

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.

Environmental
Data



Policies on biological resources

From an early stage, the Kirin Group has been pursuing initiatives concerning biological resources, which have a high possibility of being connected to environmental and human rights issues.

After making a Declaration of Support for Biodiversity Conservation in 2010, in 2013, we formulated the Kirin Group's Guidelines on Sustainable Sourcing of Biological Resources and the Action Plan on Sustainable Use of Biological Resources. Black tea leaves, paper and printed materials, and palm oil are specified in the Guidelines and Action Plan as particularly important supplies. After the formulation and announcement of the Kirin Group CSV Commitment in February 2017, we revised the Kirin Group Action Plan on Sustainable Use of Biological Resources and accelerated our initiatives.

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.

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.

- 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.
- Resources deriving from plantations, forests, etc. that have been certified by credible third parties.**
- 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.

Kirin Group's Guidelines on Access to Genetic Resources

In order to enjoy the blessings of biodiversity worldwide, it is important to ensure proper management of genetic resources in accordance with the relevant laws and regulations agreed upon by the international community. Given the Nagoya Protocol adopted at COP 10, the Kirin Group established its Group Guidelines on the access to genetic resources and has been operating accordingly.

Kirin Group's Principles of Managing Access to Genetic Resources

- The Group shall respect international agreements concerning biodiversity.**
- 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.**
- 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.**

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

Consideration of the Environment in Product Development

■ Environmentally Conscious Designs for Containers and Packaging

To further step up conservation of resources and promote activities to reduce environmental impact, the Kirin Group operates on its “Guidelines on Environmentally Conscious Design for Containers and Packaging,” which has detailed provisions for what materials may be used and in what combinations. Originally established by Kirin Brewery in 1998, the Guidelines have been widely applied to its entire alcoholic and non-alcoholic beverages business since 2014. In 2019, it was expanded to all Kirin Group companies in Japan, excluding the Pharmaceutical Business.

■ LCA Initiatives for Containers

The Kirin Group performs LCA (Life Cycle Assessment)* on major containers for alcoholic beverages and non-alcoholic beverages whenever necessary. For example, in the case of a glass bottle, we make an assessment by performing calculations in consideration of raw materials used for all parts of the bottle, including the glass, paper for labels, and crown cap, energy used to produce raw materials, and energy associated with recycling after use. 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.

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 society that is based on recycling, use materials that are easy to recycle or dispose of and that have minimal environmental impact.
- (3) In order to contribute to realizing a low-carbon 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) activities in accordance with the following.

4. Guidelines for Promoting the 3Rs (Reduce, Reuse, Recycle)

- (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.

Stakeholder Dialogue

Voluntary participation leading to policy recommendations

Organization	Activities
Japan Sustainability Local Group (JSLG)	Kirin Holdings participates as a steering committee member and director of the JSLG.
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" and "improvement of water security."
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.
Fun to Share/COOL CHOICE	Since 2014, Kirin has endorsed the Japanese government's new climate change campaigns, Fun to Share and COOL CHOICE, and has registered with these campaigns.
United Nations Global Compact	The Kirin Group joined the United Nations Global Compact in September 2005.
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.
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 was 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.

Organization	Activities
Green Purchasing Network (GPN)	The Kirin Group is a member of the Green Purchasing Network (GPN).
Containers and Packaging Diet Declaration by nine prefectures and cities	Kirin Brewery, Kirin Beverage, and Mercian endorse the Containers and Packaging Diet Declaration being promoted by the four prefectures of Saitama, Chiba, Tokyo, and Kanagawa, and the five cities of Yokohama, Kawasaki, Chiba, Saitama, and Sagami-hara, and are striving to reduce their containers and packaging.
Forest Supporters	Forest Supporters Kirin 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	Kirin 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	Kirin is a founding member of and active participant in the Rainforest Alliance Consortium, which was established in September 2015 by the Rainforest Alliance and companies that handle Rainforest Alliance certification products with the aim of promoting sustainable agriculture.
Consortium for Sustainable Paper Use (CSPU)	The Consortium for Sustainable Paper Use was established by five (now ten) companies engaged in leading-edge paper use initiatives and WWF Japan. As a founding member of the CSPU, the Kirin Group pursues initiatives for the pursuit of sustainable paper use.

Disclosure of environmental information through products (Environmental label, etc.)

Label Name	Nature of Disclosure
Eco-Rail	In 2006, Kirin Beverage, and in 2010, Kirin Brewery were certified to display the "Eco-Rail" mark on their products by the Ministry of Land, Infrastructure, and Transport 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 approved in February 2011 and revised in December 2013.
Rainforest Alliance Certification Label	The paper drink boxes used for Kirin Gogo-no-Kocha Straight Tea (500 ml) (from the renewed product launched in March 2015) display a Rainforest Alliance certification label.
FSC Certification Label	Kirin aims to switch to FSC-certified paper for all of its paper packaging and containers by 2020. To encourage understanding among consumers about the importance of protecting the forests, we place FSC-certified labels on all containers and packaging where it is possible. In 2019, we began displaying the FSC logo on the top of our 6-can beer packs and cardboard cartons for beer and RTD products. The FSC-certified labels are also displayed on some of the labels for our Sunrise brand of Chilean wines.
ECOCERT	Mercian has been selling Bon Rouge Organic Wine Pet Bottle Red, a wine made with 100% organic fruits, since 2009. This wine is certified by ECOCERT JAPAN, the Japanese subsidiary of the global organic certification body, ECOCERT.
R100 Bottle	From June 2019, we have adopted the R100 Bottle, which is made from 100% recycled PET materials, for our Kirin Nama-cha Decaf green tea beverage.

Education Programs

Name of program	Nature of Activity
Plant Environmental Tours	A total of 2,208 people participated in 96 guided environmental tours of our manufacturing facilities in 2017. These included the Yokohama Plant's "Feel the Blessings of Nature Tour" and the Kobe Plant's "Environmental Tour." Related information→P.28
Kirin School Challenge	Since December 2014, Kirin has been holding Kirin School Challenge workshops with the aims of exchanging opinions with young people, discussing and coming up with ideas about what we should do to "lead the rich blessings of globe to the future." Another aim of the workshops is for junior and senior high school students to convey those ideas to their own generation. These workshops are held eight to ten times a year. reference URL : https://www.kirin.co.jp/csv/eco/schoolchallenge/

Environmental Data Calculation Methods

(1) Usage Factors

Energy Use Conversion Factors (2014 and prior)

	Japan	Overseas
Fuel	"Act on Rationalizing Energy Use" Factors	
Electricity	Used 3.6 (MJ/kWh), which is used by International Energy Agency (IEA) and other organizations	

Energy Use Conversion Factors (2015 and later)

	Japan	Overseas	
Fuel	"Act on Rationalizing Energy Use" Factors	Lion	<ul style="list-style-type: none"> • Australia - National Greenhouse Account Factors • New Zealand - Guidance for Voluntary, Corporate Greenhouse Gas Reporting
		Other than the above	"Act on Rationalizing Energy Use" Factors
Electricity	Used 3.6 (MJ/kWh), which is used by International Energy Agency (IEA) and other organizations		

Emission factors for GHG emissions (2014 and prior)

	Japan	Overseas
Fuel	Emission factors from Greenhouse Gas Emissions Calculation and Reporting Manual (Ministry of Environment/Ministry of Economy, Trade & Industry)	
Electricity	Emission factors published by individual power companies	Emission factors by country from IEA CO ₂ Emissions from Fuel Combustion for the year in question

Emission factors for GHG Emissions (2015 and after)

	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 - Guidance for Voluntary, Corporate Greenhouse Gas Reporting
		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 CO₂ Emissions from Fuel Combustion 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, Kirin Beverage Value Vendor Hokkaido Kirin Beverage, Kirin Maintenance Service, KIRIN Tropicana each site of Kirin Beverage Service (Hokkaido, Sendai, Tokyo, Chubu, Kansai) Hakodate Daiichi Vending, KIRINVIVAX, Tokai Beverage Service
Oceania Integrated Beverages Business	Lion
Pharmaceuticals and Bio-chemicals Businesses	Kyowa Kirin (Formerly Kyowa Hakko Kirin, name changed in July 2019), Kyowa Hakko Bio, KYOWA PHARMA CHEMICAL, Kyowa Hakko Kirin China Pharmaceutical, BioKyowa Inc., Shanghai Kyowa Amino Acid, Thai Kyowa Biotechnologies
Other Businesses (all companies included)	Mercian, NIPPON LIQUOR, Daiichi Alcohol, Wine Curation, Myanmar Brewery Interfood, Vietnam Kirin Beverage, Azuma Kirin, Four Roses Distillery Kirin Holdings, Kirin, Kirin Business Expert, KIRIN BUSINESS SYSTEM, KOIWAI DAIRY PRODUCTS, Kirin Echo, Kirin and Communications, Kirin Engineering, Kirin City, Kirin Techno-System, KIRIN GROUP LOGISTICS

* Where Kyowa Hakko Kirin Entire Group (Global) is mentioned, this indicates the same range as for the Pharmaceuticals and Bio-chemicals Businesses

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, Kirin Beverage Value Vendor Hokkaido Kirin Beverage, Kirin Maintenance Service, KIRIN Tropicana each site of Kirin Beverage Service (Hokkaido, Sendai, Tokyo, Chubu, Kansai) Hakodate Daiichi Vending, KIRINVIVAX, Tokai Beverage Service Kyowa Kirin (Formerly Kyowa Hakko Kirin, name changed in July 2019) Kyowa Hakko Bio, KYOWA PHARMA CHEMICAL 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, Kirin Business Expert, KIRIN BUSINESS SYSTEM
Oceania	Lion
Southeast Asia	Myanmar Brewery, Interfood, Vietnam Kirin Beverage Thai Kyowa Biotechnologies Co., Ltd.
Others	Kyowa Hakko Kirin China Pharmaceutical, BioKyowa Inc., Shanghai Kyowa Amino Acid Kirin Brewery (Zhuhai), Azuma Kirin, Four Roses Distillery

Calculation boundary of actual emissions against mid-term and long-term GHG emission targets (Scope 1, Scope 2) (P.13, P.18, P.21, P.55, P.64, P.91)

Business	Company
Japan Beer and Spirits Business	Kirin Brewery, Kirin Distillery, SPRING VALLEY BREWERY, Eishogen
Japan Non-Alcoholic Beverages Business	Kirin Beverage, Shinshu Beverage, Kirin Beverage Value Vendor Hokkaido Kirin Beverage, Kirin Maintenance Service, KIRIN Tropicana each site of Kirin Beverage Service (Hokkaido, Sendai, Tokyo, Chubu, Kansai) Hakodate Daiichi Vending, KIRINVIVAX, Tokai Beverage Service
Oceania Integrated Beverages Business	Lion
Pharmaceuticals and Bio-chemicals Businesses	Kyowa Kirin, Kyowa Hakko Bio, KYOWA PHARMA CHEMICAL Kyowa Hakko Kirin China Pharmaceutical, BioKyowa Inc., Shanghai Kyowa Amino Acid Thai Kyowa Biotechnologies Co., Ltd.
Other Businesses (all companies included)	Mercian, NIPPON LIQUOR, Daiichi Alcohol, Wine Curation, Kirin Kirin Holdings, Kirin, Kirin Business Expert, KIRIN BUSINESS SYSTEM, KOIWAI DAIRY PRODUCTS, Kirin Echo, Kirin and Communications, Kirin Engineering, Kirin City, Kirin Techno-System, KIRIN GROUP LOGISTICS

Calculation boundary of Scope 3 emissions (P.90)

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 and Bio-chemicals Businesses	Kyowa Kirin, Kyowa Hakko Bio, KYOWA PHARMA CHEMICAL Kyowa Hakko Kirin China Pharmaceutical, BioKyowa Inc. Shanghai Kyowa Amino Acid Thai Kyowa Biotechnologies Co., Ltd.
Other Businesses (all companies included)	Mercian, Daiichi Alcohol Myanmar Brewery, Interfood, Vietnam Kirin Beverage Kirin KOIWAI DAIRY PRODUCTS KIRIN GROUP LOGISTICS

Calculation boundary of actual emissions against mid-term and long-term GHG emission targets (Scope 3) (P.13, P.18, P.21, P.55, P.64, P.91)

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

Breakdown of business locations subject to water risk assessments (P.33, P.38)

Constituent/Name of Group Company	Country	Number of manufacturing plants	Remarks
Kirin Brewery	Japan	8	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	1	Yatsushiro
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	2	Takasaki, Fuji
	China	1	Kyowa Hakko Kirin China Pharmaceutical
Kyowa Hakko Bio	Japan	2	Yamaguchi Production Center (Hofu), Yamaguchi Production Center (Ube)
Kyowa Pharma Chemical	Japan	1	Head office
Koiwai Dairy Products	Japan	1	Koiwai
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	
Azuma Kirin	Brazil	1	Campinas
Lion	Austraria	12	Bentley Milk, Burnie, Canberra, Castlemaine Perkins Brewery, Chelsea Heights, James Boag Brewery, Little Creatures Brewery Fremantle, Morwell, Penrith, Smithfield, Tooheys Brewery, West End Brewery
	Newzealand	3	Palmerston North, Pride Brewery, Speights Brewery

Environmental Accounting

Environment conservation costs

(Unit: million yen)

Category	Specific details	Investment amounts			Expense amounts		
		2016	2017	2018	2016	2017	2018
Environmental conservation costs to control environmental impact resulting from production and service activity within the business areas (total of ①②③ below)		1,028	1,311	763	4,606	5,971	5,499
① Pollution prevention costs	Air and water pollution prevention activities, analysis and measurement of air and water quality, etc.	594	1,093	533	2,182	3,229	2,477
② Global environmental conservation costs	Solar power generation, CO2 recovery, energy saving, cogeneration, etc.	242	147	215	743	947	828
③ Resource circulation costs	Reduction of sludge, waste recycling, water recycling, etc.	191	71	16	1,681	1,795	2,195
Upstream / downstream costs	Containers and Packaging Recycling Act, Recycling contracting costs	2	0	1	532	40	584
Administration costs	Operation of environmental management systems, environmental education, greenification in business sites, etc.	58	15	13	342	305	319
Research and development costs	Container lightweighting, R&D regarding mitigation of environmental load of byproducts, wastewater, etc.	0	24	29	99	105	100
Social activities costs	Environmental conservation activity costs such as activities to protect the blessings of water, donations to nature conservation groups, etc.	1	3	0	65	95	47
Environmental remediation costs		0	0	0	0	0	0
Others		0	0	0	1	3	1
Total		1,088	1,353	806	5,645	6,520	6,550

Economic effect

(Unit: million yen)

Items	Details	2016	2017	2018
Proceeds from sales of valuables, etc.	Waste recycling, etc.	777	851	840
Resources saving effects	Energy saving, waste reduction, resources saving, etc.	466	418	555

Calculation boundaries

2016: January - December 2016 (Includes Kirin Brewery, Kirin Beverages, and certain other constituent companies), Kyowa Hakko Kirin, Kyowa Medex, Kyowa Hakko Bio, KYOWA PHARMA CHEMICAL, Koiwai Dairy Products

2017: January - December 2017 (Includes Kirin Brewery, Kirin Beverages, and certain other constituent companies), Kyowa Hakko Kirin, Kyowa Medex, Kyowa Hakko Bio, KYOWA PHARMA CHEMICAL, Koiwai Dairy Products

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

Material Balance

Material Flow (2018, entire Group)

	Unit	Japan Beer and Spirits Business	Japan Non-Alcoholic Beverages Business	Oceania Integrated Beverages Business	Pharmaceuticals and Bio-chemicals Businesses	Other Businesses	Total			
							2018	2017	2016	
Substance	thousand t	541	91	246	159	282	1,318	2,452	2,505	
	%	41.0	6.9	18.6	12.1	21.4	100.0			
	Raw material	thousand t	362	39	131	157	169	857	1,733	1,746
	Packaging material	thousand t	179	51	115	2	113	460	719	759
Water (fresh water only)	thousand m ³	14,049	2,345	5,378	48,503	6,044	76,319	79,583	81,620	
	%	18.4	3.1	7.0	63.6	7.9	100.0			
Water recycling	thousand m ³	3,014	351	224	119,981	433	124,003	61,112	54,611	
Energy	TJ	4,098	950	2,426	4,241	1,366	13,081	12,972	12,803	
	%	31.3	7.3	18.5	32.4	10.4	100.0			
Production volumes	Alcoholic and non-alcoholic beverages	thousand kL	2,821	713	1,643	0	704	5,881	5,743	5,798
	Food products/Pharmaceuticals and biochemicals	thousand t	8	0	92	80	11	191	188	186
Wastewater	thousand m ³	11,913	1,666	4,159	49,689	4,319	71,747	73,563	71,695	
	%	16.6	2.3	5.8	69.3	6.0	100.0			
Greenhouse gas emissions (Scope1+Scope2)	thousand t-CO ₂ e	232	59	235	359	101	986	996	1,012	
	%	23.5	6.0	23.8	36.4	10.3	100.0			
NOx	t	150	20	200	30	35	436	429	431	
SOx	t	0	0	1	9	9	19	95	11	
Waste products	thousand t	196	19	99	61	46	421	427	407	
	%	46.6	4.5	23.4	14.5	10.9	100.0			
	Volume disposed on site	thousand t	0	0	0	11	1	12	35	27
	Volume of recycled waste	thousand t	194	19	95	50	44	402	378	368
	Final disposed volume	thousand t	3	0	4	0.2	1	8	14	12

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)	
		Japan standard	IFRS
2014	79,314	39	–
2015	80,625	39	–
2016	81,620	42	44
2017	79,583	–	43
2018	76,319	–	40

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 and Bio-chemicals Businesses	Other Businesses (all companies included)	Total
2014	12,292	2,633	5,807	52,817	5,765	79,314
2015	13,101	2,515	5,444	52,682	6,884	80,625
2016	12,896	2,656	5,514	52,706	7,848	81,620
2017	13,190	2,341	5,469	52,426	6,156	79,583
2018	14,049	2,345	5,378	48,503	6,044	76,319

Trend in water use volumes (by region)

(Unit: thousand m³)

	Japan	Oceania	Southeast Asia	Other	Total
2014	63,165	5,807	490	9,852	79,314
2015	63,292	5,444	2,317	9,573	80,625
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

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

	Unit	Fresh water					Total
		Service water	Rivers (including industrial water)	Underground water	Storm water	Gray water* (Reclaimed water)	
2014	thousand m ³	9,473	39,751	30,061	1	28	79,314
	%	12	50	38	0.0	0.0	100
2015	thousand m ³	10,155	40,374	30,067	0	30	80,625
	%	13	50	37	0.0	0.0	100
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

* Externally supplied gray water

Trend in water use volumes of Japan Integrated Beverages Business

	Unit	Kirin Brewery	Kirin Distillery	Kirin Beverage	Shinshu Beverage	Mercian
2014	thousand m ³	10,579	1,109	1,376	1,257	4,839
	m ³ /kL	4.8	3.1	3.6	6.2	38.4
2015	thousand m ³	11,104	1,274	1,309	1,205	5,041
	m ³ /kL	4.9	3.3	3.4	5.4	39.3
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

* 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	
2104	thousand m ³	13,020	88,348	101,368	56
	%	12.8	87.2	100.0	
2015	thousand m ³	13,508	91,386	104,894	57
	%	12.9	87.1	100.0	
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	

Trend in wastewater volume by destination (entire Group)

	Unit	Wastewater volume				Total
		Sewage water	Direct release into rivers, etc.	Indirect release into ocean	Other*	
2014	thousand m ³	7,452	26,048	38,067	302	71,869
	%	10	36	53	0.4	100
2015	thousand m ³	6,247	27,890	36,768	8	70,913
	%	9	39	52	0.0	100
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

* 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 and Bio-chemicals Businesses	Other Businesses (all companies included)	Total
2014	thousand t	186	142	343	3	35	709
	%	26.3	20.0	48.4	0.4	4.9	100.0
2015	thousand t	204	152	281	2	114	752
	%	27.1	20.2	37.3	0.3	15.1	100.0
2016	thousand t	208	45	391	2	113	759
	%	27.4	6.0	51.4	0.3	14.9	100.0
2017	thousand t	219	51	332	2	116	719
	%	30.4	7.0	46.1	0.3	16.1	100.0
2018	thousand t	179	51	115	2	113	460
	%	38.9	11.1	24.9	0.5	24.5	100.0

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

(Unit: t)

		Aluminum cans	PET bottles	Glass bottles	Cartons	6-can packs
2014	Volume reduction	19,295	8,771	606	5,187	2,691
	Volumes used	80,040	61,165	34,328	95,707	16,075
2015	Volume reduction	18,908	9,517	792	5,598	3,758
	Volumes used	82,605	58,866	32,668	102,113	15,522
2016	Volume reduction	18,795	11,326	960	8,012	3,564
	Volumes used	80,430	63,000	33,532	0	0
2017	Volume reduction	30,031	7,710	1,332	8,792	3,444
	Volumes used	66,915	60,561	31,276	102,693	14,499
2018	Volume reduction	16,587	11,936	0	5,096	3,629
	Volumes used	73,724	66,894	31,183	61,494	6,175

* 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

		2013	2014	2015	2016	2017	Target*
Aluminum cans	Weight of consumed(thousand t)	304	313	332	341	336	—
	Recycled weight(thousand t)	255	273	299	315	310	—
	Recycling rate(%)	83.8	87.4	90.1	92.4	92.5	≥90
Steel cans	Weight of consumed(thousand t)	611	571	486	463	451	—
	Recycled weight(thousand t)	567	525	451	435	422	—
	Recycling rate(%)	92.9	92.0	92.9	94.0	93.4	≥85
PET bottles	Sales volume of specified PET bottles (thousand t)	578,706	569	563	596	587	—
	Recycling volume in Japan(thousand t)	258	271	262	279	298	—
	Recycling volume outside Japan (thousand t)	239	199	227	221	201	—
	Recycling volume of used PET bottle (thousand t)	497	470	489	500	498	—
	Recycling rate(%)	85.8	82.6	86.9	83.9	84.8	≥85
Glass bottles	Melted weight(thousand t)	1702	1652	1618	1606	1583	—
	Cullet usage volume(thousand t)	1274	1230	1228	1211	1189	—
	Cullet usage rate(%)	74.8	74.4	75.9	75.4	75.1	≥90
	Recycling rate(%)	67.3	69.8	68.4	71.0	69.2	—

* Recycling target of 2nd Voluntary Action Plan


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

	Sale volumes(million bottles)	Collected volume(million bottles)	Collection rate (%)
2014	263.1	261.7	99
2015	248.7	247.1	99
2016	232.0	232.7	100
2017	224.6	227.8	101
2018	205.1	203.2	99

* 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%.

Global Warming

Actual results for Fiscal 2018 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
2014	963	(963)	0.48	—
2015	1,004	(1,002)	0.49	—
2016	1,012	(1,010)	0.52	0.55
2017	996	(995)	—	0.53
2018	986	(983)	—	0.51


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 and Bio-chemicals Businesses	Other Businesses (all companies included)	Total 
2014	235	67	258	338	64	963
2015	239	68	258	360	79	1,004
2016	233	70	251	363	95	1,012
2017	231	61	247	363	95	996
2018	232	59	235	359	101	986

Trends in greenhouse gas emissions (by region)

(Unit: thousand tCO₂e)

	Japan	Oceania	Southeast Asia	Other	Total 
2014	600	258	9	96	963
2015	597	258	32	116	1,004
2016	593	251	46	122	1,012
2017	581	247	50	119	996
2018	570	235	57	124	986

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)
2014	180	83
2015	177	79
2016	174	80
2017	170	80
2018	171	75

(b) Kirin Beverage

	Shonan Plant	
	Greenhouse gas emissions (thousand tCO ₂ e)	Greenhouse gas emissions intensity (kgCO ₂ e/kL)
2014	29	90
2015	28	90
2016	31	77
2017	28	64
2018	27	60

(c) Mercian

	Greenhouse gas emissions (thousand tCO ₂ e)
2014	25
2015	26
2016	28
2017	29
2018	30

Trends in energy usage (entire Group)


Energy usage by type	2014	2015	2016	2017	2018
Total usage (TJ)	12,129	12,426	12,803	12,972	13,081
Coal (t)	1,938	1,403	1,758	2,294	2,339
Gasoline (kL)	3,425	4,734	3,887	3,600	3,621
Kerosene (kL)	94	87	166	1,466	1,399
Diesel oil (kL)	5,016	11,399	12,242	13,790	12,611
Heavy fuel oil (kL)	11,515	10,544	11,674	12,475	14,006
LPG (t)	2,616	2,711	2,623	3,334	3,356
Town gas (thousand Nm ³)	106,862	108,465	111,648	110,950	112,987
LNG (t)	0	0	0	0	0
Purchased electricity (MWh)	753,267	780,123	818,925	811,123	811,507
Renewable electricity (MWh)	937	815	843	937	844
Purchased steam (TJ)	2,014	1,963	1,979	1,925	1,886
Other (TJ)	1,669	1,680	1,662	1,771	1,811

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 and Bio-chemicals Businesses	Other Businesses (all companies included)	Total 
2014	154	44	73	70	29	369
2015	158	45	82	64	42	391
2016	159	45	77	64	56	401
2017	164	44	74	68	56	405
2018	168	42	74	68	60	412

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

(Unit: thousand tCO₂e)

	Japan	Oceania	Southeast Asia	Other	Total 
2014	252	73	5	40	369
2015	254	82	17	37	391
2016	259	77	18	47	401
2017	266	74	21	44	405
2018	271	74	21	46	412

Breakdown of greenhouse gas emissions in Scope 1(2018)


(Unit: thousand tCO₂e)

CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆
411	0.3	<0.1	0.3	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 and Bio-chemicals Businesses	Other Businesses (all companies included)	Total 
2014	81	24	186	267	35	594
2015	81	23	176	296	37	613
2016	74	26	174	299	39	611
2017	67	17	173	296	39	591
2018	64	17	161	291	42	574

Trends in greenhouse gas emissions from electricity and steam purchases (by region)

(Unit: thousand tCO₂e)

	Japan	Oceania	Southeast Asia	Other	Total 
2014	348	186	4	56	594
2015	342	176	15	79	613
2016	334	174	28	75	611
2017	315	173	28	75	591
2018	299	161	36	79	574

■ Scope3 (other indirect emissions)

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

See P. 83 for calculation boundaries

(Unit: thousand tCO₂)

	Japan Beer and Spirits Business	Japan Non-Alcoholic Beverages Business	Oceania Integrated Beverages Business	Pharmaceuticals and Bio-chemicals Businesses	Other Businesses (all companies included)	Total
2014	1,488	976	920	299	457	4,140
2015	1,553	1,037	1,314	242	416	4,561
2016	1,521	1,099	800	246	535	4,200
2017	1,413	1,060	1,083	265	542	4,364
2018	1,483	1,060	882	273	586	4,284

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

See P. 83 for calculation boundaries

(Unit: thousand tCO₂)

	Japan	Oceania	Southeast Asia	Other	Total
2014	3,181	920	1	39	4,140
2015	3,209	1,314	0	39	4,561
2016	3,244	800	112	44	4,200
2017	3,081	1,083	152	47	4,364
2018	3,145	882	209	48	4,284

Trends in CO₂ emissions*1 accompanying transportation volumes and distances (Japan)

	Business	Kirin Brewery	Kirin Beverage	Mercian	Total
2013	Transport volumes (thousand ton kilometer)	564,105	809,530	76,074	1,449,709
	CO ₂ emissions (thousand tons-CO ₂)	49	68	7	124
2014	Transport volumes (thousand ton kilometer)	589,483	706,443	99,654	1,395,580
	CO ₂ emissions (thousand tons-CO ₂)	49	60	7	116
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

*1 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 Rationalizing Energy Use.

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 2018 CO₂ emissions in Scope 1 and 2 from the entire Kirin Group and those in Scope 3 from the Japan Integrated Beverage Business. The independent assurance report is shown on Page 99.

Calculation results of Scopes 1 and 2 for the entire Kirin Group*1 (2018) (Unit:tCO₂e/year)

Scope1	Scope2
411,747	574,169

Calculation results of Scope 3 for Japan Integrated Beverages Business*2 (2018) (Unit:tCO₂/year)

Upstream/ Downstream	Scope3 Categories	Calculation results	Remarks
Upstream	1 Products and services purchased	1,655,118	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	50,782	Calculated by multiplying the purchased volume of fuel or electricity by CO ₂ emissions factors for each energy type
	4 Transportation and delivery (upstream)	329,657	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 FY2017 data)
	5 Waste from operations	10,030	Calculated by multiplying the amount of waste discharged, etc. by the CO ₂ emission factors for each disposal method
	6 Business travel	2,308	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
	7 Employee commuting	6,557	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
	8 Leased assets (upstream)	-	Included in Scopes 1 and 2
Downstream	9 Transportation and delivery (downstream)	742,995	Customer: 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	21,985	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
	12 Disposal of sold products	59,250	Calculated by multiplying the amount of containers and packaging disposed of 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		2,878,682	

Progress toward Mid-Term Greenhouse Gas Emission Reduction Targets Through SBTs*3 (2018)

See P. 83 for calculation boundaries

(Unit:tCO₂e/year)

■ Scope1+2

		total
Scope1+Scope2		927,337
	Scope1	375,096
	Scope2	552,241
Reduction rate (compared to 2015 base year)		-3.8%

■ Scope3

		total
Scope3		4,092,881
Upstream	1 Products and services purchased	2,446,307
	2 Capital goods	0
	3 Fuel and energy-related activities not included in Scopes 1 and 2	142,437
	4 Transportation and delivery (upstream)	365,183
	5 Waste from operations	43,302
	6 Business travel	9,822
	7 Employee commuting	10,099
	8 Leased assets (upstream)	0
Downstream	9 Transportation and delivery (downstream)	923,083
	10 Processing of sold products	0
	11 Use of sold products	32,776
	12 Disposal of sold products	119,872
	13 Leased assets (downstream)	0
	14 Franchises	0
	15 Investments	0
Reduction rate (compared to 2015 base year)		-10.2%

*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 Rationalizing Energy Use.

•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 Companies included in calculations: Kirin Brewery, Kirin Distillery, Kirin Group Logistics, Kirin Beverage, Shinshu Beverages, Mercian, Daiichi Alcohol, and Kirin

*3 30% reduction by 2030 compared to 2015 levels.

Trends in biogas electricity and biogas generated at Kirin Brewery plants

	Biogas electricity generated (Unit: million kWh)	Biogas generated (Unit: thousand Nm ³)
2014	20.1	8,588
2015	20.5	8,967
2016	21.2	8,593
2017	19.2	8,115
2018	18.6	8,689

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

	Annual electricity consumption (Unit: kWh/year)
2014	726
2015	708
2016	724
2017	712
2018	702

Source: Japan Vending Machine Manufacturers Association

Breakdown of purchased electricity (Kirin Brewery plants)

(Unit: thousand kWh)

		2017	2018	
Purchased electricity	Renewable energy through energy mix	16,089	18,054	
	Other than renewable energy	94,112	94,782	
	Power Certificates	Hydro-electric power	15,184	20,627
		Wind power	0	0
Total		125,386	133,462	
Renewable energy/purchased electricity (%)		25%	29%	

Breakdown of electricity usage (entire Group)

(Unit: thousand kWh)

		2017	2018	
Purchased electricity	Other than Power Certificates	787,561	780,192	
	Power Certificates	Hydro-electric power	22,912	30,813
		Wind power	650	502
		Total	23,562	31,315
Private power generated	Other than renewable energy	252,413	210,472	
	Biogas-generated electricity	19,189	19,099	
	Solar-generated electricity	287	342	
Electricity usage		1,082,169	1,039,669	
Of which, renewable energy (excluding energy mix)		43,037	50,757	

Reduction of waste and prevention of pollution

Volume of waste generated (2018)

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

Japan Beer and Spirits Business	Japan Non-Alcoholic Beverages Business	Oceania Integrated Beverages Business	Pharmaceuticals and Bio-chemicals Businesses	Other Businesses (all companies included)	Total
196 (47)	19 (4)	99 (23)	61 (15)	46 (11)	421 (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 (%)
2014	244	20	224	0.4	99.8
2015	228	14	213	0.5	99.8
2016	237	17	219	0.4	99.8
2017	243	24	219	0.6	99.7
2018	346	12	333	0.7	99.8

Wastewater quality

	COD (t)			Nitrogen (t)			Phosphorous (t)		
	Japan	Overseas	Total	Japan	Overseas	Total	Japan	Overseas	Total
2017	675	3,557	4,232	396	954	1,350	53	271	324
2018	742	3,127	3,869	344	826	1,170	45	220	265
Y/Y change	67	-430	-363	-52	-128	-180	-8	-51	-59

Trend in emissions of air pollutants

Trends in emissions of NOx and SOx (entire Group)

(Unit:t)

	NOx	SOx
2014	275	53
2015	271	71
2016	442	64
2017	431	95
2018	436	19

Trends in emissions of VOCs (Japan Pharmaceuticals and Bio-chemicals Businesses)

(Unit:t)

	Methanol	Acetone	Substances subject to PRTR Act	Ethyl acetate, etc.	Total
2014	373	33	64	138	608
2015	376	32	57	105	570
2016	324	21	55	88	488
2017	417	21	62	97	596
2018	308	13	57	103	481

Soil Investigations Status (2018)

Number of investigations	Area of investigations (m ²)
14	40,030

Targets regarding chemical substances

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

Status of PCB management (2018)

High-concentration capacitors, reactors, etc.	Trace-quantity capacitor reactors, etc.	High-concentration stabilizers	Trace-quantity stabilizers
5	27	915	109

Status of asbestos management (2018)

Number of buildings	Area (m ²)
4 buildings	2,590

Status of HCFC management (2018)

Number of offices	Weight (kg)
14 locations	25,486

Status of HFC management (2018)

Number of offices	Weight (kg)
6 locations	16,289

Status of Environmental Management Certifications

Status as of July 2019

Japan

Number of independently certified business locations	7
Number of business locations making self-declaration of conformity	21
Certification rate (%)	100

Overseas

Number of certified business locations	29
Number of uncertified business locations	8
Certification rate (%)	78

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
GRI 102	102-1	P.5
	102-2	P.5 https://www.kirinholdings.co.jp/english/company/business/index.html
	102-3	P.5
	102-4	P.5 https://www.kirinholdings.co.jp/english/company/organization/index.html
	102-5	P.5
	102-6	P.5 https://www.kirinholdings.co.jp/english/ir/finance/segment.html https://www.kirinholdings.co.jp/english/ir/private/global.html
	102-7	P.5 ESG Data Profile(https://www.kirinholdings.co.jp/english/csv/esg_gri/esg.html) https://www.kirinholdings.co.jp/english/company/organization/index.html
	102-8	P.5 ESG Data Profile, Employees(https://www.kirinholdings.co.jp/english/csv/esg_gri/esg.html)
	102-9	P.8, 22, 32, 40, 54 https://www.kirinholdings.co.jp/english/csv/safety/policies.html https://www.kirinholdings.co.jp/english/csv/procurement/csr.html
	102-10	P.3, 82-84 ESG Data Notes (https://www.kirinholdings.co.jp/english/csv/esg_gri/esg.html)
	102-11	P.8, 11-16, 68-69 https://www.kirinholdings.co.jp/english/csv/governance/risk_management.html

GRI Contents Index Standard	Disclosure matters	Page number or URL
GRI 102	102-12	P.79-81 https://www.kirinholdings.co.jp/english/csv/sustainability/gc.html https://www.kirinholdings.co.jp/english/csv/human_resources/promote.html
	102-13	P.79, 80 https://www.kirinholdings.co.jp/english/csv/sustainability/gc.html https://www.kirinholdings.co.jp/english/csv/alcohol/policies.html
	102-14	P.4, 6-7 https://www.kirinholdings.co.jp/english/csv/story/ https://www.kirinholdings.co.jp/english/ir/library/integrated/2016/message01.html
	102-15	P.8, 11-16, 23, 33 https://www.kirinholdings.co.jp/english/ir/policy/risks.html https://www.kirinholdings.co.jp/english/csv/materiality/
	102-16	https://www.kirinholdings.co.jp/english/company/philosophy/ https://www.kirinholdings.co.jp/english/csv/governance/compliance.html
	102-18	P.67-70 https://www.kirinholdings.co.jp/english/ir/policy/management.html ESG Data Governance (https://www.kirinholdings.co.jp/english/csv/esg_gri/esg.html)
	102-40	P.74-75, 79-81 https://www.kirinholdings.co.jp/english/csv/sustainability/stakeholder.html
	102-41	ESG Data Employees (https://www.kirinholdings.co.jp/english/csv/esg_gri/esg.html)
	102-42	P.74-75, 79-81 https://www.kirinholdings.co.jp/english/csv/sustainability/stakeholder.html

GRI Contents Index Standard	Disclosure matters	Page number or URL
GRI 102	102-43	P.74-75, 79-81 https://www.kirinholdings.co.jp/english/csv/sustainability/stakeholder.html https://www.kirinholdings.co.jp/english/csv/commitment/index.html#sect03 https://www.kirinholdings.co.jp/english/csv/alcohol/policies.html https://www.kirinholdings.co.jp/english/csv/human_rights/policies.html
	102-44	P.74-75 https://www.kirinholdings.co.jp/english/csv/sustainability/stakeholder.html https://www.kirinholdings.co.jp/english/csv/human_rights/policies.html
	102-45	P.3 https://www.kirinholdings.co.jp/english/company/organization/index.html
	102-46	P.8, 10
	102-47	P.8, 9, 11 https://www.kirinholdings.co.jp/english/csv/commitment/ https://www.kirinholdings.co.jp/english/csv/materiality/
	102-49	P.83 ESG Data Notes (https://www.kirinholdings.co.jp/english/csv/esg_gri/esg.html)
	102-50	P.3
	102-51	June 2018
	102-52	Year
	102-53	Back cover
	102-54	P.3
	102-55	P.105-107
	102-56	P.110
	Biological Resources	
GRI 103	103-1	P.8, 9, 11, 12, 14-16, 23
	103-2	P.9, 12, 14-18, 21, 23
	103-3	P.21, 23

GRI Contents Index Standard	Disclosure matters	Page number or URL
GRI 304	304-2	P.6-7, 24-27
	304-3	P.28
	304-4	P.25, 28, 31
Water Resources		
GRI 103	103-1	P.8, 9, 11, 12, 14-16, 23
	103-2	P.9, 12, 14-18, 21, 33
	103-3	P.21, 33
GRI 303	303-1	P.8-12, 14-18, 24, 32-39
	303-2	P.37
	303-3	P.85, 86, 95
	303-4	P.85, 87
	303-5	P.33, 39, 85-87, 95
Containers and Packaging		
GRI 103	103-1	P.8, 9, 11, 13, 14-16, 23
	103-2	P.9, 13, 14-18, 21, 41
	103-3	P.21, 41
GRI 301	301-1	P.85, 87
	301-2	P.41, 42, 47, 48, 88
	301-3	P.88
Global Warming		
GRI 103	103-1	P.8, 9, 11, 13, 14-16, 23
	103-2	P.9, 13, 14-18, 21, 55
	103-3	P.21, 55
GRI 302	302-1	P.64, 85, 89
	302-2	P.92
	302-3	P.95
	302-4	P.85, 89

GRI Contents Index Standard	Disclosure matters	Page number or URL
GRI 305	305-1	P.64, 65, 82, 83, 88-91
	305-2	P.64, 65, 82, 83, 88, 90, 91
	305-3	P.64, 90, 91
	305-4	P.65, 89, 95
	305-5	P.55, 64, 65, 88-90
	305-6	P.93
	305-7	P.71, 85, 93-94
Waste and prevention of pollution		
GRI 103	103-1	P.71
	103-2	P.30, 71
	103-3	P.30, 71, 85, 93-94
GRI 306	306-1	P.37, 71, 85, 86, 93-95
	306-2	P.71, 85, 93, 95
	306-5	P.95
GRI 307	307-1	P.71
Supply chain		
GRI 103	103-1	P.8, 9
	103-2	P.9, 12-18
	103-3	P.21
GRI 308	308-2	P.12-18, 21, 23-27, 72

TCFD Recommendations' Recommended Disclosure Index

	Recommended Disclosure	Page
Governance	a) Describe the board's oversight of climate-related risks and opportunities.	P.67-70
	b) Describe management's role in assessing and managing climate-related risks and opportunities.	P.67-70
Strategy	a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	P.8, 11-16
	b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	P.12-16
	c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2° C or lower scenario.	P.14-16
Risk Management	a) Describe the organization's processes for identifying and assessing climate-related risks.	P.68
	b) Describe the organization's processes for managing climate-related risks.	P.68-70
	c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	P.68-69
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.8, 9, 17, 55
	b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	P.55, 64, 65, 85, 88-91
	c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	P.8, 9, 17, 18, 21, 55

Independent Assurance Report



Independent Assurance Report

To the President and CEO of Kirin Holdings Company, Limited

We were engaged by Kirin Holdings Company, Limited (the "Company") to undertake a limited assurance engagement of the CO₂ emissions in Scopes 1 and 2 from the entire Kirin Group and those in Scope 3 from the Japan Integrated Beverages Business marked with for the period from January 1, 2018 to December 31, 2018 (the "Indicators") included in its Kirin Group Environmental Report 2019 (the "Report") for the fiscal year ended December 31, 2018.

The Company's Responsibility

The Company is responsible for the preparation of the Indicators in accordance with its own reporting criteria (the "Company's reporting criteria"), as described in the Report.

Our Responsibility

Our responsibility is to express a limited assurance conclusion on the Indicators based on the procedures we have performed. We conducted our engagement in accordance with the 'International Standard on Assurance Engagements (ISAE) 3000, Assurance Engagements other than Audits or Reviews of Historical Financial Information' and the 'ISAE 3410, Assurance Engagements on Greenhouse Gas Statements' issued by the International Auditing and Assurance Standards Board. The limited assurance engagement consisted of making inquiries, primarily of persons responsible for the preparation of information presented in the Report, and applying analytical and other procedures, and the procedures performed vary in nature from, and are less in extent than for, a reasonable assurance engagement. The level of assurance provided is thus not as high as that provided by a reasonable assurance engagement. Our assurance procedures included:

- Interviewing the Company's responsible personnel to obtain an understanding of its policy for preparing the Report and reviewing the Company's reporting criteria.
- Inquiring about the design of the systems and methods used to collect and process the Indicators.
- Performing analytical procedures on the Indicators.
- Examining, on a test basis, evidence supporting the generation, aggregation and reporting of the Indicators in conformity with the Company's reporting criteria, and recalculating the Indicators.
- Visiting the Shonan Plant of Kirin Beverage Company, Limited selected on the basis of a risk analysis.
- Evaluating the overall presentation of the Indicators.

Conclusion

Based on the procedures performed, as described above, nothing has come to our attention that causes us to believe that the Indicators in the Report are not prepared, in all material respects, in accordance with the Company's reporting criteria as described in the Report.

Our Independence and Quality Control

We have complied with the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants, which includes independence and other requirements founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behavior. In accordance with International Standard on Quality Control 1, we maintain a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

KPMG AZSA Sustainability Co., Ltd.

KPMG AZSA Sustainability Co., Ltd.
Tokyo, Japan
September 25, 2019