

Joy brings us together



Environmental Report 2021



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About this Environmental Report

Editorial Policy

The Kirin Group operates in three business areas in Japan, Oceania, and Asia: "Food (Alcoholic & non-alcoholic beverages)," "Pharmaceuticals," and "Health Science."

Approximately 65% of net sales are attributable to the Japan Beer and Spirits Businesses, Japan Non-alcoholic Beverages Businesses, and Oceania Integrated Beverages Business.

Initiatives to address the environmental issues are positioned as one of the purposes of CSV (the creation of value that can be shared with society), which is the core of our management strategy for the realization of sustainable growth.

The editing of this report has taken into account the characteristics of the Kirin Group's business and the positioning of its environmental approaches.

* For information on activities, data, and revised policies since August 2021, please access Kirin Holdings' environmental website.

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 the interests of a wide range of stakeholders in our local communities, including our customers.

Kirin Holdings Investor Relations Information

<https://www.kirinholdings.com/en/investors/>



Kirin Holdings Impact The Environment Website

<https://www.kirinholdings.com/en/impact/>



KIRIN CSV REPORT (Integrated Report)

<https://www.kirinholdings.com/en/investors/library/integrated/>



Kirin Holdings The Environment Website

<https://www.kirinholdings.com/en/impact/env/>



Lion Sustainability Website

<https://lionco.com/our-commitments/our-sustainability-approach/>



Kirin Group Environmental Report

https://www.kirinholdings.com/en/investors/library/env_report/



KYOWA KIRIN Sustainability Website

<https://www.kyowakirin.com/sustainability/>



Reporting Period

FY2020 (January–December 2020)

Where necessary, this report also contains historical data showing trends for the past 3 to 5 years.

Organizations Covered by this Report (FY2020)

Business	Company
Japan Beer and Spirits Businesses	Kirin Brewery, Kirin Distillery, SPRING VALLEY BREWERY, Eishogen Kirin Brewery (Zhuhai)
Japan Non-alcoholic Beverages Businesses	Kirin Beverage, Shinshu Beverage, Hokkaido Kirin Beverage, Kirin Maintenance Service, each site of Kirin Beverage Service (Hokkaido, Sendai, Tokyo, Chubu, Kansai) KIRINVIVAX, Tokai Beverage Service
Oceania Integrated Beverages Business	Lion, New Belgium Brewing
Pharmaceuticals Businesses	Kyowa Kirin, Kyowa Kirin Frontier, Kyowa Medical Promotion, Kyowa Kirin plus, Kyowa Hakko Kirin China Pharmaceutical, Kyowa Kirin Pharmaceutical Research
Other Businesses (all companies included)	Mercian, NIPPON LIQUOR, Daiichi Alcohol, Wine Curation, Myanmar Brewery Interfood, Vietnam Kirin Beverage, Four Roses Distillery Kyowa Hakko Bio, KYOWA PHARMA CHEMICAL, KYOWA Engineering, BioKyowa, Shanghai Kyowa Amino Acid, Thai Kyowa Biotechnologies, Kirin Holdings, Kirin Business Expert, KIRIN BUSINESS SYSTEM, KOIWA DAIRY PRODUCTS, Kirin Echo, Kirin and Communications, Kirin Engineering Kirin City, Kirin Techno-System, KIRIN GROUP LOGISTICS

* Lion announced the transfer of its beverage business unit on January 25, 2021.

Calculation Method of Environmental Data

About Calculation Method of Environmental Data → P.93~P.95

Reference Guidelines

- GRI Standards
- Ministry of the Environment, Government of Japan's Environmental Reporting Guidelines (FY2018 version)
- Recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD Recommendations) (June 2017)
- CDSB framework v2.2 (December 2019)
- SASB Standards (October 2018 version) Food & Beverage Sector/Alcoholic Beverages Industry and Non-Alcoholic Beverages Industry

→ P.109~P.115

Forward-looking statements 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.

We will continue to exercise leadership in environmental management and contribute to Japan becoming a “leading environmental nation”

First, I would like to express my deepest condolences to all those who lost loved ones as a result of the COVID-19 pandemic, and extend my heartfelt sympathies to all those affected. I would also like to express my deepest respect for the national and local governments in their day-to-day endeavors to control the spread of the disease, as well as the medical professionals constantly making every effort to diagnose and treat infected patients.

Scenario analysis based on the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), which the Company is implementing, shows that global warming is likely to increase the number of people at risk of contracting infectious diseases. In 2020, Kirin registered the *Lactococcus lactis* (LC) Plasma that it discovered as the first Food with Function Claims (FFC) that “helps maintain the immune system in healthy people” with Japan’s Consumer Affairs Agency (CAA) in Japan. In addition to preparing for the impact of climate change on our ingredients, i.e. agricultural products and water resources, we hope to deploy advanced fermentation technology and biotechnology to resolve social issues such as health risks and achieve business growth at the same time.

Our long-term environmental strategy, the Kirin Group’s Environmental Vision 2050, announced in February of last year, shifts our aim towards creating positive impact, marking a significant change from curbing negative impact, which was the focus of Kirin’s previous strategy. We are pursuing effective initiatives in the four priority issues of climate change, containers and packaging, biological resources, and water resources. Regarding climate change, in November 2020 we joined RE100, an initiative committed to sourcing 100% renewable electricity. In December, the Group’s medium-term GHG reduction target commitment was accepted by SBTi, as a “Business ambition for 1.5°C.” When the TCFD developed its Guidance on Scenario

Analysis for Non-Financial Companies, which was published in October, we were the only Japanese company and the only alcoholic beverage company in the world to present our opinions as one of 15 companies interviewed. With regard to “containers and packaging,” we launched a joint project with Mitsubishi Chemical Corporation last year aimed at the practical application of chemical recycling, as part of efforts to establish a circular economy for PET bottles. This year, we also became the first Japanese food company to participate in the Alliance to End Plastic Waste, a non-profit organization that works on a global basis to resolve the issue of waste plastics. As for “biological resources,” we converted paper containers to 100% FSC®-certified paper in the Japan alcohol and non-alcoholic beverages businesses last year. In February this year, we became the first company in the Japanese food and medical products industry to participate in the Corporate Engagement Program of the Science Based Targets Network, a global organization that develops scientific approaches to setting targets for the use of natural capital, including “water resources.”

I view the “realization of the decarbonization of society” advocated by the Japanese government as a long-term national policy vision comparable to the “Income Doubling Plan” and the “Plan for Remodeling the Japanese Archipelago.” The world recognizes the harmonization of nature and mankind as a philosophy of Japan. By continuing to demonstrate leadership in environmental management, the Kirin Group aims to contribute to Japan becoming a “leading environmental nation,” in which humankind and nature coexist, and to become a global leader in CSV.

President & CEO, Kirin Holdings Company, Limited
Yoshinori Isozaki



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

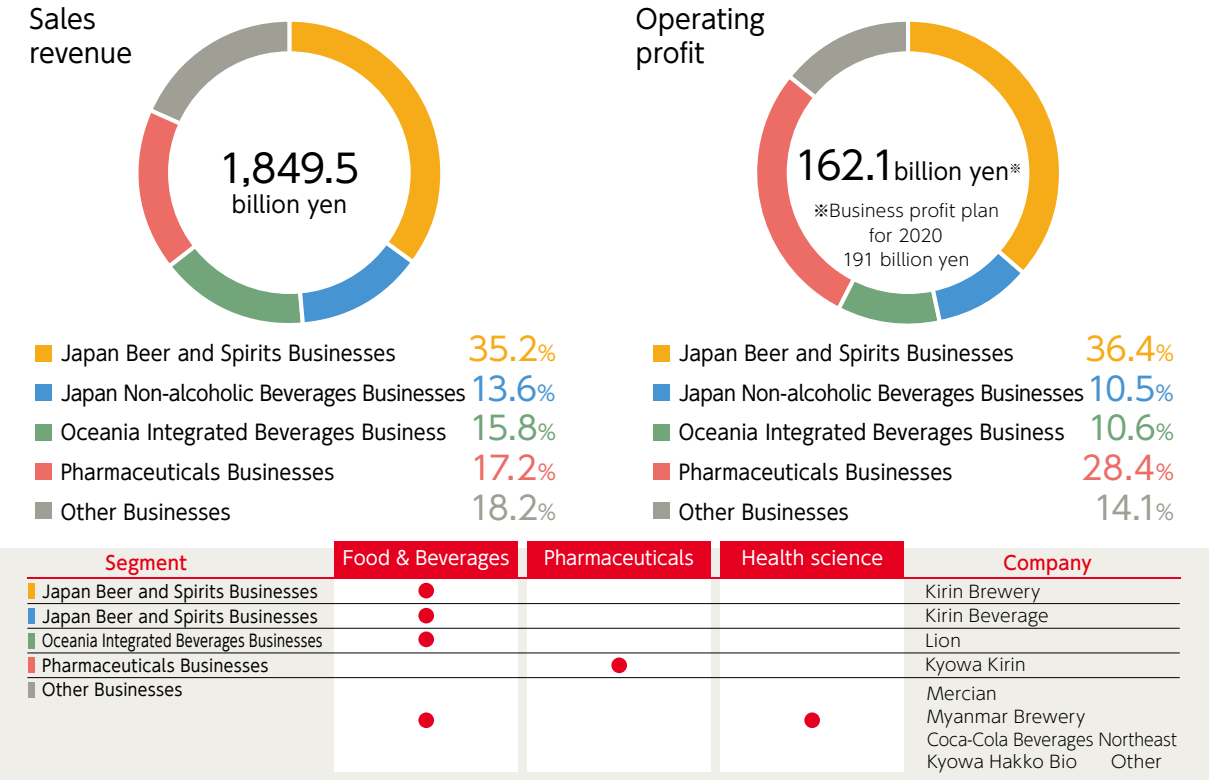
Our determination to continuously provide our customers and society with new value propositions based on innovative ideas, and our enthusiasm to meet goals with pride in the companies we work for and the brands we offer.

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

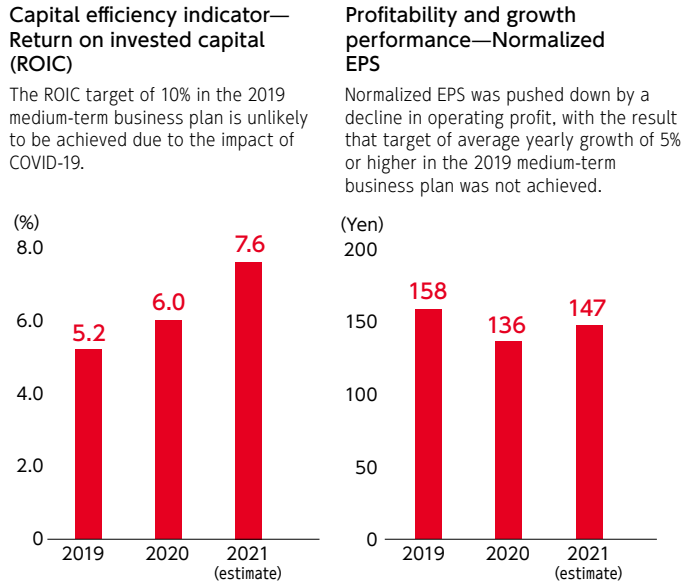
Our respect for different perspectives and values that enable constructive discussions, and our belief that the “differences” have the power to change the world and create better solutions.



Company overview

Trade Name	Kirin Holdings Company, Limited
Date of Incorporation	February 23, 1907 <small>*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.</small>
Head Office	NAKANO CENTRAL PARK SOUTH 10-2, Nakano 4-chome, Nakano-ku, Tokyo 164-0001, Japan
Paid-in Capital	102,045,793,357 yen
Number of Employees	31,151employees on a consolidated basis (as of December 31, 2020)

Financial Key Performance Indicators



Our R&D and engineering capabilities create a positive impact.

The Kirin Group has been continuously developing TCFD scenario analysis since 2017. We revised our long-term environmental vision last year based on our assessment of the business impact of climate change obtained through scenario analysis. Mitigation measures, such as upgrading to a Science Based Target (SBT) of 1.5°C and participating in RE100, as well as adaptation measures, such as expanding support for acquiring Rainforest Alliance certification to coffee farms in Vietnam, all represent a concrete manifestation of the insights gained from scenario analysis. The Kirin Group is conducting a unique environmental strategy based on its strengths in R&D and engineering.

At Kirin's Packaging Innovation Laboratory, one of the world's largest containers and packaging development bodies created by a food company, we have achieved significant CSV results in terms of reducing the amount of materials used, cutting GHG emissions, and reducing costs, by decreasing the weight of containers and packaging. We are currently working with Mitsubishi Chemical Corporation to develop practical applications for chemical recycling, as part of efforts to achieve a circular economy for PET bottles.

In joint research with Bridgestone Corporation aimed at producing plants that are potential natural rubber substitutes, "bag-type culture vessel system technology," Kirin's proprietary technology that is expected to contribute to the production of large quantities of seeds of superior varieties, is applied. The practical application of Kirin Central Research Institute's mass plant propagation technology is expected to contribute to the development of various plant strains adapted to future global warming and the expansion of crop acreage in a short period of time.

We believe that contributing via the Health Science business to solutions for social issues such as the risk of infectious diseases associated with global warming offers business opportunities. The LC Plasma that we registered with the CAA as the first FFC

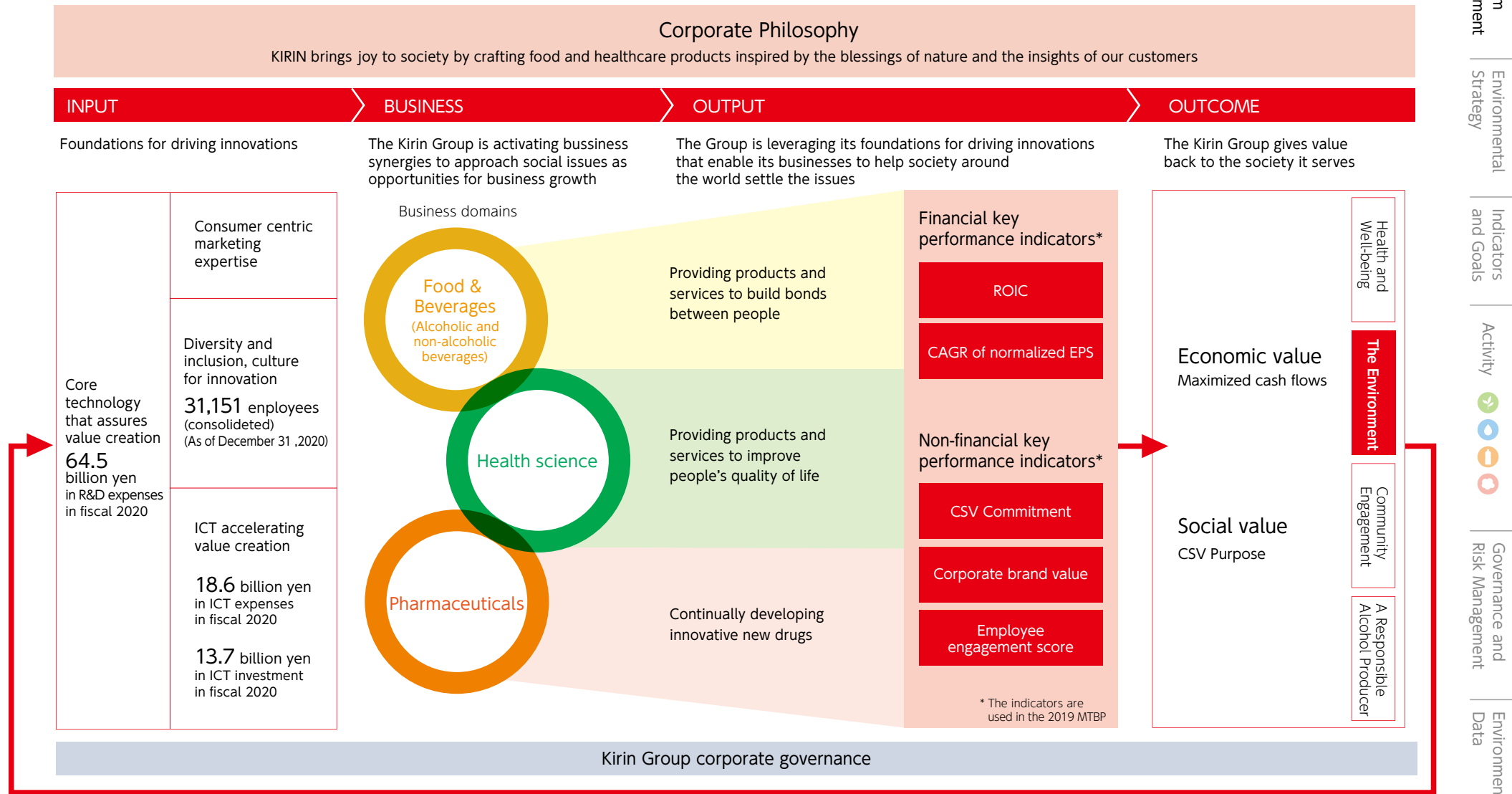
in the area of immune systems in Japan in 2020 was also the result of our efforts at the Kirin Central Research Institute. The reduction of environmental impact and the introduction of new environmental technologies at plants requires engineering with full knowledge of the manufacturing process and production technology. In addition to the engineering divisions in each company, the Kirin Group includes an integrated engineering company, Kirin Engineering Company, Limited. By leveraging its nimbleness and facility technology capabilities through coordination between these divisions and Kirin Engineering, the Kirin Group supports the swift deployment of environmental measures. Kirin's beer business, which is the origin of the Kirin Group, has a brewing philosophy of "Reverence for Life." The idea is that not only agricultural products, which are the raw materials, but also fermentation, which is the production process, are supported by the bounty of living things. Kirin's strengths in technology are rooted in humble learning from agricultural products and yeast, and our organizational culture, which places the preservation of the environment as one of our purposes, have been nurtured to ensure that we pass on nature, the foundation of production, to the next generation.

Even when our business portfolio changes in future, Kirin will keep on utilizing fermentation and biotechnology to engage in business activities that benefit from nature. As we look to achieve the Kirin Group's Environmental Vision 2050, we will continue to take on the challenge of creating positive impacts on people, society, and the natural environment by leveraging our R&D capabilities, engineering capabilities, and networking capabilities with NGOs and local communities.

Senior Executive Officer, Kirin Holdings Company, Limited
(Officer in Charge of CSV Strategy, Group Environmental Manager)
Ryosuke Mizouchi



Value Creation Model



Details can be found in the KIRIN CSV REPORT 2021 P.20 <https://www.kirinholdings.com/en/investors/files/pdf/kirinreport2021.pdf>

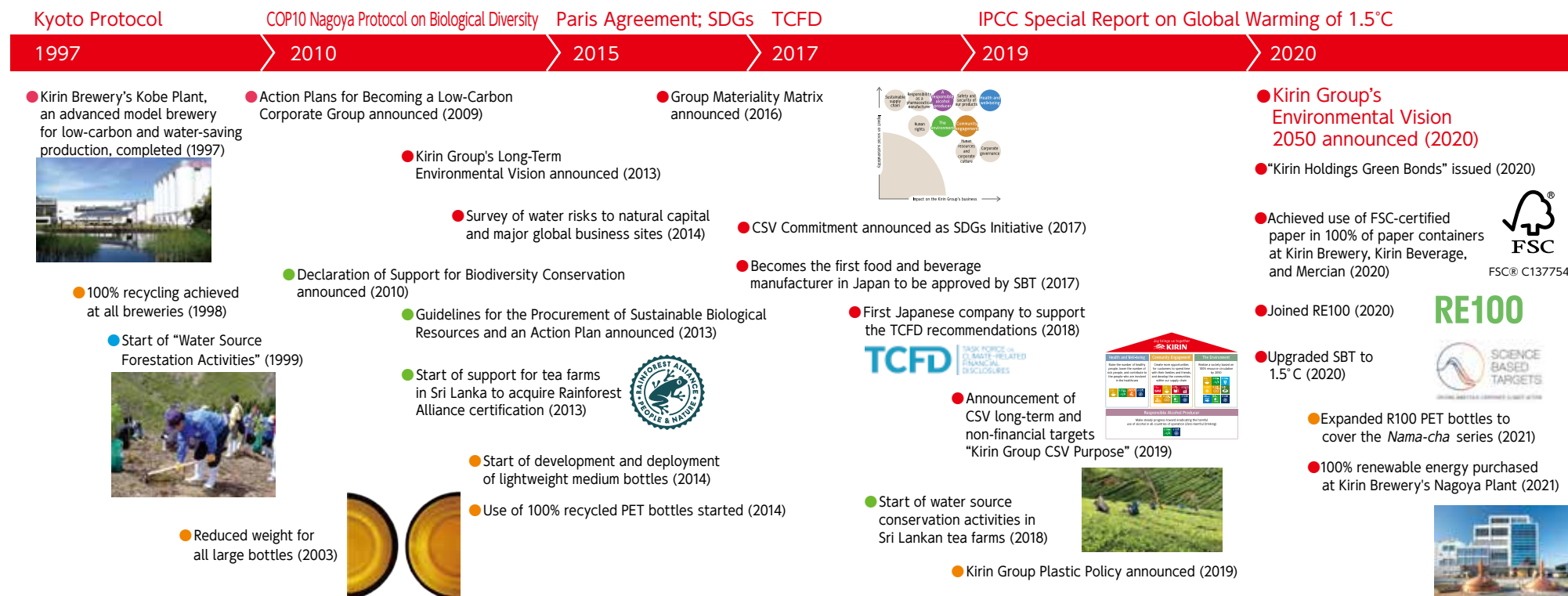
Global Trends and Kirin's Actions

All of the Kirin Group's businesses are directly formed from the benefits of natural capital. For example, we use agricultural products and water to make beverages, and then package them and deliver them to customers. The greenhouse gases (GHGs) generated during these processes lead to climate change and have a major impact on agricultural products and water, our raw materials. Environmental initiatives are essential to the business continuity of the Kirin Group.

Based on this understanding, the Kirin Group has always been a pioneer in its promotion of environmental measures. The Kirin Group Long-Term Environmental Vision that we announced in 2013 was a long-term strategy targeting the year 2050, which was not common at the time. We were the first Japanese food company to implement a number of initiatives, including our support for tea farms to acquire the certification for sustainable agriculture, the approval of our 2°C reduction target by the SBT Initiative, and our expression

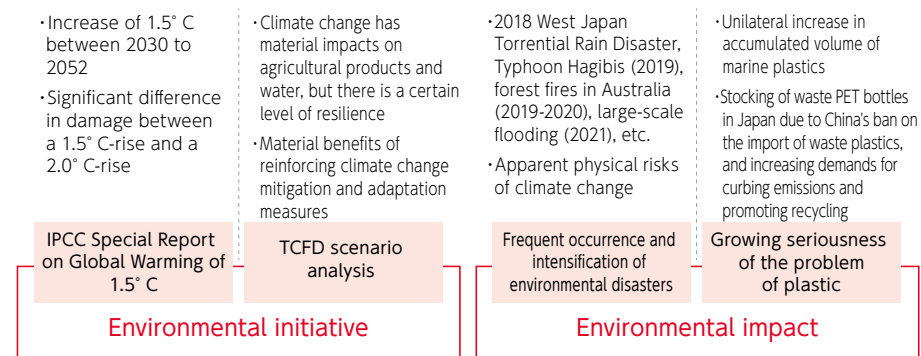
of support for the TCFD recommendations.

Following the announcement of our new long-term strategy, the Kirin Group's Environmental Vision 2050, in February 2020, we will continue to be an industry pioneer, including using FSC®-certified paper for all paper containers of alcohol and non-alcohol beverages in Japan, upgrading our Science Based Target for reducing emissions to a 1.5°C pathway, and switching to renewable energy for all electric power used at Kirin Brewery's Nagoya Plant.



Determination of Materiality

Environmental problems may pose a major business risk in the Kirin Group's businesses, but solving them can also lead to the creation of value for society and our businesses. From this perspective, when determining the materiality of environmental issues, we make sure to fully understand various social issues and impacts, such as trends in international standards, policies, and initiatives, the results of scenario analysis, and the circumstances surrounding natural disasters, and we not only consider the impact on the Kirin Group's businesses, but also fully consider the impact on the value chain of our businesses and the communities and societies in which we operate. We determine materiality by engaging in dialogue with a variety of stakeholders, including those interested in our company's finances, as well as those affected by our business activities in social and environmental terms, both currently and in the future. Based on environmental materiality analysis, we have determined that "biological resources," "water resources," "containers and packaging," and "climate change" are significant environmental issues for the Kirin Group. Targets and specific initiatives also reflect our environmental vision, which forms a long-term strategy.



CSV Purpose



Identification of relevant issues

We examine the circumstances surrounding the Kirin Group to identify relevant issues. When developing the Environmental Vision 2050, we identified issues by referring to factors such as international standards and policies, domestic and international discussions, trends in international initiatives, the results of scenario analysis based on the TCFD, the seriousness of natural disasters and other environmental impacts that are actually occurring, and opinions obtained in workshops with investors and young people. Going forward, we will continue to engage in dialogue with various stakeholders, including local communities in areas where we source our agricultural raw materials and where business sites are located, as well as customers, to identify relevant issues.

Confirmation of appropriateness

We reflect diverse dialogue with various stakeholders, including external experts and NGOs, in our internal discussions. In formulating our Environmental Vision 2050, we confirmed the appropriateness of the vision through consultation with experts and stakeholders and holding dialogue with the Group's operating companies and management teams.

Determination of materiality

By holding discussions at the executive management level, we identify risks to and opportunities for businesses and society, assess their materiality and develop action plans that include metrics. In formulating the Environmental Vision 2050, based on the issues identified and information gathered in STEPS 1 and 2, we determined the four most material environmental issues as "biological resources", "water resources", "containers and packaging" and "climate change", and identified relevant risks and opportunities.

Continual review

We continue to consider the need to review material issues, reflecting the constantly changing state of social and environmental issues and the Kirin Group's circumstances. The Environmental Vision 2050 was formulated and resolved by the Board of Directors following an exchange of opinions by the Executive Committee. Going forward, we will integrate our environmental vision with our business strategies and management plans by revising or newly setting the CSV Commitment, our medium-to-long-term action plan. We will perform periodic reviews to update issues and KPIs that need to be addressed on an ongoing basis.

STEP1

STEP2

STEP3

STEP4

Kirin Group's Environmental Vision 2050

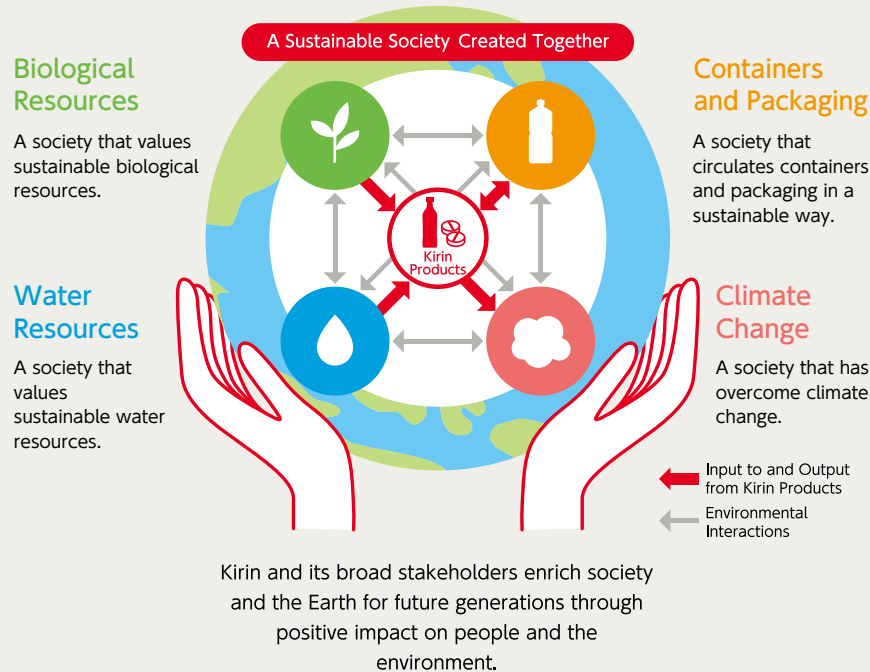
The Kirin Group reviewed its previous environmental vision and developed the Kirin Group's Environmental Vision 2050 as a new long-term strategy to strengthen the resilience of society and the Kirin Group. We announced the vision in February 2020, and are promoting efforts to achieve it. Since 2013, the Kirin Group has placed the concept of "CSV," in which we address social issues through our core businesses by making social and corporate value compatible, at the center of our management strategy. At the same time, in order to take the initiative in addressing global environmental issues, we developed

the Kirin Group Long-Term Environmental Vision, a long-term strategy for 2050, and have been developing our businesses with the aim of achieving this vision. Starting with the adoption of the Paris Agreement, there have been significant changes, however, in global developments surrounding the environment, including a number of international initiatives such as SBTi and the TCFD being launched, and the discussion of marine pollution caused by plastics as a global issue. Furthermore, it is expected that corporate environmental initiatives will also shift from being self-contained to having a positive impact on society as a whole.

The Kirin Group has concluded that we must establish a new environmental vision to meet such social demands. Kirin aims not only to minimize negative impact and attain environmental neutrality, but also to have a positive impact on society beyond the boundary of our own company. Based on this new vision, we will broaden our horizons and expand the scope of our activities from our value chain to cover society as a whole. Together with society, including the young people who will lead the future, we will create a prosperous world for the next generations.

Kirin Group's Environmental Vision 2050

Enrich the Earth with Positive Impact



Efforts for Realization

Biological Resources A society that values sustainable biological resources.	Cultivate, expand and procure sustainable agricultural raw materials <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Achieve RE100 at an early stage and source the company's energy from 100% renewable energy. Realize Net-Zero GHG emissions from in the entire value chain. Lead to build a decarbonized society <ul style="list-style-type: none"> 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.

Aiming for a positive impact from the start

The Kirin Group will not describe the Environmental Vision 2050 as something occurring in the distant future, but will instead start at a rapid pace with products that embody our vision, thus creating outcomes that have a positive impact.

Kirin Group's Environmental Vision 2050

Enrich the Earth
with Positive Impact

A Sustainable Society Created Together



Message from
Top Management

Environmental
Strategy

Indicators
and Goals

Activity

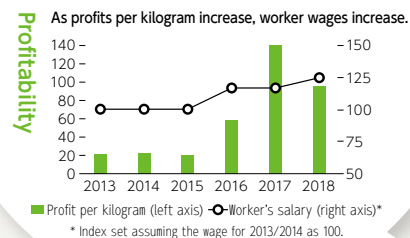
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Governance and
Risk Management

Environmental
Data

Increasing profits at Sri Lankan tea farms, leading to higher salaries for workers

Social impact of supporting for Sri Lankan
tea farms to get Rainforest Alliance Certified



Realization of a society where plastics are recycled and forest conservation

Expanded the use of "R100 bottles"
and no label products
Reduced resin usage by approximately
1,400 tons per year
Reduced CO₂ emissions by approximately
1,300 tons per year
100% use of FSC-certified paper



Biological resources

- Started supporting for small coffee farms in Vietnam to get Rainforest Alliance Certified (March 2020)
- 93 large tea farms in Sri Lanka obtained certification. (December 2020)
- Released of products for year-round sales using certified tea leaves. (July 2021)

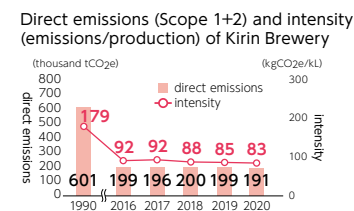


Research and development

Through joint research with Bridgestone, Kirin succeeded in developing a method that utilizes "bag-type culture production technology," one of Kirin's proprietary "mass plant propagation systems," to improve the productivity of natural rubber derived from the "guayule," which can be grown in arid regions. (January 2021)

Mitigation of climate change

As a result of introducing renewable energy:
Kirin Brewery Nagoya Plant
Reduced GHG emissions by 7,400 tons per year
Kirin Brewery's Nagoya, Sendai, Kobe, and Shiga plants
Reduced GHG emissions by 4,500 tons per year



Container and packaging

- Expanded "R100 PET bottles" made from 100% recycled PET resin to cover Kirin Nama-cha (600ml) and Kirin Nama-cha Hoji Sencha (600ml). (March 2020)
- Released Kirin Nama-cha No Label and Kirin Nama-cha Hoji Sencha No Label as exclusive e-commerce products. (March 2020)
- Start collection of used PET bottles at convenience stores. (July 2021)
- Kirin Brewery, Kirin Beverage, and Mercian, became Japan's first companies to use 100% FSC-certified paper for all paper containers. (November 2020)



Climate change

- Kirin Brewery's Nagoya Plant began using 100% renewable energy for all purchased electricity. (August 2021)
- Kirin Brewery's Nagoya, Sendai, Kobe, and Shiga plants introduced solar power generation using a PPA model. (2021)



Declaration and participation for green recovery

- Signed joint statements "Business Ambition for 1.5°C" and "Uniting Business and Governments to Recover Better." (June 2020)
- Joined RE100. Declared our aim of using renewable energy for 100% of electric power used by 2040. (November 2020)
- Upgraded SBT "2°C target" to "1.5°C target" certification. (December 2020)

Disclosure based on TCFD recommendations

The Kirin Group has been building the capacity to disclose information that complies with the recommendations released in 2017 by the Task Force on Climate-related Financial Disclosures (TCFD) of the Financial Stability Board (FSB). We aim to achieve

this within about five years. Our disclosures include assessments of social and business risks and opportunities relating to climate change, and of the resilience of our strategies. We began to conduct and disclose scenario analysis in 2018 and also became

the first Japanese food company to declare our support for the TCFD recommendations in December 2018. Since 2020, we have analyzed and disclosed opportunities for business growth brought about by climate change.

Item	Description
Governance	<p>At the Kirin Group, the Board of Directors deliberates and makes resolutions on significant matters, such as basic policies related to the environment as a whole, including climate change issues, while the Group Executive Committee deliberates and makes decisions concerning the setting of targets, such as upgrading to SBT1.5 and joining RE100. The Kirin Group sets environmental targets as part of its CSV Commitment, a non-financial key performance indicator. We incorporate these targets into the management plans of each operating company, and reflect progress in achieving them in the performance evaluations of Kirin Holdings Executive Officers. The Group CSV Committee, which is chaired by the CEO of Kirin Holdings and whose members consist of the CEOs of key operating companies, discusses responses to environmental issues across the Kirin Group and submits any decisions it makes to the Board of Directors. Every year, the Board of Directors receives reports on and reviews progress in environmental management and risks and growth opportunities related to environmental issues.</p> <p>More information on corporate governance→P75</p>
Strategy	<p>Following the adoption of the Paris Agreement in 2015, the IPCC special report on the impacts of global warming of 1.5° C in 2018, and the results of scenario analysis, the Kirin Group revised its environmental vision, which forms a long-term strategy, enhanced its targets, and incorporated them into its management strategy.</p> <p>As mitigation measures, in order to achieve net zero GHG emissions across the entire value chain by 2050, we have upgraded our SBT to a 1.5° C target, and we will address transitional risks by expanding the use of renewable energy and making efforts to save energy. As adaptation measures, we will respond to physical risks with technologies for utilizing alternative sugars that do not depend on barley, mass plant propagation technologies, technologies that reduce water usage, our support for the acquisition of sustainable farming certification, etc. We will also contribute to solving social issues caused by climate change, such as the spread of heatstroke and infectious diseases, by providing products that offer solutions.</p> <p>More information on our environmental vision→P10</p> <p>More information on scenario analysis→P14~18</p> <div> <div> <p>Main potential impacts</p> <ul style="list-style-type: none"> • Increase in procurement costs due to decline in yields of agricultural products • Increase in energy costs due to carbon pricing • Disruptions to operations due to droughts </div> <div> <ul style="list-style-type: none"> • Disruptions to operations due to floods • Decline in yields of agricultural raw materials due to droughts and floods • Social issues caused by climate change (infectious diseases and heatstroke) </div> </div> <div> <div> <p>Measures to respond and adapt to physical risks</p> <ul style="list-style-type: none"> • Brewing technology that does not rely on barley • Mass plant propagation technologies • Development of advanced water usage reduction technologies and flood response manuals • Support for farms to acquire the certification for sustainable agriculture and conservation of water sources in growing areas • Products addressing social issues associated with climate change, etc. </div> <div> <p>Measures to respond to and mitigate transitional risks</p> <ul style="list-style-type: none"> • Net zero GHG emissions across the value chain (2050) • Enhanced medium-term emission reduction target (obtained approval for the "SBT1.5") • Increase use of renewable energy (joined RE100) • Reduce GHG emissions on a medium- to long-term profit and loss neutral basis </div> </div>
Risk management	<p>The Kirin Group has established the Group Risk and Compliance Committee within Kirin Holdings to oversee risk management through activities such as quarterly monitoring of risk factors, including climate change-related risks. However, we have concluded that climate change-related risks cannot be sufficiently identified solely through the conventional approach of judging the materiality of risks based on the degree of impact and the likelihood of occurrence. For that reason, we have adopted a new approach to identify and examine significant risks based on the development, analysis, and assessment of scenarios for risk for which the probability of occurrence is unknown, but where the consequences of occurrence on our businesses would be extremely serious.</p> <p>More information on risk management→P76</p>
Metrics and targets	<p>The Kirin Group has set a target of net zero GHG emissions across the entire value chain by 2050. As medium-term targets, we have revised our GHG reduction targets upward to a 50% reduction under Scope 1 + 2 and a 30% reduction under Scope 3 from the 2019 level by 2030 (obtained approval for the "SBT for 1.5° C" standard), and have set a target for renewable energy use of 100% (joined RE100) by 2040 (both targets were set in 2020).</p> <p>For adaptation measures, e.g. support for obtaining sustainable farming certification and the supply of products that combat heatstroke and infectious diseases, each operating company breaks down the Group targets, sets its own targets as CSV commitments, and works on them by establishing a road map.</p> <div> <div> <p>Target</p> <p>Target for total Scope 1 and Scope 2 emissions*</p> <p>Target -50%</p> <p>Target Net zero</p> </div> <div> <p>Target for total Scope 3 emissions*</p> <p>Target -30%</p> <p>Target Net zero</p> </div> </div> <p>*In December 2020, we moved from the old 2° C target to a 1.5° C target, which has been approved under the Science Based Target initiative (SBTi).</p> <div> <div> <p>Progress</p> <p>Trends of GHG emissions against medium-term targets</p> <p>Scope1+2*</p> <p>(thousand tCO2e)</p> <p>2016 1,012 2017 996 2018 986 2019 949 2020 875 2030 474</p> <p>Target -50%</p> </div> <div> <p>Scope3*</p> <p>(thousand tCO2)</p> <p>2016 4,200 2017 4,364 2018 4,163 2019 4,107 2020 3,989 2030 2,875</p> <p>Target -30%</p> </div> </div> <p>*The above graph shows progress made toward the "SBT 1.5° C" target of a 50% reduction in Scope 1 + Scope 2 and a 30% reduction in Scope 3 GHG emissions from the 2019 level by 2030.</p> <div> <p>Progress toward the target for increased use of renewable energy</p> <p>Ratio of renewable energy to electricity used (%)</p> <p>2016 2 2017 4 2018 5 2019 5 2020 10 2040 100</p> <p>Target 100</p> </div> <p>Key metrics and targets→P21</p> <p>Results→P22</p> <p>More detailed data→P99~103</p>

Results of scenario analysis and reflection in strategy prior to 2020

Prior to the publication of the TCFD final recommendations at the end of June 2017, the Kirin Group, as a company formed from natural capital, had been aware of issues related to biological resources and water resources, and had conducted various risk surveys. This accumulation of many years' knowledge about risk assessment in the value chain enabled us to begin scenario analysis soon after the TCFD final recommendations were published in 2017, and to disclose information in line with the TCFD recommendations in the Kirin Group Environmental Report 2018 as early as the end of June 2018.

In 2018, we investigated and evaluated the impact on agricultural yields in three scenarios combining temperature and socioeconomic scenarios, using the IPCC's Representative Concentration Pathways (RCPs) as the main pathways and the Shared Socioeconomic Pathways (SSPs) as supplementary pathways.

In 2019, under the 2°C and 4°C scenarios set in-house, we analyzed the impacts of climate change on agricultural raw materials per major supplier country in 2050 and 2100. We also conducted water stress and water risk surveys at agricultural production sites, water risk surveys at production and distribution facilities, and carbon pricing impact assessments.

In 2020, we calculated the financial impact of declines in agricultural yields on procurement costs and the financial impact of water risk/stress on production facilities. We also estimate and disclose information pertaining to business opportunities related to heatstroke and infectious diseases caused by climate change.

Effectiveness of scenario analysis

We believe that scenario analysis is a very effective management tool for identifying and mitigating risks that would have extremely serious consequences for our businesses if they occur, regardless of the likelihood of occurrence.

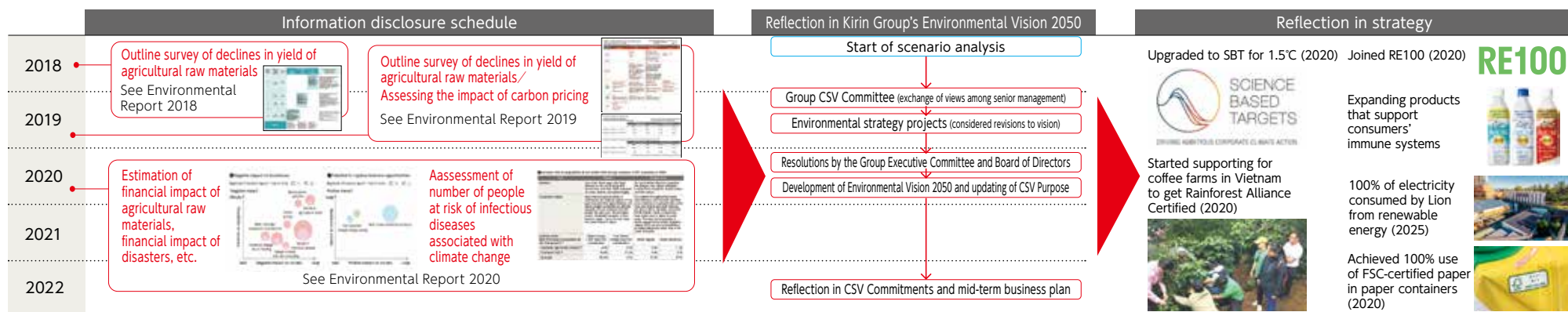
In July 2018, when we disclosed the results of scenario analysis for the first time in our 2018 Environmental Report, the 2018 West Japan Torrential Rain Disaster (the Heavy Rain Event of July 2018) occurred, causing extensive damage to a large area of western Japan and disrupting roads and railway networks.

Kirin Beverage has actively promoted a modal shift, partly also to cope with the shortage of truck drivers, and has achieved a significant reduction in GHG emissions. This shift to railway transportation, however, happened to disrupt deliveries during peak sales periods due to the disaster, which caused a major impact. We had listed the impact of natural disasters on transportation as a major risk in conventional risk management, and we had made some efforts to mitigate this risk. However, since we regarded the probability of occurrence as low, we did not consider detailed countermeasures. Learning from this experience, in the fall of 2018, we prepared and began implementing a manual for what to do in the event of similar disasters. Through this measure, we successfully avoided any major impacts from Typhoon Faxai (2019 Boso Peninsula Typhoon) and Typhoon Hagibis (2019 East Japan Typhoon) in October 2019. Currently, we apply scenario analysis methods to risk management other than climate change as well.

Reflection in strategy

At a meeting in June 2019, the Group CSV Committee reported and discussed the situation surrounding the rapidly changing environment following the adoption of the Paris Agreement, and senior management provided directions for the launch of the project in order to develop measures to take. Consequently, the Board of Directors adopted and revised the "environmental vision" and "GHG emissions reduction targets," which now reflect the results of scenario analysis as significant input information.

We have also reflected the results of scenario analysis in mitigation measures such as our joining of the RE100, our revisions of specific targets such as upgrading our SBT to 1.5°C, our use of renewable energy for 100% of electricity used at the Kirin Brewery Nagoya Plant, the introduction of large-scale solar power generation based on a PPA model at four breweries, and our use of renewable energy for 100% of electricity used in our Australian business by 2025, as well as in adaptation measures such as our rollout of support for coffee farms in Vietnam to acquire the certification for sustainable agriculture as we provide such support at tea farms in Sri Lanka, and the achievement of the use of FSC-certified paper for 100% of paper containers in the Japanese beverages businesses as a means of forest conservation. Going forward, we plan to revise our CSV Commitments to incorporate climate change and a variety of other environmental issues into the management strategies of each of our operating companies, and to incorporate them into our next mid-term business plan starting in fiscal 2022.



Scenario analysis

	Hypothetical scenario	Scenario analysis results	Scenario driver	Types of risks and business opportunities	Time frames	Financial impact		Strategies	Related pages
Kirin Group Scenario 3 4°C scenario; SSP3, RCP8.5	Laws and regulations on climate change will become more stringent in developed countries, but less so in developing countries, resulting in insufficient reductions to GHG emissions. As a result, global temperatures continue to rise and torrential rains and other natural disasters caused by climate change occur more frequently than at present. The impact of a carbon tax on energy costs will not have a significant impact on business. An increasing number of people face concerns about health impacts as global warming leads to an increase in the number of people at risk for infectious diseases, infections spread even to areas that have not previously been affected by these diseases, and the number of people requiring emergency services for heatstroke rises significantly.	Business risks: ●As a result of global warming, yields of major agricultural raw materials (barley, hops, and coffee beans) decrease significantly, affecting procurement costs. Quality degradation is also expected. ●There may also be an impact on alternative sugars and agricultural products that are sources of protein, which are required for low-malt and no-malt beer product. ●Carbon taxes are introduced in major countries where the Kirin Group operates its businesses, but they are low so the impact is negligible. ●Floods due to extreme rainfall and droughts accompanying climate change cause some business sites to suspend production.	Increase in procurement costs due to decline in yields of agricultural products	Physical risk (chronic) / transitional risk (market and reputation)	Medium-to long term	Approx. 3.0 to 12.0 billion yen		●Brewing technology that does not rely on barley ●Mass plant propagation technologies ●Support for farms to acquire the certification for sustainable agriculture	P15 P34 P29, P30, P33
			Increase in energy costs due to carbon pricing	Transitional risk (policy and law, technologies, and markets)	Medium-to long term	Tax burden if GHGs are not reduced Approx. 1.3 billion yen (2030) Approx. 1.7 billion yen (2050)	Tax burden if GHGs are reduced Approx. 0.6 billion yen (2030) 0 yen (2050)	●Reduce GHG emissions on a medium- to long-term profit and loss neutral basis	P17~P18 P59~P69
			Disruptions to operations due to droughts	Physical risk (chronic) / transitional risk (reputation)	Short- and long-term	Approx. 0.6 billion yen (Lion Castlemaine Perkins Brewery) Approx. 30 million yen (Thai Kyowa Biotechnologies)		●Advanced water usage reduction technologies	P16~P17 P37~P44
			Disruptions to operations due to floods	Physical risk (chronic)	Short- and long-term	Approx. 1.0 billion yen (Lion Castlemaine Perkins Brewery) Approx. 5.0 billion yen (Sendai Brewery)		●Development of flood response manuals	P16~P17 P37~P44
			Decline in yields of agricultural raw materials due to droughts and floods	Physical risk (chronic)	Medium-to long term	Included in procurement costs due to decline in yields of agricultural products (See above)		●Measures to address extreme rainfall and conserve water sources in areas where agricultural raw materials are produced	P16~P17, P40
		Social impact: ●The number of persons requiring emergency services because of heatstroke doubles owing to rising global temperatures. ●The population exposed to the risk of infectious diseases increases as a result of higher temperatures, and a market for immunity-related products expands and establishes itself.	Population requiring emergency services for heatstroke	Physical risk (chronic)/ transitional risk (market)/ products and services/ markets	Short- and long-term	In 2050, the size of the Japanese market is expected to increase by a factor of 2-4x compared with the years 1981 to 2000, growing to between 90 billion yen and 190 billion yen		●Contribute to products to counter heatstroke	P17~P18
			Population exposed to infectious diseases	Physical risk (chronic)/ transitional risk (market)/ products and services/ markets	Short- and long-term	The market for immune-related products in Asia as whole is expected to increase by a factor of 1.8x compared with 2020, to around 750 billion yen by 2030		●Contribute to products that support consumers' immune systems	P17~P18
Kirin Group Scenario 1 2°C or 1.5°C scenario; SSP1, RCP2.6	In addition to a carbon tax, carbon border adjustment mechanism are introduced, and stringent climate change laws and regulations are in place around the world. As a result, the increase in global temperature is suppressed, climate disasters do not increase much more than the current level, and the impact on agricultural yields is limited. On the other hand, carbon taxes and other regulations lead to increases in energy costs and affect other procurement items. Although global warming does not have a significant impact on human health, the impact of climate change becomes increasingly noticeable on a daily basis, including hot summer days and typhoon damage.	Business risks: ●Although yields of major agricultural raw materials decline owing to global warming, the impact on procurement costs is negligible. ●The impact is negligible on alternative sugars and agricultural products that are sources of protein, which are required for low-malt and no-malt beer product. ●Energy costs are significantly higher because of carbon taxes introduced in the major countries in which the Kirin Group operates its businesses. ●Some business sites are affected by floods caused by extreme rainfall and droughts associated with climate change, but it is within the scope of our ability to respond.	Increase in procurement costs due to decline in yields of agricultural products	Physical risk (acute)	Medium-to long term	Approx. 1.0 to 2.5 billion yen		●Brewing technology that does not rely on barley ●Mass plant propagation technologies ●Support for farms to acquire the certification for sustainable agriculture	P15 P34 P29, P30, P33
			Increase in energy costs due to carbon pricing	Transitional risk (policy and law, technologies, and markets)	Medium-to long term	Tax burden if GHGs are not reduced Approx. 7.7 billion yen (2030) Approx. 9.9 billion yen (2050)	Tax burden if GHGs are reduced Approx. 3.9 billion yen (2030) 0 yen (2050)	●Reduce GHG emissions on a medium- to long-term profit and loss neutral basis	P17~P18 P59~P69
			Disruptions to operations due to droughts	Physical risk (acute)	Short- and long-term	Same as 4°C scenario, but probability of occurrence is expected to be low		●Advanced water usage reduction technologies	P16~P17 P37~P44
			Disruptions to operations due to floods	Physical risk (acute)	Short- and long-term	Same as 4°C scenario, but probability of occurrence is expected to be low		●Development of flood response manuals	P16~P17 P37~P44
			Decline in yields of agricultural raw materials due to droughts and floods	Physical risk (acute)	Medium- to long term	Same as 4°C scenario but not significant		●Measures to address extreme rainfall and conserve water sources in areas where agricultural raw materials are produced	P16~P17, P40
		Social impact: ●Although the number of persons requiring emergency services for heatstroke increases owing to rising global temperatures, it is not at a level that causes significant concern. ●The population exposed to the risk of infectious diseases increases as a result of higher temperatures, leading to increased interest in enhancing immunity.	Population requiring emergency services for heatstroke	Physical risk (acute)/ transitional risk (market)/ products and services/ markets	Short- and long-term	Same as 4°C scenario but not significant		●Contribute to products to counter heatstroke	P17~P18
			Population exposed to infectious diseases	Physical risk (acute)/ transitional risk (market)/ products and services/ markets	Short- and long-term	Same as 4°C scenario but not significant		●Contribute to products that support consumers' immune systems	P17~P18

* Types of risks and business opportunities: Determined according to the TCFD risk and opportunity types and categories

Time frames: Determined as follows: Short-term: 2021 to 2024 (from present to period of next mid-term business plan); medium-term: 2025 to 2030 (period covered by KV2027 and the SDGs); and long-term: 2031 to 2050 (target year for the Kirin Group's Environmental Vision 2050)

■ Biological resources

Assessment of impact on major agricultural raw materials

In 2021, we calculated the financial impact of a decline in the yields of agricultural raw materials on our Japan alcohol and non-alcoholic beverages businesses, as well as our beer businesses in Australia, New Zealand, and Myanmar. We found that under the 2°C scenario, it may be possible (75th percentile) to reduce the financial impact by approximately 9.0 billion yen compared with the 4°C scenario. In 2020, we estimated and disclosed the financial impact of a decline in the yields of agricultural raw materials for the Japan alcohol and non-alcoholic beverages businesses. In order to expand the scope to global markets and identify the scale of the risk in the event that such a decline in yields occurs, we assessed the impact based on a range that included the middle 50% of forecast data for price volatility. (Graph 2).

We conducted studies and analyses of the impacts of climate change on agricultural raw materials twice, in 2018 and 2019, and found that yields of most agricultural products would decrease significantly (Table 1). In addition, we have also identified serious drought and flood risks in surveys on water risk and stress in areas where agricultural raw materials are produced (Table 5).

Strategy

• Brewing technology that does not rely on barley

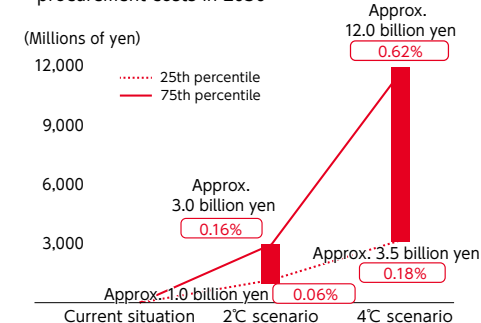
Over the past 10 years, Kirin Brewery has been a market leader in low-malt and no-malt beer, which together account for more than 40% of the Japanese market, with shares of 70% and 90% of these segments respectively (Graph 3). This accumulation of knowledge forms an advantage that will enable us to continue to win customer support and maintain profits with products that do not use barley or use it in limited quantities, even in the event that barley procurement costs increase owing to climate change.

We are also conducting a new study on the effects of climate change on yields of high-fructose corn syrup (corn) and protein sources (soybeans), which are necessary for the production of low-malt and no-malt beer products (Table 1). We learned that corn yields are unlikely to decline simultaneously in the four largest exporters at current temperatures, but are very likely to decline simultaneously across these exporters in the 2°C and 4°C scenarios (Table 4*). It is reported that research on corn lags behind other grains in relation to the cultivation of varieties that are tolerant to heat, but in the United States, a sustainable agriculture platform has started providing support to farmers, so we will keep a close eye on these developments. The impacts of climate change on soybeans are shown in Table 1, and we do not expect any significant decline in yields at present. The results of a survey of soybeans per country disclosed by an NPO also indicated that we are procuring soybeans from countries with low risk. Since there are significant environmental concerns related to the production of soybeans in some countries where they are produced, this year we will incorporate them into our Action Plan for the Sustainable Use of Biological Resources, as part of efforts to maintain highly sustainable procurement.

1 Impact of climate change on yields of key agricultural products (forecast for 2050 unless otherwise specified)

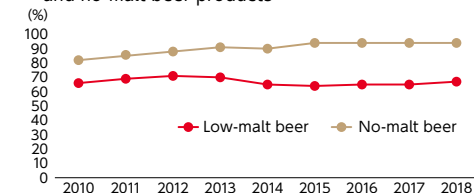
Agricultural products	Kirin Group Scenario3: 4°C, unwanted world, 2050			
	America (North and South)	Asia	Europe and Africa	Oceania
Barley	Canada -12% (2100) U.S. +9% (2100)	West Asia -5% to +10% Korea +0.5%	Finland -5.9% (spring barley) Mediterranean coast (West) -0.3% (Portugal, Spain, France, Italy) (East) +4.4% France -10% or more (Winter barley) -20% or more (Spring barley)	Western Australia -10 to -30%
Hops	U.S. (Washington) -16% (2100)		Czech Republic -8.5%	
Tea leaves		Sri Lanka Decline in yields in lowlands, low impact in highlands India (Assam region) 3.8% decline in yields per 1° C increase above average temperature of 28° C India (Darjeeling region) -40% to -80%	Kenya Change in suitable land from 1500 to 2100 meters above sea level to 2000 to 2300 meters above sea level. Drastic reduction in suitable land in the western part of Kenya, with land remaining suitable in the mountainous area of Kenya Malawi Chitipa 80% reduction in suitable land Nkhata Bay 60% reduction in suitable land Mulanje 70% increase in suitable land Thyolo 20% increase in suitable land	
Wine grapes	U.S. (California) 60% reduction in suitable land U.S. (Northwest) 231% increase in suitable land Chile 25% reduction in suitable land	Japan (Hokkaido) Increase in suitable land, Pinot Noir cultivation possible Japan (Central) Increase in suitable land while also anticipating obstacles from high temperatures	Northern Europe 99% increase in suitable land Mediterranean 68% reduction in suitable land Spain Change in overall wine production for each 1° C rise -2.1% (Spain as a whole) -4.6% (Andalusia) -4.8% (Duero River Valley) -34.6% (northern Mediterranean)	New Zealand 168% increase in suitable land Australia (southern coast) 73% reduction in suitable land Australia (ex. southern coast) 22% reduction in suitable land
Coffee beans	Brazil 55% reduction in land suitable for arabica 60% reduction in land suitable for robusta	Southeast Asia 60% reduction in land suitable for arabica 52% reduction in land suitable for robusta	East Africa 13% reduction in land suitable for arabica 16% reduction in land suitable for robusta	
Corn	U.S. (Southwest) -27% U.S. (Midwestern Iowa) -5% to -12% U.S. -46/5% (2100) Brazil -19/4% (2100) Argentina -28.5% (2100)	China -27.4%	Ukraine -40.6% (2100)	
Soybeans	U.S. -10% (2080) Brazil -20% (2080) Argentina +40% or more	China +16% to +50% (2100) India -80%		

2 Impact of decline in yields on agricultural product procurement costs in 2050



Calculations are based on the major agricultural raw materials used in the Japan alcohol and non-alcoholic beverages businesses, as well as Australia, New Zealand and Myanmar. Figures in 0.62% show the percentage of revenue.

3 Kirin Brewery's domestic market share of low-malt and no-malt beer products



4 Probability of simultaneous 10% or 20% decline in average yield due to climate change in the four largest corn exporters

	2°C scenario		4°C scenario	
	>10%	>20%	>10%	>20%
United States	68.6	29.5	100.0	96.9
China	46.2	16.8	98.8	89.2
Argentina	50.0	9.9	96.9	86.9
Ukraine	51.8	19.2	98.2	85.0

* Tigchelaar et al. (2018) Future warming increases probability of globally synchronized maize production shocks. Proceedings of the National Academy of Sciences Jun 2018, 115 (26) 6644-6649; <https://doi.org/10.1073/pnas.1718031115>

•Mass plant propagation technologies

We expect the Kirin Central Research Institute's proprietary mass plant propagation technologies to play a major role in cultivation when agricultural breeds suited to global warming are developed. It is difficult to conceive of a business model for the Kirin Group that is completely independent of barley and hops, so we will continue measures to expand the scope of potential application of heat-tolerant agricultural breeds in the event that such breeds are developed. We will also examine opportunities to expand the application of our proprietary resin film bag-type culture vessels, which we have developed for mass plant propagation, because they can use water more effectively than soil cultivation, making them suitable for cultivation in areas with high water risks.

•Support for acquisition of certification for sustainable agriculture

In supporting for Sri Lanka's tea farms to get Rainforest Alliance Certified, which we have been providing since 2013, we will reduce the agricultural impact of climate change, such as extreme rainfall and droughts, and continuously promote agriculture that is resilient to climate change. By visiting Sri Lanka every year to exchange opinions with farm managers and to confirm the situation at tea farms, we are able identify the impact of climate change on farms and take appropriate measures in response.

New Belgium Brewing, a Kirin Group company, is funding Montana State University to support a barley cultivation program focused on climate change mitigation and adaptation.

5 Water stress in major agricultural product production areas (around 2050)

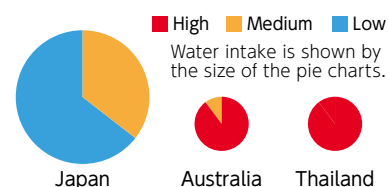
	America (North and South)	Asia	Europe/Africa	Oceania
Barley	Canada High~Extremely high	Japan Medium to high	Ukraine High~Extremely high United Kingdom Low in the North, high in the South Germany medium~High Czech Republic Medium to high in Moravia, low to medium in Bohemia Belgium High	Australia Extremely high in the East and Southeast Medium in the Southwest
Hops	United States Medium to high in Oregon, medium to high in Idaho (partially Extremely high)	Japan Medium to high in Tono, Yokote, Yamagata Low to medium in Odate	Germany Medium~High Czech Republic Medium to high in Moravia, low to medium in Bohemia	Australia Extremely high New Zealand Low
Tea leaves		Sri Lanka Extremely high in the North, and medium to high in the South and central highlands India Low in Darjeeling and Assam, low to Medium in Nilgiri Indonesia Extremely high in Java, low in Sumatra Low in Sumatra	Kenya Low Malawi Low	
Wine grapes	Chile Extremely high Argentina Extremely high		Spain High in the North, extremely high in other areas	
Coffee beans	Brazil Low to medium in the Northeast, low in other regions		Tanzania Medium to high in the North, low in other areas	

Water resources

Assessment of the effects of water risk and water stress

In 2021, we conducted surveys on water risk and water stress at production sites, as we had done previously in 2014 and 2017. The results showed that Myanmar and China (Zhuhai) had high levels of water risk, such as floods, while Lion's three breweries in Australia and Thai Kyowa Biotechnologies' plant in Rayong Province had higher levels of water stress, such as droughts. Future projections also showed that the level of water stress at Lion's six breweries in Australia will increase in future. In 2017, we conducted a detailed water risk survey of areas producing raw materials, and found that water stress was increasing in many production areas (Table 5). Table 7 shows the estimated financial impact on production from floods and droughts. When assessing water risk, we referred to Aqueduct 3.0 and hazard maps prepared by local administrations. We estimated the financial impact of floods on production sites using a global simulation system capable of quantitatively evaluating the risk of natural disasters. However, because the results of our financial impact calculations deviated from past results, we decided to identify and manage the amount of damage caused by past brewery flooding as the better estimation of financial impact. We assessed water stress based on Aqueduct 3.0, online surveys, interviews with business sites, and estimated the financial impact for business sites with a "high" level of water stress. A graph of water use by country and level of water stress (Graph 6)

6 Total water intake by country and water stress



8 Lion Risk Survey (January - December 2018)

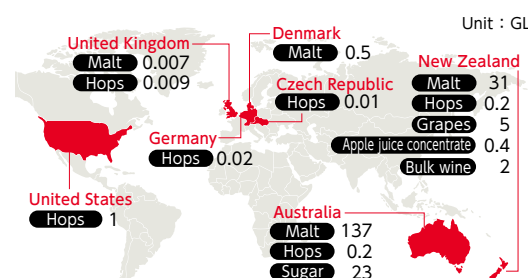
Agricultural raw materials	
■	The water footprint is 200 GL, 84% of which is related to malt production
■	We expect water stress levels in all regions cultivating barley, sugar, and hops in Australia to increase by between 1.4 and 2.8 times
Business sites	
■	Total water footprint is 2.7 GL (mostly washing and brewing)
■	All locations have experienced extreme drought except Tasmania
■	Water prices have risen by 4% on average over the past year, with a highest regional increase of 12%

7 Estimation of water risk and water stress damage

Cost of damages in past factory flooding events				
Country	Operating companies	Plant	Cost of damage*	Sales ratio
Australia	Lion	Castlemain Perkins Brewery	Approx. 1 billion yen	0.05%
Japan	Kirin Brewery	Sendai Plant	Approx. 5 billion yen	0.27%
Water stress (estimated impact of reduced production due to drought)				
Country	Operating companies	Plant	Cost of damage	Sales ratio
Australia	Lion	Castlemain Perkins Brewery	Approx. 600 million yen	0.03%
Thailand	Thai Kyowa Biotechnologies Co.	Thai Kyowa Biotechnologies	Approx. 30 million yen	0.001%

*The amount for the Sendai Brewery is from tsunami and earthquake damage in the 2011 Great East Japan Earthquake

9 Lion water footprint per agricultural raw material (January - December 2018)



shows that water use in Australia and Thailand is lower than in Japan, but water stress is high at almost all sites. In Japan, on the other hand, although water consumption is high, there were no businesses with high levels of water stress.

Lion conducted its own water risk survey in 2019. The results are shown in Table 8 and Figure 9.

Response strategy

•Development of flood response manuals and advanced water usage reduction technologies

We will respond to water risks at our business sites through measures including the preparation of a manual for adapting to floods. In 2011, when Lion's Castlemaine Perkins Brewery was flooded, we cut off power sources in the brewery in advance to prevent damage to the brewery's electrical equipment from short circuits. This reduced the cost of damage and enabled the plant to quickly resume operations. A similar measure was effective in 2000, when part of Kirin Brewery's Nagoya Plant was flooded. Following our experience of the 2018 West Japan Torrential Rain Disaster, we developed a manual for responding when we expect disruptions to logistics over a wide area. As a result, we successfully avoided any major impact from the subsequent Typhoon Faxai and Typhoon Hagibis.

As a measure against water stress at business sites, Lion will implement water-saving initiatives on an ongoing basis to achieve advanced intensity targets. Thai Kyowa Biotechnologies, which faced water intake restrictions due to drought in 2020, has been able to limit water intake and avoid negative impacts by holding enough inventories and switching temporarily to products that use less water. By sharing this knowledge within the Kirin Group, we are reinforcing our ability to respond to water risks and water stress.

•Measures to address torrential rain and conserve water resources in areas where agricultural raw materials are produced

In response to water risk in areas producing agricultural raw materials, we are working to prevent sediment runoff in torrential rains by planting undergrowth with deep roots, as part of our efforts to support for Sri Lankan tea farms to obtain the certification for sustainable agriculture. In response to water stress, we started water source conservation activities at Sri Lankan tea farms in 2018, and plan to continue to expand these activities in future.

At coffee farms in Vietnam, we are also supporting the acquisition of certification, and are trialing measures to enhance the water retention capabilities of fields. We have not taken any

specific measures in relation to major agricultural products in Europe and Australia, which are expected to experience severe water stress. However, we intend to accumulate knowledge through initiatives in Sri Lanka and other countries to use in future responses. We also plan to expand the scope of applications and accumulate knowledge for our proprietary resin film bag-type mass plant cultivation vessels, which enable the cultivation of agricultural products with little water.

Climate Change

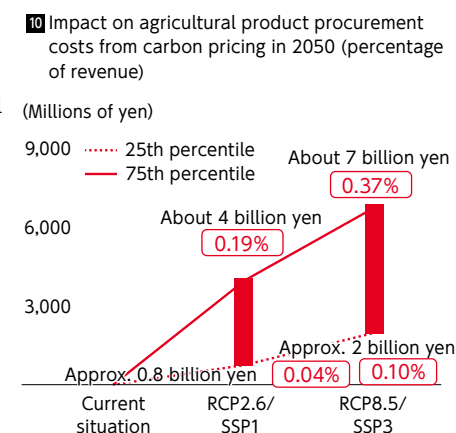
Assessment of impact of carbon pricing

In 2021, we further refined carbon pricing assessment that we originally conducted in 2019. As a result, we estimated that if we achieve the "SBT for 1.5°C" target, tax savings will amount to approximately 0.6 billion yen in 2030 under the 4°C scenario, approximately 3.9 billion yen under the 2°C scenario, and at least approximately 5.3 billion yen under the 1.5°C scenario, compared with not reducing GHG emissions.

In our estimations, we applied the IEA scenario to the 2°C scenario and the 4°C scenario for the electric power emission factor and carbon tax, and newly used the IPCC Special Report on Global Warming of 1.5°C for the 1.5°C scenario, and as the basis of carbon price forecasts (Table 11).

The results of our estimations showed that there are significant potential tax savings in reducing GHG emissions, but the financial impact of carbon taxes in the 1.5°C scenario is also significant.

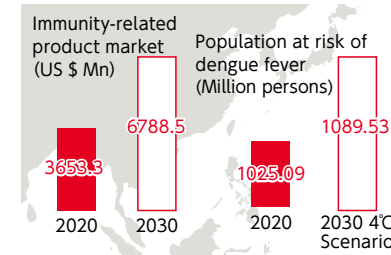
We have also estimated the financial impact of the introduction of carbon pricing on agricultural procurement costs in Japan, Australia, New Zealand, and Myanmar (Figure 10). However,



12 Forecast population exposed to risk of dengue fever under the 4°C 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 High-income countries	81	56 (▲31%)	92	69 (▲25%)
East Asia	31,093	37,559 (+21%)	28,574	21,679 (▲24%)
Southeast Asia	71,335	71,338 (0%)	75,666	75,669 (0%)

13 Market forecast for infectious disease-related products (Persistence Market Research)



11 Assessment of impact of carbon pricing

Scenario	Year	Group Scenario 3 (4° C Scenario)		Group Scenario 1 (2° C Scenario)		1.5° C Scenario	
		2030	2050	2030	2050	2030	2050
If GHG emissions are not reduced	Carbon taxes(Billions of yen)	1.3	1.7	7.7	9.9	11~476	14~791
	Percentage of revenue	0.07%	0.09%	0.42%	0.54%	0.57%~25.72%	0.73%~42.79%
If we reduce GHG emissions in line with targets	Carbon taxes(Billions of yen)	0.6	0	3.9	0	5.3~238	0
	Percentage of revenue	0.03%	0.00%	0.21%	0.00%	0.29%~12.86%	0.00%
Tax savings	Tax savings(Billions of yen)	0.6	1.7	3.9	9.9	5.3~238	14~791
	Percentage of revenue	0.03%	0.09%	0.21%	0.54%	0.29%~12.86%	0.73%~42.79%

*1 World Health Organization (2014) Quantitative risk assessment of the effects of climate change on selected causes of death, 2030s and 2050s. <https://apps.who.int/iris/handle/10665/134014>

*2 S-8 Impact Assessment and Adaptation for Climate Change Research Project Team 2014 Report https://www.nies.go.jp/s8_project/scenariodata2.html#no3

because the socioeconomic systems in the paper used for the estimation differ from the Kirin Group's scenario, we are currently using it as a reference and plan to develop further, more detailed assessments in future.

Response strategy

•Reduce GHG emissions on a medium- to long-term profit and loss neutral basis

The Kirin Group is committed to achieving medium- to long-term profit and loss neutrality in investments addressing climate change. Specifically, we will quickly implement energy-saving measures that significantly reduce costs, then use those energy cost savings as funds to introduce renewable energy. We believe that the key to success lies in production and engineering technologies to ensure that capital investment is highly economically rational. Kirin Brewery's engineering division, which has accumulated expertise by implementing measures to address climate change, will collaborate with each group company to draw up the most effective measures based on a broad view of the Kirin Group as a whole, and thereby produce results quickly.

Assessment of the impact of global warming on health

Table 12 shows the results of an analysis of the impact of dengue virus infection based on the WHO climate change and health impact scenario.*1 In this scenario, the total number of people at risk of infection in East and Southeast Asia is approximately 1 billion. When economic growth is taken into consideration, the number of people at risk in high income countries in Asia and the Pacific, as well as East Asia, decreases by approximately 25% by 2050.

Based on observational and forecast data on climate change from the National Institute for Environmental Studies*2, under the RCP 8.5 scenario (equivalent to the 4°C scenario in Kirin Group Scenario 3), the number of heat-related excess deaths in Japan between 2080 and 2100 will be between almost four times and over 10 times the number between 1981 and 2000. Estimating the number of persons requiring emergency services as a result of heatstroke in Japan,

which is considered to be closely related to the temperature, under the RCP 8.5 scenario it is expected that in 2050 this number will be approximately two to four times that of 1981 to 2000.

Response strategy

•Contribute to products that support consumers' immune systems

The WHO's report forecasts that the number of people at risk of exposure to infectious diseases in countries and regions that achieve economic growth will not increase despite further global warming, and will instead decrease. This may suggest that economic growth will result in an expansion of the market for immunity-related products. According to another survey, the total market for immunity-related products in Asia under the 4°C scenario is expected to be worth 750 billion yen by 2030, approximately 1.8 times the size of the market in 2020 (Figure 13). In response to the social issue of the spread of infectious disease, the Kirin Group's Health Science business will focus on the development of the "immunity" field. With the addition of FANCL and Kyowa Hakko Bio, we will establish a vertically integrated value chain and promote the commercialization of immunity-related products at Kirin Beverage, Koiwai, etc.

•Contribute to products to counter heatstroke

In the Kirin Group Scenario 3 (4°C scenario), assuming that the market for non-alcoholic beverages that prevent heatstroke is correlated with global warming, we estimated that the domestic market would expand by approximately 94.0 billion to 188.0 billion yen. The Japanese government takes seriously the fact that the annual number of deaths from heatstroke has exceeded 1,000 people each year since 2018. For the first time, the government has compiled a single action plan from those of each ministry and agency, in which it has set a target of no more than 1,000 deaths per year from heatstroke. In response to these trends, we will expand sales of non-alcoholic beverages that prevent heatstroke such as *SALTY LITCHI*.

Identification of risks and opportunities

In addition to issues related to climate change, the risks and opportunities related to material environmental issues that are believed to affect the Kirin Group's business and the strategies for addressing them are as follows.

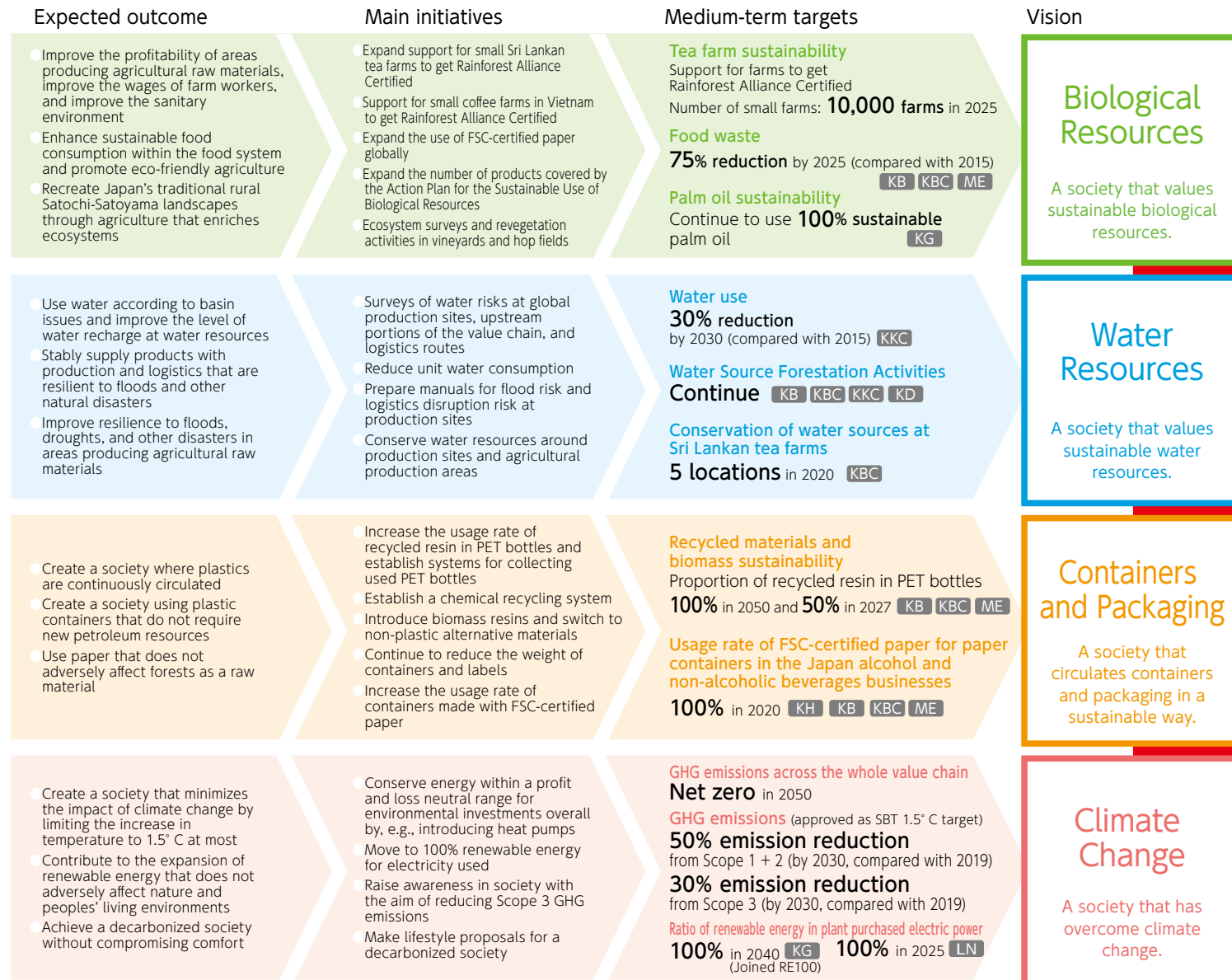
Theme	Scenario	Scenario driver	Time frame			Types of risks and business opportunities			Potential impact			Strategy	Related pages
			S	M	L				L	M	H		
Biological resources	As a result of global warming, yields of major agricultural raw materials (barley, hops, and coffee beans) decline significantly, affecting procurement costs. Quality degradation is also expected.	Increase in procurement costs due to decline in yields of agricultural products	●	●		Physical risk (acute and chronic) / transitional risk (market and reputation)	■	■				<ul style="list-style-type: none"> •Brewing technology that does not rely on barley •Mass plant propagation technologies •Support for farms to acquire certification for sustainable agriculture 	P15 P34 P29, P30, P33
	Increases in the cost of petroleum-based fertilizers and chemical pesticides due to carbon pricing, as well as competition with biofuel cultivation, affect procurement costs.	Increase in procurement costs of agricultural products due to carbon pricing	●	●		Physical risk (acute and chronic) / transitional risk (market and reputation)	■	■				<ul style="list-style-type: none"> •Brewing technology that does not rely on barley •Mass plant propagation technologies •Support for farms to acquire certification for sustainable agriculture 	P15 P34 P29, P30, P33
	Domestic hop fields and other farm land becomes idle land and traditional Satochi-Satoyama landscapes are lost as a result of the decline in domestic farmers	Biodiversity / ecosystem services	●	●		Physical risk (acute and chronic) / transitional risk (reputation)	■					<ul style="list-style-type: none"> •Support for farms to acquire certification for sustainable agriculture •Efforts to enrich ecosystems 	P31, P32
	It is discovered that the environment and the human rights of workers in areas producing agricultural products are not being protected, resulting in a loss of trust from society as a buyer and a decline in brand value.	Biodiversity / ecosystem services Violations of human rights Brand value	●	●		Reputation	■	■				<ul style="list-style-type: none"> •Support for farms to acquire certification for sustainable agriculture •Efforts to enrich ecosystems 	P29, P30, P33, P35
	Supply shortages occur as a result of limits on commercial forestry out of consideration for nature and human rights, as well as a rapid increase in demand for certified agricultural products.	Increase in procurement costs of wood, paper, and agricultural products	●	●		Reputation	■	■				<ul style="list-style-type: none"> •Support for acquisition of sustainable forestry and farm certification systems •Mass plant propagation technologies 	P29, P30, P33, P35
Water resources	Manufacturing becomes impossible owing to droughts caused by climate change. Society criticizes the company for operating during droughts.	Disruptions to operations due to droughts	●	●	●	Physical risk (acute and chronic)/ transitional risk (reputation)	■	■				<ul style="list-style-type: none"> •Advanced water usage reduction technologies 	P16~P17, P37~P42
	Floods caused by torrential rain accompanying climate change cause some business sites to suspend production.	Disruptions to operations due to floods	●	●	●	Physical risk (acute and chronic)	■					<ul style="list-style-type: none"> •Development of flood response manuals 	P16~P17, P37~P40
	Floods caused by torrential rains and droughts accompanying climate change affect areas producing agricultural products, causing significant declines in yields and affecting procurement costs.	Decline in yields of agricultural raw materials due to droughts and floods	●	●		Physical risk (chronic)	■	■				<ul style="list-style-type: none"> •Measures to address torrential rain and conserve water resources in areas where agricultural raw materials are produced 	P16~P17, P40
	Operation is suspended and brand value declines owing to the pollution of rivers and seas caused by pollutants flowing into wastewater from business sites.	Violations of laws and regulations Scale of damage to surrounding businesses and residents due to pollution	●			Reputation	■	■				<ul style="list-style-type: none"> •Improvements to environmental management systems 	P43, P76~P79, P81
Containers and packaging	Climate change results in rapid increases in the price of crude oil, meaning raw material-based resins for PET bottles rapidly increase in price or become difficult to obtain.	Usage rate of recycled resins or plant-based resins	●	●		Physical risk (acute and chronic) / transitional risk (market and reputation)	■	■				<ul style="list-style-type: none"> •Expansion of mechanical recycling •Establishment of chemical recycling manufacturing technology •Creation of social systems for collecting used PET bottles 	P47, P51, P54, P55
	A failure to address marine plastic pollution problems results in a loss of trust from society and a decline in brand value.	Usage rate of recycled resins or plant-based resins	●	●		Reputation	■	■				<ul style="list-style-type: none"> •Expansion of mechanical recycling •Establishment of chemical recycling manufacturing technology •Creation of social systems for collecting used PET bottles 	P47, P51, P54, P55
	With the shift from plastic to paper containers, the use of wood and paper from forests that are not eco-friendly results in a loss of trust from society and a decline in brand value.	FSC and other certification networks and the usage rate of recycled paper	●	●		Physical risk (acute and chronic) / transitional risk (market and reputation) Reputation	■	■				<ul style="list-style-type: none"> •Expansion of the use of FSC and other products with sustainable forest certification 	P35, P48
Climate change	Carbon taxes are introduced and stringent policy and law are enacted around the world.	Increase in energy costs due to carbon pricing	●	●		Transitional risk (policy and law, technologies, and markets)	■	■	■			<ul style="list-style-type: none"> •Reduction of GHG emissions on a medium- to long-term profit and loss neutral basis 	P17~P18, P59~P70
	The number of persons requiring emergency services as a result of heatstroke doubles owing to rising global temperatures.	Population requiring emergency services for heatstroke	●	●	●	Physical risk (chronic) / transitional risk (market) / products, services, and markets	■	■	■			<ul style="list-style-type: none"> •Contribution to products that support consumers' immune systems 	P17~P18
	The population exposed to the risk of infectious diseases increases as a result of higher global temperatures, and a market for immunity-related products expands and establishes itself.	Population exposed to infectious diseases	●	●	●	Physical risk (chronic) / transitional risk (market) / products, services, and markets	■	■	■			<ul style="list-style-type: none"> •Contribute to products to counter heatstroke 	P17~P18
	Shortages of electricity occur owing to factors such as suspensions to thermal power generation and delays to the replacement of power plants as a result of measures to address global warming, earthquakes, disasters, and LNG shortages, as well as suspensions to the supply of renewable energy as a result of natural disasters.	Power plant operating rates, power supply and demand forecasts, and power usage rates	●	●		Transitional risk (policy and law, and technologies)	■	■				<ul style="list-style-type: none"> •Investment in energy conservation •Implementation of measures to conserve energy 	P59~P70
	Brand value declines as it is pointed out that the renewable energy used by the company affects nature and the scenery in areas where power plants are located, biofuels are cultivated, etc., produces noise, and is not very resistant to disasters.	Violations of policy and law, and human rights, media reporting, and brand value	●	●		Transitional risk (policy and law, and reputation)	■	■				<ul style="list-style-type: none"> •Support for farms to acquire certification for sustainable agriculture •Procurement of certified products 	P10, P35

Strategies for addressing material environmental issue

As we aim to achieve the *Kirin Group Environmental Vision 2050*, the Kirin Group is developing a unique environmental strategy based on our strengths in R&D and engineering. When developing and implementing strategies, we listen not just to the voices of stakeholders in the value chain, but also society at large. Additionally, at the execution stage, we work with NGOs, local communities, and the next generation to develop activities with an awareness of outcomes.



Expected outcomes and key goals



Kirin Group's Environmental Vision 2050

Enrich the Earth with Positive Impact



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

Progress (The end of 2020)

Theme	We will create together	Indicators	Targets	Achievements
Biological resources	A society that values sustainable biological resources	Number of small-scale farms assisted to obtain Rainforest Alliance certification <small>KBC</small>	10,000small farms (2025)	2,120small farms
		Use of FSC-certified paper or recycled paper for office paper <small>KB KBC ME</small>	100% (2020)	100.00%
		Rate of RSPO certification through Book & Claim method <small>KB KBC KIW</small>	100% (2020)	100%
		Reduction of food waste <small>KB KBC ME</small>	-75% (2025, compared with 2015 levels)	-44% (2019)
Water resources	A society that values sustainable water resources	Rate of reduction of water consumption rate <small>MBL</small>	-28% (2021, compared with 2015 levels)	-27%
		Rate of reduction of water use volumes <small>KKC KHB</small>	30% (2030, compared with 2015 levels)	<small>KKC</small> -44% <small>KHB</small> -43%
		Number of areas where water sources were conserved among Sri Lankan tea farms <small>KBC</small>	5 sites (2020)	5sites
		Number of persons participating in education programs for valuing water in Sri Lanka <small>KBC</small>	15,000 persons (2020)	15,000 persons
Containers and packaging	A society that circulates containers and packaging in a sustainable way	Sustainable containers and packaging using recycled materials and biomass <small>KB KBC ME</small>	100% (2050)	1.5%
		Ratio of usage of recycled resin for PET bottles <small>KB KBC ME</small>	50% (2027)	1.5%
		Recycle rate of container and packaging materials <small>LN</small>	100% (2025)	95%
		Percentage of recycled materials used in container and packaging materials <small>LN</small>	Over 50% (2025)	45~49%
		Use of FSC-certified paper for 6-can packs <small>KB KBC ME</small>	100% (2020)	100%
		Use of FSC-certified paper for gift boxes <small>KB KBC ME</small>	100% (2020)	100%
		Use of FSC-certified paper for drink boxes <small>KB KBC ME</small>	100% (2020)	100%
		Use of FSC-certified paper for cardboard cartons for products <small>KB KBC ME</small>	100% (2020)	100%
Climate change	A society that has overcome climate change	GHG emissions from the entire value chain <small>KG</small>	Net-Zero (2050)	4,864 thousand tCO ₂
		GHG emission reduction rate – Scopes 1 +Scopes 2 <small>KG</small>	50% (2030, compared with 2019 levels)	-8%
		GHG emission reduction rate – Scope 3 <small>KG</small>	30% (2030, compared with 2019 levels)	-3%
		Ratio of renewable energy in plant purchased electric power <small>KG</small>	100% (2040)	10%
		Installation of solar power generation facilities <small>LN</small>	10MW (2026)	1.2MW

KG Kirin Group KH Kirin Holdings KB Kirin Brewery KBC Kirin Beverage ME Mercian KKC Kyowa Kirin KHB Kyowa Hakko Bio KIW KOIWA DAIRY PRODUCTS LN Lion MBL Myanmar Brewery

Message from
Top Management

Environmental
Strategy

Indicators
and Goals

Activity



Governance and
Risk Management

Environmental
Data

Message from Top Management	Environmental Strategy	Indicators and Goals	Activity    	Governance and Risk Management	Environmental Data
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*2 Using Book and Claim model, which is a model for the trading of certificates approved by the Round Table of Sustainable Palm Oil

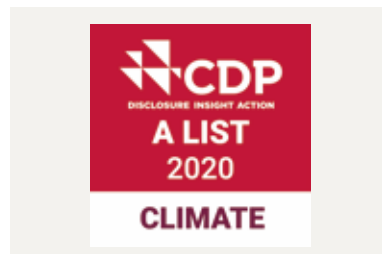
Our Commitment

<p>1 NO POVERTY</p>	<p>2 ZERO HUNGER</p>	<p>4 QUALITY EDUCATION</p>	<p>8 DECENT WORK AND ECONOMIC GROWTH</p>
<p>11 SUSTAINABLE CITIES AND COMMUNITIES</p>	<p>12 RESPONSIBLE CONSUMPTION AND PRODUCTION</p>	<p>15 LIFE ON LAND</p>	<p>17 PARTNERSHIPS FOR THE GOALS</p>

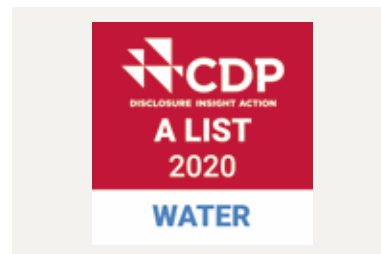
*The above is the CSV commitment as of the end of June 2020.

External Evaluation

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



CDP "climate change" category "A-List"
(two consecutive years)



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



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



"Gold Award" in the "Environmentally
Sustainable Company Category"
(two consecutive years)



"Environmental Value Award" and
highest ranked at the Second Nikkei
SDGs Management Grand Prix
(two consecutive years)



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

Selected for the following indices



MSCI Japan ESG
Select Leaders Index



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



Kirin Namacha
Decaffeinated Tea
Drink won WorldStar
Packaging Awards



The middle-sized bottle
also received WorldStar
Packaging Awards



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



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



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



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



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



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



Logistics Environmental
Grand Prize at the 18th
Logistics Environmental
Award



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



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



Activity

Biological Resources

A society that values sustainable biological resources

→P.27

Water Resources

A society that values sustainable water resources

→P.37

Containers and Packaging

A society that circulates containers and packaging in a sustainable way

→P.45

Climate Change

A society that has overcome climate change

→P.59

Performance highlight

Biological Resources

A society that values sustainable biological resources



Sri Lankan tea farms

Supporting Sri Lankan tea farms to obtain Rainforest Alliance certification

Number of large farms assisted to obtain certification **93** farms
Percentage of certified large farms that have been certified with Kirin's support **Approx. 30%**
Number of small farms assisted to obtain Rainforest Alliance certification **Total 2,120** farms

Coffee plantations in Vietnam



Supporting coffee plantations in Vietnam to obtain Rainforest Alliance certification

Number of small farms assisted to obtain Rainforest Alliance certification **350** farms

その他

Use of FSC-certified paper or recycled paper for office paper **100%**

Response to sustainable palm oil **100%**

Reduction of food waste (compared with 2015 levels) **-44% (2019)**

Water Resources

A society that values sustainable water resources

Water reduction

Rate of reduction of water consumption rate (Compared with 1990 levels) **-49%**
(Compared with 2015 levels) **5%**
(Excluding dairy products and beverage businesses) (Compared with 2015 levels) **-27%**

Amount of water use (Compared with 2015 levels) **-44%**
(Compared with 2015 levels) **-43%**

Water Source Forestation Activities

Number of participants total **Approx. 32,000** people

Number of water source conservation sites in Sri Lanka tea farms

Number of water source conservation sites **5** locations



Water Source Forestation Activities



Water source conservation sites in Sri Lanka tea farms

Waste

Recycling at the plants

Recycling rate **100%**



Containers and Packaging

A society that circulates containers and packaging in a sustainable way

PET bottles

Ratio of usage of recycled resin for PET bottles

1.5%



R100 PET bottles made of 100% recycled PET material

Paper containers made of FSC-certified paper

Paper container

Use of FSC-certified paper for 6-can packs **100%**

Use of FSC-certified paper for gift boxes **100%**

Use of FSC-certified paper for drink boxes **100%**

Use of FSC-certified paper for cardboard cartons for products **100%**

Kirin Group's Environmental Vision 2050

Enrich the Earth with Positive Impact

A Sustainable Society Created Together



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

Climate Change

A society that has overcome climate change

GHG emissions reduction

GHG emissions from the entire value chain **4,864** thousand tCO₂

GHG emission reduction rate - Scopes 1 + Scopes 2 (Compared with 2019 levels) **-8%**

GHG emission reduction rate - Scope 3 (Compared with 2019 levels) **-3%**

Renewable energy

Ratio of renewable energy to electricity used **10%**

Installation of solar power generation facilities **1.2** MW



RE100

CLIMATE GROUP | CDP
RE100 membership, SBT1.5 approved



Installation of large-scale solar power generation facilities

Next generation

Kirin School Challenge

The number of students total **1,000**人





Biological resources

Background to Initiatives

Since we announced the Kirin Group Declaration of Support for Biodiversity Conservation in 2010, we quickly became aware of issues primarily related to agricultural raw materials in terms of the environment and human rights in the upstream parts of our value chain and implemented measures to respond to these issues, including conducting risk surveys and assessments of biological resources, as well as announcing the Kirin Group Action Plan for the Sustainable Use of Biological Resources in 2013 and launching related concrete measures. However, demand for due diligence in areas that produce raw materials is increasing, and scenario analysis has confirmed that climate change may significantly impact the yield and quality of agricultural raw materials. Against this backdrop, the Kirin Group will accelerate its efforts to build a society that values sustainable biological resources.

We will create together

A society that values sustainable biological resources

- ➡ Cultivate, expand and procure sustainable agricultural raw materials
- ➡ Stand by the side of farmers to make raw material production areas sustainable



Production regions

- P.29 ➡ Tea farms
- P.31 ➡ Vineyard
- P.33 ➡ Coffee farms
- P.33 ➡ Hop Fields
- P.34 ➡ Mass plant propagation technology

Manufacturing

- P.35 ➡ Palm oil
- P.35 ➡ Paper and Printed Materials
- P.35 ➡ Biotopes at manufacturing plants

Products

- P.36 ➡ Reducing of food waste

- P.34 ➡ Kirin Central Research Institute

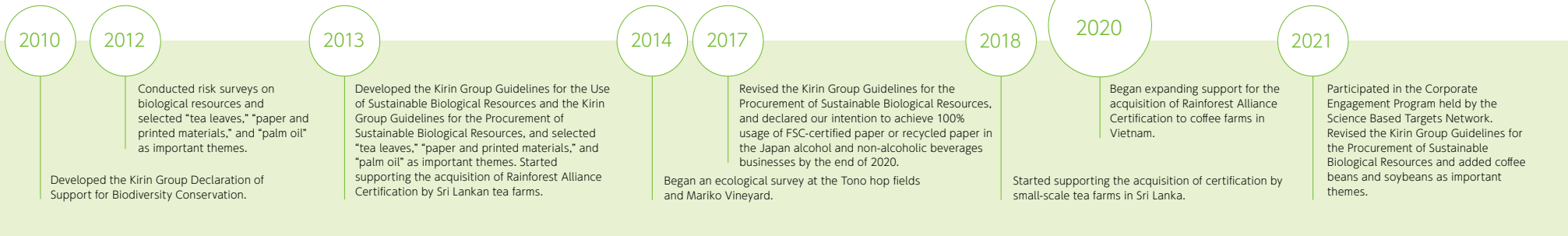
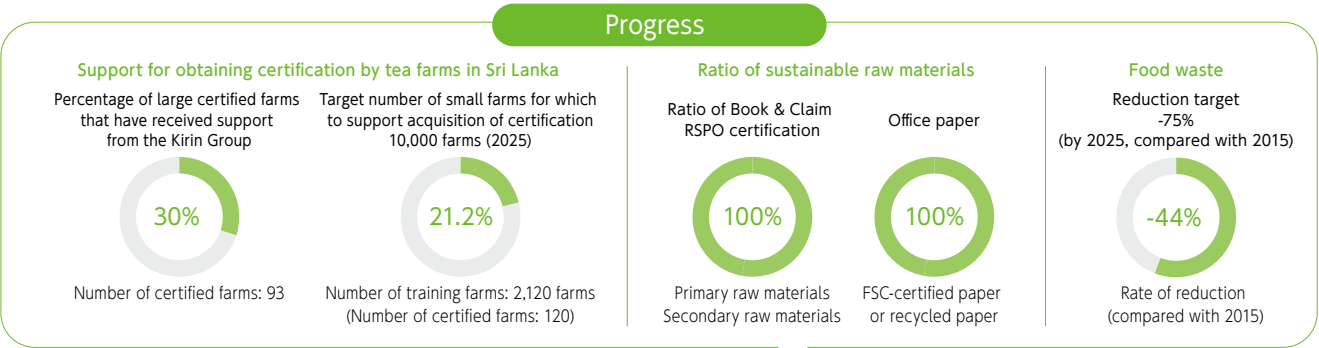
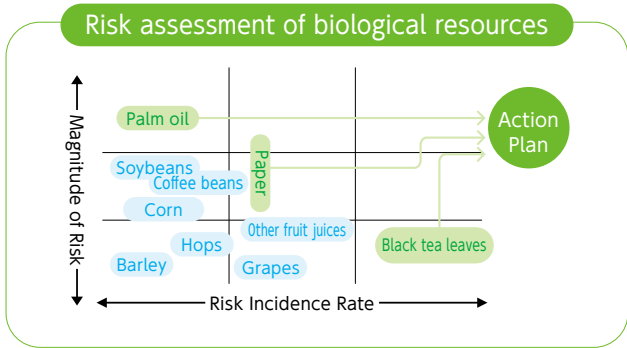
Points

- 93 tea farms have obtained Rainforest Alliance Certified with the support of the Kirin Group, approximately 30% of the total number of large tea farms that have get certified in Sri Lanka. Launched a year-round product that use certified tea leaves.
- Expanded support for the acquisition of Rainforest Alliance Certification by coffee farms in Vietnam. Started training at 350 small farms.
- Achieved 100% use of either FSC-certified paper or recycled paper for all office paper used in the Japan alcohol and non-alcoholic beverages businesses.
- Participated in the Corporate Engagement Program held by the Science Based Targets Network. Participated in the development of scientific approaches and rulemaking to set targets for the use of natural capital by companies (fresh water, land, oceans, resource exploitation, climate change, pollution, and invasive species).

Overview of initiatives

Initiative	Issue	Progress
Initiatives to achieve our vision	Risk assessment	We plan to revise the Kirin Group Action Plan for the Sustainable Use of Biological Resources to add coffee beans and soybeans as important themes.
	Rulemaking	Participated in the Corporate Engagement Program held by the Science Based Targets Network.
Cultivate, expand and procure sustainable agricultural raw materials	Office paper	As of December 2020, we had achieved 100% use of either FSC-certified paper or recycled paper for all office paper used in the Japan alcohol and non-alcoholic beverages businesses (copy paper, envelopes, business cards, etc.).
	Palm oil	The Kirin Group continues to ensure 100% use of RSPO Book & Claim-certified palm oil for primary and secondary raw materials.
	Mass plant propagation technologies	Through joint research with Bridgestone, the Kirin Central Research Institute succeeded in developing a technology that utilizes "bag-type culture production technology," a "mass plant propagation systems," to improve the productivity of natural rubber derived from the "guayule" plant, and began infield assessments.
	Food waste	As we look to achieve our food waste reduction target in the Japan alcohol and non-alcoholic beverages businesses (down 75% by 2025, compared with 2015), we will continue measures such as promoting the use of "year-month labeling" for best-before periods.
Stand by the side of farmers to make raw material production areas sustainable	Tea leaves	We have been continuously supporting the acquisition of Rainforest Alliance Certification by Sri Lankan tea farms since 2013, and as of the end of 2020, 93 tea farms had obtained certification, approximately 30% of the total number of large tea farms that have obtained certification in Sri Lanka. Conducted training on the acquisition of certification at 2,120 small tea farms. Launched a year-round product that use certified tea leaves.
	Coffee beans	In 2020, we began supporting the acquisition of certification by small coffee farms in Vietnam. In 2020, we supported the acquisition of certification by 350 farms, followed by another 350 farms in 2021. We expect these farms to begin acquiring certification from the second half of 2021, when new certification standards are applied.
	Vineyard	Continued ecological surveys to show that converting idle farming land into vineyards for Japan Wine will enrich the ecosystem. From 2018, we added birds, spiders, and earthworms to the existing list of plants and insects subject to surveys, and began researching the impact of maintaining rich ecosystems on grape production.
	Hop fields	The Kirin Group discovered a rare species near a new hop field for BEER EXPERIENCE, in which we invest.

For policies on biological resources→P.90~P.91





Tea farms

Support for acquisition of Rainforest Alliance Certification

In 2013, the Kirin Group began supporting the acquisition of Rainforest Alliance Certification by tea farms in Sri Lanka. By the end of 2020, a total of 93 farms had obtained certification thanks to this support, equivalent to approximately 30% of all certified large tea farms in Sri Lanka.

In one year, we sell approximately 1.17 billion bottles*¹ of *Kirin Gogo-no-Kocha*, making this Japan's leading black tea brand with a share of approximately 50%*² of the packaged black tea market. We have made this tea with tea leaves from Sri Lankan tea farms as an ingredient since its launch 35 years ago. When we conducted a biodiversity risk assessment in 2011, we learned that approximately 25%*³ of the Sri Lankan tea leaves imported by Japan were used for *Kirin Gogo-no-Kocha*. In order to build better partnerships with the areas where tea is produced and the people who work there, and to continue producing tasty and safe tea drinks, we continue to support Sri Lanka, a country that we are highly dependent on for ingredients.

Share of tea leaves imported by Japan by area of production



Supporting Growers Obtain Rainforest Alliance Certification*⁴



*¹ Actual data for 2020

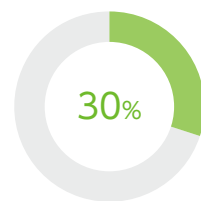
*² Actual data for 2020 based on research conducted by Food Marketing Research Institute Co., Ltd.

*³ Source: 2011 Tea Statistics, Japan Tea Association

*⁴ Certification is awarded to farms that meet comprehensive standards for sustainable agriculture to create for a better future for people and nature.

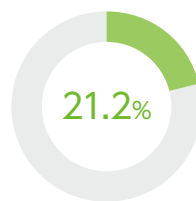
<https://www.rainforest-alliance.org>

Percentage of large certified farms that have received support from the Kirin Group



Number of certified farms: 93

Target number of small farms for which to support acquisition of certification 10,000 farms (2025)



Number of training farms: 2,120 farms (Number of certified farms: 120)

Products using certified tea leaves

On August 3, 2021, we began year-round sales of *Kirin Gogo-no-Kocha* 250ml LL Slim in paper cartons labeled with Rainforest Alliance certification seal that the product is made from more than 90% of certified tea leaves in Sri Lanka. We will convey the wishes of the farmers who are endeavoring to produce tea leaves in a sustainable manner, while also meeting the expectations of customers who seek beverages they can feel reassured about in terms of the environment and human rights.



Training content

Rainforest Alliance certification program is made up of three principal pillars of sustainability: "environment," "society," and "economy".

In terms of "environment," tea farms learn how to conserve forests and natural resources by using land, water, and energy carefully. For "society," human rights must be respected on certified farms. Farmers receive training which addresses issues such as child and forced labor, gender equality, discrimination, workplace violence and harassment. They are also required to provide decent housing for workers, and access to sanitation and healthcare for

better and safer places to live and work. In terms of "economy," farmers use agricultural practices that help improve crop yields and reduce costs. Farmers in developing

countries tend to use more agricultural chemicals and fertilizers than necessary, and while this is not the case in Sri Lanka, if agricultural yields do not increase, precious forests are sometimes lost as a result of burning neighboring forests to create new farmland. Training teaches scientific methods to increase yields while reducing the use of pesticides and fertilizers, not only to protect forests, but also to increase farm profits by reducing expenditures and to improve tea leaf safety.

In recent years, Sri Lanka has experienced frequent droughts and heavy rains presumably due to the impact of climate change. Tea farms are often located on steep, sunny slopes, so heavy rainfall not only causes the loss of fertile soil, but there have also been examples of it causing landslides that kill people living on the farms. Therefore, the training teaches farms how to distinguish between grass that is good and bad for tea trees, and instructs tea farms to ensure that the ground in the farm is covered only in good grass with deep roots. This prevents landslides by preventing rain from directly hitting the ground during heavy rain, while also serving to retain water during droughts, making it an effective measure for adapting to climate change.

In 2020, the spread of COVID-19 also led to strict curfew requirements in Sri Lanka. As a result, trainers had a period of three months or so in which they were able to visit farms to provide training for farms to obtain certification, but we are continuing our efforts in this area, while taking sufficient measures to prevent infection.

[More information on the impact of climate change on tea leaves→P.15~P.16](#)



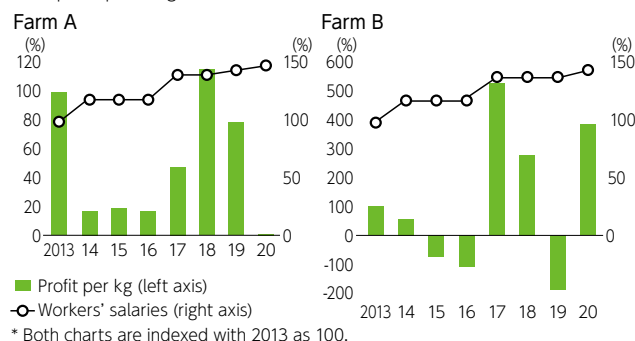
Social and economic impact of certification

The figure below shows the estimated social impact at a farm in Sri Lanka that has acquired Rainforest Alliance Certification. This data is from a specific farm, and from it, we may say that our support for certification has a positive impact, both financially and socially, on farms and farm workers, and makes areas where raw materials are produced more sustainable. In an effort to achieve greater sustainability, some farms are using some of the training expenses that Kirin provides to conduct research to significantly increase yields and attempt pesticide-free cultivation, as part of measures that go beyond the standards for certification.

Social impact of supporting the acquisition of Rainforest Alliance Certification

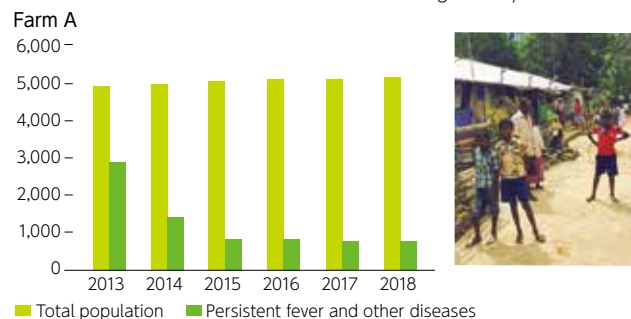
Profitability

As profit per kilogram increases, workers' salaries also increase



Sanitary conditions

While the total population of the farm is increasing slightly, the number of cases of disease have decreased significantly



* Farm A and Farm B obtained certification in 2014 and 2015, respectively.

Support for the acquisition of certification by small farms

In 2018, we began supporting the acquisition of certification by small farms, and by the end of 2020, 120 farms had obtained certification. In 2020, we conducted training for approximately 2,000 small farms, despite the impact of the spread of COVID-19. By 2025, we plan to support the acquisition of certification by 10,000 small farms.

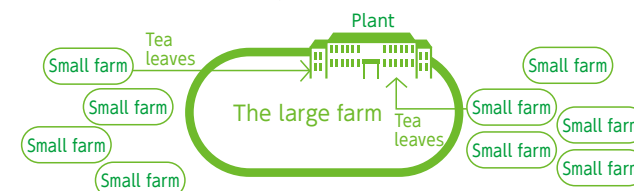
In Sri Lanka there are many small family-operated farms, with the total number said to be in the hundreds of thousands. Nationally qualified collectors collect the tea leaves that small farms produce, and sell them to large nearby farms for processing before shipping. Tea leaves from small farms can sometimes account for as much as half or more of the tea leaves processed in the large farms' plants.

In order to obtain certification for small farms, multiple small farms are organized to form a team and determine a leader. Local trainers first train the leaders, who then train the team's farms, thus ensuring that the small farms learn and acquire an understanding of the farm requirements of the Sustainable Agriculture Standard. For large farms also, the acquisition of certification by small farms will contribute to increasing the



Training posters and booklets distributed with Kirin's support

Examples of improvements as a result of obtaining certification



amount of certified tea leaves they process and ship at their own plants. As a result, in many cases, we are able to obtain the full cooperation of large farms, including the dispatch of instructors and the opening of training rooms. Since it is necessary, however, to begin by organizing the small farms into a team, it often takes time to start actual training, and the process to obtain certification is perhaps more difficult than the process for large farms.

(more information on the conservation of water sources at tea farms→P.40)



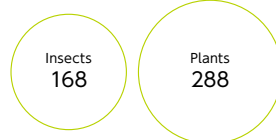
Mr. Giri Kadurugamuwa, a trainer (top left), a farm manager (top right), a small farm owner (bottom left), checking the site (bottom right)

Vineyard ecological survey for Japan Wine

We have invited researchers from the National Agriculture and Food Research Organization (NARO), and have been conducting ecological surveys of farmland producing raw materials in Japan since 2014. At Château Mercian Mariko Vineyard, on the Jinba Plateau in the Maruko district of Ueda City, Nagano Prefecture, we confirmed the existence of 168 species of insects and 288 species of plants, including endangered species listed in the Red Data Book of the Ministry of the Environment.

Many rare species, including endangered species, have also been found in Jyonohira Vineyard in Katsunuma-cho, Koshu City, Yamanashi Prefecture. Both of these vineyards are cultivated in hedgerow style.

For this reason, we believe that converting idle farming land into hedgerow-style vineyards for Japan Wine will not only contribute to the expansion of the business. It will also create valuable grasslands and lead to the expansion and protection of Japan's traditional rural Satochi-Satoyama landscapes.



Château Mercian Mariko Winery



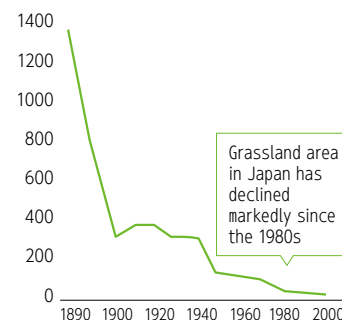
Mariko Vineyard

Vineyards as vast, good-quality grasslands develop ecosystems

Grassland is a typical example of nature that human intervention protects. Grasslands are said to have covered 30% of Japan's national land area 130 years ago, but they have dwindled to just 1% today. However, the ratio of endangered plants per unit area is extremely high (see figure on the right), and grasslands play an important role in conserving biodiversity.

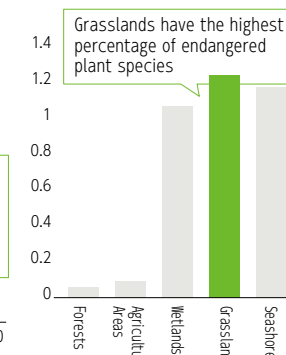
A vineyard cultivated in hedgerow style, with grass grown under the vines, can play a role as a vast good-quality grassland with proper

Trends in grassland area in Japan



Aggregated from Successive-Year Forest Area Statistics and MAFF Statistical Tables

Number of endangered species by unit area



Endangered plant species per hectare
Source: Western Japan Grasslands Research Group (2007)

undergrowth cutting, enabling the development not only of highly fertile plants but also native and rare species. In response to the expansion of the market for Japan Wine, Mercian, whose history dates back to the establishment of the Dainihon Yamanashi Wine Company, Japan's first private-sector winery, plans to expand the vineyards that it manages, which will contribute to the creation of grasslands.

In 2019, in order to also investigate the effects of grass growing on grapes themselves, we began conducting a study of spiders, soil organisms, and birds in the vineyards.

For spiders, we start by investigating what they eat. Surveys of spiders in Japan Wine vineyards are rare, and we have already confirmed the existence of certain spiders in Nagano Prefecture for the first time.

We have also confirmed the existence of 55 birds from 7 species in vineyards, and 87 birds from 21 species in forests adjacent to vineyards. We observed many larks, buntings, pheasants, and tits, suggesting that vineyards are functioning as an alternative to grasslands, which are in sharp decline in Japan. We also found eggs, including lark and bunting eggs, in the vineyards, indicating that they also function as a valuable nest site for birds using the grassland environment.

We are also investigating earthworms, a kind of soil organism, on an ongoing basis.

Surveys at Jyonohira Vineyard

Jyonohira Vineyard in Katsunuma district of Yamanashi Prefecture is a vineyard operated by Mercian that started vertical shoot positioning cultivation in 1984 in an attempt to produce the finest Cabernet Sauvignon in Japan.

In surveys conducted between 2018 and 2019, we found many rare species, including Japanese bellflower (*Platycodon grandiflorus*) and silver orchids (*Cephalanthera erecta*), which the Red Data Book of the Ministry of the Environment designates as endangered.

More than 30 years have passed since we began cultivation, and we are very careful when cutting the grass, partly because it is a relatively small vineyard, which we speculate is the reason we can see these rare species.



Careful mowing at Jyonohira Vineyard

Studies into the process of converting idle farming land into vineyards

At Tengusawa Vineyard in Koshu City, Yamanashi Prefecture, we are collaborating with NARO to conduct a research project that is rare even on a global basis, relating to changes in ecosystems as a piece of idle farming land is converted into a hedgerow-style vineyard that can be harvested.

When we investigated idle farming land prior to its cultivation in 2016, we found only insect and plant species extremely lacking in diversity, as a result of damage from deer eating the vegetation. Since we fenced and reclaimed the area in 2017, the landscape has changed to one like a vineyard, and we are seeing how the ecosystem has become richer during this process.

In vegetation surveys, we found that the flora was remarkably low in diversity owing to feeding damage from deer before development, but after development, it gradually changed from a plant colony of annual grass to one of perennial plants. At present, the amount



of nekohagi (*Lespedeza pilosa*) and lawn marshpennywort (*Hydrocotyle*

Rich vegetation inside the fence (left), and outside the fence where there are generally only fountain grass and bull thistles as a result of feeding damage by deer

sibthorpioides), both indicator species for the quality of grassland, is increasing, and there are also signs of reedgrass. Through such signs, we have confirmed that the area is becoming a high-quality grassland. The insect survey monitors butterflies as an indicator. Before development of the vineyard, the only noticeable butterflies were the pale grass blue and browns. It appeared the reason for this was because, as we confirmed in vegetation surveys, the diversity of vegetation was extremely low due to feeding damage by deer, and only plants (edible grasses) in that these larvae could eat remained. Around 2019, thanks to the diversification of vegetation on the slopes, the number of edible grasses such as mugwort and red clover increased, and we observed many painted ladies (*Vanessa cardui*), clouded yellows, and common grass yellows.

Considering that we were unable to conduct the survey in the spring of 2020 owing to the COVID-19 pandemic, we expect that the ecosystem has actually become even richer.

Evolution of the Tengu-sawa Vineyard ecosystem

	Butterflies	Plants
2016	14	-
2018	13	43
2019	18	78
2020	19	88

Revegetation activities

In 2016, under the guidance of specialists, we began activities aimed at regenerating rare and native species with the participation of employees, and we have achieved concrete results.

In fall, we collect dry grass from areas where there are rare and native species and sow it on the reclaimed land in fields in order to regenerate the vegetation. In the area where we regenerated vegetation, the average number of species present in 2016 was 8.2, but by 2020 this number had increased to 17.5. These areas are steadily becoming high-quality grassland, with tufted vetch (*Vicia cracca*), bromes (*Bromus*), lady's bedstraw (*Galium verum*), queen coralbead (*Cocculus orbiculatus*), Thunberg's geranium (*Geranium thunbergii*), toothed ixeridium (*Ixeridium dentatum*), reedgrass, violets, and nekohagi (*Lepedeza pilosa*) also becoming established. Native species with flowers have also become established, and in fall, these areas are like flower gardens.

Furthermore, along with an international NGO, Earthwatch Japan, and its volunteers, we began an activity to revegetate the shrubby sophora (*Sophora flavescens*), which is not a rare species at the national level, but is the sole grass used for feeding *Shijimiaeoides divinus*, a critically endangered IA (CR) butterfly. In 2018, volunteers collected, with the permission of the rice field owners, cuttings of

shrubby sophora from the sides of rice fields near vineyards, and took them home to grow them. Two years later, at the end of May 2021, we planted the seedlings at Mariko Vineyard.

In the fall of 2020, we invited a lecturer from NARO whom we have tasked with ecological surveys of vineyards and held an environmental class for fourth grade elementary school students at the foot of the Jinba Plateau, where Mariko Vineyard is located.

[More information on our engagement with areas that produce grapes→P.82](#)

Shrubby sophora revegetation activity



In 2019, we took cuttings (top left), which volunteers grew for approximately two years after NARO cultivated them into seedlings, and then we planted them at Mariko Vineyard at the end of May 2021

The process of converting idle and devastated land into vineyards in Tengu-sawa Vineyard



Rare species found in ecological surveys

Mariko Vineyard



Zygaena niphona niphona

Near threatened species on the Ministry of the Environment and Nagano Prefecture Red List



Sophora flavescens

The only edible grass for feeding *Shijimiaeoides divinus*, a butterfly that the Red List of the Ministry of the Environment lists as critically endangered IA (designated as endangered IB by Nagano Prefecture)



Argyronome laodice japonica

Vulnerable species on the Ministry of the Environment's Red List. Near threatened species on the Nagano Red List



Hemerocallis citrina var. vespertina

Near threatened species on the Nagano Red List



Leonurus japonicus

Near threatened species on the Nagano Red List



Vincetoxicum pycnostelma

Near threatened species on the Ministry of the Environment and Nagano Prefecture Red List

Jyonohira Vineyard



Platycodon grandiflorus

Vulnerable species on the Ministry of the Environment's Red List and near threatened on the Yamanashi Red List (NT)



Cephalanthera erecta

Vulnerable species both the Ministry of the Environment's Red List and the Yamanashi Red List (VU)

Coffee farms

Support for acquisition of Rainforest Alliance Certification

Since 2020, the Kirin Group has supported the acquisition of Rainforest Alliance Certification by coffee farms in Vietnam. In 2020, the Kirin Group provided support for training expenses for approximately 350 farms, followed by another approximately 350 small farms in 2021. We are utilizing the knowledge we have accumulated by supporting the acquisition of certification by tea farms in Sri Lanka since 2013 to expand our activities to coffee farms in Vietnam.

In 2019, approximately 30% of the coffee beans the Kirin Group imported came from Vietnam, for use in *Kirin FIRE* and other products. On the other hand, most coffee farms in Vietnam are small farms, and there are farmers who suffer from reduced yields or use chemical fertilizers inappropriately owing to a lack of appropriate educational opportunities. In 2019, we conducted scenario analysis of the impacts of climate change in 2050 and 2100 and found that coffee bean yields will likely be significantly affected



in many countries and regions. We expect that our support for the acquisition of certification, which we began in 2020, will enhance the sustainability of small farms in production areas and contribute to the stable use of high-quality raw materials in the future.



Group training



Practical training at a farm



Coffee farm with shade trees



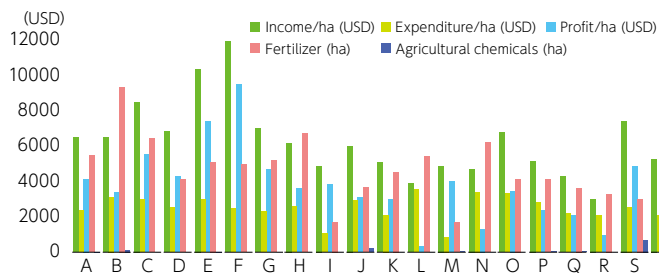
Coffee farm without shade trees

Training based on data analysis

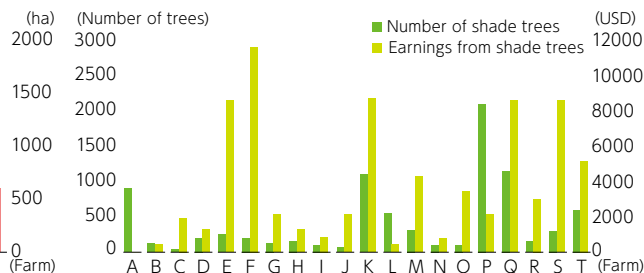
We took advantage of the period when a strict lockdown was imposed in Vietnam owing to the COVID-19 pandemic to collect and analyze detailed data online, including the ratio of chemical fertilizers and agricultural chemicals to the income and expenditure of each small farm, the number of fruit trees and other shade trees that prevent soil drying in direct sunlight and the depletion of coffee trees, and earnings from fruits harvested from those trees. Based on this information, we created a program that we use to provide training that is convincing to farmers.

[More information on the impact of climate change on coffee beans→P.15~P.16](#)

Profit structure of small coffee farms in Vietnam



Data on shade trees in coffee farms in Vietnam



Hop Fields

Hop fields living species survey

We have been conducting an ongoing living species survey in the hop fields of contracted farmers in Tono City since 2014. In 2015, the survey confirmed the presence of 104 insect species and 19 bird species. This rich diversity of living species in the hops fields is attributable to the existence of windbreak forests that protect the hops plants, which grow to a height of five meters, from the effects of the wind.



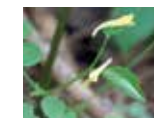
Diverse forms of life inhabit the wind-breaking forests planted to protect the hops and the underbrush planted to prevent drying of the ground.

Insects
104

Birds
19

In the fall of 2020, we conducted a survey of the vegetation in the new hop fields of BEER EXPERIENCE, an agricultural corporation funded by Kirin Brewery, in Tono City. As a result, we found there were *Corydalis raddeana*, which are designated as "Near threatened" in the Ministry of the Environment's Red Data Book, as well as *Cynoglossum asperum*, which is designated as "Near threatened" by Iwate Prefecture. In a survey we conducted in spring 2021, we found *Adonis ramosa*, designated as a "Vulnerable" species by Iwate Prefecture, as well as *Anemone debilis* and *moschatel* (*Adoxa moschatellina*), which are both designated as "Near threatened" by Iwate Prefecture. Next to the hop fields, there are creeks flowing into nearby rice and farm irrigation canals, and the area is also surrounded by forests, ensuring that the soil contains sufficient moisture.

We farm the hop fields every year, so the fields themselves do not have the function of enriching vegetation. However, it is fair to say that the creation and maintenance of windbreak forests to aid in the cultivation of hops and the continued functioning of hop fields as rich ecosystems in Japan's traditional rural Satoyama landscapes both contribute to the richness of vegetation.



Corydalis raddeana
Near threatened species on the Ministry of the Environment Red List (NT)



Cynoglossum asperum
Near threatened species on the Iwate Red List



Adonis ramosa
Vulnerable species on the Iwate Red List



Moschatel (Adoxa moschatellina)
Near threatened species on the Iwate Red List

Mass plant propagation technology

Kirin's proprietary mass plant propagation technology

Recently, various sectors are increasingly focusing on the Kirin Group's proprietary mass plant propagation technology, which we began researching based on our long use of plants such as hops and barley as ingredients for beer, as a technology that will resolve social issues. Kirin's mass plant propagation technology is original and globally unprecedented in that it consists of four elemental 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). Plant propagation is normally performed using seeds, cuttings, etc., but the cultivation period is limited and the growth rate can be quite low depending on the plant. However, Kirin's mass propagation technology that we developed through our own research makes it possible to significantly increase the number of quality plants with the same characteristics as the parent plant, regardless of the season. Kirin's scenario analyses based on the TCFD recommendations that we have conducted since 2018 show that climate change has a significant impact on yields of many agricultural products used as raw materials. Mass plant propagation technology is also useful for the mass propagation of new varieties, endangered species, and useful plants, as well as for mass propagation aimed at promoting the spread of new varieties that have been developed in response to environmental changes.

Bag-type culture vessel technology

The resin film bag-type culture vessel system that Kirin has developed for mass plant propagation technology offers the advantages of high production and operational efficiency, light weight, low cost, high operational safety, and flexibility in adjusting production size. We aerate a solution containing nutrients necessary for plant growth inside a small bag to allow plants to grow, making it easier to use water more effectively than in soil cultivation and to create a virus/pathogen-free environment. We developed the bag-type culture vessel system from research on the micro tuber method for potato propagation and have enhanced it for use in other propagation technologies.



Bag-type culture vessel system

Social impact of mass plant propagation technology

Through joint research with Bridgestone, the Kirin Central Research Institute succeeded in developing a technology that utilizes "bag-type culture vessel technology," a production technology underpinning the commercialization of "mass plant propagation technology," to improve the productivity of natural rubber derived from the "guayule" plant, and began infield assessments. "Rubber trees," which are the main source of natural rubber today, are concentrated in the tropical zones of Southeast Asia, so there is a risk of decreased yields owing to climate change. "Guayule," however, can be grown in arid areas such as deserts, and is thus expected to result in greater capacity to respond to this risk.

Regeneration of coastal forests in the Tohoku Region

For two years from 2014, the Kirin Central Research Institute participated in the Ministry of Agriculture, Forestry and Fisheries project, "Dramatic Improvement of Production of Seeds and Seedlings of *Bursaphelenchus Xylophilus* - Resistant Black Pine for Regeneration of Coastal Forests in the Tohoku Region." We worked to regenerate the coastal protection forests that suffered devastating damage from the tsunami in 2011.



Cultivation of asexual embryos



Trial planting of seedlings cultivated from asexual embryos

Status of trial planting study at Kirin Brewery Sendai Plant

* Agriculture, Forestry and Fisheries Industry/Food Industry Science and Technology Research Promotion Project (lead institution: Forest Tree Breeding Center, Forestry and Forest Products Research Institute, Forest Research and Management Organization)

Contribution to the lunar farm

The Kirin Central Research Institute took part in the lunar surface base project led by the Ministry of Education, Culture, Sports, Science and Technology launched in 2017, which included industry-academia collaboration research on a pest free farm system and emergency backup system using bag-type culture vessel technology to reproduce growth patterns similar to those under the same atmospheric pressure as on the earth.

TOPICS

Kirin Central Research Institute

Kirin Central Research Institute conducts research centered on health science. By combining our diverse strengths and technologies with those in other fields, we promote open innovation and create opportunities for new businesses and services.

Our strengths include: "raw material cultivation and production" technology, of which "mass plant propagation technology" is a representative research achievement; technology for "identifying and evaluating substances with health functions," which has discovered a constituent of aged hops that reduces body fat and a constituent of camembert cheese that improves memory function; technology for the "production of functional substances," which uses microorganisms such as *E. coli* and mold to ferment and produce raw materials for pharmaceuticals and bioactive substances; and "advanced constituent analysis" technology, which uses a combination of structural analysis called the crystalline sponge method, instrumental analysis, and information analysis to identify target constituents in samples and identify their structures in detail.

The Kirin Central Research Institute also successfully produced *Lactococcus lactis* (LC) Plasma, which we registered with Japan's Consumer Affairs Agency (CAA) last year for the first time in Japan as a Food with Function Claims (FFC) for the immune system.

Palm oil

Use of sustainable palm oil

The Kirin Group uses palm oil as an ingredient in some of its products, but because the quantity we use is very small and it is difficult to procure physically certified oil, we adopt the Book & Claim method approved by the Roundtable on Sustainable Palm Oil (RSPO) for the procurement of certified sustainable oil. In accordance with our Action Plan for the Sustainable Use of Biological Resources, we have been using this method for the total volume of palm oil used as a primary raw material every year since 2013 and the estimated total volume used as a secondary raw material from 2014. In March 2018, we became an associate member of the RSPO. We will continue to promote the use of sustainable palm oil.

Ratio of Book & Claim
RSPO certification



Primary raw materials
Secondary raw materials

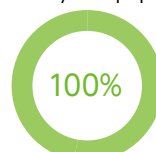
Paper and Printed Materials

Use of sustainable paper and printed materials

In the Action Plan that we revised in February 2017, we declared our aim of using 100% FSC-certified paper or recycled paper in the Japan Non-alcoholic Beverages Business for all office paper such as copy paper, envelopes, business cards, company brochures, and other printed materials, as well as paper containers, by the end of 2020. We successfully completed the switch to 100% FSC-certified paper or recycled paper in November 2020.

Currently, we are also promoting the use of FSC-certified paper for paper bags with the KIRIN logo, application postcards for prizes, and some paper cups for tasting. We plan to expand these activities to other domestic and overseas businesses in the future.

FSC-certified paper
or recycled paper



Paper and
Printed Materials

More information on paper containers and packaging → P.48



Book donations to elementary schools in Sri Lanka

In 2007, the year following the 20-year anniversary of *Kirin Gogo-no-Kocha*, we launched the Kirin Sri Lanka Friendship Project to further strengthen ties with Sri Lankan tea farms and continue to ensure stable production of tea leaves.



In Sri Lanka, unlike in urban areas, schools in rural areas such as those well known as tea-producing areas usually do not have class libraries or substantial libraries, which are taken for granted in Japan. The Kirin Group donates quality books to elementary schools for the children of tea farm workers, and continues to help children improve their academic abilities and envision their dreams for the future. We have already made donations to over 200 schools and plan to continue to increase the number of schools to which donations are made.

Black panther protection activities

The black panther, thought to be extinct, was discovered in Sri Lanka's forests in 2020. The black panther is said to be a mutation of the Sri Lankan leopard, which is listed on the IUCN Red List. Kirin Beverage provides financial support for the black panther protection effort.

Vending machines for the support of the Borneo Green Corridor



Kirin Beverage endorses the *Ongaeshi "Rewarding" Project* sponsored by the Borneo Conservation Trust Japan, a specified NPO that conserves Borneo's biodiversity, and operates vending machines that support Borneo and enable users to make donations to the project. We have installed these vending machines in approximately 200 locations throughout Japan, including offices, schools, general buildings, zoos, and construction sites.

Protection of endemic species in biotopes at manufacturing plants

At the Kirin Brewery's Yokohama Plant, in an endorsement of the "Yokohama b Plan," the city's biodiversity action plan, we built a biotope in the grounds of the plant in the summer of 2012. The Yokohama Brewery, which is part of a widespread network of ecosystems, is pursuing initiatives to enrich the local ecosystem as a whole. Also, while it was not possible to conduct these activities in 2020 as a result of the COVID-19 pandemic, since 2012, the brewery has conducted "Tours to Experience the Blessings of Nature" every week from spring through fall, in collaboration with the Tsurumi River Catchment Network, an NPO with a deep base of knowledge related to the region's natural environment.

The Kirin Brewery's Kobe Plant has been cultivating local endangered species, including the fish species, *Hemigrammocypris rasborella* (golden venus chub), and *Pogonia japonica*, a species of orchid, in the biotope that we set up in 1997. This biotope functions as a "refuge biotope" for the protection and cultivation of local endangered species.

The Kirin Brewery's Okayama Plant has been promoting a program for the artificial breeding of the kissing loach (*Parabotia curtus*), which has been a designated natural monument (protected species), since 2005. The fish population having increased with the cooperation of stakeholders and local elementary schoolchildren, they were released into the plant's biotope in 2016 and are now being bred and displayed in the brewery grounds.



The Okayama Brewery biotope

➡ Reducing of food waste

Reducing losses from disposing of products

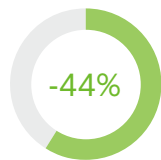
In order to reduce losses from disposing of products on an ongoing basis, we optimize production by improving demand forecasts through means such as the close sharing of information on factors affecting demand, such as retail sales, with plants and logistics centers. In addition, we will move forward with efforts to prevent valuable biological resources and containers and packaging from going to waste by strictly managing sales volume targets.

More information on the change to "year-month" labelling for production dates→P.67

More information on reducing CO₂ emissions by reducing the weight of containers→P.63

Since 2013 at Kirin Beverage and since 2020 at Kirin Brewery, we have been moving to "year-month labeling" for labeling best-before periods and production dates. By easing the way in which we label best-before periods and production dates, we expect to reduce environmental loads across the supply chain (CO₂ emissions from transporting between distribution centers and transport-related activities, etc.) and minimize inefficiencies (e.g., storage space in logistics warehouses and loading and unloading tasks at stores), and make a significant contribution to reducing losses from disposing of products.

Reduction target -75%
(by 2025, compared with 2015)



Kirin Brewery
Kirin Beverage
Mercian

* Actual data for fiscal 2019

Submitting a commitment expressing support for the United Nations Food Systems Summit 2021



The Kirin Group has made a commitment expressing our support for the United Nations Food Systems Summit 2021 (FSS) to be held in New York in September 2021. In future, we will promote initiatives that contribute to the transformation of sustainable food systems.

Recycling

Recycling spent grains from beer mashing as livestock feed

Kirin Brewery **Myanmar Brewery**

Production processes for beer, low-malt beer, and other products generate spent grains after extracting flavor during the mashing process. Because such spent grains contain residues of nutritious substances, we utilize them efficiently as livestock feed for cattle, for growing mushrooms, and other applications.



Effective use of spent grains to livestock feed

Developing food products from brewer's yeast

Lion

Lion continues to supply brewer's yeast for use as an ingredient in the Australian fermented food, Vegemite.

Re-use of wine grape lees

Mercian

The grape lees from wine-making are turned over in a compost heap on the company vineyard for a year to make compost, which is used as organic fertilizer.



Re-use of wine grape lees

Effective use of shochu lees

Kirin Holdings **Mercian**

Since 2015, we have been supplying some of the distillation residue (shochu lees) generated in the shochu production process at Mercian's Yatsushiro Plant to hog farmers in Kumamoto Prefecture. Farmers used approximately 80% of the shochu lees produced in 2019 as livestock feed.

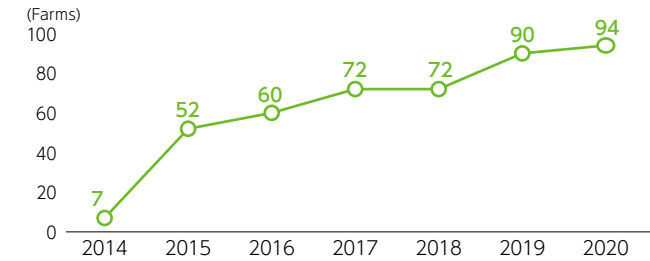
In 2019, Kirin Holdings, Mercian and the University of Tokyo jointly confirmed for the first time in the world that shochu lees can reduce stress among hogs and improve pork palatability, demonstrating the potential for the effective use and creation of value from shochu lees.

Specific initiatives and targets (commitments)

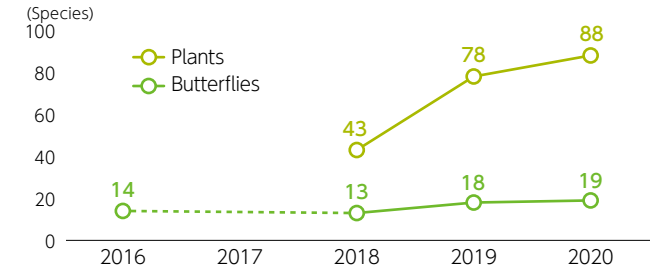
- By the end of 2025, we will have supported the acquisition of Rainforest Alliance Certification by 10,000 small tea farms in Sri Lanka, and we will continue to provide support thereafter.
- By the end of 2021, we will have supported the acquisition of Rainforest Alliance Certification by 700 small coffee farms in Vietnam, and we will continue to provide support thereafter.
- In 2020, Kirin Brewery, Kirin Beverage, and Mercian achieved the goal of using 100% FSC-certified paper for all paper containers. We will expand this goal throughout the entire Kirin Group, including overseas companies.
- We will continue to procure all palm oil through procedures approved by the Roundtable on Sustainable Palm Oil (RSPO).

Graphs of biological resources

Number of tea farms obtaining certification in Sri Lanka

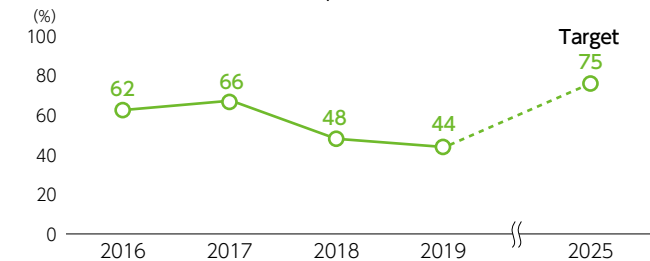


Recovery of Tengusawa Vineyard ecosystem



* There was no ecological survey in 2017, and we began plant surveys in 2018.

Food waste reduction rate (compared with 2015)





Water resources

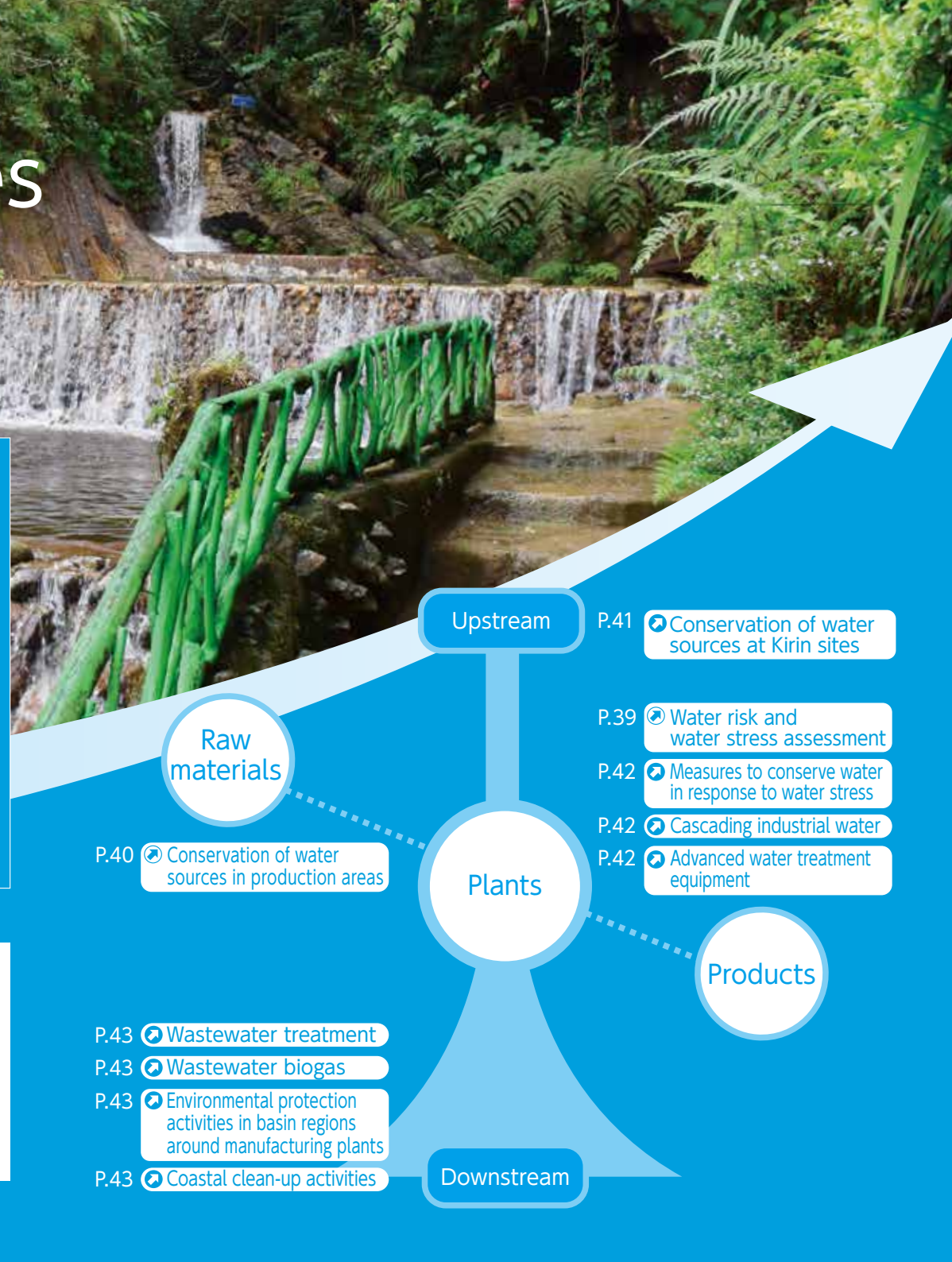
Background to Initiatives

Water is not only a basic raw material for the Kirin Group, but is also an indispensable resource for cleaning our production facilities, etc. It is also an essential resource for the growth of agricultural products that are our ingredients. On the other hand, the Kirin Group, which has large businesses in both Japan, where water stress is low, and Australia, which has experienced severe water shortages many times in the past, has been empirically aware from early on that water risks and water stress vary greatly between countries and regions. As early as 2014, we began conducting water risk surveys at our business sites and areas where we source our agricultural raw materials. Since then, we have been conducting such surveys on a regular basis. Scenario analysis conducted based on the TCFD recommendations further clarifies the seriousness of the impact of climate change on water. Against this backdrop, the Kirin Group will take appropriate measures tailored to the circumstances of each region.

We will create together

A society that values sustainable water resources

- ➡ Bring water, used as a raw material, to a sustainable state
- ➡ Solve issues with water in a way that suits the characteristics of basin regions where our business bases are located



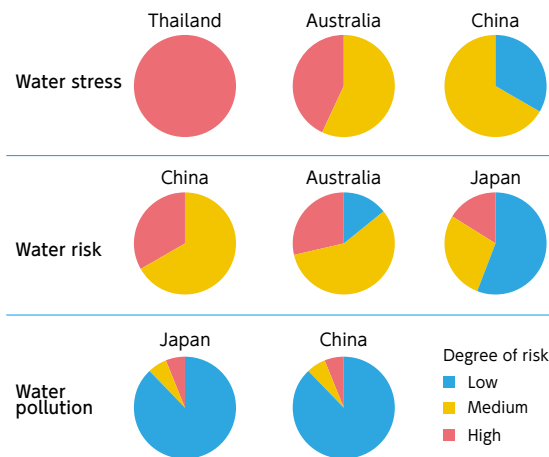
Points

- Among Sri Lanka's tea farms, we have conserved water sources at 13 locations, far exceeding our target of 5 by the end of 2020.
- We participated in the Corporate Engagement Program sponsored by the Science Based Targets Network to develop scientific approaches and rules for setting targets related to water resources.
- In our third group-wide water risk survey, we reaffirmed that water stress is high in Australia and Thailand, and that water risk is high in Australia.

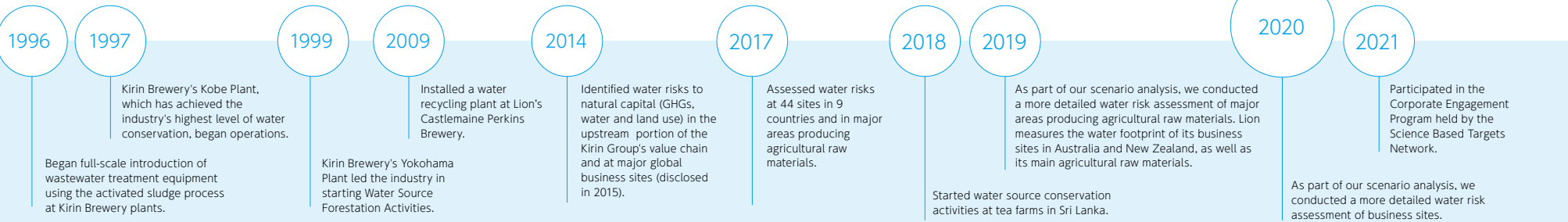
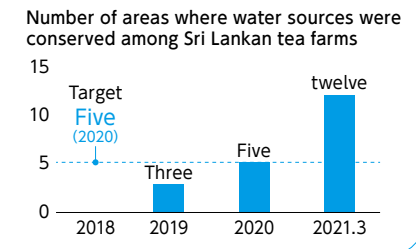
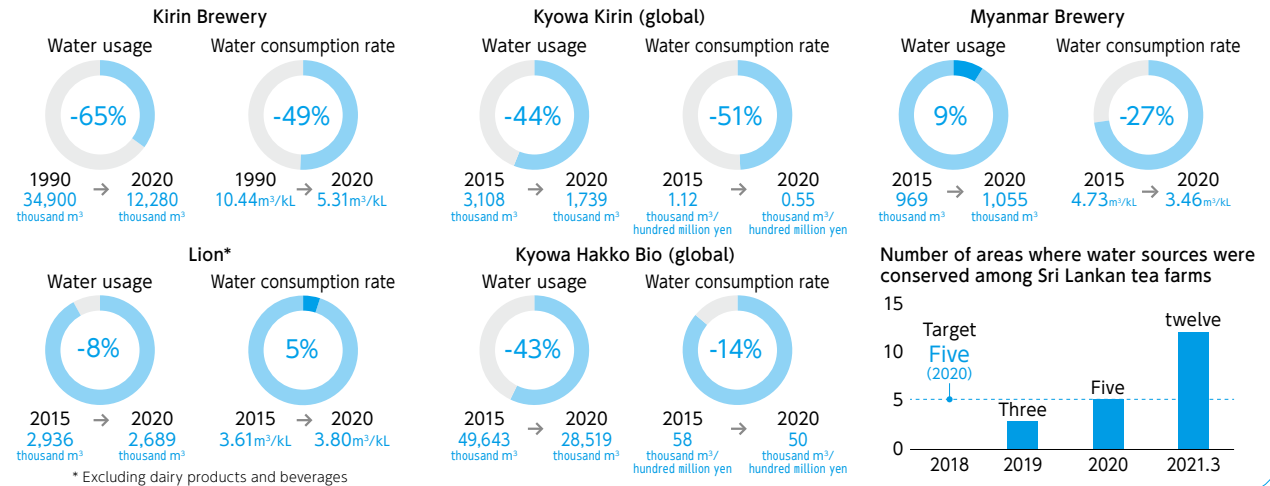
Overview of initiatives

Initiative	Issue	Progress
Initiatives to achieve our vision	Risk assessment	We conducted our third group-wide water risk survey from 2020 to 2021. Lion has also identified its water footprint.
	Rulemaking	Participated in the Corporate Engagement Program held by the Science Based Targets Network.
Bring water, used as a raw material, to a sustainable state	Kirin Brewery	Compared with 1990, we had reduced our unit water consumption by 49% and water use by 65% in 2020.
	Lion	Compared with 2015, Lion had increased its unit water consumption by 5% and reduced its water use by 8% in 2020.
	Myanmar Brewery	Compared with 2015, Myanmar Brewery had reduced its unit water consumption by 27% and increased its water use by 9% in 2020.
	Kyowa Kirin (global)	Compared with 2015, Kyowa Kirin had reduced its unit water consumption by 51% and water use by 44% in 2020.
	Kyowa Hako Bio (global)	Compared with 2015, Kyowa Hako Bio had reduced its unit water consumption by 14% and water use by 43% in 2020.
	Domestic water source forestation	In 2020, we suspended our activities as a result of the spread of COVID-19. In 2019, 1,192 people participated at 12 locations nationwide.
Solve issues with water in a way that suits the characteristics of basin regions where our business bases are located	Value chain upstream	We had engaged in water source conservation activities at Sri Lankan tea farms in 13 locations through the end of 2020, since commencing these activities in 2018. We will continue these activities after 2021.
	Response to torrential rain	In response to disruptions to logistics networks caused by the 2018 West Japan Torrential Rain Disaster, we prepared a manual for responding to similar disasters. In 2019, we successfully minimized the impact of Typhoon Faxai and Typhoon Hagibis.

Risk assessment of water resources



Progress





Water risk and water stress assessment

Results of water risk and water stress surveys

In 2020, we conducted water risk and water stress surveys, and found that business sites in Australia and Thailand have low water use, but use water from areas with a high risk of drought. We also found that in Japan, water use is high, but we use water from basins with a relatively low risk of drought. In terms of flood risk, we found that although production volume is smaller than in Japan, there is a high possibility that Australia will suffer from flood damage, which could significantly affect production. Based on these assessments, we are promoting water-saving activities in response to water stress, the development of BCPs tailored to water risks, etc.

Different water risks and stresses in different countries and regions

The Kirin Group has experienced large-scale droughts many times in Australia, an important business region, and has been empirically aware from many years ago that water issues vary greatly between countries and regions, and that action must be tailored to each situation.

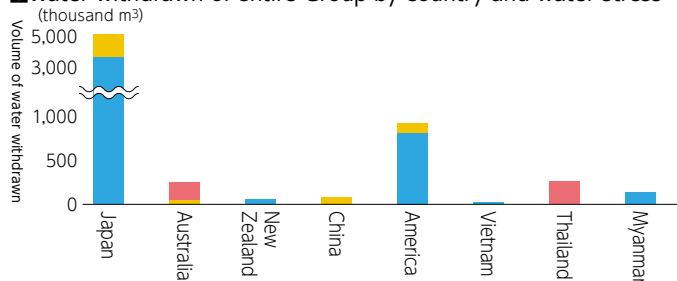
To confirm this, in 2014 the Kirin Group surveyed water risks and water stress at a total of 35 sites in six countries. We scientifically confirmed that water stress was high in Australia. We have since conducted water stress and water risk surveys every few years, including expanding the scope of the survey to nine countries and a total of 44 business sites in 2017. In surveys in 2014 and 2017, we estimated the water use of agricultural raw materials in the upstream of our value chain.

In 2020, we surveyed and assessed 45 production sites in Japan, Australia, New Zealand, China, the United States, Vietnam, Thailand, and Myanmar. In the survey, after we used WRI

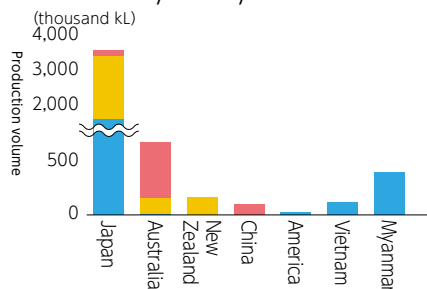
Aqueduct to simplify the survey, we made assessments based on factors such as hazard maps and other information published by administrations, as necessary, as well as interviews with all operating companies.

Graph 1 shows the total amount of water used at Kirin Group business sites by country. We divide the amount of water used into three colors according to the level of water stress. Graph 2 shows the Kirin Group's total production volume in the alcoholic and non-alcoholic beverages businesses, and Graph 3 shows the total production volume in businesses other than alcoholic and non-alcoholic beverages by country. We use different colors to show the production volume in three stages according to the level of water risks. Graph 4 shows the overall results of the water risk survey.

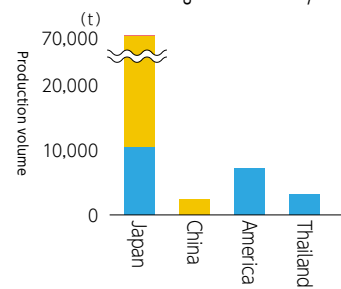
1 Water withdrawn of entire Group by country and water stress



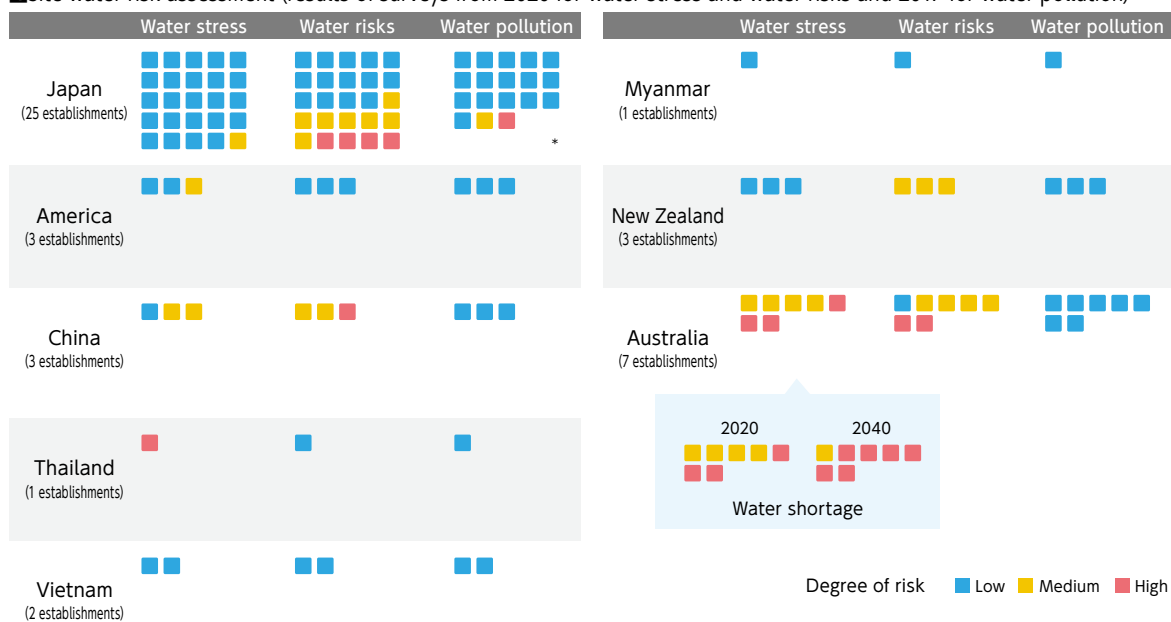
2 Production volume and water risks in alcoholic and non-alcoholic beverages businesses by country



3 Production volume and water risks in businesses other than the alcoholic and non-alcoholic beverages businesses by country



4 Site water risk assessment (results of surveys from 2020 for water stress and water risks and 2017 for water pollution)



* The results of the water pollution survey are from 2017, and the number of business sites differs from the present.



Conservation of water sources in production areas

Solving water resource issues in the upstream of the value chain

As a first step in solving water issues in areas where we source our agricultural products in the upstream of our value chain, the Kirin Group began water source conservation activities at Sri Lankan tea farms in 2018, and by the end of 2020, we had conserved water sources in 13 locations, far exceeding our target of 5. We have provided group training to 1,750 people living near water sources in order to support understanding of the necessity of conserving water sources. In addition, we have distributed pamphlets on water conservation and basin protection to 15,000 residents as part of measures to raise awareness.

Conservation activities for water sources on tea farms

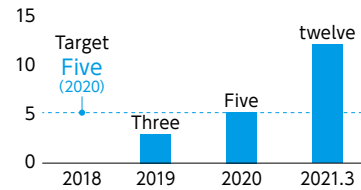
In a 2017 assessment of water risks in the value chain and scenario analysis in 2019, it was evident that climate change will cause water stress and flood risks to increase in areas producing agricultural raw materials in the future. It is not easy to respond to water resource issues in the upstream of the value chain. Therefore, the Kirin Group decided to start addressing this issue with Sri Lanka, where we have been providing assistance for obtaining sustainable tea farm certification, and where we have developed strong partnerships with local tea farms and NGOs. As such, we are working to accumulate knowledge in this area.

At the tea farms in the Sri Lankan highlands, there are many areas with tea trees on steep slopes. In such places, it is said that the level of water recharge is not high because even if it rains, the rainwater flows down the slope. In places with good conditions such as strata, however, there are places where rainwater penetrates into the ground and gushes out as many springs in certain places in tea farms. These places are known as micro watersheds. Micro watersheds on tea farms can be found in the highlands of central Sri Lanka, and, in almost all cases, they are headstreams of rivers flowing through coastal cities. For this reason, while they occupy only a tiny area, they are very

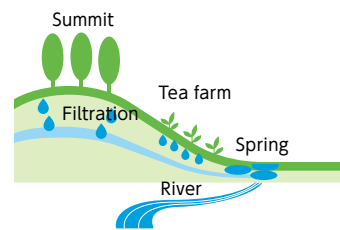


Tea bushes planted on steep slopes

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



Mechanism of micro watersheds



A stream in a tea farm



A fenced off micro watershed

precious water sources.

As part of its yearly efforts to engage with local farms managers, the Sri Lankan government went as far as mapping micro watersheds in order to support understanding of their importance and make them easier to conserve and manage. We learned that these efforts were held up owing to a lack of funds. Therefore, in order to further enhance the sustainability of tea farms whose acquisition of certification we supported and the surrounding areas, we began activities to conserve water sources at farms in 2018.

These activities involve fencing off micro watersheds so that they are not used for other purposes, and planting unique regional native species around them. This provides a diversity of vegetation at tea farms, which have a single crop, and prevents soil from flowing down the mountain slope into water sources as a result of torrential rain, etc.

Education programs to teach the value of water

Owing to the history of large Sri Lankan tea farms, going back to when the plantations were first established under British colonial rule, many people still live on the vast tea farms who make a

living by doing work that has nothing do with the tea farms themselves. These residents have been generally allowed to use empty plots that are not being used to grow tea for their living. For this reason, there have been cases in which these residents, not recognizing the micro watersheds as water sources, have converted those areas to vegetable patches or grazing pasture, or have cut down the trees around the watersheds for firewood. In order to protect the water sources, instead of merely fencing off the micro watersheds to keep the tea farms' residents away, there is a need to educate them that those areas are water sources that we should protect.

In this initiative, we are conducting an education program to teach residents living near target water sources about such matters as the importance of water and the functions of micro watersheds. At some farms, we are also working to incorporate our educational programs as part of the curriculums of day care centers and elementary schools attended by the children of tea pickers, etc.



Flyer for water education

Target number of residents to educate about the importance of water



15,000 (2020)

Contribution to water-efficient agriculture

The bag-type culture technology that Kirin has developed for the practical application of mass plant propagation technology is expected to be used in water-efficient agriculture. With the resin film-based bag-type culture vessel system, we allow plants to grow by aerating a solution containing nutrients necessary for plant growth inside a small bag, making it easier to use water more effectively than in soil cultivation. This system may have applications in cultivation in dry areas, for example.

[More information on mass plant propagation technology→P.34](#)

Conservation of Kirin water sources

Activities to protect the blessings of water

Our Water Source Forestation Activities, which we started as an activity to protect the water sources of our production plants, began in the forest of the Tanzawa district of Kanagawa Prefecture, which is the water source for Kirin Brewery's Yokohama Plant in 1999. We have since adopted this initiative, which was a pioneering initiative in the industry, in 11 locations across Japan. Under medium and long-term agreements with the local governments and other relevant parties that manage the water source forests, the program includes tree planting, undergrowth cutting, pruning, and thinning. Today, many of the forests are bright, luxuriant forests. In some locations, some of our customers have volunteered to take part in the activities. In 2019, 1,192 people participated in a total of 15 activities, but starting in 2020, we ceased our activities in most locations in response to the COVID-19 pandemic.

In the "Aso Area Grassland Regeneration Project Aimed at 'World Cultural Heritage' Status," we are providing "support for the resumption of open burning" to preserve the grassland landscape of Aso. These activities are part of the support that we provide based on the comprehensive tri-party support agreement related to the *Kirin KIZUNA Relief-Support Project* concluded between Kumamoto Prefecture, the Nippon Foundation, and the Kirin Group in 2018, with the aim of achieving a creative recovery from the 2016 Kumamoto Earthquake. Preserving the vast grasslands of Aso, which recharge large amounts of groundwater, will help protect the water that we use as a raw material at our Yatsushiro Plant. In 2019, 12 people from Mercian's Yatsushiro Plant participated in this activity.



Kirin Kiso-river water source forest



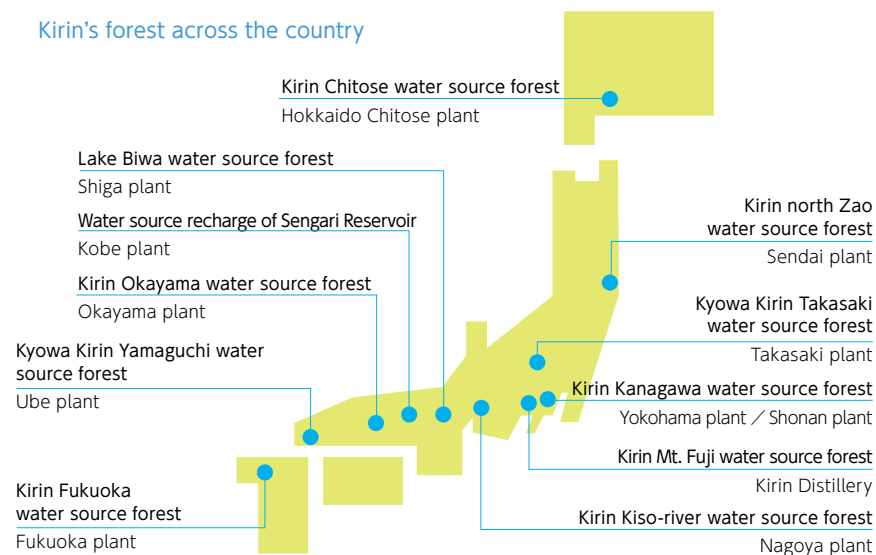
Support for the resumption of open burning

Voice of Stakeholder

Forest creation consists of planting, protection and nurturing, and taking advantage of resources. Teaching people who live in cities about forests through cutting work, and giving them hands-on experiences of making things from the thinned wood - all of these things lead to forest creation. We work with the Kirin Group on the Water and Forests Classroom, a reader-participation activity sponsored by Randonnée magazine, and other activities. With the aim of forest creation that anyone can participate in, we will continue to cooperate with the Kirin Group in the pursuit of our activities.

Tsuchi ni Kaeru Ki Forestation Society (NPO)

Kirin's forest across the country



Water Source Forestation Activities actual results* (2019)

Number of implementations	Number of participants	Locations
15	1,192	11

* In response to the COVID-19 pandemic, we suspended activities in all locations in 2020, and therefore the results for 2019 are shown here.

Production

Measures to conserve water in response to water stress

Reducing the amount of water we use in our plants is a major issue. The Kirin Group has pursued water conservation through recycling and other means, in addition to initiatives based on using water only when and as much as needed.

Focusing on water stress in the basin regions around our plants, we are installing and operating water-saving equipment according to the level of water stress.



CIP equipment



External washer

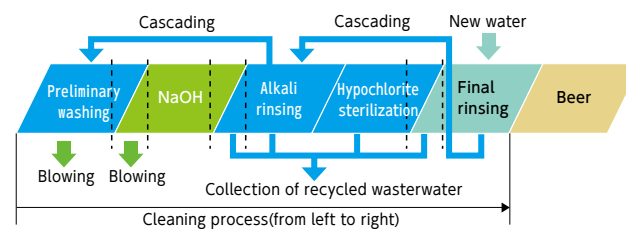
Cascading industrial water

In plants, much of our water usage is for washing and sterilizing processes for equipment and pipes. In addition to establishing frameworks and mechanisms to confirm and assure the washing, from a quality perspective, we also strictly control water flow rate and velocity to ensure that we do not waste water. We also actively pursue the re-use of water, depending on the purpose.

For example, the rinsing water that we use in the final step of the pipe and equipment washing process is still relatively clear, so we can use it again for the initial process of pipe washing. In this way, we have implemented a cascading system of water use in which we repeatedly use water that we have previously used in washing, according to the quality of the water. In actuality, considerable knowledge on how to use equipments is necessary to guarantee that we are properly washing the equipment and pipes, such as achieving the right balance of the amount of water we can recover and the amount of water we can use, as well as the timing of recovery and use.

The Kirin Group is achieving a high level of water conservation by sharing and accumulating various different types of expertise.

Cascading rinse water for washing tanks



Advanced water treatment equipment

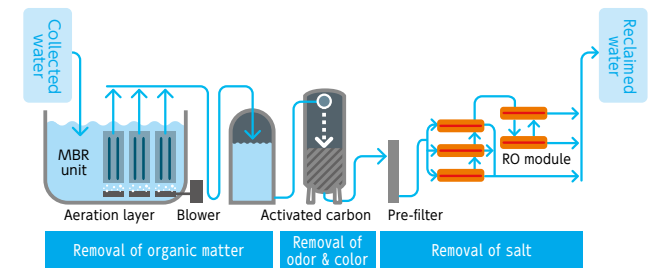
Lion is committed to exploring innovative ways to improve water management within the communities it operates.

In 2009, Lion commissioned a water recycling plant for its Castlemaine Perkins Brewery – setting out to halve the water used in brewing their classic brand, XXXX Gold.

The two main uses for water in brewing are water used in making the beer itself – plus water used in the brewing process, which is used in non-product related processes, such as cleaning, cooling, and pasteurizing. In 2009, Lion partnered with the Queensland Government to install a reverse osmosis plant, to recover waste water and minimize our reliance on mains-fed town water. In 2019, the plant generated more than 240 million liters, the equivalent of 96 Olympic-sized swimming pools. On average the brewery recycled approximately 4.7 million liters of water per week in 2019. Vitally, the plant enables Lion to produce XXXX Gold at a ratio of 2.5 liters of water for every liter of beer produced – which is approaching world class levels of water efficiency.

Lion is sharing this technology within the Kirin Group, and we are now using it at Kirin Brewery's Kobe Plant.

Flow of sophisticated water processing facility at the Kobe Plant



Wastewater

Wastewater treatment

It is our obligation as a company that uses water as a raw material to ensure that we return our wastewater to nature in pristine condition. In the Kirin Group, we purify the water that we have finished using to voluntary standards that are stricter than those required by law, before we release it into rivers and sewers.

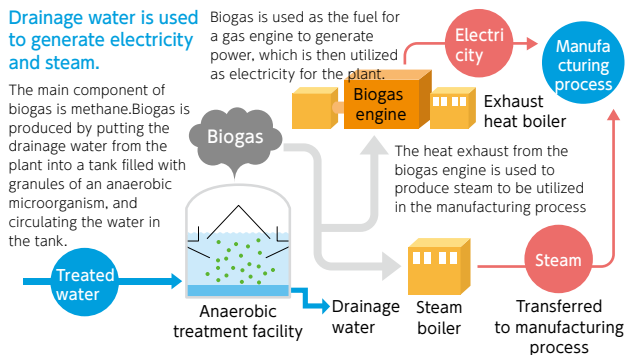
[More information on wastewater volume→P.98](#)

[More information on wastewater quality→P.105](#)

Wastewater biogas

In our breweries, we have introduced anaerobic treatment facilities to purify the wastewater generated by the production process. Unlike conventional aerobic treatment, anaerobic treatment does not require electricity for aeration. Also, the anaerobic microorganisms generate biogas as a by-product of the treatment process. This biogas, the main component of which is methane, can be utilized in biogas boilers and cogeneration systems. Derived from plant-based raw materials such as malt, biogas is a renewable energy and a CO₂-free fuel.

Anaerobic treatment mechanism



Environmental protection activities in basin regions around production plants

At the various production plants of the Kirin Group, we are conducting a range of environmental protection activities, particularly riverside clean-up activities in cooperation with local governments and NGOs. The Kirin Brewery's Yokohama Plant, in cooperation with an NPO, Tsurumi River Basin Networking, continues to conduct beautification campaigns at nearby Tsurumi River, Living Species Observation Events, and other events.

Kirin Brewery, Kirin Beverage, Mercian, Kyowa Kirin, and Koiwai Dairy Products are also engaged in local environmental beautification and environmental protection activities, focusing on the rivers they draw water from and other nearby rivers.

In response to the COVID-19 pandemic, a considerable number of our plants canceled river and beach clean-up activities in 2020. In July, however, our Toride Plant took part in coastal cleaning activities along the Kinu and Kokai Rivers, and our Shiga Plant did the same along the Seri River in Taga.

At the Four Roses Distillery in the United States, we participate in neighborhood Salt River cleanup activities.



Environmental protection activity in Tsurumi River basin regions

Coastal clean-up activities

A group of 36 people, consisting of employees of Mercian's Fujisawa Plant and their families, participated in the 43rd Zero Trash Clean Campaign - Beach Clean Up Kanagawa 2019, a clean-up activity on the Katase Coast in Fujisawa hosted by the Fujisawa City and the Kanagawa Coastal Environmental Foundation on May 26, 2019. The Plant supports the goals of this initiative, namely to "conduct a clean campaign to protect the beautiful natural surrounds of the Katase Coast, so that the beaches can be widely loved as a place of rest and relaxation for all," and participates in the campaign every year. In 2020, however, these activities were cancelled as a result of the COVID-19 pandemic.

We will continue to widen the circle of volunteers and call on everyone to participate in the beautification of the environment on the Katase Coast.

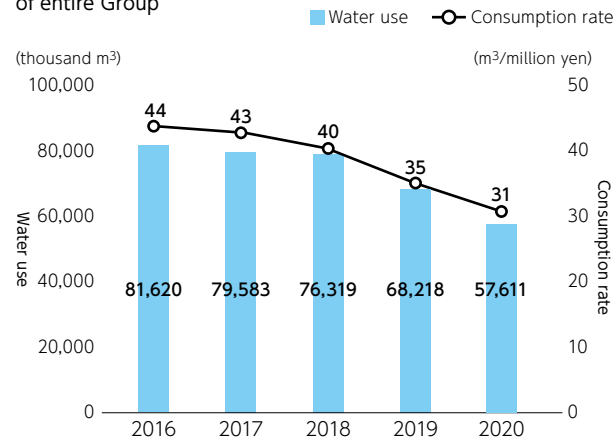


Clean-up activity on Katase Coast in Fujisawa

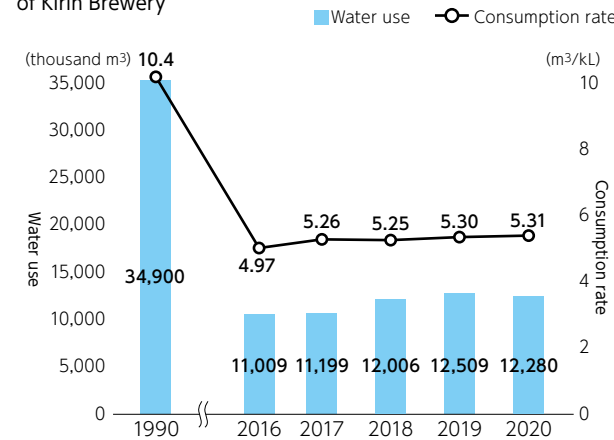
Water Graphs

Related Information→P.97~P.98

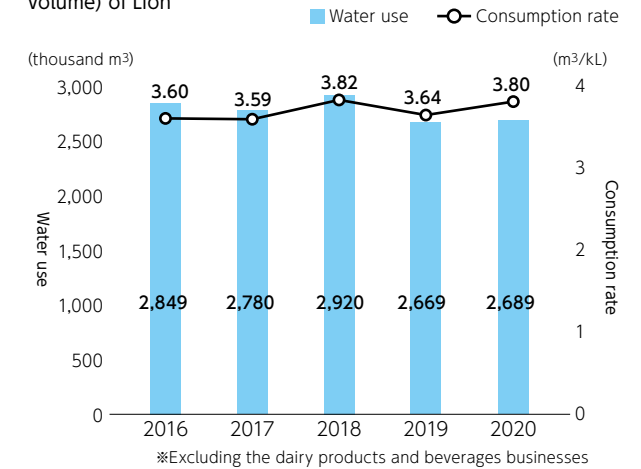
Water use and consumption rate (water use/sales revenue) of entire Group



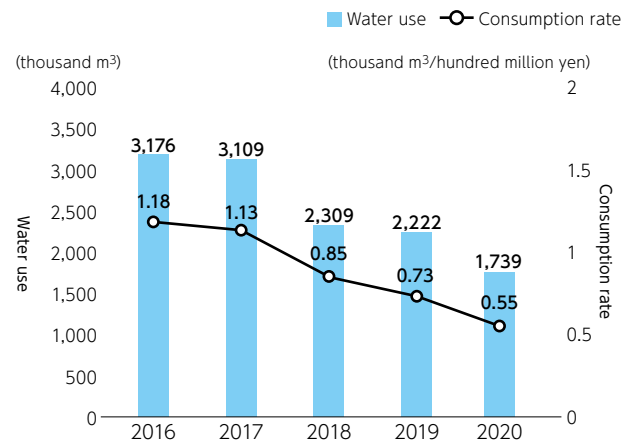
Water use and consumption rate (water use/production volume) of Kirin Brewery



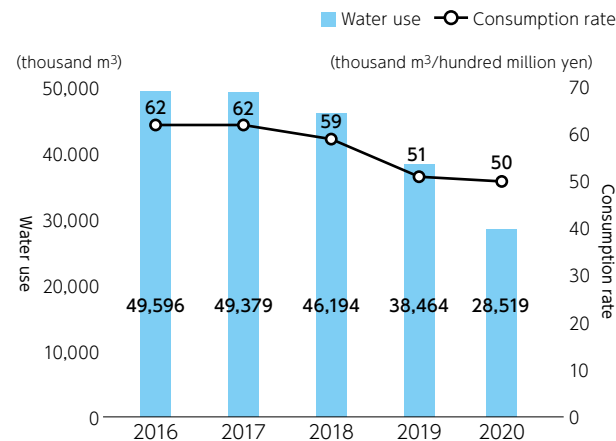
Water use and consumption rate (water use/production volume) of Lion



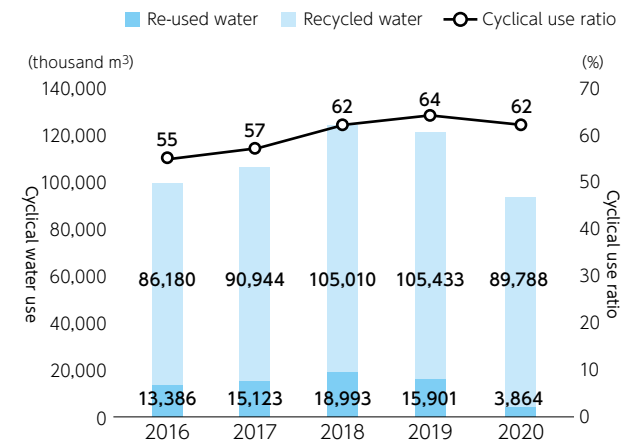
Kyowa Kirin (Global) water use and basic unit (water use / sales revenue)



Kyowa Hakko Bio(Global) water use and basic unit (water use / sales revenue)



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





Containers and Packaging

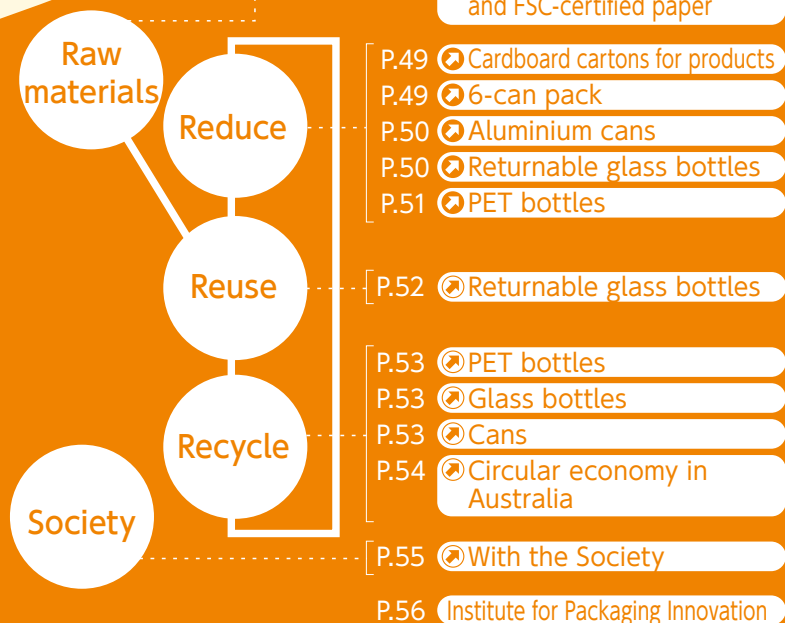
Background to Initiatives

While containers and packaging are essential to protect the quality of products for delivery to our customers, it is also true that used containers and packaging account for a high percentage of household waste. To address this issue, the entire industry has promoted 3R (reduce, re-use, recycle) and achieved a high recycling rate. However, it cannot be said that all materials are recycled. In response to problems related to deforestation and human rights, we soon began promoting sustainable paper use. By the end of 2020, we had achieved 100% use of FSC-certified paper for all paper containers in the Japan alcohol and non-alcoholic beverages businesses. In recent years, we have also begun looking seriously at the issue of plastics. Australia has also started a Container Deposit Scheme. Against this backdrop, the Kirin Group will accelerate its efforts to create a society that circulates containers and packaging, including plastics, in a sustainable manner.

We will create together

A society that circulates containers and packaging in a sustainable way

- ➡ Develop and disseminate sustainable containers and packaging
- ➡ Build a resource circulation system to make containers and packaging sustainable



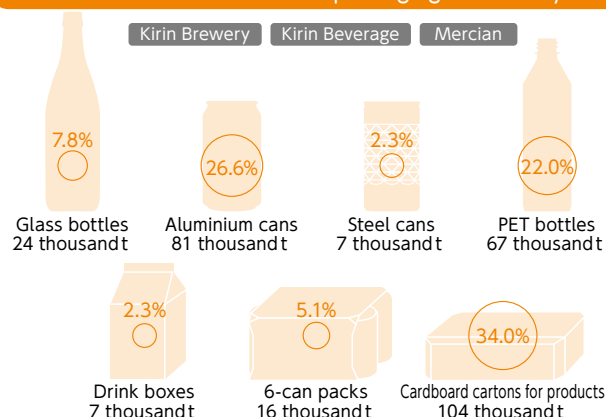
Points

- Achieved 100% use of FSC-certified paper for all paper containers in the Japan alcohol and non-alcoholic beverages businesses.
- Expanded use of "R100 PET bottles" made from 100% recycled PET resin to cover *Kirin Nama-cha* and *Kirin Nama-cha Hoji Sencha*. Also began selling no label products.
- With the aim of creating a "society that continuously circulates PET bottles," we have begun technical studies on PET recycling using chemical recycling in a joint project with Mitsubishi Chemical Corporation. As part of our aim to create a resource circulation system, we began trialing the collection of used PET bottles at convenience stores.
- Joined the "Alliance to End Plastic Waste (AEPW)," an industry-funded NGO.

Overview of initiatives

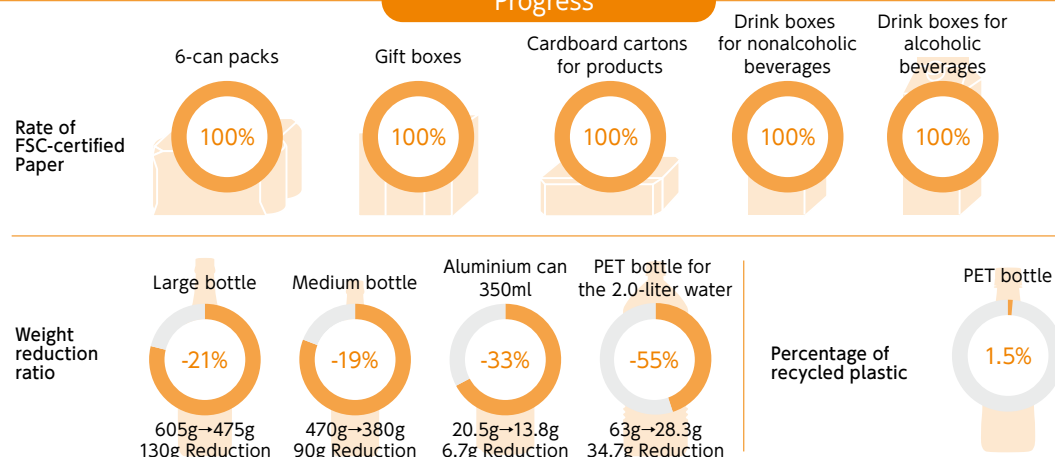
Initiative	Issue	Progress
Initiatives to achieve our vision	Joint research	In a joint project with Mitsubishi Chemical Corporation, we began studying technologies for using chemical recycling to recycle PET.
	Consortium	We were the first Japanese food company to participate in AEPW, as part of our aim to create a "society that continuously recycles plastics."
Develop and disseminate sustainable containers and packaging	Paper containers	Achieved 100% use of FSC-certified paper for all paper containers in the Japan alcohol and non-alcoholic beverages businesses in November 2020.
	Expanded use of recycled PET resin	Since 2021, we have expanded the use of "R100 PET bottles" made from 100% recycled PET resin from the previous <i>Kirin Nama-cha Decaf</i> to also cover <i>Kirin Nama-cha</i> and <i>Kirin Nama-cha Hoji Sencha</i> .
	Weight reduction of PET bottles	In 2020, we achieved a 16% weight reduction across 2L and 1.5L large PET bottle products in lines such as <i>Kirin Gogo-no-Kocha</i> and <i>Kirin Nama-cha</i> . In addition, we adopted "roll labels," which are much thinner and smaller than shrink labels, for vending machine products.
	Weight reduction of other containers	We have been continuously using the lightest returnable beer bottles produced in Japan, some of the lightest aluminum cans produced in Japan, smart-cut cartons, etc.
Build a resource circulation system to make containers and packaging sustainable	Recycling of PET bottles	As part of our aim to achieve the Kirin Group Plastic Policy (established in 2019), we have begun trialing the collection of used PET bottles at convenience stores using a bottle collection machine developed by the Institute for Packaging Innovation, as a system for recycling PET bottles. Continued use of easy-to-sort containers and packaging.
	Reuse of beer bottles	Firmly maintain a reuse system.
	Recycling of cans	Continuing to provide voluntary support for the recovery of aluminum cans.

Material mix of containers and packaging in 2020, by weight



Global resource use of containers and packaging: 524 thousand tons (For details→P.98)

Progress



* The product pictures used on pages 46 to 55 may not necessarily be the pictures of the current product because they may be the product at the time of the events described.



Sustainable PET bottles

■Expansion of the use of “R100 PET bottles” made from 100% recycled PET resin

In accordance with the Plastic Policy that we established in 2019, the Kirin Group has gradually expanded the use of “R100 PET bottles” made from 100% recycled PET resin. In June 2019, we switched to “R100 PET bottles” for 430 ml bottles of *Kirin Nama-cha Decaf*, and in March 2021, we also switched to “R100 PET bottles” for 600 ml bottles of both *Kirin Nama-cha* and *Kirin Nama-cha Hoji Sencha* sold in convenience stores throughout Japan. We use an R100 label on these packages that indicates the bottle is made from 100% recycled PET materials.

■Plastic Policy

The convenience of plastic has made it a popular material for many different products, including containers and packaging. With such a vast range of types and applications of plastics, collection and recycling rates vary depending on the type of plastic used, and it cannot be said that all plastics are being efficiently circulated. Mismanaged plastic waste discarded into the environment is finding its way into the oceans, causing marine pollution and global concern about the potential adverse effects on ecosystems.

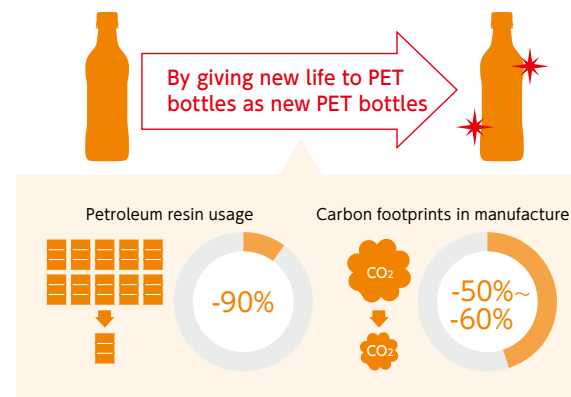
Kirin Holdings developed the Kirin Group Plastic Policy in February 2019 with the intention of finding a solution to this issue. In the Policy, to further promote the resource circulation of PET bottles, we declared a target of increasing the percentage of recycled resin in PET bottles for the Japan market to 50% by 2027. We also declared that we would consider the introduction of PET resin made derived from inedible plant material, with the aim of moving away from petroleum resources.

In the Kirin Group Environmental Vision 2050 that we announced in February 2020, we declared our goal of creating a “society that sustainably recycles containers and packaging” by 2050. To that end, we are also working to move to 100% sustainable containers and packaging that use recycled materials, biomass, etc.

[More information on our Plastic Policy→P.89](#)

■Sustainable use of PET bottles

Kirin Beverage is promoting “mechanical recycling,” which uses recycled PET resin as raw materials for PET bottles. This method involves washing the bottles before processing them at high temperatures in a condition close to a vacuum state. This volatilizes and removes the impurities stuck inside the plastic, restoring the molecular weight, which is decreased in the recycling process, to a level suited to bottle formation.



Kirin Beverages began using “R100 PET bottles” made from 100% recycled PET resin for some of the packaging of its *Kirin Gogo-no-Kocha Oishii Muto* (sugar-free) product in February 2014, followed by all *Kirin Nama-cha Decaf* packaging in 2019, and *Kirin Nama-cha* and *Kirin Nama-cha Hoji Sencha* (600 ml sizes of each) sold only at convenience stores in 2021. This bottle uses 90% less resin derived from petroleum and achieves a reduction in CO₂ emissions of 50-60% compared with regular petroleum-derived PET materials.

The R100 bottle used for *Kirin Nama-cha Decaf* won the President of Japan Packaging Institute Award at the Japan Packaging Contest 2019, and the WorldStar Award in the beverages category at the 2020 WorldStar Packaging Awards Competition.

■Aiming for a society where plastics are continuously recycled

In December 2020, Kirin started a joint project with Mitsubishi Chemical Corporation to analyze and commercialize technology for chemical recycling of PET bottles.

Some of the used PET bottles collected for recycling are

contaminated. In the current mechanical recycling system, there are impurities that are difficult to remove from recycled resins, and it is said that the quality of resins deteriorates with repeated recycling. In chemical recycling, we sort, pulverize, and wash used PET bottles to remove dirt and contaminants, then we depolymerize them (chemical decomposition treatment), and break down and purify the PET into intermediate raw materials, which we then polymerize (synthesize) again into PET, enabling us to recycle it into PET raw materials with a high level of purity. This means we can also recycle PET products other than used bottles as PET bottles. In the future, we will study the development of technologies aimed at the commercialization of this technology and establish a system to collect PET products other than bottles.

In March 2021, we joined the “Alliance to End Plastic Waste,” an international non-profit organization dedicated to solving the world's plastic waste problem, with the aim of working with participating companies to address the problem from a global perspective.

The Kirin Group aims to identify the essential issues that plastics pose and work with a variety of stakeholders to create a “society that continuously recycles plastics.”



Sustainable paper containers

■Achieving 100% use of FSC-certified paper in all paper containers and packaging

At the end of November 2020, the Kirin Group achieved the 100% use of FSC-certified paper in all paper containers and packaging at Kirin Brewery, Kirin Beverage, and Mercian. This marked the achievement of the target the Kirin Group set forth in the “CSV Commitment” in February 2017. The targeted paper containers are “6-can packs,” “gift boxes,” “drink boxes,” and “cardboard cartons.” This is the first declaration and achievement of that declaration by a Japanese manufacturer to cover all paper containers. We plan to expand this program to other businesses in the future.

■Initiatives for sustainable paper containers

In 2013, the Kirin Group developed the Action Plan for the Sustainable Use of Biological Resources, and we have since been working toward the sustainable use of paper. In the same year, with the aim of creating a society where sustainable paper is available for use in day-to-day settings, five companies engaged in advanced initiatives related to the use of paper formed the “Consortium for Sustainable Paper Use” together with WWF Japan, and engaged in initiatives such as holding dialogues with suppliers with the aim of promoting the supply of certified paper. In 2017, we revised our Action Plan for the Sustainable Use of Biological Resources, and declared a target of 100% FSC-certified paper for all paper containers. As of May 2016, before this declaration, we had adopted FSC-certified paper for all 250 ml drink boxes for the *Tropicana 100% Orange*. By the end of March 2019, all Kirin Brewery paper containers were using 100% FSC-certified paper, and by the end of November 2019, all Kirin Beverage paper containers were using 100% FSC-certified paper. In November 2020, we achieved 100% use of FSC-certified paper for all Mercian paper containers.

■FSC-certified paper targets and status of achievement

The status of achievement of targets as of the end of December 2020 is as follows.

FSC-certified paper targets and rate of achievement

Type	Target	Target Year	Rate of FSC-certified paper	Rate of FSC labeling
6-can packs for beer	100%	End of 2017	100%	about 93%
6-can packs for non-alcoholic beverages	100%	End of 2017	100%	about 78%
Gift boxes	100%	End of 2020	100%	100%
Drink boxes for non-alcoholic beverages	100%	End of 2020	100%	about 75%
Drink boxes for alcoholic beverages	100%	End of 2020	100%	about 9%
Cardboard cartons for non-alcoholic beverages	100%	End of 2020	100%	about 85%
Cardboard cartons for beer and RTD products	100%	End of 2020	100%	100%
Cardboard cartons for wine and Shochu products	100%	End of 2020	100%	0%

* Excluding commercial use

For policies on biological resources→P.90~P.91

■FSC logo displayed on top of 6-can beer packs and cardboard cartons for products

The Kirin Group is pursuing the display of the FSC-certified label to give consumers a real sense of the importance of protecting the forests. In May 2017, we became the first brewery in Japan to sell 6-can packs of beer displaying the FSC-certified label. Since October the same year, we have been progressively displaying the label on the underside of other 6-can packs and it now appears on the underside of almost all of our 6-can packs. We have also started displaying the label on the spout and sides of drink boxes for non-alcoholic beverages, with the label already visible on most of these products. Starting with January 2019 shipments, we have begun displaying the FSC logo on the top of 6-can packs and cardboard cartons for alcoholic beverages. Now consumers can see the logo on most of our products on store shelves.



* The Forest Stewardship Council (FSC) Forest Certification System is a system for the appropriate management of forests and the sustainable use and conservation of forest resources. The FSC label is a mark that protects forests.

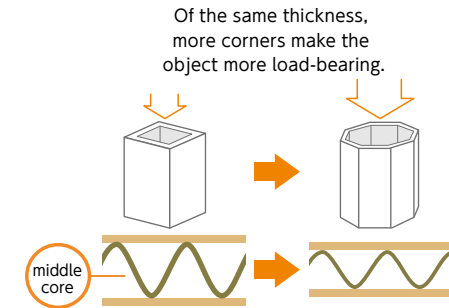
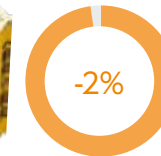
Reduce

Corner-cut cartons

The Institute for Packaging Innovation developed "corner-cut cartons" and we introduced them to the market in 2004. The beveled corners have reduced the weight of the carton and, because the carton has eight sides, making it stronger, the cardboard thickness has been reduced, resulting in a 10.9% reduction in the weight of the carton compared to conventional cartons.



Quantity of paper saved by eliminating corners



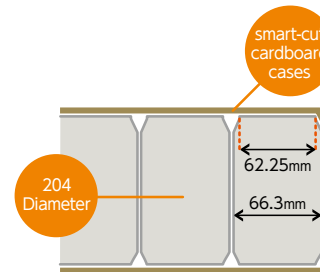
Quantity of paper saved by making cardboard core thinner



Smart-cut cartons

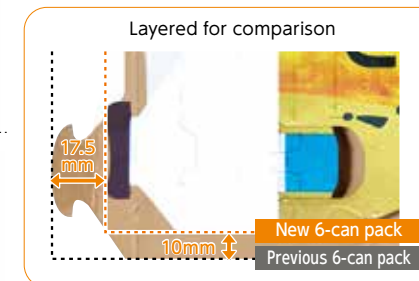
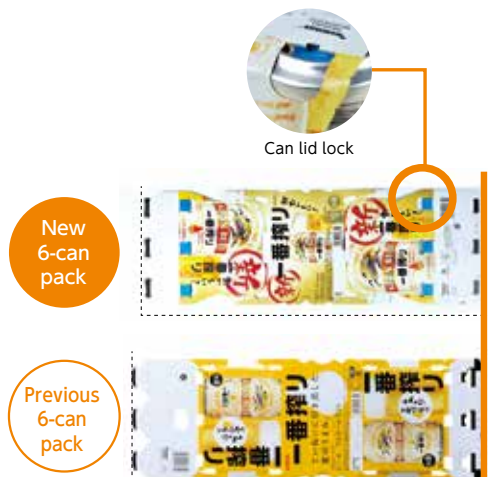
The smart-cut carton, which we introduced in 2015, is based on the corner-cut carton technology. In addition to the reduction in weight, the corners of the long edges at the top of the carton have been cut to fit the space created by the lids of the 204-diameter can, which are smaller than the rest of the can. This has resulted in a 16% weight reduction compared to the corner-cut carton.

The Institute for Packaging Innovation developed the smart-cut carton in conjunction with a container and packaging manufacturer, and obtained a joint design registration.



6-can pack

We have incorporated innovations into various parts of the 6-can pack to make it more lightweight, as well as achieving ease of carrying and removing from the shelf. For example, we have included a new cut-out section at the sides of the pack to match the can edge (Kirin patent), and use a "can bottom lock structure" to stabilize the bottoms of the can with paper. These innovations have resulted in a reduction in packaging material of 4 grams, or 8%, per 500 ml 6-can pack, while also improving the pack's can-holding power.



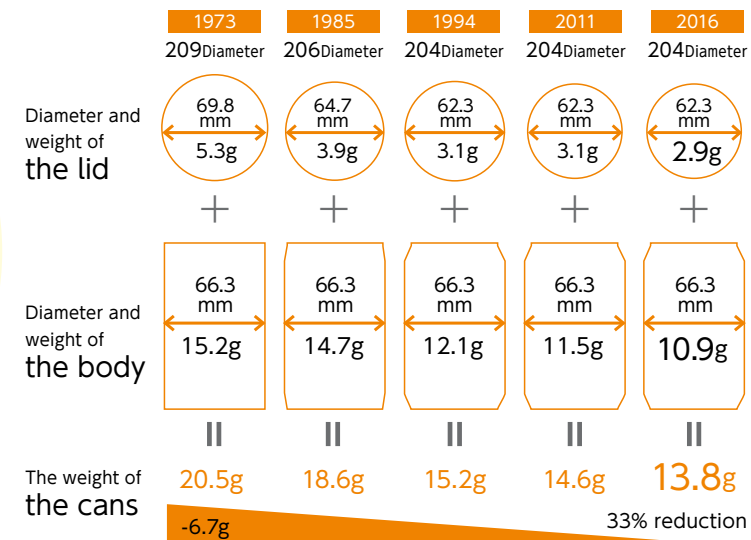
Lighter cans

At Kirin Brewery, by reducing the diameter of the can ends and narrowing the top and bottom edges of the can body to reduce the weight of the can, as well as thinning out the walls of the can body, for our 350-ml aluminum cans, we have achieved a weight reduction of approximately 29% for our 204-diameter can end compared with the 209-diameter can end in 2011.

Working with can manufacturers, we developed Japan's lightest aluminum can with thinner can ends and bodies in 2016. We have reduced the overall weight of the can by approximately 5% (0.8 grams) from 14.6 grams to 13.8 grams. This represents a weight reduction of 33% (6.7 grams) from the 209-diameter can end. Weight reduction is necessary for both steel and aluminum cans, but aluminum in particular may require a large amount of electricity for smelting, so weight reduction contributes significantly to the reduction of Scope 3 GHG emissions.



Transitioning weight of the 350 ml aluminum cans



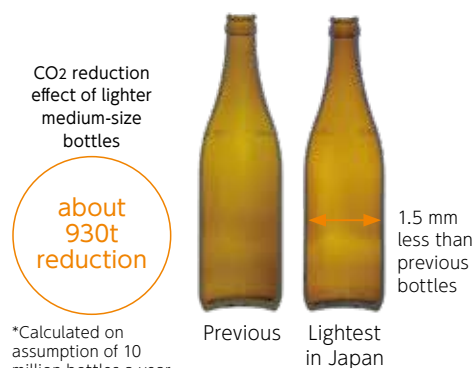
Lighter returnable glass bottles

As well as being light in weight, returnable glass bottles need to be durable enough to maintain their returnable functionality and strong enough to ensure consumer safety and peace of mind.

To meet this challenge, the Institute for Packaging Innovation made excellent use of innovations such as a ceramic coating that forms a thin film on the bottle's outside surface, an impact-resistant shape design, and a bottle mouth design that meets the conflicting requirements of being easy to open and able to be sealed tightly and that is also strong enough not to chip, achieving Japan's lightest returnable glass beer bottles in all sizes, large, medium, and small.



We applied a ceramics coating technology



*Calculated on assumption of 10 million bottles a year

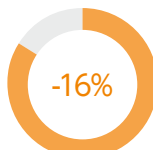
Lighter PET bottles

The Institute for Packaging Innovation is continuously developing technologies to reduce the weight of PET bottles.

We reduced the weight of the 2L PET bottle for *Kirin Alkali Ion Water* from 63 grams prior to June 2003 to just 28.9 grams in 2015, and achieved a further reduction to 28.3 grams in 2019, making it the lightest such PET bottle produced in Japan. Simply making the bottle walls thinner would make it difficult to maintain the strength of the bottle, so we developed a design that achieved both appropriate strength and ease of holding. We also incorporated innovations that made it easy even for a small child to crush the bottle after the contents have been drunk.

In April 2019, we moved forward with further weight reductions by improving the bottle's screw top, including making the screw threads narrower and the screw portion shorter. These efforts will result in annual reductions of PET resin use of approximately 107 tonnes and CO₂ emissions of approximately 375 tonnes.

2L PET bottles for tea



38.2g→32.2g
6g reduction

2L PET bottles for water



63g→28.3g
34.7g reduction

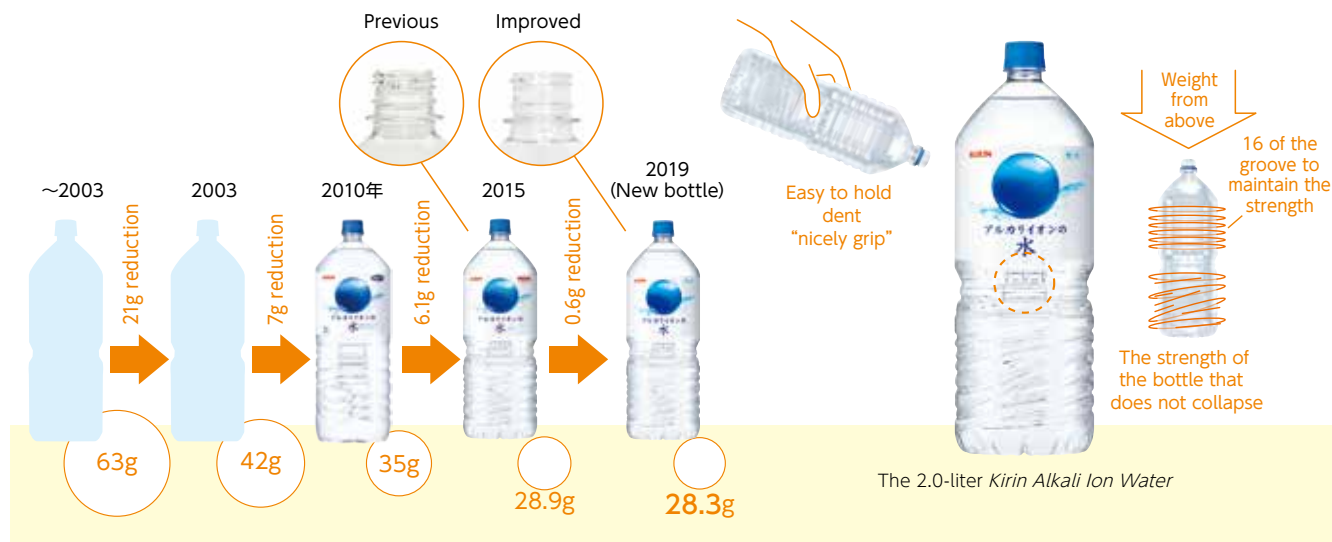
For some large-size PET bottle products such as *Kirin Gogo-no-Kocha* and *Kirin Nama-cha* in 2L and 1.5L sizes, we have reduced the weight by approximately 16%, from 38.2 grams to 32.2 grams, by improving the preform mold used for PET bottles. We began introducing these bottles sequentially starting with products in December 2020.

The Institute for Packaging Innovation developed the newly introduced 32.2 gram PET bottle by applying technology from Japan's lightest 2L bottle, the *Alkali Ion Water* 2L PET bottle. As a result, we were able to reduce the amount of PET resin used by approximately 439 tons per year, and CO₂ emissions by approximately 1,515 tons per year.

Use of roll labels for vending machine products

Since September 2020, Kirin Beverage has used "roll labels" on some PET bottle products for sale in vending machines.

There are two main types of label for PET bottled soft drinks: shrink labels and roll labels. We place shrink labels



over bottles with a labeler in the filling plant, then apply heat to shrink the label. This means a certain thickness is required to prevent the label from bending. We do not use heat to shrink roll labels, instead attaching them by wrapping them around the PET bottle, which enables us to make the label thinner. Customers can easily remove the label by simply pulling the edge of the label, making it easier to sort trash, and thereby promoting recycling.

We are introducing roll labels for certain products exclusive to vending machines, such as *Kirin Nama-cha* and *Kirin Gogo-no-Kocha Oishii Muto (sugar-free)*. By making the labels thinner and smaller, we have been able to reduce resin use by approximately 180 tons per year and CO₂ emissions by approximately 400 tons per year.

No label

Since mid-March 2021, we have been selling *Kirin Nama-cha Label-free 6-Pack* and *Kirin Nama-cha Hoji Sencha Label-free 6-Pack* at general merchandise stores nationwide, as well as *Kirin Nama-cha Label-free* (carton of 24 525 ml bottles or 9 2L bottles) and *Kirin Nama-cha Hoji Sencha Label-free* (carton of 24 525 ml bottles) exclusively online. We believe that eliminating labels makes sorting waste easier for customers and thereby promotes recycling. It also reduces the use of resin derived from petroleum and thus reduces CO₂ emissions during production.

We also use FSC-certified paper for the 6-bottle packs that we sell in general merchandise stores, and display a certification label.



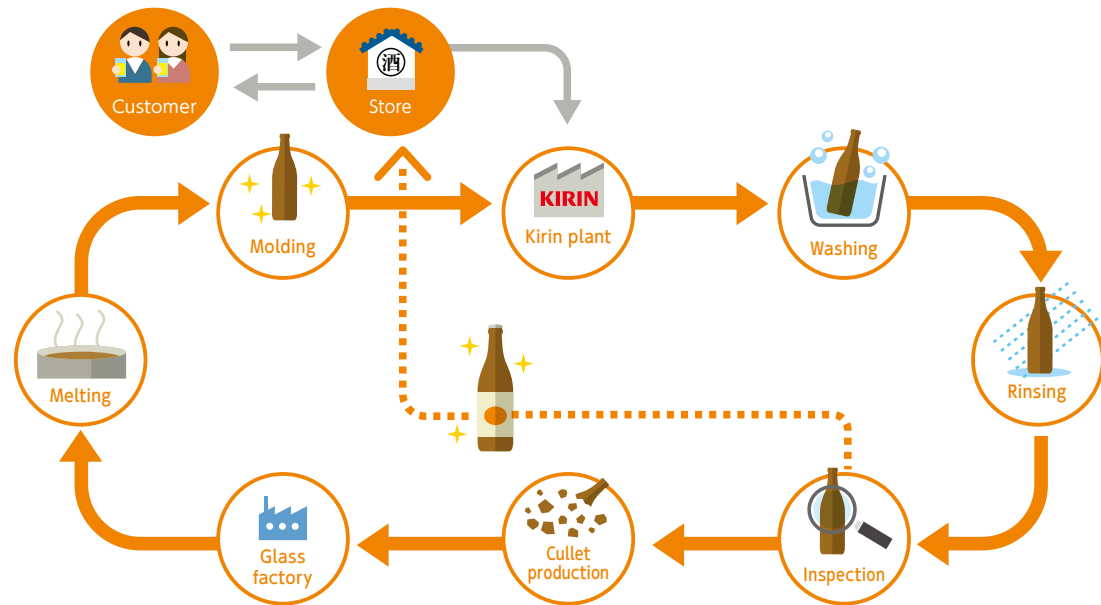
Reuse

Re-use of glass bottles

In Japan, people have collected and re-used glass bottles over and over since the Meiji Era (1868-1912), long before the word "3R" was coined.

We wash returnable glass bottles that come back to the plant thoroughly inside and out to make them as clean as a new bottle. After stringently checking the bottles for scratches and cracks with an empty bottle inspection machine, we put them back into product service and fill them with beer. When handled carefully, returnable glass bottles last for an average of about eight years. This means they are used around 24 times.

When bottles have small scratches or fine cracks or are too old to be of service any longer, we crush them and turn them into a material called cullet, which we use as the raw material to make new bottles.



Recycle

Recycling of PET bottles

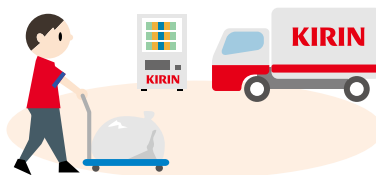
The Kirin Group promotes the recycling of PET bottles as a member of the Council for PET Bottle Recycling. Under the Council's Fourth Voluntary Action Plan (FY2021-FY2025), we are working toward a target recycling rate of at least 85% (base year: FY2004).

In July 2021, we began trialing the collection of used PET bottles at convenience stores using the proprietary bottle recovery machine we developed.

[More information on collection at stores→P.55](#)

Collection of used containers at vending machines

For vending machines installed by Kirin Beverage, the company conducts a comprehensive operation, from proposal and refilling of merchandise to service and repair of the vending machines. In addition, as an environmental initiative, we collect the empty containers and even clean the area around the vending machines.



Recycling of glass bottles

We turn old returnable glass beer bottles that can no longer be re-used and one-way bottles which are used only once into cullet, for use primarily as the raw material for making new glass bottles. We are pursuing uses for cullet made from colored glass, which cannot easily be re-used for glass bottles. We are expanding potential ways to recycle this material for other applications, including in building materials such as tiles and blocks and road paving materials.

Recycling of cans

The Kirin Group is pursuing the adoption of aluminum cans that use a high rate of recycled metal. We have also joined the Japan Aluminum Can Recycling Association, and we are providing assistance for the collection of used aluminum cans as a way to promote their recycling. Can manufacturers recycle aluminum cans discarded at breweries and use them as 100% aluminum cans for beer.

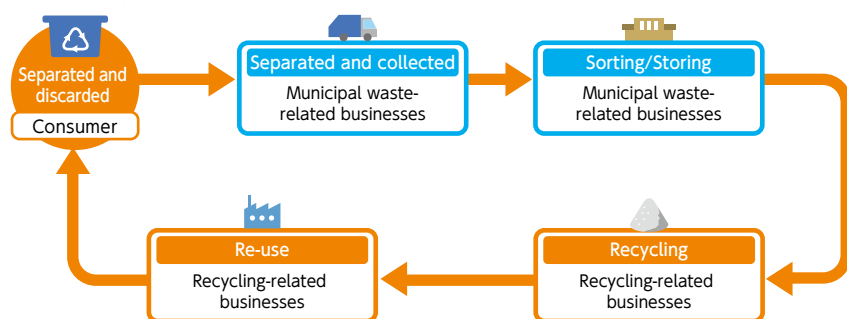
Voluntary collection of aluminum cans

The Kirin Group supports the collection of used aluminum cans by can manufacturers. Can manufacturers collect more than 40,000 tonnes of aluminum cans via these activities, all of which are recycled back into new cans, which Kirin uses for its products.

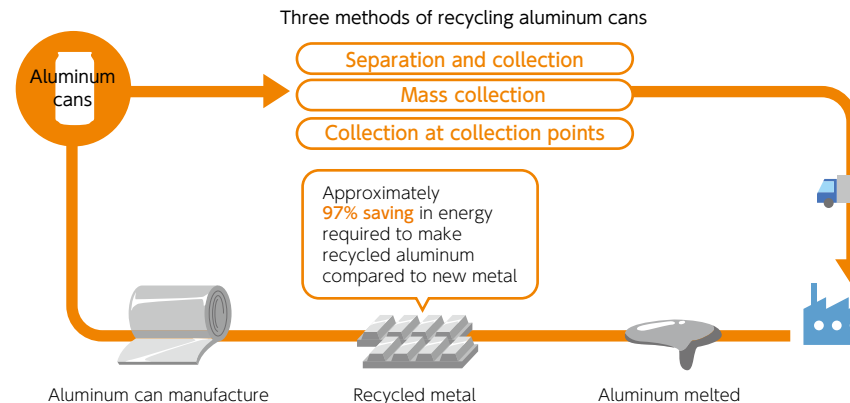


Bags for recycling provided by Kirin Brewery

Flow of recycling of PET bottles



CAN-to-CAN flow



Lion's efforts to realize a circular economy

In its "Sustainable Packaging Strategy," Lion sets out how it wants to improve the circularity of materials used in the value chain. As part of this strategy, Lion focuses on increasing the recycled content in packaging through the following three tiers of action:

1. Lion aims to maximize recycled content in existing materials while maintaining quality and safety.
2. Where it is not yet possible to increase recycled content in packaging, Lion evaluates alternative materials.
3. Lion supports recovery schemes to ensure the collection of clean, high-quality recycled materials that can be sourced by local suppliers and recycled back into products of equal or higher value.

Lion's has also set ambitious targets aligned with the Australian Packaging Covenant Organisation (APCO) 2025 targets as follows:

1. Increasing recycled content to at least 50 percent by 2025
2. 100 percent of Lion's packaging materials to be reusable, recyclable or compostable by 2025



Labels for beverage bottles that eliminate the outer plastic bag

Lion's role in Australia's Container Deposit Schemes

Australia has Container Deposit Schemes operating within six of its eight states, with future schemes announced for all the remaining states in Australia. Victoria's and Tasmania's implementation is expected in 2022/23.

Lion plays an active role in Australia's Container Deposit Schemes, holding majority ownership of Marine Stores, a Super Collector in South Australia and the Northern Territory. Lion is also a part of the joint venture which coordinates the NSW Container Deposit Scheme, Exchange for Change (EfC). In Queensland and Western Australia, Lion is a member of the Container Exchange (QLD) Limited (CoEx) and WA Return Recycle Renew Limited (WARRRL), which have been appointed as the Producer Responsibility Organisations to administer and run the Queensland and Western Australian schemes respectively.

New South Wales has returned more than five billion bottles and cans in just over three years of the Container Deposit Scheme being in place. An average of 7 million drink containers per day are being returned in New South Wales. There are currently 628 return points operating across the state.

The Queensland Container Refund Scheme has been operating for just over two years with approximately 3 billion containers returned and 311 points return points in operation.

The Western Australian Container Deposit Scheme commenced on October 1, 2020. To date, this has been the most successful scheme launch, with over 200 million containers already returned.

The South Australian scheme has been operating for over 40 years and is currently reporting a return rate of beverage containers sold of approximately 76.9%. In 2021, the South Australian government is looking to modernize the scheme and push returns even higher. Lion is working with the government to assist in the development and implementation of improvements.

In the Australian Capital Territory, the scheme operating has returned

and recycled more than 150 million containers since it commenced in December 2017.

The Northern Territory scheme continues to operate with a target return rate of 80% of containers sold in 2020.

New Zealand have announced that a Container Return Scheme is being considered for introduction across New Zealand to remove the issue of beverage containers entering landfill waste. The proposed scheme's design is expected to be finalized in 2021.



Together with society

Collecting used PET bottles at stores

In July 2021, we began trialing the collection of used PET bottles at convenience stores using the proprietary bottle recovery machine we developed.

In order to utilize PET bottles as resources, we believe it is necessary to make it more convenient for customers to place used PET bottles on collection routes. We selected convenience stores as "resource recycling infrastructure able to accept resources 24 hours a day."

The Institute for Packaging Innovation has developed a proprietary new "PET bottle volume reduction and recovery machine." We have installed these machines at convenience stores to enable customers visiting the store to throw in used PET bottles from home. By using the vending machine operation routes of affiliates of Kirin Beverage to collect used PET bottles, we aim to enhance transportation efficiency, before transporting these resources to recycling plants. The trial collection will start at one Lawson store in Yokohama and expand to several stores in Yokohama after 2022. When the "Bill for the Act on Promotion of Resource Circulation for Plastics" comes into effect after 2022, we aim to implement initiatives based on the knowledge we have gained through our demonstration experiments.



Plastic resource circulation efforts in the soft drink industry

The Japan Soft Drink Association, of which Kirin Beverages is a member, issued a Soft Drink Business Plastic Resource Reclamation Declaration in November 2018.

As one of the initiatives under this declaration, from May 2019, the Association rolled out a campaign to attach 500,000 stickers to the empty container recycling boxes placed next to vending machine, to make consumers aware that these boxes are solely for the collection of empty containers for recycling purposes. The soft drinks industry aims to reduce any contaminants from the PET bottle recycling chain to ensure



that 100% of the bottles can be used effectively. In April 2021, we made a "declaration of 50% bottle-to-bottle ratio by 2030" for PET bottles. This declaration is based on current technology and economic efficiency. In future, we will aim for a higher "bottle-to-bottle recycling ratio" through "advances in material recycling technology" and the "establishment of chemical recycling." With advances in the development of "PET materials derived from plants and organisms," we are also promoting reductions in the use of new fossil-derived resources.

Easily separated containers and packaging

In consideration of ease of trash separation, we endeavor as far as possible to use single materials in our containers and packaging or make it easier to separate them into single materials. To raise awareness about the recycling of containers and packaging, we provide containers and packaging that are easy to separate.



Since September 2020, Kirin Beverage has gradually begun selling products with "roll labels," which can be easily peeled off by simply pulling the edge of the label.

Consumer awareness activities

We are engaged in awareness-raising activities on the internet, such as the KIRIN KIDS website to raise awareness of the 3Rs among children. We also deal with the theme of 3R for containers and packaging at our Kirin School Challenge workshops for junior and senior high school students.

We also use Eco Panda, an environmental-awareness mascot character that made its first appearance to coincide with the launch of the "pecology bottle," an environmentally-friendly, resource-conserving, easily crushable container, to conduct awareness-raising activities aimed at junior and senior high school students. We have also conducted awareness-raising activities at a variety of



Kirin School Challenge (FSC logo image)

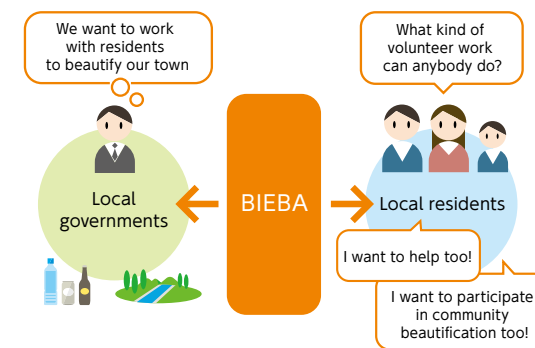


G20 Innovation Exhibition

events, including exhibiting our R100 PET Bottle for the *Kirin Nama-cha Decaf*, which uses 100% recycled PET resin, and Japan's lightest 2L PET bottle used for Kirin Alkali Ion Water, at the G20 Innovation Exhibition and PR for the International Media Center (IMC) during the G20 Osaka Summit in 2019.

Adopt Program (community beautification)

The Adopt Program is a method of community beautification in which residents "adopt" a section of a neighborhood and participate in cleanup activities. The Beverage Industry Environment Beautification Association (BIEBA) brings together six beverage producer bodies to conduct promotions and activities aimed at the beautification of communities. Kirin Brewery and Kirin Beverage participate in BIEBA as members of their respective industry bodies, the Brewers Association of Japan and the Japan Soft Drink Association, providing support for activities in this Program.



Main activities of the Beverage Industry Environment Beautification Association



Support for education
BIEBA grants awards to schools that are actively engaged in the education and practice of community beautification. It also produces and supplies community beautification education guides for teachers.

Standard "No Littering" logo



Littering prevention campaign
BIEBA places "No Littering" stickers on roadside signs and vending machines to call for the prevention of littering.



Institute for Packaging Innovation

The Institute for Packaging Innovation develops and evaluates technologies related to packaging lines and packaging and containers used in the Kirin Group's alcoholic and non-alcoholic beverages businesses. The Institute for Packaging Innovation engages in activities such as the in-house development of containers and packaging, as one of the few research laboratories of its scale owned by a global alcoholic beverage company. Based on the technologies it has accumulated over many years in areas such as glass bottles, cans, PET bottles, cardboard cartons, and other paper packaging, the Institute for Packaging Innovation utilizes AI technology, *kansei* (affective) engineering, and other technologies to provide the necessary technical assistance to bring products to market, and create technical "seeds" that enrich the lives of our customers and society through new containers and packaging.

The Institute is as well equipped as a small plant, with machinery to fill glass bottles and aluminum cans with beer, as well as equipment to attach labels to bottles.

We are also trying to solve problems related to plastics. We are working to develop technology that enables the stable recycling of plastic containers such as PET bottles. The number of times plastics can be recycled is limited because their quality generally deteriorates after repeated recycling owing to impurities. At Kirin, we are working to develop technologies for high-purity recycling and "chemical recycling" based on the chemical decomposition, purification, and repolymerization of PET bottles, as part of our aim to create a "society that continuously recycles plastics."



	Social value	Economic value
Smart-cut cartons	17% reduction in paper usage (compared to 2014) GHG 2,000 tonnes reduction	170 million yen reduction per year
Lighter PET bottle for the 2.0-liter	20% lighter(compared to 2014) GHG 3,850 tonnes reduction	160 million yen reduction per year
Lighter medium- size bottles	20% lighter GHG 1,000 tonnes reduction	30 million yen reduction per year

World-class container and packaging R&D capabilities

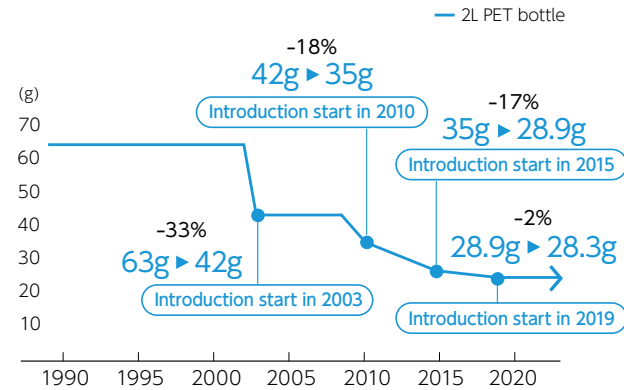


The packaging developed by the Institute for Packaging Innovation has received many prestigious awards around the world. Japan's lightest (returnable) medium-size beer bottle won the WorldStar Award in the 2018 WorldStar Packaging Awards Competition sponsored by the World Packaging Organization (WPO), while *Kirin Nama-cha Decaf* won this award at the 2020 WorldStar Packaging Awards Competition, and our New Thin Film Deposition Technology for PET bottles won it at the 2021 WorldStar Packaging Awards Competition.

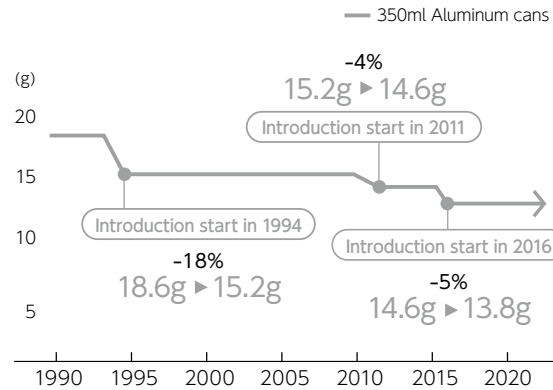
Graphs for Containers and Packaging

Related Information→P.98~P.99

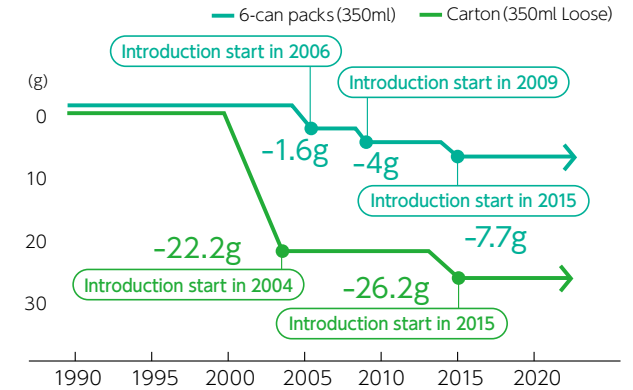
Change in weight of PET bottles (Kirin Alkali Ion Water 2L PET bottle)



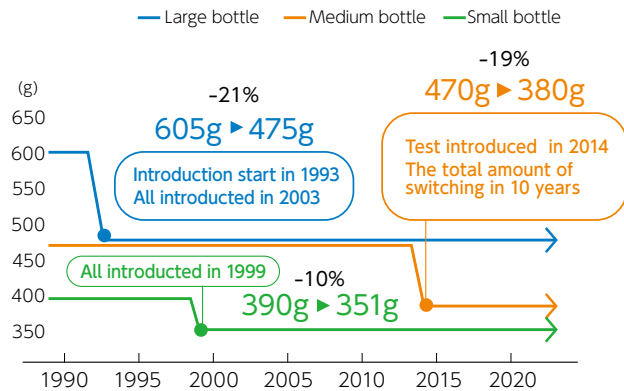
Can lighter transition



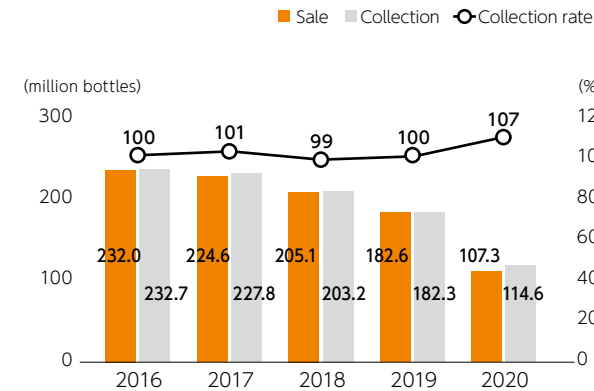
Trends in weight reduction of cartons and 6-can packs



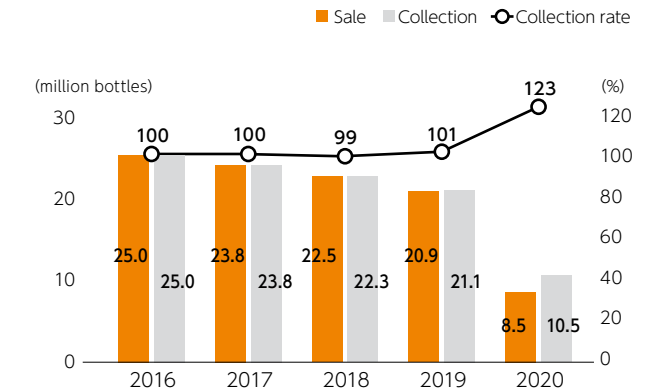
Returnable beer bottles lighter transition



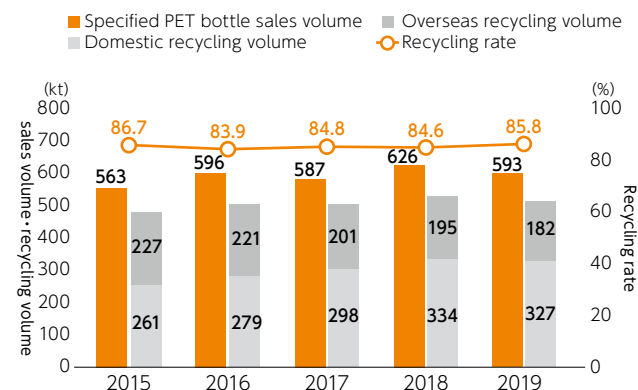
Kirin Brewery trends in sale and collection of returnable glass bottles



Kirin Beverage trends in sale and collection of returnable glass bottles

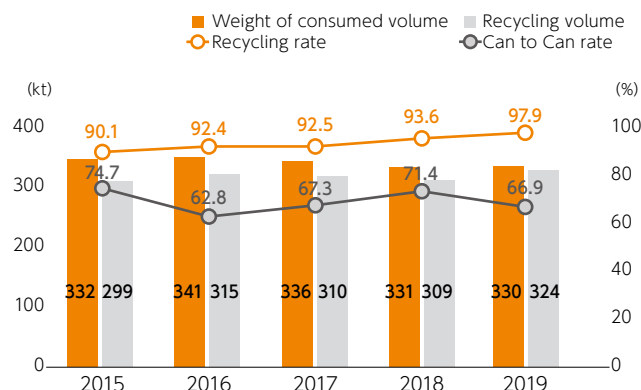


Rate of PET bottle recycling in Japan



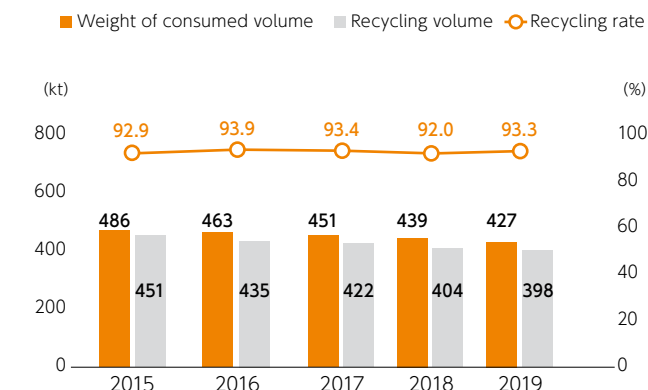
Source: The Council for PET Bottle Recycling

Rate of aluminum can recycling in Japan



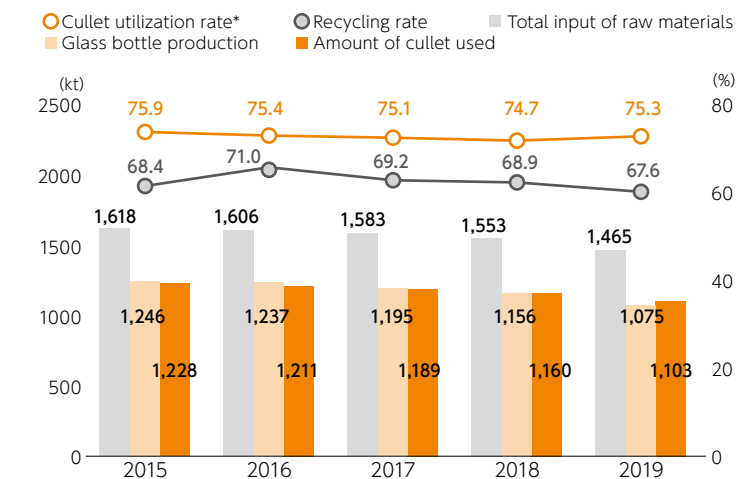
Source: Japan Aluminum Can Recycling Association

Rate of steel can recycling in Japan



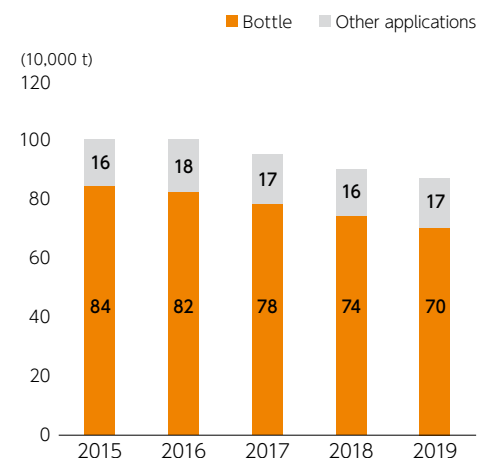
Source: Japan Steel Can Recycling Association

Glass bottle production and cullet utilization rate



* Cullet utilization rate = amount of cullet used / total input of raw materials
Source: Glass Bottle 3R Promotion Association

Cullet applications



Source: Glass Bottle 3R Promotion Association



Climate Change

Background to Initiatives

The Kirin Group has long been working to reduce GHG emissions. We have achieved significant reductions, having set an ambitious target of “reducing GHG emissions across the entire value chain by half from the 1990 level by 2050” in 2009. However, following the adoption of the Paris Agreement in 2015, the IPCC Special Report on Global Warming of 1.5° C in 2018, and other developments, society has embarked on a major move toward the creation of a decarbonized society, meaning that more ambitious GHG reduction targets are required. Scenario analysis, which the Kirin Group has been conducting since 2018, has revealed significant declines in the yields of major agricultural raw materials that are important for our businesses, as well as water risks and water stress at production sites and business sites. As such, there is pressure to implement further measures to combat climate change. Against this backdrop, the Kirin Group will accelerate efforts to lead the building of a decarbonized society, having declared our aim to achieve net zero GHG emissions by 2050 and shift to 100% renewable energy for all electricity used by 2040.

We will create together

A society that has overcome climate change

- ➡ Realize net zero GHG emissions across the entire value chain
- ➡ Lead to build a decarbonized society



Raw materials Containers

- P.63 ➡ Tea farms
- P.63 ➡ Regenerative agriculture
- P.63 ➡ In-house container manufacturing and weight reduction
- P.63 ➡ Ocean transportation in large bags

Production

- P.61 ➡ Heat pumps
- P.64 ➡ Fuel conversion
- P.64 ➡ Cogeneration
- P.64 ➡ High-efficiency production facilities

Distribution

- P.65 ➡ Modal shift
- P.65 ➡ Joint delivery
- P.65 ➡ Joint collection of beer pallets
- P.66 ➡ Improving loading efficiency
- P.66 ➡ Vendor-managed warehouse

Sale

- P.67 ➡ Vending machines
- P.67 ➡ Year-month labeling for production dates

A decarbonized society

- P.61 ➡ “SBT for 1.5°C” target
- P.62 ➡ Joined RE100
- P.68 ➡ Renewable energy
- P.68 ➡ Carbon zero certified beer
- P.69 ➡ Carbon neutral certification in Australia
- P.70 ➡ Policy recommendations
- P.69 ➡ Kirin Group engineering

Points

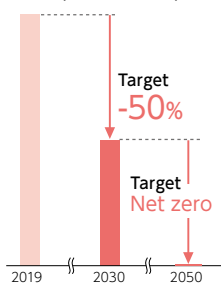
- Having obtained approval for the “SBT for 1.5° C” target, raised our target for reducing GHG emissions to 50% across Scope 1 + 2, and 30% for Scope 3 (both by 2030, compared with 2019).
- Joined RE100 and set a target for the proportion of renewable energy in electric power used (100% by 2040).
- Reduced Kirin Brewery GHG emissions by 2% from the previous year by introducing heat pump systems.
- Moved to renewable energy for 100% of electric power purchased at Kirin Brewery's Nagoya Plant. Utilized electric power from large-scale solar power generation thanks to the introduction of a PPA model at four domestic plants.

Overview of initiatives

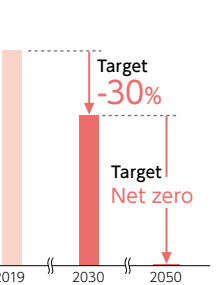
Initiative	Issue	Progress
Initiatives to achieve our vision	Reduction of GHG emissions	Acquired approval for “SBT for 1.5° C” target. We raised our targets for reducing GHG emissions to 50% across Scope 1 + 2, and 30% for Scope 3 (by 2030, compared with 2019).
	Renewable energy	Joined RE100 and declared our aim of using renewable energy for 100% of electric power by 2040.
	Energy conservation	Began introducing heat pump systems at wastewater treatment facilities in 2019.
Realize net zero GHG emissions across the entire value chain	Hydro-electric power	Began using hydro-electric power at the Kyowa Kirin Takasaki Plant in 2020, in a first for the pharmaceuticals production business. Completed installation at the Kirin Brewery's Toride Plant and the Kirin Beverage Shonan Plant in 2017.
	Solar power generation	Utilized electric power from large-scale solar power generation thanks to the introduction of a PPA model at four domestic plants in 2021.
	Renewable energy certificates	Utilized electric power with environmental value (non-fossil fuel energy certificates with tracking information) and moved 100% of electric power purchased to renewable energy at the Kirin Brewery's Nagoya Plant. Introduced renewable energy certificates (I REC) at Kyowa Hakkō Bio's Thai site, with the aim of reducing GHG emissions from electricity by approximately 25%.
Lead to build a decarbonized society	Reinforcing resilience in the upstream portion of the value chain	Prevented soil outflows from torrential rain by supporting the acquisition of Rainforest Alliance Certification by Sri Lankan tea farms.
	Green recovery declaration	Signed the “Business Ambition for 1.5° C” and “Uniting Business and Governments to Recover Better.” Consented to “Making Japan a Nation where Renewable Energy is Easily Accessed: Three Strategies and Nine Policies Sought By Corporations Engaged in Climate Action.”
	Engagement with the next generation	Supported the Decarbonization Challenge Cup. Rolled out an environmental mark program.

Target

Total emissions targets for Scope 1 and Scope 2*



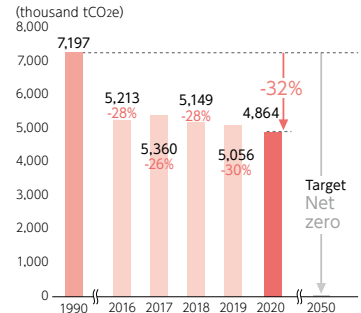
Scope 3 emissions target*



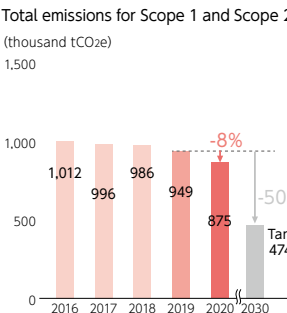
* In December 2020, we upgraded our previous “SBT for 2°C” target, and received approval for our “SBT for 1.5°C” target.

Progress

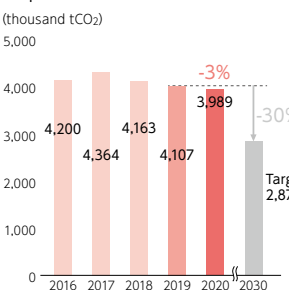
GHG emissions across the whole value chain



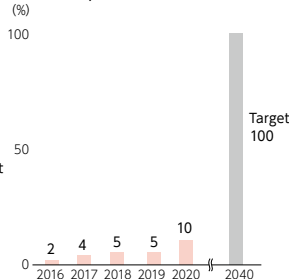
Progress towards medium-term GHG emissions reduction targets



Scope 3 emissions



Progress toward the target for increased use of renewable energy
Proportion of renewable energy in electricity used



1996

Began installing biogas boilers at breweries.

2002

Began introducing biogas cogeneration facilities at breweries.

2004

Began converting fuel used at breweries from heavy oil to city gas.

2006

Kirin Beverage was selected as an “Eco-Rail” mark-certified company. Kirin Brewery sponsored a “wind power generation project” in Yokohama City. Began introducing heat pumps for Kirin Beverage vending machines.

2007

Completed fuel conversion at Kirin Brewery.

2009

Announced Action Plans for Becoming a Low-Carbon Corporate Group, and declared aim to halve GHG emissions by 2050 compared with 1990.

2010

Kirin Brewery was selected as an “Eco-Rail” mark-certified company.

2017

Obtained approval for “SBT for 2° C” target.

2019

Introduced a heat pump at Kirin Brewery's Okayama Plant.

2020

Declared aim to achieve net zero emissions by 2050 in the Kirin Group Environmental Vision 2050. Joined RE100 and declared our aim of using renewable energy for 100% of electric power by 2040. Obtained approval for “SBT for 1.5° C” target.

2021

Moved to renewable energy for 100% of electric power purchased at Kirin Brewery's Nagoya Plant. Began utilizing electric power from large-scale solar power generation thanks to the introduction of a PPA model at four domestic plants.



“SBT for 1.5°C” target: Aiming for the world’s most advanced energy system

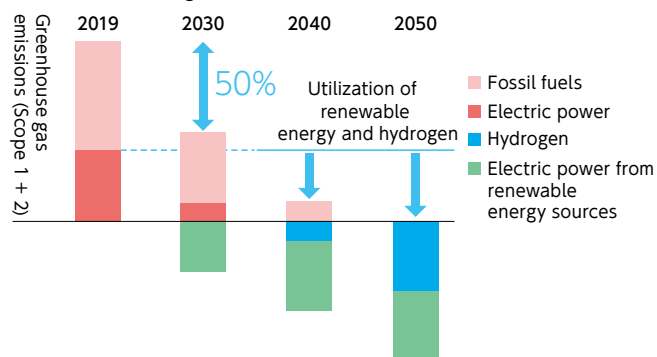
■ Upgraded from “SBT for 2°C” target to “SBT for 1.5°C” target

As a mid-term target for the reduction of GHGs, in November 2020, the Kirin Group obtained approval from the international SBT initiative (SBTi) for a target under the new standards for an “SBT for 1.5°C.” The “SBT for 1.5°C” target has been developed in order to prevent irreversible global climate change. It is a science-based target (SBT) aimed at limiting the increase in the global average temperature to 1.5°C, compared with levels prior to the industrial revolution. The Kirin Group was the first Japan food company to obtain approval for an “SBT for 2°C” target under the former standards in 2017. Now, we are the first Japanese food company to obtain an upgrade from an “SBT for 2°C” target to an “SBT for 1.5°C” target.

Although large-scale investment will be required to achieve this goal, the Kirin Group aims to implement measures to combat climate change that will be profit and loss neutral over the medium- to long-term, by introducing renewable energy, using the energy cost reduction benefits of energy conservation investments throughout the Group as funds.



Method of reducing GHG emissions



■ Use of heat pumps in production processes

At five Kirin Brewery plants, we introduced heat pump systems for wastewater treatment facilities in 2019, thereby reducing GHG emissions by 2% (approximately 3,400 tons) from the previous year across Kirin Brewery as a whole. We will disseminate the knowledge gained through these efforts to each Group company as soon as possible to maximize the effects. Kirin Brewery has successfully reduced its GHG emissions by approximately 70% over the 25 years from 1990 to 2015, thanks to its leading technological capabilities in the global beer industry. Kirin Brewery is now taking on the challenge of applying even more technological innovations to achieve the Kirin Group’s GHG emission reduction target (Scope 1+2, 50% reduction by 2030 compared to 2019 levels).

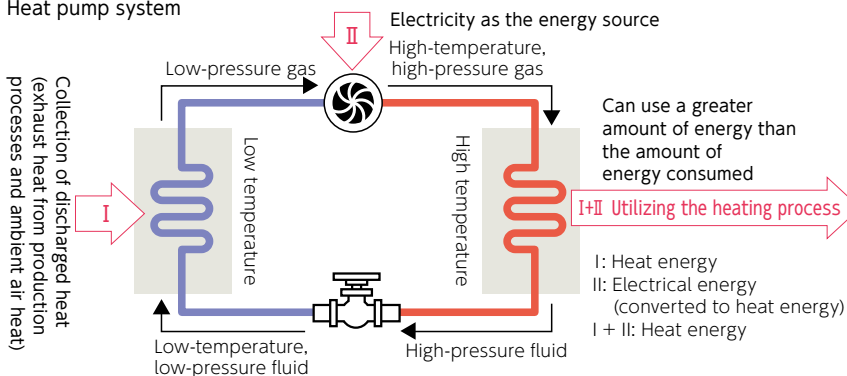
As a means to achieve this, Kirin Brewery is aiming to shift its energy sources from fossil fuels to electric power. Kirin Brewery currently uses both electric power and fossil fuels as energy sources at breweries. Comparatively, the largest amount of GHG emissions comes from fossil fuels, which we use to generate heat. Therefore, in order to reduce GHG emissions, we need to improve energy efficiency and reduce the amount of energy consumption. At the same time, we believe that shifting the energy mix to electric power, and, furthermore, using electricity generated by renewable energy sources are the most effective ways of reducing GHG emissions.

Heat pump systems are a key technology for reducing GHG emissions. We have been able to both save energy and shift to electric power by installing heat pump systems. Simply installing equipment, however, will not necessarily produce results. Before installation, it is essential to analyze the entire heat flow of the production process and optimize it through advanced designs. The Kirin Group has accumulated leading engineering technologies, and Kirin Brewery made use of that experience while aiming to put in place a production system that realizes the world’s lowest amount of GHG emissions.

We have begun introducing heat pumps at wastewater treatment plants. We treat wastewater with microorganisms, and keep the temperature of wastewater constant in order to maintain the activity of microorganisms. In the past, we used steam for heating in winter when the water temperature was low, and released the water in a warm condition after microorganism treatment. By introducing a heat pump system, we can recover waste heat from discharging water and reuse the heat in the heating process before the microorganism treatment. This initiative enables us to eliminate the use of steam, contributing to a reduction in GHG emissions. In the future, we will expand the use of heat pumps in other processes such as cleaning and sterilization.

The Kirin Group will continue leveraging its technological strengths to take on the challenge of creating the world’s best energy system.

Heat pump system



Heat pump at the Okayama Brewery



RE100: Aiming for 100% of electric power used to come from renewable energy

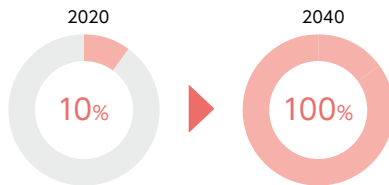
■Joining RE100 and 100% of electric power used to come from renewable energy

In November 2020, Kirin Holdings joined "RE100," an international environmental initiative consisting of companies aiming to use renewable energy for 100% of their electric power. At the same time, we announced that we would aim to increase the proportion of renewable energy in electric power used to 100% by 2040.

RE100

We are actively promoting specific initiatives such as moving to 100% renewable energy for all purchased electric power at the Kirin Brewery's Nagoya Plant, the use of solar power via a PPA model at four breweries in Japan, and the use of hydro-electric power.

Kirin Group ratio of renewable energy in power used



■100% renewable energy for all electric power purchased at Kirin Brewery's Nagoya Plant

In the summer of 2021, Kirin Brewery's Nagoya Plant will move to 100% renewable energy for all electric power purchased, marking our first step toward achieving RE100. With this move, GHG emissions from purchased electric power will be zero, and we expect to reduce GHG emissions by 7,400 tons per year. We will achieve this by purchasing power with environmental value (non-fossil fuel energy certificates with tracking information) generated at a renewable energy power plant (solar power generation) financed and operated by Mitsubishi Corporation Energy Solutions Ltd.

■Solar power generation using PPA model at four breweries in Japan

At Kirin Brewery's Sendai, Nagoya, Shiga, and Kobe Plants (four plants) we began introducing solar power generation based on the PPA (Power Purchase Agreement) model in 2021. As a result, Kirin Brewery will be able to reduce its GHG emissions by approximately 4,500 tons per year and increase the ratio of renewable energy from solar power across Kirin Brewery as a whole to approximately 22% from approximately 18%. MCKB Energy Service Co., Ltd., a subsidiary of Mitsubishi Corporation Energy Solutions Ltd., will act as a PPA provider, installing megawatt-class solar power generation facilities on the roofs of the four breweries, while Kirin Brewery will purchase and use the power generated.

Status of installation of solar power generation facilities→P.68



Nagoya Brewery



Shiga Brewery



Kobe Brewery



Sendai Brewery

■Hydro-electric power generation

Since April 2017, Kirin Brewery's Toride Plant and Kirin Beverage's Shonan Plant started using GHG-free hydro-electric power in a portion of purchased power. The plants are taking advantage of Aqua Premium, the Japan-first option offered by TEPCO Energy Partner to supply only hydroelectric power. By using hydro-electric power, which does not emit GHGs at the time of power generation, they will contribute to global warming countermeasures. This is the first example of the use of this option by any plant in Japan, not just in the food and beverages industry.

In January 2020, Kyowa Kirin's Takasaki Plant began using GHG-free hydro-electric power, for the first time in the pharmaceuticals production business.

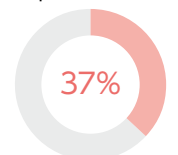


Kirin Beverage Shonan Plant

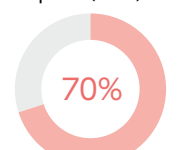


Kirin Brewery Toride Plant

Ratio of hydro-electric power(2020)



Ratio of hydro-electric power(2020)



Raw materials

Measures for adapting to climate change at tea farms

In training programs for Rainforest Alliance Certification at Sri Lankan tea farms, the Kirin Group is providing directions on how to prevent the runoff of fertile soil from rain erosion by planting grasses whose roots sink deep into the soil and that crawl the ground on slopes. The results of scenario analysis show that the effects of climate change increase water risks and water stress in many countries and regions producing agricultural products. In Sri Lanka, in recent years, they have unusual heavy rainfall in the rainy season more frequently due to the effects of climate change. In the key tea production region of Uva Province, many human lives were lost due to landslides. This initiative contributes to the prevention of landslide disasters caused by heavy rainfall, serving as a measure for adapting to the problem of climate change. We are implementing measures to adapt in the upstream portion of their value chain, such as training to increase water retention in fields in response to drought caused by climate change in Vietnamese coffee farms.



Regenerative agriculture carbon offsets

New Belgium Brewing, a Kirin Group company, purchases regenerative agriculture carbon offsets, thereby providing incentives and financial support for producers to move from traditional to regenerative agricultural methods. By shifting to regenerative agriculture, we can create healthy soil and reduce farm emissions by isolating large amounts of carbon dioxide in the soil.

Containers

In-house production of PET bottles

Kirin Beverage introduced Japan's first in-line PET blowing aseptic filling machine at Nagano Tomato (currently Shinshu Beverage) in 1997, and subsequently installed a high speed in-line PET blowing aseptic filling machine at the Shonan Plant in 2000.

In the past, we purchased empty PET bottles from container manufacturers and shipped them to plants where we filled them with beverages, to make final products. With an in-line blow aseptic filling machine, we mold PET bottle containers from a material called preform in the production process of the plant and filled under aseptic conditions. Installation consequently contributes greatly to reducing CO₂ emissions as using preforms allows us to process greater loads on trucks compared to transporting empty PET bottles.

In 2003, we installed preform molding equipment on the beverage production line at Kirin Distillery ahead of other players in the industry.

Reducing the weight of containers

Between 1990 and 2020, Kirin Brewery and Kirin Beverage reduced CO₂ emissions from container manufacturing by a total of 4.51 million tonnes* by reducing the weight of containers and packaging. Making containers lighter leads to reducing CO₂ emissions in the manufacturing process of containers and packaging and improving loading efficiency, which leads to reduction of CO₂ emissions.

* Calculated based on the Carbon Footprint Product Category Rule (Certified CFP-PCR Number: PA-BV-02) applied to the actual container usage of Kirin Brewery and Kirin Beverage from 1990 to 2020.

Ocean transportation in large bags and bottling in Japan

Mercian ships some of the wine it imports via ocean transportation in specially designed, large 24 kl bags (equivalent to about 32,000 750 ml bottles) with low oxygen permeability, and bottles the wine in Japan.

Compared to importing bottled wine, this method lets Mercian reduce CO₂ emissions during ocean transport by roughly 60% because it eliminates the need to transport heavy bottles by sea, although it increases the amount of CO₂ emissions from the company's plants in Japan owing to bottling in Japan. Bottling wine in Japan allows us to use Ecology Bottles (made with at least 90% recycled glass), lightweight bottles, and PET bottles, which contribute to making effective use of resources and reducing CO₂ emissions significantly across the value chain as a whole.



Specially designed large bags

Production

Fuel shift and cogeneration

A significant proportion of the fuel we use at breweries is used in the boilers that generate steam. At all Kirin Brewery and Kirin Beverage plants, we have completed the shift to natural gas, which generates less CO₂ than heavy oil. We have achieved more efficient boiler operations through the installation of highly efficient small boilers in line with the fuel shift. We have introduced cogeneration systems to provide some of the plants' heat and electricity.



Cogeneration

Refrigeration systems

At Kirin Brewery, we reduce energy consumption through improving the efficiency of refrigerating systems. We are introducing a cascade refrigeration system, which cools in phases in a process that involves a considerable temperature difference, and making operational improvements.

Wastewater biogas

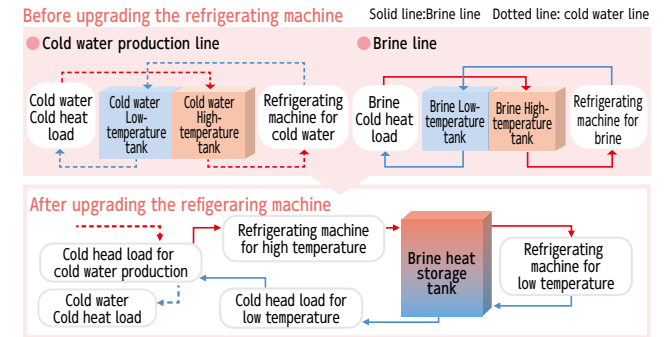
In our beer breweries, we make use of biogas generated as a by-product of anaerobic treatment facilities in boilers and other equipment.

[For details→P.43](#)

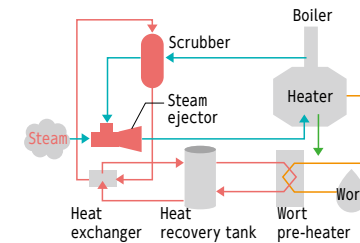
Construction of highly efficient production facilities at Myanmar Brewery

To meet skyrocketing demand, Myanmar Brewery has made major expansions at its brewing and filling facilities. Its high-efficiency 100,000 kl line started operation in the beginning of 2018. Kirin Holdings has allocated skilled engineers to the Myanmar business. They collaborate with Kirin Engineering, one of our group companies, which provides engineering services to the food industry and has a good reputation for its high quality of work such as entire design of new facilities, selection of equipment, installation, and tuning. Kirin Holdings utilizes this engineering experience and expertise to support Myanmar Brewery. Currently, with the rapid economic development in Myanmar, there are concerns about tightening of the energy supply-demand balance in the future. Contributing to solve this social issue, we are reducing energy consumption in our production processes by taking advantage of the Japanese Government's Joint Crediting Mechanism (JCM) financial assistance scheme to introduce the latest energy-saving equipment with a track record in the domestic business. In March 2020, we began operating biogas boilers.

Improving the efficiency of refrigeration systems



Installed energy-saving equipment



Wort pre-heating system
Recovery of steam generated at the time of boiling wort and use as heat source

Vapor re-compression system
Use of steam ejector

Reduction of steam used in the wort boiling process by half

Distribution

Modal shift

The Kirin Group is actively pursuing a modal shift of switching from truck transport to rail and ocean transport, which has lower CO₂ emissions, for long-distance shipments (400 to 500 km or more). Although truck transport is efficient when transporting various types of beverages over a relatively short distance to the warehouses of our business partners, rail transport causes lower CO₂ emissions over long-distance shipments. We have developed special cartons (registered as a utility model) that are less likely to rub together during long-distance rail transport. These are just some of the initiatives we are continuing to take in pursuing a modal shift as we work to reduce CO₂ emissions and maintain and improve quality during shipping at the same time.

Joint delivery

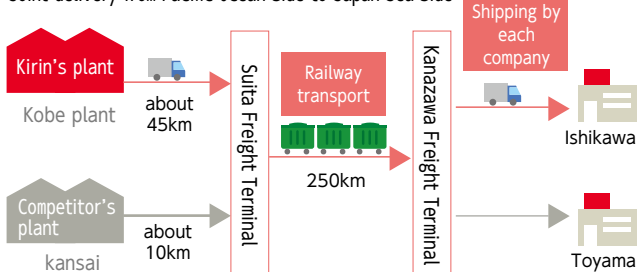
The Kirin Group has positioned the logistics area as a non-competitive sector and is actively engaging in initiatives together with other companies in this area.

In 2017, together with other companies in the industry, we established a joint delivery center in Kanazawa City, Ishikawa Prefecture, and launched joint transport by rail container from plants in the Kansai area. Neither of the companies has plants on the Japan Sea side, so products previously had to be transported by truck over long distances—of 200 km—from their plants on the Pacific Ocean side. This was inefficient and placed a great burden on the truck drivers. Joint transportation using rail containers has not only significantly reduced CO₂ emissions but shortened distances between the plants and the terminals and between the terminals and the destinations with a significant alleviation of the burden on drivers, which is helping to solve the social issue of a shortage in truck drivers. Through these efforts, we have successfully completed a modal shift from long-distance truck transportation, equivalent to 10,000 vehicles a year, to railway containers, and we estimate that we can thus annually reduce CO₂ emissions by approximately 2,700 tons.

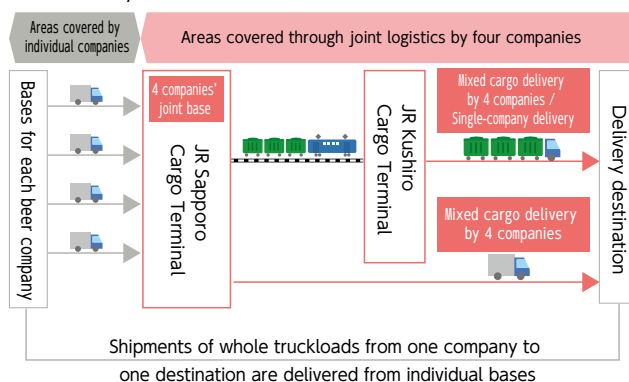
In September 2017, we began joint delivery in the eastern Hokkaido area. As a result of these efforts, we are effectively utilizing railway containers and have enhanced truck loading efficiency, leading to more efficient logistics. We estimate that this results in a reduction in annual CO₂ emissions of approximately 330 tons.*

* Contribution to Avoided Emissions through the Global Value Chain, Third Edition, Keidanren (Japan Business Foundation)

Joint delivery from Pacific Ocean side to Japan Sea side



Joint delivery in Hokkaido

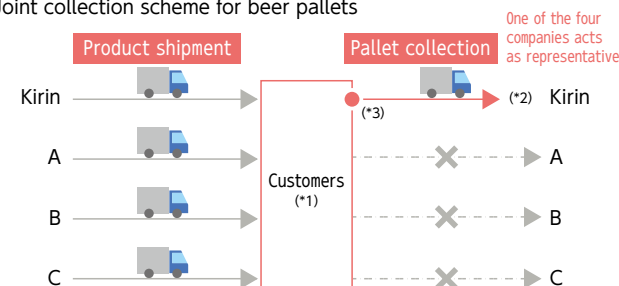


Joint collection of beer pallets

In a joint initiative by the Japan's four major breweries, we are expanding the joint collection of beer pallets. We began the joint collection of beer pallets in the Tohoku area in November 2018. From July 2019, we expanded the initiative to the Tokyo metropolitan, Tokai, and Kyushu areas, before deploying it nationwide from November 2019. Thanks to these efforts, it is estimated that in total, the four brewers have reduced annual CO₂ emissions by 5,158 tons of CO₂ (a reduction of approximately 37% compared with former methods),* by improving the loading ratio of collection vehicles and shortening distances to collection.

* Contribution to Avoided Emissions through the Global Value Chain, Third Edition, Keidanren (Japan Business Foundation)

Joint collection scheme for beer pallets



*1 Restricted to customers that have dealings with multiple companies and a transaction scale of at least a certain level (total of around 10,000 beer pallets a year from members of the Association for Joint Use of Beer Pallets)

*2 One company will represent the four beer companies and collect the pallets. None of the other companies will collect them.

*3 The representative will tally up the pallets of the four beer companies and manage the collection with the customer.

Improving loading efficiency

Using a truck allocation system that has master data for the precise loading capacities of each truck, the Kirin Group is working to transport our products with the most efficient combinations of trucks and cargo. Kirin Beverage compensated for reduction in capacity for large carbonated drink containers (1.5 L) by changing the shape of the "shoulders" of bottles and changing the diameter of PET bottles bodies from 92.5 mm to 89.5 mm. This means that the number of cases loaded on one pallet has been increased from 40 (10 cases x 4 stacks) to 60 (15 cases x 4 stacks), improving the loading efficiency by a factor of 1.5.

* Calculated based on the results of shipments of large carbonated drink containers in 2016.



Vendor-managed warehouse

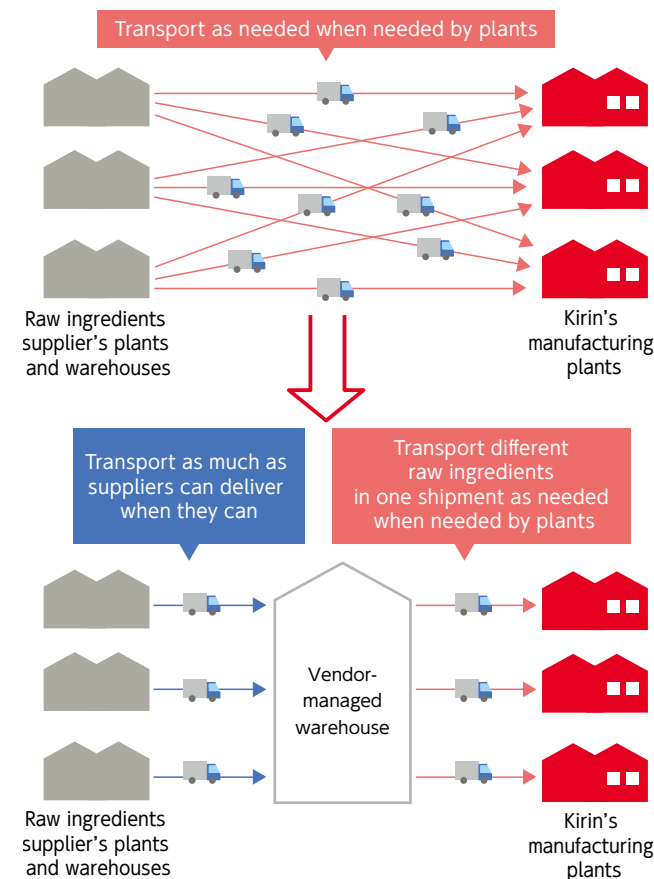
The soft drinks sold by Kirin Beverage are produced at plants throughout Japan, and they cover a wide range of beverages, including tea, coffee, carbonated drinks, and sports drinks. Because raw ingredient production plants and warehouses are extremely limited in number in contrast to product manufacturing plants, long distance shipments are increasing. Since we transport raw ingredients when necessary, and in the amounts necessary, in accordance with the production plans of product manufacturing plants, even small amounts of raw ingredients are transported over a long distance, which was becoming an inefficient practice. 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 a raw materials procurement and distribution system using a raw materials warehouse (vendor-managed warehouse) adjacent to Kirin Beverage's in-house plants, the Shonan Plant and Shiga Plant, from October 2019. By establishing this facility as a vendor-managed warehouse, raw ingredient suppliers can transport the desired amount of raw ingredients when they need to, thereby maximizing efficiency. This has made it easier to cope with sudden changes in production plans, and contributed greatly to improving the responsiveness of plants.

Based on the results of this trial, in April 2020, we increased the number of applicable raw ingredients to more than 200 types at 20 plants nationwide, including subcontracted plants, and the system is in full operation. Given full-scale operation, we have estimated that we are able to reduce GHG emissions by at least 1,000 tonnes per year (reduction rate of approximately 80%) and cut the number of long-distance*¹ transport trucks by at least 4,000 vehicles (reduction rate of approximately 63%).*²

*¹ Defined as 100 km or more

*² Estimated based on the raw ingredient transportation results in 2017, only for raw ingredients that are assumed to make use of vendor-managed warehouses.

Efforts to improve the efficiency of raw ingredient transportation by using vendor-managed warehouse



Vending machines

Kirin Beverage was the first in the industry to introduce heat pump-style vending machines in 2006, and from 2012, almost all newly installed vending machines for cans and PET bottles are of this type. As of April 2021, we have switched more than 85% of installed vending machines to this type.

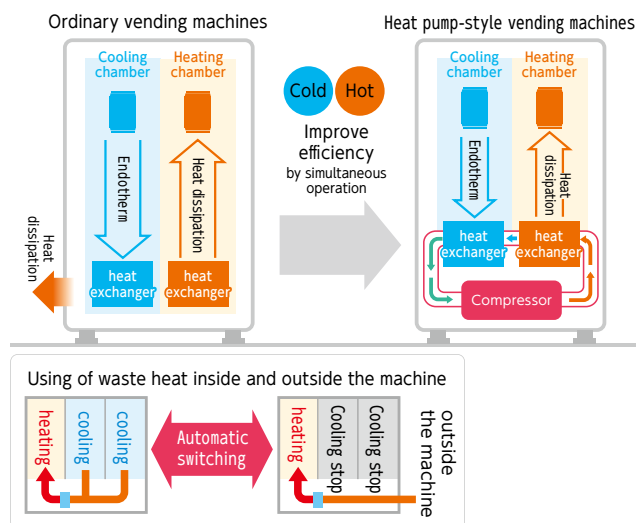
Heat pump-style vending machines pump up the waste heat generated when cooling products and use it for heating to warm up the products. This allows reduction in power consumption compared to conventional vending machines by cutting down the power used by the heaters.

The latest heat pump-style vending machines are equipped with a compressor that uses an inverter to delicately control the operation (variable speed of rotation) according to the atmospheric temperature and the temperature of the products in the machine. Some types offer higher energy-saving performance, such as with heating functions not only by using the waste heat released by the cooling chamber as previous models did, but by capturing the heat from outside the machine, and by improving hot and cold insulation performance with the heavy use of vacuum insulation materials. These vending machines have evolved to the point where power consumption can be reduced by about 40% compared to 2013. Installation of the new models began in 2015, and we are aiming for 80% of the new machines we install in 2021 to be new models.

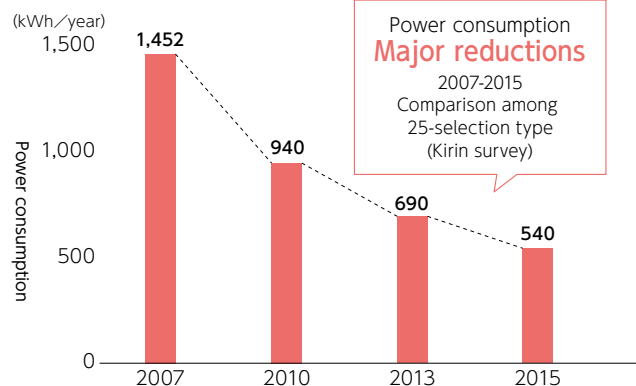
With regard to lighting, we are replacing conventional fluorescent lighting with LED lighting, which conserves more energy.



About heat pump



Trend in power consumption



Change to the best-before labeling

Since 2013, Kirin Beverage has been working to shift to labeling the “year and month” as the best before date on soft drinks.

Kirin Brewery has changed its labeling of production dates on cans and bottles of beer, low-malt beer, no-malt beer products, and non-alcoholic beer-taste beverage from the former “year, month and early/middle/late month” to “year and month” for products from October 1, 2020 onwards.

We expect that this change in labeling will contribute to alleviating the need for managing products based on periods of “one-third of a month,” streamlining store display operations at distributors, and reducing operational loads associated with in-house inventory management and shipping operations, thereby increasing efficiency across the supply chain and significantly reducing product waste losses.

More information on measures to reduce food waste→P.36



SPRING VALLEY BREWERY TOKYO

PRING VALLEY BREWERY TOKYO is an all-day dining establishment with a brewery that we opened in Log Road Daikanyama in April 2015, where patrons can enjoy craft beer made on premises. 100% of the restaurant's electricity needs are met by green power using Green Power Certificates issued by the Yokohama City Wind Power Generation Project.



SPRING VALLEY BREWERY TOKYO, where patrons can enjoy craft beer

Renewable energy

Other solar power generation

Production plants, including those of Kirin Brewery and Kirin Beverage, have installed solar-power generation equipment in their plant tour facilities and other locations. As part of the Kanagawa Prefectural Government's Thin-Film Solar Cell Promotion and Expansion Project, Kirin Brewery's Yokohama Plant installed a thin-film solar cell in 2016. Kyowa Hakko Bio and Shinshu Beverage have leased parts of their premises and building roofs to companies that build large-scale solar power generation facilities, contributing both to effective use of company assets and to the dissemination of natural energy.



Yokohama plant



Kyowa Hakko Bio



Yokohama City Wind Power Plant (Hama Wing)

Wind power

The Kirin Group has been sponsoring the Yokohama City Wind Power Generation Project, which Yokohama City promotes using the Green Power Certification System, as a Y (Yokohama)-Green Partner since 2007, as part of our support for the promotion of the use of natural energy. So far, the power generated by this project has been used by Kokoniwa, the communication space at Group Head Office, SPRING VALLEY BREWERY TOKYO, and the Earth Hour hosted by WWF.

Renewable energy certificates

Since 2021, Kyowa Hakko Bio has introduced "Renewable Energy Certificates (I-REC)" at Thai Kyowa Biotechnologies in Thailand. This marks the first adoption of these certificates in the pharmaceutical and food industries in Thailand, and enables GHG emissions associated with the use of electric power to be reduced by approximately 25% (equivalent to a reduction in annual GHG emissions of 5,300 tons), thanks to the use of renewable energy sources for some of the electricity used in the plant. In anticipation of growing global demand for Human Milk Oligosaccharide (HMO) for powdered milk, we are building a new production facility at the Rayong Plant, which we plan to bring online in the summer of 2022. By introducing this renewable energy certificate, we are aiming to achieve business growth while reducing the environmental impact.

At Kyowa Kirin's Tokyo Research Park, as a "Designated Global Warming Prevention Facility" based on the Tokyo Metropolitan Ordinance on Environmental Preservation, we achieved significant additional reductions in emissions (equivalent to 3,736 tons of CO₂) by exceeding the mandatory reductions for the first and second plan periods, and provided these reductions as credits under the "Tokyo 2020 Carbon Offset Programme," as part of our support for the achievement of "four days of zero carbon emissions in 2020." We have begun introducing the Green Heat Certificate at Kirin Brewery's Kobe Plant, which is equivalent to the heat consumption of fossil fuel, and the Green Power Certificate at Château Mercian, which is equivalent to all electricity consumption.



Thai Kyowa Biotechnologies

New Zealand's first carbon zero certified beer

Kiwi Pale Ale, which Lion produces under its sustainable beer brand, The Fermentist, became New Zealand's first carbon zero certified beer in 2019. In 2020, *Steinlager*, which Lion brews in the suburbs of Auckland, also obtained carbon zero certification. *Steinlager* accounts for about 10% of New Zealand's entire beer market, and is the most exported beer from New Zealand. To obtain this certification, Lion focused on reducing CO₂ emissions across the *Steinlager* product life cycle (from the cultivation of hops and barley, to the brewing of beer, to packaging and transportation). Lion took the approach of assessing and reducing the beer's carbon footprint and then offsetting any remaining footprint that could not be reduced. The offsets purchased are supporting native forest restoration in the Hinewai Reserve on the Banks Peninsula on the east coast of New Zealand's South Island.



Lion initiatives

Lion announced that it became Australia's first large-scale carbon neutral certified brewer in May 2020.

Lion has announced its commitment to source 100% of the electric power required to brew beer from renewable energy by 2025. To help achieve the Kirin Group's "SBT for 1.5°C" target, Lion increased its targets for reducing direct GHG emissions (Scopes 1 and 2) to an ambitious target of a 55% reduction by 2030 compared with the 2019 level.

Lion assesses its response to climate change using three key metrics: the reduction of direct emissions, increases in energy efficiency, and the use of renewable electricity.

First, to reduce dependence on natural gas, Lion is promoting the use of biogas derived from the anaerobic treatment of wastewater at breweries.

In addition to installing a solar photovoltaic system in 2019 at

Castlemaine Perkins Brewery, a brewery for the leading beer in Brisbane, Queensland, XXXX Gold beer, the company installed a solar photovoltaic system in 2020 at Little Creatures Geelong in Victoria. With a rated output of 650 kW, the system is expected to reduce Little Creatures Geelong's CO₂ emissions by 955 tonnes per year (25% of CO₂ emissions from electricity used).

In addition to continuing to invest in highly energy-efficient facilities, Lion is continuing to explore the possibility of using contracts based on a PPA model, which Lion uses to purchase renewable energy in New South Wales, in other states.



Acquisition of carbon neutral certification in Australia and New Zealand



Lion Little Creatures Geelong brewery

TOPICS

Kirin Group engineering

As a manufacturer, production equipment is an essential part of our business, and it is vital that we possess the engineering capabilities to quickly develop facilities that are capable of efficiently producing quality products while being eco-friendly and comfortable for our workers. The Kirin Group has set up engineering organizations within each operating company to ensure that our production facilities are supported by engineers with a thorough understanding of manufacturing processes, production technology, and maintenance techniques. The Kirin Group owns Kirin Engineering, a general engineering company specializing in the construction of plants producing beer, beverages, pharmaceuticals, and other products. This company is engaged in the large-scale construction, expansion, and remodeling of production facilities for both for Kirin Group companies in Japan and overseas and companies outside the Group. The capabilities of these engineering organizations are strengths of the Kirin Group, and support environmental measures of our business domains, ranging from food and beverages to pharmaceuticals.



Policy recommendations

Kirin Holdings signs the “Business Ambition for 1.5°C ” and “Uniting Business and Governments to Recover Better”

On June 24, 2020, the Kirin Group signed the “Business Ambition for 1.5° C” commitment letter jointly issued by three parties - United Nations Global Compact (UNGC), Science Based Targets initiative (SBTi) and We Mean Business—requesting companies to set targets that will limit the rise in global temperature to 1.5° C.

On the same day, we signed the “Uniting Business and Governments to Recover Better” statement, which makes requests of companies that have set SBTi targets or declared their intention to set SBTi targets. This is a declaration of our agreement to the statement calling for national governments to support activities such as the UNGC and SBTi, and maintain the current pace of climate change initiatives when considering economic aid in response to the recent COVID-19 pandemic.

There has been a growing trend, primarily in Western countries, toward a “green recovery,” in which measures to rebuild economies and societies damaged by the spread of COVID-19 do not cause the risk of the emergence of new infectious diseases or increase the spread of disease, but rather promote reconstruction in a sustainable and resilient manner while contributing to building a decarbonized society, a circular economy, and conserving ecosystems. As we face an age in which society and businesses are interrelated in a complex manner, it is necessary to overcome the simple dichotomy between the environment and the economy and aim for the sustainability of both society and businesses.

The Kirin Group has set forth the target of achieving net zero GHG emissions across the entire value chain by 2050. The aforesaid signatures are part of these efforts.

Kirin Holdings consents to “Making Japan a Nation where Renewable Energy is Easily Accessed: Three Strategies and Nine Policies Sought By Corporations Engaged in Climate Action”

On July 30, 2020, Kirin Holdings became a supporter of “Making Japan a Nation where Renewable Energy is Easily Accessed: Three Strategies and Nine Policies Sought By Corporations Engaged in Climate Action,” a recommendation by the RE-Users (Renewable Energy Users Network), which promotes the use of renewable energy mainly by companies. This recommendation was developed in January 2020 in cooperation with CDP Japan and WWF Japan based on the opinions of 20 large companies participating in the RE-Users. The RE-Users will communicate with the Japanese government and electric power companies to take measures to ensure that the country as a whole is able to promote the implementation and use of renewable energy, even in the face of the spread of COVID-19.

Participation in the “consortium for promoting the use of electric vehicles”

On May 1, 2020, the Kirin Group became a member company of “the consortium for promoting the use of electric vehicles” (hereinafter, the Consortium), which aims to promote the penetration of electric vehicles for business use. As climate change, which is considered to be a consequence of global warming, advances worldwide, specific measures are required to realize a decarbonized society. In light of this situation, there is anticipation for the use of electric vehicles as a measure to reduce GHG emissions in the transportation sector, which accounts for approximately 20% of emissions in Japan. On the other hand, there are some problems that cannot be solved by a single company in the implementation of electric vehicles for business use. The Consortium aims to promote the introduction and use of electric vehicles, solve social issues, and realize a sustainable society by having companies and organizations share issues and work together to solve them. By participating in the Consortium, the Kirin Group will study highly practical electric vehicles suitable for our business operations, share insights across industries, and promote initiatives to realize a sustainable society.

Interview in TCFD Guidance on Scenario Analysis

In the “Guidance on Scenario Analysis for Non-Financial Companies” published by the TCFD in October 2020, we expressed our opinions in an interview as one of 15 companies from around the world.

 https://assets.bbhub.io/company/sites/60/2020/09/2020-TCFD_Guidance-Scenario-Analysis-Guidance.pdf

Participation in the Review Committee of Sector-Specific Disclosure Guidance in the TCFD Consortium

On May 27, 2019, the Kirin Group became a founding member of the TCFD Consortium, which discusses effective corporate disclosure related to the Task Force on Climate-related Financial Disclosures (TCFD) and the ways in which disclosed information can be used to help financial institutions, etc., make appropriate investment decisions.

In 2020, we served as a member of the Review Committee of Sector-Specific Disclosure Guidance (food sector), the results of which were made public in the “Guidance on Climate-related Financial Disclosures 2.0 (TCFD Guidance 2.0)” published on July 31, 2020. At the TCFD Summit held on October 9, 2020 (organized by the Ministry of Economy, Trade and Industry and cosponsored by the WBCSD and the TCFD Consortium), an officer of Kirin Holdings overseeing related efforts participated in a panel discussion in response to requests.

Graphs Related to Climate Change Issues

Independent Assurance Report→P.116

Related Information→P.99~P.101

Value chain greenhouse gas emissions*

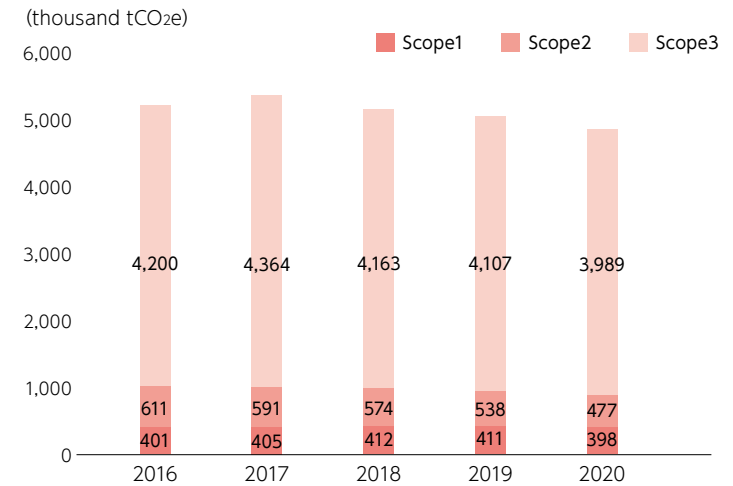
(Unit : tCO₂e)

	2016	2017	2018	2019	2020
Direct emissions from corporate activities (Scope 1 + Scope 2)	1,012,241	996,414	985,916	948,733	875,006
Scope 1 (Emissions from use of fuel)	401,081	405,005	411,747	410,875	398,216
Scope 2 (Emissions related to purchase of power and steam)	611,160	591,409	574,169	537,858	476,789
Indirect emissions (Scope 3)	4,200,483	4,363,666	4,163,408	4,106,863	3,988,639
Raw materials (Category 1)	2,682,791	2,628,183	2,444,176	2,334,076	2,308,001
Transport - Upstream (Category 4)	383,886	376,266	379,998	424,038	396,149
Transport - Downstream (Category 9)	832,989	995,389	981,069	1,002,583	958,298
Product use/disposal (Category 11, 12)	80,111	158,309	150,569	154,227	153,406
Other (Category 2, 3, 5, 6, 7, 8, 10, 13, 14, 15)	220,705	205,519	207,595	191,939	172,785
Emissions from entire value chain (Scope 1 + Scope 2 + Scope 3)	5,212,723	5,360,080	5,149,323	5,055,596	4,863,645

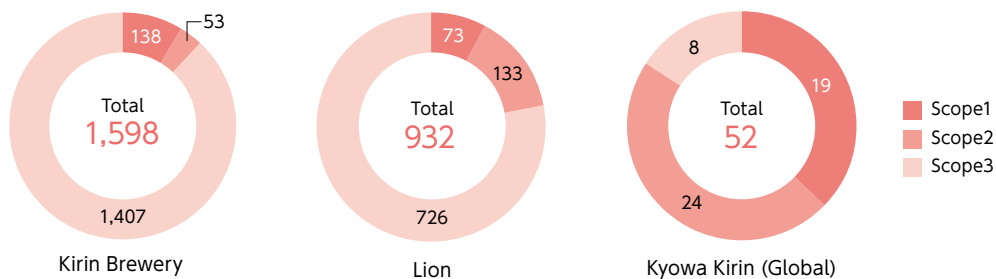
* The emissions are calculated in the same range as the target approved by SBTi.

Calculation boundaries→P.92

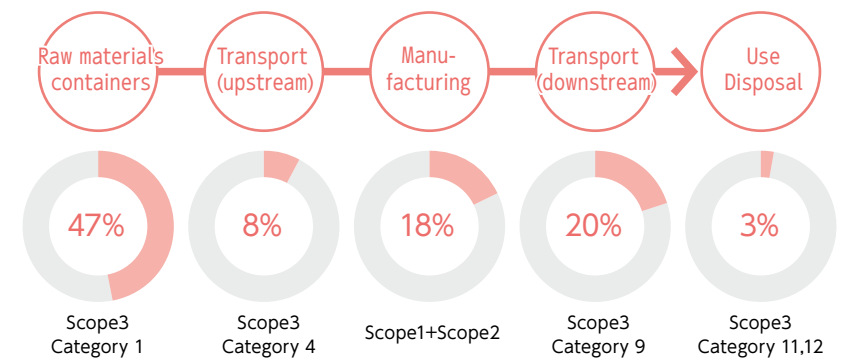
Trend in value chain greenhouse gas emissions



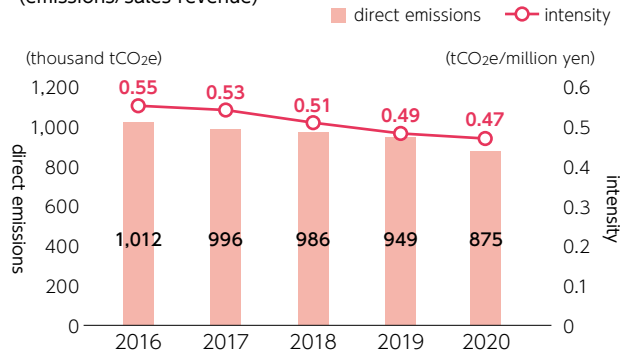
Greenhouse emissions by business (2020) (thousand tCO₂e)



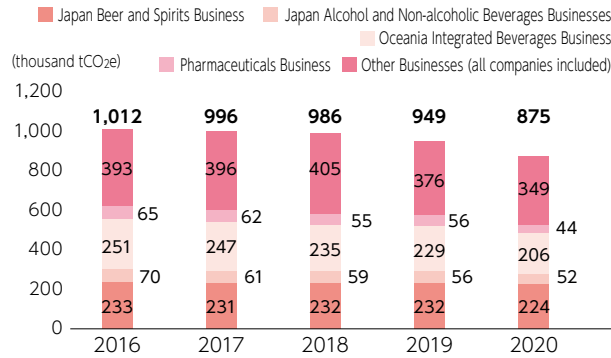
Ratios of greenhouse gas emissions in value chain



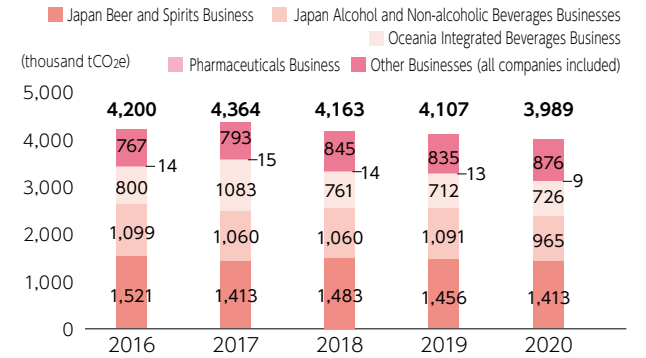
Total direct emissions (Scope 1+2) and intensity (emissions/sales revenue)



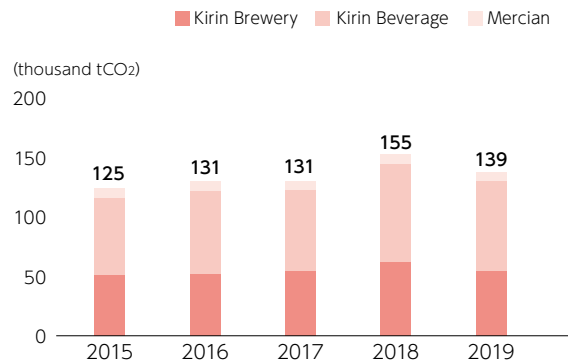
Kirin Group total direct emissions by business segment (Scope 1 + 2)



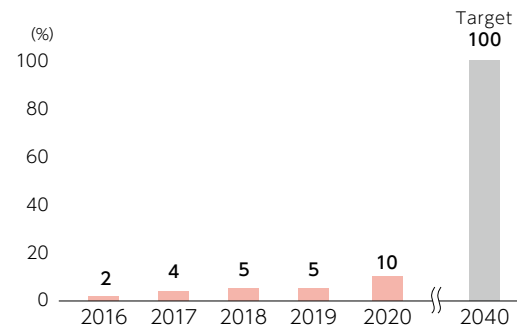
Kirin Group total Scope 3 emissions by business segment



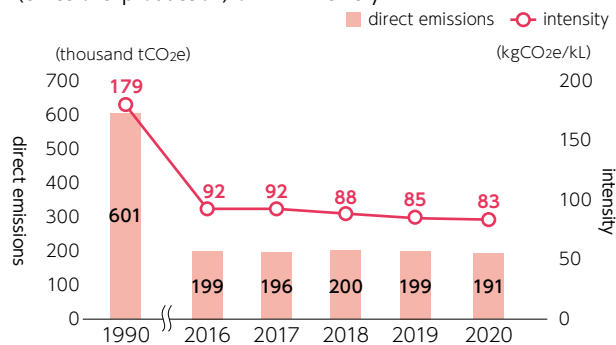
GHG emissions associated with domestic transportation



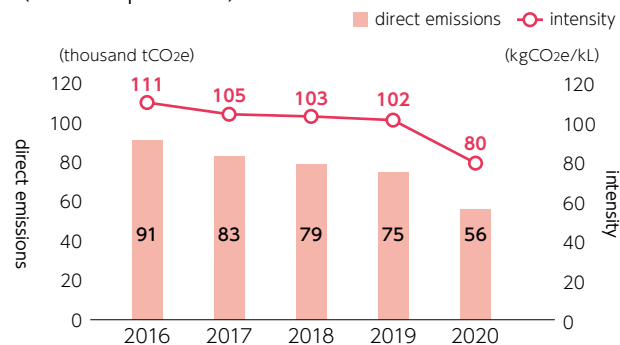
Ratio of renewable energy to total electric power used in the Kirin Group as a whole



Direct emissions (Scope 1+2) and intensity (emissions/production) of Kirin Brewery

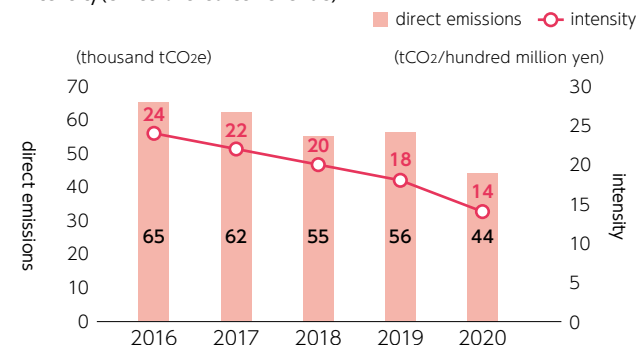


Direct emissions (Scope 1+2) and intensity (emissions/production) of Lion

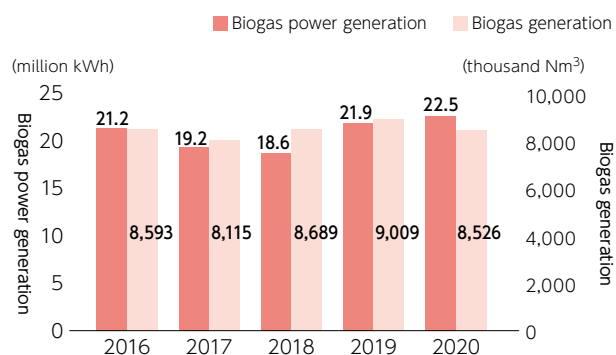


*Excluding the dairy products and beverages businesses

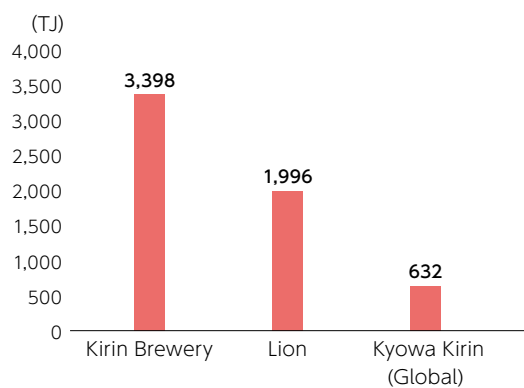
Kyowa Kirin (Global) direct emissions (Scope 1+2) and intensity(emissions/sales revenue)



Biogas generation and power generation by Kirin Brewery's



Energy use by business (2020)





Governance Risk Management



Corporate Governance System

Basic View on Corporate Governance

In line with the Kirin Group Corporate Philosophy and “One KIRIN” Values that are shared across the Kirin Group, the Kirin Group believes that achieving the “2027 Vision” outlined in the Kirin Group’s Long-Term Management Vision, Kirin Group Vision 2027 (KV2027) will lead to the Kirin Group’s sustainable growth and to greater corporate value over the medium to long term. Accordingly, the Kirin Group establishes a corporate governance system that is capable of effectively and efficiently reaching that goal. We believe that cooperation with all of our multiple stakeholders is indispensable in order to put the Kirin Group Corporate Philosophy into practice and turn the “2027 Vision” that is based on this philosophy into a reality, and respect the stakeholders’ respective viewpoints. We will disclose information promptly to our shareholders and investors in a transparent, fair and consistent fashion, will proactively engage in constructive dialogue with shareholders and investors, and fulfill our accountability with integrity.

Governance systems related to environmental issues

At the Kirin Group, the Board of Directors discusses and makes resolutions concerning basic policies and important issues related to the environment as a whole, including climate change issues, while the Group Executive Committee discusses and makes resolutions concerning the setting of important targets. We incorporate environmental targets into our CSV Commitment, one of our non-financial KPI targets, and reflect them in management plans by setting performance indicators for each operating company. The status of achievement of the CSV Commitment serves as a metric for assessing the performance of Kirin Holdings officers. As a general rule, the Board of Directors receives reports once a year on business risks, growth opportunities, strategies, and progress related to environmental issues, including climate change.

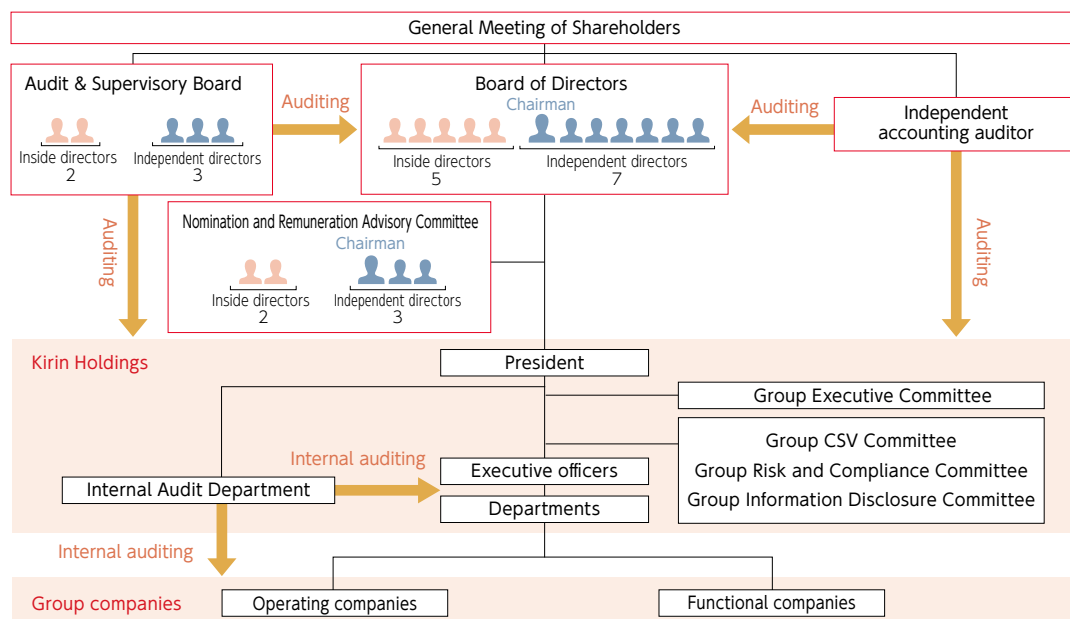
Group CSV Committee

Kirin Holdings established and operates the Group CSV Committee in order to proactively and independently promote CSV throughout the Kirin Group. Chaired by the president of Kirin Holdings and comprised of the presidents of the Group’s main operating companies, the committee deliberates on responses to environmental issues as a significant management issue. We position the Group CSV Committee as an advisory body to the president. The Group Executive Committee and the Board of Directors deliberate and receive reports on decisions made by the Group CSV Committee as necessary, and reflects these matters in strategy for the Kirin Group as a whole.

Details are shown on Page 50 to 61 of the KIRIN CSV REPORT 2021

KIRIN CSV REPORT 2021

- [https://www.kirinholdings.com/en/investors/library/integrated/Kirin Holdings Company, Limited Corporate Governance Policy](https://www.kirinholdings.com/en/investors/library/integrated/Kirin%20Holdings%20Company,%20Limited%20Corporate%20Governance%20Policy)
- https://www.kirinholdings.com/en/purpose/files/pdf/governance_policy.pdf
- [Table on Compliance with the Corporate Governance Code \(for reference\)](https://www.kirinholdings.com/en/purpose/files/pdf/governance_code.pdf)



Risk Management Structure

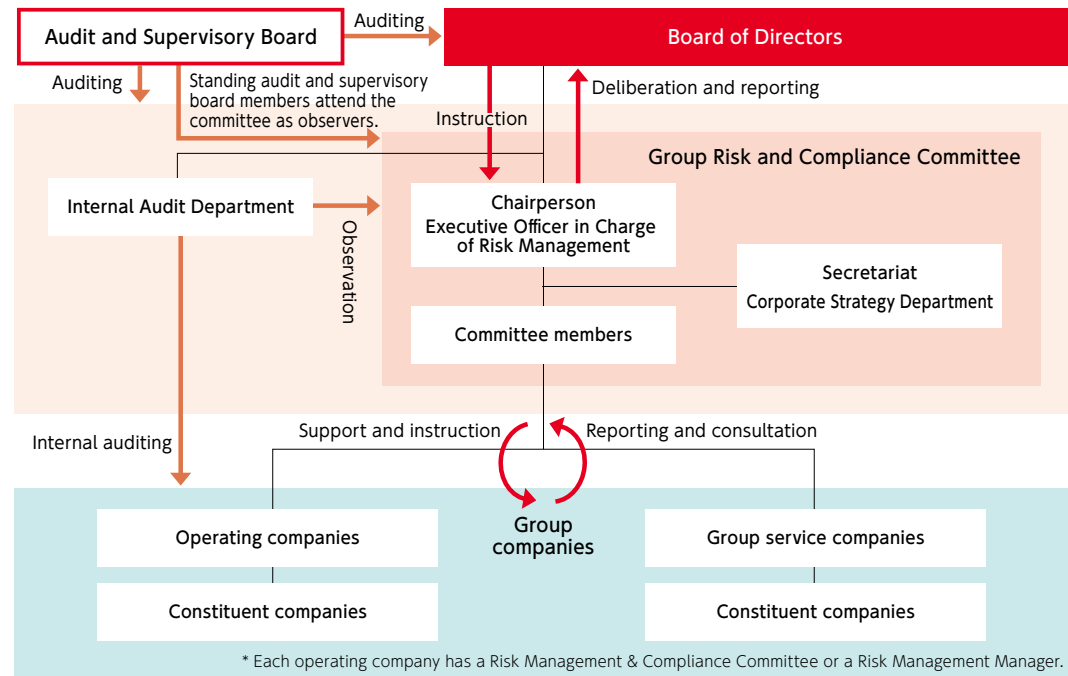
The Kirin Group defines risk as uncertainty with the potential to seriously impede the accomplishment of business targets or impact business continuity. The Group's fundamental risk management policy is to maintain a robust risk management structure and to fortify and fully implement risk control and compliance to mitigate risk, prevent risk from being actualized, and to keep risk within a manageable level. Management considers risk management as essential to continue earning the trust of customers, employees, shareholders, and society over the long term.

Risk management structure and process for determining and monitoring significant risk

In the Kirin Group, the Board of Directors deliberates and reports on significant risks. The Group additionally maintains a Group Risk and Compliance Committee consisting of Kirin Holdings Inside Directors and Executive Officers and chaired by the Executive Officer in Charge of Risk Management. The committee oversees the Group's risk management activities, including collecting risk information, controlling risk, preparing mid-term business plans, introducing risk reduction measures, communicating information and implementing countermeasures when risk arises, and providing necessary instructions and support to Group companies.

Kirin Holdings aggregates the risks faced by specific businesses on the Group level, investigates common risks across the Group, and identifies significant risks to the Group. Kirin Holdings assesses the potential quantitative and qualitative impacts of important risks from the perspective of overall Group management and classifies the risk in terms of priority. The Board of Directors deliberates the assessments and determines the significant risks for the Group. Kirin Holdings and the Group companies frame and implement measures to address the significant risks in accordance with the details of the risk, and engage in monitoring on a quarterly basis. The Kirin Holdings Board of Directors deliberates the status and reviews significant risks and provides instruction as necessary to support appropriate risk management and control in the execution of countermeasure strategies. The risk management system is designed to prevent risk from manifesting and to minimize any potential negative impact when a risk situation does occur.

Risk management structure



BCP for all types of hazards

The Kirin Group provides a large number of products and services that are directly connected to lifelines, and the Group promotes initiatives to minimize the impact on society and our customers in the event of a crisis, such as a natural disaster or pandemic. In recent years, however, a variety of crisis events have occurred, including natural disasters and the spread of COVID-19, and there have been cases in which we were unable to mount a sufficient response when circumstances differed from BCPs that we formulated

on the assumption of specific crisis situations.

Against this backdrop, the Kirin Group has changed from BCPs based on specific crisis situations to an "All-hazard BCP" with countermeasures focused on a loss of management resources, such as a reduced workforce, damaged facilities, or suspended head office functions, in a crisis situation. This approach will make the BCP more versatile when put into effect.

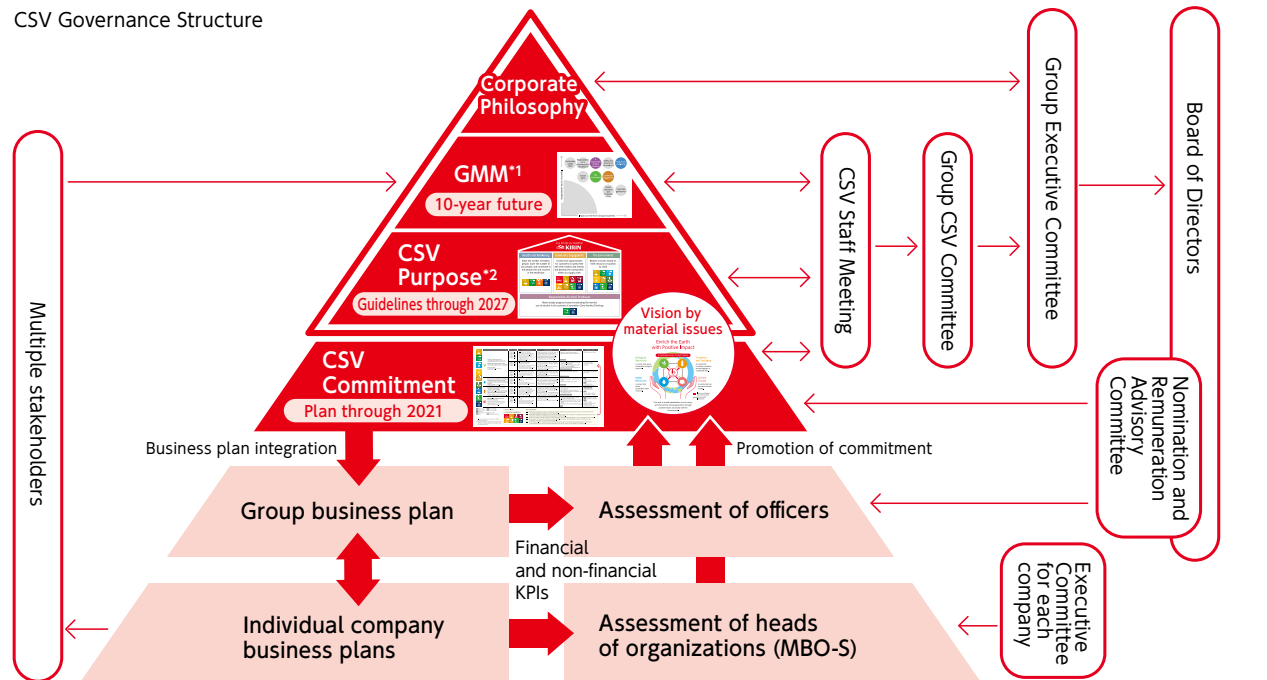
Environmental Management System

Environmental management and CSV

The Kirin Group recognizes that addressing climate change and other environmental issues is an important management issue. As such, the Board of Directors or the Group Executive Committee discusses and makes resolutions concerning important issues and targets. The Board of Directors of Kirin Holdings discussed and made resolutions concerning the Kirin Group Environmental Vision 2050, which we announced in 2020.

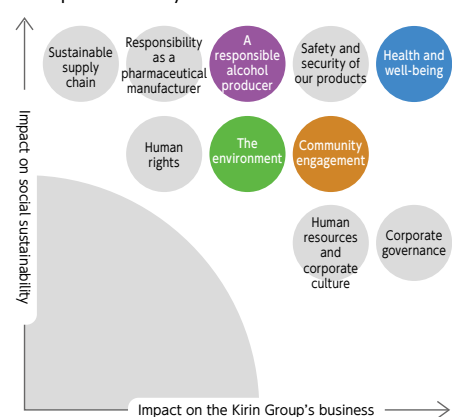
The Kirin Group engages in environmental management as part of its CSV management system. The Kirin Group has organized material issues, including the environment, as "Kirin Group's management issues for sustainable growth (Group Materiality Matrix: GMM)", as part of its commitment to sustainable development in partnership with society. To create shared value with society and promote sustainable growth, in our CSV Purpose developed as the guideline for the Long-Term Management Vision, KV2027, we set our purpose for the environment in line with the Kirin Group Environmental Vision 2050: Enrich the sustainable Earth for future generations through positive impact. In response, Group companies have established CSV Commitments as mid-term targets to achieve our environmental vision and are using them as performance indicators. As we look to achieve our Environmental Vision, Purpose, and Commitment, the Kirin Group will gather the opinions of stakeholders in an appropriate manner, identify and assess the risks and opportunities related to the environmental activities of our businesses, and take necessary action from medium to long-term perspectives.

CSV Governance Structure



^{*1} Group Materiality Matrix
^{*2} The translation of our Corporate Philosophy into our social purpose

Group Materiality Matrix



CSV Purpose



CSV Commitment

Kirin Group Environmental Vision 2050	Our Commitment	Our Approach	Our Achievement	Goals for 2021
<ul style="list-style-type: none"> 2.1.1 More sustainable production of raw materials 2.1.2 Reduce the amount of waste generated in production 2.1.3 Reduce the amount of water used in production 2.1.4 Reduce the amount of energy used in production 2.1.5 Reduce the amount of CO2 emitted in production 2.1.6 Reduce the amount of other pollutants emitted in production 2.1.7 Reduce the amount of other pollutants emitted in production 2.1.8 Reduce the amount of other pollutants emitted in production 2.1.9 Reduce the amount of other pollutants emitted in production 2.1.10 Reduce the amount of other pollutants emitted in production 	<ul style="list-style-type: none"> 2.2.1 We will promote our efforts related to biological resources or major material production sites. 2.2.2 We will reduce the amount of waste generated in production. 2.2.3 We will reduce the amount of water used in production. 2.2.4 We will reduce the amount of energy used in production. 2.2.5 We will reduce the amount of CO2 emitted in production. 2.2.6 We will reduce the amount of other pollutants emitted in production. 2.2.7 We will reduce the amount of other pollutants emitted in production. 2.2.8 We will reduce the amount of other pollutants emitted in production. 2.2.9 We will reduce the amount of other pollutants emitted in production. 2.2.10 We will reduce the amount of other pollutants emitted in production. 	<ul style="list-style-type: none"> 2.3.1 We will promote our efforts related to biological resources or major material production sites. 2.3.2 We will reduce the amount of waste generated in production. 2.3.3 We will reduce the amount of water used in production. 2.3.4 We will reduce the amount of energy used in production. 2.3.5 We will reduce the amount of CO2 emitted in production. 2.3.6 We will reduce the amount of other pollutants emitted in production. 2.3.7 We will reduce the amount of other pollutants emitted in production. 2.3.8 We will reduce the amount of other pollutants emitted in production. 2.3.9 We will reduce the amount of other pollutants emitted in production. 2.3.10 We will reduce the amount of other pollutants emitted in production. 	<ul style="list-style-type: none"> 2.4.1 We will promote our efforts related to biological resources or major material production sites. 2.4.2 We will reduce the amount of waste generated in production. 2.4.3 We will reduce the amount of water used in production. 2.4.4 We will reduce the amount of energy used in production. 2.4.5 We will reduce the amount of CO2 emitted in production. 2.4.6 We will reduce the amount of other pollutants emitted in production. 2.4.7 We will reduce the amount of other pollutants emitted in production. 2.4.8 We will reduce the amount of other pollutants emitted in production. 2.4.9 We will reduce the amount of other pollutants emitted in production. 2.4.10 We will reduce the amount of other pollutants emitted in production. 	<ul style="list-style-type: none"> 2.5.1 We will promote our efforts related to biological resources or major material production sites. 2.5.2 We will reduce the amount of waste generated in production. 2.5.3 We will reduce the amount of water used in production. 2.5.4 We will reduce the amount of energy used in production. 2.5.5 We will reduce the amount of CO2 emitted in production. 2.5.6 We will reduce the amount of other pollutants emitted in production. 2.5.7 We will reduce the amount of other pollutants emitted in production. 2.5.8 We will reduce the amount of other pollutants emitted in production. 2.5.9 We will reduce the amount of other pollutants emitted in production. 2.5.10 We will reduce the amount of other pollutants emitted in production.

Environmental management structure

The Kirin Group has defined its environmental management structure in the Principle for Kirin Group's Global Environmental Management (KGEMP).

Under the KGEMP, a Group general environmental manager has been appointed as the chief executive officer for all Group environmental matters. As of April 2021, this role is held by the Senior Executive Officer of Kirin Holdings Company, Limited with responsibility for CSV strategy. The KGEMP requires the appointment of a general environmental manager, who has responsibility and authority for environmental matters in each operating company. In addition to monitoring to ensure that the company and its constituent companies are conducting their environmental activities appropriately, the general environmental manager conducts management reviews, identifies issues for improvement, and gives necessary directions to the relevant departments. In the event of an environmental crisis, the general environmental manager

will have full authority to resolve the crisis. The KGEMP stipulates that each company complies with laws and regulations and other rules relevant to the business's environmental activities, reduces its environmental load, and prevents pollution under its own environmental management system. Each company will conduct internal environmental audits to ascertain the appropriateness and legal compliance of their systems and confirm how well targets are being met. The results of these audits will then lead into management reviews.

We integrate the management of environment-related processes with company management processes in a manner suited to the companies' respective regions.

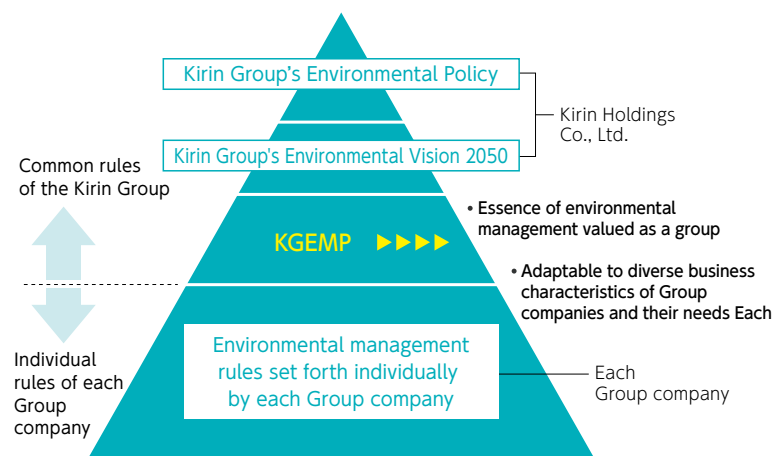
We incorporate CSV goals, including those for the environment, into the goal-setting for each organization and individual, and reflect the degree to which those goals are reached in assessments of the performances of those organizations and individuals.

Environmental audits

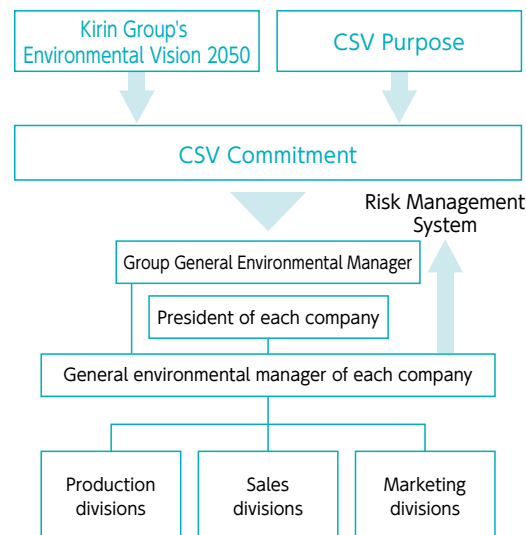
Each of the operating companies in the Kirin Group complies with ISO 14001 and other environmental management system standards. Internal auditing is conducted in each business location and constituent company, and the environmental management divisions in the head offices of each Group company conduct auditing of business locations and constituent companies. These audits lead to improvements in the individual companies' environmental management systems. On an entire Group basis, Kirin Holdings' CSV Strategy Department conducts environmental audits of each Group company in accordance with criteria established by the Group. We then utilize these audits for management reviews.

In Japan, to guarantee further transparency and independence, we have been contracting an outside consultant to perform a strict environmental legal audit since 2009. By 2014, the consultant had visited all production facilities belonging to Kirin Group companies. Starting in 2015, the consultant embarked on a second round of visits, selecting several sites to visit each year.

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



Environmental Management Structure



Status of compliance with environmental laws and regulations

Each business location is thorough in its management of legal requirements through a ledger, and works exhaustively to prevent environmental pollution by establishing voluntary management targets that are more stringent than those required by the legislation.

We have established a system for the reporting of environmental accidents within the Group, in which we share *hiyari-hatto* (near-miss) examples and accidents that occurred within the Group and extend countermeasures to other sites. We use internal environmental audits to check the status of initiatives taken toward achieving environmental targets, see how measures to prevent environmental accidents and *hiyari-hatto* (near-miss) cases are being shared with operating companies and business sites, and confirm the status of legal compliance. The Kirin Group did not violate any environmental laws or regulations in 2020.

Appropriate management of waste

The Kirin Group is working toward its declared goal of the implementation and firm establishment of thorough appropriate management of waste. To this end, we established the Kirin Holdings Waste Management Rules and are promoting the appropriate treatment of waste within the common Group systems. These rules standardize contract templates and the frequency and contents of contractor audit programs, and by keeping an updated list of staff in charge of waste management, we provide education to all staff who require it, based on standardized textbooks. We collectively manage information on all waste disposal contractors for the Group, so if in the unlikely event that a problem arises, we can immediately search for and confirm details about the contractor, its permits, the waste it is being contracted to handle, and other details. We have standardized operations in this way so that anyone who is newly assigned to waste-related work will be able to perform it with certainty.

Recycling rate 100%

The Japanese alcoholic and non-alcoholic beverages businesses (Kirin Brewery, Kirin Beverage, Kirin Distillery) have set a recycling rate target of 100% for their plants and have continued to achieve that target. Four plants, including the Kirin Brewery's Yokohama Plant, first achieved a recycling rate of 100% in 1994, and in 1998, all plants achieved 100%, the first time in the beer industry.

Preventing air pollution

The Kirin Group strives to comply with all laws and regulations relating to air pollution in the various countries in which we operate. We have established voluntary standards that exceed those required by environmental legislation and are working to reduce our emission of atmospheric pollutants. For example, for transport in Japan, we are pursuing the introduction of vehicles that comply with the NOx & PM Act in metropolitan areas. We are increasing the load capacity per vehicle by switching to larger trucks and reducing the total number of trucks.

Preventing water pollution

The Kirin Group thoroughly complies with laws and regulations for preventing water pollution in each of the countries where we operate and minimizes wastewater loads by setting our own strict control values, which go beyond those required by environmental laws.

Preventing soil contamination

When selling assets, the Kirin Group conducts thorough investigations of soil contamination, responding as necessary.

Managing chemical substances

The Kirin Group manages its chemical substances appropriately based on the Act on Confirmation, etc. of Amounts of Release of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof (PRTR Act) and other relevant legislation. The Kyowa Kirin Group has set targets for volatile organic compounds (VOC), which, due to the nature of its business, make up the majority of the chemical substances it releases, and is taking action to reduce them.

Polychlorinated biphenyl (PCB)

Managing appropriately and disposing progressively according to the law.

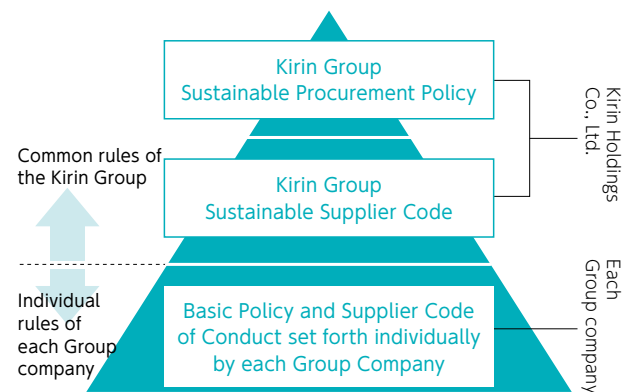
Asbestos

Managing and isolating appropriately and treating progressively according to the law.

Sustainable Procurement

Group procurement management structure

To fulfill its social responsibility, the Kirin Group manages progress toward procurement targets set forth in management plans, and strengthens governance through such means as managing procurement risks and compliance with laws and regulations, education, and internal audits, in accordance with the Kirin Group Sustainable Procurement Policy and the Kirin Group Sustainable Supplier Code. We have integrated procurement risk as part of corporate risk management. In the unlikely event that a procurement risk should materialize, under the leadership of the officer in charge



of risk management, the relevant departments will promptly work together to share information, implement countermeasures, and prevent recurrence, and will involve other departments before similar events happen elsewhere. In these ways, we work to verify and address the problem.

Kirin Group Sustainable Procurement Policy

In April 2021, the Kirin Group revised its procurement policy and established the "Kirin Group Sustainable Procurement Policy," and is working to realize this policy.

Kirin Group Sustainable Supplier Code

In April 2021, the Kirin Group established the "Kirin Group Sustainable Supplier Code"—a collection of conditions that suppliers must comply with, based on the "Kirin Group Sustainable Procurement Policy." The Code respects international standards such as the OECD Guidelines of Multinational Enterprises, the UN Guiding Principles on Business and Human Rights, the Core Conventions of the International Labor Organization (ILO), the Ten Principles of UN Global Compact, and the Women's Empowerment Principles [WEPs], and strives to ensure that all upstream channels in the supply chain, as well as the Kirin Group's own business operations, conform to these standards on an ongoing basis.

Basic procurement policy and supplier code of conduct for each Group company

Each Group company has established a basic procurement policy and supplier code of conduct tailored to the characteristics of its particular business and the laws and regulations of the countries in which it operates.

Kyowa Kirin's approaches

Kyowa Kirin has established the Kyowa Kirin Group Procurement Policy and has prepared the Kyowa Kirin CSR Procurement Guidebook. It has established the Supplier Code of Conduct with which it asks suppliers to cooperate. At Kyowa Kirin, we conduct CSR questionnaire surveys each year to analyze the current situation of CSR initiatives in the supply chain and identify issues. From 2019, we began conducting the CSR questionnaire survey for foreign suppliers. We are providing opportunities for suppliers to deepen understanding of CSR procurement activities by holding briefing sessions on CSR procurement and organizing supply chain participant meetings to exchange information on issues for the entire supply chain and measures to solve such issues.

Lion's approaches

Lion has set forth three core principles for its Procurement Policy as follows:

1. Building strong commercial outcomes & productive partnerships
2. Promoting Human Rights and Ethical Sourcing
3. Promoting sustainable (environmental, social and inclusive) sourcing practices

At the end of 2019, Lion announced its Supplier Responsible Sourcing Code, in which it seeks to mitigate ethical, environmental, labor, and human rights risks, such as instances of forced and child labor. The Code sets out strict policies on anti-bribery and corruption, conflicts of interest and protecting privacy, as well as a whistleblower policy.

Lion requires key suppliers to complete SEDEX self-assessment questionnaires (SAQs) on an ongoing basis. As of the end of 2020, 95% of Lion's primary suppliers have taken risk assessments through the questionnaire, with Lion targeting 100% of suppliers by 2021 in the CSV Commitment.

Kirin Group Sustainable Procurement Policy

The Kirin Group upholds the essential values in the areas of human rights, labor, the environment, and anti-corruption defined by the United Nations Global Compact, of which we are a signatory. We engage in procurement activities that follow five themes for initiatives in compliance with this principle and with Group policies, to improve sustainability from global perspectives, enhance corporate value, and contribute to society.

1. Steady focus on quality

- We place a high priority on pursuing quality and safety in our procurement practices, in accordance with the Kirin Group's Quality Policy.

2. Ensuring regulatory and ethical compliance

- We observe social norms and the letter and spirit of laws and regulations and conduct business in a sensible and socially responsible manner, in accordance with the Kirin Group Compliance Policy.

3. Respecting human rights

- We embody the ideas laid out in the Kirin Group Human Rights Policy and address human rights issues together with our suppliers.

4. Environmental stewardship

- We strive to protect the global environment and prevent pollution and conduct environmentally sensible procurement practices in accordance with the Kirin Group's Environmental Policy.

5. Coevolving relationships of mutual trust with suppliers

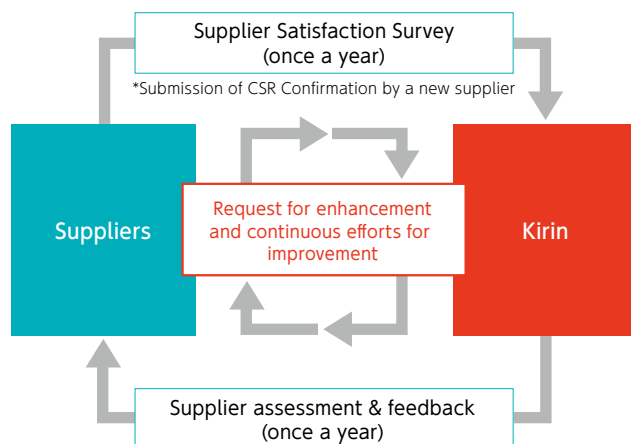
- We establish long-term relationships of trust with suppliers through fair and open procurement practices and work with suppliers to solve social issues to achieve co-existence and co-prosperity.

Two-way communication with suppliers

The Kirin Group places importance on two-way communication with suppliers.

Prior to the start of business transactions, we request that suppliers comply with the Kirin Group Sustainable Supplier Code, and after business transactions start, we monitor the status of compliance on a regular basis through surveys and supplier assessments. We give feedback to the supplier based on the results of the survey and evaluation; and if we deem that risk countermeasures are insufficient, we conduct additional surveys and request that the supplier take the necessary corrective actions. We hold supplier briefing sessions to help suppliers deepen their understanding of the Kirin Group's procurement activities, the Kirin Group Sustainable Procurement Policy, and the Kirin Group Sustainable Supplier Code. At the same time, we have established a "Supplier Hotline" to collect feedback from suppliers and to ensure fair trade. With these actions driving our PDCA cycle, we will continue to work with our suppliers and promote CSR procurement.

In FY2019, we adopted and began implementing the CSR/Sustainable Procurement Self-assessment Questionnaire developed by Global Compact Network Japan in the Japan Beer and Spirits Business and the Japan Alcohol and Non-alcoholic Beverages Businesses. In FY2020, we received responses from 412 of the 421 companies we asked to complete the questionnaire. Overall, we found that our suppliers had made progress in all areas compared with the previous fiscal year.



Environmental Education

Environmental Training

To mitigate environmental risk, the Kirin Group conducts an ongoing program for environmental training for its employees.

This systematized training consists of training for environmental staff and training by job grade, including new employees.

The training conducted at the Technical Talent Development Center has been opened to Kirin Group companies in Japan.



Scenery of environmental training

Raising environmental awareness within the Company

The Kirin Group uses in-house communications to expand the depth and breadth of interest in and understanding of the environment among employees. We utilize employee newsletters and the intranet, and at Group headquarters, use screen videos presenting Kirin's environmental initiatives on digital signage, in order to deepen understanding among employees.

On June 1, 2021, we launched the "KIRIN Now" website for Group employees. As more employees work from home owing to the COVID-19 pandemic, we are using this website to provide up-to-



"KIRIN," a Group newsletter for employees

date information from the Kirin Group in a format accessible to all Group employees, in accordance with changes in work styles. As part of this initiative, we are communicating information related to the environment and other aspects of CSV to employees in an easy-to-understand manner, and strengthening two-way communication through the use of comments and users' ability to "like" posts.

Experiential Program

The Kirin Group conducts a CSV Experiential Program for Confronting Social Issues, a CSV training program that gives employees the opportunity to focus on social issues.

Programs were held to promote understanding of examples of the Creating Shared Value that Kirin engages in with society. We plan and implement these programs that give participants the chance to experience first-hand actual operations and interactions with the local community in Tono in Iwate Prefecture, with which Kirin has had a connection in hops cultivation for more than fifty years, and in Ueda in Nagano Prefecture, where Mercian operates its own vineyard, Mariko Vineyard.

Fiscal Year	Program	Date	Number of participants
2017	At Tono hops farm	5/26 Fri~ 27 Sat	36
	At Ueda vineyard	9/22 Fri~ 23 Sat	31
2018	At Tono hops farm	6/1 Fri~ 2 Sat	36
	At Ueda vineyard	9/21 Fri~ 22 Sat	35
2019	At Tono hops farm	6/7 Fri~ 8 Sat	42
	At Ueda vineyard	10/18 Fri~ 19 Sat	40*
2020	At Ueda vineyard	10/9 Fri	38

*Scheduled to participate. Cancelled due to typhoon damage.

Stakeholder Engagement

To grow sustainably together with society, the Kirin Group has positioned Creating Shared Value (CSV) as the core of its company management in its Long-Term Management Vision, Kirin Group Vision 2027.

CSV management means the creation of economic value and social value at the same time, with the aim of sustainable growth together with society by realizing both solutions to social issues and the provision of value to customers. . To achieve this, it is important that we establish and implement mechanisms for identifying and understanding the challenges, expectations, and demands of our diverse stakeholders.

To this end, the Kirin Group has a range of opportunities for dialogue with the stakeholders involved in its business. In addition to dialogue, we work together with many of our stakeholders and cooperate in voluntary activities that lead to policy recommendations.



Engagement with tea farms

In our support for Sri Lankan tea farms to get Rainforest Alliance Certified, which began in 2013, Kirin staff travel to Sri Lanka once a year to exchange views with the plantation managers and local residents, to identify and address local issues.

The dialogue with the tea farms is an invaluable opportunity for us and the local producers to share their respective needs and issues, with a view to achieving more sustainable, higher quality and efficient tea leaf production.

We decided to expand support for small farms to obtain certification for sustainable agriculture in 2018 in response to the consultations received from managers of large tea farms that depend on small farms to cover the need to supply a large amount of tea leaves. We determined that support for small farms to obtain the certification would lead not only to increasing revenues and stabilizing the business of small and large tea farms but to securing stable procurement of tea leaves.

The activities for the conservation of water sources on the farms materialized as a result of our dialogue with managers of large farms and local residents who had significant concerns over the impact of climate change on water sources.

On November 18, 2020, in response to a request from the Rainforest Alliance, the Senior Executive Officer in charge of CSV remotely participated in the "Rainforest Alliance Tea Event 2020" event as a panelist.



Engagement with grape producers for Japan Wine

Mariko Vineyard's has received support from an international NGO, Earthwatch Japan, and its volunteers for ecological surveys. In 2018, Earthwatch Japan and its volunteers provided assistance in mapping the distribution of the shrubby sophora (*Sophora flavescens*), the sole grass eaten by the larvae of *Shijimiaeoides divinus*, a critically endangered species, on the sides of rice fields on the Jinba Plateau where Mariko Vineyard is located. Using the survey results, we have been conducting activities to increase the amount of shrubby sophora since 2019. Using the distribution map we created as a reference, we identified shrubby sophora and, with the permission of rice field owners, harvested cuttings. Volunteers grew the cuttings at home and planted them in Mariko Vineyard at the end of May 2021, two years



Violet survey

Environmental education

later. Surveys of the distribution of violets in vineyards in 2019 and 2021 revealed that violets, which are an indicator species for grassland, had begun spreading deep into vineyards. In 2020, we held an environmental class at Shiogawa Elementary School at the foot of Mariko Vineyard, focusing on the rich ecosystem of the vineyard and its background. In 2021, teachers from Shiogawa Elementary School participated in the planting of shrubby sophora, violet surveys, and taking cuttings of shrubby sophora.

Future generations

The Kirin Group, based on its Environmental Vision 2050, promotes engagement with future generations in various ways to get the next generation involved in resolving environmental issues and have a positive impact to society.

The Kirin School Challenge

Since 2014, the Kirin Group has been holding workshops called the Kirin School Challenge, in which junior and senior high school students, who will lead the next generation, learn, think about, and discuss matters for solving various social issues in the world and convey those ideas to their peers. As of the end of 2020, a total of approximately 1,000 students had participated in the workshop.

Through 2019, we held these workshops as group learning sessions on the themes of sustainable agriculture, forestry, and containers and packaging, and the output consisted of posting photos of messages that participants wanted to convey to their generation on Twitter. In response to the COVID-19 pandemic, however, we decided to hold the event online in 2020, and have changed the output to a sketchbook relay (a video showing a sketchbook filled with different messages). Although there are issues with holding the event online, such as maintaining concentration for long periods and difficulty in communication among participants, there is a positive side of no need to meet at the venue; participation can go beyond national borders, to encompass countries such as France, Ireland, and New Zealand.

Japan Environmental Youth Network

The Kirin Group has supported the Japan Environmental Youth Network, sponsored by the Environmental Restoration and Conservation Agency's Japan Fund for the Global Environment, since 2013 (from the time of its predecessor, the National High School Students Eco-Action Project).

The Japan Environmental Youth Network invites examples of day-to-day environmental activities from high school students, and selected students participate in the National Convention after passing through regional stages. At the national convention, the project presents various awards to outstanding efforts, including the Minister of the Environment Award. The Kirin Group serves as a judge at both the regional and national conventions. The environmental activities of high school students often reflect local issues, and they serve as a valuable forum for understanding the issues faced by the younger generation, who will lead the next generation.

As part of our support activities, we welcome high school students to visit our companies once a year. To date, the Head Office in Nakano, the Institute for Packaging Innovation and the Central Research Institute in Yokohama, and Mariko Vineyard, as well as BEER EXPERIENCE, an agricultural corporation in Tono that is funded by Kirin have all accepted visits, providing opportunities for the students to exchange views while observing actual research and production facilities.

Environmental mark program

In 2019, together with the Japan Network for Climate Change Actions (JNCCA), we began trialing the "Environmental mark program," in which children work together to find environmental marks. This program was developed with the support of the Japan Fund for the Global Environment as an opportunity for children to work together to find environmental marks on various products and services and think about environmental issues. The program targets elementary school students who participate in after-school care, Girl Scouts, and Boy Scouts. Since 2020, we have been developing and deploying programs that use the "Environmental Mark Discovery Notebook," enabling us to conduct programs on a more continuous basis. When children find an environmental mark, the leader of the organization checks it

and sticks a Kirin "Eco Panda" sticker in their "Environmental Mark Discovery Notebook," which increases their motivation. In 2020, 2,000 elementary school students from approximately 80 organizations participated.

Free distribution of supplementary teaching material on SDGs

The Kirin Group is participating in the production of the section on "SDG 2: Zero Hunger" in the "SDGs Start Book," supplementary teaching material on the SDGs for elementary students. For this production, the Kirin Group collaborated with plans made by the "EduTown SDGs Alliance," a project that aims to nurture the creators of a sustainable society, primarily for elementary school students. We had originally planned to distribute 100,000 copies of the "SDGs Start Book" to elementary schools, etc., across Japan that applied. The number of applications, however, exceeded our expectations, so we printed additional copies and distributed 200,000 copies. So far, in FY2021, we have distributed 300,000 books free of charge.

On the "EduTown SDGs" website for children learning about the SDGs, there is a section called "Sustainable agriculture with Sri Lankan tea farms ~The efforts of the farms supporting the great taste of Kirin Gogo-no-Kocha~" as an example of initiatives for SDG 2. The brand manager of Kirin Gogo-no-Kocha makes an appearance in this section to explain the details of this initiative.

Decarbonization Challenge Cup

The Kirin Group supports the Decarbonization Challenge Cup which is held with the aim of building a decarbonized society for the next generation by announcing activities on global warming prevention undertaken by various organizations as a means of sharing knowhow and information to build collaboration and motivation for further activities.



Kirin School Challenge Award Ceremony



National Convention of the Japan Environmental Youth Network



Environmental Mark Discovery Notebook



SDGs Start Book

Engagement with experts

The Kirin Group has always emphasized engagement with experts and NGOs to identify social issues and confirm the direction to take. With the adoption of the Paris Agreement at COP21 in 2015, the adoption of the SDGs by the UN, and the publication of the TCFD final recommendations in 2017, the Kirin Group believes that engagement with experts, NGOs, and ESG investors is becoming increasingly important.

Experts

In formulating the Kirin Group's Environmental Vision 2050, which was announced on February 10, 2020, we organized roundtable dialogue sessions with stakeholders, with cooperation from experts who had given us valuable advice in the past and we reflected many valuable comments received in our vision.



Roundtable dialogue during the revision of the Environmental Vision

Held on November 27, 2019

Outside participants:

Yoshinao Kozuma, Professor Emeritus, Sophia University Faculty of Economics.

Manabu Akaike, Director, Universal Design Intelligence, Inc.

Mikako Awano, CEO, SusCon Japan

Chairperson:

Masakazu Oki, Environmental Restoration and Conservation Agency's Japan Fund for the Global Environment

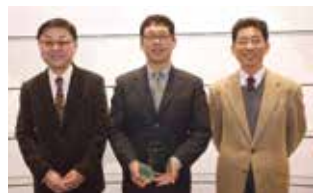
Participants from Kirin Holdings:

Ryosuke Mizouchi, Senior Executive Officer.

Ryuji Nomura, Executive Officer, Head of the CSV Strategy Department.

National Agriculture and Food Research Organization

In ecological surveys on the process of converting idle and devastated land into vineyards, we ask the experts at the National Agriculture and Food Research Organization (NARO), our partner in joint research, to



Dialog with the National Agriculture and Food Research Organization



hold a joint research presentation once a year. In addition to sharing the insights obtained through this research, we discuss how to proceed into the future.

Contribution to development of various guidelines

The Kirin Group actively participates in the development of various public guidelines. In 2018 and 2019, at the request of the Ministry of the Environment, we sent a member to the Working Group on the Environmental Reporting Guidelines and Environmental Accounting Guidelines and the Working Group on guidance and technical notes supplementing Environmental Reporting Guidelines 2018, where he deliberated with experts about disclosure of environmental information.

In 2020, responding to a request from the Ministry of Agriculture, Forestry and Fisheries and the Ministry of Economy, Trade and Industry, we participated in the TCFD Guidance by Industry Review Committee for the food industry, established as part of the Japan Food Industry Association.

SBTN Corporate Engagement Program

On February 27, 2021, the Kirin Group became the first Japanese company in the pharmaceutical and food industry to participate in the Corporate Engagement Program held by the Science Based Targets Network. SBTN is a joint venture by non-profit organizations and companies that develops and provides methods and resources for setting science-based targets for a sustainable global environment based on the activities of the Science Based Targets Initiative (SBTi). The Corporate Engagement Program aims to work with multiple companies and other partners to develop a scientific approach to setting targets related to the corporate use of natural capital by 2022 (fresh water, land, oceans, use of resources, climate change, pollution, and non-native species).

Engagement with investors

In June 2018, we held a CSV briefing for analysts and investors at the Kirin Brewery's Yokohama Plant on the topics of "approach to the environment" and "the strengths of Kirin's technological expertise." At the briefing, we explained the various initiatives on the four themes of the Long-Term Environmental Vision, and the weight reduction technologies for containers and packaging being developed by the Institute for Packaging Innovation. We gave attendees a tour of the Institute and the Yokohama Plant.

In December 2020, we held the "KIRIN CSV DAY 2020" event online

to report on the progress of our CSV management. With regard to our environmental efforts, we provided detailed explanations centered on the issues in our four important themes and Kirin's strengths in solving them.

Dialogue with CDP

In the individual meetings with investors, we exchange opinions on our new Environmental Vision announced in February 2020 and responses to climate-related issues, including TCFD recommendations. We hope these meetings provide an opportunity for attendees to better understand the Kirin Group's initiatives.

Since 2017, we have been taking the opportunity when the CDP's chairman or CEO visits Japan to set meetings with Kirin Holdings' Senior Executive Officer in charge of CSV strategy (Group general environmental manager) and exchange opinions on responses to climate change.



CDP Executive Chair
Paul Dickinson



CEO
Paul Simpson

TCFD Summit

In response to a request from the host, the Ministry of Economy, Trade and Industry (cosponsors: the TCFD Consortium and WBCSD), the Senior Executive Officer in charge of CSV appeared as a panelist on Panel Discussion 2 "Implementation of Scenario Analysis and Case Studies" at the TCFD Summit held on October 9, 2020. During the panel discussion, participants shared information on topics such as the importance of starting and continuing scenario analysis, the significance of management and other departments' involvement in scenario analysis, and the impact of scenario analysis in changing management's mindset.

Speakers at the TCFD Summit included the Prime Minister, the Minister of Economy, Trade and Industry, Executive Vice-President of the European Commission, and the President and CEO of the World Business Council for Sustainable Development (WBCSD). The event was delivered online to a global audience with simultaneous interpretation in Japanese and English, and had over 2,500 actual viewers.

Voluntary participation leading to policy recommendations

Participation in consortium, government, and ministry activities

Organization	Nature of activity
TCFD Consortium	Kirin Holdings has participated in the TCFD Consortium since it was established in 2019. Kirin Holdings serves as a member of the Guidance by Industry Review Committee (food sector) from 2020.
Clean Ocean Material Alliance (CLOMA)	Kirin Holdings is a member of the Clean Ocean Material Alliance, which was established with a view to accelerating innovation through public-private partnerships that drive new 3R initiatives to make the use of plastic products more sustainable and promote the development and introduction of alternative materials.
WE MEAN BUSINESS	In the WE MEAN BUSINESS coalition, the Kirin Group has committed to "setting reduction targets by SBT," "report on climate change responses in mainstream reports by CDSB"
Science Based Targets (SBT)	The Kirin Group's emission reduction targets for 2030 were the first in Japan's food and beverages industry to be approved by SBT in 2017. In 2020, we acquired approval for our target under the new "SBT of 1.5° C" standards. On February 27, 2021, Kirin became the first Japanese company in the pharmaceutical and food industry to participate in the Corporate Engagement Program held by the Science Based Targets Network.
United Nations Global Compact	The Kirin Group joined the United Nations Global Compact in September 2005.
Japan Sustainability Local Group (JSLG)	Kirin Holdings participates as a steering committee member and director of the JSLG.
Fun to Share/COOL CHOICE	Since 2014, the Kirin Group has supported the Japanese government's new climate change campaigns, Fun to Share and COOL CHOICE, and has registered with these campaigns.
Voluntary Action Plan of Japan Business Federation (Nippon Keidanren)	In consideration of the conservation of the global environment, the Brewers Association of Japan, of which Kirin Brewery is a member, and the Japan Soft Drink Association, of which Kirin Beverage is a member, participate in initiatives for the reduction of environmental load conducted by Nippon Keidanren (Japan Business Federation) and are tackling CO ₂ reductions and the recycling of waste.

Organization	Nature of activity
Eco-First	Eco-First is a program in which companies make a pledge to the Minister of the Environment to conduct their own environmental conservation initiatives, such as counter-measures to global warming. The Kirin Group became the first manufacturer to be Eco-First accredited. It also participates in the Eco-First Promotion Council whose members comprise accredited companies.
Japan Business and Biodiversity Project	Kirin Holdings has joined the Japan Business and Biodiversity Partnership, which was established by Nippon Keidanren (Japan Business Federation), Japan Chamber of Commerce and Industry, and Keizai Doyukai (Japan Association of Corporate Executives) in 2010.
Green Purchasing Network (GPN)	The Kirin Group is a member of the Green Purchasing Network (GPN).
Forest Supporters	The Kirin Group participates in the activities of Forest Supporters, a civic movement that promotes the creation of beautiful forests. The National Land Afforestation Promotion Organization serves as secretariat for this movement.
Water Project	The Kirin Group has been involved in the Water Project, a public-private sector collaborative awareness-raising project established to promote the maintenance and restoration of healthy water cycles, since 2014.
Rainforest Alliance Consortium	The Kirin Group is a founding member of and active participant in the Rainforest Alliance Consortium, which was established in September 2015 by the Rainforest Alliance (Japan) and companies that handle Rainforest Alliance Certified products with the aim of promoting the certification program and certified products recognition.
Consortium for Sustainable Paper Use (CSPU)	Five (now ten) companies engaged in leading-edge paper use initiatives and WWF Japan established the Consortium for Sustainable Paper Use. As a founding member of the CSPU, the Kirin Group pursues initiatives aimed at sustainable paper use.

NGOs and environmental groups

Organization	Nature of activity
WWF Japan	We received support from the WWF Japan when developing our Guidelines for the Procurement of Sustainable Biological Resources and our Action Plan. The Consortium for Sustainable Paper Use was under joint efforts, and we are continuing to conduct activities.
Rainforest Alliance	We are working together to support the Sri Lankan tea farms and Vietnamese coffee plantations in getting Rainforest Alliance Certified.
FSC Japan	We jointly engage in activities to promote the wide use of FSC-certified paper. Kirin declared its commitment to the Vancouver Declaration on SDGs and FSC certification in 2017.
Roundtable on Sustainable Palm Oil (RSPO)	Kirin Holdings engages in activities as an associate member of the Roundtable on Sustainable Palm Oil (RSPO), a nonprofit organization that promotes the production and use of sustainable palm oil.
Earthwatch Japan	We are jointly pursuing ecological surveys at Mariko Vineyard and conducting activities to regenerate <i>Sophora flavescens</i> .

Industry organizations

Organization	Nature of activity
Brewers Association of Japan	We are jointly working on developing voluntary environmental action plans related to containers and packaging, global warming, creation of a recycle-based society, etc., and implementing associated measures and on conducting activities to prevent the scattering of beverage containers and promote community beautification.
Japan Soft Drink Association	We are jointly working on developing voluntary environmental action plans related to containers and packaging, global warming, creation of a recycle-based society, etc., and implementing associated measures and on conducting activities to prevent the scattering of beverage containers and promote community beautification.
Recycling related organizations	We are promoting 3R activities together with The Japan Containers and Packaging Recycling Association and various councils for promoting recycling.
The Beverage Industry Environment Beautification Association (BIEBA)	BIEBA brings together six beverage producer bodies to conduct activities aimed at beautification of communities.

Engagement with the next generation

Name of activity	Nature of activity
Kirin School Challenge	We hold environmental workshops for students in junior and senior high schools.
Japan Environmental Youth Network	We support the Japan Environmental Youth Network organized by the Ministry of the Environment and Environmental Restoration and Conservation Agency of Japan and serve on the adjudication panel at the regional and national conventions.

Environmental Data



Environmental Policy

Kirin Group's Environmental Policy

Basic policy

Kirin Group, a supplier of food and health products, will contribute to building a society where people and nature live in harmony by reducing the carbon footprint of all its business operations, implementing environmental conservation activities, and bringing environmental value to its customers.

Activity policy

1. Implementing an environmental policy throughout the entire value chain and all aspects of business activities, and
2. Assuring the quality of environmental activities through assessments and audits.
Under the leadership of top management and through the participation of all employees, Kirin Group will incorporate environmental measures into business management and pursue challenging goals by recognizing them as one of the top management priorities.

■ Legal requirements

We will comply with environmental laws, regulations, and agreements as well as voluntary control standards with high moral values.

■ Technological development

We will develop technologies that coexist with nature and are valuable for both the global environment and our customers.

■ Environmental management

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

■ Human resources development

We will make continuous efforts to develop human resources who contribute to environmental conservation activities.

■ Environmental performance

We will promote resource/energy saving, reduce greenhouse gas emissions, prevent environmental pollution, and promote the 3 R's (Reduce, Reuse, Recycle).

■ Communication

We will conduct community-based environmental conservation activities while providing accurate environmental information to increase transparency and gain trust.

Revised on October 2008

Policies on Plastic Policy

The Kirin Group Plastic Policy

1. Promoting recycling of PET bottles

The plastic containers, packaging, and other materials provided by the Kirin Group are mostly PET used for beverage bottles and the Kirin Group has used recycled resin for a part of them. The Kirin Group will promote the recycling of PET bottles by aiming to increase this recycled plastic ratio to 50% by 2027.

The recycling of PET bottles cannot be promoted without an efficient method for collecting high-quality used PET bottles. At the Kirin Group, we will proactively work with national and local governments, and industry organizations to create an efficient collection and reuse system for high-quality used PET bottles.

2. Efforts to reduce single-use plastic* and replace it with other materials

Most plastic waste is comprised of what is referred to as single-use plastic. The Kirin Group will make efforts to reduce the single-use plastic provided by its group companies and replace it with other materials.

* Disposable plastic that is used only and not intended for reuse.

3. Improving sustainability of raw materials for PET bottle

At the Kirin Group, we have made continuous efforts to reduce the weight of our PET bottles from the standpoint of reducing our environmental impact. We will keep striving toward even lighter bottles in the future.

In addition, to improve the sustainability of raw materials for PET bottle, we will study the introduction of PET bottle materials derived from inedible plants to reduce our dependence on petroleum resources.

In addition to the above measures, we will proactively participate in educational programs to promote plastic recycling, coastal cleanup activities, and other programs.

Kirin Beverage Company, Limited also supports the Soft Drink Business Plastic Resource Reclamation Declaration 2018 announced last year by the Japan Soft Drink Association, and will take proactive measures to realize the "100% Effective Utilization of PET Bottles by 2030" plan put forth by the industry.

Established on February 2019

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 announced in October 2010

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

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

Established in December 2012, announced in June 2013

Related Information→P.26~P.35

Kirin Group Action Plan for the Sustainable Use of Biological Resources

1. Black Tea

Kirin Company, Limited conducts the following three-step survey and, through annual reviews, is raising the level of sustainability.

Step.1 Specify the tea growers from which to procure black tea leaves.

Step.2 Evaluate the sustainability*1 of the specified growers.

Step.3 Aim to use black tea leaves from those growers with a high level of sustainability.

2. Paper and Printed Materials

Kirin Company, Limited, Kirin Brewery Company, Limited, Kirin Beverage Company, Limited and Mercian Corporation will:

Office paper*2

aim to use only FSC®-certified paper or recycled paper by the end of 2020.

Containers and packaging*3 *4

1) 6-can packs: aim to use only FSC-certified paper by the end of 2017.

2) Gift boxes: aim to use only FSC-certified paper by the end of 2020.

3) Drink boxes: aim to use only FSC-certified paper by the end of 2020.

4) Cardboard cartons for products: aim to use only FSC-certified paper by the end of 2020.

Other

Priority will be given to the use of paper that is FSC-certified, paper made with wood from FSC-managed forests, paper made from recycled paper, and paper that has been confirmed through supplier surveys as not resulting in the destruction of high conservation value forests*5.

3. Palm Oil*6

Operating companies in Japan will use the Book and Claim model in their handling of palm oil used as a primary or secondary ingredient. Book and Claim is a model for the trading of certificates approved by the Roundtable on Sustainable Palm Oil (RSPO).

When the identification of palm oil producers and the direct purchase of sufficient quantities of RSPO-certified palm oil becomes possible, a new, upgraded action plan will be formulated.

Notes

*1 Sustainability of tea in Step 2 will be evaluated according to the status of Rainforest Alliance certification.

*2 "Office paper" refers to copy paper, envelopes (excluding non-standard sizes and some industrial-use envelopes), business cards, and printed materials such as company pamphlets.

*3 Includes Kirin-Tropicana Inc.

*4 Excludes limited-edition products, small-lot product varieties, special shapes, imported products, etc.

*5 HC VF (High Conservation Value Forest), as defined by FSC®.

*6 Palm oil refers to the oil derived from the fruit of the oil palms, and includes palm kernel oil obtained from their seeds.

Established on February 2013

Revised on February 2017

Kirin Group's Principles of Managing Access to Genetic Resources

1.The Group shall respect international agreements concerning biodiversity.

2.Access to genetic resources shall be based on prior informed consent of the country providing such resources, and no genetic resources whose backgrounds are unknown shall be carried in or used.

3.Use of genetic resources, including fair and equitable sharing of the benefits arising out of their utilization, shall be properly managed in accordance with international treaties.

Established and announced in October 2010

Consideration of the Environment in Product Development

Guidelines on Environmentally Conscious Design for Containers and Packaging

1. Purpose

The Kirin Group aims to pass down the bounty of natural environment of our Earth in sustainable form to the future generations and continue providing value to customers and society on the whole. To this end, we comply with the relevant laws and regulations and with the Guidelines on Environmentally Conscious Design for Containers and Packaging in pursuing product development in consideration of the environment and promoting reduction and recycling of wastes in its business activities. By so doing, the Kirin Group aims to realize a society that is based on 100% recycling so as to balance the environmental impact produced by the Kirin Group's value chain with the Earth's ability to supply resources.

2. Basic Concept for Development, Design and Adoption of Containers and Packaging

- (1) In development and design, maintain quality, safety and hygiene of product contents, safety of containers and packaging, and appropriate presentation of product information as prerequisites, and take into account environmental applicability, user-friendliness, transport efficiency and economic performance.
- (2) In adoption, select containers and packaging that meet customers' purchasing and drinking styles, form of selling, and characteristics of product contents.

3. Concept of Caring for the Environment in Development, Design and Adoption of Containers and Packaging

- (1) Strive to reduce the environmental impact associated with containers and packaging throughout the lifecycle, i.e., from procurement to recycling, and keep the impact on the natural environment to a minimum.
- (2) In order to make effective use of resources and contribute to the realization of the circular economy, use materials that are easy to recycle or dispose of, that have minimal environmental impact, and materials that use recyclable resources.
- (3) In order to contribute to realizing a decarbonized society, select materials that require low energy use and that generate minimal greenhouse gas emissions during processes of manufacturing containers and packaging and of transporting products.
- (4) Select materials in consideration of preventing environmental pollution at the stage of disposal.
- (5) Promote the 3R (reduce, reuse, recycle) + Renewable (sustainable resources) activities in accordance with the following.

4. Guidelines for promoting the 3R (reduce, reuse, recycle) + Renewable (sustainable resources)

- (1) Reduce
 1. Make efforts to reduce weight of containers and packaging, sales promotion tools, etc. and to reduce the amount of materials used.
 2. Make efforts to design containers and packaging so that the volume can be reduced as much as possible by folding or crushing them when they are recycled or disposed of.
 3. Shift to simple packaging, try to eliminate individual pieces of wrapping and outer packaging, and make efforts to keep packaging reasonable.
- (2) Reuse
 1. Make efforts to design containers and packaging so that the number of reuses and refills can be repeated as much as possible.
 2. Make efforts to keep the environmental impact associated with reuse and refilling as small as possible.
- (3) Recycle
 1. Use single material as much as possible, and when using two or more types of materials, make efforts so as to enable their easy separation.
 2. Make efforts to use recycled materials and those with high recycling rates.
 3. Make efforts to adopt specifications and designs that facilitate separated discharge, sorted collection, and material sorting.

Established by Kirin Brewery in 1998. The scope was expanded to cover the entire Japanese alcoholic and non-alcoholic beverages businesses from 2014, and then to cover all domestic group companies excluding the pharmaceuticals business from 2019.

* The Kirin Group performs LCA (Life Cycle Assessment) on major containers for alcoholic beverages and non-alcoholic beverages whenever necessary. We also take into account the product characteristics, unit of purchase by customer at each purchase, major sales store format, projection on collection of empty containers and other relevant factors on a comprehensive basis to select containers.

Environmental Data Calculation Methods

(1) Usage Factors

Energy Use Conversion Factors

	Japan	Overseas	
Fuel	"Act on the Rational Use of Energy" Factors	Lion	<ul style="list-style-type: none"> •Australia - National Greenhouse Account Factors •New Zealand - Measuring Emissions:Detailed Guide •USA - GHG Emission Factors Hub
		Other than the above	"Act on the Rational Use of Energy" Factors
Electricity	Used 3.6 (MJ/kWh), which is used by International Energy Agency (IEA) and other organizations		

Emission factors for GHG Emissions

	Japan	Overseas	
Fuel	Emission factors from Greenhouse Gas Emissions Calculation and Reporting Manual (Ministry of Environment/Ministry of Economy, Trade & Industry)	Lion	<ul style="list-style-type: none"> •Australia - National Greenhouse Account Factors •New Zealand - Measuring Emissions:Detailed Guide •USA - GHG Emission Factors Hub
		Other than the above	Emission factors from Greenhouse Gas Emissions Calculation and Reporting Manual (Ministry of Environment/Ministry of Economy, Trade & Industry)
Electricity	<ul style="list-style-type: none"> •Emission factors published by individual power companies →If none published: Emission factors by country from IEA's Emission Factors for the year in question 		

(2) Calculation boundaries

Entire Group

Business	Company
Japan Beer and Spirits Business	Kirin Brewery, Kirin Distillery,SPRING VALLEY BREWERY, Eishogen Kirin Brewery (Zhuhai)
Japan Non-Alcoholic Beverages Business	Kirin Beverage, Shinshu Beverage, Hokkaido Kirin Beverage, Kirin Maintenance Service, each site of Kirin Beverage Service (Hokkaido, Sendai, Tokyo, Chubu, Kansai) KIRINVIVAX, Tokai Beverage Service
Oceania Integrated Beverages Business	Lion, New Belgium Brewing
Pharmaceuticals Businesses	Kyowa Kirin, KYOWA KIRIN FRONTIER Co., Ltd., Kyowa Medical Promotion Co., Ltd., Kyowa Kirin plus Co., Ltd., Kyowa Hakko Kirin China Pharmaceutical, Kyowa Kirin Pharmaceutical Research
Other Businesses (all companies included)	Mercian, NIPPON LIQUOR, Daiichi Alcohol, Wine Curation, Myanmar Brewery Interfood, Vietnam Kirin Beverage, Four Roses Distillery Kyowa Hakko Bio, KYOWA PHARMA CHEMICAL, KYOWA ENGINEERING CO.,LTD, BioKyowa Inc., Shanghai Kyowa Amino Acid, Thai Kyowa Biotechnologies Co., Ltd., Kirin Holdings, Kirin Business Expert, KIRIN BUSINESS SYSTEM, KOIWA DAIRY PRODUCTS, Kirin Echo, Kirin and Communications, Kirin Engineering Kirin City, Kirin Techno-System, KIRIN GROUP LOGISTICS

Breakdown of Calculations by Business

Refer to above "entire Group" calculation boundary table.

Breakdown of Calculations by Region

Region	Company
Japan	Kirin Brewery, Kirin Distillery, SPRING VALLEY BREWERY, Eishogen, Kirin Beverage, Shinshu Beverage, Hokkaido Kirin Beverage, Kirin Maintenance Service, each site of Kirin Beverage Service (Hokkaido, Sendai, Tokyo, Chubu, Kansai) KIRINVIVAX, Tokai Beverage Service, Kyowa Kirin, KYOWA KIRIN FRONTIER Co., Ltd., Kyowa Medical Promotion Co., Ltd., Kyowa Kirin plus Co., Ltd., Kyowa Hakko Bio, KYOWA PHARMA CHEMICAL, KYOWA ENGINEERING CO.,LTD, KOIWAI DAIRY PRODUCTS, Kirin Echo, Kirin and Communications, Kirin Engineering, Kirin City, Kirin Techno-System, KIRIN GROUP LOGISTICS, Mercian, NIPPON LIQUOR, Daiichi Alcohol, Wine Curation, Kirin Holdings, Kirin Business Expert, KIRIN BUSINESS SYSTEM
Oceania	Lion
Southeast Asia	Myanmar Brewery, Interfood, Vietnam Kirin Beverag, Thai Kyowa Biotechnologies Co., Ltd.
Other	Kyowa Hakko Kirin China Pharmaceutical, Kyowa Kirin Pharmaceutical Research, BioKyowa Inc., Shanghai Kyowa Amino Acid, Kirin Brewery (Zhuhai), Four Roses Distillery, New Belgium Brewing

Calculation boundary of Scope 3 emissions (P.12,59,70,71,100,101)

Business	Company
Japan Beer and Spirits Business	Kirin Brewery, Kirin Distillery,Kirin Brewery (Zhuhai)
Japan Non-Alcoholic Beverages Business	Kirin Beverage, Shinshu Beverage
Oceania Integrated Beverages Business	Lion
Pharmaceuticals Businesses	Kyowa Kirin, Kyowa Hakko Kirin China Pharmaceutical, Kyowa Kirin Pharmaceutical Research
Other Businesses (all companies included)	Mercian, Daiichi Alcohol, Myanmar Brewery, Interfood, Vietnam Kirin Beverage, Kyowa Hakko Bio, KYOWA PHARMA CHEMICAL, BioKyowa Inc., Shanghai Kyowa Amino Acid, Thai Kyowa Biotechnologies Co., Ltd., Kirin Holdings, KOIWAI DAIRY PRODUCTS, KIRIN GROUP LOGISTICS

Breakdown of business locations subject to water risk assessments (P.38)

Constituent/Name of Group Company	Country	Number of manufacturing plants	Remarks
Kirin Brewery	Japan	9	Hokkaido Chitose, Sendai, Toride, Yokohama, Nagoya, Shiga, Kobe, Okayama, Fukuoka * Because Kirin Beverage Shiga Plant is attached to Kirin Brewery Shiga Plant, it is included in Kirin Brewery Shiga Plant
Kirin Distillery	Japan	1	Gotemba
Mercian	Japan	3	Yatsushiro, Fujisawa, Katsunuma Winery
Kirin Beverage	Japan	1	Shonan * Because Kirin Beverage Shiga Plant is attached to Kirin Brewery Shiga Plant, it is included in Kirin Brewery Shiga Plant
Shinshu Beverage	Japan	1	
Kyowa Kirin	Japan	3	Takasaki, Fuji, Ube
	China	1	Kyowa Hakko Kirin China Pharmaceutical
Kyowa Iryo Kaihatsu	Japan	1	
Kyowa Hakko Bio	Japan	3	Yamaguchi Production Center (Hofu), Yamaguchi Production Center (Ube), Healthcare Plant (Tsuchiura)
Kyowa Pharma Chemical	Japan	1	Head office
Koiwai Dairy Products	Japan	2	Koiwai, Tokyo
BioKyowa Inc.	America	1	
Shanghai Kyowa Amino Acid	China	1	
Thai Kyowa Biotechnologies Co., Ltd.	Thai	1	
Kirin Brewery (Zhuhai)	China	1	
Interfood	Vietnam	1	
Vietnam Kirin Beverage	Vietnam	1	
Four Roses Distillery	America	2	Lawrenceburg, Cox's Creek
Myanmar Brewery	Myanmar	1	
Lion	Austraria	7	Castlemaine Perkins, James Boag Brewery, Little Creatures Brewery Fremantle, Tooheys Brewery, West End Brewery, Little Creatures Brewery Geelong, Malt Shovel Brewery
	Newzealand	3	Pride Brewery, Speights Brewery, Wither Hills Winery

Environmental Accounting

Environment conservation costs

(Unit : million yen)

Category	Specific details	Investment amounts			Expense amounts		
		2018	2019	2020	2018	2019	2020
Environmental conservation costs to control environmental impact resulting from production and service activity within the business areas (total of ①②③ below)		763	1,243	1,406	5,499	5,854	4,856
① Pollution prevention costs	Air and water pollution prevention activities, analysis and measurement of air and water quality, etc.	533	536	319	2,477	2,330	2,075
② Global environmental conservation costs	Solar power generation, CO2 recovery, energy saving, cogeneration, etc.	215	655	1,064	828	854	814
③ Resource circulation costs	Reduction of sludge, waste recycling, water recycling, etc.	16	53	23	2,195	2,669	1,968
Upstream / downstream costs	Containers and Packaging Recycling Act, Recycling contracting costs	1	86	54	584	375	475
Administration costs	Operation of environmental management systems, environmental education, greenification in business sites, etc.	13	35	65	319	300	301
Research and development costs	Container lightweighting, R&D regarding mitigation of environmental load of byproducts, wastewater, etc.	29	63	40	100	131	158
Social activities costs	Environmental conservation activity costs such as activities to protect the blessings of water, donations to nature conservation groups, etc.	0	0	0	47	49	38
Environmental remediation costs		0	0	0	0	0	5
Others		0	131	0	1	186	0
Total		806	1,559	1,566	6,550	6,895	5,834

Economic effect

(Unit : million yen)

Items	Details	2018	2019	2020
Proceeds from sales of valuables, etc.	Waste recycling, etc.	840	949	656
Resources saving effects	Energy saving, waste reduction, resources saving, etc.	555	591	548

Calculation boundaries

2018: Kirin Brewery, Kirin Distillery, Eishogen, Kirin Beverages, Shinshu Beverages, Mercian, Kyowa Kirin, Kyowa Hakko Bio, KYOWA PHARMA CHEMICAL, Koiwai Dairy Products, Kirin

2019: Kirin Brewery, Kirin Distillery, Eishogen, Kirin Beverages, Shinshu Beverages, Mercian, Kyowa Kirin, Kyowa Hakko Bio, KYOWA PHARMA CHEMICAL, Koiwai Dairy Products, Kirin Holdings

2020: Kirin Brewery, Kirin Distillery, Eishogen, Kirin Beverages, Shinshu Beverages, Mercian, Kyowa Kirin, Kyowa Hakko Bio, KYOWA PHARMA CHEMICAL, Koiwai Dairy Products, Kirin Holdings

Material Balance

Material Flow (2020, entire Group)

		Unit	Japan Beer and Spirits Business	Japan Non-Alcoholic Beverages Business	Oceania Integrated Beverages Business	Pharmaceuticals Businesses	Other Businesses	Total		
								2020	2019	2018
Substance		thousand t	519	61	324	1	404	1,308	1,431	1,484
		%	40	5	25	0.0	31	100		
	Raw material	thousand t	338	24	85	0.1	337	784	889	858
	Packaging material	thousand t	181	37	239	0.5	66	524	542	626
Water (fresh water only)		thousand m ³	14,295	1,815	5,054	1,747	34,700	57,611	68,218	76,319
		%	25	3	9	3	60	100		
Water recycling		thousand m ³	2,825	311	246	3,735	86,534	93,651	121,334	124,003
Energy		TJ	3,916	857	2,269	632	4,449	12,123	12,630	13,081
		%	32	7	19	5	37	100		
Production volumes	Alcoholic and non-alcoholic beverages	thousand kL	2,823	608	1,599	0	745	5,775	5,860	5,881
	Food products/Pharmaceuticals and biochemicals	thousand t	8	0	78	0.4	53	139	171	191
Wastewater		thousand m ³	11,820	1,450	3,313	1,840	35,489	53,912	67,387	71,747
		%	22	3	6	3	66	100		
Greenhouse gas emissions (Scope1+Scope2)		thousand t-CO ₂ e	224	52	206	44	349	875	949	986
		%	26	6	24	5	40	100		
NOx		t	124	43	185	5	45	403	425	436
SOx		t	0.4	0.2	1	0	8	10	15	19
Waste products		thousand t	137	12	190	2	84	426	470	421
		%	11	4	58	0.7	26	100		
	Volume disposed on site	thousand t	0	0	0	0.5	2	3	2	12
	Volume of recycled waste	thousand t	134	12	187	2	81	416	455	402
	Final disposed volume	thousand t	3	0	3	0.1	1	7	12	8

Water Resources

Trends in water use volumes and water consumption rate (entire Group)

	Water use volume (thousand m ³)	Water consumption rate(by sales revenue) (m ³ /million yen)
2016	81,620	44
2017	79,583	43
2018	76,319	40
2019	68,218	35
2020	57,611	31

Trend in water use volumes (by business)

(Unit: thousand m³)

	Japan Beer and Spirits Business	Japan Non-Alcoholic Beverages Business	Oceania Integrated Beverages Business	Pharmaceuticals Businesses	Other Businesses (all companies included)	Total
2016	12,896	2,656	5,514	3,110	57,443	81,620
2017	13,190	2,341	5,469	3,047	55,534	79,583
2018	14,049	2,345	5,378	2,309	52,238	76,319
2019	14,470	2,211	5,023	2,232	44,283	68,218
2020	14,295	1,815	5,054	1,747	34,700	57,611

Trend in water use volumes (by region)

(Unit: thousand m³)

	Japan	Oceania	Southeast Asia	Other	Total
2016	62,707	5,514	2,560	10,838	81,620
2017	61,721	5,469	2,500	9,892	79,583
2018	58,120	5,378	2,811	10,011	76,319
2019	50,333	5,023	3,654	9,208	68,218
2020	40,187	4,598	3,449	9,377	57,611

Trends in annual water use volumes by water source (entire Group)

	Unit	Fresh water* ¹					Total
		Service water	Rivers (including industrial water)	Underground water	Storm water	Gray water* ² (Reclaimed water)	
2016	thousand m ³	9,946	41,375	30,289	2	8	81,620
	%	12	51	37	0.0	0.0	100
2017	thousand m ³	9,765	42,150	27,667	1	0	79,583
	%	12	53	35	0.0	0.0	100
2018	thousand m ³	10,312	40,415	25,592	0	0	76,319
	%	14	53	34	0.0	0.0	100
2019	thousand m ³	10,605	35,679	21,934	0	0	68,218
	%	16	52	32	0.0	0.0	100
2020	thousand m ³	10,566	24,936	22,109	0	0	57,611
	%	18	43	38	0.0	0.0	100

*1 No use of sea water or external wastewater or quarry water collected in the quarry.

*2 Externally supplied gray water

Trend in water use volumes of Japan Integrated Beverages Business

	Unit	Kirin Brewery	Kirin Distillery	Kirin Beverage	Shinshu Beverage	Mercian
2016	thousand m ³	11,009	1,324	1,359	1,297	4,317
	m ³ /kL	5.0	3.1	2.9	5.2	32.6
2017	thousand m ³	11,199	1,383	968	1,374	3,391
	m ³ /kL	5.3	3.2	2.2	5.2	25.5
2018	thousand m ³	12,006	1,379	971	1,374	3,240
	m ³ /kL	5.3	3.1	2.1	5.3	22.5
2019	thousand m ³	12,509	1,380	968	1,243	2,825
	m ³ /kL	5.3	3.1	2.2	4.8	19.8
2020	thousand m ³	12,280	1,386	925	890	3,669
	m ³ /kL	5.3	3.3	2.3	4.2	19.6

* Because Kirin Beverage Shiga Plant is attached to Kirin Brewery Shiga Plant, it is included in Kirin Brewery Shiga Plant

Trend in use of recycled water in entire Group manufacturing plants and business locations

	Unit	Cyclical use			Recycling rate (%)
		Re-used water	Recycled water	Total	
2016	thousand m ³	13,386	86,180	99,566	55
	%	13.4	86.6	100.0	
2017	thousand m ³	15,123	90,944	106,067	57
	%	14.3	85.7	100.0	
2018	thousand m ³	18,993	105,010	124,003	62
	%	15.3	84.7	100.0	
2019	thousand m ³	15,901	105,433	121,334	64
	%	13.1	86.9	100.0	
2020	thousand m ³	3,864	89,788	93,651	62
	%	4.1	95.9	100.0	

Trend in wastewater volume by destination (entire Group)

	Unit	Wastewater volume				
		Sewage water	Direct release into rivers, etc.	Indirect release into ocean	Other*	Total
2016	thousand m ³	6,620	27,068	37,898	109	71,695
	%	9	38	53	0.2	100
2017	thousand m ³	7,224	27,679	38,559	102	73,563
	%	10	38	52	0.1	100
2018	thousand m ³	6,980	26,063	38,604	99	71,747
	%	10	36	54	0.1	100
2019	thousand m ³	9,551	24,603	33,135	98	67,387
	%	14	37	49	0.1	100
2020	thousand m ³	8,888	23,587	21,342	95,755	53,912
	%	16	44	40	0.2	100

* Water sprayed onto forest areas

Containers and Packaging

Volume of resources used in containers and packaging

	Unit	Japan Beer and Spirits Business	Japan Non-Alcoholic Beverages Business	Oceania Integrated Beverages Business	Pharmaceuticals Businesses	Other Businesses (all companies included)	Total
2016	thousand t	208	45	391	0.2	114	759
	%	27	6	51	0.03	15	100
2017	thousand t	219	51	332	0.3	117	719
	%	30	7	46	0.03	16	100
2018	thousand t	179	51	281	0.2	115	626
	%	29	8	45	0.03	18	100
2019	thousand t	178	49	249	0.6	65	542
	%	33	9	46	0.1	12	100
2020	thousand t	181	37	239	0.5	66	524
	%	35	7	46	0.1	13	100

Volume of resources used by container(Major companies in Japan)

(Unit: t)

		Aluminum cans	Steel cans	PET bottles	Glass bottles	Drink boxes	Cartons	6-can packs
2016	Volume reduction	18,795	—	11,326	960	—	6,078	3,564
	Volumes used	68,850	11,580	63,000	33,531	7,584	111,631	13,736
2017	Volume reduction	30,031	—	7,710	1,332	—	8,792	3,444
	Volumes used	66,915	11,295	60,561	31,276	6,311	102,693	13,974
2018	Volume reduction	19,226	—	12,218	870	—	5,798	3,629
	Volumes used	73,724	9,424	68,677	31,183	6,515	107,771	13,969
2019	Volume reduction	22,975	—	11,998	340	—	5,910	3,646
	Volumes used	77,912	8,542	74,894	27,844	7,825	109,526	14,611
2020	Volume reduction	24,177	—	12,244	248	—	6,237	4,008
	Volumes used	81,137	6,876	67,061	23,853	6,995	103,738	15,601

* Reduction volumes are totals for Kirin Brewery and Kirin Beverage, use volumes are totals for Kirin Brewery, Kirin Beverage, and Mercian.

(Ref.) Trends in recycling rates of other containers in Japan

The Kirin Group pursues initiatives in cooperation with Japanese industry organizations involved in container recycling.

		2015	2016	2017	2018	2019	Target*
Aluminum cans	Weight of consumed (thousand t)	332	341	336	331	330	—
	Recycled weight (thousand t)	299	315	310	309	324	—
	Recycling rate (%)	90.1	92.4	92.5	93.6	97.9	≥92
Steel cans	Weight of consumed (thousand t)	486	463	451	439	427	—
	Recycled weight (thousand t)	451	435	422	404	398	—
	Recycling rate (%)	92.9	94.0	93.4	92.0	93.3	≥90
PET bottles	Sales volume of specified PET bottles (thousand t)	563	596	587	626	593	—
	Recycling volume in Japan (thousand t)	262	279	298	334	327	—
	Recycling volume outside Japan (thousand t)	227	221	201	195	182	—
	Recycling volume of used PET bottle (thousand t)	489	500	498	529	509	—
	Recycling rate (%)	86.9	83.9	84.8	84.6	85.8	≥85
Glass bottles	Melted weight (thousand t)	1,618	1,606	1,583	1,553	1,465	—
	Cullet usage volume (thousand t)	1,228	1,211	1,189	1,160	1,103	—
	Cullet usage rate (%)	75.9	75.4	75.1	74.7	75.3	—
	Recycling rate (%)	68.4	71.0	69.2	68.9	67.6	≥70

* Recycling target of 4th Voluntary Action Plan


State of sale and collection of returnable glass bottles (Kirin Brewery)

	Sale volumes(million bottles)	Collected volume(million bottles)	Collection rate (%)
2016	232.0	232.7	100
2017	224.6	227.8	101
2018	205.1	203.2	99
2019	182.6	182.3	100
2020	107.3	114.6	107

* Total of major returnable bottles (large, medium, small bottles)

* Kirin Brewery is engaged in the re-use of beer bottles and commercial large draft kegs. With the diversification of containers, the volume of returnable bottles used has fallen, but the collection rate is 99%.Kirin Beverage also uses returnable bottles for Kirin Lemon and other products and has a collection rate of nearly 100%.

Climate Change

Actual results for Fiscal 2020 marked with  have received independent assurance by KPMG AZSA Sustainability Co., Ltd.in accordance with International Standard on Assurance Engagements (ISAE) 3000 and ISAE3410.

Trends in greenhouse gas emissions


■ Scope 1 (direct emissions) + Scope 2 (indirect emissions from energy use)

Trends in greenhouse gas emissions and emissions intensity (entire Group)

	Greenhouse gas emissions (thousand tCO ₂ e)		Greenhouse gas emissions intensity (per unit of sales) (tCO ₂ e/million yen)	
		(of which, CO ₂)	Japan standard	IFRS
2016	1,012	(1,010)	0.52	0.55
2017	996	(995)	—	0.53
2018	986	(983)	—	0.51
2019	949	(948)	—	0.49
2020	875	(874)	—	0.47


Trends in greenhouse gas emissions (by business)

(Unit : thousand tCO₂e)

	Japan Beer and Spirits Business	Japan Non-Alcoholic Beverages Business	Oceania Integrated Beverages Business	Pharmaceuticals Businesses	Other Businesses (all companies included)	Total 
2016	233	70	251	65	393	1,012
2017	231	61	247	62	396	996
2018	232	59	235	55	405	986
2019	232	56	229	56	376	949
2020	224	52	206	44	349	875

Trends in greenhouse gas emissions (by region)

(Unit : thousand tCO₂e)

	Japan	Oceania	Southeast Asia	Other	Total 
2016	593	251	46	122	1,012
2017	581	247	50	119	996
2018	570	235	57	124	986
2019	520	229	76	124	949
2020	463	187	72	153	875

Trends in greenhouse gas emissions and emission intensities from manufacturing plants

(a) Kirin Brewery

	Greenhouse gas emissions (thousand tCO ₂ e)	Greenhouse gas emissions intensity (kgCO ₂ e/kL)
2016	194	89
2017	191	90
2018	195	85
2019	196	84
2020	189	82

*Greenhouse gas emissions include the greenhouse gas emissions from sold electricity.

(b) Kirin Beverage

	Shonan Plant	
	Greenhouse gas emissions (thousand tCO ₂ e)	Greenhouse gas emissions intensity (kgCO ₂ e/kL)
2016	31	77
2017	28	64
2018	27	60
2019	26	59
2020	25	62

(c) Mercian*

	Greenhouse gas emissions (thousand tCO ₂ e)
2016	28
2017	29
2018	30
2019	25
2020	44

*Alcohol business was transferred from Kyowa Hakko Bio to Mercian in July 2020.

(d) Kyowa Kirin (global)

	Greenhouse gas emissions intensity (thousand tCO ₂ e/t)
2018	253
2019	124
2020	106

Trends in energy usage (entire Group)


Energy usage by type	2016	2017	2018	2019	2020
Total usage (TJ)	12,803	12,972	13,081	12,630	12,123
Coal (t)	1,758	2,294	2,339	2,079	1,613
Gasoline (kL)	3,887	3,600	3,621	4,758	3,706
Kerosene (kL)	166	1,466	1,399	1,342	1,379
Diesel oil (kL)	12,242	13,790	12,611	14,965	14,573
Heavy fuel oil (kL)	11,674	12,475	14,006	9,430	7,429
LPG (t)	2,623	3,334	3,356	3,331	2,698
Town gas (thousand Nm ³)	111,648	110,950	112,987	96,747	95,972
LNG (t)	0	0	0	0	0
Purchased electricity (MWh)	818,925	811,123	811,507	777,626	719,361
Renewable electricity (MWh)	843	23,848	31,657	31,947	74,439
Purchased steam (TJ)	1,979	1,925	1,886	1,599	1,461
Other (TJ)	1,662	1,771	1,811	2,413	2,308

Breakdown and Trends in Greenhouse Gas Emissions

■ Scope 1 (direct emissions)

Trends in greenhouse gas emissions from fuel use (by business)

(Unit : thousand tCO₂e)

	Japan Beer and Spirits Business	Japan Non-Alcoholic Beverages Business	Oceania Integrated Beverages Business	Pharmaceuticals Businesses	Other Businesses (all companies included)	Total 
2016	159	45	77	18	101	401
2017	164	44	74	21	103	405
2018	168	42	74	18	110	412
2019	169	40	72	20	108	411
2020	162	38	73	19	105	398

Trends in greenhouse gas emissions from fuel use (by region)

(Unit: thousand tCO₂e)

	Japan	Oceania	Southeast Asia	Other	Total
2016	259	77	18	47	401
2017	266	74	21	44	405
2018	271	74	21	46	412
2019	264	72	26	48	411
2020	253	63	23	60	398

Breakdown of greenhouse gas emissions in Scope 1(2020)

(Unit: thousand tCO₂e)

CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆
398	0.5	0.1	0	0	0

■ Scope 2 (indirect emissions from energy use)

Trends in greenhouse gas emissions from electricity and steam purchases (by business) (Unit: thousand tCO₂e)

	Japan Beer and Spirits Business	Japan Non-Alcoholic Beverages Business	Oceania Integrated Beverages Business	Pharmaceuticals Businesses	Other Businesses (all companies included)	Total
2016	74	26	174	46	292	611
2017	67	17	173	41	293	591
2018	64	17	161	37	295	574
2019	62	16	157	35	268	538
2020	61	14	133	24	244	477

Trends in greenhouse gas emissions from electricity and steam purchases (by region) (Unit: thousand tCO₂e)

	Japan	Oceania	Southeast Asia	Other	Total
2016	334	174	28	75	611
2017	315	173	28	75	591
2018	299	161	36	79	574
2019	256	157	50	76	538
2020	209	125	49	94	477

■ Scope3 (other indirect emissions)

Trends in CO₂ emissions by other parties related to business activities (by business)

See P. 93 for calculation boundaries

(Unit: thousand tCO₂)

	Japan Beer and Spirits Business	Japan Non-Alcoholic Beverages Business	Oceania Integrated Beverages Business	Pharmaceuticals Businesses	Other Businesses (all companies included)	Total
2016	1,521	1,099	800	14	767	4,200
2017	1,413	1,060	1,083	15	793	4,364
2018	1,483	1,060	761	14	845	4,163
2019	1,456	1,091	712	13	835	4,107
2020	1,413	965	726	9	876	3,989

Trends in CO₂ emissions by other parties related to business activities (by region)

See P. 93 for calculation boundaries

(Unit: thousand tCO₂)

	Japan	Oceania	Southeast Asia	Other	Total
2016	3,244	800	112	44	4,200
2017	3,081	1,083	152	47	4,364
2018	3,145	761	209	48	4,163
2019	3,084	712	267	44	4,107
2020	2,941	726	275	47	3,989

Trends in CO₂ emissions* accompanying transportation volumes and distances (Japan)

		Kirin Brewery	Kirin Beverage	Mercian	Total
2015	Transport volumes (thousand ton kilometer)	604,865	791,106	85,488	1,481,459
	CO ₂ emissions (thousand tons-CO ₂)	51	66	8	125
2016	Transport volumes (thousand ton kilometer)	641,171	830,808	87,036	1,559,015
	CO ₂ emissions (thousand tons-CO ₂)	52	71	8	131
2017	Transport volumes (thousand ton kilometer)	735,996	822,256	87,904	1,646,156
	CO ₂ emissions (thousand tons-CO ₂)	55	68	8	131
2018	Transport volumes (thousand ton kilometer)	823,267	906,144	94,212	1,823,623
	CO ₂ emissions (thousand tons-CO ₂)	62	84	8	155
2019	Transport volumes (thousand ton kilometer)	755,308	963,748	90,991	1,810,047
	CO ₂ emissions (thousand tons-CO ₂)	55	76	8	139

* Tally period is April to March of following year for each year. Calculated within the reporting scope of specified consigners, in line with the calculation standards of the Act on the Rational Use of Energy.

Independent Assurance

The Kirin Group has been receiving independent assurances to ensure the reliability and transparency of information disclosed.

The Kirin Group has engaged an independent third party to provide assurance on the 2020 CO₂ emissions in Scope 1 and 2 from the entire Kirin Group and those in Scope 3 from Kirin Brewery, Kirin Beverage and Mercian. The independent assurance report is shown on (P.116).

Calculation results of Scopes 1 and 2 for the entire Kirin Group*¹ (2020) (Unit:tCO₂e/year)

Scope1	Scope2
398,216	476,789

Calculation results of Scope 3 for Kirin Brewery, Kirin Beverage and Mercian (2020) (Unit:tCO₂/year)

Upstream/ Downstream	Scope3 Categories	Calculation results	Remarks
Upstream	1 Products and services purchased	1,569,466	Calculated by multiplying the purchased volume of raw materials, etc. by the CO ₂ emission factors for producing each type of raw material, etc.
	2 Capital goods	—	Not calculated
	3 Fuel and energy-related activities not included in Scopes 1 and 2	40,336	Calculated by multiplying the purchased volume of fuel or electricity by CO ₂ emission factors for each energy type
	4 Transportation and delivery (upstream)	304,761	Calculated by multiplying the shipping volume of products as shipper and the purchased volume of raw materials, etc. by the distance of transportation and then by the CO ₂ emission factors for each transportation method (the amount of CO ₂ emissions based on shipping volume of products as shipper is calculated using FY2019 data)
	5 Waste from operations	6,392	Calculated by multiplying the amount of waste discharged, etc. by the CO ₂ emission factors for each disposal method
	6 Business travel	975	Calculated by multiplying the number of employees by the annual average distance of transportation and then by the CO ₂ emission factors for each means of transportation, considering the percentage of travel restrictions to prevent the spread of COVID-19
	7 Employee commuting	2,156	Calculated by multiplying the number of employees by the annual average distance of transportation and then by the CO ₂ emission factors for each means of transportation, considering the percentage of employees who are restricted from coming to work to prevent the spread of COVID-19
	8 Leased assets (upstream)	—	Included in Scopes 1 and 2
Downstream	9 Transportation and delivery (downstream)	717,706	Customers: Calculated by multiplying the product sales volume by the CO ₂ emission factors for selling products for each sales method Vending machines: Calculated by multiplying the estimated power consumption of vending machines in operation by the CO ₂ emission factor for electricity
	10 Processing of sold products	—	Not applicable
	11 Use of sold products	33,735	Calculated by multiplying the product sales volume by the estimated power consumption per product unit amount in homes, etc. and by the CO ₂ emission factors for electricity. From 2019, the amount of CO ₂ injected into products is considered as the amount of CO ₂ released to the atmosphere. The amount is calculated based on the product specifications.
	12 Disposal of sold products	51,919	Calculated by multiplying the amount of containers and packaging disposed by the CO ₂ emission factors for each type of container and packaging
	13 Leased assets (downstream)	—	Not applicable
	14 Franchises	—	Not applicable
	15 Investments	—	Not applicable
Total		2,727,446	

Progress toward Mid-Term Greenhouse Gas Emission Reduction Targets Through SBTs*² (2020)

(Unit:tCO₂e)

■ Scope1+2

Scope1+Scope2		Total
		875,006
Scope1		398,216
Scope2		476,789
Reduction rate (compared to 2019 base year)		-8%

■ Scope3

Scope3			Total
			3,988,639
Upstream	1	Products and services purchased	2,308,001
	2	Capital goods	—
	3	Fuel and energy-related activities not included in Scopes 1 and 2	127,901
	4	Transportation and delivery (upstream)	396,149
	5	Waste from operations	28,919
	6	Business travel	7,894
	7	Employee commuting	8,070
	8	Leased assets (upstream)	—
Downstream	9	Transportation and delivery (downstream)	958,298
	10	Processing of sold products	—
	11	Use of sold products	44,017
	12	Disposal of sold products	109,389
	13	Leased assets (downstream)	—
	14	Franchises	—
	15	Investments	—
Reduction rate (compared to 2019 base year)			-3%

*¹ Methods of calculating Scope 1 and 2 emissions

- Fuel: Lion calculates emissions according to the calculation standards set by the Australian and New Zealand governments.
- All other manufacturing sites calculate emissions according to the calculation standards in Japan's Act on Promotion of Global Warming Countermeasures and Act on the Rational Use of Energy.
- Electricity: Calculated by multiplying the amount of purchased electricity by the CO₂ emission factors published by the individual power companies (or, if there are no published figures, by the country-specific emission factor published by the IEA).
- Greenhouse gas emissions include the greenhouse gas emissions from sold electricity.

*² By 2030, reduce GHG emissions of Scope 1+2 by 50% and Scope 3 by 30% compared to 2019.

Trends in biogas electricity and biogas generated at Kirin Brewery plans

	Biogas electricity generated (Unit: million kWh)	Biogas generated (Unit: thousand Nm ³)
2016	21.2	8,593
2017	19.2	8,115
2018	18.6	8,689
2019	21.9	9,009
2020	22.5	8,526

Trend in annual electricity consumption per one can and bottle vending machine shipped

	Annual electricity consumption (Unit: kWh/year)
2015	708
2016	724
2017	712
2018	702
2019	704

Source: Japan Vending Machine Manufacturers Association

Breakdown of electricity usage (entire Group)



(Unit: thousand kWh)

			2018	2019	2020
Purchased electricity	Renewable energy	Solar power	—	—	18,546
		Hydro-electric power	30,813	30,480	53,753
		Wind power	502	499	403
		Total	31,315	30,979	72,703
	Non-renewable energy		780,694	777,626	719,361
Private power generated	Biogas-generated electricity		19,099	22,291	25,313
	Solar-generated electricity		342	968	1,736
	Other than renewable energy		165,746	160,790	135,476
Electricity usage			997,197	992,654	954,590
	Of which, renewable energy (excluding energy mix)		50,757	54,238	99,752

Green bonds

18th Series of Unsecured Corporate Bonds (Green Bonds) funding allocation and impact reporting (as of December 2020)

Amount raised	Unallocated amount
10.0 billion yen	7.7 billion yen

Project name	Summary	Impact reporting
Procurement of recycled PET resin	<p>Recycled PET resin is produced by mechanical recycling of used PET bottles. By using recycled PET resin as the raw material for PET bottles, it is possible to recycle PET bottles into PET bottles, which contributes to reducing the use of fossil resources. It has been shown that this process reduces CO2 emissions at the manufacturing stage by approximately 50-60% compared with the production of petroleum-derived PET bottles. While 613,000 tons of PET bottles are manufactured annually in Japan, the total amount of recycled PET resin used as a raw material for PET bottles is only 72,700 tons. As such, there is a need to expand the use of recycled PET resin in PET bottle manufacturing.</p> <p>Amount allocated (cumulative): 2.1 billion yen (99% refinanced)</p>	 <p>The ratio of recycled PET resin across the Kirin Group as a whole was 1.5%.</p>
Introduction of heat pump systems at plants	<p>A heat pump system is a technology that recovers low-temperature heat sources from air and water and converts them into high-temperature energy by adding energy. In industrial applications, unutilized heat sources such as waste air and waste heat are used to generate high-temperature energy, which is then applied to production processes such as heating, insulation, sterilization, drying, cleaning, and distillation. The Kirin Group plans to replace the burning of fossil fuels in the heating process, which accounts for the majority of GHG emissions from manufacturing processes, with heat pump systems. We are working to develop a manufacturing system that emits less GHGs by sourcing the electric power we use as a source of energy from renewable energy. We have completed the introduction of heat pump systems at five plants in Japan.</p> <p>Amount allocated (cumulative): 0.2 billion yen (99% refinanced)</p>	 <p>The Kirin Group reduced GHG emissions by 3,400 tons in FY2020 through the introduction of heat pump systems.</p>

Reduction of waste and prevention of pollution

Volume of waste generated (2020)

(Unit: thousand tons. Figures in brackets: %)

Japan Beer and Spirits Business	Japan Non-Alcoholic Beverages Business	Oceania Integrated Beverages Business	Pharmaceuticals Businesses	Other Businesses (all companies included)	Total
137 (32)	12 (3)	190 (45)	2 (0.6)	84 (20)	426 (100)

Trends in volume of waste generated and recycling rates (Japan)

	Volume of waste generated (thousand t)	Volume disposed on site (thousand t)	Volume of recycled waste (thousand t)	Final disposed volume (thousand t)	recycling rates (%)
2016	237	17	219	0.4	99.8
2017	243	24	219	0.6	99.7
2018	346	12	333	0.7	99.8
2019	230	2	227	0.6	99.8
2020	151	3	148	0.3	99.8

Wastewater quality

	COD (t)				Nitrogen (t)			Phosphorous (t)		
	Japan	Overseas	Total	load / tonne product*	Japan	Overseas	Total	Japan	Overseas	Total
2018	742	3,127	3,869	11.0	344	826	1,169	45	220	264
2019	735	3,682	4,417	5.6	315	754	1,069	47	265	312
2020	620	5,010	5,630	6.8	205	766	971	48	265	313

* Kyowa Kirin (global) (Unit: kg/ t)

Trend in emissions of air pollutants

Trends in emissions of NOx and SOx (entire Group)

(Unit:t)

	NOx	SOx
2016	442	64
2017	431	95
2018	436	19
2019	425	15
2020	403	10

Trends in emissions of VOCs (Kyowa Kirin Group, Kyowa Hakko Bio Group)

(Unit:t)

	Methanol	Acetone	Substances subject to PRTR Act	Ethyl acetate, etc.	Total
2016	324	21	55	88	488
2017	417	21	62	97	596
2018	308	13	57	103	481
2019	183	8	49	74	314
2020	144	6	35	57	242

Soil Investigations Status (2020)

Number of investigations	Area of investigations (m ²)
2	4,441

Targets regarding chemical substances

Kyowa Kirin Group
50% reduction of VOC emissions in 2020 compared to FY2003 levels

Status of PCB management (2020)

High-concentration capacitors, reactors, etc.	Trace-quantity capacitor reactors, etc.	High-concentration stabilizers	Trace-quantity stabilizers
0	12	58	22

Status of asbestos management (2020)

Number of buildings	Area (m ²)
4 buildings	2,440

Status of HCFC management (2020)

Number of offices	Weight (kg)
12 locations	23,086

Status of HFC management (2020)

Number of offices	Weight (kg)
9 locations	15,382

Site Data

Kirin Brewery (2020) *1

Brewery	Energy intensity (GJ/kL)	Water use per unit of production (m ³ /kL)	GHG emissions per unit of production (kgCO ₂ e/kL)	Wastewater intensity (m ³ /kL)
Hokkaido Chitose	1.56	4.5	147	3.3
Sendai	1.42	11.1	90	11.4
Toride	1.10	5.1	47	4.1
Yokohama	3.52	6.2	174	4.4
Nagoya	1.20	4.7	77	4.2
Shiga*2	1.20	4.0	72	3.5
Kobe	1.06	3.5	59	3.5
Okayama	1.05	5.4	75	4.3
Fukuoka	1.43	5.5	75	5.3

*1 Energy intensity and unit GHG emissions include electricity sold.

Kirin Beverage*2 (2020)

Plant	Water use (thousand m ³)	GHG emissions (thousand tCO ₂ e)	Waste emissions (t)	Recycling rate (%)
Shonan	925	25	7,404	100

*2 The Shiga Plant of Kirin Beverage is included in Kirin Brewery because it is co-located with the Shiga Plant of Kirin Brewery.

Mercian (2020)

Plant	Water use (thousand m ³)	GHG emissions (thousand tCO ₂ e)	Waste emissions (t)	Recycling rate (%)
Fujisawa	292	7	170	100
Yatsushiro	2,434	20	827	100
Hofu*3	912	16	0.08	100
Château Mercian	31	0.4	23	100

*3 Transfer of alcohol business from Kyowa Hakko Bio to Mercian from July 2020

Kyowa Kirin Group (Japan, 2020)

Plant	Water use (thousand m ³)	GHG emissions (tCO ₂ e)	Waste emissions (t)
Kyowa Kirin Tokyo Research Park	15	2,599	51
Kyowa Kirin Fuji Research Park / CMC Research Center	1,328	14,120	203
Kyowa Kirin Bio Production Technology Laboratories / Takasaki Plant	308	11,618	748
Kyowa Kirin Ube Plant	73	8,692	462

KOIWAI DAIRY PRODUCTS

Plant	Water use per unit of production(m ³ /t)*4		
	2018	2019	2020
Koiwai Plant	52	59	58

*4 Unit water consumption for dairy products

Status of Environmental Management Certifications

Status as of July 2021

Japan

Number of independently certified business locations	6
Number of business locations making self-declaration of conformity	21
Number of uncertified business locations	2
Certification rate (%)	93

Overseas

Number of certified business locations	27
Number of uncertified business locations	7
Certification rate (%)	79

Other information disclosure

Disclosure of environmental information through products

Label name	Nature of disclosure
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 proactively tackling global environmental issues with the use of rail freight transport.
Carbon Footprint	Kirin Brewery launched Carbon Footprint initiatives together with the beer industry in 2008. The Product Category Rule (PCR), which is the rule for the calculation of beer categories, was certified in February 2011 and revised in December 2013.
Rainforest Alliance certification seal	In March 2015, 500ml paper packs of <i>Kirin Gogo-no-Kocha Straight Tea</i> were labeled with Rainforest Alliance certification seal. We plan to launch new Rainforest Alliance Certified products in 2021.
FSC Certification Label	Kirin Brewery and Kirin Beverage (including Tropicana) display the FSC certification label on many of their paper containers to encourage understanding among consumers about the importance of protecting the forests. Mercian displays the label on some of its paper containers.
Organic Wine	Mercian sells organic wines certified by Euro Leaf, ECOCERT, BIODYVIN, bioagricert, SOHISCERT and so on.

GRI Contents Index

This report uses the following disclosure matters of the GRI Standard 2016 as reference.

GRI Contents Index Standard	Disclosure matters	Page number or URL
General Disclosures		
GRI 102: General Disclosures 2016	102-1 Name of the organization	P.5
	102-2 Activities, brands, products, and services	P.5 Domains (https://www.kirinholdings.com/en/domains/)
	102-3 Location of headquarters	P.5 Corporate Overview (https://www.kirinholdings.com/en/profile/overview/)
	102-4 Location of operations	P.5 Group Companies (https://www.kirinholdings.com/en/profile/organization/)
	102-5 Ownership and legal form	P.5 Corporate Overview (https://www.kirinholdings.com/en/profile/overview/)
	102-6 Markets served	P.5 Group Companies (https://www.kirinholdings.com/en/profile/organization/)
	102-7 Scale of the organization	P.5 Kirin Group profile (https://www.kirinholdings.com/en/investors/esg/esg/) Group Companies (https://www.kirinholdings.com/en/profile/organization/)
	102-8 Information on employees and other workers	P.5 ESG data (Kirin Group profile, Employee) (https://www.kirinholdings.com/en/investors/esg/esg/)
	102-9 Supply chain	P.27, 37, 45, 59, 80 Promoting responsible procurement (https://www.kirinholdings.com/en/impact/procurement/csr/)
	102-10 Significant changes to the organization and its supply chain	P.3 KIRIN CSV REPORT 2020 P.77 ESG data (Notes) (https://www.kirinholdings.com/en/investors/esg/esg/)
	102-11 Precautionary Principle or approach	P.10, 78, 88-92 Kirin Group's Environmental Policy (https://www.kirinholdings.com/en/impact/env/policy/mission/)
	102-12 External initiatives	P.85-86 ESG data/Guideline Content Index/Third-Party Evaluations (https://www.kirinholdings.com/en/investors/esg/esg/) The GC and the Kirin Group (https://www.kirinholdings.com/en/impact/csv_management/gc/) Embracing Diversity (https://www.kirinholdings.com/en/drivers/hr/diversity/)

GRI Contents Index Standard	Disclosure matters	Page number or URL
	102-13 Membership of associations	P.85-86
	102-14 Statement from senior decision-maker	P.4, 6 Message from Top Management (https://www.kirinholdings.com/en/purpose/message/)
	102-15 Key impacts, risks, and opportunities	P.9, 12-23, 26, 28, 38-39, 42, 76 Business Risk Factors (https://www.kirinholdings.com/en/purpose/risks/) Management Issues for Sustainable Growth (Group Materiality Matrix) (https://www.kirinholdings.com/en/impact/materiality/) Scenario analysis (TCFD) (https://www.kirinholdings.com/en/impact/env/tcf/)
	102-16 Values, principles, standards, and norms of behavior	P.5, 7, 75, 77-80, 88-92 Corporate Policy (https://www.kirinholdings.com/en/profile/philosophy/) Policy and system (https://www.kirinholdings.com/en/impact/env/policy/mission/) Compliance (https://www.kirinholdings.com/en/purpose/governance/compliance/) Promoting responsible procurement (https://www.kirinholdings.com/en/impact/procurement/csr/)
	102-17 Mechanisms for advice and concerns about ethics	P.81 Compliance (https://www.kirinholdings.com/en/purpose/governance/compliance/)
	102-18 Governance structure	P.75-78 Management Structure (https://www.kirinholdings.com/en/purpose/governance/management/) ESG data (Governance) (https://www.kirinholdings.com/en/investors/esg/esg/)
	102-19 Delegating authority	P.75-78 System to Promote CSV (https://www.kirinholdings.com/en/impact/csv_management/promotion_impact/) Policy and system (https://www.kirinholdings.com/en/impact/env/policy/mission/)
	102-20 Executive-level responsibility for economic, environmental, and social topics	P.75-78 System to Promote CSV (https://www.kirinholdings.com/en/impact/csv_management/promotion_impact/) Policy and system (https://www.kirinholdings.com/en/impact/env/policy/mission/)
	102-21 Consulting stakeholders on economic, environmental, and social topics	P.82-84 Overview (https://www.kirinholdings.com/en/purpose/governance/governance/) IR Events Releases and Presentations (https://www.kirinholdings.com/en/investors/library/event/archive/) Stakeholder Engagement (https://www.kirinholdings.com/en/impact/csv_management/stakeholders/)



GRI Contents Index Standard	Disclosure matters	Page number or URL
GRI 102: General Disclosures 2016	102-22 Composition of the highest governance body and its committees	P.75 KIRIN CSV REPORT 2021 P.52-54, 59 Management (https://www.kirinholdings.com/en/purpose/governance/provisions/)
	102-23 Chair of the highest governance body	KIRIN CSV REPORT 2021 P.53-54 ESG data (Governance) (https://www.kirinholdings.com/en/investors/esg/esg/)
	102-24 Nominating and selecting the highest governance body	KIRIN CSV REPORT 2021 P.52 Management Structure (https://www.kirinholdings.com/en/purpose/governance/management/)
	102-25 Conflicts of interest	KIRIN CSV REPORT 2021 P.57 Corporate Governance Policy (https://www.kirinholdings.com/en/purpose/files/pdf/governance_policy.pdf)
	102-26 Role of highest governance body in setting purpose, values, and strategy	P.75-78 System to Promote CSV (https://www.kirinholdings.com/en/impact/csv_management/promotion_impact/) Policy and system (https://www.kirinholdings.com/en/impact/env/policy/mission/)
	102-27 Collective knowledge of highest governance body	P.75 System to Promote CSV (https://www.kirinholdings.com/en/impact/csv_management/promotion_impact/)
	102-28 Evaluating the highest governance body's performance	KIRIN CSV REPORT 2021 P.58 System to Promote CSV (https://www.kirinholdings.com/en/impact/csv_management/promotion_impact/) Policy and system (https://www.kirinholdings.com/en/impact/env/policy/mission/)
	102-29 Identifying and managing economic, environmental, and social impacts	P.9, 75-78 System to Promote CSV (https://www.kirinholdings.com/en/impact/csv_management/promotion_impact/) Stakeholder Engagement (https://www.kirinholdings.com/en/impact/csv_management/stakeholders/) Policy and system (https://www.kirinholdings.com/en/impact/env/policy/mission/)
	102-30 Effectiveness of risk management processes	P.9, 76 System to Promote CSV (https://www.kirinholdings.com/en/impact/csv_management/promotion_impact/) Policy and system (https://www.kirinholdings.com/en/impact/env/policy/mission/)
	102-31 Review of economic, environmental, and social topics	P.9, 74-76 System to Promote CSV (https://www.kirinholdings.com/en/impact/csv_management/promotion_impact/)
	102-32 Highest governance body's role in sustainability reporting	The Kirin Group's Environmental Vision 2050 has been approved by the Board of Kirin Holdings. The overall content of the Kirin Group Environmental Report is supervised by the Senior Executive Officer (in charge of CSV strategy, Group general environmental manager) of Kirin Holdings Company, Limited. System to Promote CSV (https://www.kirinholdings.com/en/impact/csv_management/promotion_impact/) Policy and system (https://www.kirinholdings.com/en/impact/env/policy/mission/)

GRI Contents Index Standard	Disclosure matters	Page number or URL
	102-33 Communicating critical concerns	P.75-78 System to Promote CSV (https://www.kirinholdings.com/en/impact/csv_management/promotion_impact/) Risk Management (https://www.kirinholdings.com/en/purpose/governance/risk_management/) Policy and system (https://www.kirinholdings.com/en/impact/env/policy/mission/)
	102-35 Remuneration policies	P.75 KIRIN CSV REPORT 2021 P.60-61 Remuneration of Officers (https://www.kirinholdings.com/en/purpose/governance/compensation/)
	102-36 Process for determining remuneration	KIRIN CSV REPORT 2021 P.60-61 Remuneration of Officers (https://www.kirinholdings.com/en/purpose/governance/compensation/)
	102-40 List of stakeholder groups	P.82-86 Stakeholder Engagement (https://www.kirinholdings.com/en/impact/csv_management/stakeholders/)
	102-41 Collective bargaining agreements	ESG data (Employee) (https://www.kirinholdings.com/en/investors/esg/esg/)
	102-42 Identifying and selecting stakeholders	P.82-86 Stakeholder Engagement (https://www.kirinholdings.com/en/impact/csv_management/stakeholders/)
	102-43 Approach to stakeholder engagement	P.82-86 Stakeholder Engagement (https://www.kirinholdings.com/en/impact/csv_management/stakeholders/) Our CSV Commitment (https://www.kirinholdings.com/en/impact/csv_management/commitment/#sect03) A Responsible Alcohol Producer (https://www.kirinholdings.com/en/impact/alcohol/policies/) Embedding the Kirin Group Human Rights Policy in practice (https://www.kirinholdings.com/en/impact/human_rights/policies/)
	102-44 Key topics and concerns raised	P.82-84 Stakeholder Engagement (https://www.kirinholdings.com/en/impact/csv_management/stakeholders/) Embedding the Kirin Group Human Rights Policy in practice (https://www.kirinholdings.com/en/impact/human_rights/policies/)
	102-45 Entities included in the consolidated financial statements	P.3 Group Companies (https://www.kirinholdings.com/en/profile/organization/)
	102-46 Defining report content and topic Boundaries	P.8-10, 77 Our CSV Commitment (https://www.kirinholdings.com/en/impact/csv_management/commitment/#sect03) Management Issues for Sustainable Growth (Group Materiality Matrix) (https://www.kirinholdings.com/en/impact/materiality/)

KIRIN CSV REPORT <https://www.kirinholdings.com/en/investors/library/integrated/>

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GRI 102 : General Disclosures 2016	102-47 List of material topics	P.8-11, 19-23, 26 Our CSV Commitment (https://www.kirinholdings.com/en/impact/csv_management/commitment/#sect03) Management Issues for Sustainable Growth (Group Materiality Matrix) (https://www.kirinholdings.com/en/impact/materiality/)
	102-48 Restatements of information	No corrections to the previous year's report. See page 93 for changes in the calculation boundaries due to business divestitures.
	102-49 Changes in reporting	P.3 ESG data (Notes) (https://www.kirinholdings.com/en/investors/esg/esg/)
	102-50 Reporting period	P.3
	102-51 Date of most recent report	July 2020
	102-52 Reporting cycle	Year
	102-53 Contact point for questions regarding the report	Back cover
	102-54 Claims of reporting in accordance with the GRI Standards	P.3
	102-55 GRI content index	P.109-113 GRI Contents Index (https://www.kirinholdings.co.jp/csv/esg_gri/gri.html)
	102-56 External assurance	P.116

Material topics

Biological Resources

GRI 103 : Management Approach 2016	103-1 Explanation of the material topic and its Boundary	P.10-21, 27 Our CSV Commitment (https://www.kirinholdings.com/en/impact/csv_management/commitment/#sect03) Management Issues for Sustainable Growth (Group Materiality Matrix) (https://www.kirinholdings.com/en/impact/materiality/)
	103-2 The management approach and its components	P.10-12, 19-23, 27-36, 90-92 Our CSV Commitment (https://www.kirinholdings.com/en/impact/csv_management/commitment/#sect03) System to Promote CSV (https://www.kirinholdings.com/en/impact/csv_management/promotion_impact/)
	103-3 Evaluation of the management approach	P.15, 23, 26, 28 Our CSV Commitment (https://www.kirinholdings.com/en/impact/csv_management/commitment/#sect03) System to Promote CSV (https://www.kirinholdings.com/en/impact/csv_management/promotion_impact/)

GRI Contents Index Standard	Disclosure matters	Page number or URL
GRI 304 : Biodiversity 2016	304-2 Significant impacts of activities, products, and services on biodiversity	P.29-36, 48
	304-3 Habitats protected or restored	P.31-35
	304-4 IUCN Red List species and national conservation list species with habitats in areas affected by operations	P.31-33, 35

Water Resources

GRI 103 : Management Approach 2016	103-1 Explanation of the material topic and its Boundary	P.10-21, 37 Our CSV Commitment (https://www.kirinholdings.com/en/impact/csv_management/commitment/#sect03) Management Issues for Sustainable Growth (Group Materiality Matrix) (https://www.kirinholdings.com/en/impact/materiality/)
	103-2 The management approach and its components	P.10-12, 19-23, 37-43, 92 Our CSV Commitment (https://www.kirinholdings.com/en/impact/csv_management/commitment/#sect03) System to Promote CSV (https://www.kirinholdings.com/en/impact/csv_management/promotion_impact/)
	103-3 Evaluation of the management approach	P.16-17, 22, 24, 26, 38 Our CSV Commitment (https://www.kirinholdings.com/en/impact/csv_management/commitment/#sect03) System to Promote CSV (https://www.kirinholdings.com/en/impact/csv_management/promotion_impact/)
GRI 303: Water and Effluents 2018	303-1 Interactions with water as a shared resource	P.37-43 Water Resources (https://www.kirinholdings.com/en/impact/env/3_2/)
	303-2 Management of water discharge related impacts	P.43
	303-3 Water withdrawal	P.38-39, 93, 95-98, 107 ESG data (Water resources) (https://www.kirinholdings.co.jp/csv/esg_gri/esg.html)
	303-4 Water discharge	P.93, 95-96, 98, 105, 107 ESG data (Water resources) (https://www.kirinholdings.co.jp/csv/esg_gri/esg.html)
	303-5 Water consumption	P.38-39, 44, 93, 95-98, 107

Containers and Packaging

GRI 103 : Management Approach 2016	103-1 Explanation of the material topic and its Boundary	P.10-11, 19-21, 45 Our CSV Commitment (https://www.kirinholdings.com/en/impact/csv_management/commitment/#sect03) Management Issues for Sustainable Growth (Group Materiality Matrix) (https://www.kirinholdings.com/en/impact/materiality/)
	103-2 The management approach and its components	P.10-11, 19-23, 46-56, 89, 92 Our CSV Commitment (https://www.kirinholdings.com/en/impact/csv_management/commitment/#sect03) System to Promote CSV (https://www.kirinholdings.com/en/impact/csv_management/promotion_impact/)

GRI Contents Index Standard	Disclosure matters	Page number or URL
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GRI 301 : Materials 2016	301-1 Materials used by weight or volume	P.46, 58, 96, 98-99 ESG data (Containers and packaging) (https://www.kirinholdings.com/en/impact/env/3_4/)
	301-2 Recycled input materials used	P.22,46-47, 53-54, 58, 99, 107 Containers and packaging (https://www.kirinholdings.com/en/impact/env/3_4/)
	301-3 Reclaimed products and their packaging materials	P.52, 57-58, 99 Containers and packaging (https://www.kirinholdings.co.jp/csv/env/packaging.html)
Climate Change		
GRI 103 : Management Approach 2016	103-1 Explanation of the material topic and its Boundary	P.10-21, 59 Our CSV Commitment (https://www.kirinholdings.com/en/impact/csv_management/commitment/#sect03) Management Issues for Sustainable Growth (Group Materiality Matrix) (https://www.kirinholdings.com/en/impact/materiality/)
	103-2 The management approach and its components	P.10-12, 19-23, 60-70, 92 Our CSV Commitment (https://www.kirinholdings.com/en/impact/csv_management/commitment/#sect03) System to Promote CSV (https://www.kirinholdings.com/en/impact/csv_management/promotion_impact/)
	103-3 Evaluation of the management approach	P.17-18, 22, 24, 26, 60 Our CSV Commitment (https://www.kirinholdings.com/en/impact/csv_management/commitment/#sect03) System to Promote CSV (https://www.kirinholdings.com/en/impact/csv_management/promotion_impact/)
GRI 201 : Economic Performance 2016	201-2 Financial implications and other risks and opportunities due to climate change	P.12-20 Scenario Analysis (TCFD) (https://www.kirinholdings.co.jp/csv/env/tcf.html)
GRI 302 : Energy 2016	302-1 Energy consumption within the organization	P.73, 93, 96, 100, 103 ESG data(Climate Change) (https://www.kirinholdings.com/en/investors/esg/esg/)
	302-2 Energy consumption outside of the organization	P.103
	302-3 Energy intensity	P.107
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GRI 305 : Emissions 2016	305-1 Direct (Scope 1) GHG emissions	P.71, 93-94, 100-102 ESG data (Climate change) (https://www.kirinholdings.com/en/investors/esg/esg/)
	305-2 Energy indirect (Scope 2) GHG emissions)	P.71, 93-94, 101-102 ESG data (Climate change) (https://www.kirinholdings.com/en/investors/esg/esg/)
	305-3 Other indirect (Scope 3) GHG emissions	P.60, 71-72, 93-94, 101-102 ESG data (Climate change) (https://www.kirinholdings.com/en/investors/esg/esg/)
	305-4 GHG emissions intensity	P.72, 93-94, 99-100, 107 ESG data (Climate change) (https://www.kirinholdings.com/en/investors/esg/esg/)
	305-5 Reduction of GHG emissions	P.22, 60-62, 65-66, 68-69, 71-73, 93-94, 102 Climate change (https://www.kirinholdings.com/en/impact/env/3_1/)
	305-6 Emissions of ozone-depleting substances (ODS)	P.105
	305-7 Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	P.96, 105-106 ESG data (Reducing industrial wastes and preventing pollution) (https://www.kirinholdings.com/en/investors/esg/esg/)
Waste and prevention of pollution		
GRI 103 : Management Approach 2016	103-1 Explanation of the material topic and its Boundary	P.10-11, 19-21, 27, 45, 79 Our CSV Commitment (https://www.kirinholdings.com/en/impact/csv_management/commitment/#sect03) Management Issues for Sustainable Growth (Group Materiality Matrix) (https://www.kirinholdings.com/en/impact/materiality/)
	103-2 The management approach and its components	P.10-11, 19-23, 36, 46-56, 79, 89, 92 Our CSV Commitment (https://www.kirinholdings.com/en/impact/csv_management/commitment/#sect03) System to Promote CSV (https://www.kirinholdings.com/en/impact/csv_management/promotion_impact/)
	103-3 Evaluation of the management approach	P.16-17, 22, 24, 26, 28, 46 Our CSV Commitment (https://www.kirinholdings.com/en/impact/csv_management/commitment/#sect03) System to Promote CSV (https://www.kirinholdings.com/en/impact/csv_management/promotion_impact/)
GRI 306 : Waste 2020	306-1 Waste generation and significant waste-related impacts	P.36, 45, 79
	306-2 Management of significant waste-related impacts	P.11, 19-23, 36, 46-47, 49-56, 79
	306-3 Waste generated	P.93, 96, 105, 107 ESG data (Reducing industrial wastes and preventing pollution) (https://www.kirinholdings.com/en/investors/esg/esg/)

TCFD Recommendations' Recommended Disclosure Index

Recommended Disclosure		Page
Governance	a) Describe the board's oversight of climate-related risks and opportunities.	P.12, 75, 77
	b) Describe management's role in assessing and managing climate-related risks and opportunities.	P.12, 75, 77
Strategy	a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	P.12-19
	b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	P.12-19
	c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2° C or lower scenario.	P.12-20
Risk Management	a) Describe the organization's processes for identifying and assessing climate-related risks.	P.12, 76
	b) Describe the organization's processes for managing climate-related risks.	P.12, 76-78, 80
	c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	P.12, 76-78, 80
Metrics and Targets	a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	P.12, 17-18, 21-23, 60 KIRIN CSV REPORT 2021 P.61-62
	b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	P.12, 14, 60, 71-73, 99-102
	c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	P.10, 12, 14, 21-23, 26, 60, 71-73, 102

CDSB framework

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REQ-02	Management's environmental policies, strategy and targets	P.7, 9-23, 27, 28, 37, 39, 45, 59, 82-86
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REQ-04	Sources of environmental impacts	P.28, 29, 31, 33, 35, 36, 44, 46, 57-58, 71-73, 93-103, 105-106
REQ-05	Performance and comparative analysis	P.22, 26, 28, 38, 46, 60
REQ-06	Outlook	P.4, 6
REQ-07	Organisational boundary	P.3, 93-95
REQ-08	Reporting policies	P.3, 93, 109-115 The reporting provisions are consistent with those of the previous year.
REQ-09	Reporting period	P.3
REQ-10	Restatements	No corrections to the previous year's report. See page 93 for changes in the calculation boundaries due to business divestitures.
REQ-11	Conformance	P.3, 9, 113
REQ-12	Assurance	There is no third-party assurance concerning conformance with the CDSB framework. Third-party assurance has been obtained for some GHG emissions. (P.99-102, 116) .

GRI Contents Index Standard	Disclosure matters	Page number or URL
GRI 306 : Waste 2020	306-4 Waste diverted from disposal	P.58, 93, 96, 99, 105, 107 ESG data (Reducing industrial wastes and preventing pollution) (https://www.kirinholdings.com/en/investors/esg/esg/)
	306-5 Waste directed to disposal	P.93, 96, 105
GRI 307 : Environmental Compliance 2016	307-1 Non-compliance with environmental laws and regulations	No legal violations in the year ESG data (Environmental management) (https://www.kirinholdings.com/en/investors/esg/esg/)
Supply chain		
GRI 103 : Management Approach 2016	103-1 Explanation of the material topic and its Boundary	P.10, 19-21, 27, 37, 45, 59 Our CSV Commitment (https://www.kirinholdings.com/en/impact/csv_management/commitment/#sect03) Management Issues for Sustainable Growth (Group Materiality Matrix) (https://www.kirinholdings.com/en/impact/materiality/)
	103-2 The management approach and its components	P.10-12, 19-23, 80-82 Our CSV Commitment (https://www.kirinholdings.com/en/impact/csv_management/commitment/#sect03) System to Promote CSV (https://www.kirinholdings.com/en/impact/csv_management/promotion_impact/) Promoting responsible procurement (https://www.kirinholdings.com/en/impact/procurement/csr/)
	103-3 Evaluation of the management approach	P.22, 24, 26, 28, 38, 46, 60, 81 Our CSV Commitment (https://www.kirinholdings.com/en/impact/csv_management/commitment/#sect03) System to Promote CSV (https://www.kirinholdings.com/en/impact/csv_management/promotion_impact/) Promoting responsible procurement (https://www.kirinholdings.com/en/impact/procurement/csr/)
GRI 308 : Supplier Environmental Assessment 2016	308-2 Negative environmental impacts in the supply chain and actions taken	P.16-17, 28-29, 33, 36, 38-39, 47-48, 63, 66, 81 ESG data (Supplier) (https://www.kirinholdings.com/en/investors/esg/esg/)

SASB Content Index

Food & Beverage sector/ Alcoholic beverages industry October 2018 version

Sustainability Disclosure Topics & Accounting Metrics

Topics	Accounting Metrics	Code	Disclosure
Energy Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable ^a	FB-AB-130a.1	P.96, P.100
Water Management	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress ^b	FB-AB-140a.1	P.38, P.39, P.44, P.97-98
	Description of water management risks and discussion of strategies and practices to mitigate those risks	FB-AB-140a.2	P.10-11, P.16-17, P.19-20, P.21, P.37-44
Responsible Drinking & Marketing	Percentage of total advertising impressions made on individuals at or above the legal drinking age ^c	FB-AB-270a.1	n/a
	Number of incidents of non-compliance with industry or regulatory labeling and/or marketing codes ^d	FB-AB-270a.2	ESG Data (Social, Customer) (https://www.kirinholdings.com/en/investors/esg/esg/)
	Total amount of monetary losses as a result of legal proceedings associated with marketing and/or labeling practices ^e	FB-AB-270a.3	ESG Data (Social, Customer) (https://www.kirinholdings.com/en/investors/esg/esg/)
	Description of efforts to promote responsible consumption of alcohol	FB-AB-270a.4	A Responsible Alcohol Producer (Our CSV Commitment) (https://www.kirinholdings.com/en/impact/csv_management/commitment/#sect01) A Responsible Alcohol Producer (Policy and System) (https://www.kirinholdings.com/en/impact/alcohol/policies/)
Packaging Lifecycle Management	(1) Total weight of packaging, (2) percentage made from recycled and/or renewable materials, and (3) percentage that is recyclable, reusable, and/or compostable ^f	FB-AB-410a.1	P.22, P.46, P.57-58, P.98-99
	Discussion of strategies to reduce the environmental impact of packaging throughout its lifecycle	FB-AB-410a.2	P.10-11, P.13, P.19-20, P.21-23, P.45-58
Environmental & Social Impacts of Ingredient Supply Chain	Suppliers' social and environmental responsibility audit (1) non-conformance rate and (2) associated corrective action rate for (a) major and (b) minor non-conformances ^g	FB-AB-430a.1	Efforts to promote CSR procurement (https://www.kirinholdings.com/en/impact/procurement/csr/) ESG Data (Social, Supplier) (https://www.kirinholdings.com/en/investors/esg/esg/)
Ingredient Sourcing	Percentage of beverage ingredients sourced from regions with High or Extremely High Baseline Water Stress ^h	FB-AB-440a.1	P.16-17 Kirin Group Environmental Report 2020 P.41 (https://www.kirinholdings.com/en/investors/library/env_report/)
	List of priority beverage ingredients and description of sourcing risks due to environmental and social considerations	FB-AB-440a.2	P.14-17, P.19-20, P.27-36, P.37-41

Activity Metrics

Activity Metrics	Code	Disclosure
Volume of products sold ⁱ	FB-AB-000.A	P.96
Number of production facilities ^j	FB-AB-000.B	Group Companies (https://www.kirinholdings.com/en/profile/organization/) P.39, P.95
Total fleet road miles traveled ^k	FB-AB-000.C	P.101

^a Percentage of grid electricity and renewable energy can be estimated from the amount of energy consumed.

^b Total water consumed can be estimated based on (water consumed - wastewater volume).

^c Not disclosed.

^d Only the information on alcoholic beverages is disclosed.

^e Monetary losses are not disclosed. In addition, for some cases of violation of laws concerning alcoholic beverages, a reference URL is provided in the notes.

^f The content ratio of recycled materials is disclosed in some containers.

^g Kirin Holdings discloses the self-assessment rate of suppliers, but not the rate of non-conformance. In the event of non-conformance, Kirin makes requests for correction.

^h Although the percentage is not disclosed, water consumption by raw material and by country is disclosed. The results of scenario analyses, including those on the water risk of agricultural products, which are important sources for beverages, are disclosed.

ⁱ Volume of products sold is not disclosed, but volume of products manufactured is disclosed.

^j Number of major production facilities is disclosed.

^k While the total distance traveled is not disclosed, freight transport volume (= freight weight x distance of transport) within the reporting boundaries of specified consignors in the Act on the Rational Use of Energy is disclosed only for Japan.

Sustainability Disclosure Topics & Accounting Metrics

Topics	Accounting Metrics	Code	Disclosure
Fleet Fuel Management	Fleet fuel consumed, percentage renewable* ^a	FB-NB-110a.1	P.100, P.101
Energy Management	(1) Operational energy consumed, (2) percentage grid electricity, (3) percentage renewable* ^b	FB-NB-130a.1	P.68, P.96, P.100
Water Management	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress* ^c	FB-NB-140a.1	P.38, P.39, P.44, P.97-98
	Description of water management risks and discussion of strategies and practices to mitigate those risks	FB-NB-140a.2	P.10-11, P.16-17, P.19-20, P.21, P.37-44
Health & Nutrition	Revenue from (1) zero- and low-calorie, (2) noadded- sugar, and (3) artificially sweetened beverages* ^d	FB-NB-260a.1	ESG Data (Social, Customer) (https://www.kirinholdings.com/en/investors/esg/esg/)
	Discussion of the process to identify and manage products and ingredients related to nutritional and health concerns among consumers* ^e	FB-NB-260a.2	Our CSV Commitment (Supporting self-care for healthy people and people with pre-disease) (https://www.kirinholdings.com/en/impact/csv_management/commitment/#sect01)
Product Labeling & Marketing	Percentage of advertising impressions (1) made on children and (2) made on children promoting products that meet dietary guidelines* ^f	FB-NB-270a.1	n/a
	Revenue from products labeled as (1) containing genetically modified organisms (GMOs) and (2) non-GMO* ^g	FB-NB-270a.2	n/a
	Number of incidents of non-compliance with industry or regulatory labeling and/or marketing codes* ^h	FB-NB-270a.3	ESG Data (Social, Customer) (https://www.kirinholdings.com/en/investors/esg/esg/)
	Total amount of monetary losses as a result of legal proceedings associated with marketing and/or labeling practices* ⁱ	FB-NB-270a.4	ESG Data (Social, Customer) (https://www.kirinholdings.com/en/investors/esg/esg/)
Packaging Lifecycle Management	(1) Total weight of packaging, (2) percentage made from recycled and/or renewable materials, and (3) percentage that is recyclable, reusable, and/or compostable* ^j	FB-NB-410a.1	P.22, P.46, P.57-58, P.98-99
	Discussion of strategies to reduce the environmental impact of packaging throughout its lifecycle	FB-NB-410a.2	P.10-11, P.13, P.19-20, P.21-23, P.45-58
Environmental & Social Impacts of Ingredient Supply Chain	Suppliers' social and environmental responsibility audit (1) non-conformance rate and (2) associated corrective action rate for (a) major and (b) minor non-conformances* ^k	FB-NB-430a.1	Efforts to promote CSR procurement (https://www.kirinholdings.com/en/impact/procurement/csr/) ESG Data (Social, Supplier) (https://www.kirinholdings.com/en/investors/esg/esg/)
Ingredient Sourcing	Percentage of beverage ingredients sourced from regions with High or Extremely High Baseline Water Stress* ^l	FB-NB-440a.1	P.16-17 Kirin Group Environmental Report 2020 P.41 (https://www.kirinholdings.com/en/investors/library/env_report/)
	List of priority beverage ingredients and description of sourcing risks due to environmental and social considerations	FB-NB-440a.2	P.14-16, P.19-20, P.27-36, P.37-41

Activity Metrics

Activity Metrics	Code	Disclosure
Volume of products sold* ^m	FB-NB-000.A	P.96
Number of production facilities* ⁿ	FB-NB-000.B	Group Companies (https://www.kirinholdings.com/en/profile/organization/) P.39, P.95
Total fleet road miles traveled* ^o	FB-NB-000.C	P.101

*a Fuel consumed by energy type and CO₂ emissions from transportation as a shipper are disclosed, but fleet fuel consumed is not disclosed. The percentage of recyclable vehicle fuel is not disclosed (not used).

*b Total energy consumption by energy type and GHG emissions from plants are disclosed, but operational energy consumed is not disclosed. The data of some plants, the amount of purchased electricity, and the amount of renewable electricity are disclosed.

*c Total water consumed can be estimated based on (water consumed - wastewater volume). Although data on water stress by country is disclosed, the percentage of regions with high baseline water stress to total water withdrawn and total water consumed is not disclosed.

*d Revenues from no-added sugar beverages are not disclosed, but revenues from low-sugar and low-fat products are disclosed. Revenue from artificially sweetened beverages is not disclosed.

*e Commitment is disclosed, but no specific management process is disclosed.

*f Not disclosed.

*g Not disclosed.

*h Only the information on alcoholic beverages is disclosed.

*i Monetary losses are not disclosed. In addition, for some cases of violation of laws concerning alcoholic beverages, a reference URL is provided in the notes.

*j The percentage of recycled material content in some containers is disclosed.

*k Kirin Holdings discloses the self-assessment rate of suppliers, but not the rate of non-conformance. In the event of non-conformance, Kirin makes requests for correction.

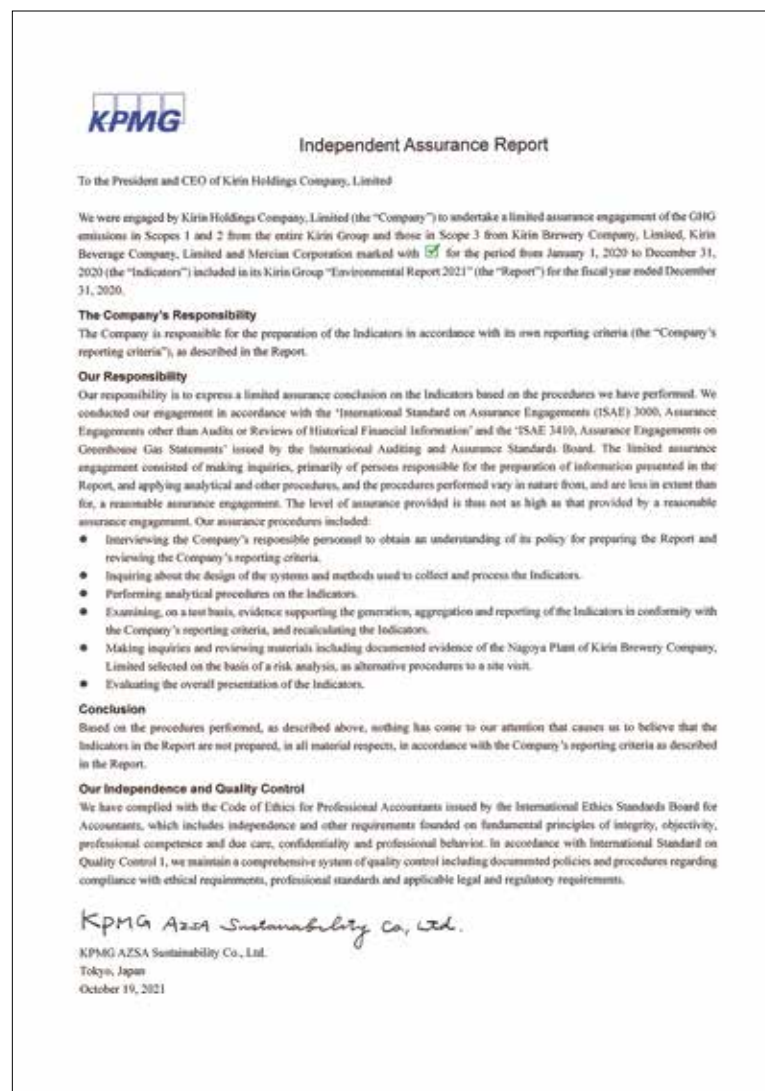
*l Although the percentage is not disclosed, water consumption by raw material and by country is disclosed. The results of scenario analyses, including those on the water risk of agricultural products, which are important sources for beverages, are disclosed.

*m Volume of products sold is not disclosed, but volume of products manufactured is disclosed.

*n Number of major production facilities is disclosed.

*o While the total distance traveled is not disclosed, freight transport volume (= freight weight x distance of transport) within the reporting boundaries of specified consignors in the Act on the Rational Use of Energy is disclosed only for Japan.

Independent Assurance Report



The KIRIN, the messenger of Good Luck.



The KIRIN is a mythical creature, a messenger of good luck. Derived from various ancient legends, it is said to appear as a prelude to joyous times to come. The KIRIN, a gentle creature, flies the skies; its feet never touching the ground as not to harm any insects or plants. The KIRIN, which creates the rich natural environment for future generations, is a symbol of the Kirin Group.