Environmental Report 2017

KIRIN

2017.8

CONTENTS

About this Environmental Report

Editorial Policy

The Kirin Group consists of its Integrated Beverages Business, which covers Japan, Oceania, and Brazil, its Pharmaceuticals and Bio-chemicals Business, and other businesses, with the Integrated Beverages Business, including overseas operations, accounting for approximately 80% of net sales. Initiatives to address the environmental issues are positioned as one of the three key issues 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.

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 http://www.kirinholdings.co.jp/english/ir/
Presents information for shareholders and investors, including the management plans and financial information of the Kirin Group.

Kirin Holdings CSV Website http://www.kirinholdings.co.jp/english/csv/
Presents the approaches being taken to CSV (creating value that can be shared with society) by the Kirin Group to achieve "the creation of social value through efforts toward social issues" alongside "corporate growth."

KIRIN REPORT 2016 (Integrated Report) http://www.kirinholdings.co.jp/english/ir/library/integrated/2016/

KIRIN GROUP ENVIRONMENTAL REPORT http://www.kirinholdings.co.jp/csv/env/report/index.html

LION SUSTAINABILITY REPORT http://lionco.com/sustainability/sustainability-reporting/

Reporting Period

FY2016 (January–December 2016)

Please note that some environmental data for Lion Pty Limited and Myanmar Brewery covers the period October 2015-September 2016.
Where necessary, this report also contains historical data showing trends for the past 3 to 5 years.

Organizations Covered by this Report (FY2016)

Business	Company
Japan Integrated Beverages Business	Kirin, Kirin and Communications, Kirin Engineering, Kirin City, Kirin Techno-System, Kirin Brewery, Kirin Beer Marketing, Kirin Distillery, KIRIN GROUP LOGISTICS, SPRING VALLEY BREWERY, Eishogen, Mercian, NIPPON LIQUOR, Daiichi Alcohol, Wine Curation, Kirin Beverage, Shinshu Beverage, Kirin Chilled 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
Overseas Integrated Beverages Business	Kirin Brewery (Zhuhai), Lion, Brasil Kirin, AZUMA KIRIN, Myanmar Brewery, Interfood, Vietnam Kirin Beverage, Four Roses Distillery
Pharmaceuticals and Bio-chemicals Business	Kyowa Hakko Kirin, KYOWA MEDEX, Kyowa Hakko Bio, KYOWA PHARMA CHEMICAL, Kyowa Hakko Kirin China Pharmaceutical, BioKyowa Inc., Shanghai Kyowa Amino Acid, Thai Kyowa Biotechnologies
Other	Kirin Holdings, Kirin Business Expert, KIRIN BUSINESS SYSTEM, KOIWAI DAIRY PRODUCTS, YOKOHAMA ARENA, Kirin Echo

Reference Guidelines

GRI Standards 2016
Environmental Reporting Guidelines (FY2012 version), Ministry of the Environment of Japan
Draft framework for reporting environmental information & natural capital, Climate Disclosure Standards Board (CDSB) (October 2014 version)

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.

Corporate Data

Trade Name	Kirin Holdings Company, Limited
Date of Incorporation	February 23, 1907
Head Office	NAKANO CENTRAL PARK SOUTH 10-2, Nakano 4-chome, Nakano-ku, Tokyo 164-0001, Japan +81-3-6837-7000 [Information Desk]
President and CEO	Yoshinori Isozaki
Paid-in Capital	102,045,793,357 yen
Number of Employees	39,733 employees on a consolidated basis (as of December 31, 2016)
Main Business	Developing group-wide management strategies and overseeing their implementation

Japan

Japanese Integrated Beverages Business

Sales 1,153 billion yen

CO_2 emissions 329 $ktCO_2e$

Water consumption results
17,149 thousand m^3

- Kirin Brewery Co., Ltd.
- Kirin Beverage Co., Ltd
- Mercian Corporation
- Other

Pharmaceuticals and Bio-chemicals Business

Sales 336 billion yen

CO_2 emissions 367 $ktCO_2e$

Water consumption results
52,772 thousand m^3

- Kyowa Hakko Kirin Group

Asia

- Myanmar Brewery Limited

Sales 22 billion yen

CO_2 emissions 19 $ktCO_2e$

Water consumption results
991 thousand m^3

Other group companies

- Interfood Shareholding Company
- Vietnam Kirin Beverage Co., Ltd.
- Other

Oceania

- Lion Pty Ltd

Sales 373 billion yen

CO_2 emissions 251 $ktCO_2e$

Water consumption results
5,514 thousand m^3

Americas

- Brasil Kirin

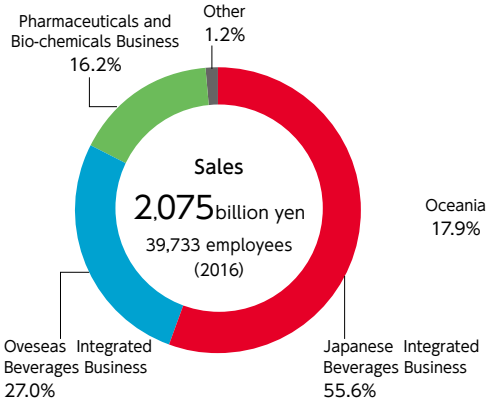
Sales 118 billion yen

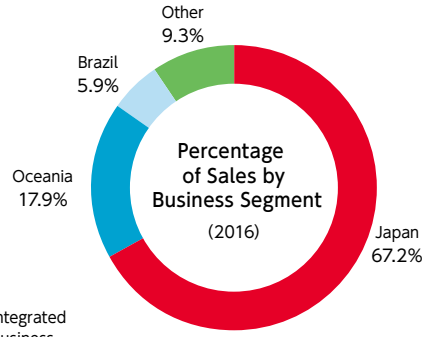
CO_2 emissions 112 $ktCO_2e$

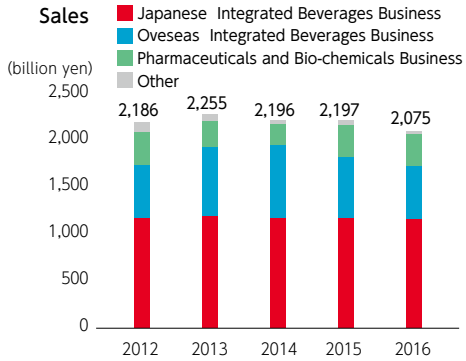
Water consumption results
8,418 thousand m^3

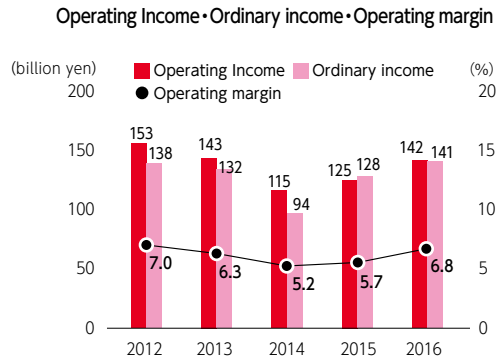
Other group companies

- AZUMA KIRIN Indústria e Comércio de Bebidas e Alimentos Ltda.
- Four Roses Distillery LLC
- Other









Kirin Group's Long-Term Environmental Vision	CSV Commitment	Performance
Biological Resources Work toward sustainable use of biological resources by 2050.	●Improve the sustainability of farms in Sri Lanka ●Secure biodiversity in Japan's agricultural areas	 **Assist Sri Lankan tea farms to obtain Rainforest Alliance certification** Total tea farms trained: more than 90 Total tea farms certified: more than 40 **Hops fields in Tono City**: 104 insect species, 19 bird species **Mariko Vineyard in Ueda City**: 168 insect species, 258 wild plant species, 30 cultivated plant species
Water Resources Strive to see that water resources in each region can be ensured on a permanent basis by 2050	●Reduce water usage (Pharmaceuticals and Bio-chemicals Business: 30% less in 2030 than in 2015)	 **Water-Source Forestation Project** Number of implementing sites: 11 Number of participants: 1,467 **Trend in water usage of Pharmaceuticals and Bio-chemicals Business** (thousand m³) 60,000 40,000 20,000 0 2015 2016
Containers and Packaging Work toward sustainable use of packaging and containers by 2050	●Maintain and expand the bottle-to-bottle initiative ●Study and promote the use of bioplastics ●Maintain and expand the use of FSC®-certified paper for primary and secondary containers ●Lion Pty Limited: Increase the use of recycled packaging raw materials: >50% by 2030	 **Bottle-to-bottle ratio** *Gogo-no-Kocha Oishii Muto (sugar-free)* 500-ml PET bottle: 100% **Ratio of FSC-certified paper in paper containers** 250-ml, 350-ml, 500-ml 6-can beer packs: 100% Drink boxes: 60% * As of June 30, 2017
Global Warming Keep CO_2 emissions across our value chain within the Earth's capacity to absorb them by 2050	●Implement initiatives aiming to achieve medium-term GHG reduction targets based on the SBT (Science Based Targets) approach ●Increase the proportion of renewable energy (set target in 2017)	 **Hydro-electric power** Toride Plant, Shonan Plant **Commence use of Green Power Certificate and Green Heat Certificate** **Trend in value chain GHG emissions** ($ktCO_2e$) 8,000 6,000 4,000 2,000 0 -17% Target -50% 1990 2015 2016 2050
Reducing and Recycling Waste Materials	●Maintain 100% recycling rate for industrial waste materials ●Reduce discharge of chemical substances	 **recycling rate** 100% (All plants of Kirin Brewery, Kirin Beverage and Kirin Distillery) **chemical substances** 46% reduction of VOC emissions (Pharmaceuticals and Bio-chemicals Business, compared to 2003)

●Achieved ●In Progress ●Unachieved

The Kirin Group is focusing its efforts on three key social issues: “health and well-being,” “community engagement,” and “the environment.” Addressing these issues with a deep commitment, we envision a bright future and aim to realize our goals as we work together with our customers.

Director of the Board, Senior Executive Officer Kirin Company,Limited and
Director of the Board, Senior Executive Officer Kirin Holdings Company,Limited

Ryosuke Mizouchi (Group CSV Strategy)

Creating Shared Value and Changes in Society

In all of its businesses, Kirin has placed great importance on contributing to people’s healthy and spiritually enriched lives through its businesses of alcoholic and non-alcoholic beverages, food products, and advanced pharmaceuticals. To achieve this ideal, four years ago, the Kirin Group positioned the CSV (creating shared value) approach at the center of its management strategy. This approach seeks to achieve the sustainable growth of our business by realizing value for society as value for our customers. The concept of creating shared value is by no means a new one. For example, many readers may have heard the principle of *sanpo-yoshi*, meaning “benefit for three parties,” namely the seller, the buyer, and society, followed by the old merchants of Ohmi in Edo Japan, as well as the theory of “harmony of good ethics and business” advocated by Shibusawa Eiichi, one of the investors in Japan Brewery, the forerunner of Kirin, cited as archetypes of CSV.

In recent years, global progress has been made in the sustainability movement, and it has become increasingly necessary for companies to set their own, independent targets. In 2015, there were two major events that propelled this trend forward.

One was the adoption of the Sustainable Development Goals (SDGs) by the United Nations. The SDGs organized the social issues that the world needed to work together to address. For companies, they provide targets for creating common values with society by fulfilling their responsibility to help solve social issues. The other was the adoption of the Paris Agreement at COP21 (21st session of the Conference of the Parties to the UN Framework Convention on Climate Change). The Paris Agreement is a global framework for responses to climate change beyond 2020, aimed at keeping global warming to less than 2° C above pre-industrial levels. This agreement could be described as having set targets for more specific issues.

CSV Story and Commitment

In response to these developments, the Kirin Group held repeated discussions on how to accelerate our approaches in these areas towards achieving sustainable growth. In February 2017, Kirin’s thinking on CSV and our directions for achieving it were elucidated in the form of the CSV Story and the CSV Commitment. As part of this, we decided to focus on the three key social issues of “health and well-being,” “community engagement,” and “the environment,” all of which are deeply relevant to our business and in which we can leverage our strengths. The CSV Story and CSV Commitment represent a declaration of how we want our businesses to contribute to these issues, the approaches we will take to make those contributions, and the outcome indicators to verify the achievement. In terms of “the environment,” adopting a backcasting approach to the previously announced Kirin Group’s Long-Term Environmental Vision, which has targets for 2050, we established outcome indicators with target years of from 2020 to 2030 for each of four themes, “biological resources,” “water resources,” “containers and packaging,” and “global warming.” These targets were positioned as medium-term goals that would clarify our path to achieving the targets of the Long-Term Vision. For “biological resources,” we will assist Sri Lankan tea farms, which are an irreplaceable source of the main ingredients for our *Gogo-no-Kocha* range of bottled tea beverages, to obtain certification as sustainable farms, and we will contribute to ensuring biodiversity in Japan’s agricultural areas. In the area of “water resources,” we will continue to reduce our water usage and to pursue conservation activities in water resource regions. In “containers and packaging,” in addition to the pursuit of 3R, we will engage in initiatives to increase the sustainability of our container and packaging materials. Specifically, we set a target of the complete conversion to FSC®-certified paper for all paper

containers and packaging by the end of 2020, and announced that target to the outside world on February 27, 2017. In terms of "global warming," we have set an ambitious target of reducing our CO_2 emissions by 30% compared to 2015 levels by 2030. In a first for the Japanese food and beverages industry, this target was recognized by the Science Based Targets (SBT) Initiative as a science-based CO_2 reduction target aimed at keeping global warming to less than 2° C above pre-industrial levels. Moreover, two plants in the Kirin Group announced, on March 24 and March 28, 2017, that they would adopt electricity derived from hydroelectric power generation, which does not emit CO_2.

For a Happy Future for our Customers

To be able to pass on a beautiful planet for our children' s generations is the common desire of many. Kirin, whose business is based on the many blessings of nature, shares in this hope. Achieving this common wish will require that our many stakeholders, from producers to suppliers, government, NGOs, customers, and companies, step beyond their mutual boundaries and share in the work of addressing the tasks involved.
We have already begun cooperative efforts towards the sustainable production of raw materials and ingredients, by working together with tea farmers in Sri Lanka, hops farmers in Tono City in Japan, and dairy farmers in Australia. We have also committed to the ambitious targets set by international corporate consortia and are proceeding with initiatives in cooperation with international NGOs. We are further cooperating with our competitors in the areas of shared freight and raising awareness of sustainable certification programs, in our endeavors to contribute to the sustainability of society as a whole. We also believe that workshops designed to foster understanding about the links to the world through beverages among young people, who will shoulder the future, are a very important initiative.
With the aim of creating a happy future in which we can all benefit from the blessings of nature in a rich local community, we will continue to engage in these issues in cooperation with our customers and our many other stakeholders.
Further, in 2017, as medium-term targets to clarify our path to achieving the goals of our Long-Term Environmental Vision, we have established outcome indicators with target years of between 2020 and 2030 in the form of the CSV Commitment, and declared that we would accelerate our endeavors to meet those targets. By engaging in the Commitment together as a Group, we will aim to contribute to a happy future for our customers.

Our CSV Story

The Kirin Group is focusing its efforts on three key social issues: "health and well-being," "community engagement," and "the environment." Addressing these issues with a deep commitment, we envision a bright future and aim to realize our goals as we work together with our customers.

The Kirin Group was founded in 1907. We started our business with a beverage that was relatively new to Japan at the time - beer - and since then, we have created a new lifestyle and tradition. Beer was not a very familiar beverage to most Japanese in the early 20th century, but through packaging our product in bottles, one by one, and delivering them to people's homes, we were able to spread happiness to our customers. Later, we expanded our business to include a wide variety of alcoholic beverages, soft drinks, and foods as well as advanced pharmaceuticals that have evolved from the fermentation and culturing technologies involved in brewing beer. In doing so, our business activities have spread around the world. What we have valued throughout our history are the contributions we have made to people's health and well-being and to enhancing the affluence of society in the fields of food and health. These efforts are underpinned by craftsmanship based on high quality and cutting-edge technologies. We aspire to realizing a bright future by working together with our customers, driven by our passion and integrity. This is our philosophy.

In the more than one hundred years of our history, the world has changed dramatically. Noncommunicable diseases and other health problems, rising healthcare costs, an aging society, the disintegration of bonds between people, and economic disparity are becoming more and more serious. Over and above these issues, the degree of global warming and climate change and the destruction of the natural environment are growing increasingly severe. Through proactively working to help solve these very serious problems, we aim to further contribute to our customers' happiness.
By leveraging our strengths to tackle these issues, we can change our way of thinking and generate even greater originality and ingenuity, leading to new innovations. Through these efforts, we will enhance Kirin's organizational capabilities, which will enable us to continuously generate value for our customers. This is CSV - the creation of value that can be shared with society - and this is our most important management policy.
The lifestyle and culture of enjoying alcoholic beverages is part of the fabric of society, but it is also true that in some cases drinking alcohol can harm one's health. As a responsible alcohol producer, we are working, first and foremost, to help solve alcohol-related problems. With that as our top priority, we are focusing our efforts on three key social issues: "health and well-being," "community engagement," and "the environment."
Through the sustainability of our planet, which is blessed with a natural beauty that we must pass on to future generations, we will realize rich and vibrant communities that foster sound physical and mental health - and lead to happiness in everyday life.

Contributing to people's health and well-being is the philosophy of the Kirin Group. Through the development of beverages and foods that, in addition to being safe and secure, promote customer self-care while ensuring good taste, as well as through the creation of products and services that leverage the Group's strengths in the pharmaceutical business, we work to contribute to our customers' physical and mental well-being. In line with this theme, we continue to develop new medicines that will contribute to enhancing quality of life, thanks to our work in cutting-edge biotechnology.
Beverages including alcoholic drinks facilitate communication and deepen bonds between people. A prerequisite for these relationships is the existence of a rich and vibrant community, which forms the foundation of people's daily lives. We aim to provide products and services that are highly regarded by the local community and that help foster a sense of unity. Also, we will contribute to the revitalization of local communities through relationships with our supply chain as well as with the communities, by participating in businesses and projects that energize communities and by working together to solve problems faced by raw material producers, among other efforts.
To be able to pass on a beautiful planet to future generations is a wish for all of us. As a company that benefits from the many blessings of nature, including water and agricultural products, we recognize that sustainability of the global environment is essential to ensuring the continuity of our business. By reducing the environmental load in our value chain with regard to containers and packaging, as well as working to address the issue of global warming, we not only address environmental issues but also strengthen the foundation of our business. Under the Kirin Group's Long-Term Environmental Vision, introduced in 2013, we are working together with a number of our stakeholders on various initiatives that aim to realize a society based on 100% recycling by 2050.
While we are most passionate and sincere concerning a wide variety of matters facing our customers, we are focusing our efforts on the three key social issues of "health and well-being," "community engagement," and "the environment." We aspire to achieve a level of happiness where people can live healthy lives in affluent communities while enjoying the many blessings of nature. We aim to share this ambition with all of our employees with a view to changing our way of thinking and generating even greater originality and ingenuity in our day-to-day work, and creating thrilling value together with our customers so that the Kirin Group will continuously grow well into the future.

Kirin Group Long-Term Environmental Vision and Kirin Group CSV Commitment

In order to pass down the bounty of nature of our Earth to the future generations, we set forth the Kirin Group's Long-Term Environmental Vision for 2050. We identified four target areas - conservation and sustainable use of biological resources and water resources that are the most important raw materials for our business, sustainable use of containers and packaging that are essential in delivering our products to customers, and combat global warming that can impact these resources. Our target is the "realization of a society that is based on 100% recycling" as we aim to balance the environmental impact produced by the Kirin Group's value chain with the Earth's ability to supply resources by 2050, and we have been working toward this goal.

Further, in 2017, as medium-term targets to clarify our path to achieving the goals of our Long-Term Environmental Vision, we have established outcome indicators with target years of between 2020 and 2030 in the form of the CSV Commitment, and declared that we would accelerate our endeavors to meet those targets. By engaging in the Commitment together as a Group, we will aim to contribute to a happy future for our customers.

Kirin Group Long-Term Environmental Vision

The Kirin Group shares with all the people associated with its value chain
its aspiration to continue to enjoy the bounty of nature and pass it down to the generations to come.

■Our direction：Realization of society that is based on 100% recycling

The Kirin Group will use resources in a cyclical manner, so as to keep their use at or below the level that the Earth can replenish them, while reducing the environmental loads that the Kirin Group generates through its value chain.

■Our efforts

We will share responsibilities in the implementation of activities, working in cooperation with non-governmental organizations and industry groups, maintaining close communication with a wide range of stakeholders.

Our 2050 Targets and related Risks and Opportunities

Water Resources

We make sustainable use of water togethere with our communities.

Attainment target: Strive to see that water resources in each region can be ensured on a permanent basis by 2050

Risks: Securing stable supplies of quality water, increased costs for water usage, impacts of disasters on production

Opportunities: Advanced water-saving technologies, progress with methods for tracking risks in catchment areas and along the value chain

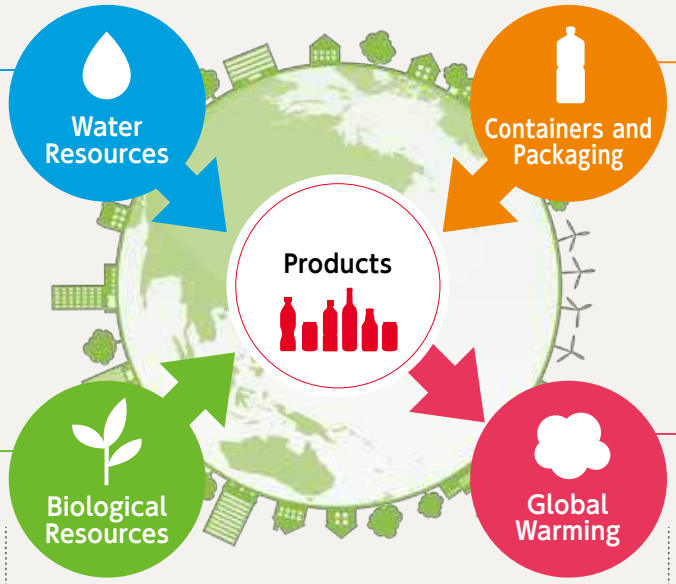
Biological Resources

We support agricultual communities and make sustainable use of biological resouces.

Attainment target: Work toward sustainable use of biological resources by 2050.

Risks: Loss of producer communities, securing stable supplies of raw materials, regulatory risk, reputational risk

Opportunities: Establishment of good relationships with producers, securing high-quality raw materials with consideration for nature



Containers and Packaging

We use sustainable containers and pakaging in consideration of their users.

Attainment target: Work toward sustainable use of packaging and containers by 2050

Risks: Resource scarcity, raw material cost increases, CO_2 emissions from products life cycle, regulatory risk

Opportunities: Advanced technologies and R&D competence for packaging and containers, reduction of raw material usage, reductions in CO_2 emissions, cost reductions

Global Warming

We keep the CO_2 emissions of the value chain within the Earth's natural CO_2 absorption ability in cooperation with all the people associated with our value chain.

Attainment target: Keep CO_2 emissions across our value chain within the Earth' s capacity to absorb them by 2050

Risks: Impact of climate change on the business on the whole, rising energy costs, regulatory risk

Opportunities: Advanced energy-saving technologies, renewable energy, cost reductions

Kirin Group Long-Term Environmental Vision
▶P.8

outcome indicators with target years of between 2020 and 2030

Kirin Group CSV Commitment
▶P.11、62

"New Kirin Group Vision 2021" (New KV2021)
▶P.60

Water Resources
Containers Pand ackaging

Realization of society that is based on 100% recycling

Biological Resources
Global Warming

Water Resources
- Reduce water usage (30% less in 2030 than in 2015)
- Continue conservation of water source areas including reforestation activities.

Water Resources
- Improve the sustainability of farms in Sri Lanka.
- Secure biodiversity in Japan's agricultural areas.

Containers and Packaging
- Maintain and expand the bottle-to-bottle initiative (use of 100% recycled PET for certain products)
- Study and promote the use of bioplastics.
- Maintain and expand the use of FSC®-certified paper for primary and secondary containers.
- Increase the use of recyclable container raw materials(>90% by 2030 Lion)
- Increase the use of recycled packaging raw materials(>50% by 2030 Lion)

Global Warming
- Implement initiatives aiming to achieve medium-term GHG reduction targets based on the SBT (Science Baced Targets)
- Increase the proportion of renewable energy (set target in 2017)

a happy future for our customers

health and well-being
environment
community engagement
a responsible alcohol producer

The Group CSV Committee positioned
"the environment" as a priority CSV theme for contributing to "a happy future for our customers,"
along with **"health and well-being," and "community engagement."**

Strategic framework(=**Kirin Group's unique CSV (Creating Shared Value)**)

Value Creation **Social issues**
Value Creation **Consumer expectations**

Technological Capabilities
Organizations Capabilities

Corporate philosophy
The Kirin Group - Focused on people, nature and craftsmanship to redefine the joy of food and well-being

Identification of Materialities

In 2013, the Kirin Group announced its Long-Term Environmental Vision, setting out its long-term targets for achievements in environmental performance. In making the decisions on the Long-Term Environmental Vision and the important areas it covers, we consulted extensively with the Kirin Group's various stakeholders, including external experts and NGOs, and, upon discussion with the Kirin Group operating companies and executive management, extracted and deliberated on the risks and opportunities inherent in our business and society. As a result, we identified the four most important issues, or materialities, for a sustainable society and business, namely "biological resources," "water resources," "containers and packaging," and "global warming," and established the state that we hoped to achieve by 2050.

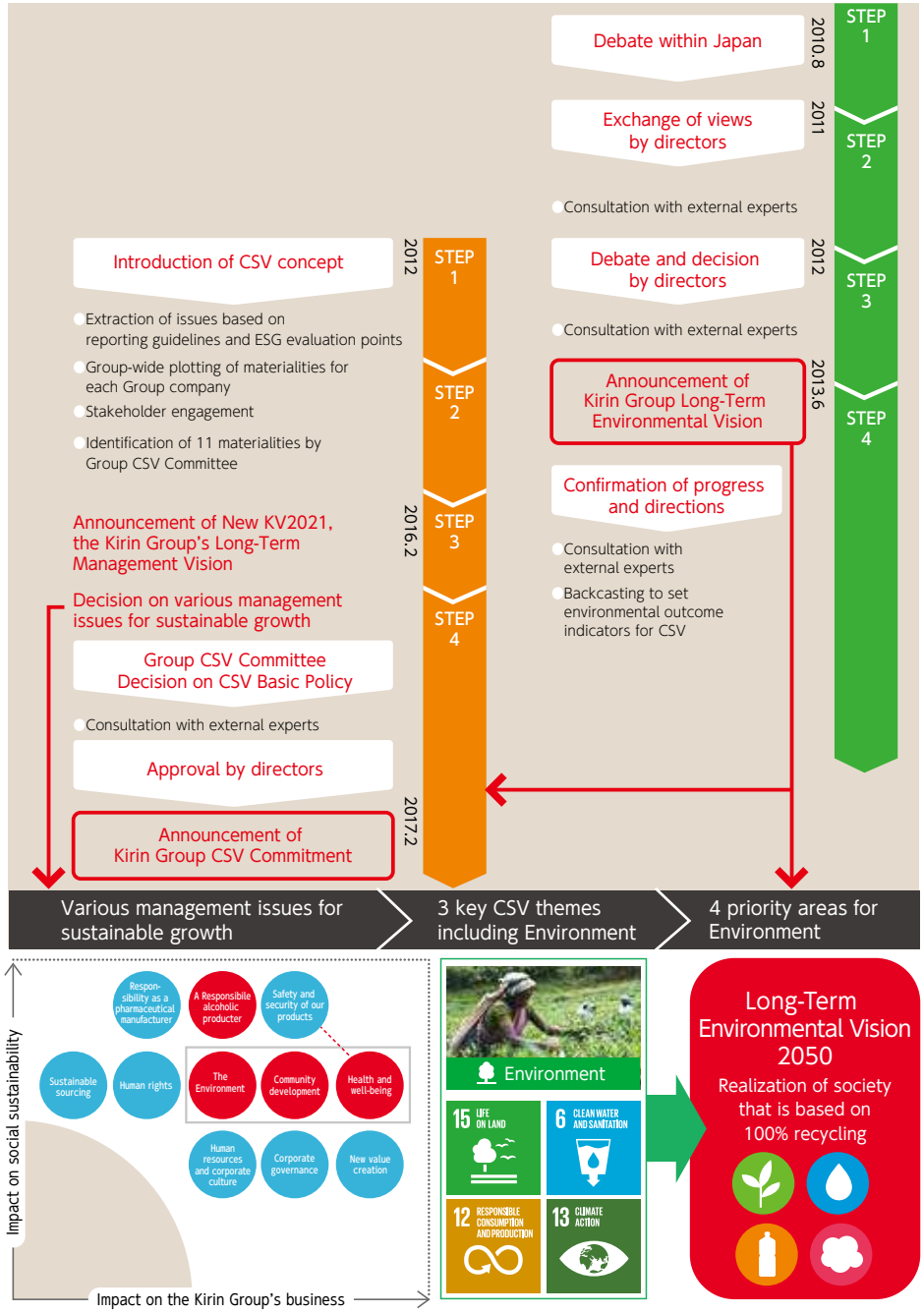
For the Kirin Group to continue to create new value and achieve sustainable growth into the future, it requires a strategy framework that will form the basis of the Group's management and that will lead to the leveraging and strengthening of the foundations for value creation. This is CSV (Creating Shared Value: the creation of value that can be shared with society). CSV involves positioning the creation of value, through approaches to social issues, as a new growth opportunity. Since becoming one of the first companies in Japan to introduce the CSV concept in 2012, we have seen numerous examples of individual success in each of our businesses.

In 2016–2017, we have been continuing to discuss how to clarify the directions in which the Kirin Group should head to take the concept one step further. While developing our long-term management vision, New KV2021, 11 themes were extracted and organized, and selected as "key themes for the sustainable survival and development of the Kirin Group, together with society, into the future." In the course of those discussions, the 11 themes were further evaluated from the perspectives of the company and our stakeholders, and, from among them, the Group CSV Committee positioned "the environment" as a priority CSV theme for contributing to "a happy future for our customers," along with "health and well-being," and "community engagement." Further, with reference to the Sustainable Development Goals (SDGs) the CSV Commitment was developed to clarify the state towards which the Group's various businesses should aspire. In "the environment," a CSV Commitment was established for each of the four priority themes of the Long Term Environmental Vision as medium-term targets to clarify our path toward achieving the Long-Term Vision, and outcome indicators were established with target years of between 2020 and 2030.

Materialities Decision-Making Process

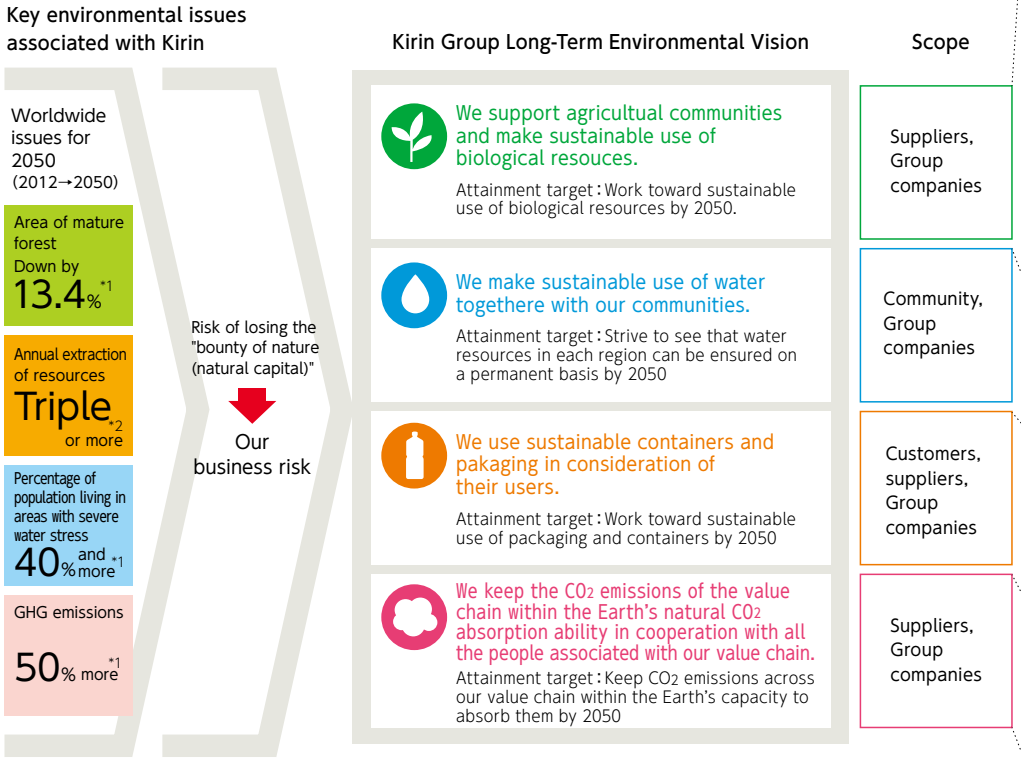
STEP 1 Extraction of relevant issues	Considers the circumstances surrounding the Kirin Group and extracts the relevant issues, referring to international standards and trends in domestic and international debate.
STEP 2 Confirmation of appropriateness	Consults extensively with various stakeholders, including external experts and NGOs, reflecting their views in internal discussions within Kirin.
STEP 3 Identification of Materialities	Holds discussions at the executive management level, determines risks and opportunities for business and society, and develops an action plan, which includes target indicators.
STEP 4 Ongoing Review	Ongoing consideration of the need for review of the materialities, reflecting the constantly changing state of social and environmental issues and the Kirin Group's circumstances.

Background to Identification of Environment and CSV Materialities



Key environmental topics and their scope, relevance to CSV Commitment

In regards to “the environment,” in the decision on the Long-Term Environmental Vision, the sustainable use of “biological resources” and “water resources,” which are valuable raw materials for our business, and “containers and packaging,” which are needed to maintain the high quality of our products and deliver them to our customers, and measures to combat “global warming,” which has an impact on those issues, were adopted as the key themes. The CSV Commitment declares four commitments for addressing each of these important themes, and the outcome indicators for those commitments are the medium-term targets that will set the path for achieving the goals of the Long-Term Environmental Vision.
Also, commitment to reinforcing the sustainability of the supply chain in “community engagement” is deeply intertwined with “the environment.” By engaging in these commitments together as a Group, we will aim to contribute to a happy future for our customers.



*1 OECD (2012) Environmental Outlook to 2050
*2 UNEP (2011) Decoupling natural resource use and environmental impacts from economic growth

CSV Commitment in Supply Chain

SDGs	Our Commitment	Our outcomes
2 ZERO HUNGER	We will work on improving the quality and stable procurement of Japanese hops and brew unique beers that can only be made by using Japanese hops, while contributing to the revitalization of key producing areas. (Kirin Brewery)	●Stop the reduction in harvest volume of Japanese hops. ●Develop unique products that use Japanese hops. ●Aim to be highly valued and used by not only Kirin but many brewers around the world. ●Disclose actual results related to the cooperation between local communities and Kirin.
	We will support Sri Lankan black tea farmers through long-term initiatives such as facilitating the acquisition of Rainforest Alliance certification, and expand the use of certified tea leaves. (Kirin Beverage)	●Expand the number of farms to which assistance in obtaining Rainforest Alliance certification is provided. ●Expand the use of Rainforest Alliance certified tea leaves.
	We will drive development of Japanese wines to ensure global recognition, and contribute to revitalizing key producing areas and local communities that are the foundations of growing grapes and making wines. (Mercian)	●Improve evaluation of “Chateau Mercian” and increase its sales volume. ●Expand the size of vineyards for Japanese wines. ●Also disclose actual results of vari- ous initiatives in contracted farm- ing areas.
	We will continue to develop long-term, sustainable and mutually beneficial partnerships with our dairy farmers that build a profitable demand for dairy and ensure sustainable returns and the creation of value through the supply chain. (Lion)	●Ensure long-term partnerships with our dairy farmers across Australia. ●Maintain and continue to build strong engagement with our dairy farmers. ●Roll out the Lion Dairy Pride Program to all our dairy suppliers and ensure completion of the On-line Self Assessment Tool.

CSV Commitment to Environment

SDGs	Our Commitment	Our outcomes
15 LIFE ON LAND	We will protect the natural environment and preserve the ecosystems surrounding our business sites as well as areas rich in raw materials.	●Improve the sustainability of farms in Sri Lanka. ●Secure biodiversity in Japan’s agricultural areas. * Also related to Supply Chain CSV Commitment.
6 CLEAN WATER AND SANITATION	We will reduce water usage in production activities, and continuously preserve water sources.	●Reduce water usage (30% less in 2030 than in 2015). (Kyowa Hakko Kirin) ●Continue conservation of water source areas including reforesta- tion activities.
12 RESPONSIBLE CONSUMPTION AND PRODUCTION	We will continue to reduce the weight of containers and packaging, and rely less on non-renewable resources and increase the sustainability of materials.	●Maintain and expand the bottle- to-bottle initiative (use of 100% recycled PET for certain products). ●Study and promote the use of bioplastics. ●Maintain and expand the use of FSC®-certified paper for primary and secondary containers. ●Increase the use of recyclable container raw materials: >90% by 2030. (Lion) Increase the use of recycled ●packaging raw materials: >50% by 2030. (Lion)
13 CLIMATE ACTION	We will work to further reduce GHG emissions through various initiatives including the introduction of renewable energy.	●Implement initiatives aiming to achieve medium-term GHG reduction targets based on the SBT (Science Based Targets) approach. ●Increase the proportion of renew- able energy (set target in 2017).

CSV Commitment maintain and expand the use of FSC-certified paper containers and packaging

Use FSC®-certified paper for all paper containers by 2020

On February 13, 2017, the Kirin Group announced its CSV Commitment, indicating the state it would aim towards in the medium to long term for the pursuit of creating value that can be shared with society. As part of that, it declared that it would increase the sustainability of its containers and packaging materials. Then, on February 24, it released the revised version of its concrete Sustainable Biological Resources Action Plan, in which it announced to the outside world its goal of shifting to FSC-certified paper for all of its paper containers by 2020. FSC certification is given to wood and paper that is produced in an economically sustainable manner, while taking the environmental conservation of forests into consideration and gaining benefits for the local communities of the regions in which those forests are located.

The Kirin Group has for some time pursued 3R initiatives at a high level, while giving due consideration to customer convenience. For example, for the "reduce" aspect of 3R, in 2015, we adopted Japan's lightest PET bottle, at just 28.9 grams, for our *Kirin Alkali Ion Water* product. In terms of "reuse," we developed a 380-gram bottle for our medium (returnable) glass beer bottle, achieving a weight reduction of 19% compared to a conventional one. This bottle was introduced in earnest in 2016, with the aim of a complete shift in ten years. For "recycling," in 2014, we introduced an environmentally friendly recycled PET bottle, made with 100% recycled PET material, for our 500-ml *Kirin Gogo-no-Kocha Oishii Muto (sugar-free)* product.

The initiative aiming for 100% use of FSC-certified paper for our paper containers could be described as the second step in our endeavors to raise the sustainability of the containers and packaging materials themselves.

The Kirin Group has already adopted drink boxes made with FSC-certified paper for its 250-ml *Tropicana 100%* range in May 2016, and has added the certification mark to the side of the product. In addition, on March 21, 2017, we adopted FSC-certified paper for the 900-ml *Tropicana 100% Marugoto Kajitsukan* range of juice in drink boxes with caps, a first for large containers in the Kirin Group, and began using FSC-certified paper for the *Kirin Gogo-no-Kocha Summer Citrus Tea* drink boxes on May 9.

We will continue to work toward the adoption of FSC-certified paper for paper containers by other companies in the Kirin Group. Specifically, the use of FSC-certified paper began for some 6-can packs manufactured in April, with the total shift scheduled to be completed by the end of 2017. For drink boxes, gift boxes, cardboard boxes, and other applications, some will be shifted to FSC-certified paper from the end of 2017, with the aim of a complete shift by the end of 2020.

Kirin Group Action Plan for the Sustainable Use of Biological Resources Paper and Printed Materials

Kirin Company, Limited, Kirin Brewery Company, Limited, Kirin Beverage Company, Limited and Mercian Corporation ,Kirin-Tropicana Inc. will:

Office paper*2

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

Containers and packaging*3 *4

- ❶6-can packs aim to use only FSC-certified paper by the end of 2017.
- ❷Gift boxes aim to use only FSC-certified paper by the end of 2020.
- ❸Drink boxes aim to use only FSC-certified paper by the end of 2020.
- ❹Cardboard cartons for products aim to use only FSC-certified paper by the end of 2020.

*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.

The lightest 2-liter PET bottle in Japan, weighing 28.9 grams for *Kirin Alkali Ion Water*.(left)

The lightest medium-size bottle in Japan at 380 grams.(middle)

100%-recycled PET materials for its *Kirin Gogo-no-Kocha Oishii Muto (sugar-free)* 500-ml PET bottle. (right)

250-ml paper container for the *Tropicana 100%*.

FSC label
FSC N002499

900-ml paper container with cap for the *Tropicana 100% Marugoto Kajitsukan*.

CSV Commitment Implement initiatives aiming to achieve medium-term GHG reduction targets based on the SBT (Science Based Targets) approach

Towards further reductions of greenhouse gas emissions

At a glance, global warming may seem like an issue that is far removed from the Kirin Group. However, climate change is already having a major impact on our business. In Sri Lanka, which is the main production region of the tea leaves used to make *Kirin Gogo-no-Kocha*, landslides caused by torrential rainfall in 2015 caused major damage to many of the tea farms and the people who worked there, and at the end of last year, they were struck by widespread drought. In Australia, one of our major manufacturing centers, the effects of drought have caused major impediments to operations in the past. It was against this background that the Kirin Group established "global warming" as one of the key themes of its Long-Term Environmental Vision, and it has engaged in emission reduction efforts, with the goal of halving CO_2 emissions compared to 1990 levels across the entire value chain of the business by 2050.

To accelerate these efforts further, in the CSV Commitment announced in February 2017, the Group declared that it would pursue further reductions in greenhouse gas emissions, including the introduction of renewable energies. It announced a specific action plan on March 24, in which it committed to reduce absolute Scope 1 and 2 GHG emissions by 30% by 2030 from a 2015 base-year, and Scope 3 emissions by 30% within the same timeframe. This target was recognized by the Science Based Targets (SBT) Initiative as a science-based CO_2 reduction target aimed at keeping global warming to less than 2 ° C above pre-industrial levels. This was the first example of such recognition in Japan's food industry.

To achieve these medium-term targets, on March 28, we announced that we would pursue further energy-conservation initiatives in Japan, and expand the introduction of renewable energies. Specifically, Kirin Brewery's Toride Plant will use hydro-electric power, which is free of CO_2 emissions, for 70% of its purchased electricity, and Kirin Beverages' Shonan Plant will use it for 50% of its purchased power. The plants will avail themselves of a hydro-electric power only option launched by TEPCO Energy Partner, Inc. in a Japan first in April, as a means of contributing to global warming countermeasures.

We will further promote the use of the "Green Heat Certificate" at Kirin Brewery's Kobe Plant, which corresponds to the Plant's fossil fuel-generated heat consumption, and Chateau Mercian's "Green Power Certificate," which corresponds to that company's entire electricity consumption, to contribute to the expansion of renewable energy in society overall.

Kirin Beverage's Shonan Plant

50% reduction of CO_2 emissions from power generation

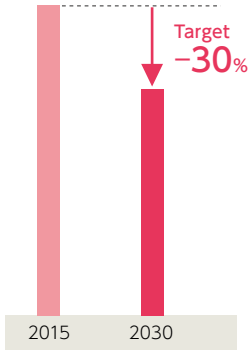
* Compared to 2015

Kirin Brewery's Toride Plant

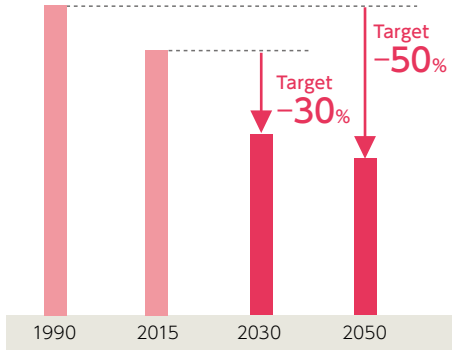
70% reduction of CO_2 emissions from power generation

* Compared to 2015

Total Scope 1 and Scope 2 emissions target



GHG emissions and reduction target across entire value chain



At the tea farms, obtaining Rainforest Alliance certification, which is a certification scheme for sustainable farms, will allow the tea farms to improve their capacity to cope with climate change through efficient water use, prevention of soil erosion from torrential rainfall, and other measures. Already, more than 40 tea farms in Sri Lanka have obtained certification with Kirin's assistance.

SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

Science Based Targets is a joint initiative by CDP, the UN Global Compact (UNGC), the World Resources Institute (WRI) and WWF. The methods of Science Based Targets are 100% science-based and this is what makes Science Based Targets a unique organisation.

Green Power (natural energy) and Green Heat certification marks.

Green Power Green Heat

Stakeholder Engagement

The Kirin Group is committed to the realization of its Long-Term Environmental Vision together with everyone involved in its value chain.

Together with Production Regions

With the aim of sustainable agriculture, Kirin works with producers, experts, and NGOs to pursue initiatives in key agricultural production regions.

Sri Lanka

In Sri Lanka, which is the main source of tea leaves used in Kirin Gogo-no-Kocha, Kirin is assisting tea farms to obtain Rainforest Alliance certification, with the objective of increasing their sustainability. In four years, more than 90 tea farms have undergone training, and more than 40 farms have obtained certification.

Hops fields in Tono City, Iwate Prefecture

At the hops fields in Tono City, which have grown hops, an ingredient of beer, under contract for Kirin for more than 50 years since 1963, Kirin undertook a survey of the living creatures in the hops fields from 2014, and is engaged in initiatives to elucidate their role in protecting the rich ecosystem of Satoyama landscapes.

Vineyards in Ueda City, Nagano Prefecture

The Mariko Vineyard is managed directly by Chateau Mercian, on the Jinba Plateau in Ueda City, Nagano Prefecture. Most of the area was originally idle farming land, which was developed into a vineyard, taking into account the original landscape and scenery. A survey of the vineyard's ecosystem began in 2014.

Australian dairy farms

Lion Pty Limited, in conjunction with Landcare, has established a fund to assist dairy farmers that supply milk to Lion Pty Limited to engage in sustainable dairy farming practices.

Sharing Our Goals

The Kirin Group shares lofty goals for solving environmental issues with corporate consortia, suppliers, and NGOs, and is contributing to the development of a sustainable society together with those parties.

WE MEAN BUSINESS

WE MEAN BUSINESS is a consortium of companies and investors. The Kirin Group is committed to "the establishment of reduction targets based on the SBT," "reporting on responses to climate change in mainstream reports by using CDSB framework," and "improvement of water risk."

Science Based Targets (SBT)

The SBT Initiative is an organization that pursues greenhouse gas emission reduction targets that are based on science, to keep global warming to less than 2℃ above pre-industrial levels. The Kirin Group's 2030 emission reduction targets were the first in Japan's food and beverages industry to be recognized by the SBT Initiative.

Consortium for Sustainable Paper Use (CSPU)

The CSPU is a consortium jointly established by five companies (now 8 companies) committed to advanced paper use initiatives, along with the World Wide Fund for Nature (WWF) Japan. The Kirin Group is a founding member of this consortium and is actively engaged in initiatives for the sustainable use of paper.

Eco-First

Eco-First is a program in which companies submit to the Minister of the Environment their commitments to carry out independent actions to protect the environment, such as measures to combat global warming. Kirin Company, Limited was the first manufacturer to obtain Eco-First certification, and it also serves as the Deputy Chair of the Eco-First Promotion Council, whose members are Eco-First certified companies.

WWF Japan

WWF is an environmental conservation organization that is active in approximately 100 countries, whose goal is a future in which humans can live in harmony with nature. WWF Japan has cooperated with the Kirin Group in the development of the Group's guidelines and action plans for biological resources.

Rainforest Alliance

The Rainforest Alliance is an international non-profit organization established with the objective of maintaining the world's tropical rainforests. The Kirin Group is engaged in a joint project with the Rainforest Alliance to assist Sri Lankan tea farmers to obtain Rainforest Alliance certification.

FSC®

FSC is an international agency that certifies timber-producing forests in the world and the distribution and processing processes of wood and paper obtained from those forests. Kirin aims to be using FSC-certified paper for all of its paper containers in the Japan Integrated Beverages Business by the end of 2020.

Suppliers

The Kirin Group requests its suppliers to engage in activities to reduce the environmental footprint of the Group's value chain according to the Supplier CSR Guidelines.

Japan TCGF

This is an organization launched predominantly by companies in the consumer goods distribution industry. It is engaged in finding solutions to common issues in non-competitive sectors in Japan.

Through Our Products

We are engaged in approaches for offering products that will enable our customers to participate in solutions to environmental issues through the beverages that they enjoy.

Containers made with recycled PET materials

Containers made with FSC®-certified paper

Drinks made with certified tea leaves

Beer made with organic malt

Together with the youth who will shoulder the future

To pass on the abundant blessings of this Earth to future generations, we have developed opportunities to foster understanding, through beverages, of how our lifestyles are connected to the world.

Kirin School Challenge

The Kirin School Challenge is a workshop in which we exchange opinions with young people in junior and high school and together come up with ideas about how to pass on the abundant blessings of this Earth to the future, and to convey those ideas to their own generation. It is held 8–10 times a year, with around 25 students participating each time.

National Youth Environment Network

The National Youth Environment Network is an initiative organized by the Ministry of the Environment and the Environmental Restoration and Conservation Agency. It calls for examples of youth who are active in environmental endeavors on a daily basis from around Japan. Kirin sponsors the Network's national convention, and also accepts visits to the company by senior high school students every year.

Public Recognition

Kirin Holdings selected for CDP's top "A List" status for water resources

Kirin Holdings has been selected as a "CDP Water A List" company by CDP, an international NGO that works to catalyze action toward a sustainable economy. In its most recent survey, 607 companies around the world responded to a questionnaire sent by CDP, providing information about their water resources initiatives, and 24 of those 607 companies were chosen for the CDP "A List."

Top Award in the WWF Japan "Business & Biodiversity Katte-ni Award"

The Kirin Group received the highest "King of Beasts Award" in WWF Japan's "Business & Diversity Katte-ni Award" given based on examinations performed by WWF Japan on initiatives regarding biodiversity taken by companies. This award was established for the first time in 2015 as a unique award proposed by the NGO to present to society "companies that the NGO recommends" rather than "companies that want attention."
The Kirin Group was recognized for its initiatives taken in dealing with biodiversity issues through business activities, such as the support for tea farmers in Sri Lanka to receive the Rainforest Alliance certification and the sustainable use of palm oil and paper in consideration of protecting the tropical rain forests.

Japan's lightest domestically-produced aluminum can receives 41st Kinoshita Prize

Aluminum cans developed by Kirin that are Japan's lightest have been awarded the 41st Kinoshita Prize in the Improvement and Rationalization category. The weight of the 350-ml can has been reduced by about 5% from 14.6 grams to 13.8 grams, and the 500-ml can has also been made about 7% lighter, going from 18.1 grams to 16.8 grams. Commencing in late November 2016, we have started progressively rolling out these cans in our beer, happo-shu (low-malt beer), and new-genre lines. This was Kirin's second consecutive Kinoshita Prize, after winning it in 2016 for Japan's lightest PET bottle.

Kirin Holdings was placed on the A List for the third consecutive year in FY2016 by CDP.

An international NPO that work with 822 institutional investors around the world holding investment assets totaling USD 95 trillion, and collects and evaluates information on initiatives relating to greenhouse gas emissions, climate change, etc. taken by companies.

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

In the 26th Global Environment Awards, an industry awards program organized by the Fuji-Sankei Group with the aim of the co-existence of industrial development and the global environment, Kirin Holdings was presented with the Fuji-Sankei Group Award. The award was in recognition of the Kirin Research & Development Division's Research Laboratories for Packaging Technologies' efforts to reduce the weight of containers and packaging, including cans, glass bottles, PET bottles, and cartons.

Received the Best Long-Term Target Award in the 2016 Low-Carbon Cup

Kirin Holdings was selected by the executive committee of the Low-Carbon Cup as the recipient of the Best Long-Term Target Award. In line with the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change (COP 21) held in Paris, the executive committee selected seven out of 158 local governments and 10 out of 256 private companies that set out long-term CO_2 reduction targets and actively take initiatives to achieve their goals.

Kirin Holdings is included in the following SRI indices. (As of April 2017)

FTSE4Good

MS-SRI モーニングスター社会的責任投資株価指数 Morningstar Socially Responsible Investment Index

Member of SNAM Sustainability Index 2016

No.1 in WWF Japan Ranking for Corporate Measures Against Global Warming in Food Sector

Kirin Holdings received the top score (80.0 points out of 100) in a research project conducted by WWF Japan among 25 Japanese companies in the food sector, and was ranked No.1 in the Ranking for Corporate Measures Against Global Warming announced by WWF Japan on April 12, 2016. We received perfect scores for four of the seven key indicators, including long-term vision and disclosure of life-cycle emissions.

Activity

Progress report for Long-Term Environmental Vision and CSV Commitment

Biological Resources

Work toward sustainable use of biological resources by 2050

→ P18

Water Resources

Strive to see that water resources in each region can be ensured on a permanent basis by 2050

→ P26

Containers and Packaging

Work toward sustainable use of packaging and containers by 2050

→ P34

Global Warming

Keep CO_2 emissions across our value chain within the Earth's capacity to absorb them by 2050

→ P42

Biological Resources

Long-Term Environmental Vision

We support agricultual communities and make sustainable use of biological resouces.

Social Issues

Interest in biodiversity is low, but the importance of programs for certification of sustainable farms is growing

At COP10 (Conference of the Parties to the Convention on Biological Diversity) in 2010, the Strategic Plan for Biodiversity 2011-2020, including Aichi Biodiversity Targets was adopted. In Japan as well, consideration of biodiversity is starting to be incorporated into areas such as the procurement guidelines for the Tokyo Olympics, but community interest in biodiversity could not yet be described as high. On the other hand, the various actions being taken under sustainable farm certification programs are clearly contributing to biodiversity and the adaptability of farms to climate change.

Risks and Opportunities for Kirin

Risk of becoming unable to procure continuous supplies of farm produce

Biological resources, particularly agricultural products, are the most important and fundamental raw material of the Kirin Group' s Integrated Beverages Business. It would be impossible to continue that business without them. However, the regions that produce such agricultural products are being impacted by torrential rains, droughts, and other consequences of climate change, and they face problems such as the aging of the farming population. Solving these problems will be essential for the continued, stable procurement of high-quality agricultural products at reasonable prices.

Long-Term Environmental Vision

Work toward sustainable use of biological resources by 2050

In 2010, the Kirin Group announced its Declaration of Support for Biodiversity Conservation. Subsequently, after assessing the risks to the Kirin Group, we selected “black tea leaves,” “paper and printed materials,” and “palm oil” as priority areas, formulated the Kirin Group’s Guidelines on Sustainable Sourcing of Biological Resources and the Action Plan for Sustainable Use of Biological Resources, and pursued initiatives in each of these areas. Further, in Japan, after a re-evaluation of the sustainability of our supply chain, we also selected Japan-grown hops and grapes are priority areas.

CSV Commitment

Improving the Sustainability of Farms in Sri Lanka

In 2013, we began helping tea farmers with the costs of training to obtain Rainforest Alliance certification. By the end of 2016, about 90 tea farms in accumulated total had begun training, and about 40 farms had obtained certification.

Secure biodiversity in Japan's Agricultural Areas

Kirin has been conducting biodiversity assessments at the hops fields in Tono City and the Mariko Vineyard in Ueda City since 2014, and has found that these farms are contributing to diverse forms of life in their regions. In future, we will conduct initiatives to ensure an even richer natural environment.

Long-Term Environmental Vision

Work toward sustainable use of biological resources by 2050

Palm Oil

Entire volume sourced from RSPO certified sources (both primary and secondary raw materials)

Status (as of end of March 2017)

- Continue to source entire volume via Book & Claim method

CSV Commitment

Paper, Printed Materials

- Maintain and expand the use of FSC®-certified paper for primary and secondary containers.

Status of use of FSC-certified paper

- Business cards, Integrated Reports, Environmental Reports, product catalogues, etc.
- Some reply postcards (See ▶P.38 for information about paper containers)

Black tea leaves

- Expand the number of farms to which assistance in obtaining Rainforest Alliance certification is provided.
- Expand the use of Rainforest Alliance certified tea leaves.
- Improve the sustainability of farms in Sri Lanka.

Status of assistance to obtain certification (as of end of 2016)

- Cumulative total of farms that have undertaken training : More than 90 farms
- Cumulative total of farms that have obtained certification : More than 40 farms

Hop

- Stop the reduction in harvest volume of Japanese hops.
- Secure biodiversity in Japan's agricultural areas.

Number of hops farmers in Tono

Six new producers moved into area(stemming decline)

Tono Hops Fields Biological Survey Results

- Insects: 47 families, 104 species
- Birds: 13 families, 19 species

Grapes

- Improve evaluation of "Chateau Mercian" and increase its sales volume.
- Secure biodiversity in Japan's agricultural areas.

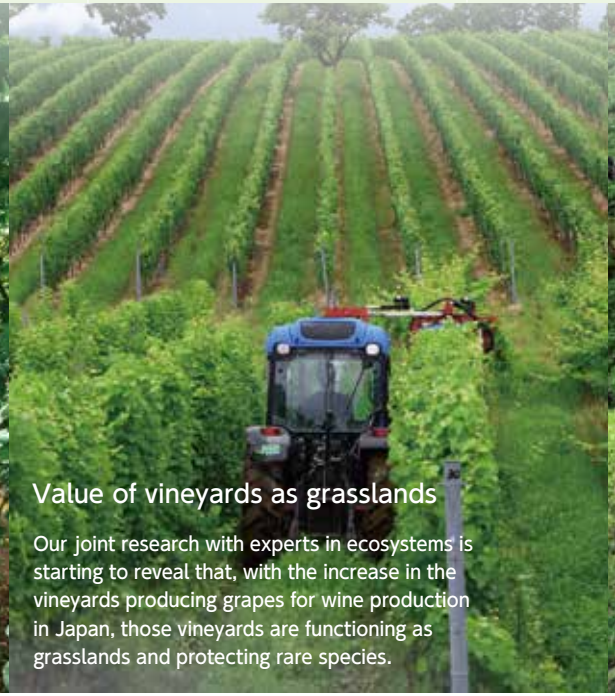
The Mariko Vineyard Ecosystem Survey Results

- Vegetation: 258 species (wild plants; national-level endangered plants also found)
- Insects: 64 families, 168 species

Commencement of joint research on ecosystem in new vineyards in Koshu City, Yamanashi Prefecture

Kirin uses 70% of hops grown in Japan

By making it clear that the hops fields in Tono City form an element of the traditional Japanese rural *Satochi-Satoyama* landscape, we will contribute to the creation of value for domestic hops, the maintenance of production, and the invigoration of Tono's local community.



Value of vineyards as grasslands

Our joint research with experts in ecosystems is starting to reveal that, with the increase in the vineyards producing grapes for wine production in Japan, those vineyards are functioning as grasslands and protecting rare species.

Sustainable farm certification program

Approximately 40% of the black tea leaves imported into Japan from Sri Lanka is used in Kirin's *Gogo-no-Kocha* range of bottled black tea beverages. With Kirin's help, more than 40 Sri Lankan tea farms have obtained certification as sustainable farms, which is leading to tea cultivation that is better for both the environment and the people who work on the farms.

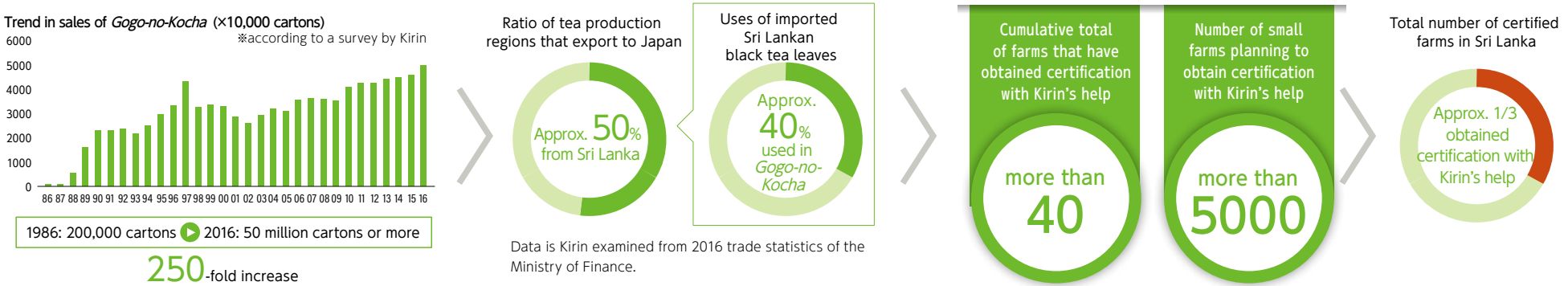
Black tea leaves

Basic Thinking

Kirin Gogo-no-Kocha is Japan's top brand of black tea beverage, which has been loved by our customers for more than 30 years. This range alone uses approximately 40% of the black tea leaves imported into Japan from Sri Lanka. Amidst Kirin's high dependence on Sri Lankan tea farms, those farms have suffered from the effects of climate change in the form of torrential rainfall and droughts in recent years. Initiatives to raise the sustainability of Sri Lankan tea farms are vital.

Current Status

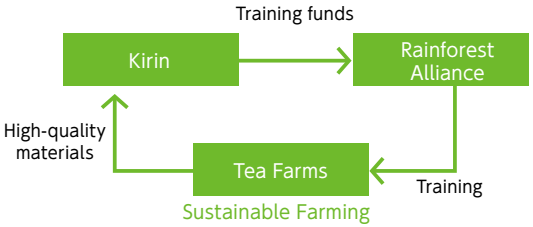
Kirin provides assistance for Sri Lankan tea farmers, with a focus on our suppliers, to obtain certification from the Rainforest Alliance sustainable farm certification scheme. By the end of 2016, about 90 tea farms in accumulated total had commenced training, and about 40 farms had obtained certification. This has improved the lives of the people who work on those farms, and enhanced the farms' ability to adapt to climate change.



Data is Kirin examined from 2016 trade statistics of the Ministry of Finance.

Sixty-percent of black tea leaves imported by Japan are grown in Sri Lanka and, in fact, roughly one-third of those leaves are used for *Kirin Gogo-no-Kocha**1.
Quality tea leaves with a strong character grown in Sri Lanka have been supporting the good taste of *Kirin Gogo-no-Kocha*, the No. 1 bottled tea brand since the product was launched. Because the characteristics of black tea leaves significantly vary depending on where they are produced, no alternatives can be used. Therefore, the Kirin Group has been moving forward with its initiatives to increase the sustainability of tea growers in Sri Lanka, the key producing area.
Initially, in 2011, we conducted surveys on supplier tea growers in Sri Lanka concerning their sustainability and efforts to conserve the ecosystem.
Sri Lanka previously had numerous large coffee plantations. However, in the latter half of the 19th century, coffee plants died due to the spread of rust. Therefore, tea trees were planted as alternatives and coffee plantations were converted into tea farms.
As a result of our research, we found that tea growers did not pose a material environmental load. Furthermore, it became evident that many growers were not able to become certified as sustainable, environment-friendly growers despite their eagerness to do so, due to a lack of funds.
So, the Kirin Group decided to help growers that are eager to increase their sustainability in acquiring Rainforest Alliance Certification by providing funds for training eligible growers starting in 2013.
It has been four years since we began offering support and by the end of 2016, a total of over 90 tea grower had begun training. About 40 grower have already received certification with support from Kirin. The Kirin Group recognizes this project as a good example of CSV, and will continue to support tea grower in Sri Lanka to become Rainforest Alliance-certified in 2017 and beyond.

Supportiing Growers Obtain Rainforest Alli ance Certification



Expansion of book donations to elementary schools

Under the Kirin Sri Lanka Friendship Project, we began a project called the Kirin Library in 2007. In this project, we donate, on a continual basis, bookshelves and about 100 books to each of the schools that the children of the tea farm workers attend. In the 10 years from 2007, we have donated books to approximately 120 schools, and we have plans to increase that number by 100 schools by the year 2022.

Japanese hops

Basic Thinking

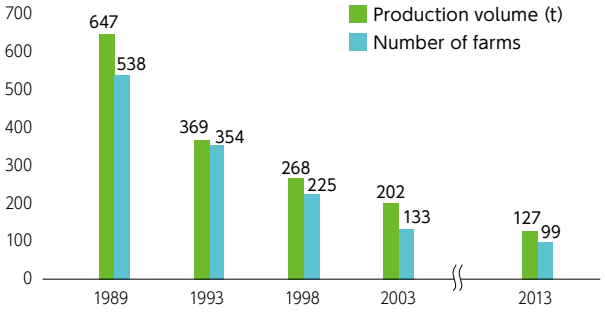
Due to factors such as the aging of Japan's hops farmers, hops production has fallen to about a third of what it was at its peak, and there is a possibility that it could completely disappear within 10 years. Its use in the beer business overall is limited, but high hopes are being held for domestic hops, which offers unique characteristics, in craft beers and other niche avenues. As a company that uses 70% of the domestic hops crop, Kirin wishes to take responsibility for its continued stable procurement.

Current Status

For more than 10 years, Kirin has been working with the City of Tono to roll out a variety of initiatives to raise awareness of Tono's hops. In addition, by making clear through our biodiversity research of the Tono hops fields that the hops fields form an element of the traditional Japanese rural *Satochi-Satoyama* landscape, we will contribute to the creation of value for domestic hops, the maintenance of production, and the invigoration of Tono's local community.

Tono City in Iwate Prefecture, which has a rich nature and is blessed with a cool climate, is suitable for growing hops-essential raw materials for producing beer-and is a leading hop-producing area in Japan. The hops harvested during the year are amply used in our *Ichiban Shibori Toretate Hop Nama Beer*. In 2014, we conducted preliminary research on hop farms and their vicinities in Tono to identify the status of inhabitants from the perspective of biodiversity. As a result, we found that diverse living species, more than expected, existed in the fragrant hop fields, and that the combination of wind-breaking trees, neighboring grasslands, and underbrush in hop fields possibly contributed to having diverse forms of life in the area. So, to confirm the function of hop fields and their vicinities as *Satoyama* landscapes *, we conducted research throughout the seasons of spring, summer, and fall in 2015. We found from our research that in Tono's nature, which is blessed with unique Japanese landscapes made up of forests, creeks, and rice paddies, hop fields also form an element of the *Satoyama* landscape. Based on our comparative research of fallow fields, we discovered that the diversity of living forms was greater in hop fields cared for by human hands than in fallow fields. We can say that while the hop fields in Tono offer blessings to people by providing raw materials for beer, various creative farming tasks performed contribute to nurturing diverse forms of life and collectively lead to preserving the Satoyama landscapes of Tono.The Kirin Group will continue to conduct research and verify the value of hop fields in Tono as *Satoyama* landscapes. At the same time, we hope to contribute to developing the city of Tono as the home of beer.

Hops crop acreage and production volumes in Iwate Prefecture



Source: *Data Regarding Hops (2013)*, Iwate Prefectural Government

* Japan's *Satoyama* landscapes are small mosaics composed of various types of ecosystems including secondary woodlands,field, rice paddies, grasslands, from which landholders have traditionally harvested resources, in a sustainable way. *Satoyama* landscapes have evolved out of the long term interaction between people and the environment.Activities such as the periodic clearing of forests and the harvesting of forest litter,prevent the system from being dominated by a few species and allow for a greater diversity of species to exist in the system.

Insects found in the hops fields

104 species

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

Brake on decline of hops farms

In 2016, six new farmers moved into the area from other parts of Iwate Prefecture and outside the prefecture. This has halted the decline in the area' s hops fields. The new farmers said that the region's united efforts to provide support for incoming farmers was the deciding factor in their move to the region, so it could be said that Tono City's and Kirin's steady endeavors have borne definite fruit.

Hops Fields Living Species Observation Event

In summer, the hops fields hold an observation event for the children of the region and their families to observe the living species found in and around the hops fields. This gives the residents of Tono the opportunity to experience for themselves the value of the hops fields as an element of the rural *Satochi-Satoyama* landscape.

JAPAN HOP PROJECT

As a company that uses approximately 70% of the hops grown in Japan, Kirin will launch the JAPAN HOP PROJECT. As well as rolling out initiatives to raise the quality of Japanese hops and to halt the decline in harvested volumes, this project will add value to Japan-grown hops within the context of "making the faces and intentions of the makers (hops producers and brewers) visible," and pursue the invigoration of the local community through hops.

Japanese vineyards

Basic Thinking

Mercian, whose history dates back to the establishment of Dai-Nihon Yamanashi Budoushu-Gaisha, Japan's first private sector wine company, has been a driving force in the expansion of the Japanese wine market for 140 years. In the production of wine, "the grapes come first and foremost." More new vineyards will need to be established in Japan in the future, but there is much that is still unknown about the impact on nature of converting idle and fallow farming land into vineyards, and scientific research into environmentally friendly grape growing is needed.

Current Status

At Mariko Vineyard, the vineyard managed by Mercian in Ueda City, we have commissioned the Institute for Agro-Environmental Sciences, NARO to conduct a study, which has revealed that the vineyards, on which grapes are grown in hedges, are contributing to the conservation of grasslands, which are the habitat of precious species in Japan. From 2016, we also began joint research into how the conversion of idle and fallow farming land in Koshu City, Yamanashi Prefecture, into vineyards will contribute to biodiversity.

Mariko Vineyard, on the Jinba Plateau of Ueda City's Maruko District in Nagano Prefecture, is a spacious vineyard stretching for about 20 hectares that is directly managed by Mercian. Most of the land on which it was built was idle farming land, but with the cooperation of the landowners and people in the community and the government, the land was converted into vineyards, taking the land's natural form and the surrounding landscapes into account.

From 2014, we have invited researchers from Institute for Agro-Environmental Sciences, NARO to conduct ecosystem research at the vineyard, and this research has uncovered rare vegetation there. At Mariko Vineyard, grapes are grown using hedge cultivation, and the ground's surface is covered with pasture and native species of gramineous plants. In other words, the hedge-cultivation vineyards are also wide-open grasslands. When the underbrush is cut several times a year, the native grassland vegetation and rare species are exposed to the sun, making it possible for them to grow in the grasslands of the vineyards.

Grasslands are believed to have occupied some 30% of Japan's total land area 130 years ago, but today, they have shrunk to just 1%. The number of endangered plant species that exist per unit area of grassland is much greater than that of forest areas, so increasing and protecting grasslands would conserve endangered plant species, while at the same time helping to protect the richness of Japan's ecosystems.

In 2016, we launched activities for the restoration and conservation of native plant species, including rare species, in the vineyards, with the participation of our employees. Under the guidance of experts, in autumn, participants will cut some of the vegetation from areas in which rare species (*Sophora flavescens, Vincetoxicum pycnostelma, Leonurus japonicus*, and *Hemerocallis citrina var. vespertina*) are found in and around the vineyards, as well as representative grassland native species (*Miscanthus sinensis, Arundinella hirta, Sanguisorba officinalis, Adenophora triphylla var. japonica*, and *Thalictrum minus var. hypoleucum*), and spread those cuttings onto a plot in the vineyard that has been scheduled for restoration. This will result in the seeds being scattered, and if all goes well, the plot will serve as a green belt known as a beetle bank, which the insects that inhabit the vineyards will use to catch food and for migration. It is hoped that this will lead to Mariko Vineyard becoming a vineyard with an even richer ecosystem. Further, we have also commenced a joint research study, the first of its kind in Japan, to determine how, by turning newly developed plots of idle and fallow farming land into vineyards, the grasslands will contribute to the creation and protection of rich ecosystems.

Rare species discovered at Mariko Vineyard

Hemerocallis citrina var.vesperitima

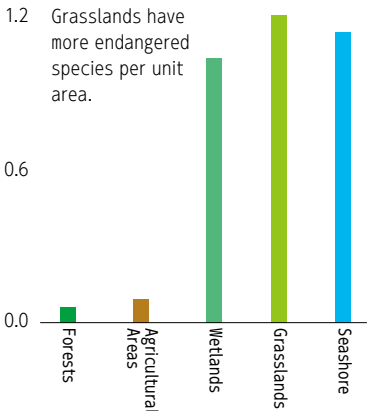
Sophora flavescens

Leonurus japonicus

The vineyards are also vast grasslands.

We have begun activities to restore native and rare species.

Endangered plant species per hectare



Source: West Japan Grasslands Association Report (2007)

Joint Research

In 2016, we began a joint research study with Institute for Agro-Environmental Sciences, NARO, into how the conversion of newly developed idle and fallow farming land in Koshu City, Yamanashi Prefecture, into vineyards will contribute to biodiversity. This is the first time that the impact on ecosystems of the process of converting idle and fallow land into vineyards is being studied and researched in Japan, and it is expected to provide valuable data. In 2016, a study was conducted of the state of the idle and fallow farming land before it was prepared for conversion.

This study revealed that the land had a very low level of biodiversity, with extremely monotonous vegetation, and only a few species of insects found. The cause of this lack of biodiversity is believed to be feeding damage from deer. In many sites, there were places that were totally taken over by *Pennisetum alopecuroides*, a species of grass that deer avoid, and even in other groups of vegetation, the average number of native species was only around half that of normal areas. Grapevines are scheduled to be planted on this land in the spring of 2018, after which the researchers will study how the ecosystem changes, and we will use that information to develop methods of growing grapes that better contribute to the natural environment.

Paper and printed materials

Basic Thinking

Paper containers and packaging are needed to maintain the quality of our beer and non-alcoholic beverages and deliver them to our customers. Office paper is used to conduct our business. None of the paper used for these purposes must come from sources that have destroyed the tropical rainforests. In that belief, in 2013, with the cooperation of the environmental protection organization, WWF Japan, we adopted an action plan for the use of paper that is considerate of forest conservation, and began taking action to achieve the goals of that plan.

Current Status

In 2013, we adopted the Action Plan for Sustainable Use of Biological Resources, under which we encouraged our suppliers to use sustainable paper, and at the same time, together with a number of companies and NGOs, formed the Consortium for Sustainable Paper Use and began a variety of actions aimed at enabling the use of sustainable paper throughout the whole of society. In 2017, we revised the Action Plan, and began initiatives aimed at the use of FSC®-certified paper for all of our paper containers.

The Integrated Beverages Business uses massive quantities of paper, not only for office purposes, but also for packaging such as cardboard cartons, 6-can packs, drink boxes, and gift boxes. In 2013, the Kirin Group adopted an action plan for the use of forest-friendly paper, and began working towards that plan. We conducted a questionnaire survey of the paper companies and other suppliers, which confirmed that none of the copy paper and paper containers used by the group comes from sources that cut down rainforests and other precious forests.
As the next step, in February 2017, we adopted a new policy and action plan. Under this new action plan, the Kirin Group will aim to switch to FSC*1®-certified paper for paper containers and packaging, including 6-can packs, gift boxes, drink boxes, and cardboard cartons for products, by the end of 2020. We have already achieved 100% use of FSC-certified paper for 250-ml, 350-ml, and 500-ml beer six-can packs, and converted to FSC-certified paper for 60% of our drink boxes. We are also striving towards the aim of 100% use of FSC-certified paper or recycled paper for our office paper requirements.

*1 FSC Certification is given to wood and paper products produced in an economical and sustainable manner that is considerate of the conservation of forest environments and that will benefit the local communities where those forests are located. The FSC Recycled Label may be attached to paper that is made from reclaimed paper from consumer and industrial sources under proper controls.

Kirin Group Action Plan for the Sustainable Use of Biological Resources

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	①6-can packs：aim to use only FSC-certified paper by the end of 2017. ②Gift boxes：aim to use only FSC-certified paper by the end of 2020. ③Drink boxes：aim to use only FSC-certified paper by the end of 2020. ④Cardboard 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.

*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 HCVF (High Conservation Value Forest), as defined by FSC.

Environmental Report 2016

Kirin product catalog

Mercian wine catalog

Integrated Report

envelopes


Reply postcards

Palm oil

Basic Thinking

Although our palm oil use is very limited, because this is a product with the potential to lead to inappropriate deforestation of rainforests, we intend to pursue sustainable use.

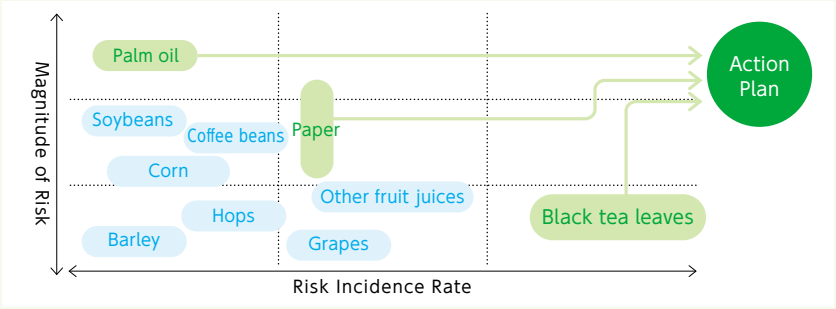
Current Status

We are procuring all quantities of palm oil for primary and secondary materials through the Book & Claim purchasing method certified by the RSPO.

From 2011 to 2012 we surveyed all of our raw material procurement activities and ascertained the status of our palm oil purchasing. While it is a relatively small amount, we found that the Kirin Group uses some palm oil as a raw material.
we consulted the WWF on methods to address issues, and decided to use the RSPO-certified Book & Claim purchasing method for oil in our action plan as part of our activities to procure sustainable palm oil.
In 2013, we procured certified palm oil under the Book & Claim purchasing method for all primary materials for 2012. In 2014, we took the same approach as for primary materials taken in 2013, while ascertaining raw materials containing palm oil for secondary materials, and estimated the amount of use also through conducting a questionnaire survey on suppliers. In 2015, we completed the action plan by procuring certified palm oil under the Book & Claim purchasing method by estimating the amount of use of palm oil as a secondary material in addition to that of palm oil used as a primary raw material for 2014.We plan to participate in the RSPO from 2017.

Risk research

In 2010, we conducted a risk assessment by utilizing data on the countries and regions from which biological raw materials were procured and the amount of procurement, which we obtained when calculating the amount of CO2 emissions in our value chain. Based on this assessment, we selected paper and printed materials and palm oil as targets of risk management in consideration of the high risk of leading to inappropriate deforestation in tropical rainforests and the high magnitude of impact of risks associated with biodiversity on the business. We also selected black tea leaves which we regard as important raw materials that cannot be replaced.
The results of this assessment showed that there was a potential risk to biodiversity in the following regions. Tea leaves: forests in Sri Lanka; paper used in paper containers and packaging: forests in the United States and Canada; paper used for other purposes (printed materials, etc.): tropical rainforests in Asia; palm oil: tropical rainforests in Indonesia and Malaysia.
Our forest preservation projects in the catchments (water source areas) of our manufacturing sites are also contributing to the enhancement of biodiversity (see p.25 and p.34).



Consortium Activities

The Consortium for Sustainable Paper Use

We are one of the founding members of the Consortium for Sustainable Paper Use established by WWF Japan, Response Ability, Inc. and nine (originally five) companies that take innovative initiatives on paper use.
We lead efforts with the aim of expanding and penetrating sustainable paper use throughout our communities.

Rainforest Alliance Consortium

We are one of the founding members of the Rainforest Alliance Consortium established by the Rainforest Alliance, an organization promoting sustainable agriculture, and six companies handling Rainforest Alliance-certified products, and have been taking initiatives to promote the penetration of Rainforest Alliance certification and to continuously provide products using sustainable agricultural products.

To raise awareness of the certification logo, the Consortium member companies jointly conducted a Twitter-based giveaway campaign.

100% of the tea leaves used to make *Kirin Gogo-no-Kocha Straight Tea* (500-ml drink box), one of the most popular items in the *Kirin Gogo-no-Kocha* chilled product range, come from Rainforest Alliance-certified tea farms.

Activities in Collaboration with Stakeholders

Kirin Brewery Yokohama Plant

Kirin Brewery's Yokohama Plant has ponds and various vegetation grounds that offer diverse possibilities in its premises to promote conservation and recovery of biodiversity in the region. To make use of such resources, Kirin Brewery built a biotope (a living space for plants and animals) in the summer of 2012. This was part of the initiatives in support of the "Yokohama b Plan," a biodiversity promotion action plan formulated by the City of Yokohama in April 2011, and Kirin Brewery works in collaboration with Tsurumi River Basin Networking, an NPO well-versed in the natural environment of the region. By properly maintaining a biotope of ponds and vegetation, we conserve the habitat of various forms of life and take part in reinforcing the ecosystem network. In addition, as a plant open to the local communities, we aim to lead the vigorous activities of life into the future by holding observation tours using the biotopes.

Initiatives in Brazil

The partnership with the SOS Mata Atlântica Foundation is one of the company's main initiatives to guarantee the preservation of natural resources and promote environmental education. With a capacity to produce 750,000 seedlings annually, since 2007, the project's start date, the SOS Mata Atlântica - Brasil Kirin Forest Experiment Center, located in Itu (SP), has grown more than 4.5 million seedlings of more than 100 species of native trees of the Atlantic Forest. This equates to the restoration of an upper area 2,571 football fields.

In addition to the work of growing seedlings and restoring native forests, the center also has an environmental education program that since 2010 has received the visit of approximately 44 thousand people, including students (from kindergarten to high school), teachers, visitors and others Interested in the Atlantic Forest

Australian dairy farms

The Lion Landcare Grants program support Lion's dairy farmers to become more sustainable in the production and supply of milk. The wellbeing, profitability and environmental sustainability of milk suppliers and their communities is integral to Lion's business.

RM Smart and TM Hole in Tasumania aimed to increase on-farm biodiversity by fencing off waterways, fencing off paddock corners and installing a variety of native plants and plant guards. These areas will ultimately become habitat for native flora and fauna while also providing some shelter and shading for cows. 430 native trees and shrubs were planted in early October 2015 after a very dry winter. They survived the dry summer well with very limited water (most plants received irrigation drift) and have had a huge growth spurt this autumn 2016. The native plants have already been noted as attracting a number of fairy wrens, wagtails and swallows which nested over the summer in the fenced off shelter belt areas.

Water Resources

Long-Term Environmental Vision

We make sustainable use of water togethere with our communities.

Social Issues

Water risk differs by location, and climate change increases its impact significantly

Water resources are unevenly distributed around the earth, and different countries and regions have different risks associated with water. Meanwhile, in recent years, the impacts of climate change are being felt even in regions where water risk was considered to be low in the long term, in the form of torrential rains and water shortages, making it difficult to predict the degree of risk in the short term. The severity of those impacts also differs depending on the degree of development and dilapidation of infrastructure for urbanization and agricultural irrigation.

Risks and Opportunities for Kirin

In addition to impacts on production, risk to farm crops is also becoming marked

Water resources are not only a major raw material for the Kirin Group's Integrated Beverages Business. They are also a vital, indispensable resource for washing pipes and tanks in our production equipment. Globally, our Australian business could be said to have a high risk in the manufacturing area, but risks further upstream in the value chain are becoming increasingly apparent, such as torrential rains and droughts in the regions that produce the farm crops from which the Kirin Group obtains its ingredients. There is also a noticeable problem with the trade-off with the large amounts of energy required to achieve a high level of water efficiency.

Long-Term Environmental Vision

Strive to see that water resources in each region can be ensured on a permanent basis by 2050

In 2013, the Kirin Group conducted a survey to identify the water risks in each of its 35 manufacturing sites worldwide, and reaffirmed the high degree of water risk in Australia. In light of these findings, it was decided that Australia would continue its high level of water efficiency, and in Japan, which has relatively low water risk, efficient water use would be continued while monitoring the balance between those conservation efforts and the energy expended in doing so. Work has also been done to identify water risk in the regions that produce raw materials.

CSV Commitment

Reduce water usage

Kyowa Hakko Kirin has established a target of a 30% reduction in water usage compared to 2015 levels by 2030 and has launched actions to meet that target.

Continuation of "water source forestation project" and other water resource conservation initiatives

Thanks to the forest preservation projects being undertaken at water sources near our plants, an initiative that the Kirin Group was the first in the industry to undertake, the forests in those regions have turned into bright, healthy places. As well as continuing with these projects, we will also pursue initiatives intended to help the local community and our customers to experience the forest projects first-hand.

Long-Term Environmental Vision

Strive to see that water resources
in each region can be ensured on a permanent basis by 2050

Japanese Integrated Beverages Business	Lion Pty Ltd	Brasil Kirin
4.95 m^3/kL	2.93 kL/kL	3.28 m^3/kL

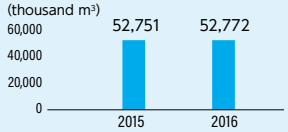
(water intensity)

CSV Commitment

- Water usage reduction target of Pharmaceuticals and Bio-chemicals Business (2030 compared to 2015)

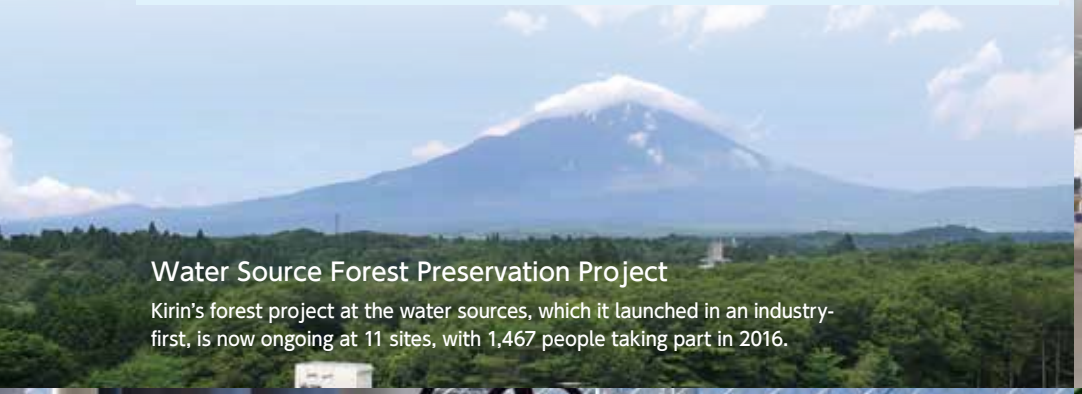
30% reduction

Trend in water usage of Pharmaceuticals and Bio-chemicals Business



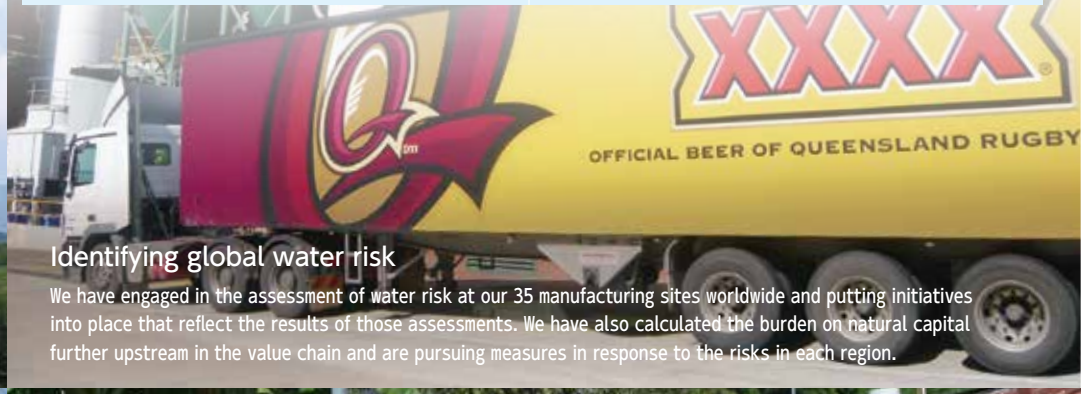
- Continuation of "water source forestation project" and other water resource conservation initiatives

Cumulative total number of participants	Size of activity sites
28,000	800 ha



Water Source Forest Preservation Project

Kirin's forest project at the water sources, which it launched in an industry-first, is now ongoing at 11 sites, with 1,467 people taking part in 2016.



Identifying global water risk

We have engaged in the assessment of water risk at our 35 manufacturing sites worldwide and putting initiatives into place that reflect the results of those assessments. We have also calculated the burden on natural capital further upstream in the value chain and are pursuing measures in response to the risks in each region.

Water efficiency activities

Through water efficiency measures that delved further into changes to actual equipment and processes, Kirin Beer has succeeded in halving its water usage, both in terms of total volume and water-usage intensity, compared to 1990 levels.

Adapting to climate change

By obtaining Rainforest Alliance certification, the tea farms in Sri Lanka have improved their adaptability to torrential rain caused by climate change.

Water sources

Basic Thinking

Despite the fact that forests account for almost 70% of Japan's land area, as the forestry industry has fallen into decline, more and more forests are not being properly cared for through thinning and other measures. This is resulting in a growing number of forests that have lost their inherent function of recharging of groundwater. As a company that consumes vast quantities of water, the Kirin Group is undertaking projects to preserve the forests at the water sources used by its beer and beverages businesses, and intends to use its water resources in a stable manner.

Current Status

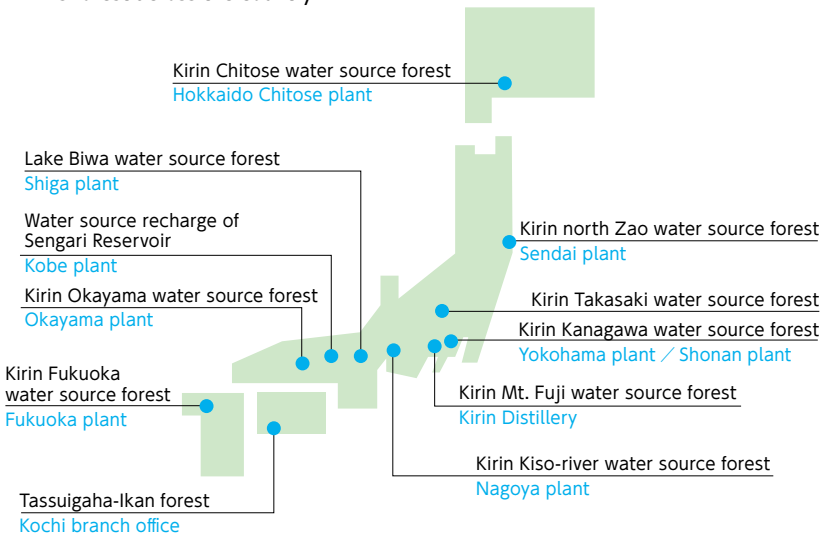
In the belief that water resources should be shared with the people of the communities in the water source catchments, in 1999, the Kirin Group started preserving forests at its water sources, the first project of its kind in the industry. Since then, it has made progress in forest preservation in many areas, and those areas have grown into bright and lush forests. As well as continuing with these forest activities, we intend to use those forests as places in which our customers can experience first-hand the links between water and the forests.

Forests play a vital role in providing us with the bounty of water and nurturing diverse forms of life. They also offer blessings of nature, including conservation of biodiversity, protection of the Earth's environment, prevention of sediment disasters, preservation of soil, and recharge of groundwater.
In our water source forestation project in Japan, we work together with employees and their families, people in local communities and volunteers who sign up to take part in our activities, in thinning, pruning, and mowing the forest to maintain sound forest functions and promote sustainable use of water sources.
These activities have contributed to making forests brighter and thicker in each area. We will continue to work with people in local communities to protect forests and also offer opportunities for our customers to experience the connection between forests and water.

What is the Kirin Group' s Water-Source Forestation Project?

Objective	Protect forests that nurture biodiversity and provide an abundance of water resources
Approaches	Forestation that respects plant life and ecosystems
Volunteer activities	Active participation by employees and their families
Total contracted forest area	Well-designed environmental education that takes safety into account 11 locations across Japan Total 800 ha (as of June 2017)
Participants	FY2016: 1,467 people (19 projects)

Kirin's forest across the country



Yutaka Komatsu, Tsuchi ni Kaeru Ki Forestation Society (NPO)

Forestation consists of planting forests, protecting them as they grow, and making use of their resources. All of our activities, such as helping city dwellers to learn about the forest through improvement cutting, and giving them hands-on experiences of woodcraft using the timber from forest thinning, are linked to forestation. With our aim of forestation accessible to all, we hope to continue our activities in cooperation with the Kirin Group.

Manufacturing processes

Basic Thinking

Much of the water consumed at our plants is used to wash the equipment and pipes. We conserve water, starting with using only as much water as is needed when it is needed, but these efforts are not enough to achieve major water efficiency. At the Kirin Group, to achieve and maintain world top-class water efficiency, we are even implementing changes to our equipment washing methods and manufacturing processes.

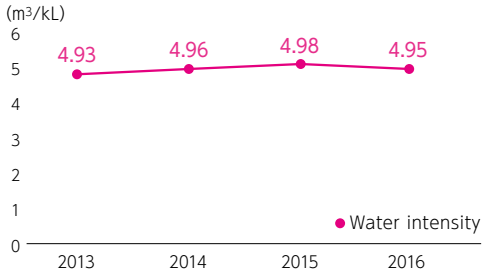
Current Status

The water efficiency measures, such as making changes to the washing process and using the same water for multiple stages of the process, go as far as changing the equipment processes themselves. We are also developing new quality confirmation and assurance systems to ensure that the equipment is being washed properly and pursuing initiatives to maintain a balance between washing processes and manufacture. In addition, we are sharing the know-how thus gained across the entire Group to achieve even further water efficiency.

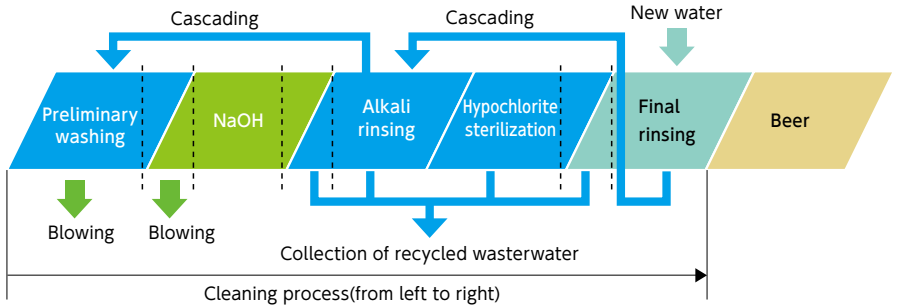
Japanese Integrated Beverages Business

4.95 m³/kL

(-1% yoy)



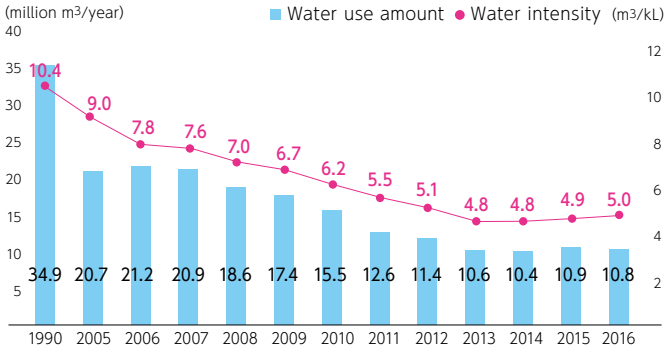
Cascading rinse water for washing tanks



Water intensity of Kirin Brewery in 2016 than in 1990

52% reduction

Trend of water intensity of Kirin Brewery



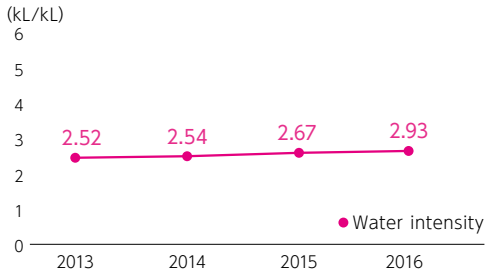
In the Japan Integrated Beverages Business, water usage, at 17,060,000 m³, was up by 309,000 m³, but water-use intensity fell by approximately 1% from 2015 levels to 4.95 m³/kL. Due to the expansion of product varieties, there was some impact from increased frequency of washing of tanks, pipes and other equipment when switching between products, but the promotion of water efficiency initiatives allowed us to reduce our water-use intensity.

Large amounts of water are used in the cleaning and sterilization processes for equipment and pipes in beer manufacturing. Each brewery has set its own targets for saving water and reviews processes for achieving more efficient water use. At the same time, by promoting water recycling tailored to particular purposes, we have been able to significantly reduce water use.

At the beer brewery, we make cascaded use of water where rinsing water used to clean individual items of equipment is reused as cleaning water for preliminary washing. This initiative even makes use of water whose quality has dropped after being used in a post-process as cleaning water for a preliminary process because the quality of water is highly sufficient for the purpose. By so doing, we are able to reuse water that has been used once as cleaning water as long as the water quality is acceptable for the appropriate purpose, which contributes considerably to reducing water consumption.

Lion Pty Ltd

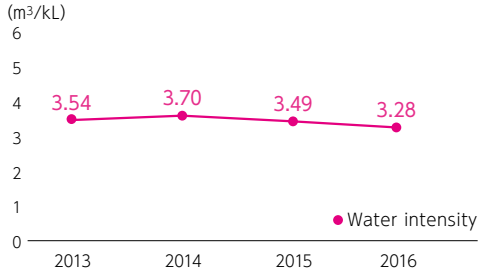
2.93 kL/kL
(+9% yoy)



Water consumption at Lion Pty Limited increased by 14,000 m³ to 5,512,000 m³, and water-use intensity increased by 9% to 2.93 kL/kL from 2015 levels.
Lion has some of the world's best water-efficient equipment and is engaged in water management that has high targets. It is also working with its suppliers to reduce water usage throughout its value chain.
However, with the diversification of its product lines in 2016, there was an increase in the frequency of washing of tanks, pipes and other equipment when switching between products, and this was the main cause of the increase in both water consumption and water-usage intensity.

Brasil Kirin

3.28 m³/kL
(-6% yoy)



In the factories, the specific consumption of water (hL water / hL of produced beverage) decreased by 6% in 2016, from 3.49 to 3.28.
This result, which is extremely relevant for a beverage industry, is the result of several improvements to the rational use of water in the DC's and factories.
The water management of all the factories in Brasil Kirin is consolidated monthly through the system. In addition, internal audits are conducted twice a year and audits of the PGF (Factory Management Program), and managers of factories and corporate managers have water consumption targets. All water sources follow the laws of grants and environmental laws.

Initiatives at Kirin Brewery's Kobe Plant

Kirin Brewery's water intensity (water use per unit of production) was 10.4 m³/kL in 1990, but declined more than 50% to 4.95 m³/kL in 2016, reflecting improvements in using water efficiently. The Kobe Plant of Kirin Brewery, in particular, managed to record a water intensity of 3.60 m3/kL based on its top-class water-saving technologies in Japan. The Kobe Plant began operation in May 1997. Because it was a new plant, we incorporated ideas for water-saving from the construction drawing phase. For example, pipelines and tanks were located as simply as possible. We took other steps to make water-saving easier at the new plant compared to conventional plants. However, when the plant actually went into operation, processes did not work as designed, and water intensity at the initial phase of operations exceeded 6 m³/kL, so the new plant turned out to be not so different from conventional plants.

Because the facility had water-saving functions, we did not make new capital investments. Instead, we reviewed the processing conditions. For instance, at the Kobe plant, a cascade system for water was introduced.

This used rinsing water for the pipe and tank cleaning process as cleaning water in the pre-washing process. Cleaning water was further recycled for use as reserved cleaning water. However, the system was not easy to control because it was difficult to maintain a good balance between the amount of recoverable water and the amount of water consumed, and to match the timing of collection and consumption. Therefore, we thoroughly confirmed the timing of the cleaning process, which was carried out several tens of times a day, and adjusted the amount of cleaning water. As a result, we managed to accumulate expertise for effectively using the facility and succeeded in saving a significant amount of water.

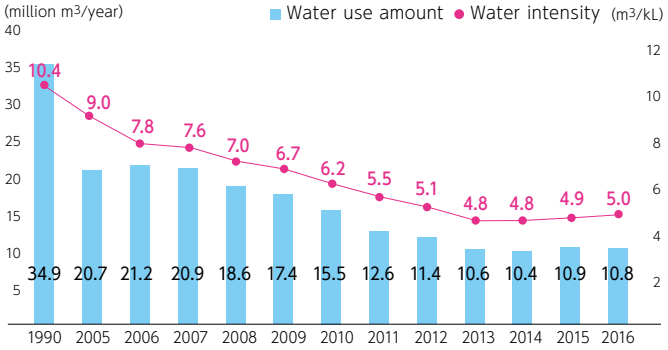
To change the conventional process, there is a need, for example, to confirm and guarantee that cleaning is performed reliably as well as its quality during the cleaning process. To achieve this, we organized a team by appointing new members responsible for quality assurance in addition to the original members handling operations, and decided to take plant-wide steps. These members exchanged ideas, provided feedback by reporting results, discussed what other steps could be taken, and went through a trial and error process repeatedly as they moved forward with their initiatives. Consequently, by 2000, the Kobe Plant managed to save water to the extent of that it recorded a water intensity of nearly 4 m³/kL.

Subsequently, given the example of the Kobe Plant, other plants also adopted a similar structure and measures. In 2005 (need to confirm year), we were able to achieve a water savings by reducing the water intensity of Kirin Brewery on the whole by 50% from the level of 1990. Meanwhile, the Kobe Plant took on the challenge of achieving further water savings. Although the plant had continued to implement water-saving activities, it was difficult to clear the hurdle of 4.0 m³/kL, due mainly to an increasing frequency of cleaning associated with an increase in the types of liquid produced and flexible production.

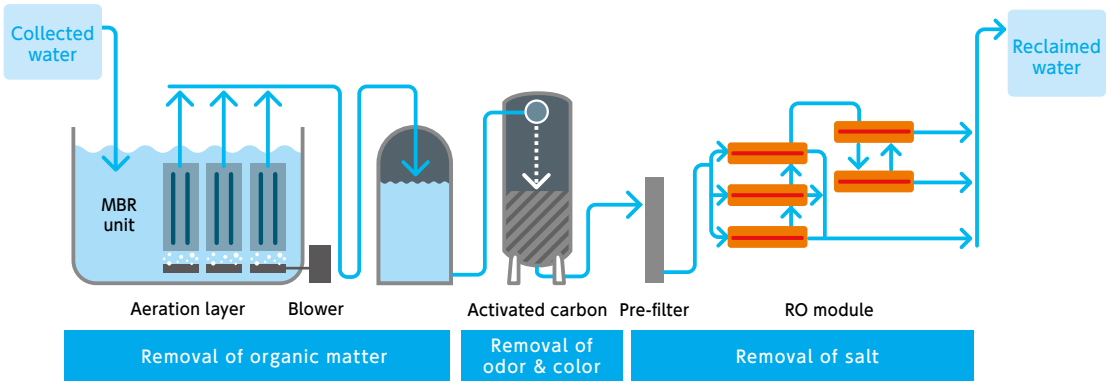
In 2010, we adopted a sophisticated water-processing facility using reverse osmosis membrane technology, which filters impurities at an ion level and does not permeate anything but water. This facility was introduced in 2008 by Lion, a group company in Australia where the risk of droughts is higher than in Japan. Because the facility made it possible to reuse water through sophisticated processing, it was also introduced in Japan.

As a result of installing this facility, it became possible to collect, process, and use water that we previously drained, and we managed to achieve a water intensity of 3.9 m³/kL in 2010, the fiscal year in which we installed the facility. We continued to make improvements and currently post water intensity below 3.7 m³/kL. Today, this water-saving technology is being shared within the Kirin Group, and the entire group continues to pursue water-saving activities.

Trend of water intensity of Kirin Brewery



Flow of sophisticated water processing facility at the Kobe Plant



Wastewater

Basic Thinking

As a company that uses water as a raw material, it is our responsibility to clean up our wastewater before returning it to nature. Also, in the case of factories located on inland bays and inland seas, we must also pay attention to the impact on enclosed coastal seas. For these reasons, it is vital that we manage wastewater treatment facilities appropriately and conduct proper water quality testing of wastewater.

Current Status

Anaerobic and aerobic (activated sludge process) methods are used to treat wastewater for stable purification. In addition, the water quality of wastewater discharged into waterways and sewers is managed to voluntary standards that are more stringent than the government-mandated standards. We are also rolling out environmental conservation activities in the local areas near our factories and in the rivers and coastlines where our wastewater is discharged, working together with environmental beautification projects and local organizations.

Drainage management

The Kirin Group thoroughly complies with laws and regulations for preventing water contamination 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 law. At production plants of Kirin Brewery, highly concentrated wastewater derived from raw materials and low-concentrated wastewater such as cleansing water are generated during production processes. That wastewater, after being collected in an equalizing tank, is purified using an anaerobic wastewater-treatment process and aerobic treatment (activated sludge) process. Biogas generated from the anaerobic wastewater-treatment process is used for power generation in the cogeneration system to mitigate global warming.
At Kyowa Hakko Kirin, we collect phosphoric acid during the wastewater treatment process to use as a raw material of fertilizer By so doing, we contribute to water purification and material recycling.

Improve water security

We Mean Business is a consortium of companies and investors established with the CDP, UN Global Compact, and WBCSD playing a central role. Of the actions declared by We Mean Business, Kirin declared its commitment to the “Report climate change in mainstream reports through the CDSB” action on August 26, 2014, and to the “Adopt a science-based emissions reduction target” action on July 14, 2016.
On December 12, 2016, Kirin agreed to implement the following three things and declared its commitment to “improve water security.” We will continue to engage in actions in line with this commitment.

Commitment	1 Analyzing water-related risks and implementing collaborative response strategies	2 Measuring and reporting water use data (through CDP’ s water questionnaire, our environmentak report)	3 Reducing impacts on water availability and quality in direct operations and along the value chain

Responses to climate change and water issues in tea leaf production regions through certification

Tea farms in Sri Lanka, which are a major production region of the black tea leaves used in the "*Kirin Gogo-no-Kocha*" range, have suffered major impacts from climate change in recent years. In the rainy season, heavier rainfall than usual has become more frequent, and in the Uva region, which is an important producer of black tea, there have been landslides that have caused major loss of life. At the Glen Alpin Tea Estate, which Kirin representatives visited in February 2017, we were told that a village in the highlands at an altitude of 1,500 meters had been ordered by the government to relocate due to the risk of landslides. In the training for Rainforest Alliance certification, the farmers are taught how to prevent fertile soil from being washed away by erosion caused by rain. Specifically, they are taught to plant grass whose roots sink deep into the soil and crawl along the ground on slopes, to prevent the rain from hitting the ground directly and eroding the soil. This kind of action simultaneously prevents disasters such as landslides caused by rain and prevents the loss of fertile soil, and is also a climate change adaptation measure. Another important action is to prevent pollution of the rivers from wastewater from the tea farms. Tea farms are dispersed throughout the highlands of inland Sri Lanka, so any pollution of the rivers will impact on the people living downstream. With Rainforest Alliance certification, for example, even if the tea crops are sprayed with pesticides, the farmers are taught to keep the amount of pesticide sprayed to a minimum, and to establish buffer zoned of a certain distance from the rivers where no spraying is to take place. These measures prevent the rivers from being polluted by pesticides. Factory wastewater is also filtered appropriately before being discharged into the waterways or disposed of through percolation in the ground. Many of Sri Lanka's tea farms are very large in scale, with several thousand people living on the farm. Therefore, handling of domestic wastewater from those homes is also important. Partly because Sri Lanka is still a developing nation, joint wastewater treatment tanks are expensive and out of the reach of most people, so wastewater is treated by filtrating it through materials that are easy to obtain locally, such as bricks, pebbles, sand, coconut shells, and charcoal. Proper treatment of the farm residents' domestic wastewater is included in the criteria for Rainforest Alliance certification. The Sri Lankan tea farms appreciate the act of obtaining certification, as it is helping to prevent the pollution of Sri Lanka's rivers and to conserve biodiversity on the tea farms and their surrounding areas, as well as contributing to improvements in the sanitary conditions of the region's residents.

Water filter system that uses bricks, pebbles, sand, coconut shells, charcoal and other materials

Some locations have not made progress in this area, but improvements are being planned in anticipation of obtaining certification.

Risk research

Water is the main resource for the Kirin Group and although we at the Group have conventionally made keen efforts to save water, we are coming to realize that only so much water-saving can be done based on creativity and innovation. In order to further save water, we would need to recycle and reuse water by consuming more energy. That will trade off actions to mitigate global warming, and we have been facing more instances where we must determine which is of a higher priority.

Given these circumstances, the Kirin Group once again conducted an assessment of water risk in catchment areas where production sites are located and has been moving forward with initiatives that are in line with the level of water risk of each country or region.

Water is necessary for growing farm crops which are also vital resources for the Kirin Group. Over the last few years, we have become more aware of the issue of water risk in the upstream segment of the value chain. In order to address this issue, we, at the Kirin Group, performed a quantitative risk assessment of natural capital in the upstream segment of the value chain mainly in relation to the Japan Integrated Beverages Business and have been sharing relevant data with the Procurement Division.

Assessment of water risk in catchments areas where production sites locate

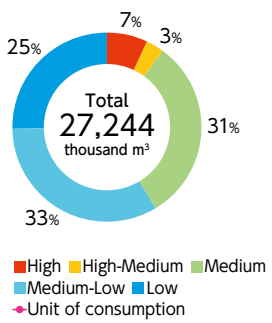
We performed an assessment of water risk in catchments areas where the major production sites of the Kirin Group's globally operated integrated beverages business are located (total of 35 locations in 6 countries). In identifying water risk, we utilized WRI Aqueduct *1 and WBCSD Global Water Tool *2 to conduct examinations and then applied publicly available information concerning droughts and floods as supplements with regard to some locations to make the assessment. The results of the assessment based on the examinations are as follows.

The results reflecting the high water risk in Australia objectively supported the recognition the Kirin Group has had on water risk based on experience.

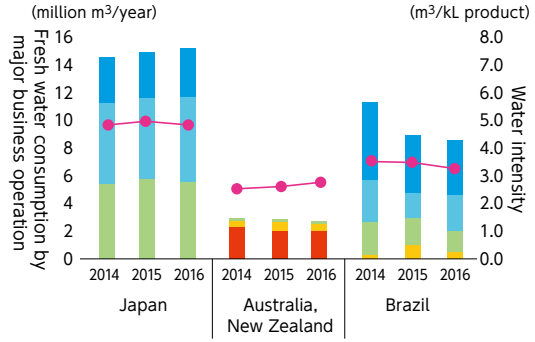
The Kirin Group has conventionally worked to reduce water use in line with the water risk level. In Oceania, where water risk is extremely high, we actively take measures to keep the amount of water use per product of 1 kL at a very low level. Meanwhile, in Japan, where water risk is relatively low, we work to reduce water intensity by taking into account the balance with energy consumption and other environmental measures. Going forward, we will operate based on this fundamental policy and make efforts to reduce water consumption in line with the level of water risk at each location.

On the other hand, in regions whose water security is at high risk, there is potential for droughts, torrential rainfall, floods, and the like to have a grave impact on biodiversity in those regions. In Japan, our forest preservation projects at our manufacturing plants' water sources serve to protect those sources of water, while also contributing to the conservation of biodiversity in those regions' forests. Similar initiatives are being conducted by Brasil Kirin, where surveys have confirmed increases in the bird populations in the forests where forestation activities are being conducted.

Global water consumption by water risk in catchments areas (2016)



Water consumption by water risk and by region of major business operations*3



*1 A tool developed and launched by the World Resources Institute (WRI) that provides water risk information free of charge.
*2 A tool developed and launched by the World Business Council for Sustainable Development (WBCSD) that provides water risk information free of charge.
*3 The chart represents 32 locations with large water consumption in Japan, Australia, New Zealand and Brazil.

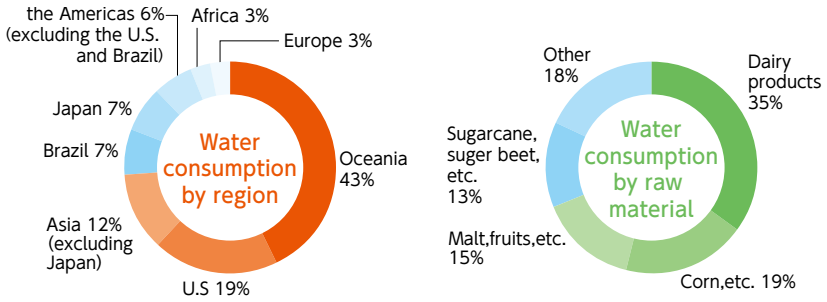
Quantitative Assessment of Natural Capital in the Upstream of the Value Chain

We performed a quantitative assessment of the natural capital in the upstream segment of the value chain by estimating the amount of impact, i.e., "water consumption," "the amount of greenhouse gas emissions (GHG)" and "land use area" primarily in relation to the Kirin Group's Japan Integrated Beverages Business*1. We used ESCHER*2 in deriving estimations. The results of the assessment of this research are provided below.
At the Kirin Group, we will share this new data with the Procurement Division and proceed to take measures against risks that are appropriate for each region.

Assessment results

- The amount of water consumption in the supply chain can be as much as seven times that of the company.
- Water used in relation to procurement from Australia and the U.S. accounts for 62% of the total.
- The amount of water consumption in connection with the production of raw milk in Australia and corn (raw material for liquid sugar) in the U.S. is significant.
- While water risk is extremely high in Australia, corn-producing areas in the U.S. are also faced with a water risk mainly due to excessive drawing of water caused by irrigation.

Water consumption by region and by procured item in the upstream segment of the value chain (2013)



*1 Estimate targets were Kirin Brewery, Kirin Beverage, Mercian, and Koiwai Dairy Products, and estimates were derived based on 2013 results.
*2 ESCHER is an abbreviation for Efficient Supply Chain Economic & Environmental Reporting. It is a calculation tool in which the multi-regional input-output model and various pieces of unit requirement data are incorporated. It is used to estimate the magnitude of dependence and impact on natural capital going back up the supply chain by procurement item and by country (region). The tool was developed by a German affiliate of PricewaterhouseCoopers Co., Ltd.

Containers and Packaging

Long-Term Environmental Vision

We use sustainable containers and pakaging in consideration of their users.

Social Issues

Promotion of Recycling and Sustainable Resource Use

Containers and packaging are essential to protect the quality of our products and deliver them to our consumers. In Japan, a high standard of 3R (Reduce, Reuse, Recycle) has been achieved through the cooperation of companies, government, and consumers, but that is not always the case overseas. In some countries, a 3R mechanism has not yet been adequately established, and in others, scattering of discarded containers is seen as a prioritized societal problem. In Japan, along with the maintenance and management of 3R, and under circumstances in which further major reductions in the weight of containers has become difficult, the sustainability of containers and packaging raw materials is becoming the focus of increased attention.

Risks and Opportunities for Kirin

Besides 3R, sustainability of raw materials also needs to be considered

With used containers and packaging accounting for a significant proportion of household waste, 3R initiatives are of great importance to the Kirin Group's Integrated Beverages Business. Lightweighting of containers and packaging will lead to a reduction in the raw materials used and will help to lower costs. On the other hand, increased attention is being focused on the sustainability of container and packaging raw materials themselves. Particular consideration is needed regarding PET bottles, which use petroleum resources, and paper containers and packaging, which rely on forests in overseas countries.

Long-Term Environmental Vision

Use of sustainable materials for all containers and packaging by 2050

Leveraging its advantage of having its own Research Laboratories for Packaging Technologies, the Kirin Group has succeeded in developing Japan's lightest PET bottles and returnable beer bottles, and has also developed lightweight cartons. We are also pursuing various initiatives in the area of 3R, with the cooperation of many of our stakeholders.
Further steps that we will take to increase the sustainability of raw materials include the use of recycled PET materials and the full conversion to FSC-certified paper.

CSV Commitment

Maintenance and expansion of bottle-to-bottle initiative

Recycled PET materials are used in the manufacture of the *Kirin Gogo-no-Kocha Oishii Muto (sugar-free)* 500-ml PET bottle.

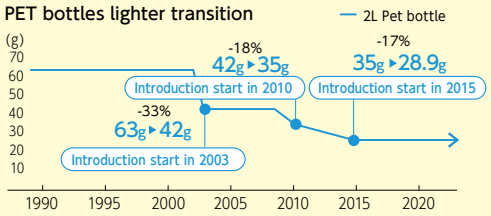
Expansion of use of FSC®-certified paper

We have established targets of the use of FSC-certified paper for all 6-can packs by the end of 2017 and for all gift boxes, drink boxes and cardboard cartons by the end of 2020, and are working towards those targets.

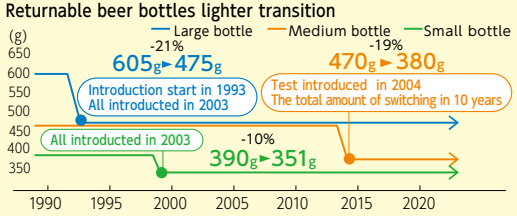
Long-Term Environmental Vision

We use sustainable containers and pakaging in consideration of their users.

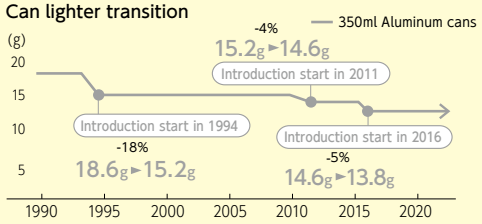
PET bottles lighter transition



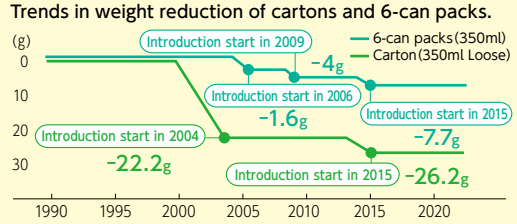
Returnable beer bottles lighter transition



Can lighter transition



Trends in weight reduction of cartons and 6-can packs.



CSV Commitment

Maintenance and expansion of bottle-to-bottle initiative

Bottle-to-bottle ratio

Kirin Gogo-no-Kocha Oishii Muto (sugar-free) 500-ml

100%

Expansion of use of FSC®-certified paper for primary and secondary containers

100%

Ratio of FSC-certified paper in paper containers

* As of June 30, 2017

250-ml, 350-ml, 500-ml 6-can beer packs

100%

Drink boxes

60%

Research Laboratories for Packaging Technologies

Kirin is an industry pioneer in the development of many environmentally conscious containers and packaging, including the lightweighting of corner-cut cartons, returnable bottles, and PET bottles.

Bottle-to-bottle

Our bottle-to-bottle initiative, which uses recycled PET materials to make new PET bottles, has enabled a 90% reduction in the quantity of petroleum used.

Paper packaging and containers made with FSC-certified paper

FSC-certified paper is already used for 100% of our 350-ml and 500-ml 6-can packs. We have also switched to certified paper for 60% of our drink boxes.

Cardboard for Packaging

Basic Thinking

The Integrated Beverages Business uses large volumes of paper not only for primary containers, but also for secondary containers such as 6-can packs, cardboard cartons, and gift boxes. Exhaustive efforts have been placed into reducing the weight of these containers to date, but in consideration of the fact that we rely on imports for the majority of our paper raw material requirements, we have started to work on raising the sustainability of the paper itself.

Current Status

We have reduced the quantity of paper used through innovations in construction, such as the corner-cut cartons that we have developed ourselves. In our pursuit of lightweighting, we have also given consideration to ease of use and the situations of use of our containers and packaging. Further, to ensure the sustainability of the paper itself, we are aiming to adopt FSC-certified paper for all of the paper containers and packaging used by the Japanese Integrated Beverages Business by the end of 2020.

Use of sustainable FSC®-certified paper

In its CSV Commitment announced in February 2017, the Kirin Group declared a goal of reducing its dependence on non-renewable resources for its containers and packaging materials. To meet that goal, we revised our Action Plan for the Sustainable Use of Biological Resources, and declared a target of the adoption of FSC-certified paper for all paper containers and packaging by the end of 2020, in consideration of the environment (biodiversity) and for the conservation of forests.*

In the *Kirin Tropicana* range, FSC-certified paper was adopted for the 250-ml drink box in May 2016, prior to these announcements, and FSC the certification logo has been printed on the side of the pack. With the new declarations, we are starting to adopt FSC-certified paper progressively for other paper packaging and containers. As of June 2017, FSC-certified paper is in use 900-ml drink box with cap for the *Tropicana 100% Marugoto Kajitsukan*, launched in March 2017, and the 550-ml gable-top drink box for *Kirin Gogo-no-Kocha Summer Citrus Tea*, launched in May 2017. These containers both have the FSC certification label printed on them. For beer six-can packs, FSC-certified paper is in use on all 350-ml and 500-ml products, and the certification label was attached to certain products for a limited time only in April.

* See the Special Feature on P.14 for details.

Introducing Corner-cut Cardboard Cases

Kirin Brewery was the first Japanese beverage company to use corner-cut packing cardboard, which is a wrap-around cardboard shipping case for canned beverages. With beveled-off corners, the case requires less paper and is shaped to make it easier to carry and handle. The company began adopting corner-cut cardboard cases in 2004, and currently applies them in almost all of its products. By reducing the weights of packing cardboards and 6-pack paperboards, Kirin Brewery succeeded in decreasing the use of raw materials by 60,000 tons and cutting CO_2 emissions by 78,000 tons during the period between 1994 and 2014.

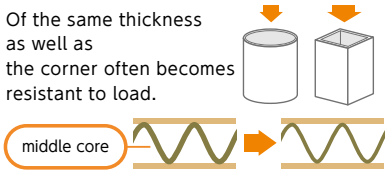
Quantity of paper saved by eliminating corners

2% reduction

Corner-cut Carton

10.9% reduction

Of the same thickness as well as the corner often becomes resistant to load.



Quantity of paper saved by making cardboard core thinner

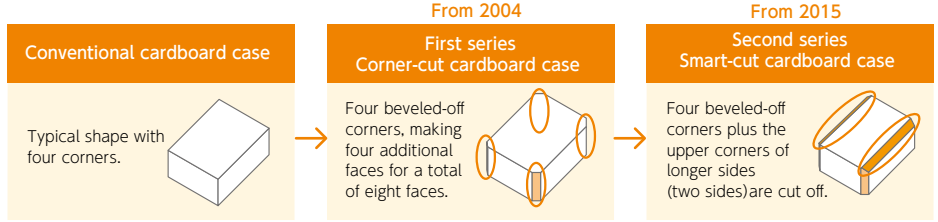
8.9% reduction

Introducing smart-cut cardboard cases

Under joint development with Oji Container Co., Ltd., Kirin developed and introduced smart-cut cardboard cases by combining Kirin's corner-cut cardboard cases technology and Oji Container's diet box technology. The smart-cut cardboard case is made to fit a 204-diameter can*. The diameter of the upper lid of the can is made smaller, and the upper corners of the longer sides (two sides) of the case are cut off to reduce the use of paper approximately 16% compared to a corner-cut cardboard case (case for a pack of six 500 ml cans).

Use of paper

16% reduction



Zooper Dooper Shelf-Ready Packaging

Australian Daily Drinks Co. achieved a significant reduction in the self-ready packaging materials used for the Zooper Dooper products. The original design required two cardboard components, a hood and a tray. This has now been replaced with a single piece wrap around case, which is a reduction in approximately 560 tonnes or 40% cardboard. This project was achieved through collaboration with our suppliers and retail customers.
Furthermore, Australian Lion reduced the weight of cardboard used in the 30 can cartons produced at Tooheys, West End, Castlemaine and James Boag breweries. This has reduced the weight by 17g per carton, which is approximately 18 tonnes per year.

PET bottles

Basic Thinking

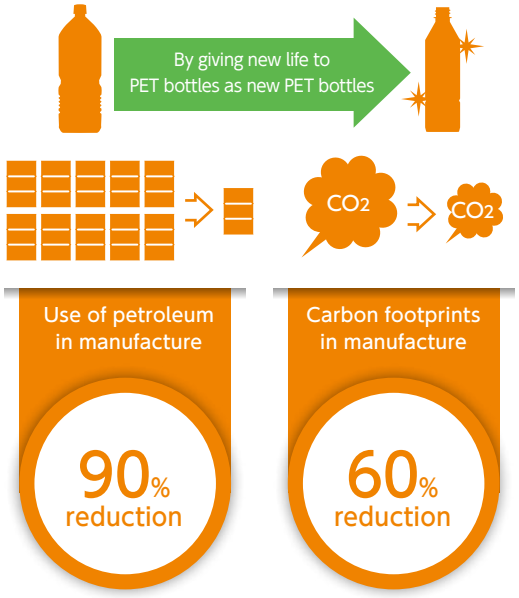
With the convenience of a resealable cap for easy portability and storage, and their transparency and light weight, PET bottles are an excellent container for beverages, and they are in wide use for that purpose. On the other hand, their raw materials are derived from petroleum, which is a finite resource. For this reason, in addition to reducing the quantity of raw materials used, we believe in the importance of advancing the recycling cause throughout society as a whole, and have been pursuing initiatives toward that end.

Current Status

Since introducing the “pecology bottle,” an environmentally friendly container that saves on resources and crushes easily, in June 2003, we have continued the pursuit of lighter-weight PET bottles, and have worked hard on the penetration of recycling initiatives across the whole of society. Further, to raise the sustainability of the raw materials themselves, we are pursuing initiatives for the use of recycled PET materials, while taking cost and suppliable quantities into consideration.

“Bottle-to-Bottle”

Kirin Beverage has been a pioneer in initiatives to reduce the weight of PET bottles. As an initiative for the reduction of dependence of non-recyclable resources for containers and packaging declared in the CSV Commitment, the company is engaged in a “bottle-to-bottle” initiative for the use of recycled PET materials. Currently, it uses 100% recycled PET materials for its *Kirin Gogo-no-Kocha Oishii Muto (sugar-free)* 500-ml PET bottle.
PET bottles have maintained a high degree of recyclability to date, and have been recycled into a variety of products, such as egg cartons, plastic film, and clothing fabrics. In recent years, a new method of recycling PET plastic has been established. Called “mechanical recycling,” this method allows used PET bottles to be recycled into the raw material for new PET bottles. In the mechanical recycling process, used PET bottles are washed and then processed at high temperatures in a state close to a vacuum. This process volatilizes and removes impurities trapped inside the plastic, and restores the molecular weight, which declines in the recycling process, to a level suitable for molding into bottles.
Giving new life to PET bottles as new PET bottles removes the need to use more petroleum to make new materials, enabling a 90% reduction in the petroleum resources involved in manufacturing. At the same time, it also enables a 60% in carbon footprints.



Making PET Bottles Lighter

At Kirin Beverage, we have made efforts to make PET bottles lighter.
In June 2003, we introduced our "pecology bottle" for the 2.0-liter *Kirin Alkali Ion Water* and succeeded in reducing the weight of the bottle to 42 grams from 63 grams. In March 2005, we adopted the pecology bottle also for the 2-liter PET bottles of *Kirin Nama-cha* and *Kirin Amino Supli*. Further, since April 2008, we have applied the pecology bottle for the 1.5-liter PET bottle for *Kirin Gogo-no-Kocha*. In November 2010, we succeeded in further bringing the weight of our pecology bottle down to 35 grams (38 grams for some products) and also introduced a universal design that makes bottles easier to carry and easier to serve the contents for all 2-liter PET bottles.
In 2014, we developed the lightest 2-liter PET bottle in Japan, weighing 28.9 grams*, despite the recognition in the market that it was difficult to make PET bottles that weigh less than 29 grams. We have rolled out this lightest PET bottle for *Kirin Alkali Ion Water* starting in March 2015. Given this success in weight reduction, we are able to reduce the use of PET resin by 938 tons per year and cut CO_2 emissions by 3,390 tons per year.

* The *Kirin Alkali Ion Water* 2L PET bottle was awarded the Asia Star Award in the Asia Star 2015 Contest run by the Asian Packaging Federation, the World Star Award in the World Star 2016 Contest run by the World Packaging Organization, and the Japan Packaging Institute’s 40th Kinoshita Prize (Improvement and Rationalization category).

*As of February, 2015; according to a survey by Kirin

3L Milk Bottles

In collaboration with Lion's suppliers, the Lion achieved 5-17% reduction in weight of per plastic (HDPE) bottle. Depending on the production site packaging plant, we were able to achieve bottle weights of between 60 grams and 68 grams per bottle, down from the original 72g. This light weighting project is estimated to reduce the HDPE amount by around 290 tonnes per year. We are aiming to implement a similar project for our 2L milk bottles, reducing the bottle weight from 40.5g to 37.5g.

Research Laboratories for Packaging Technologies

Kirin is one of the few Japanese integrated beverages companies to have its own “laboratory” for the development of containers and packaging. Located in the Techno-Village of Kirin Beverages’ Yokohama Plant, the Research Laboratories for Packaging Technologies is mainly engaged in the development of containers and packaging for beverages such as beer, happo-shu (low-malt beer), wine, and soft drinks, and the development of packaging technology. It leverages the technologies it has accumulated in these areas to provide the necessary technical assistance to bring products to market, including eco-design packaging. The Laboratory is as well equipped as a small factory, with machinery to fill glass bottles and aluminum cans with beer and equipment to attach labels to bottles.

* See P.65 for basic policies and initiatives for the design of environmentally conscious containers and packaging.

State of Containers and Packaging Recycling in Japan

The Act on the Promotion of Effective Utilization of Resources was enacted in Japan in 1991, and the Act on Recycling of Containers and Packaging came into force in 1997. Since then, under the principles of 3R and expanded producer responsibility, systems for the effective collection and recycling of glass bottles, steel and aluminum cans, PET bottles, paper containers and packaging, and plastic containers have been developed throughout the nation. Japan has maintained one of the highest levels of recycling in the world, with a recycling rate of 86.9% for PET bottles, 90.1% for aluminum cans, 92.9% for steel cans, and 68.4% for glass bottles in FY2015.

Cans

Basic Thinking

Today, almost all beer consumed in the home is in cans, and cans are also used for coffee and many other non-alcoholic beverages. There are two types of material used to make cans—steel and aluminum. Lightweighting is important for both of these materials, but for aluminum in particular, ongoing lightweighting and recycling efforts are essential to achieve Scope 3 emission reductions as well, because they consume massive amounts of electricity in the smelting process.

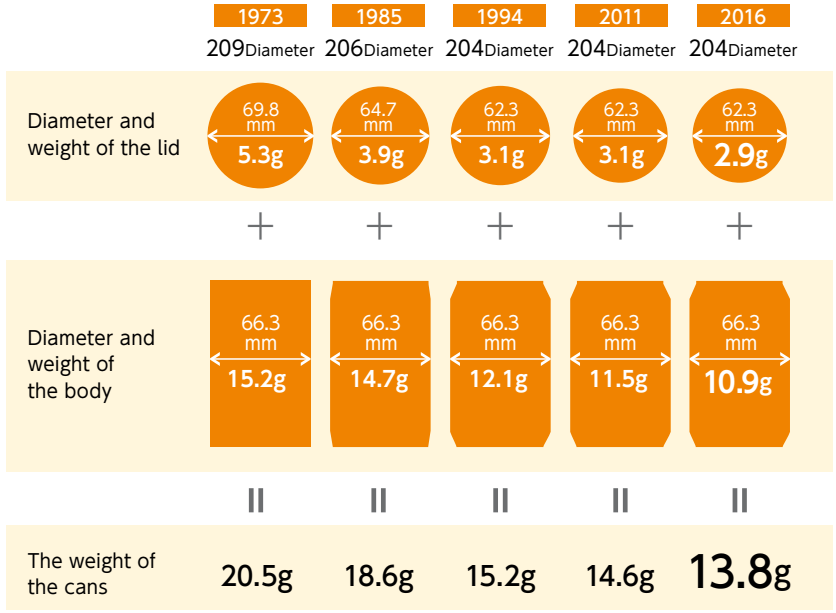
Current Status

One approach that accounts for a large proportion of lightweighting of cans is reducing the size of the diameter of the can ends. Making the can ends smaller reduces the weight of the lid, and it also allows for lightweighting of the body of the can by narrowing the top and bottom edges. We will continue to pursue lightweighting efforts in cooperation with can manufacturers.

Lighter Cans

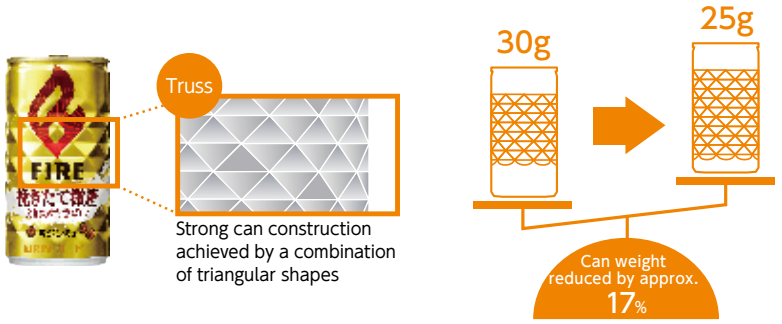
At Kirin Brewery, by reducing the diameter of the can ends and narrowing the top and bottom edges of the can body to reduce the weight of the can, as well as thinning out the walls of the can body, for our 350-ml aluminum cans, the current 204-diameter can end has achieved a weight reduction of approximately 29% compared to the old 209-diameter can end. This means an annual saving in aluminum resources* of approximately 19,000 tonnes. (*Kirin data from 2015 production volumes)
Further, working with can manufacturers, we developed Japan's lightest aluminum can with thinner can ends and bodies in 2016. The overall weight of the can has been reduced by approximately 5% (0.8 grams) from 14.6 grams to 13.8 grams. This represents a weight reduction of 33% (6.7%) from the 209-diameter can end.

Transitionin weight of the 350ml aluminum cans



Beverage cans

Kirin Beverage also cut the weight of 350-ml cans by approximately 19% between 1990 and 2013, and reduced the weight of 190-gram steel cans by about 6% between 1998 and 2012. Besides, Kirin Beverage reduced the weight of the steel can adopted for its core *FIRE* brand beverage, *Hikitate Bito*, by approximately 23% per can between 2008 and 2012.



Glass bottles

Basic Thinking

For more than 100 years in Japan, beer bottles have been collected after use and used many times over. Drinking establishments still use many returnable bottles, alongside kegs. Returnable bottles are washed and re-used, but to handle the washing and repeated use, the bottle walls need to be thick, which makes them heavy. In respect of lightening the burden on people who have to carry them and the environmental burden of transporting them, we have continued to work on the lightweighting of returnable bottles.

Current Status

With the decline in use of returnable bottles in the home, the volume of returnable bottles in use has fallen. However, in cooperation with various stakeholders, we have worked to maintain the returnable bottle system, and even today, almost 100% of returnable bottles are reused. Further, with the growing popularity of craft beers, the use of one-way bottles is increasing, the lightweighting of which is also being pursued.

Developing Japan's lightest returnable bottle

Almost 100% of returnable bottles shipped from Kirin Brewery's plants are returned to the plants within about four months through sales stores after beer is consumed by customers. Because the average life of properly used returnable bottles is eight years, bottles are reused as many as 24 times. For this reason, bottles need to be strong to withstand repeated use and maintain the quality of our products. At the same time, Kirin has managed to make bottles lighter.

We have already succeeded in reducing the weight of a returnable large-size beer bottle by 21% from the conventional 605-gram bottle, and developed the lightest large beer bottle in Japan, weighing 475 grams, completing the transition to lightweight large-size beer bottles in 2003. We also reduced the weight of small beer bottles and, in 1999, completed the transition to a lightweight bottle after cutting the weight of the previous small 390-gram bottle by 10% to 351 grams.

Furthermore, in 2014, we developed the lightest medium-size bottle in Japan*1 at 380 grams after reducing the weight of the conventional 470-gram medium-size bottle by 90 grams. To cut weight 19% from the conventional bottle, we applied a ceramics coating technology developed for our large bottles, which lets us maintain the strength of bottles, while making them scratch-resistant and lighter. In late

November of 2014, we began test-deployment of these medium-size bottles in Kyushu with a plan to complete the transition to lightweight bottles over a period of 10 years. This development enables us to reduce approximately 930 tons of carbon footprints annually*2 in our manufacturing and distribution processes.

When we complete the transition to lightweight returnable medium-size bottles, all of our returnable bottles, i.e., large, medium-size and small bottles, will be the lightest in the country.

*1 As of November 12, 2014; according to a survey by Kirin Brewery.
*2 Assumes blowing of 10 million bottles per year.

Lighter medium-size beer bottles

Previous　Lightest in Japan

We applied a ceramics coating technology

CO_2 reduction effect of lighter medium-size bottles

930t reduction

* Calculated on assumption of 10 million bottles a year

Development of Japan's Lightest One-way Bottle

Kirin Brewery developed a Premium Glass Bottle, a 140-gram bottle, which is the lightest in Japan*, for use as a one-way (non-returnable) bottle for 330-ml carbonated drinks.

This bottle is 20% lighter than previous 170g one-way bottles used for the same capacities of beverage. This has enabled us to reduce our CO_2 emissions during production by 23g per bottle, and improved ease of drinking thanks to the wide mouth design.

To make the bottle lighter, we developed a molding method that made a dent at the inner part of the opening and optimized the shape of the metal and the molding conditions to secure the required strength, and achieved the necessary thickness for the portion that contacts with other things, such as other bottles or walls, when displayed. In addition, we changed the bottom of the bottle by making the curve of the corner section larger and securing the necessary thickness during the molding process. Kirin Brewery began adopting this bottle for its *Grand Kirin beer* in 2012, which is currently on sale at all convenience stores in Japan that sell alcohol beverages.

In 2016, Lion Pty Limited also succeeded in reducing the weight of its one-way bottles from 205 grams to 190 grams. The adoption of these bottles for its *Tooheys Extra Dry, James Squires*, and *Hahn Super Dry Bottle beers* is expected to result in a reduction in glass use of 2,000 tonnes a year.

* As of September 26, 2013. Survey by Kirin.

330ml one-way bottle

18% Lighter

CO_2 emmissions per one at the time of manufacture

23g reduction

Global Warming

Long-Term Environmental Vision

We keep the CO_2 emissions of the value chain within the Earth's natural CO_2 absorption ability in cooperation with all the people associated with our value chain.

Social Issues

Failure to achieve the goals of the Paris Agreement will make it difficult to stop global warming

The nature of greenhouse gases is that, no matter what part of the earth their emissions come from, they have an impact on the earth as a whole. Taking action to prevent global warming is the shared responsibility of the entire world. The Paris Agreement is a revolutionary outcome, but past actions against global warming have tended to be affected by the circumstances of individual nations, and the voluntary action of private-sector companies has become even more important.

Risks and Opportunities for Kirin

The risks resulting from climate change are already becoming apparent

Global warming may seem like a far-off problem for the Integrated Beverages Business, but the significant impact that climate change is having on biological resources and water resources makes it a serious issue for the Kirin Group. Not only have some of our manufacturing sites already suffered from the impact of floods and water shortages, but the impacts of climate change are also starting to become apparent in the regions that produce our raw materials. There is also the possibility of stricter regulations.

Long-Term Environmental Vision

Keep CO_2 emissions across our value chain within the Earth's capacity to absorb them by 2050

In 2009, the Kirin Group declared the lofty goal of halving CO_2 emissions compared to 1990 levels across the entire value chain by 2050, and is taking action toward that target. The Group was also the first in the industry to identify its Scope 3 emissions. At this point in time, steady progress is being made in the reduction of CO_2 emissions towards this target. The Group has also established a CO_2 emissions reduction target based on scientific grounds, with a target year of 2030, and will accelerate the pace of the actions it is taking to meet that target.

CSV Commitment

Implement initiatives aiming to achieve medium-term GHG reduction targets based on the SBT (Science Based Targets) approach

The target of a 30% reduction in total Scope 1 and Scope 2 emissions and a 30% reduction in Scope 3 emissions by 2030 from a 2015 base-year has been recognized by the Science Based Targets (SBT) Initiative.

Increase the proportion of renewable energy

In Japan, the Kirin Group has commenced the use of hydroelectric power and the proactive use of Green Power Certificates and Green Heat Certificates. Moving forward, we plan to develop a roadmap for the use of renewable energies.

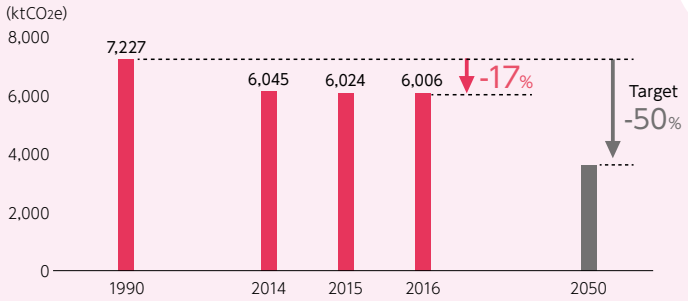
Long-Term Environmental Vision

Long-term CO_2 reduction target (2050 compared to 1990)

Value chain

50% reduction

Trend in value chain GHG emissions



CSV Commitment

Conduct activities to achieve the science-based middle-term GHG reduction target

Increase the proportion of renewable energy (set target in 2017)

Middle-term GHG reduction target (2030 compared to 2015)

Scope1+Scope2: 30% reduction

Scope3: 30% reduction

Scope1+Scope2

Scope3

Promotion of joint shipping

Joint shipping with other companies in the same business will not only reduce CO_2 emissions, but will also enable significant reductions in the physical burden placed on truck drivers.

Establishment of medium-term GHG emissions reduction targets

Certain factories have started using hydroelectric power, which does not generate CO_2 emissions, with the aim of meeting the Group's medium-term GHG emissions reduction targets that have been recognized by the Science Based Targets (SBT) Initiative.

Reductions across the entire value chain

Although the use of in-line PET bottle aseptic blow-fill equipment results in an increase of CO_2 emissions from the factory, it will enable significant reductions across the entire value chain.

Manufacturing

Basic Thinking

The Integrated Beverages Business requires massive amounts of energy for boiling and cooling. The target established in 2013 of a 35% reduction in domestic CO_2 emissions from manufacture, logistics and offices compared to 1990 levels by 2015 was reached ahead of schedule, so a new target of a 30% reduction in absolute Scope 1 and Scope 2 emissions by 2030 from a 2015 base-year has been set.

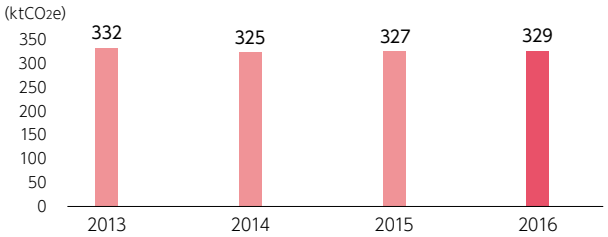
Current Status

In the manufacturing sector, we are aggressively introducing a range of new technologies aimed at reducing energy consumption. This includes shifting from heavy oil to natural gas for fuel requirements, installing co-generation systems that can use exhaust heat, and introducing anaerobic wastewater treatment systems, which do not require energy for aeration and also provide biogas.

Japanese Integrated Beverages Business

329 $ktCO_2e$

(+5% yoy)



CO_2 emissions in the Japan Integrated Beverages Business increased by 2,000 tonnes from 327,000 tonnes to 329,000 tonnes, an increase of 0.5% over the previous year.
The nine breweries need to produce a wide range of products, such as the “47 Todofuken no Ichiban Shibori Beer” range (47 kinds of beer representing the 47 prefectures of Japan), as well as craft beers, but by making the most of the high-mix low-volume production technologies that are one of Kirin’s strengths, we were able to keep GHG emissions to almost the same level as the previous year.

Shift from heavy oil to natural gas for fuel requirements

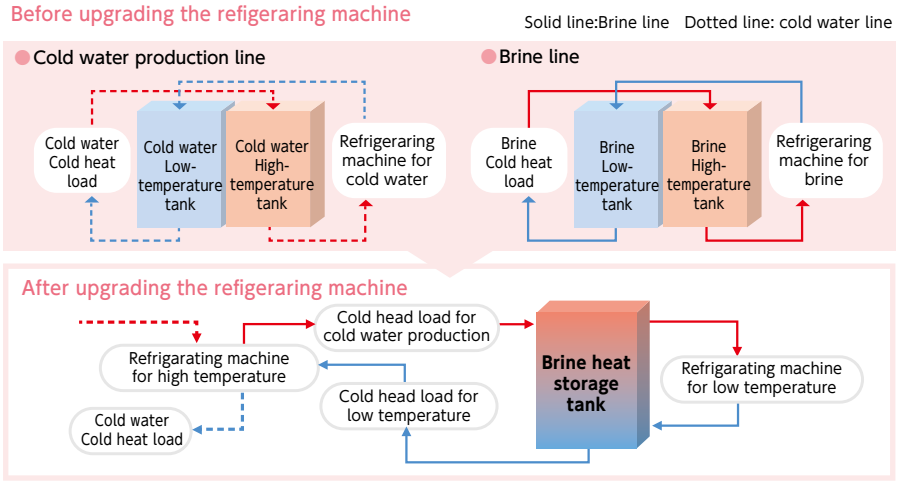
A significant proportion of the fuel used in breweries is used in the boilers that generate steam. Previously, our breweries had been using heavy oil, but they have now shifted to natural gas, which generates less CO_2 than heavy oil. This fuel conversion had been completed in all domestic nine breweries by 2007. Kirin Beverage factories have also completed the same conversion. Also, by upgrading from large boilers to a row of multiple high-efficiency, small through-flow boilers, more efficient operation and control have been made possible.

Cogeneration System

The Kirin Group has been actively introducing a cogeneration system that generates both electricity and heat. Using this system, exhaust heat from private power generation is recovered to be applied in processes that require heat. It can significantly improve energy efficiency. Kirin Brewery introduced a cogeneration system using biogas produced by anaerobic wastewater-treatment facilities at seven plants.

Improvement of the refrigeration system

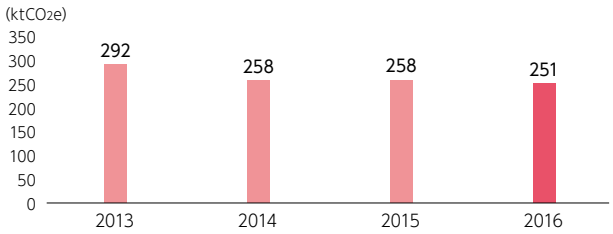
At some of the plants of Kirin Brewery and Kirin Beverage, energy-saving efforts are made through improving the efficiency of refrigerating systems. This is done by implementing a cascade refrigeration system, which cools in phases in a process that involves a considerable temperature difference, or making operational improvements.



Lion Pty Ltd

251 ktCO2e

(-3% yoy)

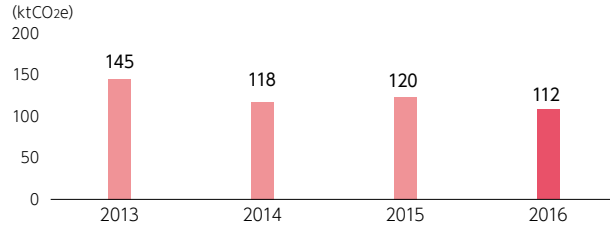


Lion Pty Limited's Scope 1 and Scope 2 GHG emissions in 2016 totaled 251,000 tonnes, achieving a 3% reduction over 2015.
This is believed to be due to energy consumption efficiency improvements resulting from the integration of manufacturing from Swan Brewery to West End and the undertaking of energy efficiency projects at several plants at West End.

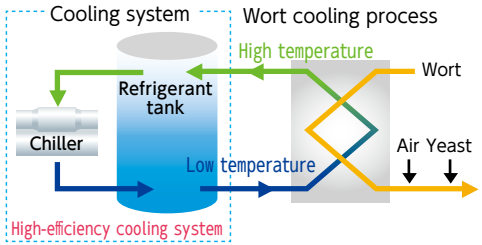
Brasil Kirin

112 ktCO2e

(-7% yoy)



Brasil Kirin Holding S.A. achieved a reduction in GHG emissions in 2016 of about 7% over 2015. In Scope 1, there was a 4% increase due to increased manufacture of beverages and other reasons, but in Scope 2, there was a massive reduction of 36% due to an increase in hydroelectric power's share of total power consumption.
Brasil Kirin sets monthly and yearly targets for the reduction of energy consumption and is undertaking a range of energy-saving initiatives. In 2016, energy consumption was down 4.2% over 2015. The company is also taking action in the logistics sector, such as more efficient use of trucks and using ships to transport goods to distant locations.



Introduction of energy-saving equipment at Myanmar Brewery Limited, taking advantage of the Joint Crediting Mechanism

The Kirin Group will take advantage of the Japanese government's Joint Crediting Mechanism (JCM) Model Projects of the JCM Financing Programmes to fund part of the expansion of Myanmar Brewery's Yangon brewery. Myanmar Brewery is Myanmar's largest beer company, which Kirin Holdings acquired in 2015. The facilities to be financed through the JCM Model Projects are a system for recovering exhaust heat from the wort boiling process, a high-efficiency chiller system used for wort cooling and other processes, and small through-flow boilers.
The exhaust heat recovery system will recover and re-use steam from the wort boiling process. In conventional systems, the steam used in the wort boiling process accounted for 30–40% of steam used, but with the introduction of this new system, the use of steam in this process is expected to be halved. The high-efficiency chiller system is designed to raise the efficiency of the cooling system overall and reduce power used by the pumps by introducing a cascade arrangement of chillers and stratified/vertical tanks. In particular, the wort cooling process accounts for 30–40% of the total cooling load, but the introduction of this system will enable a 30–35% reduction in the power consumed by this process. These two systems will be the first such technologies to be introduced at a brewery in Myanmar.
With the small through-flow boilers, the installation of multiple boilers will mitigate efficiency reductions at low-load times and loss during start-up, enabling significant fuel reductions.
Due to the sharp rise in energy demand resulting from rapid economic growth in Myanmar, it is predicted that domestically sourced fossil fuels will be insufficient to meet that demand, leading to fears of the cost burden of importing fossil fuels.
For this reason, energy conservation has become an important policy for the nation, and there are expectations that the Myanmar Brewery project will serve as a model project for the dissemination of technology, contributing to energy conservation.

Distribution

Basic Thinking

Drinks are heavy and require a great deal of energy to transport them. This makes the improvement of transport efficiency an important approach. The difficulty in securing truck drivers in Japan has also added to the need to take action to reduce truck transport. To this end, the Kirin Group has declared logistics to be a non-competitive sector, and is pursuing initiatives for efficient transport.

Current Status

In truck transport, to increase load efficiency, changes are being made to product specifications to enable a greater quantity of drinks to be packed onto a single pallet, and systems for the optimal loading per truck are being introduced. Also, with the aims of reducing energy consumption and long-haul transport by truck drivers through the promotion of modal shift, the Kirin Group is actively engaging in joint shipping with other companies in the same business.

Promoting Modal Shift in Transportation of Goods

The Kirin Group promotes rail freight with lower CO_2 emissions. Kirin Beverage and Kirin Brewery became certified with the Eco Rail Mark for their extensive use of rail freight in 2006 and in 2010, respectively. Furthermore, Kirin Beverage has switched from truck transport to rail container freight for mid-to long-distance shipments (400 to 500 km or more) and has adopted a utility model of special cartons it has developed that are less likely to rub together during long-distance shipments. These are just some of the ways we are working to reduce CO_2 emissions and maintain and improve quality during shipping.

Improving loading efficiency

In truck transport, improving loading efficiency will increase transport efficiency, and CO_2 emissions will also be reduced. In the Kirin Integrated Beverages Business in Japan, using a truck allocation system that has master data for the precise loading capacities of each truck, we are working to transport our products with the most efficient combinations of trucks and cargo.
In the transportation of beer, Kirin commenced joint shipping with another company in Tokyo in 2011, and added another company in June 2015. Further, in January 2017, a joint shipping center was established together with a competitor in Kanazawa, Ishikawa Prefecture, and joint transport by rail container from breweries in the Kansai area commenced. This will be expanded to Toyama Prefecture from autumn 2017. These moves will remove the necessity to transport goods long distances by truck, which will alleviate the burden on truck drivers.
We are also pursuing joint shipping of other beverages in different parts of Japan, including Tohoku, the greater Tokyo area, Kinki, and Kyushu.

Joint delivery

The Kirin Group recognizes logistics as an area of operations to collaborate with other firms in the same business. It is working to improve the efficiency of logistics by promoting joint deliveries and to reduce CO_2 emissions from transport activities.
In the transportation of beer, Kirin commenced joint shipping with another company in Tokyo in 2011, and added another company in June 2015. Further, in January 2017, a joint shipping center was established together with a competitor in Kanazawa, Ishikawa Prefecture, and joint transport by rail container from breweries in the Kansai area commenced. This will be expanded to Toyama Prefecture from autumn 2017. These moves will remove the necessity to transport goods long distances by truck, which will alleviate the burden on truck drivers.
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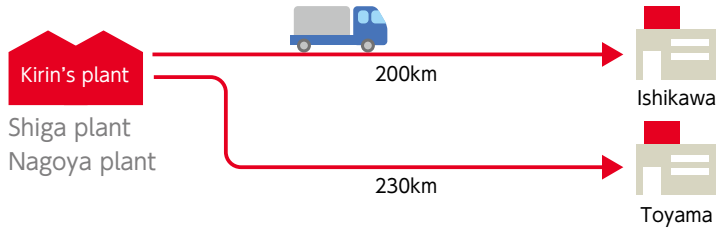
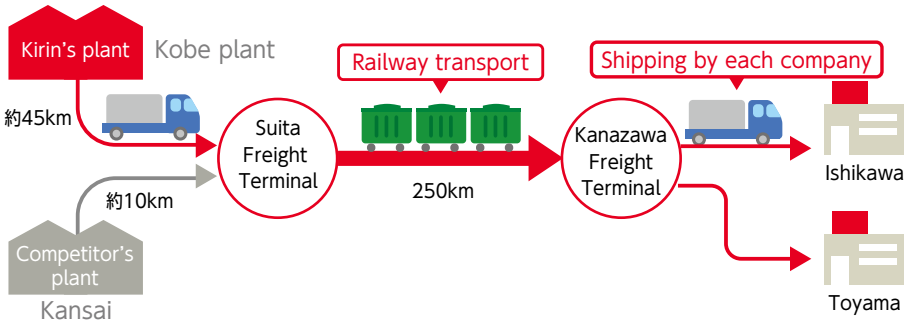
Before joint delivery



After joint delivery



Sales

Basic Thinking

Vending machines offer the convenience of buying rrquires energy. Vending machines have been designated as specified equipment under the Act on Rationalizing Energy Use and energy conservation targets for them have been established. Working with the vending machine manufacturers, the Kirin Group is aggressively pursuing the introduction of energy-saving vending machines that will achieve those targets. Through its vending machines, the Kirin Group is not only delivering the delicious taste of its products to customers, it is also engaging in consideration of the environment.

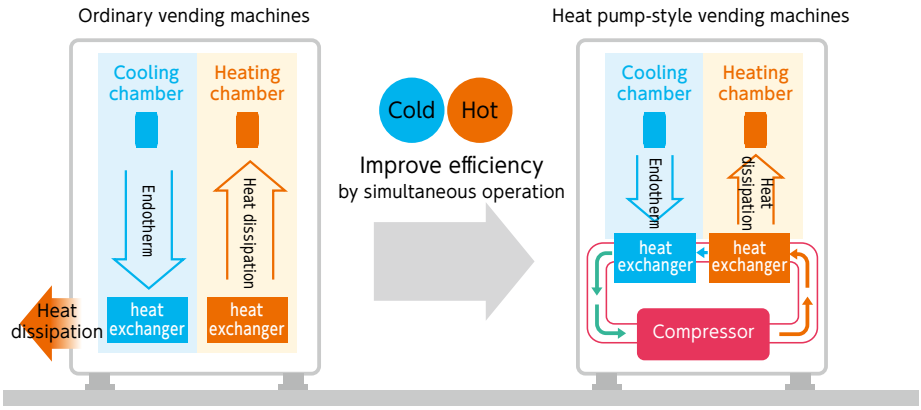
Current Status

Major improvements in the energy-saving performance of vending machines have been achieved through such measures as the adoption of a heat pump function to cut back on the power used by the heaters when heating the products, the use of vacuum-insulation materials with high heat retention properties, and the installation of LED lighting. Further, with the agreement of customers, the lighting in indoor vending machines are switched off 24 hours a day, and the peak-cut function is used to suspend cooling functions during times of peak power consumption in summer. With these and other measures, we are pursuing actions in response to electric power demand throughout the entire community.

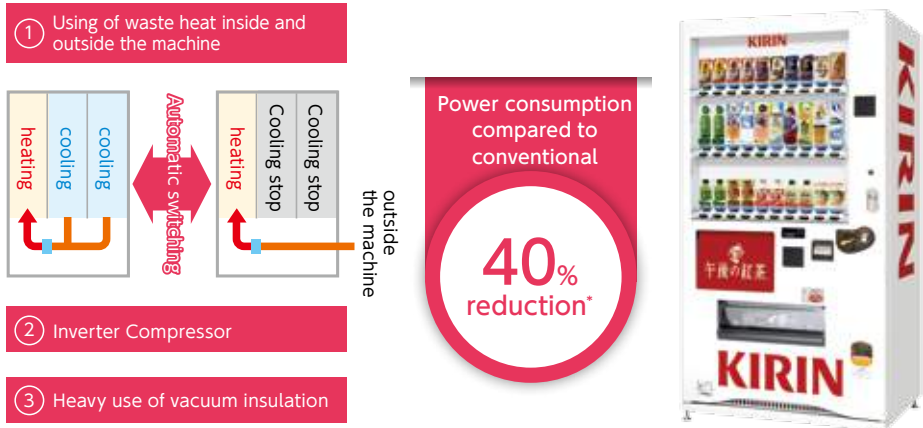
Vending machines

Heat pump-style vending machines pump up the waste heat generated when cooling cold beverages and use it to heat up the hot beverages. This cuts down on the power used by the heaters, allowing reductions in electricity consumption compared to conventional 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 can and PET bottle vending machines are of this type*.
As of May 2017, close to 80% of the company's installed vending machines are heat pump-style machines.
It is also aggressively introducing the latest models of heat pump vending machine, which has evolved to offer an approximately 40% reduction in power consumption over the 2013 model. Installation of these new models began in 2015, and by 2016, they accounted for approximately 50% of all newly installed vending machines. The company is aiming for a 60% installation rate in 2017.
One of the features of the latest models of heat pump vending machine is that they are equipped with a compressor that uses an inverter to control the machine's operation (number of rotations variable) in minute detail according to the atmospheric temperature and the temperature of the products in the machine. Some types offer even more advanced energy-saving performance, such as not only using the waste heat generated by the cooling chamber as previous models did, but also capturing heat from outside the machine in the heating process, and increasing cooling and heat retention capacity with the heavy use of vacuum insulation.
Also, from 2013, Kirin Beverage has adopted LED lighting for the illumination of all newly installed can and PET bottle vending machines.

About heat pump



Energy saving function of the latest model heat pump-style vending machine



* Comparison of standard 2017 model and 2013 model

[SPRING VALLEY BREWERY TOKYO]

SPRING VALLEY BREWERY TOKYO is an all-day dining establishment that 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. *See P.53

Value chain

Basic Thinking

Global warming is a challenge for the entire world. Even if our own CO_2 emissions are reduced, it would be meaningless unless the CO_2 emissions of society as a whole are reduced as well. For this reason, the Kirin Group is actively engaged in initiatives that, while they may lead to an increase in our own CO_2 emissions, will reduce CO_2 emissions across the value chain as a whole and help to reduce costs.

Current Status

In the beverages business, we are pursuing a shift to domestic manufacture of PET bottles, and in the imported wine business, wine is being imported in special bags for bottling in Japan. Although they will mean an increase in energy needed for manufacture here in Japan, initiatives such as these will enable reductions in CO_2 emissions across the value chain as a whole. Reducing the weight of containers and packaging will also lead to less energy consumption in containers and packaging production and in transport.

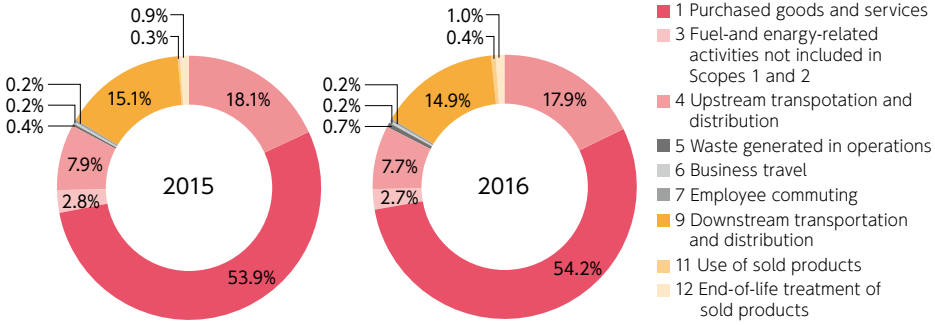
Value chain GHG emissions reduction targets

The Kirin Group was quick to realize the importance of reducing GHG emissions across the whole value chain and has continued to pursue initiatives towards that end. In August 2009, it formulated and announced its specific quantitative target, the Action Plans for Becoming a Low-Carbon Corporate Group, which declared the lofty target of halving CO_2 emissions across the Kirin Group value chain compared to 1990 levels by 2050. Further, to accelerate this action, in March 2017, it established and announced a new medium-term reduction target for Scope 1 and Scope 2 total emissions and Scope 3 emissions of 30% from a 2015 base-year by 2030. This target was recognized by the international Science Based Targets (SBT) Initiative as a science-based GHG reduction target aimed at keeping global warming to less than 2° C above pre-industrial levels. This was the first example of such recognition in Japan's food industry.

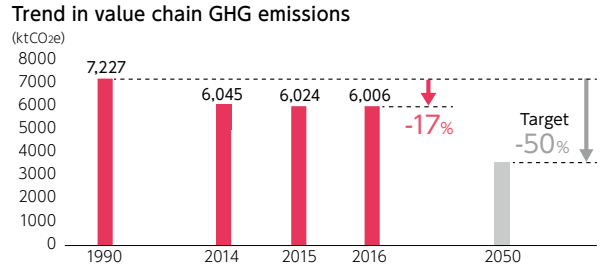
Calculation of value chain GHG emissions

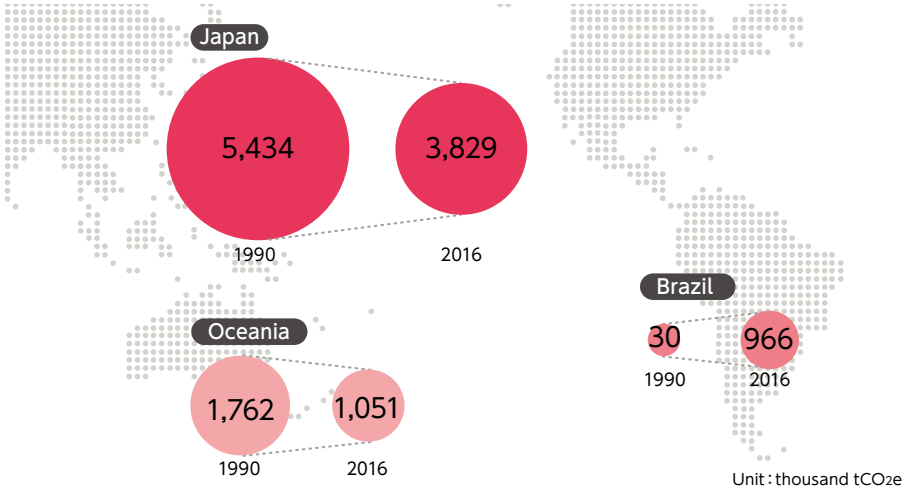
To achieve reductions in the entire value chain's GHG emissions, it is first necessary to measure them. The Kirin Group has been calculating its emissions since 2009, when the GHG Protocol*1, the standard for measuring greenhouse gases, was still in the draft stage. In April 2011, it became the first in the industry to disclose the GHG emissions of its whole value chain according to the GHG Protocol. It has continued to calculate them every year since, and in 2013, it estimated the value chain's 1990 GHG emissions, and expanded the number of categories in FY2013.
The organizations subject to the calculation process were also expanded, and with the inclusion of Brasil Kirin in 2014 and Myanmar Brewery in 2016, the Group is now able to calculate whole value chain GHG emissions in almost all of its business domains.
Also, to ensure the reliability and transparency of the information disclosed, since 2015, the Group has obtained third-party guarantees*2 for the Scope 1 and Scope 2 emissions of the entire Kirin Group, and for the Scope 3 emissions of the Japan Integrated Beverages Business.

Changes in Kirin Group's Value-chain CO_2 Emissions



Trend in value chain GHG emissions

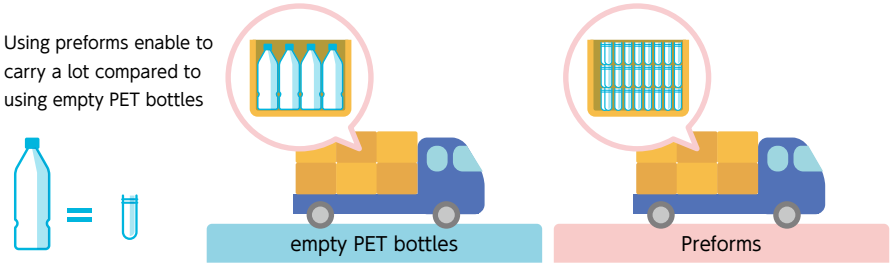




*1 GHG Protocol: An international effort jointly convened in 1998 by the World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD) to develop and promote the use of standards for calculating and reporting emissions of greenhouse gas (GHG). The GHG Protocol has three "scopes" (Scope 1, Scope 2, and Scope 3) and separate standards for calculating are issued for each.
*2 Please refer to the following for third-party assurance.

In-line blowing aseptic filling machine

An in-line blowing aseptic filling machine forms PET bottles from materials known as preforms and fills bottles under aseptic conditions. Kirin Beverage introduced Japan's first in-line PET blowing aseptic filling machine to 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.
Although installation of the machine increases CO_2 emissions from the plant, using preforms allows us to process greater loads on trucks compared to using empty PET bottles; therefore, it significantly enhances transport efficiency. Installation consequently contributes greatly to reducing CO_2 emissions from the value chain as a whole and to cutting costs.
Furthermore, in 2003, we installed a preform molding equipment on the beverage manufacturing line at Kirin Distillery ahead of other players in the industry.



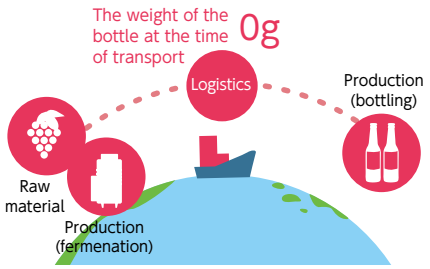
Support dairy farmers

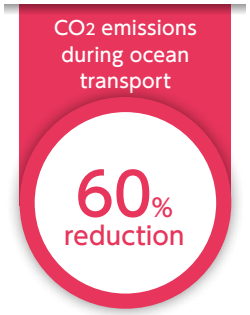
The Lion Landcare Grants program support Lion's dairy farmers to become more sustainable in the production and supply of milk. The price of energy accounts for a significant proportion of a dairy farm's total costs. Recent personalised on-farm energy assessments by Dairy Australia found that while no two dairies are the same, milk cooling, milk harvesting and hot water production are the areas of highest energy use. The assessments identified opportunities for farmers to increase profitability by reducing costs and simultaneously reduce greenhouse gas emissions.
Seven Lion Landcare Grant recipients used the funding to implement the proposed assessment changes, for example, replacement of constant speed vacuum pump with variable speed controlled pump or conversion of waste milk heat to water heating.

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 kiloliter bags (equivalent to about 32,000 750 liter bottles) with low oxygen permeability and bottles the wine in Japan. Compared to importing bottled wine, this method lets Mercian reduce CO_2 emissions during ocean transport by roughly 60%. In addition, bottling wine in Japan allows us to use Ecology Bottles (made with at least 90% recycled glass) and lightweight bottles, which contributes to making effective use of resources and reducing CO_2 emissions during shipment within Japan.

Structure of Transportation in Large Bags and Bottling in Japan





Container lightweighting

Reducing the weight of containers will lead to CO_2 emissions reductions in the manufacture of containers and packaging and in transport through more efficient loading. The cumulative reduction in CO_2 emissions from container manufacture resulting from lightweighting of containers and packaging by Kirin Brewery and Kirin Beverage is 3,430,000 tonnes* from 1990 to 2016.

* Calculated from the actual volume of use of containers by Kirin Brewery and Kirin Beverage from 1990 to 2016, based on the Carbon Footprint Product Category Rule (Approved CFP-PCR No. PA-BV-02).

Renewable energy

Basic Thinking

To achieve the Kirin Group's lofty target of reducing GHG emissions by 30% compared to 2015 levels by 2030, we need to make even more progress in energy conservation in factories and efficiency improvements in the logistics sector. In addition, the use of renewable energies is also an important action. At the same time, we also hope to contribute to the promotion of renewable energy use by the community at large.

Current Status

The Kirin Group has pursue the use of green power such as solar and hydroelectric power for many years, but it will pursue the use of renewable energy even more aggressively moving forward. Specifically, in addition to the use of hydroelectric power, which does not generate CO_2 emissions, in some of our factories, we will also expand the use of Green Heat and Green Power certificates.

Use of CO_2-free hydroelectric power

In its CSV Commitment announced in February 2017, the Kirin Group declared that it would aggressively pursue the introduction of renewable energies.
The first action taken towards that goal is to use hydroelectric power, Kirin Brewery's Toride Plant will use hydroelectric power, which is free of CO_2 emissions, for 70% of its purchased electricity, and Kirin Beverage's Shonan Plant will use it for 50% of its purchased power.
The plants will avail themselves of a hydro-electric power only option launched by TEPCO Energy Partner, Inc. in a Japan first in April, as a means of contributing to global warming countermeasures. These actions will be the first examples of the use of this option of any factory in Japan, not just in the food and beverages industry. Part of the electricity tariff paid by Kirin in this mechanism will be put towards the maintenance and expansion of hydro-resources, such as the cultivation of groundwater-recharging forests.

*1 Both compared to actual 2015 figures

Use of Green Heat and Green Power Certificates

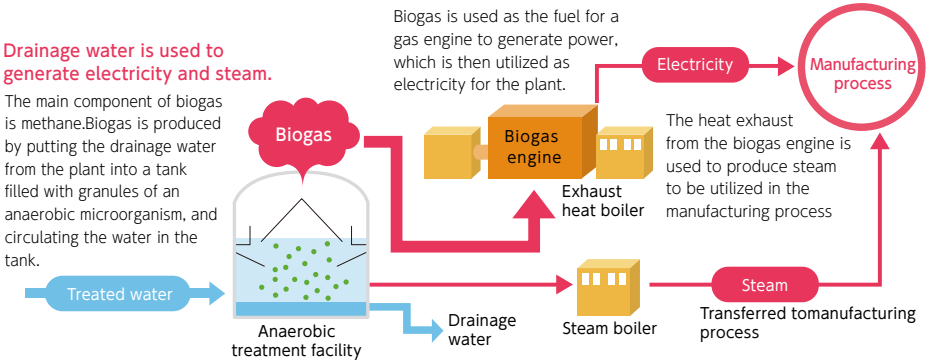
The Kirin Group is pursuing the use of the Green Heat Certificate at Kirin Brewery's Kobe Plant, which corresponds to the Plant's fossil fuel-generated heat consumption, and the Green Power Certificate at Chateau Mercian, which corresponds to that company's entire electricity consumption.

Recovering Biogas from Wastewater Treatment

Kirin Brewery maintains anaerobic wastewater-treatment facilities to process wastewater generated during the manufacturing process.
Because this anaerobic wastewater treatment uses fermentation biotechnology that does not require a power-consuming ventilation process, we can restrict CO_2 emissions associated with treatment. In addition, this technology lets us to recover biogas comprising mostly of methane gas. This biogas is a renewable energy source derived from organic substances such as brewer's grain, and is collected from our anaerobic wastewater-treatment facilities to operate a biogas boiler or a cogeneration system. By so doing, we reduce CO_2 emissions generated when burning fuel.

Cogeneration system using biogas

The system allows us to obtain different types of energy while using a single unit.



Wind Power Generation

Kirin has sponsored the Yokohama City Wind Power Generation Project, which uses the Green Power Certification System, as a Y (Yokohama)-Green Partner since 2007, and has supported the promotion of the use of natural energy. The electricity generated by this project has, to date, been used in the Kirin Group headquarters communication space, Kokoniwa, the SPRING VALLEY BREWERY TOKYO, and the WWF-organized Earth Hour.

Using solar power generation

Kirin Brewery, Kirin Beverage, Kyowa Hakko Kirin, and Koiwai Dairy Products have installed solar power generation facilities for use in plant tour facilities and other areas. In 2016, thin film solar cells were installed at Kirin Brewery's Yokohama Plant, as part of Kanagawa Prefecture's project to promote the widespread penetration of thin film solar cells.
At Kyowa Hakko Bio and Shinshu Beverage, we lease out parts of the property and roofs of manufacturing buildings to large-scale solar power generation facility-operating companies, in order to make effective use of in-house assets and to promote the penetration of natural energy.

Cooperation with government global warming strategies

Since 2014, the Kirin Group has endorsed the Japanese government's climate change campaigns, Fun to Share and COOL CHOICE, and has participated in their activities.

COOL CHOICE 未来のために、いま選ぼう。

Fun to Share みんなの知恵で、低炭素社会へ。

Kirin has also obtained certification as an "Eco-First Company." In the Eco-First Program, companies commit to their own environmental conservation initiatives, and the Minister of the Environment certifies them as companies that are conducting "progressive, original, and industry-leading activities." Kirin also serves as the Deputy Chair of the Eco-First Promotion Council, whose members are Eco-First certified companies.

ECO FIRST

Reducing and Recycling Waste Materials

Social Issues

Attention to the circular economy is needed, along with proper treatment of waste

The proper treatment of waste materials remains an important social requirement in Japan. In overseas markets, attention also needs to be given to the littering of containers in the streets. Meanwhile, the circular economy being advocated calls for a move towards services and sharing in business, less food waste, and the development of durable products that are easy to repair. The expectation is for the reduction of the environmental burden and cost reductions across the entire value chain, uniting production, distribution, and sales.

Risks and Opportunities for Kirin

The risks of inappropriate treatment and the opportunities of reducing treatment costs

Already, the factories in Japan's Integrated Beverages Business have achieved a 100% recycling rate for the waste materials they generate, through the effective use of waste products and other efforts. The actual treatment of those waste materials is outsourced, making it important to manage outsourcing contractors to ensure that the waste materials are being treated appropriately. Also, in the management of controlled substances, the range of targeted substance is becoming broader and the regulations stricter. In response, the departments within the company charged with management of those substances are growing, and systems for the appropriate management and treatment of such substances need to be developed and/or maintained.

Targets

Maintain 100% recycling rate for industrial waste materials

(Kirin Brewery, Kirin Beverage, Kirin Distillery)

Reduce discharge of chemical substances

Reduce discharge of VOCs by half compared to 2003 levels in FY2020
(Kyowa Hakko Kirin Group)

Controll generation of product waste

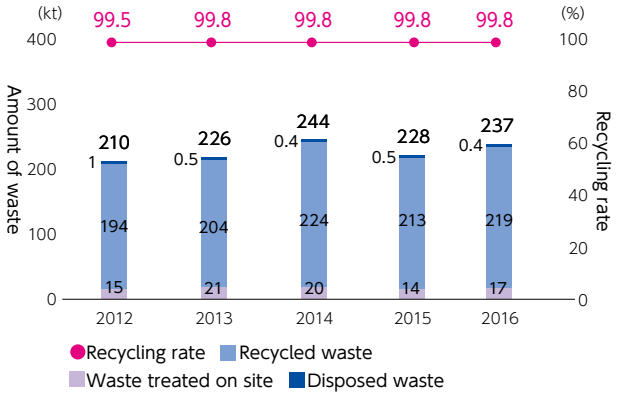
(Kirin Beverage)

Reducing and Recycling Waste Materials

Recycling rate

The Kirin Group works to minimize waste materials from its business operations and maintain a high recycling rate. Furthermore, at its main plants for its alcohol and soft drink businesses in Japan, which comprise a large share of its waste generation, the Group has achieved and maintained a 100% recycling rate.

By-products Recycling Rate and Wastes Associated with Domestic Business



Reducing losses from disposing of food products

Kirin Holdings participates in Japan TCGF, which was launched by companies in the consumer goods industry in August 2011, and pursues activities to resolve common issues in areas where they do not compete. For example, the Sustainability Project Committee identifies and aims to resolve environmental issues in the value chain of manufacturing, distribution, and sales processes (e.g., stop global warming, reduce wastes, etc.) Specifically, the Committee is working to change to labeling the year and month as the best before date for soft drinks. By so doing, we expect to see significant effects on cutting losses from disposing of products. Also, we can cut environmental loads on the supply chain (CO2 emissions from transporting between distribution centers and transport-related activities, etc.) and reduce inefficiencies (e.g., storage space in distribution warehouses and loading and unloading tasks at stores) as well, by changing how to manage product delivery, storage, and display in stores based on the new best-before labelling.

We also continue to exchange information on retail sales and demand fluctuation factors with plants and distribution centers to improve demand projections and reduce disposal losses. In addition, we will move forward with efforts to reduce disposal losses by strictly managing sales volume targets. Implementing these steps, we will prevent valuable biological resources and containers and packaging from going to waste.

Recycling spent grains from Beer Mashing as Livestock Feed (Kirin Brewery,Lion)

Production processes for beer and happo-shu (low-malt beer) generate spent grains after extracting flavor during the mashing process. Because such spent grains contain residues of nutritious substances, they are efficiently used as livestock feed for cattle or for growing mushrooms. When used as feed for cattle, these spent grains help improve the quality of beef.

The spent grain from brewing processes goes to farmers as animal feed, also the spent grain is used as input in making Vegemite as well as providing animal feed.

Effective use of spent grains to livestock feed

Proper management of waste materials

The Kirin Group has declared a goal of the thorough implementation and entrenchment of proper management of waste materials, and is working steadily toward that goal. To that end, it has established the Kirin Group Waste Management Guidelines and is pursuing the proper treatment of waste within a common framework across the Group.

International shipping of hazardous waste

The Kirin Group has no past record of the international shipping of hazardous waste.

Waste Reduction Initiative

Containers and Packaging Diet Declaration

In an endorsement of the "Containers and Packaging Diet Declaration" initiative being pursued by the four prefectural governments of Saitama, Chiba, Tokyo, and Kanagawa, and the five municipal governments of Yokohama, Kawasaki, Chiba, Saitama, and Sagamihara, Kirin Brewery, Kirin Beverage, and Mercian have made their own Containers and Packaging Diet Declarations and are taking action to reduce containers and packaging in their own companies. These three companies are also cooperating with the programs to cut back on the production of containers and packaging being pursued by these nine local governments.

Preventing Air, Water, and Soil Contamination

Preventing Air Pollution

The Kirin Group complies with all relevant laws and regulations relating to exhaust gases of automobiles, such as the Act on Special Measures to Total Emission Reduction of Nitrogen Oxides and Particulate Matters from Automobiles in Special Areas (NOx PM Act) and environmental regulations for the nine prefectures/ordinance-designated cities in the Kanto area (Tokyo, Kanagawa, Chiba, and Saitama Prefectures plus cities of Yokohama, Kawasaki, Sagamihara, Chiba, and Saitama). At Kirin Brewery, we adopt vehicles that comply with the NOx PM Act. We also use large trucks to increase load capacity per vehicle and reduce the total number of trucks. In addition, we have made a modal shift to using railroads for transporting goods and limiting the use of trucks to transport between the production plant and the departing station, and between the arrival station to the distribution site. Using railroad containers for transport, we prevent air pollution associated with transporting goods.

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 law.

Preventing Soil Contamination

When selling assets, the Kirin Group conducts thorough investigations of soil contamination, addressing them where necessary.

Soil Investigations Status (2016)

Number of investigations	Area of investigations
3	8,329m^2

Environmental management

System to Promote Environmental Stewardship

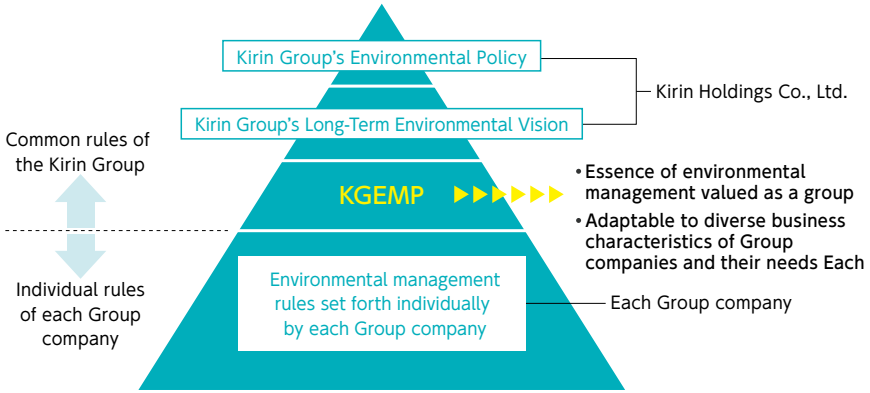
Group CSV Management Structure

The Kirin Group has established a Group CSV Committee to manage the discussions and progress of CSV policy and strategy, based on an understanding of the medium- to long-term risks and opportunities of the entire Group. The Group CSV Committee is chaired by the President & Chief Executive Officer of Kirin Holdings, with the presidents of the major regional headquarters and of the Japan Integrated Beverages Business companies making up its membership. It meets once a year as a general rule. As well as other CSV issues, the Committee also oversees the development of medium to long-term environment strategies and the confirmation of the progress of those strategies.

Kirin Group's Environmental Management System

The environmental management system requirements necessary for Kirin Group operating companies are embodied in the Principle for Kirin Group Global Environmental Management (KGEMP). Based on the KGEMP, each operating company has developed and operates its own environmental management system that best suits the nature of its business, the region it operates in, and other characteristics, to meet the objectives of environmental policies, the Kirin Group Long-term Environmental Vision, and the CSV commitments determined by the Group CSV Committee.
Each company has its own general environmental manager, who has responsibility and authority for environmental matters in that company's own business. In addition to monitoring to ensure that the company itself and its constituent companies are conducting their environmental activities appropriately, the general environmental manager conducts management reviews, identifies issues for improvement, and gives required directions to the relevant departments. In the event of an environmental crisis, the general environmental manager will have full authority to resolve the crisis.

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



Under its environmental management system, each company will strive to comply with legislation and other regulations relevant to the business's environmental activities, reduce its environmental footprint, and prevent pollution. They will also 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.
The opinions of stakeholders will be gathered in an appropriate manner, and the risks and opportunities surrounding the business's environmental activities identified and evaluated, to allow the required responses to be put into place from medium and long-term perspectives.

Environmental Risk Management System

Believing in the essential for risk prevention, the Kirin Group pursues risk management with a group-wide approach, including its overseas consolidated subsidiaries. Specifically, it strives for the definite implementation of risk management by identifying material risks for the Kirin Group as a whole and putting measures in place to address those risks, as well as reflecting the material risks of Group companies into the business plans of each company. Our environmental risk management is also addressed as part of this integrated approach to risk management.
In the event of a crisis, the Group Risk Management Committee will share information with each Group company and provide support for responding to the crisis. This is one aspect of the Group's system for appropriate responses to crises.
When any environmental risk becomes apparent, it will also be addressed with a similar system. Under the leadership of the executive officer in charge of risk, the relevant departments will work together without delay to share information, implement countermeasures, and prevent recurrence, and will also involve other departments. In these ways, we will work to verify and address the problem.

Compliance with Environmental Laws and Regulations

Each site is thorough in its management of its legal requirements through a ledger, and also works exhaustively to prevent environmental pollution by establishing voluntary management targets that are more stringent than those required by the legislation. A system for the reporting of environmental accidents has also been established within the Group, in which hiyari-hatto (near-miss) examples are shared within the Group and counter-measures extended to other sites. Internal environmental audits are used to confirm the status of legal compliance.
In Japan, to guarantee further transparency and independence, an outside consultant has been contracted to perform a strict environmental legal audit. Beginning in 2009, the consultant completed its first audit of all manufacturing sites in the Group companies in 2014. It has since embarked on a second round of audits, beginning in 2015, with several sites a year being audited. In addition to general environmental laws and regulations, these audits also examine in detail the status of compliance with local ordinances of the regions in which each site is located, agreements with those regions, and other requirements. With two or three sites selected for audit each year, it will take several years to complete a full circuit of all sites. By adding the observations of a neutral third party to the Group's internal audits and other means of investigating the status of legal compliance, we aim to establish a thorough system for legal compliance. The issues identified in this year's audits were all minor ones.

Environmental Management Methods Integrated with Company Management

In Japan, environment-related processes are controlled by a strategic management system called KISMAP. KISMAP is the Kirin Group's own management system that uses a balance score card to develop strategies and manage targets from four perspectives – financial, customer, process, and learning and growth. Because many of the company management's environment-related issues are closely related to the business, strategy development and target management for the environment are integrated with that of other company management issues through the use of KISMAP.
In the operating companies of other regions as well, environmental issues are being addressed in an integrated manner with company management processes, in a manner suited to their respective regions.

Environmental Performance Evaluation System

In Japan, environmental performance evaluation is incorporated into the implementation of the Kirin Group's own balance score card, KISMAP. KISMAP goals are reflected in the goal-setting for each organization and individual, and the performances of the organizations and individuals are evaluated according to the degree to which they achieved those goals.
In the operating companies of other regions as well, the environmental performance of organizations and individuals is evaluated in a manner suited to their respective regions.

Internal Commendation Scheme

Kirin Group Technical Award	Technical developers and researchers who display remarkable creativity and ingenuity are selected from among the Kirin Group's latest research and technological development outcomes to be provided with incentives. The aim of this scheme is to elevate the Group's technological development capabilities.

Environmental Auditing System

Each of the business companies in the Kirin Group complies with ISO 14001 and other environmental management system standards.
Internal auditing is conducted in each office and constituent company, and the environmental management divisions in the head offices of each group company conduct auditing on offices and constituent companies. This has led to improvements in each company's environmental management system.
Furthermore, environmental audits are conducted in each group company by the Kirin Holdings group environmental manager, and this is both reported to the group environmental officer and included in the management review.

Environmental Education

In the belief that accurate understanding of environmental risk is vital to the reduction of those risks, the Kirin Group has an ongoing program for environmental training for its employees.
This structured environmental training consists of training for environmental managers and training by job grade, including new employees. The training conducted at the Technical Talent Development Center has also been opened to Kirin Group companies in Japan.

Scenery of environmental training

Raising Environmental Awareness within the Company

In-house communications, specifically employee newsletters and the Intranet, are used to expand the depth and breadth of interest in and understanding of the environment among Kirin Group employees. At Group headquarters, videos presenting Kirin's environmental initiatives are screened on digital signage to deepen understanding among employees.

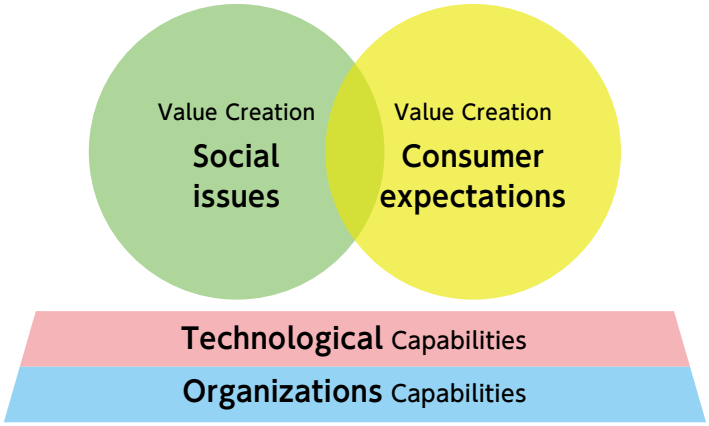
Employee newsletters "KIRIN CSV TIMES"

Corporate Policy

Corporate Philosophy

The Kirin Group - Focused on people, nature and craftsmanship
to redefine the joy of food and well-being

“New Kirin Group Vision 2021” (New KV2021)

Corporate philosophy	The Kirin Group - Focused on people, nature and craftsmanship to redefine the joy of food and well-being
2021 Vision	Co-achieve sustainable growth with our societies by realizing value creation, addressing social issues and understanding consumer expectations via the core businesses* of the Kirin group * alcoholic beverages, non-alcoholic beverages, pharmaceuticals and biochemicals
Outcomes	Creation of Economic Value and Social Value
Strategic framework(=Kirin Group's unique CSV)	
“One Kirin” Values	“Passion and Integrity”

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

Two main concepts are:

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

Kirin Group Long-Term Environmental Vision

Kirin Group Long-Term Environmental Vision	The Kirin Group shares with all the people associated with its value chain its aspiration to continue to enjoy the bounty of nature and pass it down to the generations to come.
Our direction	**Realization of society that is based on 100% recycling** The Kirin Group will use resources in a cyclical manner, so as to keep their use at or below the level that the Earth can replenish them, while reducing the environmental loads that the Kirin Group generates through its value chain.
The Four Target Areas of the Kirin Group	●Biological Resources : Work toward sustainable use of biological resources by 2050 ●Water Resources : We make sustainable use of water together with our communities by 2050. ●Containers and Packaging : Work toward sustainable use of packaging and containers by 2050 ●Global Warming : We keep the CO_2 emissions of the value chain within the Earth's natural CO_2 absorption ability in cooperation with all the people associated with our value chain.
Our efforts	We will share responsibilities in the implementation of activities, working in cooperation with non-governmental organizations and industry groups, maintaining close communication with a wide range of stakeholders.

Our CSV Commitment

The Environment

Reflecting environmental activities in our business strategies

Our Commitment

We will work to further reduce GHG emissions through various initiatives including the introduction of renewable energy.

Our Commitment

We will reduce water usage in production activities, and continuously preserve water sources.

Our Commitment

We will protect the natural environment and preserve the ecosystems surrounding our business sites as well as areas rich in raw materials.

Our Commitment

We will continue to reduce the weight of containers and packaging, and rely less on non-renewable resources and increase the sustainability of materials.

Community Engagement

Enhancing sustainability of the supply chain

Our Commitment

We will work on improving the quality and stable procurement of Japanese hops and brew unique beers that can only be made by using Japanese hops, while contributing to the revitalization of key producing areas. (Kirin Brewery)

Our Commitment

We will drive development of Japanese wines to ensure global recognition, and contribute to revitalizing key producing areas and local communities that are the foundations of growing grapes and making wines. (Mercian)

Our Commitment

We will support Sri Lankan black tea farmers through long-term initiatives such as facilitating the acquisition of Rainforest Alliance certification, and expand the use of certified tea leaves. (Kirin Beverage)

Our Commitment

We will continue to develop long-term, sustainable and mutually beneficial partnerships with our dairy farmers that build a profitable demand for dairy and ensure sustainable returns and the creation of value through the supply chain. (Lion)

Regional revitalization through business activities

Our Commitment

We will develop products and services that energize local communities, with each of our business sites cooperating with local stakeholders.

Health and Well-being

A Responsible Alcohol Producer

Education in appropriate drinking and nurturing a positive drinking culture

Our Commitment

We will work towards eradicating the harmful use of alcohol, consistent with regional challenges.
We will work to develop no-and lower-alcohol products in each category and improve consumer acceptance of these products.

Safety and security of our products

Our Commitment

We will establish a hygiene management system for the production process based on global standards* and continue to work on improving product safety. Also, we will enhance communication related to quality in order to build trust and increase a sense of security among our customers.

Supporting self-care for healthy people and people with pre-disease

Our Commitment

We will help consumers manage their daily energy (calories/kilojoules) and nutrient intake through providing a balanced portfolio of products and information - helping them address major noncommunicable diseases, including obesity.

Our Commitment

We will contribute to enhancing customers' quality of life throughout their lifetime, and strive to create revolutionary products, services, and new businesses.

Health-oriented business management

Our Commitment

As a company that delivers products and services contributing to consumer health, we will create an environment and opportunity for our employees to proactively improve their own health.

Our Commitment

We will address any mental health issues facing our employees and work to prevent lifestyle-related diseases. Also, as a member of the alcohol beverage industry, we will promote responsible drinking that encourages employees to be role models for society.

Evolution in medical treatment

Our Commitment

We will continuously discover innovative drugs and expand our commercialization activities globally. (Kyowa Hakko Kirin)

Our Commitment

By providing inexpensive, high quality biosimilars and "Authorized versions" of biologics, we will contribute to the further use of biomedicines and to solving a global issue, increases in healthcare spending. (Kyowa Hakko Kirin)

*HACCP: Hazard Analysis and Critical Control Point

Risks and Opportunities related to Environmental issues

Biological Resources

Target items	Context and Issues	Risks and Opportunities	Management Objectives	Approaches
Tea leaves (beverage business)	●*Kirin Gogo-no-Kocha* is the top brand of bottled tea beverages (for 30 years since launch) ●Kirin uses approximately 1/3 of the tea leaves imported into Japan from Sri Lanka ●Sri Lanka has been severely impacted by climate change, including torrential rain and drought	●Tea leaves determine the flavor and aroma of the product directly, so there are no alternative sources ●Sri Lanka has many large-scale tea estates, making it relatively easy to specify suppliers	●Assist Sri Lankan tea estates to obtain Rainforest Alliance certification ●Expand use of certified tea leaves	●Regular visits to tea estates, identification of issues and needs ●Improvement of environment for people living on the tea estates
Domestic hops (beer business)	●Aging of hops farmers ●Decline in Japan's hops production (1/3 of peak production) ●Possibility of Tono's hops fields disappearing within next ten years	●Risk of becoming unable to use Japan's distinctive hops ●Distinctive hops are needed for craft beers, etc.	●Ensure biodiversity of hops fields	●Scientific investigation by experts ●Initiatives to enhance the natural environment, with participation by employees
Domestic grapes (wine business)	●Need for new vineyards in response to Japan's wine boom ●Expectations of eco-friendly grape production	●Impact on natural environment of conversion of idle farming land into vineyards ●Expectations of locals and consumers towards eco-friendly grape production	●Ensure biodiversity of vineyards	●Joint research with Institute for Agro-Environment Sciences, NARO ●Initiatives to enhance the natural environment, with participation by employees
Paper (all businesses)	●Integrated Beverages Business uses massive quantities of paper containers and packaging ●Visualization of value chain upstream	●Reliability of supplier surveys ●Increase in suppliers capable of supplying FSC®-certified paper in Japan	●100% use of FSC-certified or recycled paper for office paper	●Expand suppliers of FSC-certified paper ●Establish and operate consortium with other companies and NGOs
Palm oil (dairy products business)	●Impact of questionable logging in tropical rainforests	●Only an extremely small quantity is used ●Reputation risk from inappropriate handling	●Handle all quantities of primary and secondary use through RSPO-approved Book & Claim model	●Ongoing activities toward the objective

Water Resources

Target Items	Context and Issues	Risks and Opportunities	Management Objectives	Approaches
Water sources	●Fewer people to look after forests, means many forests are abandoned	●Risks to stable supply of precious water resources	●Continuation of forest activities in water source areas by all breweries and beverage plants	●Provide local residents with opportunities to participate
Manufacturing processes	●More water needs to be used to clean plant tanks and pipes than in the products themselves	●Cost reductions from reductions in water use ●Increase in energy used for sophisticated water treatment	●30% reduction compared to 2015 levels by 2030 (Kyowa Hakko Kirin)	●More advanced water conservation efforts in regions of high water risk ●Water conservation efforts balanced with energy use in regions of low water risk
Wastewater	●River pollution	●Legal risks	●Legal compliance	●Establish voluntary regulations of higher level than legal requirements

Containers and Packaging

Target Items	Context and Issues	Risks and Opportunities	Management Objectives	Approaches
Paper containers	●Large quantities of paper containers used not only as primary containers but also as secondary containers ●Possibility that paper coming into Japan includes some associated with questionable logging	●Reputation risk in event of use of paper containers associated with questionable logging	●Use only FSC®-certified paper for 6-can packs by 2017 and for gift boxes, drink boxes, and cardboard cartons by the end of 2020	●Expand suppliers of FSC-certified paper ●Establish and operate consortium with other companies and NGOs
PET bottles	●Raw materials are derived from petroleum; concerns about resource depletion and global warming ●Difficulties in obtaining recycled PET material	●Possibility that recycled PET material costs could become a major burden, depending on market conditions ●Consideration of ease of use in the event of weight reductions	●Continue use of recycled PET materials in PET bottles	●Ongoing pursuit of weight reduction in consideration of ease of use ●PR activities to increase the availability of recycled PET materials
Cans	●The environmental footprint of aluminum cans is relatively large through its entire life cycle	●Risk of increase in Scope 3 emissions	●Continual weight reductions	●Weight reduction in consideration of ease of use ●Continued recycling of cans with cooperation of industry and many stakeholders
Glass bottles	●Heavy items strain transporters ●Maintenance of returnable mechanisms amidst decline in use of returnable bottles	●Reduce burden to ensure workforce sustainability ●Dilution of society's understanding about reuse mechanisms	●Introduction/shift to returnable mid-sized bottles (complete shift within ten years)	●Continue returnable bottle system with cooperation of industry and many stakeholders

Global Warming

Target Items	Context and Issues	Risks & Opportunities	Management Objectives	Approaches
Manufacturing	●Decline in energy efficiency due to increasingly high mix of products ●Possibility that energy conservation measures alone will be insufficient to meet targets	●Possibility of tighter regulations ●Possibility that, with Paris Agreement, etc., CO_2 emissions reductions and use of renewable energy will become easier in society overall ●Costs and technical risks of adopting low-carbon technologies ●Suspension of operations due to physical risks such as climate change-induced typhoon and floods	●30% reduction compared to 2015 figures for total of Scope 1 and Scope 2 by 2030 ●Continued pursuit of energy conservation activities	●Energy conservation activities ●Production of road map for achieving 2030 reduction targets ●Conduct water risk assessments at manufacturing sites
Logistics	●Amidst concentration of manufacturing bases, long-distance truck haulage is increasing ●Decline in number of drivers to carry out this work	●Possibility that transport itself could become difficult ●Possibility of contributing to reductions in CO_2 emissions and costs by sharing freight with other companies	●Pursue joint freight with other companies in same industry ●Continue with domestic bottling of imported wine	●Modal shift ●Collaboration with competitors
Sales	●Vending machines operating 24 hours	●Criticism of vending machines left on 24 hours a day at times of disaster	●Continue with introduction of energy-saving vending machines	●Vending machine energy conservation measures in collaboration with machine manufacturers
Value chain	●Scope 3 CO_2 emissions are approximately 5 times the total of Scope 1 and Scope 2 ●Difficulty in exerting influence	●Difficulty in limiting global warming to under 2° C if CO_2 emissions in value chain are not reduced ●Poor harvests and increased costs due to impact of climate change on regions where raw materials and ingredients are produced	●Reduce CO_2 emissions in entire value chain to half of 1990 figures by 2050. ●Reduction of 30% compared to 2015 figures by 2030 in Scope 3	●In-house manufacture of PET bottles, sea freight, etc. ●Seek cooperation of suppliers ●Support production regions with adapting to climate change
Renewable energy	●Limited options for renewable energy under current circumstances	●Possibility of not being able to introduce renewable energy at reasonable cost when it becomes necessary	●Proactive introduction of renewable energy (develop roadmap for introduction)	●Waste water treatment biomass generation ●Use of power derived from hydro-electric power generation ●Use of green power, including purchasing certificates

Policy for 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.

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.

Kirin Group Action Plan for the Sustainable Use of Biological Resources

Established on February 2013
Revised on February 2017

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 HCVF (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.

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

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.

Environmentally Conscious Product Development

Environmentally Conscious Designs for Containers and Packaging

In order to further step up conservation of resources and promote activities toward reducing environmental impact, the Kirin Group operates on its "Guidelines on Environmentally Conscious Design for Containers and Packaging." Established originally by Kirin Brewery in 1998, the Guidelines have been widely applied to the entire Japan Integrated Beverages Business since 2014. With the cooperation of our business partners, we continue to make efforts in developing containers and packaging that have minimal impact on the natural environment.

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.

Revised on November 18, 2014

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.

* LCA (Life Cycle Assessment) is a method of making a comprehensive analysis and assessment of environmental impacts associated with all stages of a product's life cycle from cradle to grave, i.e. from raw material extraction through to manufacturing, distribution and disposal.

Responsible Care

Kyowa Hakko Kirin has participated in Responsible Care. In all process with each company handling chemicals, throughout development, manufacture, distribution, use, and final consumption, global chemical industry work together to improve "environment, safety and health" voluntarily, and is carrying out activity which releases results of activities and performs dialog and communication with society. This activity is called the Responsible Care.

Environmental consideration in procurement of raw materials / packaging

Kirin Group Procurement Basic Policy

When applying the Kirin Group's management philosophy by providing customers with safe and reliable products and services with clear value propositions, the Kirin Group is committed to fair and open procurement with the support and cooperation of our suppliers.

1. Steady focus on quality

1) In procurement practices, we place a high priority on pursuing quality and safety in accordance with the "Kirin Group Basic Policy on Quality," while also taking costs into account.
2) We welcome new ideas and technical solutions for increasing customer value from suppliers.

2. Fair and open business dealings

1) We select suppliers based on their performance in quality (Q), cost (C), delivery (D), reliable supply, CSR efforts, technological expertise, ability to propose innovative ideas, etc.
2) We use a competitive bidding and selection process for procurement to ensure fairness to all suppliers.

3. Ensuring regulatory and ethical compliance

1) We observe social norms and the letter and spirit of laws and regulations, and conduct business in a sensible and socially responsible manner.
2) No Kirin Group employee engaged in procurement practices shall have personal conflicts of interest with any supplier. Employees shall not receive from any supplier rewards or gifts, regardless of value. They shall not force any supplier to make donations to the Group or to buy products and services from the Group. They shall not impose a reciprocal business arrangement with any supplier.

4. Environmental stewardship

1) We observe environmental laws, regulations, and ordinances, voluntary industry standards for the environment, and our own voluntary standards to help society maintain a harmonious coexistence with nature.
2) We conduct environmentally sensible, nonpolluting procurement practices in accordance with the Kirin Group's Environmental Policy.

5. Coevolving relationships of mutual trust with suppliers

1) We strive to establish long-term, coevolving relationships of trust with suppliers. We work with suppliers to manage and avoid risks to minimize their impacts on society and the Kirin Group's business.
2) We take the utmost care when managing personal information and confidential business information provided to us by suppliers, and do not disclose them to internal or external parties without the explicit approval of the original suppliers of such information.

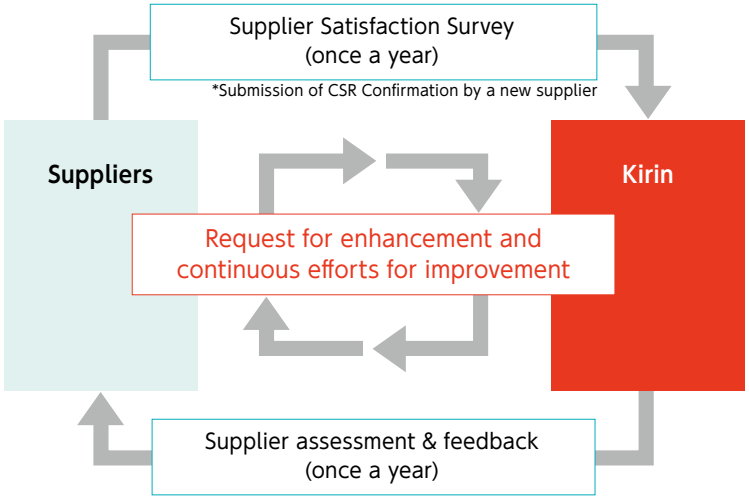
Updated in February 2012

Environment-related categories within the large categories for compliance with the Kirin Group Supplier CSR Guidelines

1. Environmental management activities
2. Low-carbon society approaches
3. Conservation of biodiversity
4. Effective use of resources
5. Management of chemicals and prevention of pollution

Activities to Promote CSR Procurement

Within the Kirin Group, we promote CSR procurement by actively communicating with suppliers. Each time we start business transactions with a new supplier, we ask the supplier to submit a supplier "CSR Confirmation" based on the six categories of the code of conduct stipulated in the "Kirin Group Supplier CSR Guidelines." With regard to existing suppliers, we incorporate CSR issues into the supplier assessment we conduct annually for all suppliers, and check their CSR activities through on-site inspections conducted by our procurement staff. We then provide feedback from the investigation results to suppliers and, if necessary, request them to enhance their CSR activities or conduct additional investigations.
Furthermore, to execute fair business practices, we periodically conduct a supplier questionnaire survey to seek feedback from suppliers to the Kirin Group. We make sure to reflect the comments received on our procurement activities to execute open and fair business transactions and ensure compliance.
It is through a series of these activities that constitute a PDCA cycle that we continue to work closely with suppliers in promoting CSR procurement.



External Assurance

The Kirin Group has received independent assurance to ensure the reliability and transparency of information disclosed. In 2016, the Kirin Group engaged an independent third-party to provide assurance on the amount of CO_2 emissions in Scopes 1 and 2 from the entire Kirin Group and in Scope 3 from the Japan Integrated Beverages Business. The external assurance report is shown on P70.

CO_2 Emissions in Scopes 1 and 2 in 2016 from the Kirin Group*1

(tCO2e/year)

Scope1	Scope2
493,830	634,131

CO_2 Emissions in Scope 3 in 2016 from the Kirin Group's Japan Integrated Beverages Business*2

(tCO2e/year)

Upstream/Downstream		Categories of Scope 3	Emissions	Remarks
Upstream	1	Purchased goods and services	1,769,731	Calculated by multiplying the purchase volume of raw materials by the CO_2 emission factor for producing each type of raw material
	2	Capital goods	-	Not calculated
	3	Fuel- and energy-related activities (not included in Scope 1 or Scope 2)	50,285	Calculated by multiplying the purchase volume of fuel or electricity by the CO_2 emission factor for each energy type
	4	Upstream transportation and distribution	337,104	Calculated by multiplying the shipment volume of products as shipper and the purchase volume of raw materials by the distance of transport by the CO_2 emission factor for each means of transport (the amount of CO_2 emissions based on the shipment volume of products as shipper is calculated using FY2015 data)
	5	Waste generated in operations	10,091	Calculated by multiplying the amount of waste disposed of by the CO_2 emission factor for each disposal method
	6	Business travel	1,901	Calculated by multiplying the number of employees by the average annual distance of travel by the CO_2 emission factor for each means of travel
	7	Employee commuting	5,402	Calculated by multiplying the number of employees by the average annual distance of travel by the CO_2 emission factor for each means of travel
	8	Upstream leased assets	-	Included in Scopes 1 & 2
Downstream	9	Downstream transportation and distribution	712,283	Customer: Calculated by multiplying the product sales volume by the CO_2 emission factor for selling products for each sales method Vending machine: 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	21,751	Calculated by multiplying the product sales volume by the estimated power consumption per product unit amount in homes by the CO_2 emission factor for electricity
	12	End-of-life treatment of sold products	56,021	Calculated by multiplying the amount of containers and packaging disposed of by the CO_2 emission factor for each type of container and packaging
	13	Downstream leased assets	-	Not applicable
	14	Franchises	-	Not applicable
	15	Investments	-	Not applicable
Total			2,964,570	

*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. Brasil Kirin calculates emissions according to the calculation standards set by the Brazilian government.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 CO_2 emissions coefficient published by the individual power utilities (or, if there are no published figures, by the country-specific emission coefficients published by the IEA).
- GHG emissions include the GHG emissions from sold electricity.

*2 Companies included in calculations: Kirin Brewery, Kirin Distillery, Kirin Group Logistics, Kirin Beverage, Kirin Chilled Beverage, Shinshu Beverage, Mercian, Daiichi Alcohol, Kirin

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 CO_2 emissions in Scopes 1 and 2 from the entire Kirin Group and those in Scope 3 from the Japan Integrated Beverages Business for the period from January 1, 2016 to December 31, 2016 (the "Indicators") disclosed in the Kirin Group Environmental Report 2017 (the "Report") for the year ended December 31, 2016.

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 'International Standard on Assurance Engagements (ISAE) 3000, Assurance Engagements other than Audits or Reviews of Historical Financial Information', 'ISAE 3410, Assurance Engagements on Greenhouse Gas Statements', issued by the International Auditing and Assurance Standards Board, and the 'Practical Guidelines for the Assurance of Sustainability Information' of the Japanese Association of Assurance Organizations for Sustainability Information. 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 with the Company's responsible personnel to obtain an understanding of its policy for the preparation of 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 reviews of 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 also recalculating the Indicators.
- Visiting to the Yamaguchi Production Center Hofu of Kyowa Hakko Bio Co., Ltd. and the Headquarters Plant of Brasil Kirin selected on the basis of a risk analysis.
- Evaluating the overall statement in which the Indicators are expressed.

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
August 21, 2017

KIRIN

Contact Us

http://www.kirinholdings.co.jp/english/customer/