yen
Climate change	Business opportunity	Increase in infectious diseases*9	Market for immunity and health supplements: 28,961.4 million US dollars (2030)
		Increase in heatstroke*10	Market for non-alcoholic beverages that prevent heatstroke: 94 billion yen to 188 billion yen (2100, 4℃ scenario)
Natural capital	Business opportunity	Reducing food waste*11	0.9 billion yen
		Financial impact from the reduction of chemical fertilizers and pesticides for coffee farms in Vietnam*12	0.1 billion yen

Environmental themes	Risk types	Business risks / social issues	Financial impacts
Climate change	Transitional risks	Exposure of production sites to floods*13	1.0 billion yen to 5.0 billion yen
		Residual value of related facilities due to strengthening of energy-saving legislation*14	1.1 billion yen

Transition Plans

Investment and financial 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 on the right.

Investment plans and financing plans

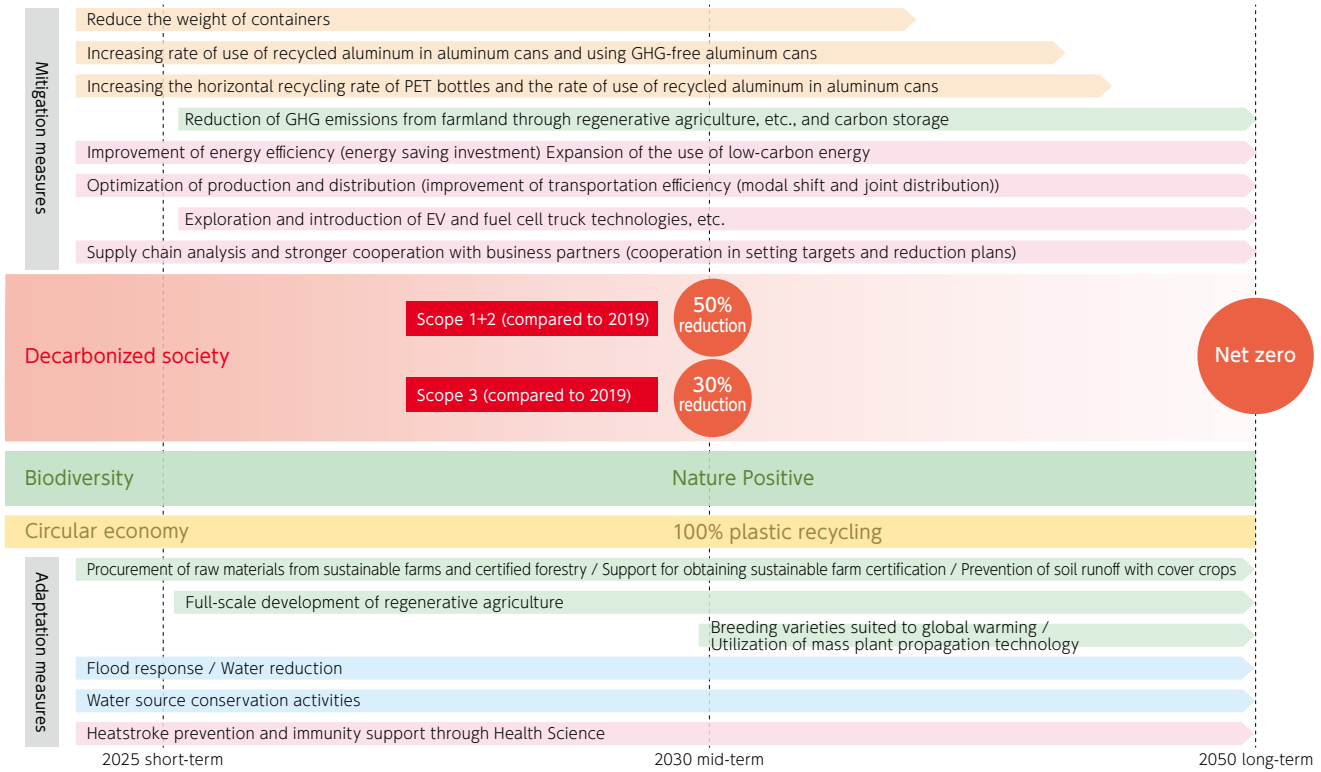
Investment and financing plans for “Scope 1+2 GHG emissions reduction” and “expansion of the use of recycled PET resin” are shown in the figure on the bottom right. Additionally, when considering “Scope 3 transition plans” in the future, we will consider transition strategies related to “Nature Positive” and “Circular Economy,” and thus formulate holistic plans that also incorporate investments and costs.

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.

As part of the transition plan towards Nature Positive, we have activities such as supporting certification acquisition at Sri Lankan tea plantations, developing and pilot testing of Regenerative Tea Scorecard for regenerative agriculture, and conducting joint research with NARO at Mariko Vineyard, which includes GHG strage. Additionally, we are considering the full-scale implementation of regenerative agriculture and expanding efforts to other raw agricultural products such as soybeans, hops, and barley, beyond the tea leaves and wine grapes we have already addressed. We anticipate that these activities will require associated research and deployment costs.

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.

Image of an integrated transition plan from the perspective of climate change



Investment plans and financing plans (partial)

	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
Expanded 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	

Transition Plans

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 materialize not only to reduce GHG emissions, but also to mitigate and adapt to climate change.

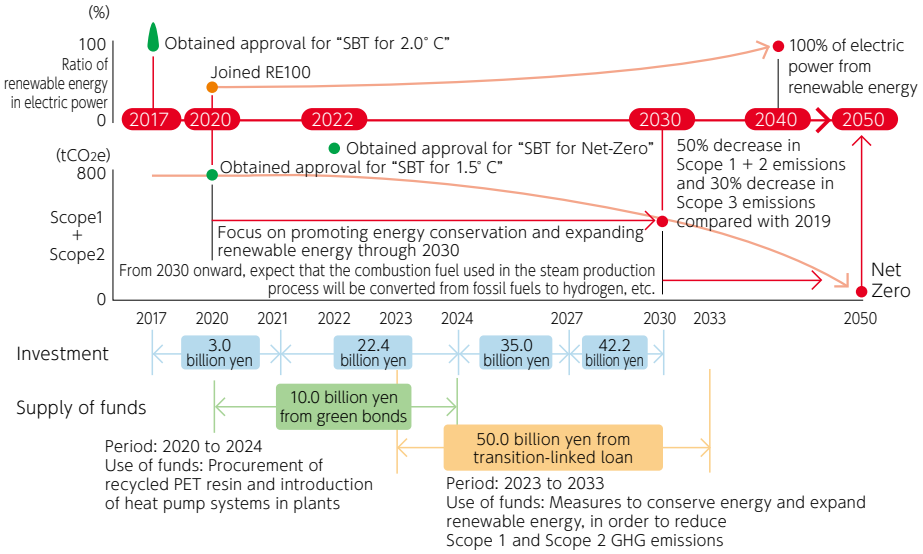
Scope 1+2 emissions reduction

Our roadmap for reducing Scope 1 and Scope 2 emissions by 2030, as well as our investment and financing plans, is shown in the figure below.

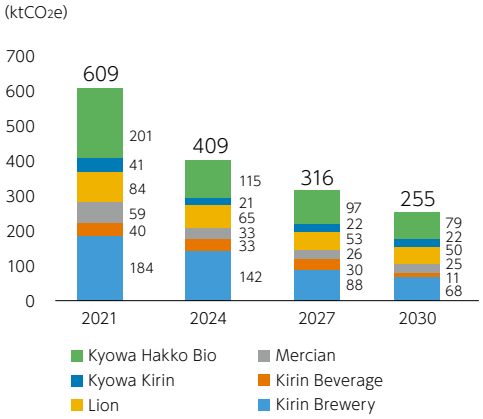
We will take a three-pronged approach to reducing Scope 1 and Scope 2 emissions, namely: "promotion of energy conservation," "expansion of renewable energy," and "energy transition," and will also develop ways to optimize production and logistics, etc. Our actions in each area are on the right.

	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 Brewery
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 ●At Kirin Brewery Hokkaido Chitose Plant, a demonstration project to transition energy from fossil fuels to green hydrogen will commence in June 2026

Roadmap to Net-Zero

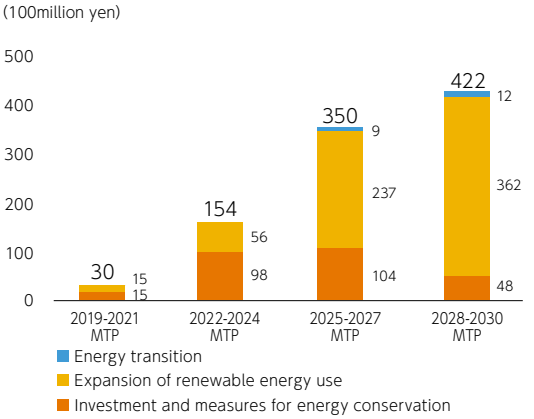


Reduction of Scope 1 and Scope 2 emissions*



*Company information that is deemed to have a significant impact on group management and GHG emissions is extracted and disclosed. We will review the companies to be extracted in the future as appropriate.

Investment



Transition Plans

Plan to transition to a decarbonized society

Scope 3 emissions reductions

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.

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. Using the technologies of Institute for Package Innovation, which is the largest research institute in the world owned by a consumer goods manufacturer, to reduce GHG emissions from containers and packaging materials. 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.

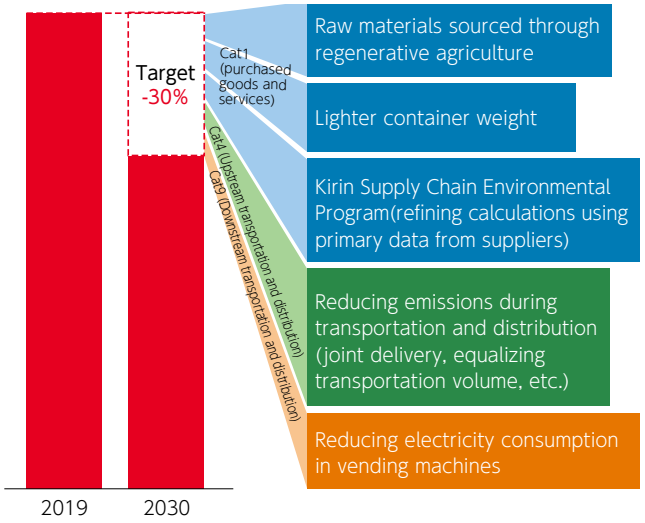
To address the challenges related to Scope 3 emissions, we have requested all suppliers to comply with the "Kirin Group Sustainable Supplier Code," which includes measures to tackle climate change. Additionally, in April 2024, we launched the "Supply Chain Environmental Program." This initiative aims to enhance collaboration with high GHG-emitting business partners and reduce Scope 3 emission through three main pillars: mutual disclosure of actual GHG emission data, setting and supporting GHG emission reduction targets at the SBT level, and collaboration on GHG emission reduction efforts. This initiative is expected to contribute to a 10% reduction in Scope 3 emissions, which accounts for one-third of our medium-term goal to reduce group-wide GHG Scope 3 emissions by 30% by 2030 compared to 2019. Combined with other measures targeting Scope 3 emission categories 1, 4, and 9, we plan to achieve a total reduction of 30%.

Lion is a member of the Australian Climate Leaders Coalition, a group of Australian company CEOs. Within this group, we have confirmed that using a system where actual GHG emission data is pooled by a third-party organization without mutual disclosure among value chain companies such as suppliers and retailers, allows for a more accurate understanding of Scope 3 emissions. This approach serves as a starting point for collaboration among stakeholders to collaborate how to reduce emissions throughout the value chain, raising Scope 3 reduction targets and leading to more effective actions. Additionally, we use the calculation of the carbon footprint (CFP) per product to visualize and set targets for GHG reduction across the entire supply chain. These results are featured in the publication "Scope 3 Roadmap" by the Australian Climate Leaders Coalition.

Scope 3 emissions reduction actions led by our company in collaboration with external partners

	Action
Containers and packaging (about 30% 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, considering the practical application of GHG-free aluminum refined with renewable energy and low-emission aluminum with a higher recycling rate, we are exploring the introduction of carbon-free aluminum cans ●Joint adoption of "EcoEnd" can lids with a higher recycled aluminum ratio by four beer manufacturers ●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 ●Refine Scope 3 emission calculations by accurately capturing actual GHG emission reduction amount through the Supply Chain Environmental Program ●Strengthen Scope 3 emissions reduction efforts through participation in the Australian Climate Leaders Coalition
Agricultural raw materials (about 30% 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 (about 10% of Scope 3 emissions)	●Optimize production and logistics (including the use of AI and on-site warehouses), level transportation volumes, conduct joint deliveries, and shift to modal transportation. ●Reduce emissions during maritime transportation by importing wine in large-capacity bags. ●Consideration of conversion to fuel cell trucks and EV trucks

Scope 3 emissions reduction actions



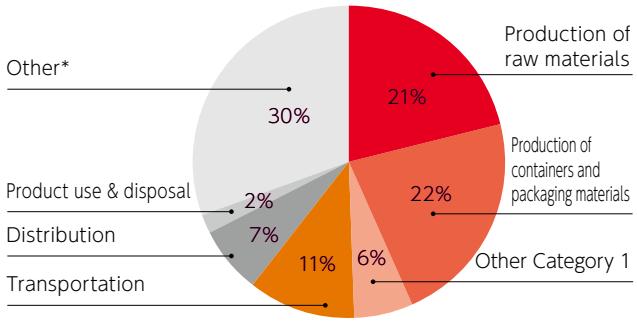
Transition Plans

Plan to transition to a decarbonized society

GHG emission reductions from agricultural raw materials

For upstream suppliers (farmers), it is important to reduce GHG emissions from the cultivation process of agricultural raw materials through regenerative agriculture and to decarbonize the energy needed for transportation and storage. For raw material processing companies, reductions can be achieved through process improvements such as energy conservation, the use of renewable energy, and energy conversions. As a product manufacturer, reaching upstream suppliers can sometimes be challenging. In such cases, procuring certified products that have implemented various GHG reduction measures in these upstream processes can be an effective option. Additionally, implementing food loss countermeasures and recycling at each stage can help reduce GHG emissions associated with waste. Regarding agricultural raw materials, we have positioned Japan's Mariko Vineyard and Sri Lankan tea plantations as model cases to accumulate knowledge on climate change mitigation and adaptation through regenerative agriculture. The insights gained will be applied to other agricultural products and production areas. Furthermore, we have started verifying a technology for long-term evaluation of soil sequestration using satellite data. In this verification, we aim to establish a technology to measure carbon sequestration without soil sampling or measurements in the production area fields, using barley fields with high procurement volumes as test sites.

Proportion of Scope 3 emissions

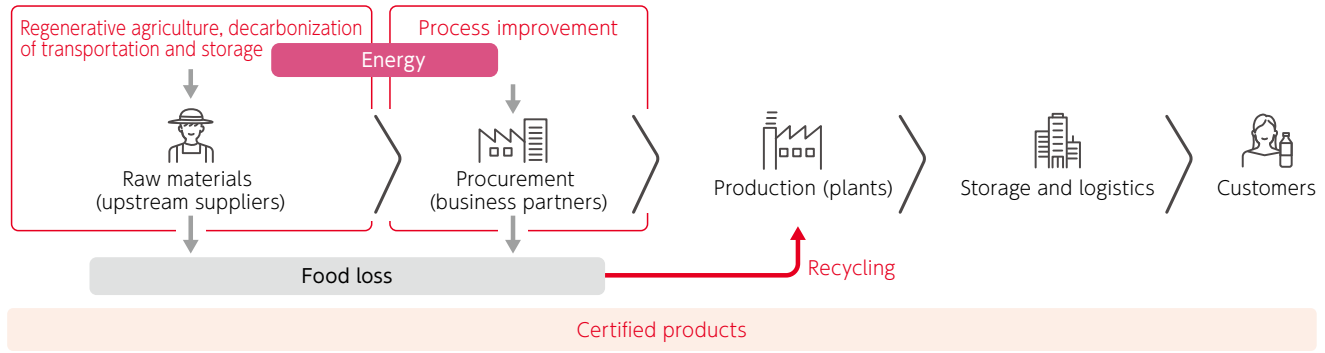


* Emissions other than the above (emissions from the manufacture and transportation of capital goods, fuel, etc., waste from business operations, travel and commuting of employees, etc.)

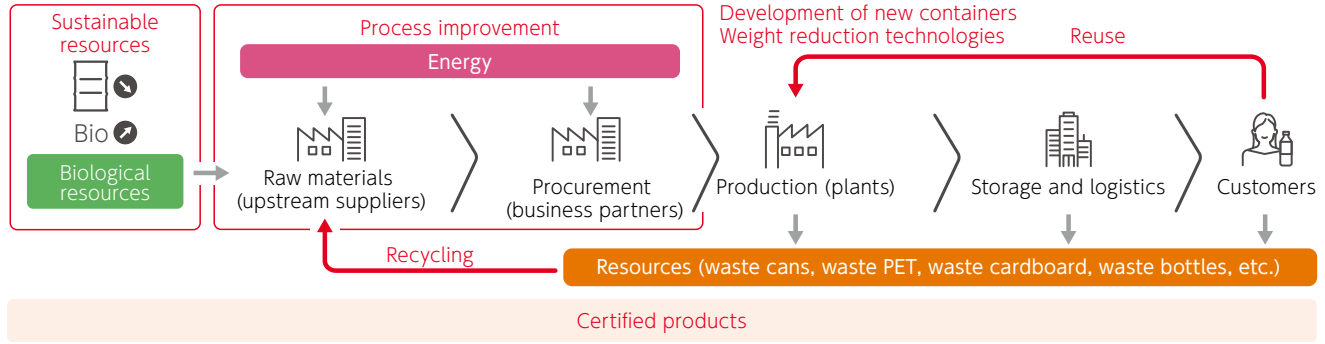
GHG emission reductions from containers and packaging

In reducing GHG emissions from containers and packaging, recycling and reuse as much as possible is the priority. Additionally, selecting and switching to sustainable materials such as paper and biomass PET is crucial. Upstream suppliers (of materials) and processing companies are expected to implement process improvements for GHG reductions through energy conservation, the use of renewable energy, and energy transitions, as well as decarbonizing the energy needed for transportation and storage. As a product manufacturer like the Kirin Group, procuring certified products that have implemented various GHG reduction measures in these upstream processes can be an effective option. Moreover, reducing the amount of containers and packaging used through the development of new functionalities, new materials, and lightweight packaging is essential when advancing energy reduction and renewable energy use in recycling, processing, and transportation throughout the supply chain. Recycling used resources and reusing bottles can also help reduce GHG emissions associated with waste.

Approach to reducing GHG emissions from agricultural raw materials



Approach to reducing GHG emissions from containers and packaging



Transition Plans

Plan to transition to Nature Positive

We will organize our transition to Nature Positive using the AR3T (Avoid, Reduce, Restore & Regenerate, Transform) framework for natural capital proposed by the SBTN (SBTs for Nature).

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 business 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.

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. In addition to Kirin's engagement with local communities at Sri Lankan tea plantations and Japanese vineyards, Lion provides employee training programs that teach the traditional knowledge of Aboriginal culture and nature. Lion also promotes coexistence and positive impacts in local communities by expanding business transactions and creating employment with indigenous-owned businesses. In Blackmores' health science business, the role of indigenous communities in biodiversity conservation has been recognized while exploring nature-based solutions (NbS) to preserve valuable medicinal herbs. Through events such as bushwalks that teach the traditional use of plants as medicine, employees have opportunities to engage more deeply with members of indigenous communities. Moving forward, we will consider sharing knowledge within the Group and expanding applicable areas through supplier collaboration in the "Supply Chain Environmental Program" that began in 2024.

Regarding water risk, we have prioritized production sites based on water stress and intake in the watershed, and have considered non-financial goals and CSV commitments based on drought risk. Although the Asheville brewery of New Belgium Brewing in the U.S. was not evaluated as a high-risk site by tools, it experienced flood damage from a hurricane in 2024, highlighting the need to consider flood risk. This prompted a risk assessment of all group sites using the latest global tools and local information to identify priority sites. In the future, to strengthen resilience to water risks, we plan to collaborate with watershed stakeholders at identified priority sites to undertake activities to reduce water risks.

	Actions
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. ●Identify priority sites for water risk using the latest global tools and local information, and work to avoid and mitigate water risk.
Reduce	●Support Rainforest Alliance certification acquisition and develop and implement the Regenerative Tea Scorecard for tea plantations in Sri Lanka and coffee plantations in Vietnam. ●Continue supporting Rainforest Alliance certification acquisition for coffee plantations in Vietnam. ●Reduce food loss and waste. ●Introduce, continue, and expand advanced water treatment using reverse osmosis membranes at breweries in water-stressed areas in Australia to achieve significant water savings.
Restore & Regenerate	●Utilization of derelict farmland as Japan Wine vineyards. Restore ecosystems through hedgerow-style cultivation. ●Conserve water sources within tea plantations in Sri Lanka and educate local residents. ●Water source conservation activities at production sites in Japan. ●Procure certified regenerative agriculture raw materials for Stone & Wood Brewery in Australia.
Transform	●Participate in TNFD and SBTs for Nature to develop guidance on natural capital financial disclosures and target-setting frameworks. ●Lion and Blackmores declare themselves as TNFD adapters in Australia. ●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.

Priority of production sites for each indicator

Country	Production site	Water stress	Water intake	Biodiversity risk
United States	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)	★★★☆☆	★★☆☆☆	★★☆
United States	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

Transition Plans

Plan to Transition to Circular Economy

Containers and packaging

We will adopt a 3R(Reduce, Reuse, Recycle)+Renewable approach for promoting a transition to the circular economy for containers and packaging. Our main actions are on the right.

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 Package 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 the reduction of GHG emissions in transportation by measures such as reducing the weight of containers and packaging, we will 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 positions 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 production 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 production processes (e.g., spent grains) as feed and compost.

	Action
Reduce	● Utilize the "Institute for Package 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. ● Promote the reduction of single-use plastics and the switch to alternative materials.
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.
Renewable	● Based on "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. ● Engage in chemical recycling initiatives using non-food grade PET materials. ● Anticipate future supply and demand for recycled PET resin and, while monitoring the progress of chemical recycling practical application, develop and promote a roadmap towards 2050.

Transition Plans

Plan to Transition to Circular Economy

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 ●Procurement of raw materials from regenerative agriculture	●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 worldleading 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 ●Conduct water risk surveys as foundational data to enhance group-wide resilience, due to the increasing visibility of water risks such as droughts and floods influenced by climate change (starting in 2025)	●Establishment of mass plant propagation technology for hops ●Coinciding with pilot testing of Regenerative Tea Scorecards for tea farms in Sri Lanka, cover crops preserve soil moisture and prevent soil runoff in heavy rainfall ●Procure raw materials from regenerative agriculture at Stone & Wood Brewery	●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	●Joined the Alliance To End Plastic Waste and supported projects to solve the global problem of plastic pollution ●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 Brewery (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

Risk and Impact Management

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. Senior management deploys mitigation and adaptation strategies and manages targets under the supervision of the Board. The same applies to overall sustainability-related risks, 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.

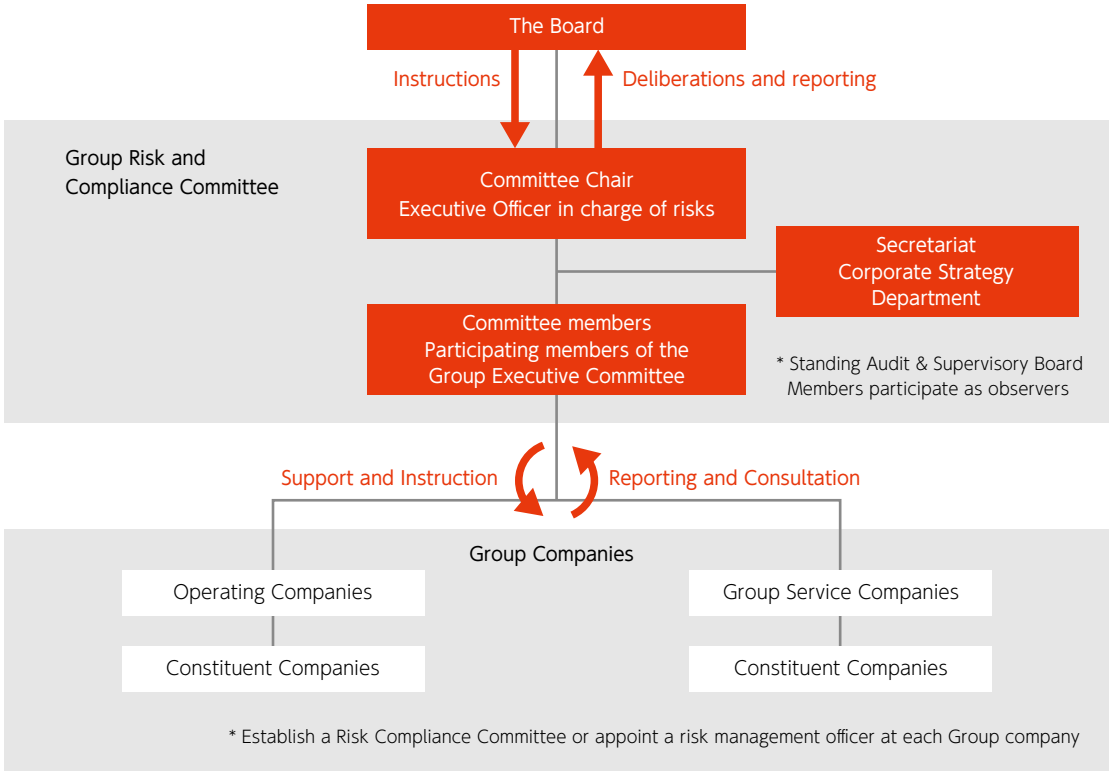
Risk management system

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*1 and opportunities related to sustainability include environmental issues such as climate change, natural capital, and the circular economy; social issues such as human rights*2, local communities, indigenous peoples, small-scale farmers, and gender; and the mutual relationships among such issues and regulatory responses (under our risk management system, "opportunities" are included in the management of "risks"). The Board oversees the effectiveness of risk management through deliberations and reports on important risks for the Group.

Regarding the process of determining the Group's important risks, based on the Kirin Group's risk management policy established each fiscal year, Group companies consider and identify risks to their strategies and business operations, as well as risks that could develop into major crises. Kirin Holdings aggregates these business-specific risks and examines risks common to the entire group*3.

*1 Please see "Identification of Materiality" P.7 for details concerning the identification of materiality for risks and opportunities related to environmental issues, including climate change.
*2 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/
*3 Details of our "risk management system" are disclosed below.
https://www.kirinholdings.com/en/purpose/governance/risk_management/

Risk management system



Management of risks related to sustainability

Sustainability-related risks include 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 counter-measures are promptly implemented. When we expect the impact to be significant, we respond based on business continuity plans (BCPs) adopting all hazards approach*4 . 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. In 2024, New Belgium Brewing's Asheville Brewery suffered significant flood damage. Previous water risk assessments had not identified Asheville as a high-risk site. This incident underscored the importance of incorporating local information in addition to desktop studies. Currently, we are re-evaluating water risk assessments across the entire Kirin Group.

*4 All hazards approach: A business continuity plan that focuses on the loss of management resources due to inter-correlated hazards such as employee and equipment damage or temporary suspension of headquarters functions, rather than approaching each individual crisis event.

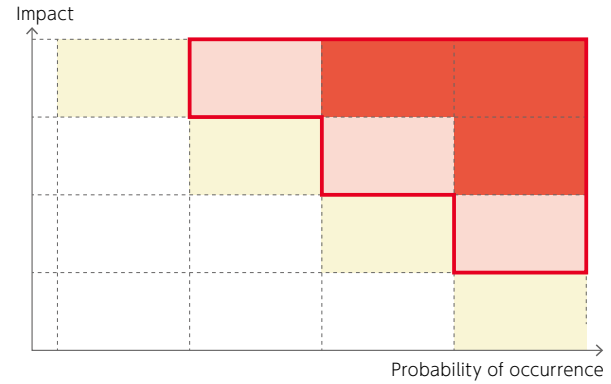
Improving risk response capabilities

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 also to the Group Risk and Compliance Committee Secretariat, which manages them together with other risks. Additionally, we share internal cases of sustainability-related risks, such as responses to climate disasters, within the Group in order to strengthen resilience across the Group as a whole.

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 take measures to address high-impact risks by the Board's monitoring.

Risk map



We unify important risks for the Group on a risk map, and review their importance and countermeasures. The Board of Directors also monitors the most important risks, which are placed within the red frame ▭ .

Risk and Impact Management

Significant Risks and Opportunities

As described in Strategy section, we have analyzed and assessed sustainability-related risks which are interconnected with climate change, natural capital, the circular economy, and other social issues using scenario analysis and other methods. We have summarized significant risks and opportunities identified as a result in the table below. The physical risks primarily focus on major agricultural raw materials and water-related risks that are highly relevant to businesses ranging from food to pharmaceutical sectors. 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. As for containers and packaging, we set the scope of analysis after comprehensively taking resource recycling and related impacts on climate change and natural capital into consideration. 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 and Opportunity	Classification	Category	Main Risk	Impact	Risk Emergence Period			Financial Impact			Response Strategy
					S	M	L	L	M	H	
Physical risk	Chronic risks	Climate change, biological resources and water resources	Declining yields of agricultural products and increase in procurement costs Changes in the state of nature	• Procurement costs due to reduced agricultural yields (2°C scenario: 1.2 billion yen to 3.2 billion yen in 2050, 4°C scenario: 3.1 billion yen to 12.2 billion yen)		●	●			■	• Support for farms to acquire certification for sustainable agriculture (adaptation measures) • Technology development to improve plant heat tolerance in response to global warming (adaptation measures) • Mass plant propagation technologies (adaptation measures) • Development of alternative raw materials and new production technologies (adaptation measures) • Introduction of perennial grains into annual crop production systems (adaptation measures) • GHG emission reduction (mitigation measures)
		Climate change, biological resources, water resources, containers and packaging	Environmental pollution by improper disposal of used containers	• Negative impact on life in river basins and oceans • Expenses associated with measures to address ocean pollution (1.1 billion yen)		●	●		■		• Building a society that recycles plastics • Horizontal recycling of alcoholic beverage caps
	Acute risks	Climate change and water resources	Disruption of operations owing to floods	• Historical examples of actual flood damage (1.0 billion yen to 5.0 billion yen) • Exposure to 200-year disasters (total of 20 locations in Japan: 1.0 billion yen)	●	●	●		■		• Sharing of knowledge on responses to floods (adaptation measures) • Insurance for floods (adaptation measures) • Addressing flooding at facilities (adaptation measures)
		Climate change and water resources	Impact on transportation from floods	• Risk of flooding at shipping ports for raw materials	●	●	●		■		• Sharing of knowledge on responding to floods (adaptation measures) • Diversification of suppliers (adaptation measures)
		Climate change and water resources	Disruption of operations owing to droughts	• Impact from decline in production owing to droughts (30 million yen to 600 million yen)	●	●	●	■			• Advanced water reduction technology (adaptation measures) • Sharing drought response knowledge (adaptation measures)

Risk and Impact Management

Significant Risks and Opportunities

Risk and Opportunity	Classification	Category	Main Risk	Impact	Risk Emergence Period			Financial Impact			Response Strategy
					S	M	L	L	M	H	
Physical risk	Acute risks	Climate change, biological resources and water resources	Impact on agricultural products from 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 (adaptation measures) • Prevention of soil runoff in areas producing agricultural raw materials (adaptation measures)
		Climate change and biological resources	Impact of diseases and air pollution on agricultural products	• Declining quality of agricultural products due to smoke and air pollution • Spread of disease	●	●		■			• Research and measures from a long-term perspective (adaptation measures)
Transitional risks	Policy	Climate change, biological resources and water resources	Carbon pricing and energy procurement costs	• Energy procurement costs (2°C scenario by 2030: 7.7 billion yen, 4°C scenario: 1.2 yen billion, 1.5°C scenario: 10.4 billion yen to 904.4 billion yen)		●	●			■	• Energy saving/renewable energy/energy conversion • GHG emission reduction through logistics optimization • GHG emission reduction through lightweight packaging • GHG emission reduction at the sales stage
		Climate change, biological resources and water resources	Financial impact on the procurement of agricultural products from carbon pricing	• Procurement costs due to reduced agricultural yields (2°C scenario: 0.9 billion yen to 4.0 billion yen in 2050, 4°C scenario: 2.2 billion yen to 8.0 billion yen in 2050.)	●	●			■		• Risk mitigation through mass plant propagation technologies • Measures against fertilizer price increases
		Climate change, biological resources and water resources	Impact on currently held assets	• Difficulty in recovering investment in facilities and equipment due to legal restrictions, etc. • Damage to facilities and equipment due to flooding, etc.		●	●	■			• Identification of trends in technology and implementation of our roadmap with adaptive updates
		Climate change, biological resources and water resources	Cost of regulatory response	• Increase in human resources • Increase in cost of response		●	●	■			• Development of information disclosure infrastructure
		Biological resources	Environmental and economic 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, biological resources, water resources, containers and packaging	Lack of research and development resources and lack of long-term perspective	• 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

Risk and Impact Management

Significant Risks and Opportunities

Risk and Opportunity	Classification	Category	Main Risk	Impact	Risk Emergence Period			Financial Impact			Response Strategy
					S	M	L	L	M	H	
Transitional risks	Technology	Climate change	Decline in ability of engineering departments to respond and lack of appropriate investment	• Introduction of facilities and equipment at appropriate times and prices	●	●	●	■			• Strengthening engineering capabilities • Understand technological trends and flexibly introduce facilities and equipment
	Markets	Climate change, containers and packaging	Social resistance to fossil-derived raw materials	• Growing negative impression of PET bottles	●	●		■			• Plastic resource recycling
		Climate change, biological resources and water resources	Concerns about deforestation	• Decrease in confidence in the amount of GHGs absorbed and stored through forests, etc.	●	●		■			• Promotion of sustainable forestry and agriculture • Creation of high-quality forest-based carbon credits
		Climate change, biological resources and water resources	Opportunity loss due to ethical consumption	• Decline in the reputation of our brand	●	●		■			• Environmentally friendly products
		Climate change	High energy prices	• Possibility that natural gas and oil prices do not fall		●	●		■		• Steady implementation of our roadmap to achieve our science-based 1.5°C target
	Reputation	Climate change, biological resources, water resources and containers and packaging	Consumer reputation	• Decline in the reputation of our brand	●	●	●	■			• Appropriate communication to consumers
		Climate change, biological resources, water resources, and containers and packaging	Concerns about facilities of renewable energy	• Opposition to installation from regions where power plants are constructed • Deforestation caused by sourcing raw materials for biomass energy	●	●	●	■			• Introduction of renewable energy that does not have a negative impact on the environment or local communities
		Climate change, biological resources, water resources, and containers and packaging	Loss of trust from investors	• Loss of trust due to lack of adequate disclosure • Increase in cost of capital	●	●	●		■		• Appropriate disclosure in line with TCFD and TNFD recommendations
		Climate change, biological resources, water resources, and containers and packaging	Responsibility for pollution of the natural environment	• Compensation, fines, administrative dispositions, and loss of social trust	●	●	●	■			• Improvements to environmental management systems

Risk and Impact Management

Significant Risks and Opportunities

Risk and Opportunity	Classification	Category	Main Risk	Impact	Risk Emergence Period			Financial Impact			Response Strategy
					S	M	L	L	M	H	
Systemic risk	Stability of food and social systems	Biological resources	Ecosystem damage due to the abandonment of farmland	• Reduction of agricultural land for food	●	●	●	■			• Promotion of regenerative agriculture
		Biological resources	Ecosystem damage due to the excessive use of agricultural chemicals	• Decline in ecosystem services	●	●	●	■			• Ecosystem restoration activities focusing on hedgerow-style cultivation
		Biological resources	Damage to ecosystems owing to reduction in agricultural land for food	• Loss of ecosystem sources on agricultural land due to years of use of agricultural chemicals	●	●	●		■		• Enhancing engagement with agricultural production areas
Business opportunity	Markets	Climate change and biological resources	Increasing distribution in infectious diseases caused by global warming	• Concerns related to increases in the number of infections and regions affected • Northward movement of the habitat of the Aedes albopictus	●	●	●		■		• Contribution to 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 counter heatstroke
	Products and services	Climate change	Increased expectations for products and services that contribute to decarbonization	• Possibility that products will be required that contribute to decarbonization or the shift to a low-carbon society		●	●	■			• Provision of decarbonized products
	Resource efficiency	Climate change	Sustainable logistics	• Decline in product supply capabilities	●	●	●	■			• Reduction in costs from more efficient transportation
		Climate change and containers and packaging	Reduction of container and packaging raw materials and stable procurement	• Demands for the 3Rs and reduction in costs from the move to lightweight containers	●	●	●	■			• Reducing the weight of containers and packaging
	Energy sources	Climate change	Reduction in reliance on fossil fuels	• Reduction of energy cost	●	●	●		■		• Achievement of an energy mix to achieve net-zero emissions
		Climate change	Stable procurement of renewable energy	• Stable use of renewable energy with additionality	●	●	●	■			• Use of renewable energy with a focus on additionality
	Resilience	Climate change, biological resources, water resources, containers and packaging	Strengthening the supply chain	• Ensuring the stability of the procurement of agricultural raw materials and reduction of Scope 3 GHG emissions	●	●	●		■		• Enhancement of engagement • Utilization of the Kirin Supply Chain Environmental Program

Activities

Value Chain Overview

The Kirin Group actively engages in various social issues to connect the desire to enjoy and pass on the rich blessings of the Earth to future generations with everyone involved in the value chain. To achieve the "Kirin Group's Environmental Vision 2050," which aims for "Enrich the Earth with positive impact," we identify risks and opportunities at each stage of the value chain and execute them strategically to ensure more reliable achievement of our goals.(Details on the "Kirin Group's Environmental Vision 2050" → P.10)

Research & Development

- Impact of diseases and air pollution on agricultural products P.47
- Financial impact on the procurement of agricultural products from carbon pricing P.53
- Lack of research and development resources and lack of long-term perspective P.57
- Concerns about deforestation P.60
- Opportunity loss due to ethical consumption P.60
- Increasing distribution in infectious diseases caused by global warming P.68
- Increase in heatstroke caused by global warming P.68
- Increased expectations for products and services that contribute to decarbonization P.69
- Reduction of container and packaging raw materials and stable procurement P.70

Procurement

- Declining yields of agricultural products and increase in procurement costs P.39
- Changes in the state of nature P.39
- Impact on agricultural products from floods and droughts P.46
- Financial impact on the procurement of agricultural products from carbon pricing P.53
- Cost of regulatory response P.55
- Environmental and economic incompatibility due to rapid agricultural policy transitions P.56
- Concerns about deforestation P.60
- Ecosystem damage due to derelict farmland P.66
- Ecosystem damage due to the excessive use of agricultural chemicals P.66
- Damage to ecosystems owing to reduction in agricultural land for food P.66
- Strengthening the supply chain P.72

Manufacturing

- Disruption of operations owing to floods P.42
- Disruption of operations owing to droughts P.44
- Carbon pricing and energy procurement costs P.48
- Impact on currently held assets P.54
- Decline in ability of engineering departments to respond and lack of appropriate investment P.58
- Social resistance to fossil-derived raw materials P.59
- High energy prices P.61
- Concerns about renewable energy P.63
- Responsibility for pollution of the natural environment P.65
- Reduction in reliance on fossil fuels P.71
- Stable procurement of renewable energy P.71

Supply and Logistics

- Impact on transportation from floods P.43
- Carbon pricing and energy procurement costs P.48
- Impact on currently held assets P.54
- Sustainable logistics P.70

Sales

- Environmental pollution from improper disposal of used containers P.41
- Consumer reputation P.63
- Trust from investors P.63

Activities

Activities in response to Significant Risks and Opportunities

Physical risk / Chronic risks

Declining yields of agricultural products and increase in procurement costs [medium to long term]

Biological Resources | Water Resources | Climate Change

Yields of agricultural raw materials may decline significantly owing to global warming and reductions in daily temperature ranges caused by climate change. Additionally, we identified, in surveys related to water risk and water stress, severe levels of drought risk and flood risk in areas producing agricultural raw materials.

Changes in the state of nature [medium to long term]

Biological Resources | Water Resources | Climate Change

Soil erosion and soil runoff have become problems owing to factors such as heavy rainfall caused by climate change and land development in areas surrounding the farms due to economic growth. In addition, there is soil pollution caused by the use of agricultural chemicals and other problems, and these factors may change ecosystems and reduce yields of agricultural raw materials.

Response strategy

▶Support for farms to acquire certification for sustainable agriculture (adaptation measures)

We will continue to support farmers for the acquisition of sustainable farm certification in order to secure production areas for agricultural products that are resilient to climate change. Through comprehensive training on techniques that maintain crop yields while reducing the use of pesticides and fertilizers, we aim to minimize the impact of environmental changes on raw agricultural products and contribute to reducing the environmental footprint of agriculture.

▶Technology development to improve plant heat tolerance in response to global warming (adaptation measures)

To adapt to climate change, we promote research and development of breeding and cultivation technologies to stably produce hops with high tolerance to environmental stresses such as heat and drought.

▶Mass plant propagation technologies (adaptation measures)

We will continue efforts to accumulate knowledge concerning applications for “mass plant propagation technologies” developed by the Kirin Central Research Institute, to prepare for the risk of falling yields of agricultural products as a result of climate change. We expect the knowledge can be used if heat-tolerant varieties adapted to global warming are commercialized. Given the challenges for us of creating a beer business that doesn’t rely on barley and hops, we aim to contribute to the stable procurement of key agricultural products and the sustainability of agriculture through breeding technology improvements that address global warming.

▶Development of alternative raw materials and new production technologies (adaptation measures)

Barley, a vital agricultural input for our core product, faces the risk of yield declines due to climate change. Accordingly, advancing technical expertise to reproduce similar flavor characteristics without depending on barley is regarded as a key adaptation strategy to mitigate potential supply chain vulnerabilities. Additionally, we are investigating and analyzing the medium- to long-term yield impacts of climate change on the agricultural products used as raw materials for the isomerized sugar needed in beer-flavored beverages, tailored to each region.

▶Introduction of perennial grains into annual crop production systems (adaptation measures)

In many wheat-producing regions of Australia, intensive cultivation of annual crops has negatively affected water quality and soil health. By integrating perennial grains into the production system in these areas, we aim to simultaneously achieve ecosystem restoration and productivity improvement.

▶GHG emission reduction (mitigation measures)

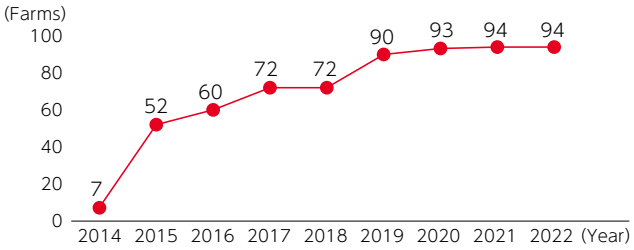
In order to minimize the risk of falling agricultural yields, we will promote initiatives aimed at achieving Net-Zero emissions by 2050, our science-based 1.5℃ target by 2030, and renewable energy targets under RE100 by 2040.

Activities

▶Support for obtaining Rainforest Alliance certification for raw agricultural product farms

Rainforest Alliance (RA) certification is an international system that verifies agricultural producers and businesses meet stringent standards for sustainable agriculture and forest management. These standards encompass environmental protection, respect for human rights, worker welfare, and community well-being. Farms and businesses that achieve these standards are awarded the RA symbol, featuring a frog logo. This logo signifies the health of ecosystems and indicates that the products have been produced sustainably.The Kirin Group supports the acquisition of RA certification for tea farms in Sri Lanka, which produce raw agricultural products for “Kirin Gogo-no-Kocha,” and for coffee farms in Vietnam, from which Kirin sources 30% of its coffee beans. To date, with the support of the Kirin Group, 94 large tea estates and as well as 659 coffee farms (including those transitioning from UTZ certification, a sustainable agriculture certification by a Dutch non-profit organization, to RA certification), have obtained certification. In August 2021, the Kirin Group also began year-round sales of “Kirin Gogo-no-Kocha Straight Tea” made with tea leaves from these certified farms.

Number of large farms obtaining certification in Sri Lanka



Activities

Activities in response to Significant Risks and Opportunities

Supporting growers to obtain Rainforest Alliance Certification

▶Activities related to technology development to improve plant heat tolerance in response to global warming

The Kirin Group's Institute for Future Beverages and the startup CULTA, originating from the University of Tokyo, are conducting joint research to enhance the heat tolerance of hops for climate change-adapted hop production. Traditionally, hop quality assessments were only conducted once a year in line with harvest frequency. However, with the establishment of indoor cultivation technology, hops can now be harvested multiple times a year regardless of the season, allowing for more frequent quality assessments. This shortens the evaluation cycle for breeding and cultivation techniques, accelerating research and development to counteract yield and quality decline, thus contributing to sustainable hop production when high-temperature-tolerant hop varieties are commercialized.

▶Plant mass propagation technology (adaptation measures)

To address the risk of reduced agricultural yields due to climate change, rapid and large-scale propagation technology is required when heat-tolerant varieties adapted to global warming are commercialized. Kirin Central Research Institute utilizes its proprietary "plastic bag-type culture vessel technology" made of plastic film, enabling the mass production of healthy seedlings and clones with identical genotypes as the parent plants, with multiplication rates ranging from tens of thousands to hundreds of thousands, depending on the plant species. Because the plants are grown in small bags with nutrient solutions circulated for growth, water resources are used more efficiently than in soil cultivation, allowing stable cultivation even in areas with high water stress. This technology is expected to significantly contribute to establishing a sustainable agricultural supply system in conjunction with the spread of heat-tolerant varieties.

▶Possession of technology for achieving beer flavor using soybeans

"Kirin Nodogoshi Nama," a beer-flavored alcoholic beverage sold by Kirin Brewery in Japan, is brewed using isomerized sugar and soybeans instead of barley. By possessing brewing technology that reproduces beer flavor with raw materials expected to have a stable supply, we can address the risk of reduced barley yields. Although climate change is expected to impact soybean yields differently across regions, the overall global yield is not expected to change significantly.

Research and analysis on isomerized sugar used to beer-flavored beverages has shown that the probability of a simultaneous 10% yield decrease in corn in the four major production regions (USA, China, Brazil, Argentina) exceeds 80% by the end of the century under a 4°C scenario, and about 10% around 2050 under a 2°C scenario. However, for other agricultural products that can be used as raw materials for isomerized sugar, such as sugarcane and potatoes, the yield is not expected to decrease globally, despite regional variations. Based on these results, we believe that combining production regions, crops, and brewing technologies will allow us to respond to medium- to long-term yield fluctuations under climate change, and that brewing technology that does not rely on barley is effective as an adaptation measure to physical risks.

▶Introduction of perennial grains into annual crop production systems

The "The Good Grain" initiative, in collaboration with Sustainable Table and Stone & Wood, explores the potential for ecosystem restoration and productivity improvement by introducing perennial grains (Mountain Rye) into annual crop production systems. Large-scale cultivation and malt production are being promoted in demonstration fields, and new uses in beer brewing are being tested. Additionally, symposiums involving the supply chain, agricultural industry, and brewing industry are held to share results and challenges.

▶GHG emission reduction (mitigation measures)

We will implement GHG emission reductions across the entire value chain, from product development to sales. (details on GHG emission reduction initiatives→P.48~52)

Activities

Activities in response to Significant Risks and Opportunities

Physical Risk / Chronic Risk

Environmental pollution from improper disposal of used containers [medium to long Term]

Biological Resources | Water Resources | Containers and Packaging | Climate Change

If used containers are not properly recycled and are released into the environment, they may have a negative impact on a wide range of ecosystems in the form of greenhouse gas emissions, damage to the natural environment, and marine plastic pollution. Furthermore, stricter future regulations on the improper disposal of plastic containers could present transition risks, potentially increasing extended producer responsibility and diminishing corporate brand value.

Response strategy

▶Building a society that recycles plastics

In accordance with the "Kirin Group Plastic Policy" that we established in 2019, the Kirin Group is progressively increasing the ratio of recycled PET resin used in its bottles to meet the targets of 50% by 2030 and of 100% sustainable container use by 2050.

Additionally, Lion has developed the "Sustainable Packaging Strategy" to enhance recycling efforts in Australia and New Zealand. In collaboration with the Australian Packaging Covenant Organization (APCO), Lion has set ambitious goals to incorporate over 50% recycled material in its packaging by 2025 and ensure that 100% of its packaging is reusable, recyclable, or compostable. Progress toward these goals has been consistent, with Lion receiving recognition from APCO in 2023 for its exemplary practices.

Activities

▶Horizontal recycling of PET bottles

We are collaborating with various companies to efficiently segregate, collect, and recycle used PET bottles through the bottle-to-bottle initiative. Our partnerships have gradually expanded, including WELCIA YAKKYOKU, Tobu Railway, and Chiba Yakuhin in 2022, Sugi Pharmacy and Tokyo Tatemono in 2023, and Yomiuri Land in 2024. Additionally, we are strengthening our collaboration by forming agreements with local governments. In 2023, for example, we signed a partnership agreement on the horizontal recycling of PET bottles with Asahi Soft Drinks Co., Ltd. and four cities (Joso City, Toride City, Moriya City, Tsukubamirai City), represented by the Joso Regional Municipal Union. All used PET bottles sorted by citizens in these cities are recycled mechanically or chemically to regenerate PET bottle material, which is then reused in PET bottle products.

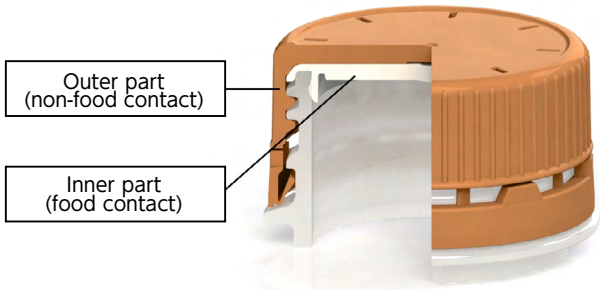
New Functional Recycling Box and Awareness Sticker

Furthermore, new functional recycling boxes with educational stickers have been installed in various locations near vending machines, and with the cooperation of consumers, PET bottles are collected in these boxes, promoting horizontal recycling throughout society.

▶Horizontal recycling of beverage caps

Starting in 2024, we are conducting Japan's first proof-of-concept trial for the practical implementation of horizontal recycling of caps used for alcoholic beverage PET bottles in collaboration with Nihon Yamamura Glass Co., Ltd. This initiative utilizes two-piece caps with 10% recycled resin in the outer part (non-food contact) to enable horizontal recycling into caps for the same purpose. The trial will use approximately 40,000 caps, with an estimated reduction in GHG emissions of about 1.7g per cap.

Two-Piece Cap Used in the Proof-of-Concept Trial



▶VicReturn initiative

In Victoria, Lion continues to play an active role as a founding member of VicReturn, the coordinator of the container deposit scheme. Launched in November 2023, this initiative successfully collected 500 million containers by June 2024.

Activities

Activities in response to Significant Risks and Opportunities

Physical Risk / Acute risk

Disruption of operations owing to floods [short to long term]

Water Resources | Climate Change

Significant impacts, including disruptions to brewing and manufacturing, may occur as a result of damage from typhoons, heavy rainfall, and other disasters caused by climate change. The Kirin Group has operated businesses in Japan and Australia, where the level of water stress differs significantly. As such, we have developed an understanding rooted in experience of the fact that problems related to water differ between countries and regions, and that they largely depend on basins and specific locations. Since 2014, the Kirin Group has been conducting regular scientific surveys. In 2024, we conducted surveys and analyses of water risk at brewing and production sites using Aqueduct 4.0, hazard maps created by local governments, and other resources (Details of Manufacturing Site Water Risk/Stress → P.18). As a result, we found that water stress and water risk have worsened at many business sites. Our management benchmark for the financial impact of flooding on brewing and production sites is approximately 1.0 billion yen to 5.0 billion yen, in line with the actual amounts of flood damage in the past (Details of financial impact → P.34). We are also using wind and water damage simulation systems to forecast losses from the risk of flooding. We are also concerned about flooding at our business sites due to rising sea levels caused by global warming. Although sea levels in Japan are expected to rise by 0.46 to 0.97 meters under the 4°C scenario, we think it is still difficult to form a quantitative assessment. Going forward, we will continue paying close attention to the results of latest research.[*1]

*1 We are conducting multifaceted risk assessments for floods using multiple systems. Aqueduct can be used for risk assessments that include future predictions, not just current evaluations. It is the most widely used tool at present, providing high comparability, but it has limitations in tracing the basis of evaluations in detail and may not fully reflect complex water systems. Hazard maps, created by local governments with deep understanding of the region, provide evaluations assuming the worst-case scenario. Using them in conjunction with Aqueduct allows for more accurate risk assessments. Simulation systems can estimate damage ratios and loss amounts for different recurrence periods, aiding in exposure understanding and insurance coverage decisions.

Response strategy

▶Sharing of knowledge on responses to floods (adaptation measures)

We share the knowledge and experiences of locations that have dealt with flooding within the group to minimize damage.

▶Insurance for floods (adaptation measures)

We will consider insurance at business sites as an effective measure against natural disasters, including floods.

▶Addressing flooding at facilities (adaptation measures)

We assume that flooding would have a serious impact on the continuity of our businesses, and we will therefore promote physical countermeasures as necessary at business sites where we must continue to fulfill our responsibility to supply customers.

Activities

▶Re-evaluation and analysis of water risks across the group

New Belgium Brewing's Asheville brewery was not previously evaluated as high-risk by conventional assessment tools but suffered flood damage from Hurricane Helene in September 2024. This event has prompted a plan to re-evaluate and analyze water risks at all manufacturing sites across the group. We will conduct comprehensive water risk assessments using both the latest global tools and local information. The new evaluation and analysis results will be accumulated as knowledge, and measures to address similar future damages will be considered and shared, thereby strengthening water-related resilience across the group.

▶Decision-making on insurance coverage using wind and water damage simulation systems

In 2020, we used the natural disaster model AIR to simulate wind and water damage for our main 20 business sites in Japan, thereby estimating loss percentages and amounts of damage for each recurrence period. For 200-year disasters (a disaster occurring once every 200 years), the total exposure across the Kirin Group was approximately 1.0 billion yen. At KYOWA PHARMA CHEMICAL, however, we calculated that the annual amount of damage from a wind and water disaster of a scale occurring once every 500 years would be equivalent to 42% of the value of its property. Accordingly, in 2022, we conducted on-site surveys, and confirmed that the amount of damage would be precisely equivalent to 17%. We also conducted risk surveys at Thai Kyowa Biotechnologies, which is located in an area where flood and other water risks are expected, in 2023. Going forward, we will continue conducting on-site risk surveys and assessing the possibility of insurance for business sites that we have judged to be at high risk of future flood damage, based on our wind and flood simulation system.

▶Flood prevention measures at Kyowa Kirin

At Kyowa Kirin, we have judged that the amount of damages from recovery, production disruption, and business opportunity losses would be considerable in the event that water damage, etc., caused long-term disruptions to operations at Kyowa Kirin's own pharmaceutical plants, commissioned manufacturers of drug substances, and packaging material suppliers. At Kyowa Kirin's own sites, we have formulated policies on countermeasures against water damage, and have taken measures to prevent flooding (geographically distributed storage of important assets related to production, waterproofing of buildings, moving important facilities to high floors and locations, the installation of flood walls, etc.). In the future, we intend to continue to address these issues through investment in our facilities. We will assess and address the impact across the supply chain as a whole, and take steps to avoid production disruptions and minimize damages. At the same time, there will be a significant impact on companies commissioned to manufacture drug substances, packaging material suppliers, etc., so we will gather information about water damage countermeasures at each partner company, identify issues, and consider measures such the formulation of BCPs and disaster response drills.

Activities

Activities in response to Significant Risks and Opportunities

Physical Risk / Acute risk

Impact on transportation from floods [short to long term]

Water Resources | Climate Change

There may be an impact on product distribution and the transportation of raw materials from typhoons, heavy rainfall, and other disasters caused by climate change. In 2018, the West Japan Torrential Rain Disaster resulted in long-term disruptions to railroads and roads in the Chugoku region, and there were major obstacles to the transportation of products from breweries and plants to customers. In 2022, we conducted a survey concerning flooding risk and countermeasures in major barley shipping ports overseas. As a result of this survey we found that flooding risk was low in Canada, Australia, and the United Kingdom, and that while there was a risk of future floods of between 0.5 and 5 meters in the Netherlands and Germany, planned countermeasures have been formulated and implemented. We also found that, even when flooding risk is not high in the bays themselves, disasters affecting railroads and roads linked to the bays, as well as adjacent cities, would cause obstacles to the functioning of the ports.

Response strategy

▶Sharing of knowledge on responding to floods (adaptation measures)

We utilize response manuals for widespread logistics disruptions caused by natural disasters to address similar incidents. Additionally, we continuously update these manuals and accumulate knowledge whenever new disasters occur.

▶Diversification of suppliers (adaptation measures)

We reduce risk by having multiple suppliers. We work with our suppliers as part of endeavors to sustain our supply chain, to ensure that we can stably deliver safe and secure products to customers, at the optimal price.

Activities

▶Utilizing knowledge for responding to transportation impacts from typhoon damage

Immediately after we recovered from major damage to logistics networks from the 2018 West Japan Torrential Rain Disaster, we created a manual for responding to similar events. As a result, we were able to avoid any significant impact from subsequent typhoon damage on product distribution, including Typhoon Faxai, which caused significant damage, particularly in Chiba Prefecture, and Typhoon Hagibis, the first typhoon to receive the designation of a Disaster of Extreme Severity (both occurred in 2019) and a Specified Anomalous Disaster.

▶Diversification of malt suppliers and long-term contracts with hop farmers

We have diversified our procurement of malt, the main ingredient of beer, across three continents: North America, Europe, and Australia. We combine procurement measures for hops, such as adopting long-term contracts with producers, as part of efforts to secure the necessary amounts, and minimize the impact of market prices.

Activities

Activities in response to Significant Risks and Opportunities

Physical risk / Acute risk

Disruption of operations owing to droughts (short to long term)

Water Resources | Climate Change

Water is essential in brewing and production processes for alcoholic beverages, soft drinks, pharmaceutical products, and biochemical products. Accordingly, there may be disruption or obstacles to brewing and production in the event of severe droughts caused by climate change. In our assessment of water stress at production and brewing sites based on Aqueduct 4.0, and other resources, water stress such as drought was elevated as high at seven plants in Australia, two in the U.S., two in China, and one in Thailand. The financial impact of the drought on the manufacturing sites was estimated assuming Aqueduct 3.0. We have identified the estimated financial impact of droughts on breweries and production sites based on the volume decline in brewing and production under certain assumptions at business sites with a "high" level of water stress. We estimated that the financial impact was between approximately 30 to 600 million yen. Based on past cases, we have judged that the impact can be minimized to a negligible level even during droughts. However, in light of the effects of climate change in recent years, which have been becoming more severe and frequent as evidenced by the flood damage at NBB Asheville, we are currently re-examining the water risk assessments of the Kirin Group's global bases.

Response strategy

▶Advanced water reduction technology (adaptation measures)

We conduct assessments of water stress and water risk to obtain scientific evidence. Based on this understanding, we implement appropriate water reduction measures tailored to the different levels of water stress in each country and region.

▶Sharing drought response knowledge (adaptation measures)

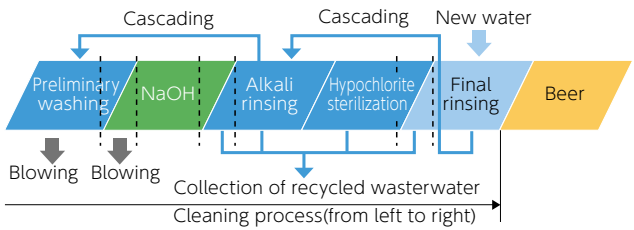
We enhance the resilience of each business by sharing the knowledge and insights gained from drought experiences across our global sites.

Activities

▶Introduction of reverse osmosis (RO) water recycling plant at Tooheys Brewery

Unlike Japan, which is rich in water resources, Australia faces chronic water shortages. For example, in Sydney, New South Wales, there is a high risk of drought, and a significant amount of water is used for industrial purposes rather than daily living, necessitating water conservation in the business sector. The Kirin Group aims to reduce water usage by constructing facilities in Australia that purify and reuse water used in breweries. In 2024, following the Castlemaine Perkins Brewery in Queensland, Tooheys Brewery became the second site to introduce a reverse osmosis (RO) water recycling plant. The recycled water is used for equipment cleaning and other purposes. This facility's introduction allows for the reuse of approximately 270 million liters of water annually, contributing to water conservation. This amount is equivalent to filling 108 Olympic swimming pools. Additionally, a $7.2 million investment will save over $700,000 in annual water bills.

The water used for cleaning is cascaded for repeated use according to water quality.



▶Strict management of flow rate and flow velocity to avoid wasting water in the production process

In our production process, we use a lot of water in cleaning and sterilizing processes. We have established management system to strictly control quality of the cleaning processes and water consumption by optimizing flow rate and other parameters. We also actively promote reuse of water, depending on purposes. For example, the rinsing water that we use in the final cleaning step of an equipment is relatively clean, so we can use it again for the initial cleaning step of other equipment. In this way, the water used for cleaning is cascaded for repeated use according to water quality. In order to ensure that equipment is appropriately cleaned, it is necessary to know how to use the equipment, such as how to balance the amount of water that can be recovered with the amount of water that is used, and how to time the process. The Kirin Group is achieving a high level of water conservation by accumulating best practices and sharing them among production sites.

▶Addressing watershed-level water stress through collaboration with local communities, global environmental organizations, and experts

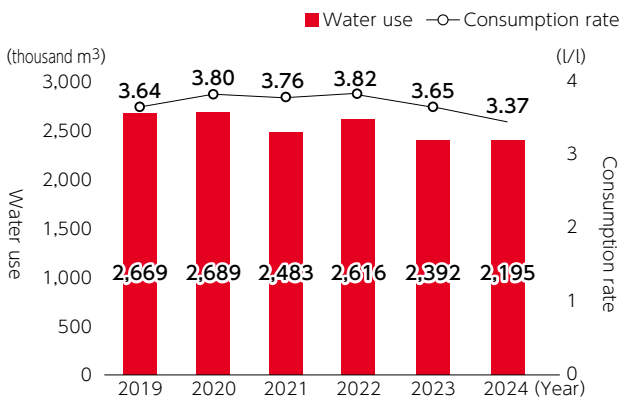
The Fort Collins Brewery, under the Kirin Group, uses water from the Colorado River Basin in the United States. In recent years, the Colorado River Basin has experienced a decrease in river flow due to reduced snowfall. Despite this, water demand has increased due to the expansion of agriculture and dairy farming upstream, and population growth downstream. Additionally, there are stringent restrictions on water usage imposed by geographical and historical contexts. This water stress cannot be resolved through our water-saving efforts alone. Therefore, the Kirin Group has begun collaborating with watershed stakeholders and the community to find solutions together. In March 2023, we held a TNFD scenario analysis workshop with TNFD stakeholders and local water experts to discuss and consider strategies for addressing water stress issues. By collaborating not only within our company but also with local communities, experts, and environmental organizations, we are strengthening our ability to approach shared challenges. We share this knowledge across the entire group to enhance our response capabilities.

Activities

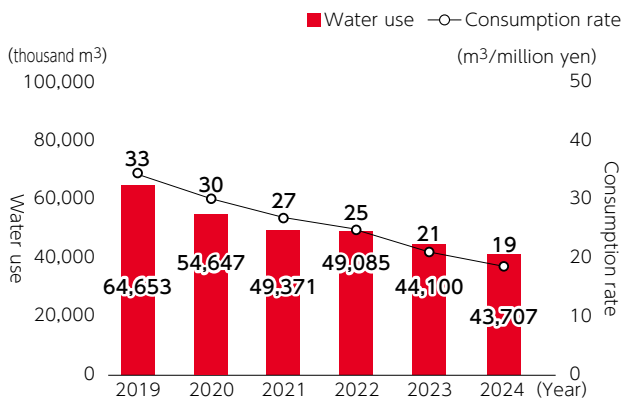
Activities in response to Significant Risks and Opportunities

Metrics and targets

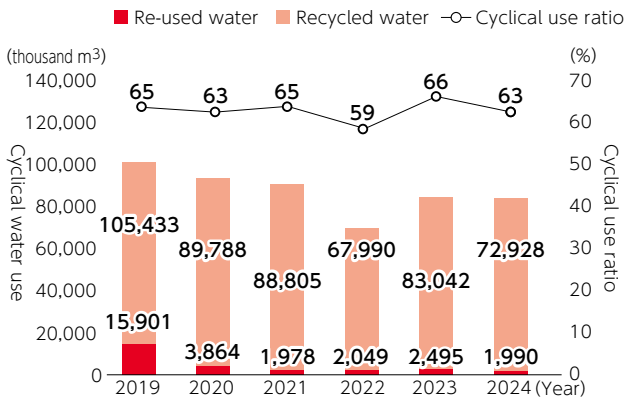
Water use and consumption rate (water use / production volume) of Lion(Oceania region)



Water use and consumption rate (water use / sales revenue) of entire Group



Cyclical water use and cyclical use ratio (cyclical use / (tap water use + cyclical use)) of entire Group



Activities

Activities in response to Significant Risks and Opportunities

Physical Risk / Acute Risk

Impact on agricultural products from floods and droughts [short to long term]

Biological Resources | Water Resources | Climate Change

There is a possibility that water risk and water stress from climate change, as well as disasters, may result in a decline in agricultural yields and an increasing financial impact related to procurement. We conducted a detailed water risk survey of raw material production areas using Aqueduct3.0 in 2019, and identified that water stress will be high in many production areas (Impacts of Climate Change on Major Agricultural Yields and Water Stress on Agricultural Land Around 2050 → P.19). In recent years, such concerns have emerged in many regions around the world.

Response strategy

▶Responses to water stress in areas producing agricultural raw materials (adaptation measures)

In addition to mitigating long-term climate risks by reducing GHG emissions, it is essential to strengthen our preparedness for floods and droughts as part of our short-term strategy. For this purpose, priority sites will be narrowed down after conducting water risk analysis in production areas. Among the priority sites, action sites will be identified and water resource conservation activities and training will be promoted, as well as appropriate disaster mitigation measures and sustainable water use management. This will contribute to the risk reduction of yield declines due to extreme weather events and to ensuring a stable agricultural product supply.

▶Prevention of soil runoff in areas producing agricultural raw materials (adaptation measures)

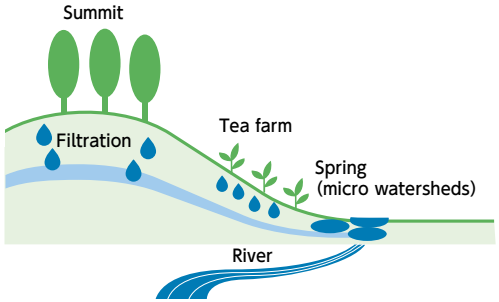
Soil runoff leads to a decline in agricultural productivity and negatively impacts the conservation of water resources. Enhancing soil conservation and water management practices is crucial for ensuring the sustainability of agricultural land, particularly as precipitation patterns become more unpredictable. Effective soil management can reduce erosion during rainfall, improve water permeability, and increase water retention during droughts. Additionally, maintaining forests and vegetation supports water source recharge and contributes to the stability of the regional water cycle. Through these measures, we aim to mitigate procurement risks.

Activities

▶Training on measures to address water stress in agricultural production areas

Many tea farms in the highlands of Sri Lanka are planted with tea trees on steep slopes. In areas with favorable geological conditions, rainwater seeps into the ground and emerges as springs in corners of the tea farms. These springs are known as micro watersheds. Located in the highlands of central Sri Lanka, these micro watersheds are the sources of most rivers flowing to coastal cities, making them small but valuable sources of water. In recognition of their importance, we initiated conservation activities in 2018, and by the end of 2024, 27 water sources had been preserved. As part of these conservation activities, we have provided training to 1,750 residents to raise awareness about the need for water source conservation. Additionally, pamphlets on the importance of water, conservation, and watershed protection have been distributed to approximately 15,000 people. Some farms have integrated water education into nursery and elementary school programs for harvest workers. In Vietnam, coffee farms began training in 2020 to acquire certification, introducing methods to prevent land from drying out during droughts and to store water for use during dry periods.

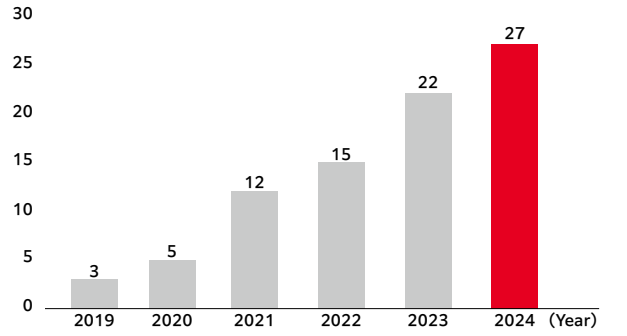
Mechanism of micro watersheds



▶Cover crop training to prevent soil runoff

In Sri Lanka, the impact of climate change has led to frequent occurrences of drought and heavy rain. Urbanization, industrialization, and inappropriate land use have exacerbated soil erosion and runoff, which are significant problems. Tea farms, often situated on steep, sunny slopes, face additional challenges. Heavy rains not only cause the runoff of fertile soil but have also led to landslides that have resulted in loss of lives. Covering the ground with grass (cover crops) is an effective soil management measure that enriches ecosystems and serves as an adaptation strategy to climate change. This approach prevents soil runoff by shielding the ground from direct rainfall during heavy rains and helps retain water during droughts. In our training activities to support the acquisition of certification for sustainable tea farms in Sri Lanka, we teach how to identify grasses that negatively impact tea cultivation. We instruct tea farms to ensure that the ground is covered with well-rooted grasses. In collaboration with neighboring universities, we have developed a method that is accessible to farm workers, providing them with science based guidance.

Number of areas where water sources were conserved among Sri Lankan tea farms



Number of residents educated on the importance of water

Group training : 1,750 people
Distribution of pamphlets : 15,000 people

Activities

Activities in response to Significant Risks and Opportunities

Physical Risk / Acute Risk

Impacts of diseases and air pollution on agricultural products [short to medium term]

Biological Resources | Climate Change

With climate change and the degradation and pollution of the natural environment, there is growing concern about the impact of diseases and air pollution on agricultural yields. In Sri Lanka, air pollutants from neighboring India are damaging tea leaves in lowland areas. Global warming is expected to exacerbate grape diseases. Additionally, Brazil, a major producer of oranges for processing, has experienced a sharp decline in production due to extreme heat, low rainfall, and disease.

Response strategy

▶Research and measures from a long-term perspective (adaptation measures)

We will leverage our strength of having fields where we are able to conduct surveys and various types of tests to solve various issues related to the environment through a scientific approach and research and development with a long-term perspective.

Activities

We believe that comprehensive pest management is an effective way to control agricultural diseases, and we have already begun trials in some vineyards and tea farms. It seems likely that ecosystems will become stable when a variety of species inhabit in the fields. We have also begun research concerning the possibility that the enrichment of ecosystems through hedgerow-style cultivation may suppress diseases, as well as focusing on the early detection of insects and mites that are vectors of diseases.

Long-term, ongoing research is necessary to solve various issues related to climate change and natural capital. In the Kirin Group, we have our own vineyards, and we have established strong relationships of trust with tea farms in Sri Lanka through long term engagement.

One of the major diseases in grape cultivation is downy mildew, with serious damage reported worldwide. To mitigate this damage, it is urgent to accurately identify the pathogens affecting grape quality and yield and to develop technologies that maximize control effectiveness. The Institute for Future Beverages has established the following two technologies:

▶Technology for year-round maintenance and management of downy mildew pathogens

The research team has developed an innovative method to stably maintain and manage downy mildew pathogens throughout the year. This technology allows for the continuous cultivation of pathogens in the laboratory without relying on conventional overwintering by oospores in leaf litter.

▶Pesticide efficacy evaluation technology

Utilizing the aforementioned maintenance technology, the team has established a drug resistance evaluation system that can be assessed year-round. This technology is expected to significantly contribute to the early detection of resistant bacteria and the verification of the effectiveness of new pesticides.

The development of these technologies will significantly advance downy mildew control strategies and enable more effective and sustainable disease management. These research results received a conference presentation award from the American Society for Enology and Viticulture (ASEV) Japan.

Activities

Activities in response to Significant Risks and Opportunities

Transition Risk / Policy Risk

Carbon pricing and energy procurement costs [medium to long term]

Biological Resources | Water Resources | Climate Change

It is highly likely that energy procurement and logistics costs will spike if governments introduce systems such as carbon taxes, emissions trading schemes, and carbon border adjustment mechanisms. In Japan, we anticipate initiatives such as the introduction of an emissions trading scheme by the GX League, and the introduction of systems that require generators of electric power to purchase emission allowances in the future. Such initiatives result in additional cost for energy procurement. The Kirin Group will minimize the risk of cost increase by steadily reducing emissions to meet the 1.5℃-aligned SBT and Net-Zero target.

As a result of estimating the financial impact on energy procurement and the emission reduction effect due to carbon pricing, achieving the SBT 1.5℃ target would result in tax savings of approximately 2.7 billion yen under the 4℃ scenario, 4.6 billion yen under the 2℃ scenario, and 4.9 billion yen under the 1.5℃ scenario by 2030.

Response strategy

▶Energy saving/renewable energy/switch of energy source

In order to minimize the financial impact of carbon pricing, we will first reduce GHG emissions in accordance with our roadmap, under the basic principle of profit and loss neutrality as a group, aiming for the 1.5°C-aligned SBT targeting 2030 for Scope 1 and Scope 2 emissions. Specifically, the merit from saving energy will offset depreciation and amortization from the investment and the procurement costs increase of renewable energy. Since the outlook for technological innovations in areas such as switch of energy source and trends in energy costs are currently unclear, we cannot accurately estimate costs for 2030 onward. We will, however, incorporate measures to reduce GHGs aimed at achieving our RE100 renewable energy target by 2040 and the net-zero target by 2050 into our business plan.

Metrics	target of 2030	Progress of 2024
Scope1+2 reduction rate	50%	34%
Scope3 reduction rate	30%	10%

▶GHG emission reduction through logistics optimization

In order to reduce GHG emissions in logistics departments, we will develop the various initiatives such as modal shifts, joint deliveries with industry peers, and higher loading ratios. GHG emissions from upstream transportation (category 4), including the transportation of products, account for approximately 10% of total Scope 3 emissions, and are a major target for the reduction of emissions. In recent years, reducing the impact of transportation has also been an important initiative from the perspective of reducing the risk that we will not be able to transport products owing to the shortage of truck drivers.

▶GHG emission reduction through lightweight packaging

By lightweighting containers and packaging such as bottles and labels, we will reduce GHG emissions in manufacturing and logistics.

▶Increasing the ratio of recycled materials in packaging

We will adopt can lids that increase the ratio of recycled aluminum, thereby reducing Scope 3 emissions, instead of primary aluminum ingot which requires significant electricity during manufacturing.

▶GHG emission reduction at the sales stage

By introducing high energy-efficient heat pump vending machines, we will reduce Scope 3 emissions.

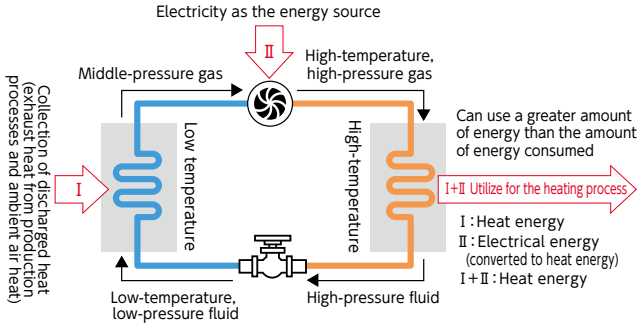
Activities

▶Energy saving/renewable energy/switch of energy source

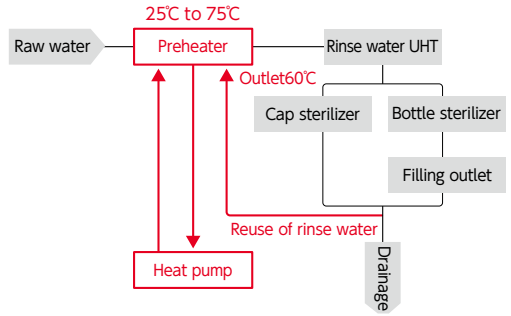
【 Utilization of heat pumps in production processes 】

The Kirin Group believes that reducing dependency on fossil fuel combustion and increase that on electricity, and, furthermore, using renewable electricity are the most effective ways of energy efficiency. Kirin Brewery has reduced GHG emissions by approximately 70% over the 25 years from 1990 to 2015. Since 2019, heat pump systems have been introduced at wastewater treatment plants in six Kirin Brewery plants, reducing GHG emissions by 3% (approximately 4,800 tonnes) compared to last year (As of November 2023). At Shinshu Beverage, about 970 tonnes of GHG emissions are reduced annually by reusing waste heat, which is difficult to use directly, in the bottle cap rinsing process. The Kirin Brewery Okayama Plant has reduced annual GHG emissions by approximately 180 tonnes by reusing waste heat and using thermal energy of atmosphere to a hot water sterilization process for cans (As of November 2023).

Heat pump system



Shinshu Beverage production line



Activities

Activities in response to Significant Risks and Opportunities

【 Improving compressor efficiency 】

At the Kirin Beverage Shonan Plant, in 2021, we switched our high-pressure compressors for PET bottle molding from V-type reciprocating compressors to screw compressors and horizontally opposed reciprocating compressors with variable frequency drives, thereby reducing annual power usage by around 8%. These machines enable us to recover waste heat from themselves and to reuse the heat to other processes.

Improving compressor efficiency

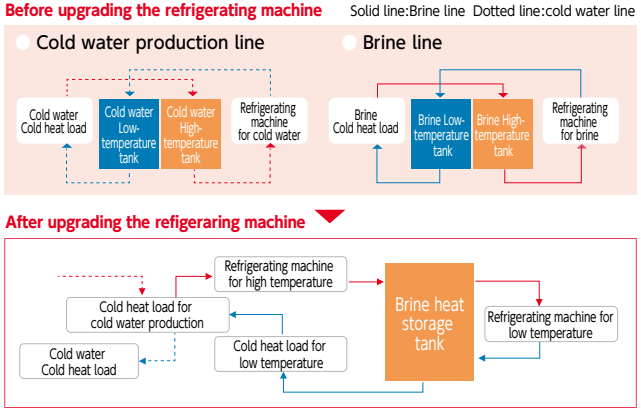
Inverter-controlled pneumatic machinery

The Information and product images above are as of the end of June 2023.

【 Improving the efficiency of refrigeration systems 】

At Kirin Brewery, we reduce energy consumption through improving the efficiency of refrigerating systems. We are implementing a phased approach to the refrigeration system, which cools cooling media in multi-steps, a methodology to maximize energy efficiency of refrigerators.

Improving the efficiency of refrigeration systems



▶Renewable energy

【 Switch purchased electricity for plants to 100% renewable 】

Kirin Brewery has achieved 100% of renewable energy for purchased electricity at Sendai and Nagoya plants since 2022, Fukuoka and Okayama plants since January 2023, Toride plant since April 2023, and Hokkaido Chitose, Yokohama, Shiga, and Kobe plants, as well as all sales sites, since January 2024. As a result, Kirin Brewery has achieved 100% renewable energy for purchased electricity at all production and sales sites, and the proportion of renewable energy in all electricity usage is 66%.

We aim to achieve RE100 target as soon as possible and replace all electricity used in our global operation to renewable energy in the future.

Kyowa Kirin completed to switch purchased electricity to renewable of its production sites and research laboratories in Japan. Kyowa Kirin expanded the initiative from Takasaki Plant, Bio Production Technology Laboratories, Fuji Research Park, and CMC Research Center, in 2020, to Ube Plant in April 2023. Through these initiatives, Kyowa Kirin Group as a whole reduced CO_2 emissions from its operation by more than 55% by the end of 2023 compared with those of 2019, and has already achieved its 2030 target.

Since January 2022, all "Château Mercian" wineries (Château Mercian Katsunuma Winery, Château Mercian Mariko Winery, and Château Mercian Kikyogahara Winery) have achieved 100% renewable energy by applying renewable energy certificates with purchased electricity. At breweries in Australia and New Zealand for Lion, 100% of purchased electricity has been sourced from renewable energy since January 2023.

Kirin Brewery Sendai Plant

Kirin Brewery Nagoya Plant

Kirin Brewery Fukuoka Plant

Kirin Brewery Okayama Plant

Kirin Brewery Toride Plant

Château Mercian Katsunuma Winery

Château Mercian Mariko Winery

Château Mercian Kikyogahara Winery

【 Use of large-scale solar power generation 】

Kirin Group values, in its renewable energy procurement, "additionality," which refers to creating new sources of renewable energy in the world, as well as "ethical procurement," which refers to considering the environmental impact and human rights in generating energy. Kirin Brewery has introduced large-scale photovoltaic system at all nine plants (eight plants, excluding Yokohama Plant, use PPA model[*1]). At Mercian Fujisawa Plant, we introduced photovoltaic electricity based on PPA model from March 2023. This initiative has reduced annual GHG emissions by approximately 124 tonnes and increased the proportion of renewable energy in electric power used by Mercian from approximately 5% before introduction to approximately 8%. At Kyowa Kirin, we have introduced large-scale photovoltaic system (1.47MW) based on PPA model at Ube Plant in 2023. This initiative reduced annual CO_2 emissions by approximately 1,029 tonnes. Vietnam Kirin Beverage introduced a large-scale solar power generation facility (369 KW) using the PPA model, which starts operation in May 2025. This is expected to reduce CO_2 emissions by approximately 340 tonnes annually. Kirin Group Logistics, Kyowa Hakko Bio, and Shinshu Beverage also rent parts of their premises and building roofs to large-scale solar power generation facility companies, contributing to the effective use of their assets and promoting the spread of natural energy.

Activities

Activities in response to Significant Risks and Opportunities


Kirin Brewery Hokkaido Chitose Plant


Kirin Brewery Kobe Brewery Plant


Kirin Brewery Shiga Brewery Plant

Mercian Fujisawa Plant

【 Use of solar power generation in Australia 】

Lion installed photovoltaic system to Castlemaine Perkins Brewery in 2019 and to Little Creatures Brewery in Victoria in 2020. Tooheys Brewery, the largest brewery in New South Wales, collaborates with Australian Hotels Association (AHA), contracting PPA with a renewable energy distributor. By leveraging a buying power of Tooheys, AHA was able to introduce renewable energy at a lower price, successfully reducing the electricity unit cost for hotels' pubs from 11.5c/kWh to 6.9c/kWh. In May 2020, Lion became Australia's first large scale carbon neutral brewer, certified by Climate Active[*2]. Lion discloses carbon credits used to offset its emissions for a year in the annual report to comply certification requirement by Climate Active. The requirement is a new standard for carbon neutral certification in Australia. In New Zealand, Lion has obtained Toitū[*3] carbon zero certification since 2021.

*1 PPA stands for the "Power Purchase Agreement" model and refers to an agreement between a business that sells electricity to users (PPA provider) and the users of electric power. At Kirin Brewery, MCKB Energy Service Co., Ltd., a subsidiary of Mitsubishi Corporation Energy Solutions Ltd., acts as a PPA provider, installing megawatt-class solar power generation facilities on the roofs of breweries, while Kirin Brewery purchases and uses the power generated.
*2 A third-party certification body established by the government of Australia.
*3 A third-party certification body established by the government of New Zealand.


Lion's Little Creatures Geelong

【 Wind power generation 】

Mitsubishi Corporation Offshore Wind Ltd., Venti Japan Inc., C-Tech Corporation, and Mitsubishi Corporation have been selected as power generation business operators for projects off the coast of Noshiro City, Mitane Town, and Oga City in Akita Prefecture, off the coast of Yurihonjo City in Akita Prefecture, and off the coast of Choshi City in Chiba Prefecture, through a consortium (the "Consortium") represented by Mitsubishi Corporation Energy Solutions, Ltd. Kirin Holdings is a partner in the Consortium. These projects are Japan's first fixed-bottom offshore wind power generation projects in general sea areas. Both projects will be the largest power sources in Japan and will make a significant contribution to the Japanese government's commitment to achieve carbon neutrality by 2050. The maximum power output of the three projects will be approximately 1.69 million kW, which is sufficient to meet the electric power demand of approximately 1.21 million households.

【 Renewable energy certificates 】

Since 2021, Kyowa Hakko Bio has introduced "Renewable Energy Certificates (I-REC)" at Thai Kyowa Biotechnologies in Thailand. This is the first case of I-REC application in pharmaceutical and food industries in Thailand. The initiative has offset emissions from electricity and reduced annual GHG emissions by 9,050 tonnes in 2024. We have also introduced renewable energy certificates to Shanghai Kyowa Amino Acid and BioKyowa (I-REC and REC, respectively).

▶Switch of energy source

【 Switch of energy source from heavy oil to natural Gas 】

The majority of the fuel we use at breweries are consumed in boilers that generate steam. At all plants of Kirin Brewery and Kirin Beverage, At all plants of Kirin Brewery and Kirin Beverage, and Mercian Yatsushiro plant, we completely switched the fuel to natural gas, which generates less GHG emissions than heavy oil. We have achieved more efficient boiler operations through the installation of highly efficient gas boilers. To meet part of the plant's heat and electricity needs, cogeneration systems have been installed to provide both heat and electricity.

【 Introduction of electric boilers 】

Lion is planning to install an electric boiler at a brewery in New Zealand, which will begin operation in late 2025. It will save approximately 700 t-CO_2-e per year (6% of Lion Scope 1 and 2 emissions in New Zealand) by replacing the current LPG fuel.

【 Green hydrogen utilization demonstration project 】

Kirin Brewery, along with Mitsubishi Corporation, MCKB Energy Service which is sponsored by Mitsubishi Corporation Clean Energy, Takasago Thermal Engineering and Miura, will start a pilot project in June 2026 to switch part of the boiler fuel used at Kirin Brewery's Hokkaido Chitose Brewery from fossil fuels to green hydrogen and utilize green hydrogen-derived steam in the beer production process.

In the beer production process, a large amount of steam is used for wort boiling and other processes. In this project, part of the boiler fuel used to produce steam will be switched from city gas to green hydrogen, with a plan to meet up to approximately 23% of the annual heat demand with hydrogen, reducing GHG emissions by approximately 464 tonnes per year.

▶GHG emission reduction through logistics optimization

【 Joint delivery and modal shift 】

The Kirin Group regards logistics as a noncompetitive sector and is actively engaging in initiatives together with other companies. In 2017, Kirin Brewery and Asahi Breweries opened a joint delivery center in Kanazawa City, Ishikawa Prefecture, and launched joint train transportation from plants in western area of Japan. Neither of the companies has plants on the coastal side of Japan Sea, so products previously had to be transported by truck over long distances—of 200 km—from their plants on the Pacific Ocean side. This logistic was inefficient and heavy burdens for truck drivers. Joint transportation using train containers not only reduced significant GHG emissions but also shortened driving distances of trucks, significantly reducing burdens of drivers. Thus, the joint delivery contributes to solve truck driver shortages of logistic industry, one of the biggest issues in Japanese society. Through these efforts, we have successfully completed modal shifts from long distance truck transportation, equivalent to 10,000 vehicles a year, to railway containers, and we estimate that we can thus annually reduce GHG emissions by approximately 2,700 tCO_2e. In September 2017, we began joint delivery with Asahi Breweries,

Activities

Activities in response to Significant Risks and Opportunities

Suntory, and Sapporo Breweries in the eastern Hokkaido area. We estimate that the Hokkaido case results in a reduction in annual GHG emissions of approximately 330 tCO_2e.*1

*1 Japan Business Federation (Keidanren) "Contribution to Reduction through Global Value Chains, 5th Edition" (in Japanese)
https://www.keidanren.or.jp/policy/vape/gvc2018.pdf

【 Optimizing inventory and transportation volumes through AI analysis 】

Kirin Beverage and Asahi Soft Drinks have fully introduced the production, sales, and inventory management service "MOVO PSI" developed by Hacobu and JDSC from November 1, 2024, to optimize inventory and transportation volumes. "MOVO PSI" analyzes PSI (Production, Sales, Inventory) information between companies using AI (machine learning) to level daily order quantities and replenishment volumes. The demonstration experiment achieved results such as reducing transportation costs by up to about 9.1% and inventory days by up to about 13.2%, further improving logistics efficiency by increasing self-transport loading efficiency and reducing out-of-stock rates.

Additionally, Kirin Beverage and Kao jointly transport between their logistics centers starting from February 2025 and will gradually increase delivery volumes. Specifically, the empty truck sections connecting Kao's Kawasaki Logistics Center (Kanagawa Prefecture) and Koshoku Logistics Center (Nagano Prefecture), and Kirin Beverage subsidiary Shinshu Beverage Plant (Nagano Prefecture) and Kirin Beverage Kawasaki Logistics Center (Kanagawa Prefecture) will be utilized to optimize truck transportation efficiency and reduce GHG emissions (approximately 15% in the corresponding sections).

The logistics industry faces structural issues such as truck driver shortages, and this initiative was realized under three conditions:

1. Both shippers can utilize logistics data.
2. Sufficient load can be secured for return trips.
3. There are available transportation sections to connect.

Both companies aim to reduce the number of trucks by over 300 annually and will expand joint transportation sections and promote cross-industry collaboration in the future.

【 Vendor-managed warehouses 】

The use of vendor-managed warehouse can reduce long-distance transportation. As a result, GHG emissions are reduced, contributing to a more sustainable supply chain. With the aim of mitigating the risk of not being able to transport due to an unavailability of trucks and optimizing transportation efficiency, we started a trial operation of raw materials procurement and distribution system using raw materials warehouses (vendor-managed warehouses) close to Kirin Beverage's plants, Shonan Plant and Shiga Plant, in October 2019. By establishing vendor-managed warehouses, raw material and ingredient suppliers can transport desired amount of cargo with their convenient schedules, thereby maximizing efficiency. This initiative has made it easier for plants to cope with sudden changes in production plans and contributed greatly to improving production flexibility.

【 In-line blow aseptic filling machines 】

In the past, we purchased empty PET bottles from container manufacturers and shipped them to plants where we filled them with beverages. With in-line blow aseptic filling machines, we mold PET bottles from preforms, thick, compact, semi-processed bottle, in our production processes and fill them under aseptic conditions. This system reduces GHG emissions of empty bottle transportation since trucks can carry much more preforms than empty molded PET bottles. In 2003, we installed preform molding equipment to a soft drink production line at Kirin Distillery, the first case in Japanese beverage industry, reducing transportation loads of preforms.

【 Importing wine in large bags 】

Mercian imports some of its wine via marine transportation in specially designed 24kl bags (equivalent to about 32,000 of 750ml bottles) with low oxygen permeability and fills the wine into bottles in Japan. Compared to importing bottled wine, this method reduces Mercian's GHG emissions from marine transportation by roughly 60% by eliminating needs to transport heavy bottles by sea. Bottling in Japan enables us to use Ecology Bottles (made with at least 90% recycled glass), lightweight bottles, and PET bottles as containers. This production system reduces resource consumption and GHG emissions significantly throughout the value chain.

Specially designed large bags

▶GHG emission reduction through lightweight packaging

Making containers and packaging lighter leads to reducing GHG emissions from production and transportation of the containers and packaging.

▶Increasing the ratio of recycled materials in packaging

Primary aluminum ingots in the manufacturing process consume a large amount of electricity, resulting in higher GHG emissions compared to recycled materials, posing an environmental challenge. To address this, Kirin Brewery, in collaboration with three domestic beer companies, has fully adopted "EcoEnd™" beverage can lids, which produce approximately 40%*2 fewer GHG emissions during manufacturing. Starting sequentially from February 2025, some beer products sold by each company will use "EcoEnd™" lids. Developed jointly by Toyo Seikan and UACJ, "EcoEnd™" meets the required strength and other characteristics for can lids while promoting the circular use of recycled materials. As a measure to reduce Scope 3 emissions, consideration will be given to adopting it for products other than beer.

*2 Reduction amount per can lid compared to conventional products of Toyo Seikan.

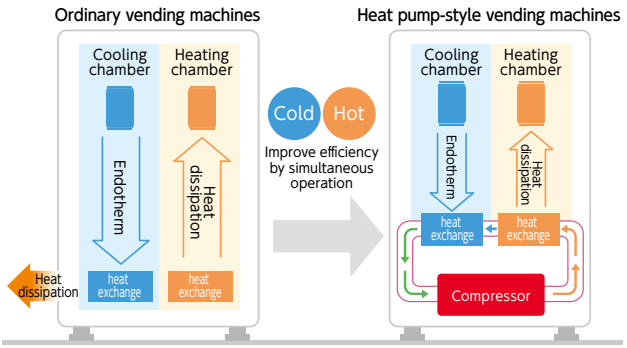
Activities

Activities in response to Significant Risks and Opportunities

▶GHG emission reduction at the sales stage

Kirin Beverage is the first in the industry to introduce heat pump-type vending machines in 2006, and from 2012, almost all newly installed vending machines for cans and PET bottles are of this type. As of March 2025, we have switched more than 93% of installed vending machines to this type. Heat pump-type vending machines pump up waste heat generated from cooling functions and use the heat to warm up the products. This system reduces electricity consumption compared to conventional vending machines. Some models offer higher energy-saving performance with heat sources not only by recovering waste heat released by the cooling function but also by capturing heat from outside the machine and with improved insulation performance by effective use of vacuum insulation materials. These vending machines have evolved to the point where electricity consumption can be reduced by about 40% compared to 2013. The "Green Power Vending Machines" that we began introducing from January 2024, achieve net-zero CO_2 emissions by obtaining Renewable Energy Certificates (REC) equivalent to the annual energy consumption required for operation, we established an application scheme for acquiring REC and will promote their further introduction.

Heat pump function



Activities

Activities in response to Significant Risks and Opportunities

Transition Risk / Policy

Financial impact on the procurement of agricultural products from carbon pricing [medium to long term]

Biological Resources | Water Resources | Climate Change

The prices of agricultural products may spike if governments introduce carbon taxes and carbon border adjustment mechanisms. We estimated the financial impact of carbon pricing on agricultural product prices for barley, hops, black tea leaves, grape juice, starch, lactose, corn, and cassava handled by Kirin Brewery, Kirin Beverage, Mercian, Lion, Kyowa Kirin, and Kyowa Hakko Bio. The results show that by 2050, under the RCP2.6/SSP1 scenario, the impact would be approximately 900 million to 4 billion yen, and under the RCP8.5/SSP3 scenario, it would be approximately 2.2 billion to 8 billion yen (both estimates include the effects of biofuel demand and nitrogen fertilizer prices). The greater the temperature rise, the higher the uncertainty and the greater the risk . Due to the impact of carbon pricing, increased demand for corn for biofuels, which are renewable energy sources, and soybeans may pose a competitive risk to raw materials for alcoholic beverages and soft drinks. Additionally, carbon pricing is expected to raise natural gas prices, which will in turn affect nitrogen fertilizer prices.

Response strategy

▶Risk mitigation through mass plant propagation technologies

To address the risk of competition for raw materials with the increased demand for biofuel corn and soybeans, we can potentially mitigate raw material shortages and price hikes by utilizing mass plant propagation technologies to improve cultivation efficiency.

▶Measures against fertilizer price increases

In response to the rising prices of nitrogen fertilizers, we support the acquisition of sustainable farm certifications and provide proper fertilizer management training to farmers.

Activities

▶Risk mitigation through plant mass propagation technology

The Kirin Group's mass plant propagation technology consists of four underlying technologies: stem propagation technique (organ culture method), sprout propagation technique (PPR method), embryo propagation technique (somatic embryo method), and potato propagation technique (micro tuber method).

This original technology is globally unprecedented. Plant propagation is normally performed using seeds and cutting. These methods result in a limited cultivation period, and the growth rate can be low depending on the plant. However, The Kirin Group's mass propagation technology that we developed makes it possible to significantly increase the number of quality plants with the same characteristics as the parent plant, regardless of the season.

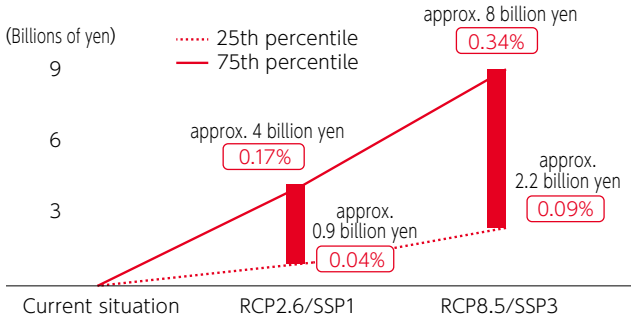
The Kirin Central Research Institute has successfully applied this technology to hops, a raw material for beer, using a world-first approach to promote the formation of axillary buds. By enabling the mass propagation of hops, this technology contributes to stabilizing the supply and improving the quality of raw materials for beer production.

Plant mass propagation technology is expected to have a positive impact on the sustainability of agriculture and ecosystems by accelerating the dissemination of varieties adapted to environmental changes, as well as the mass propagation of new varieties, endangered species, and useful plants.

▶Measures against fertilizer price increases

The Kirin Group conducts Rainforest Alliance certification support training for tea farms in Sri Lanka. The training provides scientific methods to increase yields while reducing the use of pesticides and fertilizers. (see details on certification support→P.56)

Impact on agricultural product procurement costs from carbon pricing in 2050 (percentage of revenue)*1,2



*1 The socioeconomic systems in the papers we used for our estimates differ from the Kirin Group scenarios, so we have created and disclosed our estimates under the RCP2.6/SSP1 and RCP8.5/SSP3 scenarios in these papers (sources are listed in reference documents).
*2 Recalculated with 2024 data

Activities

Activities in response to Significant Risks and Opportunities

Transition Risk / Policy

Impact on currently held assets [medium to long term]

Biological Resources | Water Resources | Climate Change

If policies, regulations, and societal demands towards decarbonization become stricter, it may become difficult to continue using existing facilities that use fossil fuels for the period that we initially planned. Under the Kirin Group's roadmap, we plan to switch the fuel for boilers, which are heat sources used in manufacturing processes such as boiling, from natural gas to GHG-free energy sources such as green hydrogen in the future. In such cases, the renewal of boilers and other facilities will be required earlier than expected. In the same way, we are required to transition the trucks we use for transportation to electric vehicles sooner than initially expected, but we believe that the impact will be small even if renewal becomes necessary before assets are fully depreciated.
(Details of the roadmap → P.26)

Response strategy

▶ **Identification of trends in technology and implementation of our roadmap with adaptive updates**

We will proceed with our transition plan based on our Net Zero roadmap, which is constantly updated in light of technological trends.

Activities

The use of GHG-free energy requires technological innovation and infrastructure development. Although the full-fledged transition will not take place until 2030, we will update existing plant facilities, including boilers and trucks in accordance with regulations. If we misjudge the timing of introducing new technology, there is a risk that our existing technology and facilities may become obsolete as a result of regulatory changes or shifts in societal trends. Accordingly, we will develop a long-term roadmap for facility renewal and introduction, and constantly update it to ensure a smooth transition.

Activities

Activities in response to Significant Risks and Opportunities

Transition Risk / Policy

Cost of regulatory response [medium to long term]

Biological Resources | Water Resources | Climate Change

In 2023, the International Sustainability Standards Board (ISSB) finalized the IFRS Sustainability Disclosure Standards, which will serve as the global baseline for the disclosure of information related to sustainability. Based on these standards, jurisdictions around the world are creating legislation concerning information disclosure requirements for companies. The Kirin Group has business sites in Japan, Australia, the US, and the EU, and in the future, it is likely that we will be required to report sustainability-related information in accordance with the requirements of each jurisdiction. The Kirin Group believes that natural capital and climate change are among the sustainability issues for which we should disclose information. Specifically, we must explain the impact of these issues on corporate value, and our response to risks and opportunities. To achieve this, we must establish systems that enable us to accurately and quickly collect information from across the value chain and utilize it in management.

Response strategy

▶Advancement of data collection and calculation methods

We will strengthen the organizational structure responsible for sustainability-related disclosure and enhance data collection and calculation by introducing an IT system.

▶Refinement of data calculation

When calculating Scope 3 emissions data, we will replace the conventional estimation method using emission factors based on literature values with calculations based on primary data from suppliers.

Activities

▶Advancing data collection and calculation methods

As a leading global CSV company, we have begun preparations for the establishment of the Disclosure Section, which will oversee the Group's financial and non-financial information disclosure (completed in April 2025). This office will ensure that our organizational structure supports continuous disclosure in compliance with international standards such as ISSB and SSBJ. By assigning dedicated people to appropriately manage disclosure, we will ensure that non-financial information related to the environment is disclosed in compliance with these standards. We have also decided to change the organizational structure to collect non-financial data to one that utilizes a system and have begun preparations for its launch. Previously, data to calculate Scope 3 emissions was collected individually from each company and then aggregated by the headquarters. By utilizing the new system, we will be able to reduce the burden of aggregation and calculation and promote higher quality disclosure.

▶Refinement in data calculation

In the past, Scope 3 data disclosure relied on secondary data from literature and published databases. However, we have started collecting primary data that reflects our suppliers' GHG reduction efforts, leveraging the Kirin Supply Chain Environmental Program launched in 2024. By replacing secondary data with supplier primary data, the results will better reflect the efforts of the GHG reduction measures taken by each supplier, enabling us to disclose calculation results that more accurately represent the actual situation.

Activities

Activities in response to Significant Risks and Opportunities

Transition Risk / Policy

Incompatibility with rapid agricultural policy transitions [short to long term]

Biological Resources

Sri Lanka's sudden ban on the import of chemical fertilizers and agricultural chemicals in the first half of 2021 (later withdrawn) caused a decline in yields of many agricultural products and caused great damage to the Sri Lankan economy. Political and macroeconomic influences can cause indirect changes in the use of land as a result of changes to crops produced and reduced yields per unit area. This could encourage deforestation. Without sufficient preparation, the transition to organic farming may weaken agriculture itself and lead to the destruction to the natural environment in the area surrounding agricultural land.

Response strategy

▶Support for training farmers in sustainable agriculture

We recognize that proactively implementing environmental initiatives ahead of policy changes can help mitigate challenges during periods of rapid transition. Through training and support programs, we aim to equip farmers with the knowledge and resources needed to successfully adopt sustainable agricultural practices.

▶Appropriate engagement with experts and policymakers

We will strengthen our network with experts and policymakers through active participation in global environmental initiatives, collaboration with environmental organizations through supporting farmers, and joint research projects with academic societies and government institutions. By leveraging these networks, we will gain knowledge about agricultural technologies, policy trends, and business, while improving agricultural sustainability.

Activities

▶Training for obtaining Rainforest Alliance certification

The Kirin Group has supported Sri Lankan tea farms to acquire Rainforest Alliance Certification. From 2022 to 2024, a total of 9 large farms and 4,804 small farms participated in the training. In Sri Lanka, droughts and frequent heavy rains caused by climate change have become serious problems. Urbanization, industrialization, soil erosion and outflow due to the inappropriate use of land are also major concerns. Since large tea farms are often located on steep, sunny slopes, heavy rains not only wash away the fertile soil, but in the past have caused landslides, in some cases taking the lives of people living on the farms. Covering the ground with grass (cover crops) not only enriches the ecosystem but also prevents soil erosion and retains water during droughts, making it an effective adaptation measure to climate change. The training teaches how to identify grasses that negatively affect tea cultivation and ensures that the ground in the tea farms is covered with good, deep-rooted grasses. Training also teaches scientific methods to increase yields while reducing the use of pesticides and fertilizers. In addition to protecting the forests, the reduced expenditure on pesticides and fertilizers improves the farms' profitability and increase the safety of the tea leaves.

Furthermore, the Kirin Group has supported coffee farms to acquire Rainforest Alliance Certification since 2020 in Vietnam, which accounts for about 30% of the coffee beans procured by the Kirin Group. Through the training, we aim to improve coffee quality by creating a system that can flexibly respond to environmental changes such as climate change, reducing water usage, preventing river pollution, considering biodiversity, and introducing regenerative agriculture. Currently, the training is being conducted in Gia Lai Province, Vietnam, and in 2024, 12 training schools were held, with 336 farms participating.

▶Joint investment project with NPO to support regenerative agriculture

Stone & Wood Brewery, a subsidiary of Lion, has launched a joint investment project with an NPO in 2024 to promote the spread of agriculture. The project foundation supports local charitable organizations and provides sustainable agriculture projects, educational support, and community support to farmers who wish to introduce regenerative agriculture. This initiative has built valuable networks with environmental organizations, experts in regenerative agriculture, and local non-profit organizations.

Metrics and targets

Targets and results of certification support training

Metrics	Targets	Results
Number of large tea farms Assisted to obtain certification in Sri Lanka (number of farms that received training)	15 (2022-2024 cumulative)	9 (2022-2024 cumulative)
Number of small tea farms assisted to obtain certification in Sri Lanka (number of farms that received training)	5,350 (2022-2024 cumulative)	4,804 (2022-2024 cumulative)
Number of coffee farms assisted to obtain certification in Vietnam (number of farms that received training)	2,000 (2024-2026 cumulative)	336 (2024)

Activities

Activities in response to Significant Risks and Opportunities

Transition Risk / Technology

Lack of research and development resources and lack of long-term perspective [short to Long Term]

Biological Resources | Water Resources | Containers and Packaging | Climate Change

Relying on suppliers for the development of technologies such as lightweight packaging and recycled PET poses a risk of losing control over the schedule for achieving Scope 3 targets and implementing the Kirin Group plastic policy.

Concepts such as "The Climate-Nature Nexus" and "NbS (Nature-based Solutions)" have emerged as adaptation measures for climate change, but since they target nature, they generally require long-term research and technological development. If we begin taking action after the risks have become clear, we risk falling behind competitors and making it difficult to recover over the long term.

Response strategy

▶In-house packaging development capability

The Kirin Group has the Institute for Package Innovation, where we develop packaging and containers in-house, as one of the few research laboratories of its scale owned by a global food and beverage, and pharmaceutical company. We think we will be able to utilize this strength to develop advanced containers and packaging with lower GHG emissions across the value chain.

Based on the technologies it has accumulated in the development of glass bottles, cans, PET bottles, cardboard cartons, and other containers and packaging, the Institute for Package Innovation utilizes AI, kansei (affective) engineering, and other technologies. Taking advantage of the strength of having this large-scale research facility, we are able to provide technical support necessary for commercialization and develop new containers. As part of the recycling of PET bottles, we are focusing on technical development related to chemical recycling. We aim to use recycled PET resin for 50% of domestic PET bottles by 2027, and we will thereby contribute to reducing social costs by transitioning to a circular economy.

▶Research and development on climate change and natural capital

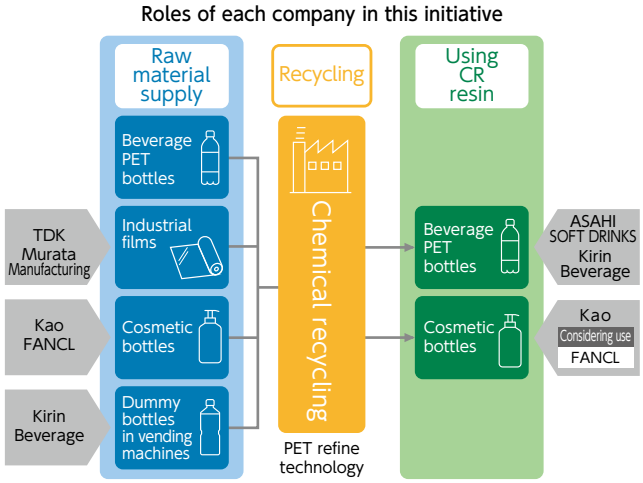
Grapes and hops are sensitive to changes in climate and cultivation conditions, and recent climate changes have already begun to affect their yields, quality, and flavors. To adapt to these climate changes, we are further promoting research and development in breeding and cultivation techniques.

Activities

▶Expansion of recycled materials through chemical recycling technology

The Institute for Package Innovation is promoting efforts to expand recycled PET resin by regenerating non-food-grade PET materials into beverage PET bottles. This initiative began trial operations in April 2025. Within a collaborative scheme involving companies from different industries, the laboratory led the safety evaluation of using chemically recycled resin, made from non-food-grade PET, in food containers. The results of this evaluation were presented at the 120th Annual Scientific Conference of the Japan Society for Food Hygiene and Safety, where it received the Young Excellence Presentation Award.

Scheme for expanding recycled materials



▶Research and development for climate change and natural capital

In 2022, the Kirin Group developed mass plant propagation technology for hops, and we intend to build a sustainable supply system for raw materials by combining improvements to breeds and mass plant propagation technology. (Details on mass propagation technology → P.53)

At Château Mercian Mariko Vineyard, we launched a joint study in cooperation with NARO in March 2024, to assess the effects of carbon storage as a climate change mitigation measure. In this research, we intend to engage in initiatives such as assessing the carbon storage effect of biochar utilizing grapevine-pruning residues from vineyards, etc.

Biochar made from grapevine-pruning residues

Activities

Activities in response to Significant Risks and Opportunities

Transition Risk / Technology

Decline in ability of engineering departments to respond and lack of appropriate investment [short to long term]

Climate Change

There is a possibility that our engineering workforces to achieve decarbonization are insufficient, or the technology may not be passed on and applied appropriately.

For example, effective utilization of waste heat is essential for the efficient utilization of energy. This requires not only the introduction of modern equipment and facilities, but also engineers and technology with a deep understanding of the production process. Technological progress is rapid, and if we cannot determine the timing for introducing technology or make quick investment decisions, we may not be able to achieve reductions in GHG emissions as planned. While momentum for the decarbonized society is rapidly increasing, there is a high possibility that we will be unable to introduce renewable energy at an appropriate time and appropriate price in Japan, where the places for installing renewable energy facilities are particularly limited.

Response strategy

▶Strengthening engineering capabilities

We assign personnel with engineering skills in each group company to ensure robust support for production facilities, while continuously developing and passing on technical expertise. The engineering department of Kirin Brewery will play a pivotal role in supporting the decarbonization engineering efforts across the entire group.

▶Understand technological trends and flexibly introduce facilities and equipment

The Kirin Group will centrally monitor technological trends and social conditions through the engineering department of Kirin Brewery.

Activities

▶Strengthening engineering functions

The Kirin Group ensures that engineers who are well-versed in production processes, production technology, and maintenance skills provide robust support for production facilities. Additionally, the group owns Kirin Engineering, a general engineering company specializing in the construction of plants producing beer, non-alcoholic beverages, pharmaceuticals, and other products. Kirin Engineering has been involved in large-scale production facility expansions and modifications for both within and outside the Group in Japan and abroad for many years. By undertaking engineering for various businesses in-house, the engineers can transfer and develop expertise and technical skills in building facilities. These technical capabilities and engineers will also support the growth and expansion of businesses ranging from food to pharmaceuticals.

▶Monitoring technological trends and agile equipment introduction

Based on the understanding of technology trends and societal movements, we reflect these insights in our climate change response roadmap. We determine where and what type of facility introduction will be effective within the group and agilely implement technologies through close communication with each Group company.

Activities

Activities in response to Significant Risks and Opportunities

Transition Risk / Market

Social resistance to fossil-derived raw materials [medium to long term]

Containers and Packaging | Climate Change

Concern about related to plastic is spreading to issues related to all aspects of climate change, not just ocean pollution. As a result, there is a possibility that people may have a stronger negative impression than before of containers and packaging using raw materials derived from fossils. In Japan, the "Act on Promotion of Resource Circulation for Plastics" was enacted on April 1, 2022, and Concern about related to plastics has been increasing. Plastics are a raw material derived from oil, and we expect that as Concern about related to climate change increases, people will focus on GHG emissions when they are burned, as well as problems related to the depletion of resources from raw materials derived from oil.

Response strategy

▶Plastic resource recycling

In accordance with the "Kirin Group Plastic Policy," which we formulated in 2019 with the aim of resolving problems related to plastics, the Kirin Group will promote PET bottles that use recycled PET resin. In this policy, we have set forth our target of increasing the percentage of recycled resin to 50% of PET bottles in our operations in Japan by 2027. We have also been advancing the use of recycled PET resin through mechanical recycling. We will promote technical development related to practical uses for chemical recycling to create high quality recycled PET resin by recycling dirty used PET bottles and other PET resin. In addition, we will create systems to recover used PET bottles and other PET resin.

Activities

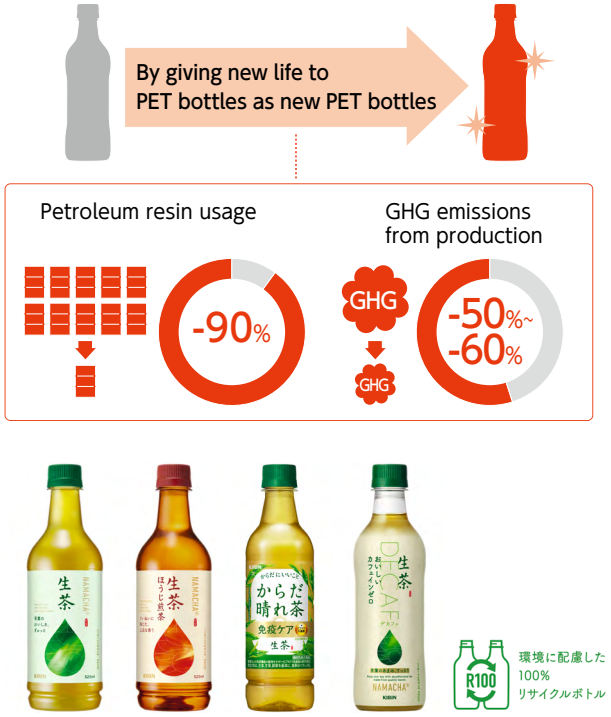
▶R100 PET bottles

In accordance with Kirin Group Plastic Policy that we established in 2019, the Kirin Group is gradually expanding the use of "R100 PET bottles" made from 100% recycled PET resin.

R100 PET bottles use mechanically recycled resin. By using this resin, we can reduce petroleum-based resin by 90% and GHG emissions by 50-60%, compared with conventional PET resin.

We began using recycled resin for some of the packaging of *Kirin Gogo-no-Kocha Oishii Muto (sugar-free)* in February 2014. Subsequently, in 2019, we began using "R100 PET bottles," which use 100% recycled PET resin, for KIRIN NAMACHA Decaf. Our use of "R100 PET bottles" as of June 2025 is shown below.

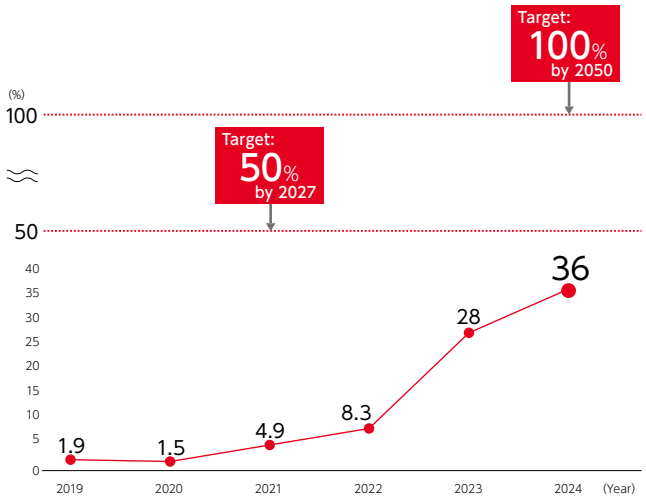
R100 PET bottles



KIRIN NAMACHA : 600ml (First photo from the left)
KIRIN NAMACHA *Hoji Sencha* : 600ml (Second photo from the left)
KIRIN NAMACHA *Karada-Hare-cha* : 525ml (Second photo from the right)
KIRIN NAMACHA *oishii caffeine Zero* : 430ml (First photo on the right)
* Product photos are as of the end of June 2025.

Metrics and targets

PET bottles: Trends in the use of recycled PET resin (Japan)



Activities

Activities in response to Significant Risks and Opportunities

Transition Risk / Market and Reputation

Concerns about deforestation [Medium to Long Term]

Biological Resources | Water Resources | Climate Change

As awareness of the importance of forests as GHG sinks grows, concerns about business activities that lead to deforestation are likely to increase more than ever, potentially leading to a stronger negative perception. The worst forest fires in Australia's history from 2019 to 2020 and the wildfires in California in 2025 have brought renewed attention to the relationship between climate change and forests.

The United Nations Food System Summit was held in 2021, the EU's "Farm to Fork" strategy and Japan's "Green Food System Strategy" have been formulated and announced, and there is a stronger focus on sustainable agricultural production than ever before. The spread of COVID-19 and geopolitical issues have also increased people's interest in food security. It is assumed that interest in sustainable agriculture due to these factors will lead to interest in forest issues.

Opportunity loss due to ethical consumption [Medium to Long Term]

Biological Resources | Water Resources | Climate Change

If we fail to provide products that respect the environment and human rights in terms of climate change, natural capital, and containers and packaging, we risk being surpassed by competitors and losing out on opportunities to generate earnings through ethical consumption. Based on scenario analysis related to climate change and natural capital, we have concluded that a rapid expansion of the market for ethical consumption is unlikely at this time. If, however, young people interested in sustainability become the main consumers, they may choose ethical products. In addition, because issues related to containers and packaging are familiar and easily recognized by consumers, we believe that if we do not respond appropriately, it is likely to lead to criticism.

Response strategy

▶Promotion of sustainable forestry and agriculture

The Kirin Group is continuing initiatives to expand sustainable forestry and agriculture, and we plan to increase the proportion of certified paper and raw materials from certified farms that we use.

▶Creation of high-quality forest-based carbon credits

We will conduct joint research aimed at creating forest-based carbon credits.

▶Environmentally friendly products

The Kirin Group will advance the production of environmentally friendly products and display the content and effects of these efforts. Additionally, through cross-industry partnerships, we are working to improve sustainability in the packaging sector.

Activities

▶Promotion of sustainable forestry and agriculture

As part of our efforts towards sustainable forestry, we are expanding the use of FSC-certified paper for paper containers. In 2020, Kirin Brewery, Kirin Beverage, and Mercian adopted 100% FSC-certified paper for all their paper containers. In 2021, we revised the Kirin Group Action Plan for the Sustainable Use of Biological Resources, and we set forth our intention to expand our use of sustainable paper to all our businesses around the world.

In terms of sustainable agriculture, we support the acquisition of Rainforest Alliance certification, which is a certification for more sustainable farming, at tea farms in Sri Lanka and coffee farms in Vietnam. Since August 2021, we have also been selling a year-round product in the Kirin Gogo-no-Kocha line that uses tea leaves from farms with Rainforest Alliance certification.

▶Creation of high-quality forest-based carbon credits

In March 2025, The Kirin Group started a joint research project with Hitachi to create forest-based carbon credits. By utilizing the Kirin Group's unique "mass plant propagation technology" and Hitachi's "natural measurement technology and digital technology related to MRV (Measurement, Reporting, and Verification)," we aim to create high-quality forest-based carbon credits while achieving both GHG reduction and biodiversity conservation in reforestation areas.

▶Environmentally friendly products

Stone & Wood has launched the "Re-In-Can-Ation" project in Australia in collaboration with suppliers such as Visy, Novelis, and Rio Tinto to aim for sustainable packaging. This initiative adopts cans made from 83% recycled aluminum and low-carbon primary aluminum, aiming to reduce CO_2 emissions by 59% compared to traditional cans. The 18-month trial expects to sell 15 million cans and reduce CO_2 emissions by 1,235 tonnes.

Cans made from recycled aluminum and low-carbon primary aluminum

Activities

Activities in response to Significant Risks and Opportunities

Transition Risk / Market Risk

High energy prices [medium to long term]

Climate Change

As initiatives targeting decarbonization accelerate around the world, it is highly possible that demand for natural gas may increase and prices may rise in the short term, owing to such factors as the transition toward sources of energy with low GHG emissions and divestment of coal.

Response strategy

▶ **Steady implementation of our roadmap to achieve our science-based 1.5˚C target**

We must surely execute our roadmap for countermeasures against climate change, which is based on our science-based 1.5℃ target, as we look to reduce our use of natural gas.

In the Kirin Group roadmap, we plan to shift our energy mix to electric power as much as possible, and use renewable energy as the source of that electric power.

Activities

We are conducting demonstration tests with the assumption of converting the heat sources in heating processes from city gas to electricity or green hydrogen.
Details on green hydrogen → P.50

Stone & Wood spearheads cross-industry alliance to transform sustainable packaging in Australia

A Collaborative Approach

Lion's Stone & Wood brand, along with its supply chain partners Visy, Novelis, and Rio Tinto, have announced a breakthrough packaging initiative that uses low carbon raw materials and recycled content to create a more sustainable beverage can.

The pilot initiative named Re-In-Can-Ation, brings together key players across the aluminium value chain to create a can that contains low carbon primary aluminium and on average, 83 per cent recycled aluminium.*

Environmental Benefits

The 18-month trial will see 15 million of these cans enter the market and is estimated to be the equivalent of reducing carbon emission by 1,235 tonnes when compared to the equivalent quantity of Stone & Wood's existing cans.**

Lion Group Sustainability Director, Justin Merrell, said "This partnership shows what's possible when industry leaders unite behind a common goal. In this project we're demonstrating the potential to reduce carbon emissions and conserve resources with the containers our consumers recycle. It's proof that when the full value chain collaborates, we see a stronger circular economy and great benefit to the environment. Only two thirds of Australia's aluminium cans are currently recycled so there is still work to do".

Each supply chain partner plays a crucial role in the initiative to ensure end-to-end environmental sustainability throughout the manufacturing process. Novelis manufactures high-recycled content aluminium coils, Rio Tinto provides low-carbon primary aluminium from its Bell Bay aluminium smelter in Tasmania, and Visy manufactures the cans locally at its Yatala site in Queensland.

With the emergence of new climate disclosure reporting around the world, this type of value chain cooperation is critical for addressing scope 3 emissions and developing a credible transition plan to a low carbon economy.

Recognition from APCO

The Australian Packaging Covenant Organisation (APCO) recognises the importance of this initiative in addressing a significant recycling challenge in Australia, where only 64 per cent of aluminium beverage cans are currently recycled.

* based on average recycled content (by mass) of an aluminium can using aluminium coils manufactured by Novelis during the period 1 June 2023 to 31 May 2024.

** reduction based on comparison with the average carbon emissions intensity of Stone & Wood's previous 2023 financial year 375mL cans. Calculation includes all carbon dioxide equivalent emissions from raw material extraction up to the manufacturing of the can (raw material extraction / smelting / recycling, transportation of materials, manufacturing of the cans). The Life Cycle Assessment (LCA) used for this calculation follows the ISO 14040/14044 (ISO, 2006b) Environmental Management—Life Cycle Assessment Standard.

Consumer communication

By offering the product, Lion intends to stimulate consumers' willingness to pay for sustainable choices. The company already started engaging with consumers on its SNS and confirmed a strong interest in practical sustainability outcomes.

Activities

Activities in response to Significant Risks and Opportunities

Transition Risk / Reputation/Liabilities

Consumer reputation [short to long term]

Biological Resources | Water Resources | Containers and Packaging | Climate Change

There is a possibility that our corporate brand value may decline if our initiatives related to climate change and other aspects of sustainability are inferior, and if we cannot engage in appropriate communication. Since 2020, Japan's national curriculum guidelines for elementary, junior high, and high schools have clearly stated the need to "enable each student to become a creator of a sustainable society." As a result, interest in environmental issues among consumers, particularly younger generations, has been increasing.

Concerns about renewable energy [short to long term]

Biological Resources | Water Resources | Containers and Packaging | Climate Change

In order to achieve our target of Net-Zero emissions, we must introduce renewable energy, but the inconsiderate construction of power plants may cause harm to scenery, nature, and human rights, and cause disasters, possibly resulting in criticism from society. For example, violations of indigenous peoples' rights when using land, harm caused by noise and vibrations from wind power generation, and deforestation caused by the procurement of raw materials for biomass energy. If measures that we implement based on an inappropriate assessment negatively impact the living environment of local residents, it is highly likely that it may result in claims for compensation.

Loss of trust from investors [short to long term]

Biological Resources | Water Resources | Containers and Packaging | Climate Change

We believe there is a high risk of losing the trust of stakeholders if we lack appropriate disclosure on climate change, natural capital, the circular economy, and other environmental issues.

The Kirin Group has declared our aim to be "a global leader in CSV, creating value across our world of Food & Beverages to Pharmaceuticals," and we aim to expand our business in the Health Science domain. We believe that the support of investors is necessary for long-term business transformation and environmental investment.

Response strategy

▶Appropriate communication to consumers

We will focus on engaging with the younger generation, who will lead the next era, and continue to communicate various environmental initiatives, including certification information.

▶Introduction of renewable energy that does not have a negative impact on the environment or local communities

We will introduce environmental values based on the principles of "responsible introduction of renewable energy" and "additionality."

▶Appropriate disclosure in line with TCFD and TNFD recommendations

We encourage investors who support these initiatives to provide funds by disclosing information in a holistic, appropriate manner, in relation to climate change and the mutually related themes of natural capital and the circular economy.

Activities

▶Engagement with the next generation

The Kirin Group use raw materials that are certified by the Rainforest Alliance (RA). The packaging of these products features the RA certification logo to communicate this to consumers. Additionally, paper packaging is made from FSC-certified paper for forest conservation and features the FSC certification logo. Since 2014, we have been hosting "Kirin School Challenge" workshops for junior and senior high school students with the theme of promoting these certifications. In these workshops, we do not just introduce certification systems. We prioritize communication with junior and senior high school students, as well as discussion, thinking, and sharing information among junior and senior high school students about what they should communicate to members of their own generation, and how they should do it. We are also teaming up with multiple companies on the free distribution of the SDGs Start Book (300,000 copies per year), which teaches elementary school students and junior high school students about the SDGs and introduces our activities in Sri Lanka as an example of actions for SDGs. For children in elementary school and younger, we are collaborating with organizations such as after-school care clubs, Girl Scouts, and Boy Scouts on the "Environmental Mark Discovery Notebook" initiative, which starts from children learning to recognize environmental marks and finding out their meanings. In 2024, we held two School Challenges, communicating the significance and initiatives of FSC and RA certifications.

▶Introduction of renewable energy that does not have a negative impact on the environment or local communities

In July 2021, the Kirin Group established our policy on the introduction of environmental value, with the basic policies of the "responsible introduction of renewable energy" and "additionality" when introducing renewable energy. With regard to the "responsible introduction of renewable energy," we prioritize ethics and select that which "causes no harm to the environment and does not violate human rights when power plants are constructed and fuel is procured," and we also set forth examples of expected risks in relation to each source of power, including solar power, wind power, and biomass, and we check these risks in advance. With regard to "additionality," our policy is to "replace thermal power by creating new renewable energy power generation facilities in society, and thereby contribute to the creation of a decarbonized society." (GHG reduction targets and achievements according to SBTi are listed on the page regarding Carbon Pricing and Energy Procurement Cost)

Activities

Activities in response to Significant Risks and Opportunities

Appropriate Disclosure in Line with TCFD and TNFD Recommendations

The Kirin Group has disclosed detailed information related to climate change and other environmental factors in our Integrated Report and Environmental Report. We have also continued to disclose information in line with the recommendations of the TCFD since 2018. Since 2022, we have been using the TNFD framework beta version, and from 2023, we have been referencing TNFD recommendations and ISSB Exposure Drafts for continuous disclosure.

We have won a "Gold Award" four times, in 2019, 2020, 2024, and 2025 in the environmentally sustainable company category of the "ESG Finance Awards Japan." We received the highest number of votes in 2022 and 2023, and the second highest number in 2024, and were also selected in 2025, from asset management institutions in the selection of "superior TCFD disclosure" requested to asset management institutions to which the GPIF outsources domestic equity management.

Activities

Activities in response to Significant Risks and Opportunities

Transition Risk / Reputation/Liabilities

Responsibility for pollution of the natural environment [short to long term]

Biological Resources | Water Resources | Containers and Packaging | Climate Change

Failure to comply with environmental regulations may result in damage to the natural environment around production, brewing, and logistics sites and related regions, resulting in liability, fines, and administrative dispositions. Specifically, this could include cases where we have polluted the surrounding environment, such as air or water, in excess of legal or in-house standards, and cases where we have not appropriately entrusted waste treatment. If genetically modified organisms and the like harm the natural environment by escaping to the outside or cause unexpected changes to ecosystems as a through "genetic disturbance" caused by hybridization, it will violate the Cartagena Protocol. In addition to compensation, fines, and administrative dispositions, we believe these risks could lead to a decline in public trust, an impact on sales, and even boycotts.

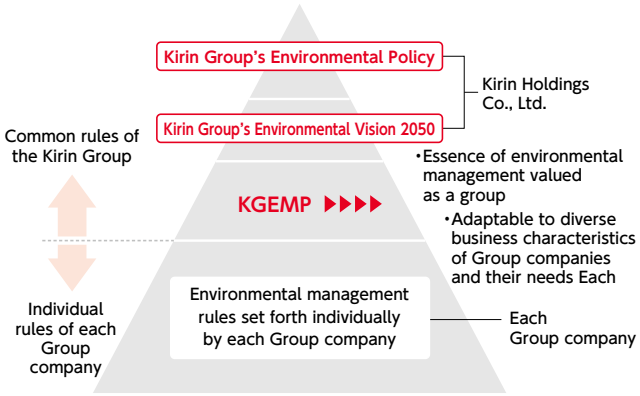
Response strategy

▶Improvements to environmental management systems

By establishing and appropriately operating an environmental management system, we ensure compliance with environmental regulations and prevent pollution of the natural environment.

Activities

Principle for Kirin Group's Global Environmental Management (KGEMP)



▶Establishment and operation of environmental management systems

The Kirin Group has established the "Principle for Kirin Group's Global Environmental Management (KGEMP)," which outlines the essential elements of environmental management that the group values. KGEMP requires the appointment of a Chief Environmental Officer, who is responsible for the overall environmental management of the group, and an Environmental General Manager for each business company, who holds responsibility and authority over environmental matters. The principles mandate compliance with all environmental laws and other relevant regulations across all business sites, reduction of environmental impacts such as GHG emissions and water intake, prevention of pollution, and confirmation of system conformity and legal compliance through internal environmental audits. It includes monitoring the achievement of goals and conducting management reviews. As of December 2024, 83% of domestic and 55% of overseas business sites have obtained environmental management system certification (including self-declaration of conformity). (details on the status of environmental management certification→P.85)

Activities

Activities in response to Significant Risks and Opportunities

Systemic Risk / Stability of Food and Social Systems

Ecosystem damage due to derelict farmland [short to long term]

Biological Resources

In Japan, the number of derelict farmlands is increasing, owing mainly to the aging farmers. These derelict farmlands quickly become covered with fertile weeds and transition to simple ecosystems, which may result in disease in nearby farmlands. Production areas in Asia and elsewhere face problems such as soil runoff due to changes in land use associated with economic development, causing water pollution in basins and the destruction of ecosystems, with the risk of negative impact spreading to downstream areas.

Ecosystem damage due to the excessive use of agricultural chemicals [short to long term]

Biological Resources

Examples have been confirmed of grape cultivation with pergolas where the application of defoliants to the soil for many years for operational reasons destroys the existing ecosystem in vineyards. We know that even if there are mountains and fields nearby and the ecosystem is very abundant, once an ecosystem completely collapses, it is not easy to recover.

Damage to ecosystems owing to reduction in agricultural land for food [short to long term]

Biological Resources

There have been cases of agricultural land for the production of food being converted to agricultural land for biofuels because of high selling prices of biofuels. Appearance, taste, the health of consumers, and other factors do not matter for agricultural products for biofuel, so the production of agricultural products for biofuel tends to focus only on economics. This results in large-scale changes to the use of agricultural land, monocropping, and the use of large amounts of agricultural chemicals and fertilizers, all of which are likely to have a negative impact on agricultural land and surrounding ecosystems.

Response strategy

▶Promotion of regenerative agriculture

Regenerative agriculture aims to restore soil health, enhance its carbon sequestration capabilities to mitigate climate change, ensure efficient and sustainable use of water resources, and improve crop yields while restoring and conserving biodiversity. However, barriers to widespread adoption include the burden of initial investments, low market recognition, and insufficient agricultural support systems. The Kirin Group is promoting regenerative agriculture by sourcing certified regenerative agricultural materials and collaborating with global alliances to contribute to the development of sustainable agriculture.

▶Ecosystem restoration activities focusing on grass cultivation

In ecological surveys at vineyards, we confirmed that even if the seeds that we sow for slope greening and grass cultivation contain invasive species, native species will gradually spread and become dominant if the environment is favorable. Therefore, even if ecosystems are damaged, we believe that it is possible to restore ecosystems by restoring grassland through grass cultivation.

▶Enhancing engagement with agricultural production areas

To achieve ecosystem conservation and sustainable agriculture, we will collaborate with producers and local communities to support certification acquisition and the introduction of environmentally conscious farming methods. By strengthening engagement with farmers, we aim to prevent the conversion of farmland to biofuel crop production and support the continued production of food crops.

Activities

▶Procurement of certified regenerative agricultural materials

At Stone & Wood Brewery in Australia, a Lion subsidiary, we actively procure certified regenerative agricultural materials. We source barley, hops, and malt grown through regenerative agriculture from multiple suppliers, contributing to the promotion of soil health. These suppliers support the practice of regenerative agriculture to reduce environmental impact by introducing cover crops to promote soil health, utilizing compost and organic fertilizers, and adopting low-tillage farming methods to enhance the organic carbon content of the soil. Furthermore, crop rotation and the planting of diverse crops help maintain soil nutrient balance and reduce the burden on ecosystems caused by monoculture practices. To conserve water resources, we improve irrigation efficiency and promote water reuse, minimizing the use of pesticides and chemical fertilizers to prevent water pollution. For pest management, we employ natural predators and control methods that consider the balance of the ecosystem, promoting soil microbial activity and reducing dependence on pesticides. Through these efforts, Stone & Wood is advancing the procurement of sustainable beer ingredients and contributing to ecosystem conservation and the future of agriculture.

▶Launch of the regenerative tea scorecard

Kirin Holdings and Kirin Beverage, in collaboration with the Rainforest Alliance, have developed the “Regenerative Tea Scorecard” to support the transition to regenerative agriculture, and its operation began in December 2024. By the end of 2025, we plan to implement this tool in one large farm and 30 small farms in Sri Lanka. This checklist-style guideline is designed for use in Sri Lankan tea farms to evaluate farming practices and environmental impact, making visible the practices needing improvement. The scorecard assesses the current state of farms based on indicators such as soil health, biodiversity conservation, ecosystem restoration, and improvement of working conditions, and provides specific improvement measures for transitioning to sustainable agriculture. Farms can use this scorecard to gradually advance their transition to regenerative agriculture.

Activities

Activities in response to Significant Risks and Opportunities

▶Conversion of vineyards to hedgerow-style and biodiversity conservation

Château Mercian is implementing efforts to convert Japanese wine vineyards from derelict farmland to hedgerow-style, thereby conserving biodiversity. Grasslands are said to have covered 30% of Japan's national land area 130 years ago, but they have dwindled to just 1% today. The ratio of endangered plants per unit area is extremely high for grasslands, and they play an important role in conserving biodiversity. Regular undergrowth cutting creates an environment where fields function as high-quality, vast grasslands, enabling the development of native and rare species, without being dominated by highly fertile plants. This farming method contributes to business expansion and creates valuable grasslands in modern Japan, expanding and protecting the rich Satochi-satoyama environment. As a result, many rare species, including endangered ones, have been found at the Mariko Vineyard in Nagano Prefecture, and the Tengusawa Vineyard and Jonohira Vineyard in Yamanashi Prefecture. As part of its biodiversity conservation activities, the Mariko Vineyard is working with local NGOs and elementary school students to increase the population of Klara, the sole food plant of the endangered butterfly *Shijimiaeoides divinus* (classified as Critically Endangered IA). Cuttings of Klara which naturally grow along the ridges of nearby rice fields are collected and grown by children in flower beds on their school grounds. They then planted the seedlings in the vineyard. In addition, we organize environmental education classes for students, thereby fostering collaboration with the local community and providing valuable learning opportunities for children. These initiatives contribute to raising awareness among the next generation about environmental conservation. In recognition of these efforts, the project was selected in 2024 by Japan's Ministry of the Environment as one of the "Top 100 Environmental Education and ESD (Education for Sustainable Development) Practice Videos," and was highly praised for embodying the essence of environmental education and ESD.

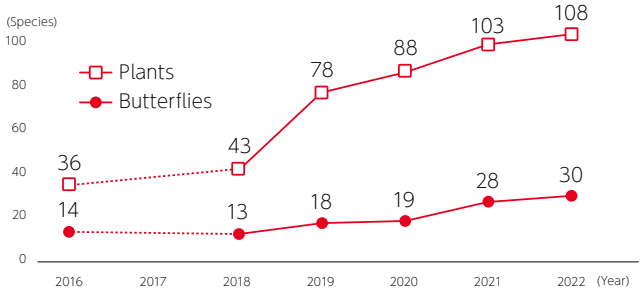
▶Supporting farmers by commercializing substandard agricultural products

The "KIRIN HYOKETSU® "(hereinafter called"HYOKETSU®)" brand has launched the "HYOKETSU® mottainai" project to utilize fruits that were not available for sale and were to be discarded as raw materials because their appearances were substandard. In addition to reducing food loss, the company donates 1 yen per can sold to the producer, thereby contributing to the continuous support of fruit farmers throughout Japan. The first product, KIRIN HYOKETSU® mottainai HAMANASHI (limited edition), was launched in May 2024. The concept of both deliciousness and social contribution was well received, and the shipment record was the highest among the HYOKETSU® limited edition products in the past 3 years. In September, a portion of the sales proceeds of approximately 6 million yen was donated to the Fruit Tree Department of the Yokohama Agricultural Cooperative. The donations will be used for the purchase of saplings and other purposes to contribute to the sustainable development of Hama-nashi. In October of the same year, we launched our second product, KIRIN HYOKETSU® mottainai PONKAN (limited edition), to support fruit farmers with the aim of reducing food loss of approximately 200,000 fruits. This project was evaluated as an effective and highly impactful initiative that is expected to have ripple effects from the perspective of reducing food loss, and was the first alcoholic beverage producer to receive the Jury Chair's Award at the Food Loss Reduction Promotion Awards sponsored by the Consumer Affairs Agency and the Ministry of the Environment.

KIRIN HYOKETSU® mottainai HAMANASHI (limited edition)

Metrics and targets

Recovery of Tengusawa Vineyard ecosystem



Activities

Activities in response to Significant Risks and Opportunities

Business Opportunities / Market

Increasing distribution in infectious diseases caused by global warming [short to long term]

Climate Change

A report from the WHO forecasts that if climate change continues, between 2030 and 2050 approximately 250,000 additional people will die each year as a result of the spread of infectious diseases. It also forecasts that the number of cases of dengue fever will increase significantly. In Japan, the habitat of the Aedes albopictus, which carries dengue fever, was confirmed to have spread as far north as Aomori in 2015. The results of analysis of the impact of the spread of dengue fever based on WHO scenarios concerning climate change and the impact on people's health project that a total of 1 billion people will be at risk of infection in East and Southeast Asia. On the other hand, if we take economic growth into consideration, we project that the population at risk will decrease by approximately 25% by 2050 in high-income countries in Asia and the Pacific and in East Asia. It appears that economic growth may result in the expansion of markets related to immunity.

Increase in heatstroke caused by global warming [short to long term]

Climate Change

Heatstroke cases are expected to increase as a result of the impact of global warming.

Based on observational and forecast data on climate change from the National Institute for Environmental Studies, under the RCP8.5 scenario (equivalent to the 4℃ scenario in Kirin Group Scenario 3), the number of heat-related excess deaths in Japan between 2080 and 2100 will be between four times and over 10 times the number between 1981 and 2000.

In Kirin Group Scenario 3 (the 4℃ scenario), we have estimated that the Japanese market for beverages that prevent heatstroke will grow by between 94 billion yen and 188 billion yen, assuming that it correlates with the number of persons requiring emergency services as a result of heatstroke caused by climate change.

Response strategy

▶Contribution to health science domain

As an adaptation measure to climate change, we will provide products that help maintain immune function for healthy people. Supporting immune function is also positioned as a management issue for sustainable growth (GMM).

▶Contribution with products to counter heatstroke

As an adaptation measure to climate change, we will provide products that help prevent heatstroke.

Activities

▶Contribution to health science domain

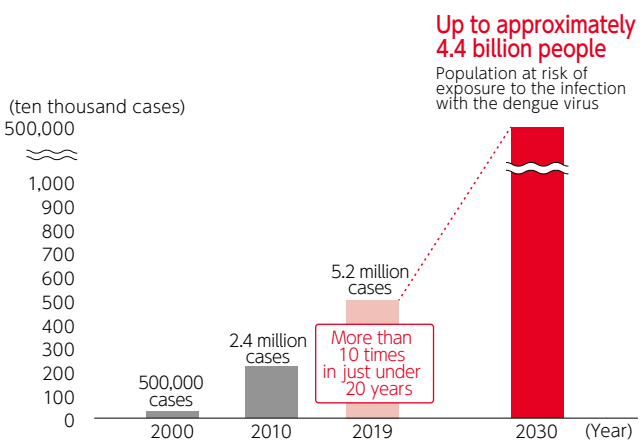
In 2021, we expanded our lineup of FFC products that "help maintain the immune system in healthy people." We began selling such products under the Nama-cha and Gogo-no-Kocha brands, which have a high level of brand awareness among consumers, in addition to yoghurt and supplement products. In our B2B models, we also licensed and provided materials to external partner companies in Japan and overseas and sold a wide range of products, including snacks, protein, etc. As a result, annual sales increased 40% in 2023 compared with the previous year.

In order to offer products to more consumers, we began selling immunity-related beverages in 100ml PET bottles at general merchandise stores, drugstores, and convenience stores nationwide from the end of March 2022. In anticipation of the expansion of the market for immunity-related products, we invested approximately 10 billion yen in enhancing production facilities for small PET bottles at the Kirin Beverage Shonan Plant, thus developing a supply system for immunity-related beverages in small PET bottles, including 100ml PET bottles.

▶Contribution with products to counter heatstroke

In 2024, as part of our heatstroke prevention efforts, we provided "Kirin Sekai no Kitchen kara Salty Lychee 500ml PET" and "Original Thermometer Cards" at cooling shelters in 23 municipalities across 22 prefectures nationwide. At Kirin Beverage, "heatstroke countermeasure advisors," who have received certification for completing training courses held by the Heat Illness Prevention - Communication Project, hold seminars on heat stroke countermeasures at schools and other institutions.

Number of dengue fever cases reported to the WHO



Estimated based on the WHO'S "Quantitative risk assessment of the effects of climate change on selected causes of death, 2030s and 2050s" report.

Activities

Activities in response to Significant Risks and Opportunities

Business Opportunities / Products and Services

Increased expectations for products and services that contribute to decarbonization [medium to long term]

Climate Change

As interest in decarbonization grows, there is a possibility that demand will increase for products that contribute to decarbonization or the shift to a low-carbon society.

In the U.S., Australia, and New Zealand, carbon-neutral products are sold, and are somewhat popular in their respective markets. Although interest in carbon-neutral products may not be high in Japan at present, awareness of the SDGs has grown rapidly. As such, it appears there is a strong possibility that interest in ethical products will increase in the future.

Response strategy

▶Provision of decarbonized products

Anticipating an increase in demand for alcoholic beverages and drinks that promote decarbonization, we will focus on product development and sales in this area.

Activities

Steinlager, which Lion sells in New Zealand, has obtained certification as a carbon zero beer under the Toitu program by a body of the New Zealand government. In 2021, we featured the Toitu carbon zero mark in our marketing campaigns to highlight to consumers the commitment Lion has made to reducing GHG emissions through Steinlager and other products.

In May 2022, Lion began selling "XXXX Zero," Australia's first carbon neutral and alcohol-free beer. XXXX Zero has obtained carbon neutral certification in the form of Climate Active certification.

In Australia, Lion is preparing to acquire carbon neutral certification through Climate Active for many key products. In order to obtain certification, Lion is working to comply with the requirement that it must offset all GHG emissions from the complete life cycle of the product, including emissions from raw materials and packaging, distribution and product waste.

In 2020, New Belgium Brewing made FAT TIRE ALE the first carbon neutral beer in the United States. The carbon credits being purchased and amortized also contribute to economic support for converting farmers to regenerative agriculture.

New Belgium Brewery has created a beer named TORCHED EARTH ALE in 2021 to show consumers what the future of beer might look like if climate change progresses. By showing consumers the taste of beer made from ingredients likely to be available in a future where climate change has progressed, the company is drawing attention to the importance to reduce GHG emissions.

Stone & Wood, a subsidiary of Lion, is developing products using malt derived from regenerative agriculture. They support producers who incorporate regenerative agriculture into the cultivation of barley and hops, the main ingredients of beer. This approach focuses on long-term soil resilience and the health of local communities rather than short-term yields, resulting in fertile soil and carbon sequestration. Under the "Responsible Sourcing Policy," we began experimental brewing with sustainable grains in Byron Bay in 2022 and launched "Northern Rivers Beer" in 2024. This beer uses 70% certified sustainable malt and 100% sustainable hops and is initially available in the regions around the brewery. It has received high praise from customers as a drinkable lager-style beer.

In Japan, we see that consumers do not yet require decarbonized alcoholic or non-alcoholic beverages. Under the CFP program operated and managed by the Japan Environmental Management Association for Industry, however, product category rules (PCR) have been established for calculating the carbon footprint of beer and soft drinks. The Kirin Group believes that it will be possible for us to calculate the carbon footprint based on this PCR.

Examples of products that contribute to decarbonization

TOITŪ NET CARBON ZERO ISO 14064-1 ORGANISATION

Product photographs are as of the time that events occurred.

Activities

Activities in response to Significant Risks and Opportunities

Business Opportunities / Resource Efficiency

Sustainable logistics [short to long term]

Climate Change

In order to reduce GHG emissions, it is important to improve transportation efficiency. By doing this, we can also expect to solve chronic driver shortages.

Transportation distances from breweries and plants to areas of consumption are tending to become longer owing to factors such as a decline in the number of breweries and plants and the concentration of breweries and plants for small-lot product varieties. In recent years, however, it has become difficult to secure drivers for long distance journeys. It is inefficient to transport products for long distances using trucks, and it increases GHG emissions. Therefore, we must solve these problems related to logistics.

Response strategy

▶Reduction in costs from more efficient transportation

We are implementing various initiatives to make deliveries more efficient and contribute to reducing logistics costs and GHG emissions, such as a modal shift, joint deliveries, and more efficient loading. We actively promote joint deliveries with other companies by positioning the logistics functions as non-competitive fields, instead of competitive fields.

Activities

▶Joint delivery using railway containers

We are using joint deliveries with railroad containers to transport products from breweries and plants in the Kansai area to the Hokuriku region, and plan to complete a modal shift away from long-distance truck transportation equivalent to 10,000 vehicles a year, which will enable us to avoid long-distance truck transportation, and we expect this to contribute to reducing annual GHG emissions by approximately 2,700 tonnes.

Details of joint delivery → P.50

Reduction of container and packaging raw materials and stable procurement [short to long term]

Containers and Packaging | Climate Change

Society continues to demand that companies address the issue of the 3Rs for containers and packaging. At the same time, this will contribute to reducing GHG emissions, make resource use more efficient, and reduce costs.

Beer and soft drinks are products that represent mass production and mass consumption, and they thus use a large number of containers and packaging. Kirin Beer, Kirin Beverage, and Mercian use 118,000 tonnes of paper container packaging, and 71,000 tonnes of PET bottles in Japan.

Response strategy

▶Reducing the weight of containers and packaging

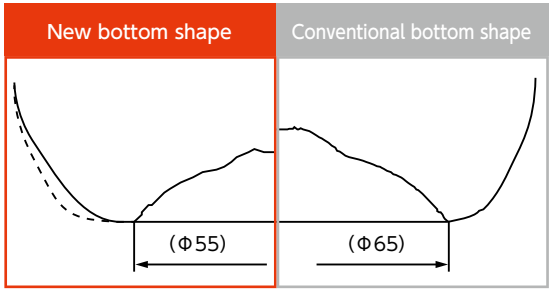
The Kirin Group has the Institute for Packaging Innovation, where we develop packaging and containers in-house, as one of the few research laboratories of its scale owned by a global food and beverage, and pharmaceutical company. We leverage this strength to promote lighter containers and packaging.

Activities

▶Lightweighting of PET bottles for wine

Since March 2022, Mercian has been using 720ml PET bottles for wine that are 5 grams lighter than the previous version, weighing 29 grams. Additionally, starting in July 2024, Mercian began adopting the lightest 1500ml PET bottles for wine in its history, developed by the Packaging Innovation Research Institute, and is gradually transitioning to these new bottles. The new 1500ml PET bottles have been reduced from 58 grams to 53.5 grams, a 4.5-gram reduction. This change is expected to reduce PET resin usage by approximately 107 tonnes and CO_2 emissions by about 346 tonnes*1 annually across all of Mercian's PET bottled wine products*2.

1500ml PET Bottle for Wine



Developed a new pressure-resistant bottom shape to suppress deformation

*1 Based on 2023 sales performance, the estimate when all 720ml and 1500ml PET bottle wine products manufactured and sold by Mercian adopt this PET bottle container.
*2 Excluding products scheduled to be discontinued by the end of 2024.

Activities

Activities in response to Significant Risks and Opportunities

Business Opportunities / Energy Sources

Reduction in reliance on fossil fuels [short to long term]

Climate Change

It will be possible to stabilize our energy procurement by reducing our use of fossil fuels and transitioning to renewable energy. As prices of fossil fuels spike, and producing countries are concentrated in places with high geopolitical risk, reducing our reliance on fossil fuels will contribute to reducing risk.

Stable procurement of renewable energy [short to long term]

Climate Change

There are various methods for introducing environmental value, each of which have their own merits and demerits, including in-house power generation, purchasing from electricity retailers, purchase of certificates that power is derived from renewable energy, and corporate PPAs. We will acquire environmental value that satisfies the criteria set forth in RE100 by introducing renewable energy, but in Japan, we expect the balance of supply and demand to grow tight over the long term as demand for renewable energy increases.

Response strategy

▶Achievement of an energy mix to achieve net-zero emissions

According to the Kirin Group's roadmap, the first step is to thoroughly implement energy-saving measures and then transition the primary energy source to electricity, actively incorporating electricity derived from renewable energy. By 2030, we aim to reduce the use of fossil fuels by advancing electrification in heating processes, thereby achieving a more sustainable energy mix.

▶Use of renewable energy with a focus on additionality

When introducing renewable energy, we prioritize "additionality," which indicates the actual increase in the supply of renewable energy. We will contribute to creating a decarbonized society and by increasing renewable energy power plant facilities to replace thermal power plants.

Activities

Lion is installing electric boilers at its breweries in New Zealand to transition away from traditional fossil fuel-powered boilers.

By reducing the usage of natural gas, Lion is decreasing its dependence on directly used fossil fuels and increasing the proportion of renewable energy in its electricity consumption, thereby further reducing reliance on fossil fuels. Additionally, Kirin Brewery is advancing demonstration projects for the use of green hydrogen as a fossil fuel alternative, working towards the realization of sustainable energy utilization.

Kirin Brewery is progressing with the introduction of solar power at its beer plants through the PPA model[*1], with installations completed at all domestic breweries except for the Yokohama plant, which has its own solar power setup. Installing solar panels in our own breweries ensures that the power plants can reliably add renewable energy, without any negative impact on the local community, while at the same time enabling us to use such energy in a stable manner.

For details on renewable energy→P.50

*1 PPA (power purchase agreement) is a business model where the PPA provider installs solar power generation equipment on the premises or rooftops of the electricity consumer at no cost and sells the generated electricity to the consumer.

Activities

Activities in response to Significant Risks and Opportunities

Business Opportunities / Resilience

Strengthening the supply chain [short to long term]

Biological Resources | Water Resources | Containers and Packaging | Climate Change

We expect that our initiatives targeting the procurement of agricultural raw materials and the reduction of Scope 3 emissions will contribute to strengthening the supply chain.

It is possible that by enhancing our engagement with suppliers and producing areas, identifying various issues, and working together to solve them, it will contribute to improving the resilience of suppliers, producing areas, and the Kirin Group.

Response strategy

▶Enhancement of engagement

In addition to producing regions, we will enhance our engagement with suppliers.

▶Utilizing supplier environmental programs

We will work with suppliers to advance environmental measures.

Activities

Every year, we visit tea farms in Sri Lanka, where we engage with local managers. As part of these initiatives, we have gained an understanding of the severity of heavy rainfall associated with climate change that is affecting tea farms in Sri Lanka, which leads to the development of our training to prevent soil outflow and our water source conservation activities. (Details of training→ P.46)

In Australia, Stone & Wood, Lion's craft beer subsidiary, is strengthening its engagement with suppliers of barley, malt, and hops. To promote the spread of regenerative agriculture, Stone & Wood launched a joint project with an NPO in 2024 and, through financial support from the “Ingrained Foundation”, a not-for-profit funding platform, is focusing on fostering the industry for “GOOD GRAIN.” This initiative will positively impact agriculture as a whole, contributing to the establishment of sustainable grain procurement routes and raising public awareness.

We have conducted detailed surveys related to the reduction of Scope 3 emissions, in addition to making requests and performing checks based on the Sustainable Supplier Code, and we base our engagement with stakeholders on the results of these surveys. In addition, we launched Supply Chain Environmental Program in 2024 together with suppliers with high emissions, and we will jointly solve issues as we target decarbonization through initiatives such as the mutual disclosure of data, setting of targets that meet the SBT standards, and the identification of new measures. Regarding aluminum, which accounts for a particularly large share of Scope 3 emissions, Kirin Brewery has obtained primary data on the can manufacturing process from suppliers and incorporated it into the calculation of emissions. As a result of these efforts, the emission reduction rate for the aluminum can manufacturing process has increased by 12% compared with previous literature data, and Kirin Brewery is expected to reduce Scope 3 emissions by approximately 1%. By using primary data, it is possible to reflect the actual GHG emission reduction efforts of each supplier in the manufacturing process as numerical values, which is expected to increase the motivation of each supplier to implement GHG reductions.

(Details of data collection and calculation → P.55)

Metrics and Targets corresponding to various disclosure frameworks

Progress on medium-term GHG emissions reduction target approved by SBT (2024)

▶Scope1+2

(unit : tCO2e)

			Total
Scope1+Scope2			581,190
	Scope1		392,258
	Scope2		188,932
Reduction rate (compared to 2019 base year)			-34%

▶Scope3

			Total
Scope3			4,076,699
Upstream	1	Purchased goods and services	2,891,246
	2	Capital goods	152,361
	3	Fuel and energy-related emissions not included in Scopes 1 and 2	137,269
	4	Transportation and distribution (upstream)	466,804
	5	Waste generated in operations	28,421
	6	Business travel	10,006
	7	Employee commuting	21,071
	8	Leased assets (upstream)	0
Downstream	9	Transportation and distribution (downstream)	273,607
	10	Processing of sold products	0
	11	Use of sold products	7,570
	12	End-of-life treatment of sold products	86,185
	13	Leased assets (downstream)	2,159
	14	Franchises	0
	15	Investments	0
Reduction rate (compared to 2019 base year)			−10%

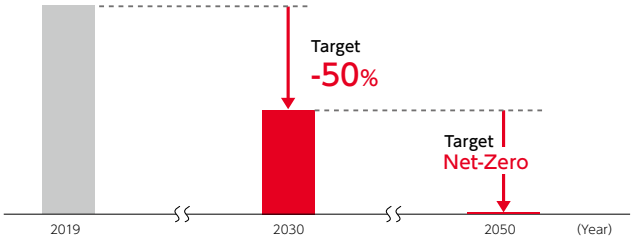
Impact for Circular Economy (2024)

▶Reduction in impact

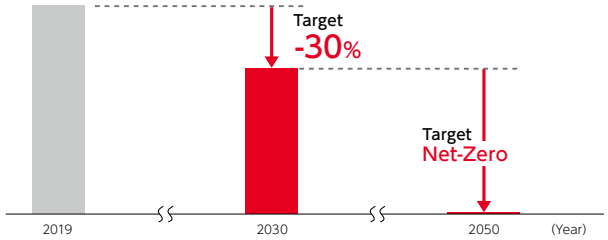
		Total
Reduction in resources (KB, KBC)	Aluminum cans	22,461t
	Glass bottles	737t
	PET bottles	6,055t
	Cardboard cartons for products	5,804t
	6-can packs	3,823t
Returnable glass bottles (KB)	Collection rate	97%

Target

Total emissions targets for Scope 1 and Scope 2*1



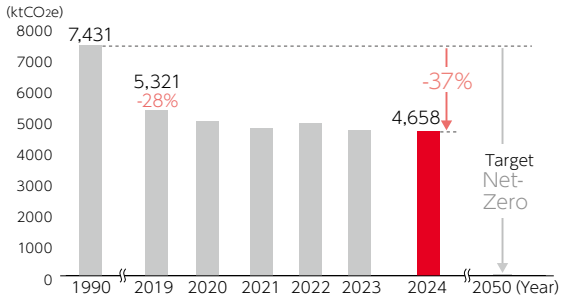
Scope 3 emissions target*1



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

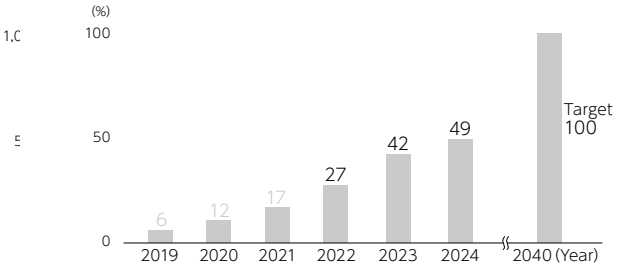
Progress

GHG emissions across the whole value chain



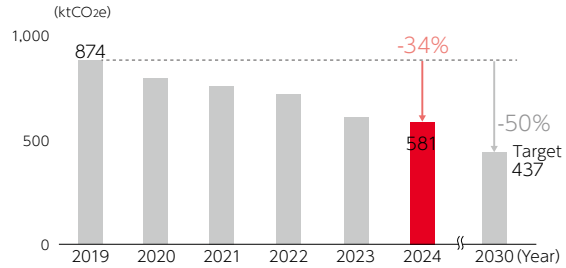
Progress toward the target for increased use of renewable energy

Ratio of renewable energy in plant purchased electric power

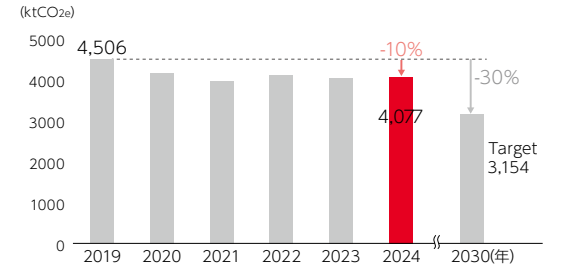


Progress toward medium-term GHG emissions reduction targets

Total emissions for Scope 1 and Scope 2



Scope 3 emissions



Metrics and Targets

Metrics and Targets corresponding to various disclosure frameworks

TNFD core global metrics

Measurement Index number	Key factors of changes in nature	Indicator	Detalls 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). ●Corn: 0.09 ●Barley: 0.25 ●Wheat: 0.35 ●Rice: 0.16 ●Soybeans: 0.50 ●Sugarcane: 0.01 ●Hops: 0.77 ●Black tea leaves: 0.14 ●Green tea leaves: 0.12 ●Oolong tea leaves: 0.23 ●Coffee beans: 0.59 ●Powdered milk/raw milk: - ●Grapefruit: 0.04 ●Lemon: 0.05 ●Orange: 0.03 ●Grape: 0.10 ●Apple: 0.04 ●Tomato: 0.01 ●Plum: 0.29 ●Palm Oil: 0.06 *The land use area for Japanese projects calculated using ESCHER in 2014 is 228,126ha.
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: approximately 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 30 ha (the area of micro watersheds within Sri Lankan tea farms conserved with the support of the Kirin Group. Within the above certified farms.) Approximately 50ha (area of self-managed vineyards in Japan)
		Land managed in a sustainable manner	33.7ha (the area of Mariko Vineyard and Jonohira Vineyard certified as Other Effective area-based Conservation Measure (OECM))
C2.0	Contamination/ decontamination	Total amount of pollutants released into soll by type	No release of pollutants into soll at plants/breweries. Vineyards for Japan Wine and Sri Lankan tea farms (suppliers) use agricultural chemicals listed on white lists within standards.
C2.1		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” In the “ESG Databook”. Reduction rate of product waste loss: Published under “Food Waste Reduction and Recycling” in this report.
C2.3		Plastic pollution	70,839 tonnes (the amount of PET bottles used, assuming most of our plastic usage is PET resin for bottles)
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 Blo 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	Invasive Alien Species and Others	Placeholder Indicator (measures against Invasive species)	We have not performed calculations because it is a placeholder Indicator and detailed criteria are unclear
C5.0	Status of nature	Placeholder Indicator (status of the ecosystem)	We have not performed calculations because it is a placeholder Indicator and detailed criteria are unclear
		Placeholder Indicator (species extinction risk)	We have not performed calculations because it is a placeholder Indicator and detailed criteria are unclear
C7.0	Risk	Financial impact on assets, liabilities, revenue, and expenses assessed to be at risk from nature-related transition risks	●RCP2.6/SSP1 (2℃) scenario: approximately 0.9 billion yen to 4 billion yen (2050) ●RCP8.5/SSP3 (4℃) scenario: approximately 2.2 billion yen to 8 billion yen (2050) (Financial impact on agricultural products due to carbon pricing)
C7.1		Financial impact on assets, liabilities, revenue, and expenses assessed to be vulnerable to nature-related physical risks	●2℃ scenario: 1.2 billion yen to 3.2 billion yen (2050) ●4℃ scenario: 3.1 billion yen to 12.2 billion yen (2050) (Financial impact due to reduced agricultural yields from climate change)
C7.2		Fines Incurred during the fiscal year due to negative impacts related to nature.Fines, detalls and amounts of lawsuits filed	None
C7.3	Opportunity	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.

Major Awards

CDP
Water Security A List
Climate Change A List

Achieved an “A” rating for both themes for the 7th time
Achieved inclusion in the Water Security A List for the 9th time (9 consecutive years)

SX Brands 2024

Recognized as a leading company that integrates sustainability challenges and societal needs into its growth strategy through constructive dialogue with investors and other stakeholders. This company is committed to promoting long-term and sustainable corporate value creation through essential management and business transformations.

ESG Finance Awards Japan
Environment Sustainable Category

Gold Award for the 1st and 2nd awards
Special Award for the 4th awards
Gold Award for the 5th and 6th awards*

*Declined the third award as we had already won the award two consecutive years

Major stock indices in which the Kirin is included

Appendix

Appendix

Environmental Policy

Kirin Group's Environmental Policy

Basic policy

The Kirin Group places sustainable business growth based on solving social issues at the core of its management, and enriches society and the Earth for future generations through positive impact on people and the environment.

Action policy

In all aspects of our business activities, we have set ambitious targets related to solving social issues connected to the environment as one of the most material management issues, and we will focus on achieving these targets under the leadership of top management and through the participation of all employees.

Compliance
We will comply with all environmental laws, regulations, and agreements as well as voluntary control standards related to our business activities with high moral values.

Technological development
In addition to developing and adopting innovative technologies and methods, we will work with our customers and broad stakeholders to resolve issues on a sustainable basis.

Environmental management
We will develop an environmental management system and make continuous improvements in accordance with our business strategy.

Fostering human capital
We will continuously develop human resources who can create and implement a positive impact on the environment and society as a whole, beyond our own company and its framework.

Communication
We will disseminate highly transparent and reliable information and broadly promote communication with stakeholders.

Revised on October 2021

Appendix

Policies on Biological Resources

Kirin Group's Declaration of Support for Biodiversity Conservation

Kirin Group relies on the bounty of nature to make products. We utilize the power and wisdom nature has to offer in conducting its business activities. Because of that, we recognize the importance of conserving biodiversity as business challenges. Kirin Group actively pursues a broad range of activities to protect biodiversity in order to continue offering new joys of "food and well-being" into the future.

1. Kirin Group promotes sustainable use of resources while ensuring conservation of biodiversity

The Kirin Group is committed to sustainable use of resources while taking biodiversity into consideration in all of its business activities so that all people around the world may continue to enjoy the bounty of nature.

2. Kirin Group makes effective use of its technologies

As a company that offers new joys of "food and well-being," the Kirin Group makes effective use of its technologies when conducting business activities to contribute to the sustainable use of resources and protection of biodiversity.

3. Kirin Group works in cooperation with stakeholders

Kirin Group adds a biodiversity perspective to the environmental protection activities which have continuously been engaged in and works in cooperation with customers and local partners to continue conserving biodiversity.

4. Kirin Group properly complies with treaties and laws

Kirin Group complies with treaties, laws and regulations concerning biodiversity and strives to help people enjoy the blessings of biodiversity worldwide.

Established and released on October 2010

- **Kirin Group Action Plan for the Sustainable Use of Biological Resources**
- **Kirin Group's Principles of Managing Access to Genetic Resources**

Kirin Group's Guidelines on Sustainable Sourcing of Biological Resources

Purpose

The purpose of the Guidelines is to present the fundamental principles of the Group so that it can continue to ensure the "sustainable sourcing of biological resources" based on the Kirin Group's Declaration of Support for Biodiversity Conservation.

Applicable scope

The Guidelines apply to biological resources procured by the Kirin Group's operating companies in Japan for which the Group has specified that there is risk of illegal deforestation, environmental destruction and such like based on risk assessment performed.

Guidelines on Sustainable Sourcing of Biological Resources

Kirin Group procures applicable biological resources based on the following principles.

1. Resources that the Group has confirmed; not to derive from a plantation developed illegally, to have been produced through appropriate procedures in compliance with the laws and regulations of the areas where the raw material is produced.
2. Resources deriving from plantations, forests, etc. that have been certified by credible third parties.
3. Resources that have not been produced by entities which are considered to be involved in environmental destructions.[*1]

Implementation and operation

The Kirin Group regularly revises these Guidelines based on biodiversity risk assessments for products sourced, taking into account the issues associated with biological resources and the fact that sourcing conditions differ for each region. In addition, the Kirin Group also separately formulates action plans and implements them in phases, taking into consideration the unique characteristics of each country or region. When implementing initiatives, the Kirin Group cooperates with suppliers, specialists, NGOs, and other stakeholders, and adopts a long-term perspective that considers support to enable people working in areas producing raw materials to transition to means of production that take into account the sustainability of biological resources.

Information disclosure and external communication

The Kirin Group is committed to maintaining transparency and disclosing the progress of its initiatives through sustainability reports, Home Pages, and other methods. At the same time, the Kirin Group also utilizes appropriate external communication to promote understanding among customers, partners, and society, and thereby increase the use of sustainable biological resources.

*1 Reference is currently made to the FSC's Policy for the Association of Organization with FSC.

Established on December 2012、Released on June 2013

Appendix

Other Policies and Principles

Policies on plastic

- The Kirin Group Plastic Policy

Consideration of the Environment in Product Development

- Guidelines on Environmentally Conscious Design for Containers and Packaging

Commitment to the Minister of the Environment

- Eco-First Program

Climate Change Initiatives

- Kirin Group Carbon Credit Policy

Links

Environmental policies are available at the following links:
https://www.kirinholdings.com/en/impact/env/e_policy/
https://www.kirinholdings.com/en/impact/env/3_4a/

Appendix

Policy Recommendations

Participation in the RE100 Climate Group policy working group to create recommendations for the Japanese government

As a member of RE100, Kirin Holdings participated in the policy working group from January to March 2024 to create recommendations for the Japanese government, including expanding renewable energy capacity to achieve the 1.5°C target. A message from the Senior Executive Officer of Kirin Holdings, Hiroshi Fujikawa is posted on the Climate Group website.
https://www.there100.org/our-work/news/re100-calls-japanese-government-urgently-grow-renewables-capacity

Participation in the "Japan Business Coalition for a Global Plastics Treaty"

Kirin Holdings has been participating in the "Japan Business Coalition for a Global Plastics Treaty" since its establishment in November 2023. This coalition conducts policy advocacy with the Japanese government to establish an ambitious international treaty aiming to eliminate plastic pollution. Together with other companies, financial institutions, and NGO partners, we seek to conclude a UN treaty that transitions the plastic value chain to a circular economy, preventing pollution.

Signing the "Business Statement for COP15 (Mandatory Assessment and Disclosure of Nature Impacts)" by Business for Nature

Kirin Holdings endorsed and signed the "Business Statement for COP15" on October 18, 2022, which was initiated by Business for Nature and called on companies worldwide, including our own, to support the mandatory assessment and disclosure of impacts and dependencies on nature by all businesses and financial institutions.

This endorsement was made in the context of the 15th Conference of the Parties to the United Nations Convention on Biological Diversity (COP15), held in Montreal, Canada in December 2022, with the goal of halting and reversing biodiversity loss by 2030.

Joining the "30by30 Alliance for Biodiversity"

Kirin Holdings joined the "30by30 Alliance for Biodiversity," led by Japan's Ministry of the Environment, on April 8, 2022. The "30by30" initiative aims to conserve and protect 30% of the Earth's land and sea areas by 2030, contributing to biodiversity conservation. We believe that Kirin Group's biodiversity conservation activities and the knowledge gained from them can contribute to other effective area-based conservation measures (OECMs).

Expressing support for the Ministry of Economy, Trade and Industry's "GX League Basic Concept"

Kirin Holdings expressed support for the "GX League Basic Concept" announced by the Ministry of Economy, Trade and Industry in March 2022. The "GX League" is a platform where companies actively involved in Green Transformation (GX) collaborate with government, academia, and finance players to discuss and implement economic and social system transformation and create new markets.

Participation in WWF Japan's "Plastic Circular Challenge 2025"

On February 22, 2022, Kirin Holdings participated in the "Plastic Circular Challenge 2025," a framework called for by WWF Japan to address plastic issues related to containers and packaging, and disposable plastics by 2025.
https://www.wwf.or.jp/campaign/pcc2025/ (in Japanese)

Participation in the Climate Leaders Coalition

Lion continues to participate in the Australian Climate Leaders Coalition (CLC), which is committed to leading corporate responses to climate change through transparent and meaningful action on mitigation and adaptation. By participating in the CLC, we call for policies and investments that enable New Zealand to transition to a zero-carbon economy. As a participant, we commit to measuring and publicly reporting emissions, setting public emission reduction targets, and collaborating with suppliers to reduce emissions.

Participation in the Study Group on Non-Financial Information Disclosure

Since 2021, Kirin Group's CSV Strategy Officers have been participating in the Ministry of Economy, Trade and Industry's Study Group on Non-Financial Information Disclosure. This study group examines the ideal form of disclosure and disclosure media that lead to high-quality dialogue with users of non-financial information and aims to accurately communicate Japan's position on non-financial information disclosure and guidelines internationally. The CSV Strategy Officer also participated in a panel discussion at the "TCFD Summit 2020" (hosted by the Ministry of Economy, Trade and Industry, co-hosted by WBCSD and the TCFD Consortium) held on October 9, 2020.

In 2020, we served as a member of the sector-specific guidance review committee (food sector) and contributed to the "TCFD Guidance 2.0" published by the TCFD Consortium on July 31, 2020.

From 2022 to 2023, we also participated in the Ministry of the Environment's "Nature Positive Economy Study Group." This study group aimed to address the integrated resolution of issues such as climate change and the circular economy, considering the relationship between biodiversity, natural capital, and business, based on Japan's industrial structure.

Appendix

Voluntary Participation Leading to Policy Recommendations

Participation in Consortiums and Government Activities (Organization Names / Activity Content)

RE100
We are a member of the international initiative "RE100," which consists of companies aiming for 100% renewable energy for electricity. We are working towards achieving 100% renewable energy for electricity by 2040.

Japan Climate Initiative (JCI)
We participate in this network to strengthen information sharing and dialogue with companies and local governments that are actively working on climate change measures.

TCFD Consortium
Kirin Holdings has been a member of the "TCFD Consortium" since its establishment in 2019. In 2020, we served as a committee member for the sector-specific guidance review committee (food sector).

We Mean Business Coalition
Kirin Group is committed to setting emission reduction targets approved by SBTi and to reporting climate actions in mainstream reports using a recognized framework as CDSB, which are advocated by We Mean Business Coalition.

Science Based Targets Network
SBTN sets scientifically grounded targets for natural capital and aim to achieve a sustainable global system. Kirin Holdings has set targets aligned with the SBTi (Science Based Targets initiative) standards for GHG emission reduction, achieving the "SBT1.5°C" target in 2020 and the "SBT Net Zero" certification in 2022.
We are the first company in the Japanese pharmaceutical and food industries to participate in the Corporate Engagement Program (CEP) of SBTs for Nature, which discusses rule-making for the new initiative for setting natural capital targets following the SBT.

United Nations Global Compact
Kirin Group has joined the "United Nations Global Compact" since September 2005.

Japan Sustainability Local Group (JSLG)
Kirin Holdings participates as a director member of the Steering Committee of UNGC.

National Movement for Creating a New and Prosperous Lifestyles toward Decarbonization
Kirin Group participates in the new national movement for decarbonization, "Creating a New and Prosperous Lifestyle toward Decarbonization," which started in 2022. We also participate in the "Public-Private Partnership Council for New National Movement" supporting this movement.

Keidanren Voluntary Action Plan
The Brewers Association of Japan, which Kirin Brewery is a member of, and the Japan Soft Drink Association, which Kirin Beverage is a member of, participate in Japan Federation of Economic Organizations' environmental impact reduction efforts, working on GHG emission reduction and waste recycling.

Eco-First
Eco-First is a programme where companies promise the Minister of the Environment to undertake their own environmental conservation efforts, such as measures against global warming. Kirin Group was certified as the first company in the manufacturing industry and also participates in the "Eco-First Promotion Council" organized by certified companies.

Private Sector Engagement Initiative on Biodiversity
Kirin Holdings participates in the "Private Sector Engagement Initiative on Biodiversity," established in 2010 by The Nippon Keidanren, the Japan Chamber of Commerce and Industry, and KEIZAI DOYUKAI (Japan Association of Corporate Executives).

Forest Supporters
Kirin Group participates in the "Forest Supporters" campaign, a national movement to promote beautiful forest creation, organized by the National Land Afforestation Promotion Organization.

Water Project
Kirin Group has participated in the "Water Project," a public-private partnership awareness project aimed at promoting the maintenance or recovery of healthy water cycles, since 2014.

Rainforest Alliance Consortium
Kirin Group has been a founding member of the "Rainforest Alliance Consortium," established in September 2015 by the Rainforest Alliance and companies handling its certified products, aiming to promote sustainable agriculture.

Consortium for Sustainable Paper Use (CSPU)
Kirin Group has been a founding member of the "Consortium for Sustainable Paper Use," established by five (currently eleven) companies and WWF Japan, promoting sustainable paper use.

Clean Ocean Material Alliance (CLOMA)
Kirin Group participates in the "Clean Ocean Material Alliance (CLOMA)," established to solve the global marine plastic waste problem by promoting the sustainable use of plastic products and the development and introduction of alternative materials, accelerating innovation.

Japan Sustainable Palm Oil Network (JaSPON)
Kirin Group participates in the "Japan Sustainable Palm Oil Network (JaSPON)," established to promote the sustainable procurement and consumption of palm oil.

Alliance to End Plastic Waste
Kirin Group participates in the Alliance to End Plastic Waste, an international non-profit organization aiming to solve the problem of waste plastic in the environment. Working together with participating companies from a global perspective, we aim to realize a society where plastic continues to circulate.

Appendix

Voluntary Participation Leading to Policy Recommendations

The TNFD Forum
The TNFD Forum is a support network sharing the mission and vision of the Taskforce on Nature-related Financial Disclosures (TNFD), a framework for information disclosure for nature capital risk management. Kirin Holdings became the first domestic food and beverage and pharmaceutical company to participate in December 2021.

Business for Nature
Kirin Holdings endorsed and signed the "Business Statement for COP15," aimed at the 15th Conference of the Parties to the Convention on Biological Diversity (COP15) held in December 2022.

Production Sites (Production Sites / Activity Content)

Sri Lanka Tea Farms
Since 2013, we have been supporting the acquisition of Rainforest Alliance certification at tea farms in Sri Lanka, the tea production region, to enhance sustainability. Since 2018, we have also started supporting certification acquisition for small farms and conservation of water sources on the farms.

Vietnam Coffee Farms
Since 2020, we have expanded our support for acquiring Rainforest Alliance certification to coffee farms in Vietnam.

Domestic Vineyards
Since 2014, at Mercian's self-managed Mariko Vineyard on the Jimbadai Plateau in Ueda City, Nagano Prefecture, and at Tengusawa and Jyonohira Vineyards in Yamanashi Prefecture, we have been conducting ecosystem surveys and vegetation restoration activities. We also hold environmental classes at elementary schools at the foot of the mountains.

NGOs/NPOs/Environmental Organizations
(Organization Names / Activity Content)

WWF Japan
We cooperated with WWF in the formulation of the "Sustainable Biological Resources Procurement Guidelines" and "Action Plan." We co-founded the "Consortium for Sustainable Paper Use" and continue to engage in activities.

Rainforest Alliance
We jointly support the acquisition of certification for tea farms in Sri Lanka and coffee farms in Vietnam.

FSC Japan
We engage in joint activities to promote FSC-certified paper. In 2017, the Kirin Group committed to the "Vancouver Declaration on SDGs and FSC Certification."

RSPO (Roundtable on Sustainable Palm Oil)
Kirin Holdings participate as a member of the non-profit organization aimed at promoting the production and use of "Sustainable Palm Oil."

Junior United Nations Environment Program (JUNEC)
We co-host the "Kirin School Challenge."

Earthwatch Japan
We jointly conduct vegetation surveys and Clara restoration activities at Mariko Vineyard.

Japan Network for Climate Change Actions
We jointly implement the "Environmental Mark Program" targeting after-school programs, Girl Scouts, Boy Scouts, and libraries.

Industry Associations (Organization Names / Activity Content)

Brewers Association of Japan
We jointly formulate and implement Voluntary Action Plans for the Environment regarding containers and packaging, global warming countermeasures, and the formation of a circular society, and work together to prevent the littering of beverage containers and promote environmental beautification.

Japan Soft Drink Association
We jointly formulate and implement Voluntary Action Plans for the Environment regarding containers and packaging, global warming countermeasures, and the formation of a circular society, and work together to prevent the littering of beverage containers and promote environmental beautification.

Recycling Organizations
We promote 3R (Reduce, Reuse, Recycle) in cooperation with the Container and Packaging Recycling Association and various recycling promotion councils.

The beverage Industry Environmental Beautification Association
Six beverage manufacturer organizations collaborate on activities for environmental beautification.

Next Generation Engagement
(Activity Names / Activity Content)

Kirin School Challenge
We organize environmental workshops for junior and senior high school students.

Japan Environmental Youth Network
We support Japan Environmental Youth Network, organized by the Ministry of the Environment and the Environmental Restoration and Conservation Agency of Japan, and serve as judges for both regional and national competitions.

Appendix

Voluntary Participation Leading to Policy Recommendations

Environmental Mark Program

The Kirin Group supports the implementation of educational programs for children in settings such as after-school care centers, Girl Scouts and Boy Scouts, and libraries, using a special version of the “Environmental Mark Program” tool. This tool was jointly developed based on the original program created by the Japan Network for Climate Change Actions with support of Japan Fund for Global Environment by the Environmental Restoration and Conservation Agency.

Plant Environmental Tours

We conduct tours such as the “Feel the Blessings of Nature Tour” at the Yokohama Plant.

Research Institutions (Organization Names / Activity Content)

National Agriculture and Food Research Organization (NARO)

We conduct joint research on ecosystem changes associated with the creation of vineyards on idle abandoned land, as well as vegetation restoration activities for rare and native species.

Appendix

Sustainable Finance

Please refer to the following website reporting on green bonds and transition-linked loans.
https://www.kirinholdings.com/en/impact/csv_management/sustainable_finance/

Appendix

Environmental Management Certification Status

Japan

As of June 2025

Business Companies	Business Locations	Type
Kirin Brewery	Integrated Certification (10)	Self Assessment
Kirin Beverage	Integrated Certification (3)	Self Assessment
Mercian	Integrated Certification (3)	Self Assessment
Kirin Distillery	Fuji-Gotemba distillery (1)	Self Assessment
Shinshu Beverage	Main Factory	Third Party Certification
Kyowa Kirin	Takasaki Plant, Ube Plant, Tokyo Research Park, Fuji office	Self Assessment
Kyowa Hakko Bio	Main office, Yamaguchi Production Center	Third Party Certification
Kyowa Pharma Chemical	Kyowa Pharma Chemical	Third Party Certification

Number of independently certified business locations	3
Number of business locations making Self Assessment of conformity	21
Number of uncertified business locations	5
Certification rate (%)	83

Overseas

Business Companies	Business Locations	Type
Lion	Little Creatures Brewery Fremantle Little Creatures Brewery Geelong Little Creatures Packaging O'Connor Castlemaine Perkins Brewery James Boag Brewery Murwillumbah Brewery Tooheys Brewery Pride Brewery Speights Brewery Wither Hills Winery	Third Party Certification
Vietnam Kirin Beverage	Vietnam Kirin Beverage	Third Party Certification
Coca-Cola Beverages Northeast	Hartford Londonderry	Third Party Certification
Kirin Brewery (Zhuhai)	Jinding Plant	Third Party Certification
Kyowa Hakko Bio	Thai Kyowa Biotechnologies Shanghai Kyowa Amino Acid	Third Party Certification

Number of certified business locations	16
Number of uncertified business locations	13
Certification rate (%)	55

Appendix

External Awards

Year	Award Recipient	Award Name	Award Content	Implementing Organization
2025	Kirin Holdings	6th "ESG Finance Awards Japan" Environmental Sustainable Company Category	Gold Award (4th time)	Ministry of the Environment
2024	Kirin Holdings	Top 100 Environmental Education & ESD Practice Videos	Selection	Ministry of the Environment
2024	Kirin Brewery	Food Loss Reduction Promotion Award	Chairman's Award	Consumer Affairs Agency, Ministry of the Environment
2024	Kirin Holdings	CDP Water Security	A List (8 consecutive years)	CDP
2024	Kirin Holdings	CDP Climate Change	A List	CDP
2024	Kirin Holdings	FY2024 Private Sector Agriculture, Forestry, and Fisheries Research and Development Achievers Award	Minister of Agriculture, Forestry and Fisheries Award (Discovery and commercialization of β-lactolin)	Ministry of Agriculture, Forestry and Fisheries
2024	Kirin Holdings	SX Brand (Sustainability Transformation Brand) 2024	SX Brand Selection	Ministry of Economy, Trade and Industry
2024	Kirin Holdings	CDP Supplier Engagement Rating	Leaders Board (5 consecutive years)	CDP
2024	Kirin Holdings	5th "ESG Finance Awards Japan" Environmental Sustainable Company Category	Gold Award	Ministry of the Environment
2024	Kirin Holdings	CDP Water Security	A List	CDP
2024	Kirin Holdings	CDP Climate Change	A-	CDP
2024	Kirin Holdings	5th "Nikkei SDGs Management Survey"	Highest Rank (5 consecutive years)	Ministry of the Environment
2023	Kirin Holdings	CDP Supplier Engagement Rating	Leaders Board	Ministry of the Environment
2023	Kirin Holdings	Leading Company in Sustainable Raw Material Procurement for Domestic Food Manufacturers	Cabinet Secretary's Award	Ministry of Agriculture, Forestry and Fisheries
2023	Kirin Holdings	4th "ESG Finance Awards Japan" Environmental Sustainable Company Category	Special Award	Ministry of the Environment
2022	Kirin Holdings	10th Ministry of the Environment Good Life Award	10th Anniversary Special Award Biodiversity Award	Ministry of the Environment
2022	Kirin Holdings	CDP Water Security	A List	CDP
2022	Kirin Holdings	CDP Climate Change	A List	CDP
2022	Kirin Holdings	CDP Supplier Engagement Rating	Leaders Board	CDP

Awards for Container and Packaging

Year	Award Recipient	Award Name	Award Content	Implementing Organization
2022	"Namacha" brand's new PET bottle: "Green Ecology Bottle"	2022 Japan Packaging Contest	Packaging Technology Award (Proper Packaging Award)	Japan Packaging Institute
2022	Development of lightweight PET bottles for wine	46th Kinoshita Award	Packaging Technology Award	Japan Packaging Institute
2022	Heartland Beer – 330ml and 500ml glass bottles	18th Glass Bottle Award 2022	Special Award	Japan Glass Bottle Association

Awards for Business Sites

Year	Award Recipient	Award Name	Award Content	Implementing Organization
2023	Shanghai Kyowa Amino Acid	Reevaluation of Water-Saving Companies	Award	Shanghai City
2023	Shanghai Kyowa Amino Acid	Evaluation Meeting for Industrial Water Reuse Cases	Excellence Award	Shanghai City

Awards for Greening

Year	Award Recipient	Award Name	Award Content	Implementing Organization
2022	Kirin Brewery Shiga Plant	Lake Biwa Forest Creation Partner Agreement	Certificate of Appreciation for Contribution to Forest Creation for Water Sources	Shiga Prefecture

Awards for Energy Conservation

Year	Award Recipient	Award Name	Award Content	Implementing Organization
2022	Kirin Brewery Hokkaido Chitose Plant	Hokkaido Energy Conservation and New Energy Promotion Grand Prize New Energy Category	Encouragement Award	Hokkaido Government
2022	Kyowa Kirin Ube Plant	Yamaguchi Prefecture Global Warming Countermeasures	Excellent Business Site	Yamaguchi Prefecture
2022	Shinshu Beverage	Business Activity Global Warming Countermeasure Plan System	Excellent Business Operator Award	Nagano Prefecture Zero Carbon Promotion Office
2022	Thai Kyowa Biotechnologies	Green Industry	Level 3	Ministry of Industry (Thailand)

Awards for Biodiversity

Year	Award Recipient	Award Name	Award Content	Implementing Organization
2025	Jyonohira Vineyard	Sustainably Managed Natural Sites	Certification	Ministry of the Environment
2023	Mariko Vineyard	Sustainably Managed Natural Sites	Certification	Ministry of the Environment

Appendix

Other Information Disclosure

Environmental Information Disclosure Through Products (Subjects / Disclosure Content)

Eco-Rail

In 2006, Kirin Beverage, and in 2010, Kirin Brewery were selected as "Eco-Rail Mark" certified companies by the Ministry of Land, Infrastructure, Transport and Tourism for actively addressing global environmental issues through the use of rail freight transportation. (As of 2022, only Kirin Brewery continues this certification.)

Carbon Footprint

Kirin Brewery began working on carbon footprint initiatives with the beer industry in 2008. The PCR (Product Category Rule) for beer, which serves as the basis for calculation, was certified in February 2011 and revised in December 2013.

Rainforest Alliance Certification Mark

In August 2021, Kirin launched the year-round sale of "Kirin Go-go-no-Kocha Straight Tea" in 250ml paper packs (LL Slim), displaying the Rainforest Alliance Certification Mark, which is awarded to farms recognized for pursuing more sustainable agricultural practices while protecting nature and producers.

FSC Certification Label

Many paper containers used by Kirin Brewery and Kirin Beverage (including Tropicana) are labeled with the FSC certification to help customers understand the importance of forest conservation. This label is also found on some of Mercian's paper containers and Sunrise brand wines.

Organic Wine

Mercian sells wines that have received "organic certification" such as Euroleaf, Ecocert, Biodivin, Bioagrisert, and Sohiscert.

Disclosure to Investors (Subjects / Disclosure Content)

Reports

We also disclose environmental information in various investor reports such as:

More information→P.3

- Integrated Report
- Kirin Group Environmental Report*
- Kirin Holdings Securities Report
- Kyowa Kirin Annual Report
- Kyowa Hakko Bio CSV Progress Report
- Lion Sustainability Report
- Blackmores Sustainability Report
- FANCL FANCL Report

Websites

Furthermore, environmental information is disclosed on various websites such as:

More information→P.3

- Kirin Holdings Creating Shared Value with Society Site (Environment)*
- Kirin Holdings IR Information

* Information based on the final report of the Task Force on Climate-related Financial Disclosures (TCFD) has been disclosed annually since 2018 in the Environmental Report and on the Environmental Site.

Lectures (Dates / Subjects)

March 1, 2024

Cabinet Secretariat Water Circulation Policy Headquarters "3rd Corporate Collaboration Water Circulation Webinar"

April 19, 2024

Green Carbon Offset Forum "2nd Public Seminar"

October 17, 2024

Hitotsubashi University CFO Education and Research Center

October 18, 2024

Ministry of the Environment "Study Group on Integrated Information Disclosure for Corporate Decarbonization (Carbon Neutrality, Circular Economy, Nature Positive)"

October 25, 2024

Japan-Australia Economic Committee

December 8, 2024

Toda Scholarship Foundation

December 11, 2024

Sri Lanka Tea Board

Case Studies (Subjects / Disclosure Content)

JB Press "Leading Practices in Sustainability Management"

"The True Value of 'Nature Positive': Kirin's Pioneering Commitment to Environmental Management"
https://jbpress.ismedia.jp/articles/-/79753 (in Japanese)

Nikkei ESG "Hot Issue"

"Kirin Shares Emissions Reduction Measures with Its Suppliers"
https://project.nikkeibp.co.jp/ESG/atcl/column/00005/041200446/ (in Japanese)

Appendix

Climate Change Scenarios / Natural Capital Scenarios

Climate change scenarios

		Kirin Group Scenario 3 4°C scenario. SSP3, RCP8.5	Kirin Group Scenario 1 2 or 1.5C Scenario. SSP1, RCP2.6
Scenario		●Laws and regulations related to climate change are strict in developed countries, but insufficient globally, resulting in failure to achieve the required reduction in GHG emissions. ●Higher temperatures, droughts and heavy rains, and reductions in daily temperature ranges lead to significant decreases in the yield and quality of agricultural products. Natural disasters caused by climate change also become frequent and severe. ●The financial impact on companies of compliance with laws and regulations and energy usage is small, but it becomes difficult to use low-cost, high-quality natural capital. ●Global warming also leads to an increase in infectious diseases, heatstroke, etc.	●Governments around the world enact strict laws and regulations related to climate change, resulting in a sufficient reduction in GHG emissions. ●The rise in temperature is curbed, natural disasters do not increase much more than current levels, and the impact on agricultural yields is also limited. Natural disasters do not change significantly from current levels. ●The financial impact on companies of compliance with laws and regulations and energy usage is large, but the cost of using natural capital is acceptable. ●The impact of global warming on health is minimal.
Analysis results		●Significant decline in yields of major agricultural products. Possible decline in quality. Increase in procurement costs. ●Damage to agricultural production areas, production stoppages, and delivery difficulties due to floods and droughts caused by climate change. ●The increase in energy costs and agricultural prices due to carbon taxes is minimal. ●There is major harm from infectious diseases and heatstroke due to global warming.	●The impact on yields of agricultural products and procurement costs is minimal. ●The impact of floods and droughts caused by climate change on agricultural production areas, production, and delivery is minimal. ●The impact of energy costs and agricultural prices due to carbon taxes is major. ●The impact of infectious diseases and heatstroke due to global warming continues.
Scientific basis	Agricultural products	●Decreases in global beer supply due to extreme drought and heat, Nature Plants, VOL.4, NOVEMBER 2018, 964-973 (Xle et al.) ●IPCC (2019) Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems Chapter 5: Food Security ●Risk of increased food insecurity under stringent global climate change mitigation policy. Nature Climate Change volume 8, pages 699-703 (Hasegawa T, Fujimori S, HavlikP, Valin H, BodirskyBL, DoelmanJC, FellmannT, Kyle P et al. 2018) ●Zebish et al. (2005) "Climate Change in Germany Vulnerability and Adaptation of climate sensitive Sectors" FAO "Food and agriculture projections to 2050," etc.	
	Drought risk	●Aqueduct 3.0 (current risk), Aqueduct 2015 (risk assessment combining future projections, climate scenarios RCP4.5 and RCP8.5, and socioeconomic scenarios SSP2 and SSP3), etc.	
	Flood risk	●AIR Touchstone version 8.2	
	Agricultural products (impact of global warming on prices and carbon taxes)	●IPCC (2019) Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems Chapter 5: Food Security and Risk of increased food insecurity under stringent global climate change mitigation policy. Nature Climate Change, volume 8, pages 699-703 (Hasegawa T, Fujimori S, HavlikP, Valin H, BodirskyBL, DoelmanJC, FellmannT, Kyle Petal. 2018)	
	Energy	●IEA "World Energy Outlook 2019" Annex A (rate of decline in future electric power emission factors), IEA WEO 2019 (Kirin Group Scenario 3: Current Policies Scenario, Group Scenario 1: SD Scenario, 1.5°C Scenario: IPCC Special Report on Global Warming of 1.5°C)	

Natural capital scenarios

		Kirin Group Scenario 3 4°C scenario. SSP3, RCP8.5
Scenario		Original scenario
Scope of analysis	Dependence	●Corn, barley, wheat, rice, soybeans, sugarcane, hops, black tea leaves, green tea leaves, oolong tea leaves, coffee beans, powdered milk, raw milk, grapefruit, lemon, orange, grape, apple, tomato, plum, palm oil, cardboard and paper cartons
	Impact	●Same as above
Scientific basis	GHG emissions by agricultural product	●Carbon footprint: CarbonCloud | ClimateHub database ●Agricultural production data: FAO average over the past five years, emissions models based on PCC guidelines, and global warming factors applied to IPCC GWP100 ●Paper: CFP data from the Japan Paper Association (because it is not in the ClimateHub database)
	Land use footprint	●Area harvested (ha) per crop and production quantity(t): Calculation of acreage per unit yield (ha/t) using 2022 data in FAO FAOSTAT ●Paper: Calculated using data from papers related to global forest product footprint estimation (because it is not included in FAOSTAT)
	Water footprint by agricultural product	●M. M. Mekonnen and A. Y. Hoekstra (2011) The green, blue and grey water footprint of crops and derived crop products Hydrol. Earth Syst. Sci., 15, 1577-1600 If not included in this, the water footprint was identified in another paper by Schyns et al. ●Joep F. Schyns, Martijn J. Booij, Arjen Y. Hoekstra (2017) The water footprint of wood for lumber, pulp, paper, fuel and firewood Advances in Water Resources Volume 107, September 2017, Pages 490-501
	Commodity risk	●Judged based on whether or not agricultural products are included in the SBTN's High Impact Commodity List ●Judged based on whether or not they are included in the list of commodities covered by the European Regulation on Deforestation Free Products (EUDR)
	Agricultural products and water risk by region	●Assessed by cross-referencing data on food production, demand, trade, prices, and hunger in countries and regions around the world from the WRI's Aqueduct Food and the International Food Policy Research Institute (IFPRI)
	Pollution (fertilizer usage)	●International Fertilizer Association (IFA) database "IFASTAT": Inputs of nitrogen, phosphorus, and potassium per hectare (kg/ha) by crop

Appendix

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- Potential impacts of climate change on agricultural land use suitability: barley (Van Gool, D. and Vernon, L.)
- Climatic changes and associated impacts in the Mediterranean resulting from a 2°C global warming. (Giannakopoulos, C., Le Seger, P., Bindi, M., Moriondo, M., Kostopoulou, E. & Goodess, C.)
- Negative impacts of climate change on cereal yields: statistical evidence from France (Gammans M. et al.)
- Extension of the CAPRI model with an irrigation sub-module (Blanco, M. et al.)
- Crop responses to temperature and precipitation according to long-term multi-location trials at high-latitude conditions. (Peltonen-Sainio, P., Jauhiainen, L. & Hakala, K.)
- Decreases in global beer supply due to extreme drought and heat (Xie, W. et al.)
- Climate change, wine, and conservation (Lee Hannah, Patrick R. Roehrdanz, Makihiko Ikegami, Anderson V. Shepard, M. Rebecca Shaw, Gary Tabor, Lu Zhi, Pablo A. Marquet, and Robert J. Hijmans)
- Climate change decouples drought from early wine grape harvests in France (Benjamin I. Cook & Elizabeth M. Wolkovich)
- Vineyards in transition: A global assessment of the adaptation needs of grape producing regions under climate change (David Santillán, Ana Iglesias, Isabelle La Jeunesse, Luis Garrote, Vicente Sotes)
- Assessment of climate change impact on viticulture: Economic evaluations and adaptation strategies analysis for the Tuscan wine sector (Iacopo Bernettia, Silvio Menghinia, Nicola Marinellia, Sandro Sacchellia, Veronica Alampi Sottinia)
- The impact of climate change on the global wine industry: Challenges &solutions (Michelle Renée Mozell, Liz Thachn)
- Climate change impacts on water management and irrigated agriculture in the Yakima River Basin, Washington, USA (Vano, J.A. et al.)
- The impact of climate change on the yield and quality of Saaz hops in the Czech Republic (Martin Mozny, Radim)Tolasz, Jiri Nekovar, Tim Sparks, Mirek Trnka, Zdenek Zalud
- Vulnerability of Sri Lanka tea production to global climate change (M. A. Wijeratne)
- Observing climate impacts on tea yield in Assam, India (J.M.A. Duncan, S.D. Saikia, N. Gupta, E.M. Biggs)
- THE FUTURE OF TEA A HERO CROP FOR 2030 (Ann-Marie Brouder, Simon Billing and Sally Uren)
- IDENTIFICATION OF SUITABLE TEA GROWING AREAS IN MALAWI UNDER CLIMATE CHANGE SCENARIOS (UTZ IN PARTNERSHIP WITH CIAT)
- Climate change adaptation in the Kenyan tea sector Ethical Tea Partnership)
- Diversity buffers winegrowing regions from climate change losses. 2864-2869, PNAS, February 11, 2020. (Morales-Castilla et.al.)
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- Other than barley: We calculated the impact using rates of change in costs associated with agricultural products from climate change (impact on yields) and mitigation measures (carbon pricing), as indicated in the results of research from Hasegawa et al., and presented in the IPCC "Special Report on Climate Change and Land (SRCCL)."
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Appendix

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Impact of climate change on high-fructose corn syrup and soybeans

- The impact of climate change on Brazil's agriculture (Zilli et al. 2020)
- Productivity and welfare impact of climate change in sugarcane and cotton producing regions of Ethiopia (Weldesilassie et al. 2015)
- Assessing the impact of climate change on sugarcane and adaptation actions in Pakistan (Farooq and Gheewala 2020)
- Simulating the Impacts of Climate Change on Sugarcane in Diverse Agro-climatic Zones of Northern India Using CANEGRO-Sugarcane Model (Sonkar et al. 2020)
- Effect of climate change on cash crops yield in Pakistan (Akbar and Gheewala 2020)
- Future climate change projects positive impacts on sugarcane productivity in southern China (Ruan et al. 2018)
- Assessing the impact of climate change on wheat and sugarcane with the AquaCrop model along the Indus River Basin, Pakistan (Alvar-Beltrán et al. 2021)
- Climate Change and Potato Productivity in Punjab—Impacts and Adaptation (Rana et al. 2020)
- Impacts of Climate Change on the Potential Productivity of Eleven Staple Crops in Rwanda (Austin et al. 2020)
- Predicting the response of a potato-grain production system to climate change for a humid continental climate using DSSAT (Tooley et al. 2021)
- Potential Benefits of Potato Yield at Two Sites of Agro-Pastoral Ecotone in North China Under Future Climate Change (Tang et al. 2020)
- Response of potato biomass and tuber yield under future climate change scenarios in Egypt (Dewedar et al. 2021)
- Impacts of Climate Change on the Potential Productivity of Eleven Staple Crops in Rwanda (Austin et al. 2020)
- Estimating cassava yield in future IPCC climate scenarios for the Rio Grande do Sul State, Brazil (Tironi et al. 2017)
- Is Cassava the Answer to African Climate Change Adaptation? (Jarvis et al. 2012)
- Estimation of potential changes in cereals production under climate change scenarios (Tatsumi et al. 2011)
- Global crop yield response to extreme heat stress under multiple climate change futures (Deryng et al. 2014)
- The combined and separate impacts of climate extremes on the current and future US rainfed maize and soybean production under elevated CO_2 (Jin et al. 2017)
- Climate impacts on crop yields in Central Argentina. Adaptation strategies (Rolla et al. 2018)
- Mitigating future climate change effects on wheat and soybean yields in central region of Madhya Pradesh by shifting sowing dates (Balvanshiand Tiwari 2019)
- Changing yields in the Central United States under climate and technological change (Burchfield et al. 2020)

Assessment of impact of carbon pricing

Estimation of impact of carbon pricing

1) We calculated the rate of decline in future electric power emission factors from the IEA "World Energy Outlook 2019" Annex A (Current Policies Scenario and SD Scenario).
2) We calculated actual electric power emission factors from the actual energy usage and GHG emissions of the Kirin Group in the base year (2019), and estimated future electric power emission factors under the two scenarios (Current Policies Scenario and SD Scenario) by multiplying actual emission factors by the rate of decline in emission factors calculated in Step 1.
3) We used the electric power emission factors that we calculated to forecast GHG emissions in the Kirin Group in 2030 and 2050. We categorized these forecasts depending on whether or not we take measures to reduce emissions.
4) We applied the IEA WEO 2019 Current Policies Scenario to the Kirin Group scenario 3, and the SD Scenario for the Kirin Group scenario 1, while also setting the IPCC "Special Report on Global Warming of 1.5°C" as our new 1.5°C scenario, and we set the carbon prices indicated in each data source as the basis for the future carbon prices for each scenario (IEA WEO 2019 P758 and IPCC Special Report on Global Warming of 1.5°C 2.5.2.1 Price of carbon emissions).
5) We calculated the future impact by multiplying the forecasts of future GHG emissions that we calculated in Step 3 by the carbon prices that we set in Step 4. We calculated the increase in costs if we did not implement initiatives to reduce GHG emissions from the difference in impact depending on whether or not we take measures to reduce emissions.

External diseconomies related to Kirin Group PET bottles

We estimated that impairment losses related to marine ecosystem services would be approximately 0.36 to 3.56 million yen (approximately 3,300 US$ to 33,000 US$) per ton of plastic in 2011, based on the estimations of Beaumont et al. We estimated that the median proportion of PET bottles that flowed into the ocean from Japan would be 0.5%, based on the "Annual Report on the Recycling of PET Bottles"
by the Ministry of the Environment. We set the total amount of PET materials used by Kirin Group major domestic companies at 66,894 tons in 2018, and multiplied this amount by the above estimates.

- Beaumont et al. (2019) Global ecological, social and economic impacts of marine plastic
- Ministry of the Environment (2018) Recent Trends Surrounding Ocean Waste, and the Council for PET Bottle Recycling, (2018) Annual Report on the Recycling of PET Bottles

Increasing interest in infectious diseases caused by global warming

- WHO: "Quantitative risk assessment of the effects of climate change on selected causes of death, 2030s and 2050s"
- WHO: "Dengue and severe dengue" 10 January 2022

Increase in heatstroke caused by global warming [short to long term]

- S-8 2014 Report by Project Team of Comprehensive Study on Impact Assessment and Adaptation for Climate Change
- National Institute of Infectious Diseases, Expansion of Aedes albopictus in Japan (IASR Vol. 41 p92-93: June 2020 edition)

Financial impact of transition risks related to natural capital (procurement of certified products)

- Estimated by multiplying by royalties, etc., if coffee and tea leaves are procured as certified products.

Financial impact of transition risks related to natural capital (reduction in agricultural chemicals and chemical fertilizers at tea farms)

- Estimated based on the results of on-site interviews, taking into account prices of chemical and organic fertilizers, as well as respective personnel expenses for the application of these fertilizers.