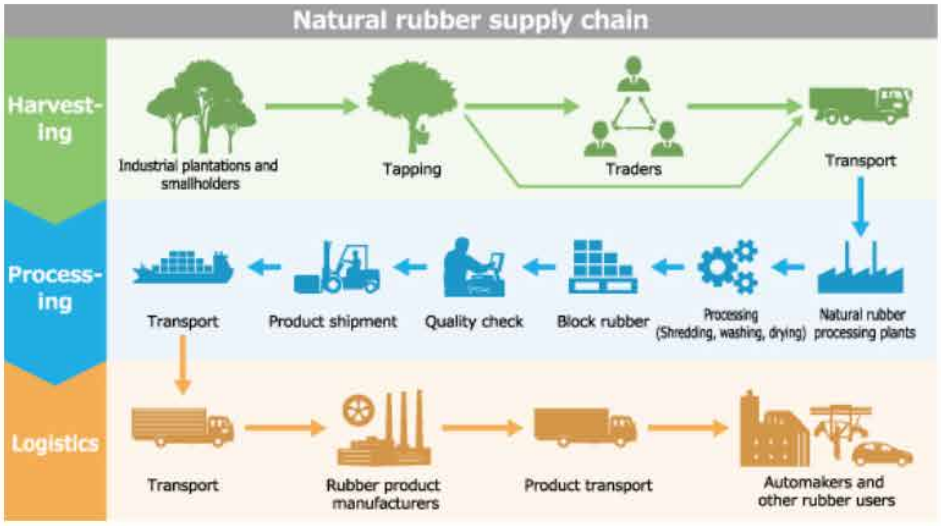
The Earth

Measures aimed at realizing stable, sustainable procurement of natural rubber

Working to make natural rubber a sustainable resource

Being able to procure natural rubber in a stable, sustainable manner is vitally important in order for Yokohama Rubber to be able to continue supplying our tires and other products to customers over the long term. In recent years, there has been a steady rise in demand for natural rubber ? which is the main raw material used in tire manufacturing ? because of the increasing global population and developments in the mobility sector. At the same time, there are growing concerns about illegal logging, land grabbing and human rights abuse, as well as about the negative impact that forest destruction and illegal logging have on biodiversity.
Recognizing our corporate social responsibility as a tire and rubber manufacturer, in 2017 Yokohama Rubber announced its support for the goals of the Sustainable Natural Rubber Initiative (SNR-i) advocated by the International Rubber Study Group (IRSG), and began participating in SNR-i activities. Yokohama Rubber is also a founding member of the Global Platform for Sustainable Natural Rubber (GPSNR), initiated by the Tire Industry Project (TIP) of the World Business Council for Sustainable Development (WBCSD), and in October 2018 Yokohama Rubber formulated its own Procurement Policy for the Sustainable Natural Rubber.



Natural rubber supply chain

Yokohama Rubber will share this policy across the entire supply chain with the aim of achieving sustainable natural rubber.

Formulation of Yokohama Rubber's Procurement Policy for the Sustainable Natural Rubber

The Procurement Policy for the Sustainable Natural Rubber specifies matters relating to the establishment of traceability and matters relating to human rights, labor, environmental protection etc., including both items to be undertaken by the Yokohama Rubber Group and items that suppliers will be requested to perform. The Yokohama Rubber Group is also undertaking a number of independent initiatives in this area, including an agro-forestry initiative by Yokohama Rubber subsidiary Y. T. Rubber Co., Ltd. (YTRC) to foster the adoption of sustainable agro-forestry techniques by farmers living in the vicinity of YTRC facilities, and projects utilizing the knowhow that Yokohama Rubber has accumulated through the implementation of the Yokohama Forever Forest initiative.

› Fair Operating Practices

Overview of the Procurement Policy for Sustainable Natural Rubber

Enhancing traceability

- Prohibition of child labor and forced labor
- Protection of high carbon stock (HCS) areas (eliminating forest destruction)
- No development of peatlands
- Consideration for biodiversity
- Abiding by the principle of free, prior and informed consent (FPIC) in regard to land rights

Yokohama Rubber's future initiatives

The Yokohama Rubber Group has launched a number of innovative activities aimed at realizing the sustainability of natural rubber. In Thailand, which is a major producing country of natural rubber, we have been undertaking joint research on natural rubber with several local universities since 2013, and we have also held Suppliers' Day meetings with natural rubber suppliers.
Y. T. Rubber Co., Ltd. (YTRC), a natural rubber processing plant operator which is a member of the Yokohama Rubber Group, has adopted a cyclic water purification system that recycles the water used in the plant, and is making a concerted effort to safeguard the natural environment and maintain the trust of local residents.
In the future, we will be implementing activities based on the Procurement Policy for the Sustainable Natural Rubber together with all of our partners in the supply chain, aiming to take "Promoting CSR activities throughout the supply chain," which we have positioned as a key CSR issue, up to an even higher level.

Expectations from an international environmental NGO

Ms. Chiaki Furusawa,
Forests Programme,
WWF Japan

The world is still losing natural forests at a rate of 7.6 million hectares per year. One of the reasons for this situation is the expansion of agricultural and forestry production; the unsustainable use of forest resources results in damage to ecosystems and social conflict, and exacerbates the problem of climate change. Increasingly, companies involved in the procurement of raw materials that derive from natural resources are expected to verify the impact on the environment and on society, and to aim for more sustainable production and utilization. Natural rubber is no exception; there is a movement towards improving traceability of raw materials, and to minimize, as far as possible, the negative impact of plantation development and management. Particularly important developments in this regard include the establishment of the Global Platform for Sustainable Natural Rubber (GPSNR) in October 2018, and the formulation by many companies ? including Yokohama Rubber ? of their own procurement policies.
WWF believes that the first step towards implementing sustainable procurement is the formulation of a clear procurement policy, and that this has an important role to play not only in procurement-related decision-making, but also in regard to engagement with suppliers, investors, NGOs and other stakeholders. However, the pursuit of sustainable procurement is no easy task, and takes time to achieve. Having formulated its own procurement policy, Yokohama Rubber could be said to be on the start-line; in the future, WWF hope that Yokohama Rubber will continue to make steady progress in implementing this policy through collaboration with its own supply chain and with the GPSNR, etc.

TOPIC

Adoption of solar power generation (Yokohama Tire Philippines, Inc.)

The adoption of low-carbon energy sources is vitally important as a response to climate change. In the first half of fiscal 2019, Yokohama Tire Philippines, Inc. began adoption of a photovoltaic (PV) solar power generation system, utilizing the Joint Crediting Mechanism (JCM).
4,000kW (4MW) class solar panels have been installed on the roofs of Yokohama Tire Philippines' facility, in the locations that receive the most hours of sunshine, covering a total area of around 40,000m2. It is anticipated that, once the solar panels are fully operational, they will provide energy savings equivalent to a reduction in CO_2 emissions of around 2.8kt per year, reducing the Philippines factory's annual CO_2 emissions by approximately 3.5%.

Realizing a reduction in CO_2 emissions of around 3.5% once the solar panels are fully operational

The Environment ›

Message from the President Business and SDGs CSR Slogan "Caring for the Future" Basic Policy Message from a manager
Corporate Governance Products The Earth People Community Primary Initiative Progress Report Reference Table for GRI Guidelines
Data Summary Related Information on CSR Report Site Data CSR News YOKOHAMA The Forever Forest Project

The Environment

Stance

Currently, society faces various issues such as the depletion of natural resources, climate change, and the destruction of ecosystems, and all business activities have an impact on the environment. Furthermore, it is also a fact that changes in the environment can lead to major risks involving business continuity. For this reason Yokohama Rubber works to minimize its environmental footprint in all of its business processes. As part of these efforts, assessments are conducted with respect to global warming prevention, resource recycling, resource conservation, and safety and comfort in the design review process for new products, and we provide customers with environmentally friendly products.

This way of thinking, and these activities, have been clearly stated in the Yokohama Rubber Environmental Policy as declarations both inside and outside of the company of our position as a top-level environment-friendly company. In addition, the actions that should be taken by employees are stipulated in the Yokohama Rubber Group Action Guidelines.

Policy

Yokohama Rubber Basic Environmental Policy

Following the principle of dealing fairly with society and valuing harmony with the environment, we shall assert our world-class strengths in technologies for protecting the environment.

- Continued improvement of environmental management.
- Action to combat global warming.
- Contributing to the creation of a sustainable recycling society.

Yokohama Rubber Environmental Policy

Following the principle of dealing fairly with society and valuing harmony with the environment, we shall embody "Caring for the Future" for the global environment and assert our world-class strengths in technologies to protect it.

1. Under leadership of top management, Yokohama Rubber will globally initiate environmentally-conscious measures in all of its activities, and will put this into practice across its entire organization.
2. Yokohama Rubber will deepen communications with stakeholders and will strive to make contributions to local communities and to society as a whole.
3. Yokohama Rubber will strengthen its environmental management system and will aim to achieve zero environmental risk by continually striving to help improve the environment by using approaches to mitigate its impact with chemical substance management, prevent environmental pollution, and reduce sensory nuisances.
4. Yokohama Rubber will comply with all related laws, regulations, and agreements as well as endeavor to continually implement activities that help improve the environment.
5. Yokohama Rubber will strive to prevent global warming, conserve energy and resources as well as promote resource recycling, aiming at the fulfillment of a recycling-oriented and low-carbon society.
6. Yokohama Rubber will strive to conserve biological diversity and use biological resources sustainably in its business activities.
7. Yokohama Rubber will promote harmony with local communities as part of its commitment to work with and become a company that is trusted by local communities.
8. Yokohama Rubber shall publish this policy and make it known to all.

Yokohama Rubber Group Action Guidelines

We shall harmonize our activities with the global environment.

<Basic Stance of the Yokohama Rubber Group>

1. As members of a corporate group with the highest levels of contribution to the environment, we shall take up the challenge of environment-related issues and help to build a sustainable society.
2. We shall construct and operate mechanisms for companywide management in order to observe environmental laws and regulations in each host country and region.

<To practice our basic stance ? our action>

1. We shall observe all laws and regulations for prevention of air pollution, water pollution, soil contamination, etc.
2. In accordance with laws and regulations, we shall control environment-burdening substances, strive to reduce environmental risks deriving from them, and exclude prohibited chemical substances from our product manufacturing processes.
3. In all stages of our business activities, we shall eliminate the waste of resources and energy, and reduce emissions of CO_2 and other greenhouse gases.
4. In all stages of our business activities, we shall promote the reduction of industrial waste derivation and final disposal volumes.
5. In order to preserve biodiversity, we shall engage in various activities in accordance with our Guidelines on Biodiversity.

Message from a manager

With the aim of achieving harmony with the global environment in line with international agreements, and in order to achieve sustainable business management, the Yokohama Rubber Group is promoting the homogenization of global environmental management aimed at the realization of a low carbon society, the realization of a resource recycling oriented society, and the preservation of biological diversity. For the realization of a low carbon society, we deliver environmentally friendly products that are assessed through our new product design reviews to customers, and work to reduce greenhouse gas emissions (GHG) throughout the entire value chain in accordance with the medium to long-term targets. For the realization of a resource recycling oriented society, we have promoted the recycling of regenerated rubber and reduction of industrial waste, and all of our production bases achieved completely zero emissions. In regard to the preservation of biological diversity, we are conducting surveys and preservation activities in order to reduce water risks in environments near our domestic and overseas production bases as well as to help ensure the stable supply of natural rubber overseas.
Furthermore, we believe that the tree planting and seedling activities in local communities and disaster areas as part our Yokohama Forever Forest Project reflect our intent to work together with local communities in order to continue protecting our blue earth.
We will promote these activities in coordination with Group companies in locations including China, Asia, North America, and Europe.

Ichiro Yamamoto
General Manager,
Head of Environmental Protection Promotion Department, Corporate Social Responsibility Division

Vision for FY 2020

- We will maintain all of our products as environmentally friendly ones.
- 50% reduction in total GHG emissions compared to 2005 in the value chain by 2050.
- We will promote the effective use of water resources in line with the characteristics of water risks.
- We will implement biodiversity preservation activities at production bases.
- Plan 1.3 million trees under the YOKOHAMA Forever Forest Project by 2030
- Promote CSR procurement of resources including natural rubber, etc.
- Achieve zero environmental risks

Main action items to be addressed first

The following items have been established as the main action items that the Yokohama Rubber Group will address first in consideration of the level of impact of business activities and the level of social interest.

Energy ›
Water ›
Biodiversity ›
Effluent and waste ›
Emissions ›
Materials ›
Products and Services ›
Environmental Grievance Mechanisms ›

Data summary

The Environment (452 KB)

Energy

KPI

Item	FY 2017 results	FY 2018 results
Total energy consumption	(Consolidated) 1,353,082 MWh * Crude oil equivalent: 342,456 KL	(Consolidated) 1,333,451 MWh * Crude oil equivalent: 337,461 KL
Total external energy consumption * Reported as Scope 3 (Other emissions)	656,390,395 MWh	623,043,588 MWh

Responsible Departments ×

Each business location

※Activities are conducted by each business location, and the Global Warming Countermeasures Committee that the Environmental Protection Promotion Department serves as a secretariat for implements company-wide policy discussions and activities.

Stance and Target ×

Why is “Energy” a critical issue to be addressed? Explanation of the reason and background

The Yokohama Rubber Group, which conducts production activities in 13 countries (Japan, United States, the Philippines, China, Thailand, Russia, Vietnam, India, Taiwan, Indonesia, Italy, Mexico and Israel) around the world, uses a large volume of energy in each business process. Because the reduction of energy consumption will lead to a response to the issue of climate change that is a problem on a global scale, the effective use of resources that are becoming depleted, and cost reductions, we have selected energy as a critical issue to be addressed.

Policies and stance relating to energy

The Yokohama Rubber Group has embodied our stance towards the environment in the Yokohama Rubber Environmental Policy and will work to minimize the burden on the environment by the provision of products and services in accordance with the Yokohama Rubber Group Action Guidelines. To this end, we take steps to realize sustainable, appropriate energy use and reduction of energy consumption throughout the value chain, starting from the design and manufacturing stage, by developing and adopting environmentally friendly technologies and working closely with everyone involved in the provision of related products and services.
We will conduct activities in an aim for the appropriate use and reduction of energy in accordance with international agreements concerning the proper use of energy, the regulations of countries where we conduct business (such as Japan’s Act on the Rational Use of Energy and Act on Promotion of Global Warming Countermeasures), and the policies of related organizations.

Vision (attainment goal) / target

In line with our shared global goal of reducing greenhouse gases by half by 2050, the Group is working to reduce total greenhouse gas (GHG) emissions as an energy use reduction target.

- Long-term target:
  By 2050, reduce total CO_2 emissions throughout the entire value chain of the Group by at least 50% of total CO_2 emissions in the base year (fiscal 2005).
- Mid-term target:
  - At our domestic group companies, we will work towards reducing the ratio of greenhouse gas emissions by 25% compared to the base year (fiscal 1990) by fiscal 2020.
  - By 2030, reduce manufacturing-related CO_2 emissions per unit of net sales, including both Scope 1 and Scope 2 emissions within the Group and (through collaboration with our partner companies) manufacturing-related CO_2 emissions throughout the value chain, by at least 30% compared to the base year (2013).

Measures for vision achievement

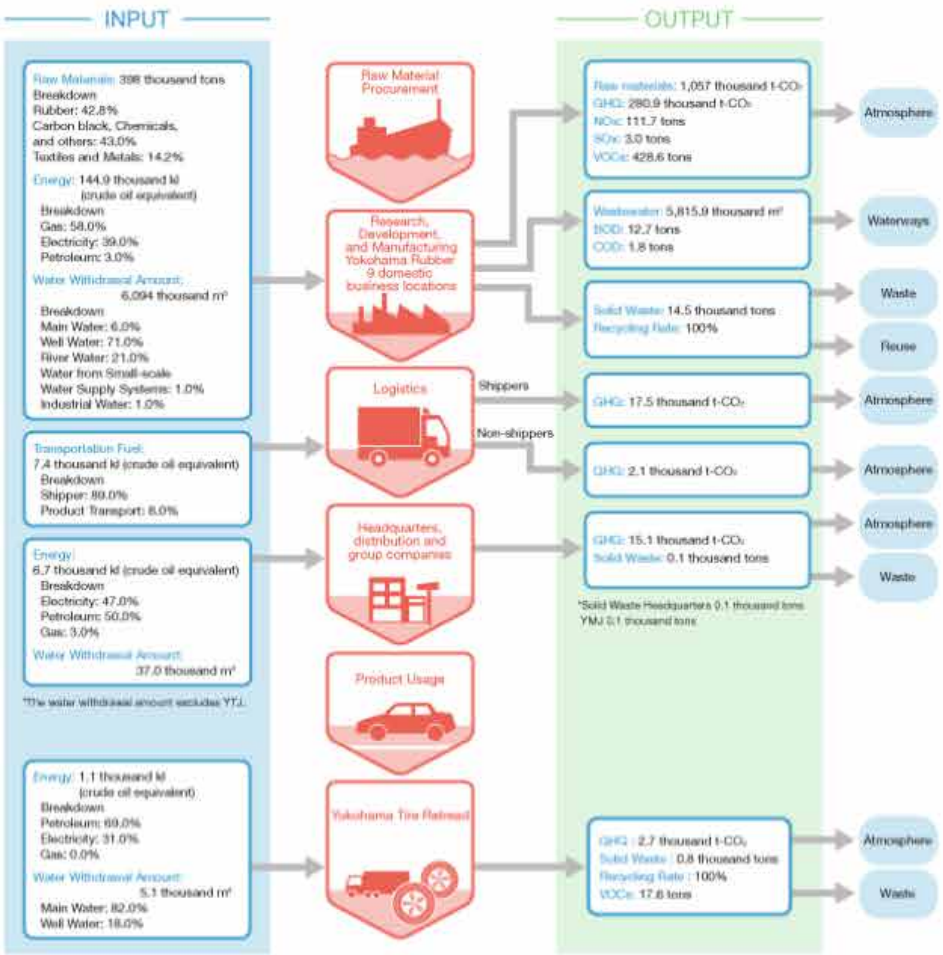
We will implement the following measures aimed at promoting the appropriate use and reduction of energy throughout overall business activities.

1. Promotion of a modal shift in logistics
2. Management of energy in production
   We will promote the effective use of energy through system improvements, savings improvements, process improvements, the development of management systems, the introduction of production systems, and the introduction of new energy (renewable energy) in the production process.
3. The Yokohama Group will establish seven energy-saving subcommittees under the supervision of the Global Warming Countermeasures Committee, and will promote energy reduction activities.
4. We will promote the development and sales of eco-products in order to reduce the amount of energy use when products are used.

Review of FY 2018 Activities ×

Domestic GHG emissions were reduced by 15% compared to fiscal year 2005 as a result of system improvements (the development of energy-efficient vulcanization systems, and utilization of cogeneration), savings improvements (expanded use of LED, improvements in capacity utilization), process improvements (optimization of the rubber kneading process), and the introduction of new energy (introduction of solar cell power generation systems).

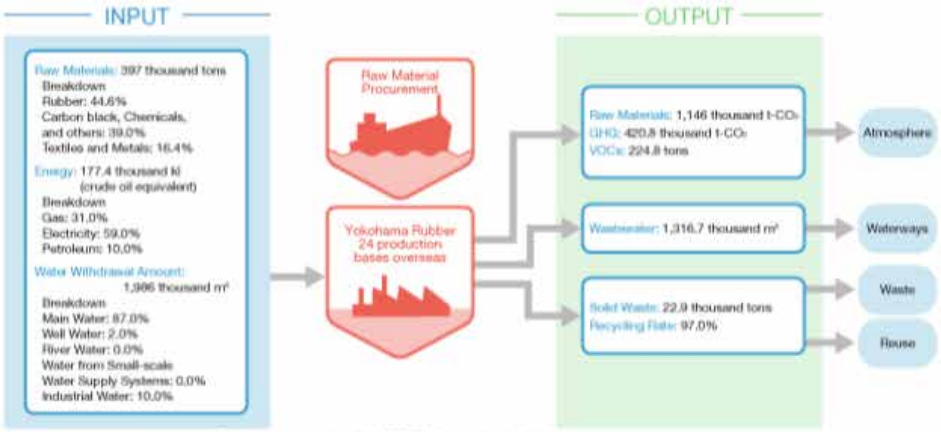
Overall picture of the environmental burden in Japan



* GHG emission is calculated based on the actual emission coefficient.

<Statistics Sources>
Research, Development, and Manufacturing: Yokohama Rubber 12 domestic sites
Headquarters and Distribution: Headquarters, tire and industrial goods distribution companies 70 sites
Retread Tires: Yokohama Tire Retread (YTR) 4 sites

Overall picture of the environmental burden overseas



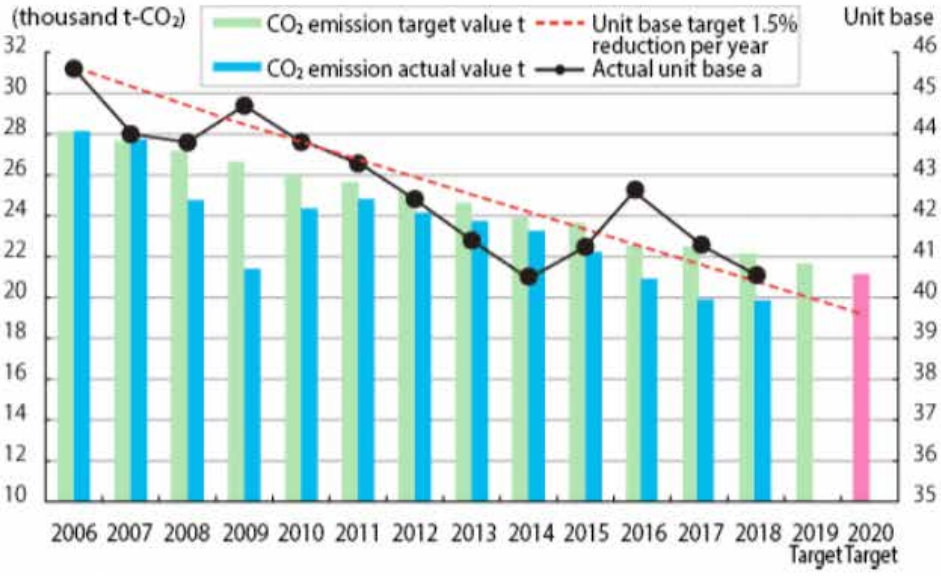
*The latest version of the GHG PROTOCOL applied for GHG emissions.

Introduction of Initiatives ×

Reduction of energy usage and CO_2

- Target: Reduce CO_2 emission by 25% by 2020 compared to the base year of 2006.
- Results: While there was overland transport due to natural disasters, a 2.0% reduction in CO_2 emissions to 19,592 tons was achieved over the previous fiscal year during fiscal year 2018 by reviewing transportation routes, reducing warehouse transportation volume and improving loading efficiency. On the other hand, emissions per unit improved by 1.5% at 40.7 KL per million ton-kilometers.

CO_2 emissions and emissions per unit of output (from 2006)



* Yokohama Rubber on a non-consolidated basis

Rail transport for Shinshiro to Kyushu shipments

Energy management

1. Use of in-house power generation
2. Control of peak demand through demand control equipment
3. Building and roof heat retention and insulation
4. Production equipment investment (improving the efficiency of air conditioners, motors and pumps, and decreasing compressed air pressure)

Energy consumption per unit was reduced through the efforts noted above.

Full Operation of Co-generation Systems

At tire plants that use a large volume of energy and steam, it is possible to achieve a significant reduction in CO_2 emissions through the adoption of co-generation systems that supply energy and steam at the same time. As of 2018, co-generation system had begun operation at three domestic plants. As a result of continuous 24-hour operations, 72% of the energy and nearly all of the steam used by these plants are now supplied by the co-generation systems, contributing to a reduction in CO_2 emissions and a reduction in peak electric power consumption and in the overall amount of power purchased from the electric company. This was also adopted at the Thai Plant.


Mie Plant co-generation system


Mishima Plant co-generation system


Shinshiro Plant co-generation system


Thai Plant co-generation system

Improving the efficiency of production equipment motors and pumps

We have upgraded production equipment motors and pumps that consume large volumes of energy to high-efficiency models, and also reviewed capacity to achieve major energy savings compared to previous equipment.


High-efficiency motor

Improving the efficiency of production equipment cooling-water pumps

We have upgraded the cooling-water pumps which play a vital role in supplying cooling-water for tire production facilities 24 hours a day with new, highly-efficient models, thereby reduced electric power consumption.

Cooling-water pump

Adoption of LED lights

We have replaced the overhead lighting (mercury lamps and fluorescent lamps) for our buildings in Japan and overseas with LED lights and high-efficiency ones, resulting in significant power reduction for lighting.

Mercury lighting → LED lighting

Solar power generation

We are proceeding with the installation of environmentally friendly, renewable solar power generation facilities.
The facilities were adopted also in plants in India and China (Suzhou) in fiscal year 2017, and in the Philippines in fiscal year 2019.

Solar power generation (Suzhou, China) installed capacity: 3,000 kw

Solar power generation (Hangzhou, China) installed capacity: 80 kw

Solar power generation (India) installed capacity: 200 kw

Solar power generation (Mie) installed capacity: 500 kw

Solar power generation (Philippines) installed capacity: 4,000 kw

Energy Saving Month activities

Based on the vision of "Connect everyone's wisdom and ingenuity, start winter energy saving on your own," we shared awareness of the significance energy saving to "strengthen corporate competitiveness through cost reductions, respond to fossil fuel depletion, reduce the burden on the global environment, and have corporate social responsibility," and made preparations for the practice; thereby during the energy-saving month of February, significant results were achieved through the accumulation of multiple small efforts, thanks to effective coordination between the production department, equipment maintenance department, and administration department at plants.

Education activities during the Energy Saving Month

Activities to strengthen energy management based on guidance from consultants.

We are strengthening energy guidance through means such as reductions in energy loss in line with production variation (switching equipment on and off), representing the adoption of a just-in-time system for energy.
Consultants provide guidance every year at business locations in Japan and overseas.

Provision of guidance by consultants

Issues and Future Improvement Measures

We will have reductions in total energy use as we plan to continue expanding the introduction of cogeneration systems. With the aim of increasing the renewable energy usage ratio, we plan to expand the introduction of solar power generation, etc. in order to increase the percentage of our business locations that use renewable energy.

Water

KPI

Item	FY 2017 results	FY 2018 results
Water intake	(Consolidated) 8,266 thousand m^3	(Consolidated) 8,102 thousand m^3
Percentage of recycled and reused water (Circulating water/water intake ratio)	(Consolidated) 141%	(Consolidated) 144%
Water sources significantly affected by water intake	(Consolidated) NA <Endangered species> There are endangered species in the Miya River (Mie), Kanogawa River (Mishima), and Kaname River (Hiratsuka) (red list of threatened species) <Intake of water from protected areas> Not applicable. There is no intake of water from protected areas.	(Consolidated) NA <Endangered species> There are endangered species in the Miya River (Mie), Kanogawa River (Mishima), and Kaname River (Hiratsuka) (red list of threatened species) <Intake of water from protected areas> Not applicable; there is no intake of water from protected areas.

Responsible Departments ×

Each business location

※Performance is managed by the Production Environmental Task Force.

Stance and Target ×

Why is “Water” a critical issue to be addressed? Explanation of the reason and background

Yokohama Rubber Group’s use of water consists of two forms: the use of water such as cooling water for boilers and production facilities at production bases (direct use) and the use of water at suppliers of raw materials etc. (indirect use). For direct use, the risks (physical, regulatory, reputation risk, etc.) vary depending on the region of each business location. For this reason, we believe that it is important to effectively use precious water resources in line with the characteristics of each production base.
In addition, for the indirect use of water in the production process for raw materials such as natural rubber as well, we believe that it is necessary to confirm the situation and take the appropriate responses as necessary. This is based on our stance that if it is not possible to procure raw materials due to water-related risks at suppliers, this could directly result in serious problems that affect our operations.

Water use policy

Our domestic bases have rich water resources, and while we use these resources effectively as a recycled resource*, there are areas with water use constraints among our overseas business locations. For this reason, it is necessary to conduct water risk assessments in these areas and work to ensure that water is properly managed. We also believe that it is necessary to confirm the state of water use at suppliers and work together to adopt countermeasures in the event of water risks arising.
For this reason, we decided on a policy after reviewing the situation from fiscal 2015 to 2017. Furthermore, we will broadly release updates on the progress of these measures through means such as external questionnaires (CDP’s water, etc.) and our website.

※We use water based on formal procedures such as agreements with regions (governments).

Water risk assessments

For many production base areas that use a lot of water, we use existing water risk assessment tools such as WRI's Aqueduct to confirm potential water risks. Existing tools and local information are used to make judgments on comprehensive water risks.
Based on these results, we identify the highest risks among representative water risks for each business location (physical, regulatory, reputation risk, etc.), and consider measures that should be taken, starting with the highest priority risks.

Vision (attainment goal) / target

We will promote 3R initiatives for water at all of our business sites, including in the supply chain, and in each community to strive to use water soundly and conserve water resources. As a result, we will contribute to an appropriate water cycle on a global scale.

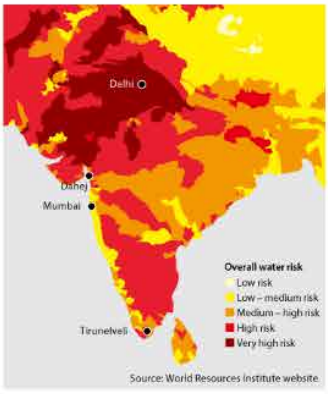
Measures for vision achievement

At domestic and overseas production bases, we conduct the following initiatives aimed at reducing water intake per unit of output by 1% year-on-year.

- Reinforce countermeasures for reducing water usage at sites with a high physical risk (water shortage)
- Thoroughly manage wastewater quality at sites with a high regulatory risk
- Enhancement of areas communication at sites with a high reputational risk

Review of FY 2018 Activities

A water risk assessment is conducted by incorporating local information with the results from WRI's Aqueduct existing water risk assessment tool to manage risks by country in the categories of water volume risk (India, the Philippines, Italy), water quality risk (Japan, US, Thailand, Vietnam, Russia, Taiwan), and water volume and water quality risk (China, Indonesia). Reduction of 1% over the previous fiscal year was set.



Level of water risk severity, based on World Resources Institute (WRI) data

- We completed a questionnaire relating to the CDP Water program and supply chain water usage once again in fiscal year 2018, and reported to suppliers.
- We have implemented the effective use of water at all business locations through continuous leakage prevention and improvements to equipment using recycled water. In particular, water closed systems have been introduced at many overseas production bases in response to physical (water shortage) risks.

Introduction of Initiatives

We have made capital investments at our Mie and Onomichi domestic production bases in leakage protection for facility pipes and recycled water use facilities.
As for our overseas production bases, we introduced a closed-loop system at the time of constructing our plant in India.
In Thailand and China, we collect rainwater and use it as cooling water and for restrooms.
In addition, water treatment facilities are being installed at all production bases to prevent deterioration in wastewater water quality.

Water treatment facilities at our production base in Italy

At our Nagano Plant, we recycle cooling water, etc., using a water recycling system.

Nagano-water recycling system

We are also conducting biodiversity conservation activities at Mie, Shinshiro, Mishima, and Ibaraki to investigate the impact on rivers that are water discharge sites.

Issues and Future Improvement Measures

A framework will be established for the assessment of global data on water use, and the following initiatives will be implemented.

- Formulation of Yokohama Rubber Group standards (guidelines) for the proper management of water
- Enhancing internal awareness of the water initiatives and the need for these initiatives
- Joint implementation of water initiatives throughout the supply chain

Biodiversity

KPI

Item	FY 2017 results	FY 2018 results
Implementation rate of biodiversity conservation activities for ecosystems near production facilities	(Consolidated) 50% (10 domestic business locations, and 7 overseas locations)	(Consolidated) 58% (10 domestic business locations, and 9 overseas locations)
Biodiversity in each area, and impact	Yokohama Tire Retread Co., Ltd. (YTRH) Vicinity of Lake Utonai	Yokohama Tire Retread (YTRH) Vicinity of Lake Utonai
Habitats being safeguarded or restored	Satoyama (traditional community-managed forest) conservation in Toyooka Village, Nagano Prefecture; Satoyama conservation in Tsuchiya district, Hiratsuka City, Kanagawa Prefecture; conservation of loggerhead turtle egg-laying sites along the Ominato Coast in Ise City, Mie Prefecture, and conservation of breeding grounds of eastern bluebird near the Virginia Plant	Satoyama (traditional community-managed forest) conservation in Toyooka Village, Nagano Prefecture; Satoyama conservation in Tsuchiya district, Hiratsuka City, Kanagawa Prefecture; conservation of Loggerhead Turtle egg-laying sites along the Ominato Coast in Ise City, Mie Prefecture, and conservation of breeding grounds of Eastern bluebird near the Virginia Plant
Total number of species included in the IUCN Red List of Threatened Species or in Japan's domestic list of species requiring special conservation efforts **<Categories of threatened species>** **・Critically endangered (CR)** **・Endangered (EN)** **・Vulnerable (VU)** **・Non-threatened (NT)** **・Least concern**	River): Loach, Catfish (Tenryu River) NT: Three species: ferocious water bug (Sonobe River), Japanese fluvial sculpins (Kuroda River), black-spotted pond frog (Tenryu River) Within factory grounds and in Satoyama forests VU: One species: Cephalanthera falcata NT: Three species: great purple emperor, whisk fern, Japanese fire belly newt Least concern: One species: grey-headed lapwing	VU: Two species: Japanese rice fish (each river) and goosefoot (Tenryu River) NT: Five species: Veronica undulata (Kaname River), ferocious water bug (Sonobe River), Japanese fluvial sculpins (Kuroda River), black-spotted pond frog (Tenryu River), Japanese pond turtle (Goten River) On premises of plants and satoyama VU: One species: golden orchid NT: Four species: great purple emperor, whisk fern, Calanthe discolor, Japanese fire belly newt Least concern: One species: grey-headed lapwing Beaches near to where wastewater flows out EN: One species: loggerhead sea turtle (Ominato sea coast)

Responsible Departments ×

Each business location

※Activities are conducted by each office, with the Biodiversity Committee (which the Environmental Protection Promotion Department serves as a secretariat for) implementing company-wide policy discussions and activities.

Stance and Target ×

Why is "Biodiversity" a critical issue to be addressed? Explanation of the reason and background

We are engaged in a business that is dependent on natural capital (the gifts of nature) including natural rubber. In addition, many production facilities use large quantities of water for the cooling of equipment, and emit heat and carbon dioxide. We recognize that the burden on the natural environment caused by these kinds of business activities is not unrelated to the loss of biodiversity currently proceeding on a global scale. We view efforts to preserve the links between the variety of life nature has blessed us with (= biodiversity) and to use natural resources in a sustainable manner and carry biodiversity on to future generations to be our responsibility.

Guidelines on Biodiversity

<Basic Policy>

In running our business, we rely heavily on nature's blessings. We should pass on this rich nature to our future generations by addressing the preservation of biodiversity and utilization of sustainable biological resources through our business activities, whilst recognizing the fact that "linking diversified lives equals biodiversity", which is the basis of nature's blessings, has been dwindling rapidly on a global scale in recent years.

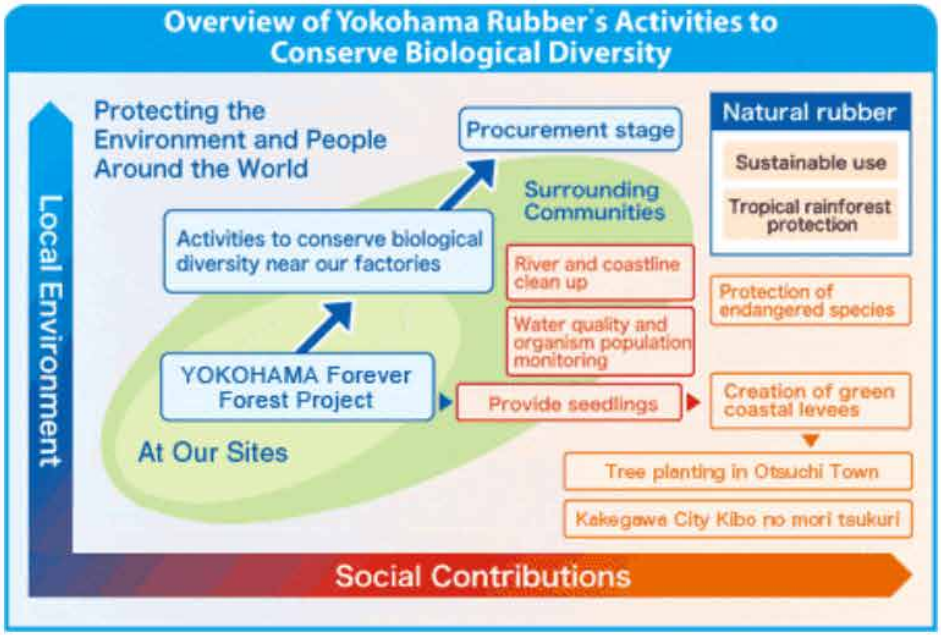
<Action Guidelines>

1. Recognition as a Management Issue
   Since Yokohama Rubber is directly using biological resources and conducting business activities that may affect biodiversity, we recognize the importance and risks towards the grace of nature. Therefore we will address the preservation of biodiversity from a long-term perspective.
2. Participation by All Employees
   We will raise the awareness of our employees in regard to the grace of nature. All our employees will contribute to the preservation of biodiversity both at work and their local communities.
3. Determine the Effect on Biodiversity and its Reduction
   We will determine the effect that our business activities may have on biodiversity, and shall thereby try to avoid or minimize such effect.
4. Preservation of Biodiversity through the Supply Chain
   In order to preserve biodiversity, by understanding that it is important to be considerate as early as the stage of resource extraction, we shall contribute to the preservation of biodiversity at resource mining sites through cooperation with relevant personnel of the supply chain.
5. Sustainable Usage of Biological Resources
   We will work on any sustainable usage of biological resources by gathering knowledge with regards to biodiversity, and also through technological development, innovation of design and production, or approaches to biodiversity in the value chain.
6. Information Sharing and Communication
   We will work on the information gathering or social requirement as to preservation of biodiversity; we shall thereby disclose our activities and achievements proactively to facilitate dialogue and tie-ups with our stakeholders, such as customers, local communities, NGOs, and the government.

Vision (attainment goal) / target

In the preservation of biodiversity, we evaluate the impact that our business activities have on the natural environment and upon ecosystems, and then implement conservation activities in order that this impact can be further mitigated. Additionally, we aim for harmony with nature and the development of employees with an awareness of the environment. YOKOHAMA Forever Forest project achieved its goal to plant 500,000 seedlings in both our domestic and overseas production sites and related department sites in September 2017. Going forward, the project is working toward the new target of planting 1.3 million trees by 2030 through afforestation at production sites and related department sites and the provision of seedlings to communities.

<Overview of Yokohama Rubber's Activities to Conserve Biological Diversity>



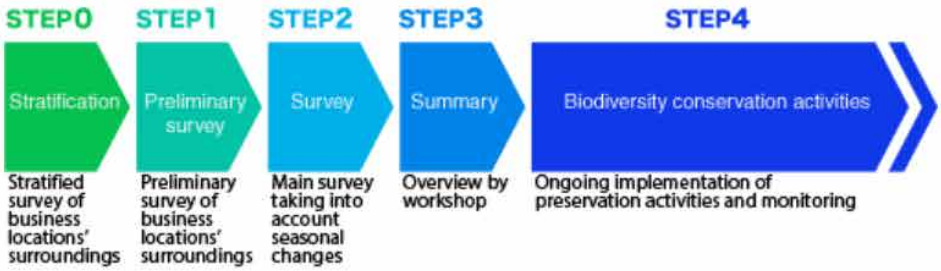
Measures for vision achievement

The locations of our offices differ in terms of geography, history, and culture. Because the living things that live at these locations also differ, we believe that it is necessary to assess the situation and establish issues for each office, and based on this we deploy our biodiversity conservation activities in stages. After gaining a general understanding of the environments surrounding offices, including waters, green areas, nature reserves, residences, and plants, we conduct surveys on the water quality of rivers that our business activities have an effect on, and monitoring of observed wildlife in the communities surrounding offices that have been surveyed, and specify the organisms subject to assessment. Through monitoring throughout the year, we assess the impact of our business activities, determine which organisms are subject to preservation, conduct preservation activities, and release the results.
In water quality surveys, we measure water temperature, electrical conductivity, pH, etc., and in the monitoring of organisms, we conduct bird observation, vegetation surveys, and observation of aquatic organisms and insects.

	Business location	Location	Water quality*	Aquatic life	Vegetation	Wild birds	Insect	Other
In Japan	Mie Plant	Within premises	○	○	○	○	○	
		Outside premises	○	○	○	○	○	Loggerhead turtle
	Mishima Plant	Outside premises	○	○		○		
	Shinshiro Plant	Within premises	○	○		○		
		Outside premises	○	○				Amphibians
	Onomichi Plant	Within premises			○	○	○	
		Outside premises	○	○	○	○		
	Hiratsuka Factory	Within premises	○	○	○	○	○	
		Outside premises	○	○	○	○	○	
	Ibaraki Plant	Within premises	○		○	○		
		Outside premises	○	○	○	○		
	Nagano Plant	Outside premises	○	○	○	○		
	Yokohama Tire Retread Hokkaido Plant	Outside premises	○	○	○	○	○	
	Yokohama Tire Retread Nagoya Plant	Within premises		○				biotope
	Yokohama Tire Retread Onomichi Plant	Outside premises	○	○	○	○	○	
	Yokohama Mold	Outside premises	○	○	○	○		
Overseas	YTMT (Thailand)	Within premises	○			○	○	
	YTRC (Thailand)	Within premises	○	○		○		
	CHZY (China)	Within premises			○	○	○	
		Outside premises	○	○	○	○	○	
	CSZY (China)	Within premises			○	○	○	

Overseas	YTPI (Philippines)	Within premises			○	○	○	
		Outside premises			○			Watershed conservation
	YTMV (United States)	Within premises			○	○		Mammals
		Outside premises	○	○		○		
	YRPZ (Russia)	Within premises						Growth of pine trees
	Y-CH (China)	Outside premises						Laojunshan Project
	YTVI (Vietnam)	Outside premises			○			

※Presence or absence of biodiversity activities



YOKOHAMA Forever Forest Project

A cumulative total of 561,000 trees have been planted as of the end of 2018. The cumulative total including the number of seedlings provided equates to 940,000 trees. This marks a 72% achievement rate for the target of 1.3 million trees by 2030. In order to assess forest growth and environmental changes, we conduct surveys on the amount of growth (measurement of tree height and diameter at breast height) and surveys on wild birds observed within plant premises. From surveys on the growth amount of seedlings we have calculated the fixed quantity of carbon dioxide from the YOKOHAMA Forever Forest Project and determined that the fixed quantity of carbon dioxide from the YOKOHAMA Forever Forest Project is higher than that for a typical broadleaf forest. This is likely the effect of the mixed planting and close planting of various kinds of trees.
In wild bird surveys at the Hiratsuka Factory, 57 species of wild birds have been observed on plant premises up until now. From the third year of tree planting, we began to see brown-headed thrushes that have a penchant for forests. We believe this reflects how the Forever Forest is functioning as it should as a forest for wild birds. In addition, we observed the crowned willow warbler and the great reed warbler that is seen near water, which suggests that the Forever Forest is functioning as a stopover for wild birds as they move throughout their habitat.

Review of FY 2018 Activities ×

Announcement of procurement policy aimed at maintaining natural rubber as a sustainable resource

Yokohama Rubber announced the Sustainable Natural Rubber Procurement Policy in October 2018 to make natural rubber a sustainable resource. In addition, we participated in the international platform GPSNR (Global Platform for Sustainable Natural Rubber) and started activities.

Communication with communities

At the "10th ThinkEco Hiratsuka" public event held at the Hiratsuka Factory, a panel discussion on biodiversity was held for the fifth year running. Based upon the theme of "What can we do to protect the environment around Hiratsuka waterways? ? Preservation of biodiversity in rivers through regional cooperation," we gained the participation of a total of around 40 stakeholders including employees, local residents, and environmental NPOs. At the panel discussion, we reported our activities on biodiversity and shared the policies on future activities. In addition, lively discussions were held on the initiatives to formulate a biodiversity action plan in Hiratsuka City that started in fiscal year 2018. All the participants learned about the importance of everyone in the region being interested and cooperating in order to protect the rich nature of Hiratsuka.

Employee education

We are working to preserve biodiversity through our business activities, carrying out employee education to increase awareness, and are further ensuring that all employees act with an awareness of the benefits of biodiversity through employee education. A biodiversity course is now provided for young employees as part of their Technology training, trainees further their understanding through lectures, monitoring, and workshops.

Announcement of monitoring results

The workshop

Introduction of Initiatives ×

Hiratsuka Factory

The Hiratsuka Factory comprises multiple divisions and departments, thus this has been the location selected for employee training in biodiversity activities in the downstream area of the Kaname River.
The presence of birds including streaked fantail warblers, kingfishers, great reed warblers, bull-headed shrikes, and migratory fish including eels, rhinogobius, and gobies in the Kaname River are indicative that both the river and the nearby sea are healthy. However, investigations of the vegetation showed significant quantities of introduced species such as giant ragweed and bur cucumber, and we decided that our conservation activities should include removal of specific introduced species. Up until last year, our 260 employees have participated in the activities and removed approximately 1.9 tons of introduced species in total.

Monitoring at Kaname River

Removal of foreign plants at Kaname River

In March each year, at the invitation of the Kaname River Basin Watershed Network, we conduct river cleanup activities in collaboration with local government authorities and civic organizations.
Additionally, starting in 2015, we began to rent abandoned land in Yadota, near Komagataki in the Tsuchiya district of Hiratsuka, to create a biotope through manual labor, and activities including the regeneration of the abandoned cedar forest around Yato.
As a result, it has become possible to find Cephalanthera falcata, Cephalanthera erecta, Calanthe discolor and Cymbidium goeringii.

Wide-bellied skimmer found in satoyama (traditional community managed forest)

Cephalanthera erecta observed in satoyama (traditional community managed forest)

In May 2017, a "dragonfly pond" was made in the grounds of the Hiratsuka Factory through manual labor, and activities began to be held to enable people to experience for themselves our links with other living things by observing the dragonflies, butterflies, frogs etc. that congregate at the pond.
These activities to conserve biological diversity and our ongoing surveys of fixed amounts of CO_2 absorption associated with the growth of the Forever Forest planted in and around the site in 2007 were recognized with Association for Business Innovation in Harmony with Nature and Community (ABINC) certification as a plant that is considerate of biodiversity in March 2017.

Emergence of blue-spotted emperor at dragonfly pond

We participate in the Hiratsuka Environmental Fair sponsored by Hiratsuka City and the Biodiversity Forum sponsored by environmental groups, and introduce the biodiversity activities of the Hiratsuka Factory to the local community.

Atsugi Nature Forum exhibition

Including participation in the Hiratsuka Biodiversity Promotion Council, a biodiversity initiative promoted by Hiratsuka City, we are also expanding activities for ecosystem conservation in Hiratsuka.

Komagataki visit by council

Mie Plant

Three teams are continuing to implement biodiversity conservation activities as follows.

- "Black Team": Conducted water quality survey on rivers that factories discharge wastewater into (Hinokijiri River and Hotosu River) and aquatic life survey on organisms such as killifish
- "Tall Team": Measured the number of foreign species removed and native plants and conducted a loggerhead sea turtle egg laying survey at beaches (Ominato sea coast) near to where wastewater flows out
- "Short Team": Created biotopes in rainwater ponds at plants, conducted water quality survey, biological survey, aquatic life survey, and water quality measurements

We presented lectures at the local Ominato Elementary School. Children at Ominato Elementary School learned about living things along the Ominato coast, and also participated in removing introduced species. In FY 2018, we newly held tree planting events and outreach classes for five elementary schools in Ise City covering the theme of activities to conserve biodiversity in our biotope. As a general activity, we held clean-up events on five occasions during the year with the community association and local government. In addition, we host a presentation on our activities to conserve biological diversity for the community association and local government twice every year where we exchange views with one another.

Aquatic life survey at Hinokijiri River

Explanation using picture-story show before conservation activities at Ominato sea coast

Living creature observation in biotope inviting elementary school students

Mishima Plant

The factory discharges water into the Goten River, and we had three teams?"Loach Team," "Softshell Turtle Team," and "Eel Team"?carry out ongoing surveys into water quality and wildlife.
These confirmed that the Goten River was home to a huge variety of wildlife, including larvae from damselflies and koyama dragonflies; fish such as the Zacco platypus (pale chub) and the dark chub; reptiles including the Chinese pond turtle; and birds such as kingfishers. However, the river also included large amounts of discarded trash, and so after monitoring, we also carried out some cleaning to do what we could in order to preserve the Goten River in a pristine state. However, river vegetation was wiped out by river dredging at the end of 2016, and the diversity of the river disappeared. Because of this, in May 2019 our Mishima Plant signed a "River Friendship" consent form with the Numazu Civil Engineering Office and Mishima City, and we started working on the regeneration of vegetation in the Goten River and creating an environment conducive to aquatic life.

Aquatic life survey (in 2016)

Softshell turtles and pond sliders near central drain

River Friendship agreement consent form signing

Shinshiro Plant

We have been carrying out monitoring of water quality in the Noda and Kuroda Rivers, which also receive discharge from factories. In the factory, we restored the biotope which had been at rest. Through these activities, we aim for verification that the discharge water has no adverse effect on the wildlife allowing dragonfly nymphs to live in an environment that the water flows into.
At Yotsuya Senmaida, we are creating and maintaining a biotope in unused farmland. Here, we can find freshwater crabs, pond frogs, forest green tree frogs, fire belly newts, and other creatures.
On October 13, we attended the 4th tree planting ceremony for the "Biodiversity Strategy 2020 of Aichi" organized by the Shinshiro-Shitara Ecology Network Council, and planted 600 broadleaf trees (provided by the Shinshiro Plant) with participants so that the planted trees will provide food for various wildlife on the mountain where conifer trees were thinned.

Aquatic life monitoring at Noda River

Yotsuya Senmaida freshwater crabs

4th Biodiversity Strategy 2020 of Aichi tree planting ceremony

Onomichi Plant

At the Onomichi Plant, we are carrying out surveys of water quality and of aquatic life, birds, and plants at the Nishifuji Shinsui Park on the Fujii River, as well as observing wild birds and insects within the plant premises.
Surveys of aquatic life in the Fujii River found aquatic insects including mayflies, damselflies, and dragonflies; fish such as cyprinids, sleepers, and rhinogobius; and crustaceans such as mitten crabs and lake prawns.
Within the plant premises, we are providing a mosaic of environments to host wildlife, by growing trees to create a Forever Forest and by creating ponds and marshes from groves, grass areas, and rainwater?this has become home to dragonflies, butterflies, crickets and grasshoppers. Within the plant premises, we can also see nest-building by skylarks, shrikes and redstarts staking out their territories, and wintering by bush warblers.
At the 42nd Fujiigawa Evening held on June 9, we introduced activities contributing towards biodiversity in the plant, and distributed 150 seedlings for the Forever Forest.
Also, we applied for Association for Business Innovation in Harmony with Nature and Community (ABINC) certification in 2017 and obtained it in January 2018.


Wild bird observation at our plant


Aquatic life at Nishifuji Shinsui Park


Seedling provision at Fujiigawa Evening

Nagano Plant

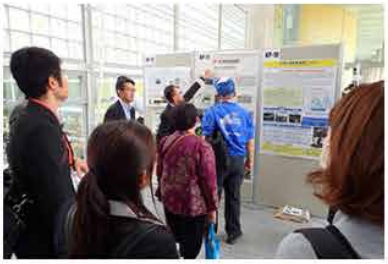
The Nagano Plant is located in an area that is highly natural compared to other plants. As there is almost no drainage other than rainwater, we believe the environmental impact of this plant is low compared to other plants.
Loach catfish, which is a quasi-endangered species in Nagano Prefecture, and stonewort, which is a category I endangered species were found during surveys into aquatic life at the area with our Nagano Plant located that is near the confluence of the Tenryu River and its tributary, the Oshima River, as well as at the Shinsui Park on the Terasawa River.
Based upon the "Forest Adoption Promotion Project" being promoted by Nagano Prefecture, we concluded with Toyooka village a "forest adoption agreement" to cooperate in maintenance of the village's forest, and are conducting conservation activities.

Ibaraki Plant

At the Ibaraki Plant, we conduct surveys on water quality, vegetation, aquatic life and birds on the Sonobe River where factory wastewater is discharged to. Because the Sonobe River is used as agricultural irrigation water, we take great care in safeguarding the quality of discharge water. Because electrical conductivity is lower and transparency is higher in the water at the plant water discharge area than in other stretches of the Sonobe River, we believe that plant wastewater management is acceptable. A water tank has been installed at the entrance to the plant offices; fish caught in the Sonobe River are able to live in the tank, which contains discharge water from the plant. Appasus, an aquatic insect that is classified as a quasi-endangered species in Ibaraki Prefecture, was found in the aquatic life survey.
When implementing monitoring, the Ambrosia trifida, Goldenrod and Star Cucumber plants that were growing rampantly on the embankments of the Sonobe River were removed; as a result, the area covered by these three non-native species has been reduced.
In 2015, we started surveys of bird life at the plant. Comparing the results of observations within the Sonobe River area has helped us to understand the different environments, further assisting in letting us provide more support for local wildlife.
These activities have been carried out with guidance from the Wild Bird Society of Japan (Ibaraki Office), and from the Omitama Wildlife Association. The activities implemented at the Ibaraki Plant to safeguard biodiversity have been featured on the Omitama Wildlife Association's website.
In recognition of the above activities, we participated in the poster session of the World Lake Conference (Lake Kasumigaura, Ibaraki, Japan, 2018) held at the Tsukuba International Congress Center in October last year.

Wild bird survey at Sonobe River


Aquatic life survey at Sonobe River


Presentation of posters at World Lake Conference

Yokohama Tire Retread Co., Ltd. Hokkaido Plant (YTRH)

Located adjacent to Lake Utonai, an internationally famous migratory bird gathering place where the Wild Bird Society of Japan opened the first sanctuary in Japan, YTRH is the only factory in the Yokohama Group that is in this kind of precious environment.
In order to protect this special place, we have been conducting clean-up events from April to November as a conservation activity for Lake Utonai since 2017, and we conduct foreign plant extermination activities in the summer.
During foreign plant extermination in 2018, the number of samples per person reached a record high for Lake Utonai (7770 in total → 555 per person).
In the future, in addition to employees of Yokohama Tire Retread, we will continue meaningful activities together with family members, affiliated companies and the Wild Bird Society of Japan.


White-tailed eagle c Wild Bird Society of Japan


Spiraea salicifolia c Wild Bird Society of Japan


Foreign plant extermination work

Yokohama Tire Manufacturing (Thailand) Co., Ltd. (YTMT)

Yokohama Tire Manufacturing (Thailand) Co., Ltd. (YTMT), a tire plant in Thailand, is located within an industrial park. Because water intake and discharge is centrally managed at industrial parks in Thailand, unlike the plants in Japan, it is not possible to confirm the impact of individual plants on water intake and discharge areas. For this reason, we monitor birds and insects in order to assess the green areas (Forever Forests and biotopes) on plant premises. In order to recreate a rich ecosystem within the plant premises, we are creating two types of biotope?marshes and ponds. We have been carrying out further planting in order to preserve the connection between aquatic and land wildlife. We also secure habitats for local species and conduct environmental education for employees through these activities.
Additionally, we carried out activities to create areas of saline soil, with the aim of helping preserve the wildlife within the Khao Yai National Park, a world heritage site.


Insect survey in biotope


Neurothemis terminata


Confirmation of observed organisms

Y.T. Rubber Co. Ltd. (YTRC)

Y.T. Rubber Co., Ltd. (YTRC) is located in Surat Thani Province, Thailand and is the only natural rubber processing plant in the Yokohama Rubber Group. While large volumes of water are used in the natural rubber processing process, we work to effectively use water resources through 100% recycling. In April, we introduced a mechanism that reduces water intake by automatically closing the valve when process facilities are not in operation to control the revolutions of the motor. As a result, we reduced water intake by around 30%. By reducing the water we use, we should be able to make greater progress with breaking down effluent in the purification pond through improved separation of impurities in the settling tank. Going forward, we will continue to check the effects of water quality improvement.
We have conducted monthly monitoring of aquatic life (fish) and water quality since November 2014. We discovered that anti-flood ponds are connected to the adjacent Tapi River during flooding in the rainy season, and contain the same kinds of fishes. Additionally, we observed that providing different configurations within the anti-flood ponds allows coexistence of different species of fishes. We found that, currently, 18 different species of fish are living in the anti-flood ponds, and 21 different bird species are found there. We realized that this contributed to saving the different types of fishes in the Tapi river as well as their genomes, and we will continue to monitor water quality trends, so that these more closely match the water quality of the river.

Biodiversity activity at rainwater pond

Fish catching survey using throwing net

Hangzhou Yokohama Tire Co., Ltd. (CHZY)

Hangzhou Yokohama Tire Co., Ltd (CHZY) is situated in an industrial park in Hangzhou, China. While there are green areas within the industrial park, there are not many species of trees, and the park has a paucity of biodiversity. Accordingly, we have carried out an evaluation of the Forever Forest, and surveys of wildlife within the Forest to confirm whether the Forever Forest at CHZY was suitable for forest dwelling wildlife.
Additionally, the Qiantang River which flows near the plant is connected to many other waterways, and sewage flowing into these has raised concerns about water quality. Together with Hangzhou Normal University and local government, we are implementing biodiversity conservation activities, using one of these waterways as a model for making improvements to water quality.

Yokohama Tire Philippines, Inc. (YTPI)

Yokohama Tire Philippines, Inc. (YTPI) is situated in the Clark Special Economic Zone in Pampanga, Philippines, so it is not near any sizable wooded areas. YTPI contributes to biodiversity conservation by providing habitats for wild birds, insects, butterflies and specific reptiles by planting and growing trees both on and off the factory grounds. We observe the growth of these living things and plants so that their safety and comfort can coexist with that of employees.
In addition, YTPI creates educational materials and holds meetings to raise employee awareness of forest and biodiversity conservation. In order to promote the improvement of the ecosystem in the vicinity, seedlings are provided to the local community, and we hold and participate in tree planting activities outside the factory.
Angeles City, adjacent to YTPI, is considered an “urbanized areas where water use due to intensive consumption is critical” indicated by the Japan International Cooperation Agency (JICA), and the water shortage level is evaluated as “critical” in a report by the environmental NGO Greenpeace.
Angeles City is said to be at risk of having water shortages by 2025. Because of this, at the request of Angeles City’s mayor Edgardo Pamintuan, an activity to plant 1 million trees in Sapang Bato, a water source area, was launched to restore the city's basin. YTPI supports this activity and participates in tree planting activities in this area.

Yokohama Tire Manufacturing Virginia (YTMV)

YTMV is located at the foot of the Appalachian Mountains of Virginia in the eastern United States. The area offers a vibrant natural environment similar to Japan where you can experience four distinct seasons. The growth of the Forever Forest planted at the company's factory has provided a natural habitat for a large variety of wildlife and wild fowl. The nearby Roanoke River, into which we discharge rainwater, also contains a wide array of aquatic life. We are carrying out activities to balance conservation of this natural environment and our production activities.
In 2015, we began setting up nests to protect the breeding of the Eastern bluebird. All of our employees keep a close watch on the growth of the chicks. We conduct periodic surveys of organisms living at the bottom of the Roanoke River as well.

Nest for eastern bluebird

Eastern bluebird

Suzhou Yokohama Tire Co., Ltd (CSZY)

At Suzhou Yokohama Tire Co., Ltd (CSZY) located in a chemical industry area of Suzhou, China, we launched biodiversity activities jointly with the New District Environmental Protection Council and a Xuguan Town elementary school in December 2016. So far, we have conducted living organism surveys at our plant three times. Biodiversity survey activities can be used not only to understand the status of the bioenvironment at our plant, but also to preserve the local ecosystem while going on plant business activities and promote harmony with local communities.
In past activities, we have observed birds such as sparrows and white eagles, plants including Chinese tallow, Hall crabapple, border privet, dandelions, morning glory and daisies, insects like honey bees and butterflies, and earthworms. Among them, we also pick up tree seeds and raise them as seedlings for Forever Forest activities. The third biodiversity survey activity on December 16, 2018 was conducted jointly by inviting students, family members and teachers from the Jing'en Experimental Primary School. Before starting the activity, participants were told the meaning of the living organism survey, and were then divided into groups to observe living organisms that could be found in the Forever Forest area at our plant. In addition to observing living organisms, this survey activity enabled everyone to know the status of growth of the Forever Forest. It was a good opportunity for deepening understanding of the positive impacts that the growth of our Forever Forest has on the community's ecosystem.

Everyone who participated in biodiversity activities

Children at Jing'en Experimental Primary School observing living organisms

LLC Yokohama R.P.Z.(YRPZ)

In 2017, we initiated joint research with Voronezh State University of Forestry and Technologies into planting one species of pine tree (Pinus SylvestrysL.) on the premises of our plant. The purpose of this activity is to research how much pine trees will grow in an industrial belt and restore YRPZ's biodiversity. In addition, this activity has been appraised as a biodiversity research activity. YRPZ and forest science experts from Voronezh State University of Forestry and Technologies are now researching the ideal conditions for the growth of trees. Additionally, we invite children from local schools to help plant oak seeds cultivated by YRPZ.

Tree planting

Planted pine seedlings

Issues and Future Improvement Measures ×

Up until now, activities have focused on assessing the species that live in areas affected by the business activities of the Yokohama Rubber Group. In the future, we will expand activities to include overseas business locations, and maintain and improve biodiversity in areas where our businesses are located with the aim of realizing sustainable operations.
Because biodiversity is a concept that people in general are still not familiar with, we will enable employees to deepen their understanding of the importance of biodiversity conservation through participation in monitoring activities and conservation activities, and we will actively communicate information to local communities to provide a better understanding of our efforts.

Effluent and waste

KPI

Item	FY 2017 results	FY 2018 results
Achievement of total zero-emissions	Landfill rate 0.0% Percentage of bases achieving target 100.0%	Landfill rate 0.0% Percentage of bases achieving target 100.0%
Water quality and total wastewater emissions by type of discharge	Surface water 5,616,000 m^3 Groundwater 0.0 m^3 Sewerage 1,114,000 m^3 Others 496,000 m^3	Surface water 5,470,000 m^3 Groundwater 0.0 m^3 Sewerage 1,196,000 m^3 Others 486,000 m^3
Total number of serious leaks and amount of wastewater leaked	None	None
Total quantity of hazardous waste transported, imported or processed, and percentage of waste that was transported internationally	NA	NA
Waterways and connected habitats affected by wastewater discharge? locations, size, conservation status, and value of biodiversity	NA	NA

Responsible Departments ×

Each business location

Stance and Target ×

Why is “Effluents and Waste” a critical issue to be addressed? Explanation of the reason and background

We believe that minimizing the impact of our business activities in Japan and overseas on the environment will lead to sustainable operations. Accordingly, we believe that it is important for effluents and waste to be minimized as much as possible in a form with a low environmental impact.

Vision (attainment goal) / target

Mid-term targets are set for water use in Japan and overseas.
Based on these targets, and after confirming water risks and the status of wastewater, we will improve recycled water use and ultimately aim for a closed system.
We will work to achieve a reduction of 1% in waste materials per unit of waste, and aim for the attainment and maintenance of 100% recycling*1. We will then aim to achieve total zero-emissions*2 at all our production bases.
Specially managed industrial wastes such as PCB, asbestos, chlorofluorocarbons, and mercury, etc., will be appropriately processed in accordance with relevant laws and regulations.

※1 100% recycling: Achieve zero final disposal (= direct landfilled amount + incineration disposal amount resulting in ineffective use)

※2 Total zero-emissions: Make the direct landfilled amount zero.

Measures for vision achievement

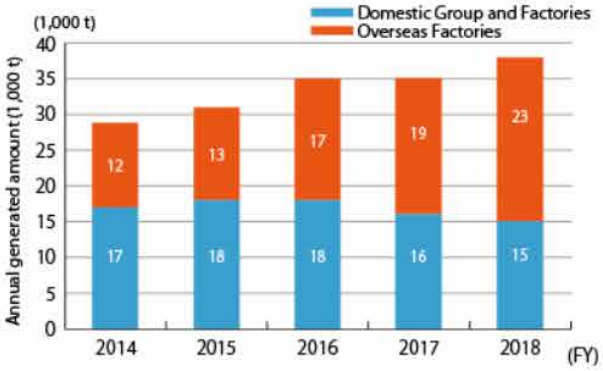
- We will introduce water recycling facilities, increase recycled water use, and reduce the volume of water discharge.
- Even in the case of business locations that are legally entitled to have waste disposed of in landfill sites, we will look for and select industrial waste disposal contractors that do not conduct landfilling, and contract with them to undertake recycling processing.
- The processing of PCB-containing devices will be conducted within the deadline specified by law.

Review of FY 2018 Activities

At overseas production bases in areas with high water risks (Thailand and India), closed systems have been introduced at the time of plant construction, and there is minimal water uptake and no water discharge.

Amount of waste material generated at Group companies in Japan and overseas

The amount of waste material generated at all Group production bases in Japan and overseas during fiscal year 2018 increased by 8.8% year-on-year to 37,929 tons.
We have conducted recycling and activities aimed at achieving total zero emissions at all our production bases in Japan and overseas.
We achieved zero emissions at the end of fiscal year 2017 at our four overseas production bases including North America, one of which in North America had been conducting landfilling before. We are maintaining zero emissions in fiscal year 2018 as well.



PCB waste storage and management

Used PCB-containing devices are properly stored and processed according to relevant laws and regulations. During fiscal year 2018, 17.4 tons of PCB-containing devices were processed. We conducted registration of the concerned stabilizers in fiscal year 2016 and are waiting for it to be processed. Partial processing was implemented in fiscal year 2018. Additionally, we will proceed with implementing proper processing of PCB-containing devices in use.

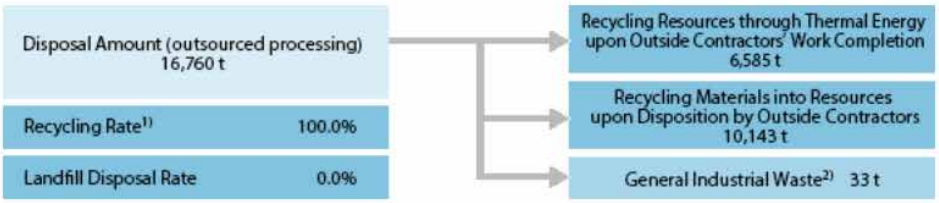
Introduction of Initiatives

At the Onomichi Plant, we improved and strengthened water filtration capabilities, worked to stabilize water quality, and succeeded in significantly improving the period of possible repeated use.

Amount of waste material generated at production bases in Japan

The amount of waste materials generated in fiscal year 2018 totaled 16,660 tons, representing a 0.3% decrease year-on-year; the unit base of the generated amount of waste materials (per net sales) improved by 0.3% compared to the previous year.

The processing flow for waste materials at production bases in Japan during fiscal year 2018 was as follows.



1) Excluding general industrial waste
2) Consumer paper manufacturing waste, tree planting material, various consumer waste

In order to prevent improper disposal such as illegal dumping, local audits of all our processing contractors are conducted every year. In fiscal year 2018, a total of 111 audits were conducted including Group companies and 35 audits at overseas factories, and it was confirmed that waste was properly disposed of.

Issues and Future Improvement Measures

- Selection of overseas production bases of industrial waste disposal contractors that don't conduct landfilling
- Development of low-water-use facilities, and review of and investment in closed systems
- Formulation of disposal plans for devices that are currently in use which contain low concentrations of PCB
- Consider increasing the effective recycling value by increasing the ratio of valuables from industrial waste

Emissions

KPI

Item	FY 2017 results	FY 2018 results
Emissions of greenhouse gases	(Consolidated) Scope1 363 thousand tons Scope2 354 thousand tons Scope3 23,237 thousand tons	(Consolidated) Scope1 371 thousand tons Scope2 349 thousand tons Scope3 22,055 thousand tons
Ozone-depleting substances	Emissions of CFCs (Domestic) 688.0 tons	Emissions of CFCs (Domestic) 545.1 tons
HAPs (Hazardous Air Pollutants)	(Domestic) 17.6 tons	(Domestic) 21.1 tons

Responsible Departments ×

Each business location

※Activities are conducted by each location, and the direction of policies and activity measures are decided on by bodies that include the Global Warming Countermeasures Committee and the Chemical Substance Management Committee.

Stance and Target ×

Why is “Emissions” a critical issue to be addressed? Explanation of the reason and background

We use resources to manufacture and sell various rubber products such as tires, hoses, and belts. In addition, we handle chemicals adhesives and sealants. In particular, we recognize the reduction of emissions in the manufacturing process and the use of products as an important initiative that will lead to the prevention of global warming and environmental pollution, as well as sustainable operations at each business location.

Policies and stance relating to air pollution

The Yokohama Rubber Group will work to minimize the burden on the environment caused by the provision of products and services in accordance with the Yokohama Rubber Environmental Policy, and Yokohama Rubber Group Action Guidelines.
To this end, we will develop and introduce environmental technologies while working together with various people involved in the provision of products and services to reduce air pollution throughout the entire value chain.
We comply with international agreements on emission, the regulations of each country (in Japan, the Energy Saving Act, Act on Promotion of Global Warming Countermeasures, etc.), and the regulatory response policy of related organizations such as the Japan Rubber Manufacturers Association while setting stricter self-imposed standards in order to control air pollution.

Risks and opportunities at the Yokohama Rubber Group related to greenhouse gas emissions

<Risks>

Risks include an increase in facility investment costs incurred in order to reduce emissions, an increase in energy costs related to the use of renewable energy, and global warming leading to deterioration in the working environment and an increase in investment costs for countermeasures.

<Opportunities>

We contribute to society by improving the energy efficiency of operations through the reduction of emissions, environmental conservation in the areas we operate in, and the external provision of heat insulation materials, etc. Because controlling emissions of volatile organic compounds (VOC) and air pollutants in addition to greenhouse gas emissions makes it possible to reduce the cost of environment-related investment, this leads to a reduction in product manufacturing costs.

Use of offsets

Offsets are not used.

Vision (attainment goal) / target

As international regulations related to emissions become increasingly stringent, as a general rule we aim to achieve control standards equivalent to those of the developed economies.
The Yokohama Group is working to reduce total greenhouse gas (GHG) emissions as an energy use reduction target.

- Long-term target:
  By 2050, we will have reduced total CO_2 emissions throughout the entire value chain of the Group by at least 50% compared to the base year (fiscal 2005).
- Mid-term target:
  By 2030, we will have reduced the Group's Scope 1 and Scope 2 emissions, as well as product manufacturing related CO_2 emissions per unit of production output (through collaboration with our supply chain partners) by at least 30% compared to the base year (2013).

Measures for vision achievement

The Group conducts the following measures to monitor and reduce the environmental footprint that is produced through our production activities, R&D, and offices.

1. The Group sets independent management standards that are stricter than those required in accordance with laws and regulations, and based upon which we conduct constant monitoring.
2. Legally-required measurement results are regularly reported to government authorities and local residents.
3. We will strengthen activities aimed at reducing our environmental burden, such as improvements to our production process.
   Conversion of energy used, introduction of renewable energy, control of waste heat through heat retention and insulation, and the introduction of the latest environmental technologies and systems.
4. Prevention of environmental pollution
   Identification and remedying of environmental pollution risks, conducting regular monitoring and measurements, etc.
5. Chemical substance management
   We confirm the suitability of chemical substances to be used in our products at the time of adoption or changes in laws and regulations.
   We minimize environmentally hazardous substances in our business activities and products, and reduce emissions of VOCs and hazardous substances.

Review of FY 2018 Activities

There were no events that led air pollution.
We carefully manage the concentration of our NOx and SOx emissions to fully comply with parameters specified by law.

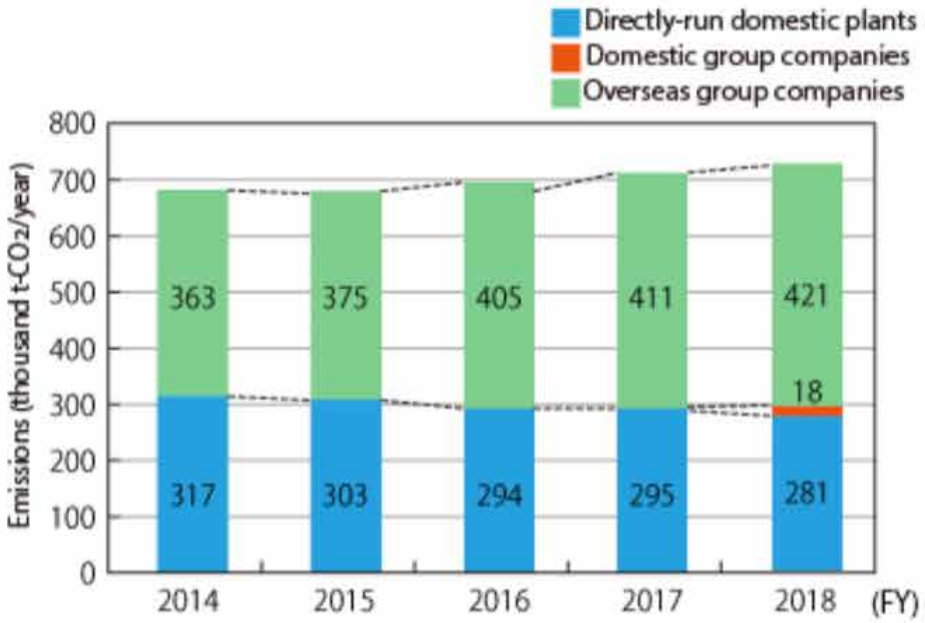
Emissions of NOx, SOx, etc.

(Domestic) (Unit: tons)

Cat	NOx	SOx
FY 2017	106.6	3.5
FY 2018	111.7	3.0

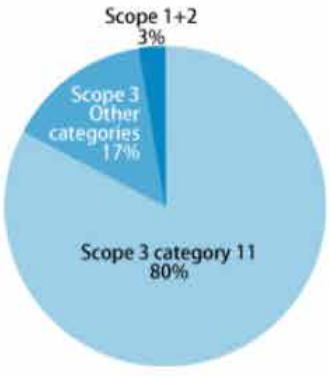
We do not use or emit any ozone-depleting substances. There were no cases of dioxin use.
While GHG emissions decreased 2.1% from the previous year in Japan, overseas emissions increased by 2.4% due to increasing production; the emissions grew overall by 0.5%.
VOC emissions were down by 9.7% overall.

Greenhouse gas emissions at domestic group companies and overseas production bases (thousand t-CO_2)



Scope 3 estimation

The results for Scope 1 to 3 emissions for fiscal 2018 are as follows. A breakdown of Scope 3 is also displayed.
Greenhouse gas emissions (Scope 1+2) resulting from the corporate activities of Yokohama Rubber during fiscal 2018 were 720 thousand t-CO_2, and greenhouse gas emissions including indirect ones (Scope 3) for the entire value chain were 22,055 thousand t- CO_2.
Scope 3 accounted for 97% of this, and use of products accounted for 80% of Scope 3 emissions. We will work towards the spread of environmentally friendly products and fuel efficient tires while working together with suppliers to reduce GHG emissions throughout the value chain.



Cat	Scope 3 category	Emissions (thousand t-CO_2)
1	Purchased products and services	2,566
2	Capital goods	57
3	Fuel and energy	107
4	Transportation and distribution (upstream)	138
5	Waste	1.4
6	Business travel	3.3
7	Commuting employees	23

8	Upstream lease assets	該当なし
9	Downstream transportation and distribution	59
10	Processing of sold products	3.7
11	Use of products	18,155
12	Disposal of products	833
13	Downstream lease assets	0.2
14	Franchise	NA
15	Investment	110
		22,055

※1 Scope 1: Direct emissions of greenhouse gases by the company (examples: fossil fuel, natural gas, etc.)

※2 Scope 2: Indirect emissions of greenhouse gases by the company (electric power use, etc.)

※3 Scope 3: Greenhouse gases emitted indirectly by the Company through the supply chain (examples: manufacturing, transportation, business travel, commuting, etc.)

※4 The calculation was conducted in accordance with the criteria of Scope 3 issued by the GHG PROTOCOL.

Verification of greenhouse gas (GHG) emissions

Verification by a third party was obtained in order to verify the reliability of GHG emission calculation information.

- Third-party greenhouse gas verification report
  - Japanese version (4,908 KB)
  - English version (5,271 KB)

Introduction of Initiatives ×

Conversion to the use of natural gas as fuel

The use of natural gas through environmentally friendly gas supply line is continuously being implemented in factories in Japan. Efforts to switch to natural gas as a source of fuel in reducing CO_2 emissions are also implemented in overseas factories where gas supply lines are not yet in place. This includes using tank lorries to transport liquefied natural gas in the Vietnam Plant and use of gas cylindersin the India Plant to replace heavy fuel oil.

Switch to gas cylinders in the India Plant

Installation of solar lights

Installation of outdoor lights using a combination of high efficiency solar panel and LED
The outdoor lights will be effective even in events of a disaster or power outage due to their independent power supply.

Installation of solar street lights

Installation of solar and wind powered street lights

Utilizing heat recovery technology to use factories' waste heat for air-conditioning (absorption chilling equipment)

By adopting absorption chilling equipment, which uses heat recovery from waste heat etc., we are able to reduce CO_2 emissions and also reduce peak electric power consumption during the summer months.


Absorption chilling equipment

Steam driven compressor

The plant gets air from air compressor powered by the energy harvested from the pressure difference as steam decompresses, which has never been used before. Showing results in cutting down power consumption and CO_2 emission.


Steam driven compressor

Energy saving improvements through heat insulation materials

We manufacture and install heat insulation materials fitting the size of equipment and piping.
We are implementing energy-saving activities that control heat release by installing heat insulation materials on and near steam pipework in our business locations both in Japan and overseas.


Pipe insulation

Energy-Saving Technology Committee

The Energy-Saving Technology Committee helps to improve the effectiveness of measures to reduce energy consumption through the adoption of energy management methods conforming to the Act on the Rational Use of Energy, the introduction of energy-saving equipment, etc.

Energy-Saving Technology Committee

As well, energy saving activities are implemented from the management level as well.

1. Promoting the office black illumination, leaving work on time campaign
2. Energy saving programs in summer (cool biz) and winter (warm biz)
3. Thoroughly enforce turning off standing by power consumption of OA equipment
4. Enhance energy saving awareness by making the energy consumption rate visible
5. Develop a lateral spread of energy saving improvements by sharing case examples (database building)

Issues and Future Improvement Measures ×

Issues include thorough management of data on global air emission volumes at overseas sales bases, etc. and working to reduce emissions in collaboration with the supply chain.

Materials

KPI

Item	FY 2017 results	FY 2018 results
Total volume of raw materials used	(Consolidated) 798,000 tons	(Consolidated) 796,000 tons
Ratio of rubber recycling	(Consolidated) 2.3%	(Consolidated) 2.4%

Responsible Departments ×

Technology and design departments

※Supervised by the 3Rs Committee

Stance and Target ×

Why is “Materials” a critical issue to be addressed? Explanation of the reason and background

Yokohama Rubber Group sells products using chemicals and natural capital such as natural rubber and water. These raw materials are made from the Earth’s natural resources, and they are by no means infinite. Accordingly, we view using minimal raw materials, promoting the sales of recycled products (such as retread tires), and the delivery of products that will please customers and society using recycled raw materials (such as regenerated rubber powder) to be important issues.

Policies and stance relating to raw materials

The Yokohama Rubber Group has presented its environmental philosophy in the Yokohama Rubber Environmental Policy and Yokohama Rubber Environmental Policy, and will work to develop and procure raw materials that lead to minimizing of the burden on the environment, and to minimize usage volumes of raw materials from natural resources in accordance with the Yokohama Rubber Group Action Guidelines.

Vision (attainment goal) / target

By reducing the amount of raw materials used, promoting the sales of retread tires, and working to expand use of recycled raw materials, we will establish a raw materials procurement system that can be used in a sustainable manner with a minimal impact on the environment and society throughout the entire life cycle. These activities will contribute to reducing CO_2 emissions in Scope 3 Category 11 (product use stage) by fiscal 2050.

Measures for vision achievement

We will develop and use raw materials with a reduced burden on the environment and society through the following initiatives in order to achieve business continuity.

1. We will review factors such as structural design and material rigidity to fulfill the required performance while achieving weight reductions.

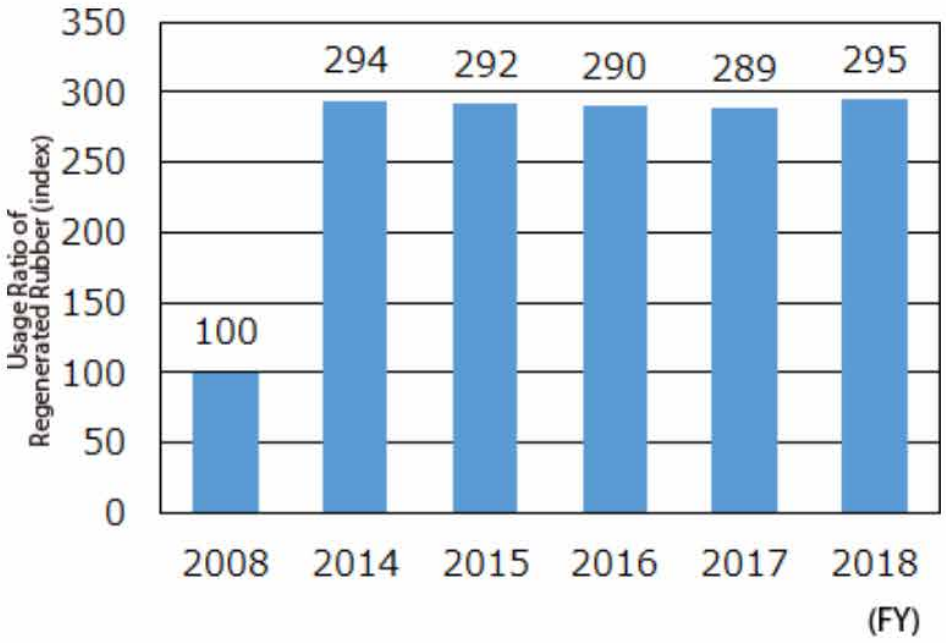
2. We will work to promote sales of retread tires.
3. Furthermore, we will develop tires and belts with a high regenerated mixture ratio, and reusable products.

Review of FY 2018 Activities

Expand the use rate of rubber recycled materials

The Yokohama Rubber group is effectively utilizing recycled materials, and working to expand the usage of regenerated rubber in all models of tires.
Rubber recycled materials can be categorized as three types?rubber powder, reclaimed rubber, and rubber regenerated from in-house sources.
The percentage of raw materials (compounds) accounted for by rubber recycled materials was 2.36% for the entire group (2.46% for domestic business locations and 2.27% for overseas business locations). We are working to enhance rubber compounding and blending technologies with the aim of increasing the adoption ratio of rubber recycled materials overseas.
Regenerated rubber powder is a powdered material obtained by grinding up waste tires, principally by using heat on the waste tires, and this recycled material contributes to major savings and recycling of resources. In the past, regenerated rubber powder had large particle size, and blending with rubber resulted in degraded physical properties?this meant that it was difficult to use in tires. However, Yokohama Rubber established blending technologies that control physical degradation with compounds of fine powder grade, and commenced mass production of tires made from a compound of this regenerated rubber from February 2009. Over the past five years, the volume of regenerated rubber used by the Yokohama Rubber Tire Group has grown by around 2.9 times since 2008.

Usage ratio of regenerated rubber in all Yokohama Rubber products*1



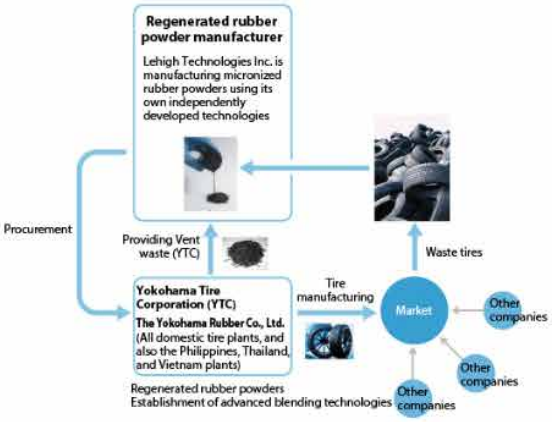
*1 Ratio of compound usage based on results of acceptance inspections

Currently, we are utilizing regenerated rubber powder in various compounds found mainly in PC, TB, and OR tread liners manufactured at our plants in Japan, the United States, the Philippines, Thailand, Vietnam, China, and India. In terms of technology, we will work to improve blending technologies, expand the applicable compounds that can be blended for regenerated rubber powder, and also actively strive to increase the compound volume through further miniaturizing of powder size.

Initiatives to expand usage, and development of new technologies

A regenerated rubber powder manufacturer has calculated that since use of recycled rubber powder was commenced at plants in the U.S. in 2006, the use amount at the Yokohama Rubber Group is equivalent to 1.88 million waste tires. This is equivalent to approximately 102,607 kl if converted into oil and equivalent to resource and energy savings of approximately 329,840,000 kWh if converted into power. In addition, if converted into CO_2 emissions, this is equivalent to an emissions reduction of approximately 48,431 tons.
We are newly establishing and expanding overseas plants, and we plan to produce tires incorporating regenerated rubber, further developing the effective usage of recycled materials.

Resources circulation by using regenerated rubber powder



Environmental impact reduction effect from the use of regenerated rubber*2

*2 Data provided by Lehigh Technologies

High-rigidity wind sealant

Our automotive glass sealant (wind sealant) has a positive reputation for its high durability, and we have developed high-rigidity wind sealant to improve the rigidity of car bodies. This not only improves safety, but also contributes to lighter car bodies through a decrease in the volume of sealant used.

Recycling activities in the MB business

As with last year, recycled rubber is mainly used in the manufacturing of rubber belts for use with railway track ballast; with this ratio being 2.7% in fiscal year 2018.
The resin mold material (thermoplastic resin) used in hose manufacturing can be crushed and melted down again after use; however, in the past the powder generated in the crushing process has normally been discarded as waste. By introducing a two-stage crushing process, the crushed particles can be kept at a larger size in the first stage, controlling the generation of powder.
The powder generated in the next stage of the crushing process can be collected and reused with the same level of traceability as the larger crushed particles.
As a result, a recycling rate of over 90% has been achieved, and the annual usage of resin mold material has been reduced by 3.6 tons.

Yokohama Rubber Nagano Plant received the JEMAI Chairman's Award for metal scrap briquetting

We received the Japanese Environmental Management Association for Industry (JEMAI) Chairman's Award for metal scrap (machining chip) briquetting at the Resource Recycling Technologies and Systems Awards in 2018.
The Nagano Plant manufactures joint fittings for hoses and assembles hoses and fittings. It has developed an effective system to contribute to resource recycling, in which the metal scrap powder generated during the production of metal fittings that had been sold to an external metal scrap supplier is briquetted for steel raw materials (solidified into a specific shape by hardening the powder with high pressure) for direct sales to steel companies.

Issues and Future Improvement Measures ×

While using raw materials in business activities is unavoidable, our final goal is a state which minimizes the use of the Earth's resources.
A key issue is correctly assessing whether the use of reusable products and recycled materials is leading to a reduction in the use of the Earth's resources and the environmental impact, and to deploy these assessments on a global level.

Products and Services

KPI

Item	FY 2017 results	FY 2018 results
Ratio of environmentally friendly products to all products handled	(Consolidated) 100.0%	(Consolidated) 100.0%
Reuse and recycling ratios for used products and packaging materials	(Consolidated) Used products Tires 54% MB 57% Packaging materials 97%	(Consolidated) Used products Tires 57% MB 58% Packaging materials 97%

Responsible Departments

Product development and planning division

Stance and Target

Why is “Environmentally Friendly Products” a critical issue to be addressed?
Explanation of the reason and background

LCA (life cycle assessment) refers to the method used to understand the environmental load (CO_2 emissions) in numerical data of each stage of the product lifecycle from production to disposal. In the case of tires, which are the core products of the Yokohama Rubber Group, 80?90% of CO_2 emissions take place during the usage period of the life cycle. For this reason, the Yokohama Rubber Group is focusing on coming up with environmentally friendly products to realize low fuel consumption.

Policies and stance relating to products and services

In accordance with the basic stance set forth in the Yokohama Rubber Basic Environmental Policy, Yokohama Rubber Environmental Policy, and Yokohama Rubber Group Action Guidelines, the Yokohama Rubber Group will work to prevent global warming, effectively use resources, and consider and improve chemical substance management in order to minimize the burden of products and services provided by the Yokohama Rubber Group on the environment. In addition, we will provide environmentally friendly products with improved safety and quality (performance) to customers.

Vision

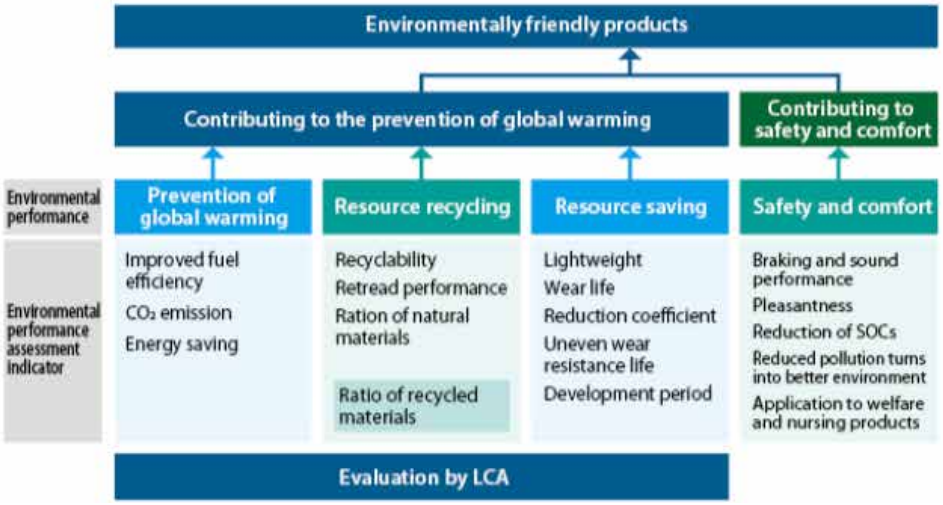
We aim to make 100% of product sold environment friendly products, and improve environmental performance based on social demands.

Measures for vision achievement

In order to become a top-level environment friendly company, we aim to make all products environment friendly products. We will not only reduce emissions of greenhouse gases through products, but also work to ensure safety and comfort through means such as resource recycling, resource savings, and the reduction of chemical substances contained in our environment friendly products. For new products, because we conduct environmental assessments at the beginning of the development process and have a framework under which development is not allowed if products do not clear our Environmentally Friendly Products Regulations*, all new products that are released are environmentally friendly products.

※Environmentally Friendly Products Regulations:
The Yokohama Rubber Group defines environmentally friendly products as newly developed products for which the average score of the four items of global warming prevention, resource recycling, resource conservation, and safety and comfort exceeds 5%, and for which the score for any of these items has not deteriorated.

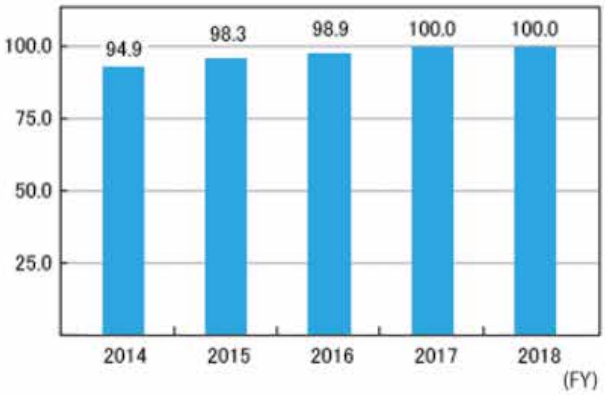
<Four Pillars of Environmental Function and Environmental Performance Evaluation Index>



Review of FY 2018 Activities

Results for the environmental contribution ratio (overall)

The ratio of environmentally friendly products for the Yokohama Rubber Group was 100.0%, and percentage for the fuel efficient tires lineup was 52%.
A performance assessment was not conducted for the degree of environmental contribution and environmental impact in the development of environmentally friendly products.
In terms of the improvement effects, 87% of standard passenger vehicle tires manufactured in Japan were fuel efficient tires, and CO_2 emissions were reduced by approximately 734 thousand tons for GHG emissions at the stage of product use (Scope 3) indirectly emitted through the supply chain.



* Environmental contribution ratio in products sold by the Yokohama Rubber Group (consolidated)

Introduction of Initiatives

Resin Adhesive (WS-242/AN-1)

There is a growing trend for automotive manufacturers to make more extensive use of plastic materials, in order to reduce vehicle weight. However, unlike metal plate, plastic components cannot be welded, and in the past plastic adhesives have also required the use of primers to be effective.
Yokohama Rubber has succeeded in developing primer-less adhesive technology, and has launched a new adhesive product made from vegetable oil which features this technology.
This new adhesive product facilitate the use of plastic components in automotive manufacturing, which in turn contributes to reducing the burden on the environment by making it possible to reduce vehicle weight by around 40%.

High-pressure Hydrogen Gas Hoses (ibar HG82)

For hydrogen infrastructure to be successfully deployed in society, the availability of durable, lightweight, flexible hoses that can withstand high pressures is an important prerequisite.
Yokohama Rubber has developed a new hose specification that features a reinforced hybrid hose structure utilizing PBO fiber (Polybenzoxazole fiber) and steel wire, and has launched new hose products that meet the requirements outlined above.

*2 Provided by Lehigh Technologies

Fuel-efficient Tires (BluEarth GT AE51)

Fuel efficiency has been further improved while ensuring the excellent wet grip performance well-established with our previous product (BluEarth-A). In the domestic labeling system, the wet grip performance has received the highest grade of "a" for all sizes. In terms of rolling resistance performance, it has acquired "AA" for 31 sizes and "A" for 26 sizes.

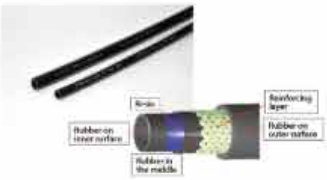
iceGUARD studless G075 SUV tires

With the iceGUARD series basic concepts of being effective on icy surfaces, being long-lasting and improving fuel consumption, low heat tread rubber using low fuel consumption BluEarth studless tire technology was adopted to reduce energy loss due to heat generation and reduce rolling resistance by 5%. By optimizing the tread layout using Yokohama Rubber's original simulation technology, pattern noise has been reduced by 28% (compared with noise energy reduction rate) to improve quietness.

ECOTEX energy-saving conveyor belt

We delivered the ECOTEX energy-saving conveyor belt to the KLT line of Taiheiyo Cement Corporation, the longest conveyor line in Japan (about 14 km). In addition to its excellent durability, ECOTEX contributes to reducing the energy consumption of conveyors by optimizing the viscoelasticity of the bottom cover rubber in contact with the roller, and reducing the resistance of the roller running over. The KLT line has achieved a significant reduction in energy consumption of more than 50% (according to our research) after the delivery compared to our conventional products.
Taiheiyo Cement Corporation was also awarded the Limestone Association of Japan's Best Achievement Award at the 77th Limestone Mining Convention because of this replacement.

Car air conditioner hoses that support next-generation coolant



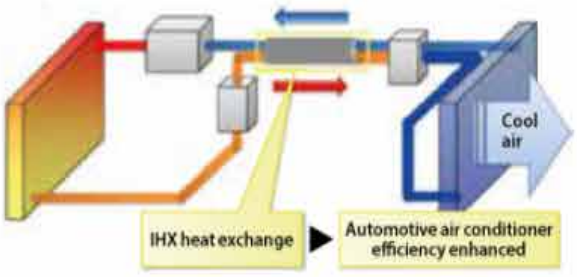
We have developed car air conditioner hoses that support HFO-1234yf, which is widely used as a next-generation coolant in car air conditioners for car manufacturers in North America. The newly developed high-pressure and low-pressure hoses have already been adopted. Currently, HFC-134a, which is widely used as a coolant for car air conditioners, has a high GWP of 1,430, but the GWP of HFO-1234yf is limited to 4, and there is a movement to promote switching in order to prevent global warming. However, HFO-1234yf gradually decomposes over long-term use and has acid-generating properties, so the resin of hoses with a resin layer on the innermost surface corrodes. There are methods of improving the resin material and preventing contact between the resin and the coolant. To meet the demands of car manufacturers in North America, a hose structure with a rubber layer on the inner surface of the resin layer was adopted, and by developing an internal rubber with improved adhesion, we have developed a car air conditioner hose that prevents direct contact between the coolant and resin, preventing resin corrosion and coolant leakage.

IHX that improves cooling efficiency of car air conditioners

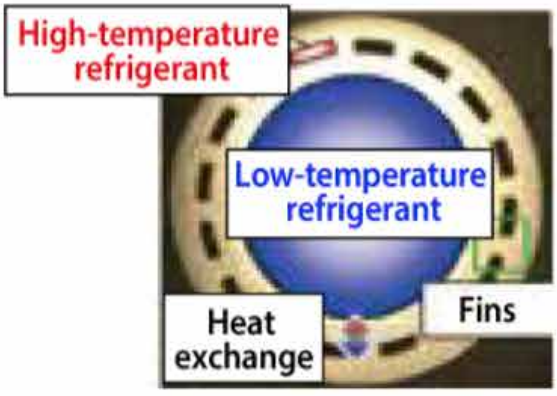
We have developed a double-tube IHX[*1] that improves the cooling efficiency of car air conditioning systems. Currently, HFC-134a, which is widely used as a coolant in car air conditioners, has a high GWP[*2] of 1,430, so the switch to HFO-1234yf (GWP = 4) with a low coefficient is progressing to prevent global warming. On the other hand, while the cooling efficiency of HFO-1234yf is lower than for HFC-134a, the developed double-tube internal heat exchanger can cover this drop in cooling efficiency. With a double-tube structure that integrates a part of two coolant tubes that were conventionally configured separately and using the temperature difference between the high-temperature and low-temperature coolants to exchange internal heat, it improves the cooling efficiency of the entire air conditioning system (Fig. 1). In addition, it was necessary to design the pipes according to the layout of the engine room since the car air conditioning system is piped in a narrow space there, but the piping could be designed freely as with conventional air conditioning by arranging the fins inside (Fig. 2) since the coolant flow path is not crushed even if it is bent. The newly developed double-tube internal heat exchanger has already been adopted.

※1 : IHX=Internal Heat Exchanger

※2 : GWP=Global Warming Potential



(Fig. 1) Car air conditioning system using double-tube internal heat exchanger



(Fig. 2) Cross section of pipe with finned double-tube structure

Hamatite SC-DM2 two-component polysulfide sealant for floor joints

Hamatite SC-DM2, a sealant used for floor joints such as concrete and tiles, hardens faster than conventional products and shortens construction time. In addition, in consideration of the safety of pedestrians, besides increasing the hardness so that high heels do not pierce the joints, we have made a product with excellent weather resistance, oil resistance and chemical resistance using our unique blending technology. In addition, it has acquired F ☆☆☆☆ certification, the highest formaldehyde emission grade, giving consideration to safety and the environment.

BluEarth-air EF21 light weight fuel-efficient tires

We have developed BluEarth-air EF21, an advanced technology concept tire that aims to contribute to the environment through the latest lightweight design.
BluEarth-air EF21 adopts Yokohama's latest lightweight design technology with the aim of contributing to weight reduction of the entire vehicle to improve fuel efficiency and contributing to the environment through reducing used resources. We achieved a lightweight, thin and highly rigid structure with a weight reduction of about 25% in mass*. A newly developed exclusive compound and the latest rubber mixing technology A.R.T. Mixing were also adopted. In the domestic tire labeling system, the rolling resistance performance has received the highest grade of "AAA" and wet grip performance has received "a", meaning it exhibits excellent fuel efficiency and wet performance.
BluEarth-air EF21 was developed in commemoration of the company's 100th anniversary and only 100 were sold in December 2017.

Issues and Future Improvement Measures ×

One issue is the handling of old products that are difficult to replace with new products due to promises made to customers.
For other products, at the end of fiscal year 2017, we achieved 100% environmentally friendly products for all products sold in Japan and overseas. In the future, we will maintain 100% environmentally friendly product production and enhance activities to further improve the environment.

Environmental Grievance Mechanisms

KPI

Item	FY 2017 results	FY 2018 results
Total number of complaints concerning the environment formally submitted to the system for handling complaints concerning human rights * Number subject to official procedures	(Consolidated) 0	(Consolidated) 0

Responsible Departments

Basic activities: each business location
Consolidation: Environmental Protection Promotion Department

Stance and Target

Why is “Environmental Grievance Mechanisms” a critical issue to be addressed?
Explanation of the reason and background

The Yokohama Rubber Group, which has production bases in Japan and overseas, views the minimizing of the adverse effects of plants (such as noise and odors), communication with local residents, and creating trust relationships by continuing to live up to expectations, to be important for achieving sustainable operations in each region.
The Yokohama Rubber Group, which has production bases in Japan and overseas, views the minimizing of the adverse effects of plants (such as noise and odors), communication with local residents, and creating trust relationships by continuing to live up to expectations, to be important for achieving sustainable operations in each region.

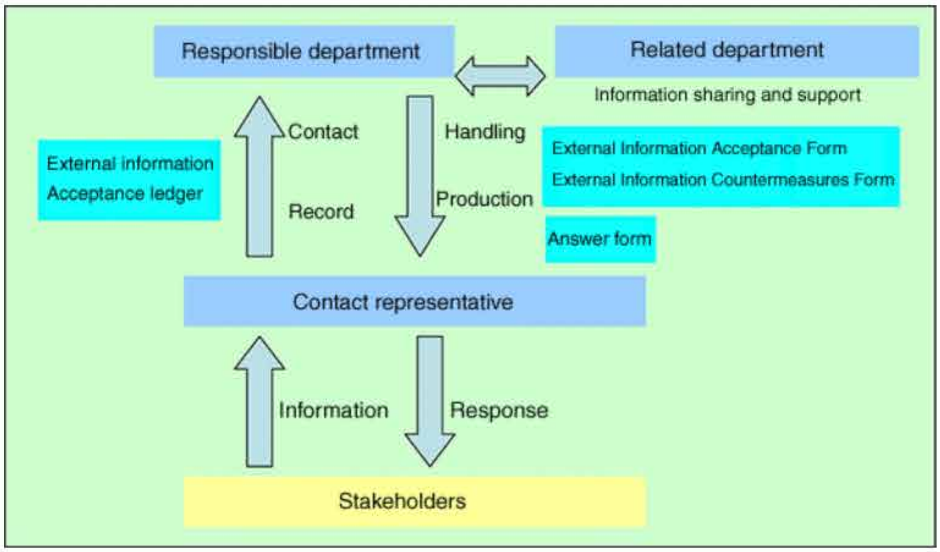
Policies and stance towards handling complaints

We aim to clarify the method for receiving information related to the environment both internally and externally throughout the entire company and achieve proper communications with external stakeholders, while promptly and accurately sharing information between business locations in order to prevent the occurrence of similar types of complaints throughout the entire company.

Overview of the Environmental Grievance Mechanisms

External environment related information gathered at each business location that could involve environmental risks and opportunities is entered in the External Information Acceptance Ledger, and it is determined whether the information constitutes an external complaint based on the external information standards of the company-wide guidelines. If such information is certified as an external complaint, it is handled in accordance with the emergency response standards of the company-wide guidelines. For information that is not certified as an external complaint, the relevant department will be contacted as appropriate if deemed necessary by the environment representative of each business location.
In the event of warning, guidance, or recommendations from the government, an External Information Acceptance Form will be issued and simultaneously sent to the Environmental Protection Promotion Department, other business locations, and the Tire and MB (industrial products) Production Environmental Task Force.
The Environmental Protection Promotion Department will provide advice on countermeasures while receiving advice from the Legal Department, and the entire Group will cooperate in response.

External information and complaint handling flow



<Resolution process when a complaint is submitted>

If an environmental management representative has deemed that there has been an external complaint, an External Information Countermeasures Form will be issued and simultaneously sent to the Environmental Protection Promotion Department, other business locations, and the Tire and MB Production Environmental Task Force.
The Environmental Management Task Force of the business location will submit an answer form to an external information provider after reporting and gaining approval from the manager of the business location for all documents from complaint receipt to response. This answer form will be sent and shared if there has been a request from other business locations or the Environmental Protection Promotion Department.

<Users of the Grievance Mechanisms>

It can be used by all stakeholders.

<Methods for spreading awareness of the Grievance Mechanisms>

We have formulated company-wide guidelines for the Environmental Grievance Mechanisms that will be distributed to all business locations in Japan and overseas. In addition, every time regular audits are conducted at each business location, we will work to ensure awareness of the overview of the system and how to use it. At the same time, we will use opportunities such as the Environment Council to deepen an understanding of the system at each business location.
When construction work takes place inside a plant, we communicate with local residents by sending out advanced notices of the period of work, hours of work each day, and a telephone number to call to local residents.

<Monitoring of the effectiveness of the Grievance Mechanisms>

We have decided on internal monitors and external monitors for each business location to gather information through regular visits, etc. conduct communication, and check that the complaint handling system is operating effectively.

Vision (attainment goal) / target

Manuals have been developed on complaint collection and response, and a system capable of uniform response throughout the Yokohama Rubber Group has been adopted. We will continue to utilize the monitor system so that the system continues to be operated appropriately.
We will aim for zero complaints.

Measures for vision achievement

As measures to strengthen coordination between each business location, we will conduct regular audits and define business locations with high risks of environmental issues as focus business locations for regular follow-up, Environment Council attendance, and guidance on improvement methods.

Review of FY 2018 Activities ×

In fiscal year 2018, no complaints were received.
We will continue to reinforce communication with stakeholders to maintain this track record of no complaints.
We will also examine and address the views and requests of outside monitors to prevent complaints from occurring in the future.
In the future, by analyzing the causes of complaints and developing suitable countermeasures, we will ensure that we are able to offer considerate explanations to the parties filing complaints and respond appropriately to their requests.

Issues and Future Improvement Measures ×

We will continue efforts to raise awareness of the complaint handling system both internally and externally and pre-dissemination as necessary, while continuing monitoring the system to ensure appropriate system operation.
In regard to countermeasures for odor issues, which constitute one cause of complaints, it is difficult to adopt uniform measures because the types and components of odors differ by business location, and they are highly susceptible to the sensitivity of individual people. With the aim of achieving zero complaints, we will conduct a detailed analysis of causes and install a reactor tank, which is effective at eliminating odorous components (through reaction, absorption, etc.), to increase the effectiveness of our countermeasures.
Going forward, we will continue to roll out initiatives horizontally and implement further countermeasures.