

The Earth



Promoting carbon-neutral, resource-recycling, and sustainable procurement of natural rubber while balancing economic activities, and working in harmony with local communities and nature. We will address customers' demands for a decarbonized society in a timely manner, as well as promote research and development and the provision of products and services as a company that plays a part in this effort.

[Click here for PDF version. \(The Earth\)](#)

[Response to climate change \(Disclose information on TCFD\)](#)

[Click here for PDF version \(Response to TCFD\)](#)

The Environment

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Management

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 respect international norms, deepen communication with its stakeholders and will strive to make contributions to local communities and to society as a whole by promoting collaboration to working with the value chain.
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 promote decarbonization measures, such as energysaving activities and the introduction of renewable energy, and strive to conserve and recycle resources in order to realize a carbon-neutral and circular economy.
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 CO₂ 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 aim to achieve zero emissions at all of our production bases. 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.

Shuichi Fukutani
General Manager,

Head of Environmental Protection Promotion Department, Corporate Social Responsibility Division

Vision for FY 2023

- We will maintain all of our products as environmentally friendly ones.
- Achieve net zero CO2 emissions (carbon neutrality) in our activities by 2050
- Reduce CO2 emissions from company activities by 28% by 2030 compared to fiscal 2019
*Equivalent to a 38% reduction compared to 2013
- 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

Environmental Grievance Mechanisms

In the event of a caution, guidance, or recommendation from the government, we should take action in accordance with the emergency response standards in the Company-wide guidelines. 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. Local residents in the vicinity of the plant, we have a system that allows anyone to file a complaint. 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.

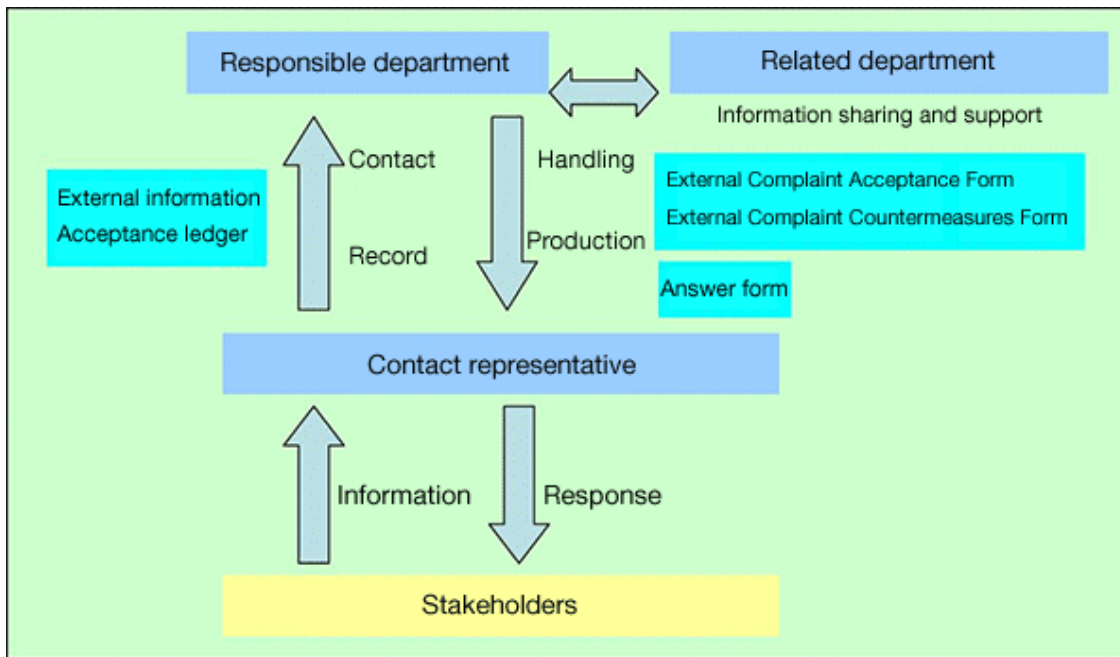
In the event of warning, guidance, or recommendations from the government, an External Information Acceptance Form will be issued and simultaneously sent to the Environmental Protection Promotion Department, other business locations, and the Tire and MB (industrial products) Production Environmental Task Force.

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.

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.

External information and complaint handling flow



Environmental Risk Management

Based on the document on "Preparation and Response to Emergencies", the environmental management representative of the sites concerned compiles a list of accidents and emergencies that may have a significant impact on the environment into a "List of Accidents and Emergencies", which is updated every year. In addition, each base verifies and trains in the procedures for responding to the accidents and emergencies identified at each site, and confirms the effectiveness of the response procedures in accordance with the relevant guidelines.

In the event of an environmental accident or emergency, the base shall take preventive and emergency measures in accordance with the "Preparedness and Response to Emergencies" document, and shall report to the local government authorities in the event that environmental standards are exceeded.

Immediately after the occurrence of an incident, the information is communicated to the relevant departments by means of a "Zero Report" in accordance with the "Management Guidelines for Responding to Emergencies" stipulated by the department in charge, and the information is communicated to the relevant departments by means of an "Environmental (1) Accident, (2) Trouble, (3) Serious Near-Fire, (4) Near-Fire" incident report within 24 hours of the occurrence.

The environmental manager of the site will follow up on the status of corrective measures after an accident or emergency situation to ensure the prevention of a recurrence and the prevention of similar accidents, and the plant manager will review the procedures after an accident or emergency.

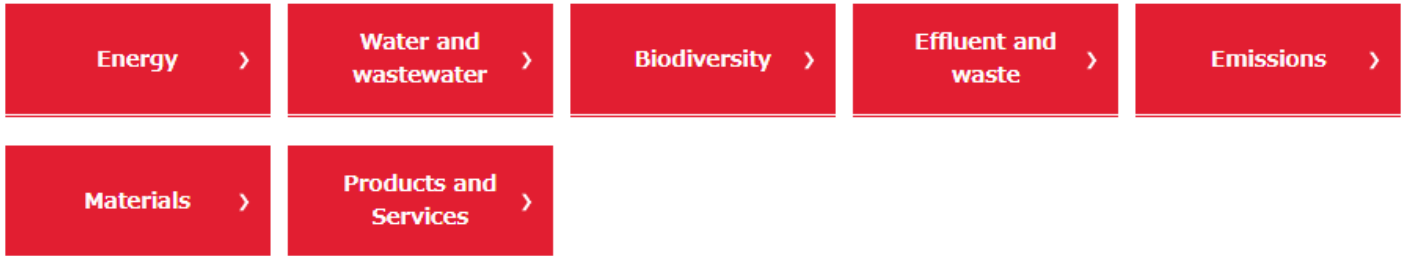
The Environmental Protection Promotion Department takes a professional and company-wide view of countermeasures and prevention of recurrence.

Environmental managers at other sites who receive this information will use it to take measures to prevent similar accidents from occurring at their own sites.


In addition, the Company-wide Environmental Management Committee investigates the causes of accidents and emergencies, implements countermeasures, and follows up on measures to prevent recurrence, and makes these findings available for reference, which will be used as reference in the ISO 14001 requirements management review.

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.



Data summary

 The Environment (300KB)

Energy

KPI

Item	FY 2020 results	FY 2021 results
Total energy consumption	(Consolidated) 1,678,571MWh * Crude oil equivalent: 424,376 KL	(Consolidated) 1,858,043MWh * Crude oil equivalent: 469,625 KL
Total external energy consumption * Reported as Scope 3 (Other emissions)	587,527,401 MWh	726,027,203 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.

In 2022, the committee structure was revised and changed to the Carbon Neutrality Promotion Committee.

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 the globally shared goal of achieving carbon neutrality by 2050, the Yokohama Rubber Group is working to reduce total greenhouse gas (GHG) emissions as an indicator for reducing energy consumption.

- Long-term target:
 - Achieve net zero CO2 emissions (carbon neutrality) in our activities by 2050
- Mid-term target:
 - Reduce CO2 emissions from company activities by 38% by 2030 compared to fiscal 2013
※This activity is the same level of effort as our goal of 28% reduction by 2030 (compared to 2019).
 - Encourage suppliers to collaborate with us in line with our targets.

Measures for vision achievement

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

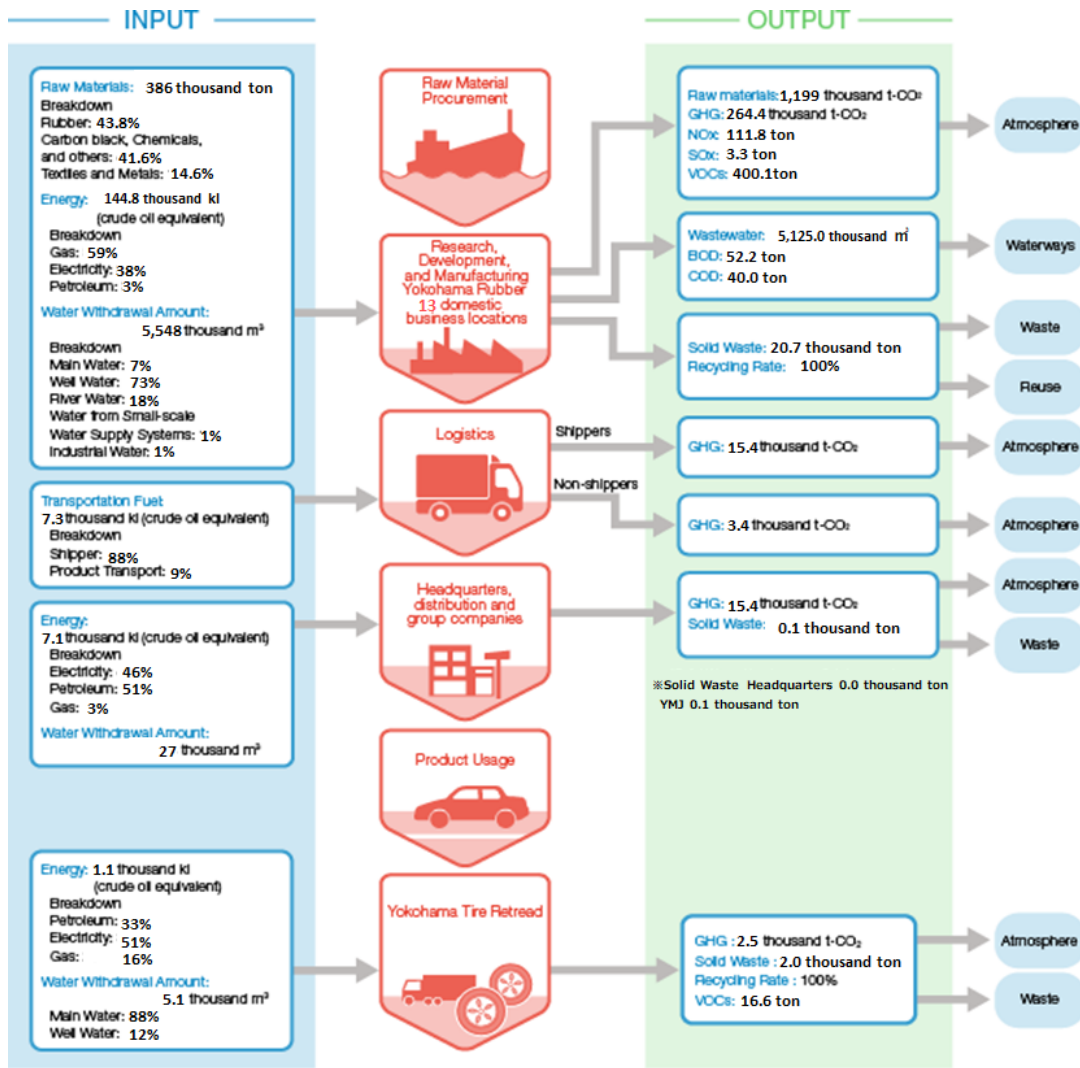
1. Promotion of a modal shift in logistics
2. Management of energy in production
We will promote the effective use of energy through system improvements, savings improvements, process improvements, the development of management systems, the introduction of production systems, and the introduction of 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 2021 Activities

System improvements (development of energy-saving vulcanization system, use of cogeneration), savings improvements (increased use of LEDs, improved equipment utilization), process improvements (optimization of rubber kneading process), and introduction of new energy (introduction of solar power generation system) were promoted.

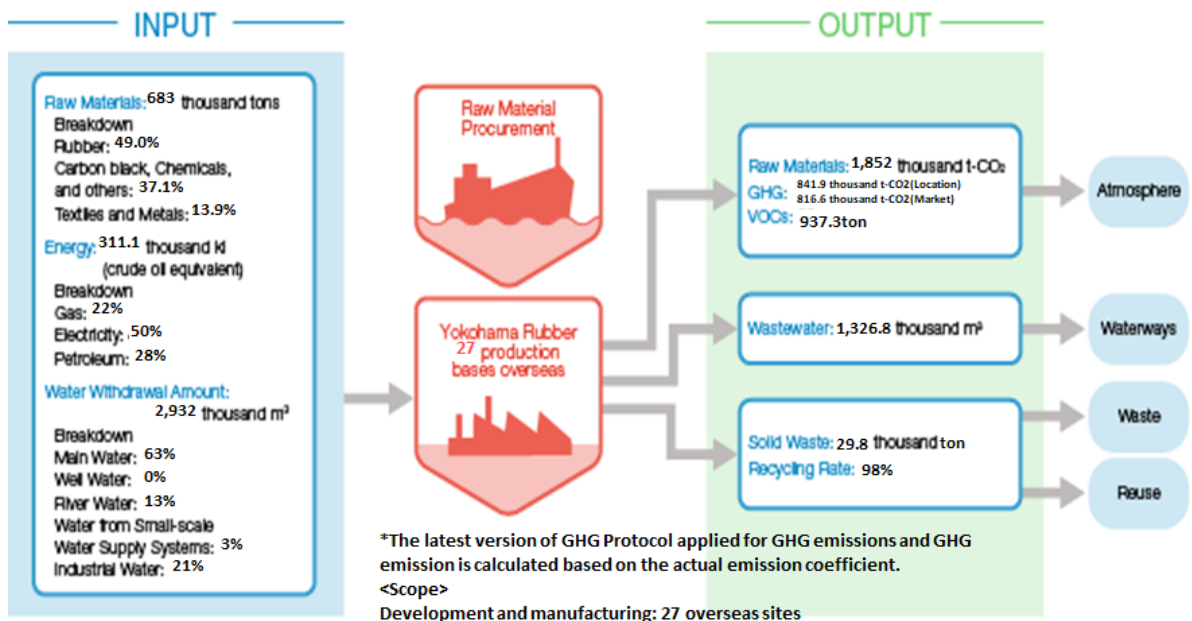
Despite the increase in production in FY2021, Yokohama Rubber on a non-consolidated basis in Japan reduced GHG emissions by 19% compared to FY 2013.

Overall picture of the environmental burden in Japan



<Statistics Source>
 Research, Development, and Manufacturing: Yokohama Rubber 14 domestic sites
 Headquarters and Distribution: Headquarters, tire and industrial goods distribution companies 72 sites
 Retread Tires: Yokohama Tire Retread (YTR) 4 sites

Overall picture of the environmental burden overseas

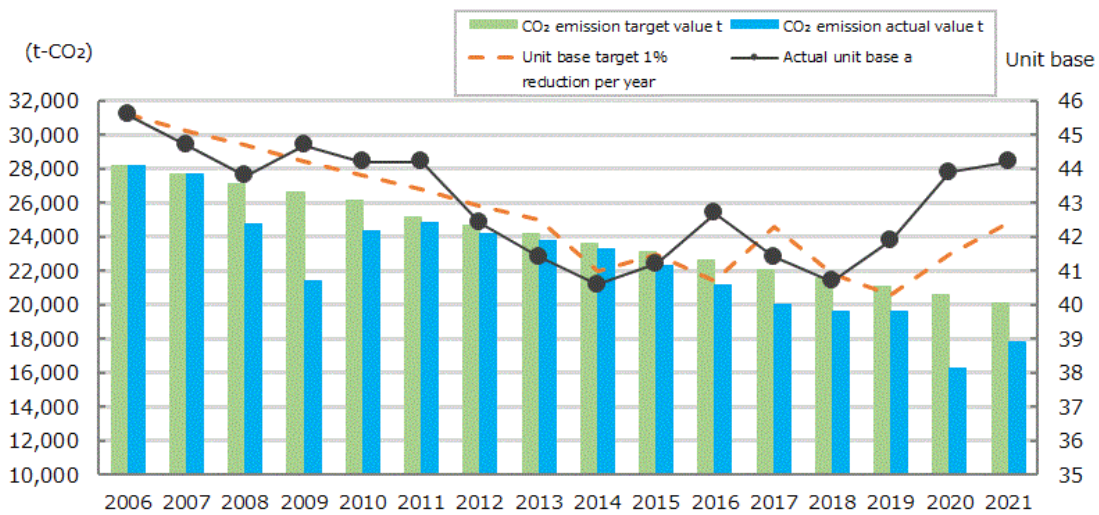


Introduction of Initiatives

Reduction of energy usage and CO₂

- Target: Reduce CO₂ emission by 25% by 2020 compared to the base year of 2006.
- Results: In logistics, we have been working to reduce CO₂ emissions by 25% by 2020 from the base year of 2006. In FY2020, we achieved the target with a 38% reduction compared to FY2006. In FY2021, we continued to review transportation routes, reduce warehouse transportation volume, and improve loading efficiency, but emissions were 17,777t-CO₂, up 2% from the previous year. On the other hand, the basic unit worsened by 3.3% to 44.2 kl/million ton-kilometer.

CO₂ 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. Visualization of energy
2. Control of peak demand through demand control equipment
3. Insulation of plant building roofs
4. Reduction of boiler fuel by updating the water supply system of boiler facilities to reduce the boiler effluent rate.

*Installed an automatic control device for the number of air compressors in operation



Boiler facilities Water supply system

The agitation motor was changed from an air type to an electric type.

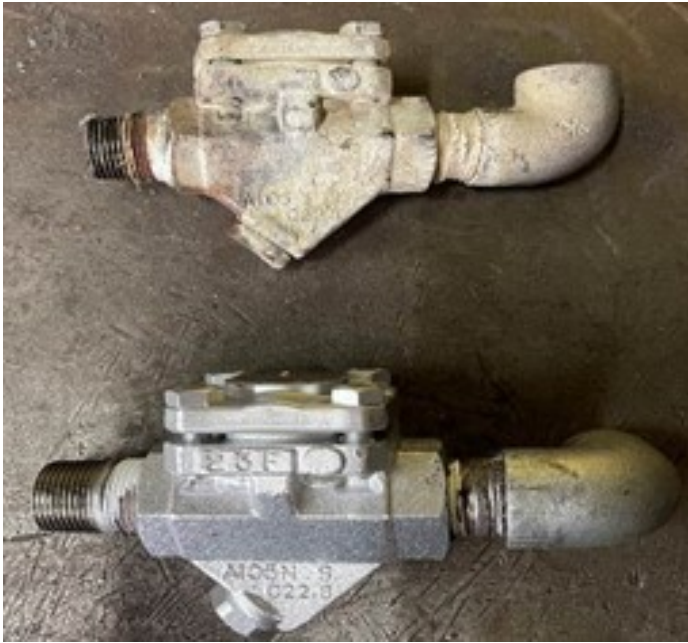


Air motor



Electric motor

Conducted steam drain trap diagnosis to control steam energy loss.



Steam drain trap (Upper photo: defective trap, lower photo: new trap)

Air leakage loss control by controlling (closing) the air source valve when not in operation.



Air valve management during non-operating hours (closed)

The heat insulation material is installed in the uninsulated part of the once-through boiler to control heat radiation loss.



Removable heat insulator

Air and steam leaks are detected using air leak visualization equipment at each plant in Japan to control increased losses due to air leaks.

Energy loss was improved by branching the piping system of steam-type unit heaters and adding individual valves after energy conservation diagnosis by the manufacturer.



Separated the steam system and installed a motor valve.

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 CO₂ emissions through the adoption of co-generation systems that supply energy and steam at the same time. As of 2019, 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

CO₂ 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

The pressure booster pumps for the pressure testers were changed to intermittent operation control and to air hydro pumps. In addition, the duct fan V-belt was replaced with an energy-saving type to reduce electricity consumption.



Air hydro pumps

The hydraulic unit for a multi-axis automatic lathe has been converted to an inverter to reduce power consumption during standby time.



Hydraulic unit inverter conversion

In addition, we are switching to high-efficiency motors.



High-efficiency motor



Improving the efficiency of production equipment cooling-water pumps

In conjunction with the renewal of the calender equipment, the heat exchange system was changed from direct mixing to indirect heating to reduce the amount of steam used.

In winter, when the water temperature in the cooling water tank drops, the circulating cooling tower equipment is deactivated to reduce the amount of electricity used.



Cooling-water pump



Optimizing the chiller tank

Adoption of LED lights

We are replacing the ceiling lights (mercury and fluorescent) in our buildings in Japan and overseas with LED and high-efficiency ones to significantly reduce the power consumption of lighting. In addition, the use of motion sensor control has been promoted, which has been highly effective in reducing electricity consumption for lighting.



Conversion to motion sensors and LEDs



Mercury lighting → LED lighting



Replacement of lighting

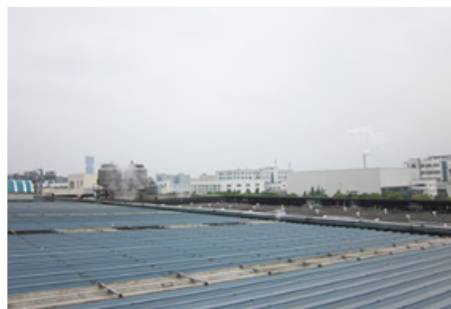
Solar power generation

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

Biogas

Food waste was going to landfill at the Tirunelveli plant in India. The problem was hygiene and the generation of methane, which has an emission factor 25 times higher than that of CO₂. Therefore, we built a biogas plant and processed 250 kg of food

waste per day to generate gas. Therefore, we built a biogas plant and processed 250 kg of food waste per day to generate gas in 2019. In 2021, LPG gas consumption was reduced by 559 kg, resulting in a reduction of 1.68 t-CO₂.

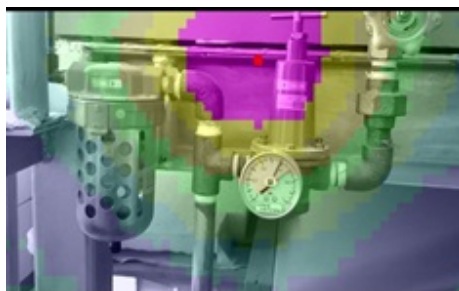


Energy Saving Month activities

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. For example, the maintenance department conducted an energy saving audit, inspected and found steam and air leaks, and made repairs.



Education activities during the Energy Saving Month



Leakage inspection and visualization



Leak repair

Energy saving subcommittee

Energy saving subcommittees are held by energy saving staff from domestic plants to follow up on annual energy saving reduction plans, investment in energy-saving equipment, and progress.

The committee introduces and horizontally deploys examples of improvements at each plant, which has been effective in reducing energy consumption.



Activities of the Energy Saving Subcommittee



Activities of the Energy Saving Subcommittee

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.

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 and wastewater

KPI

Item	FY 2020 results	FY 2021 results
Water intake	(Consolidated) 8,036 thousand m ³	(Consolidated) 8,494 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).

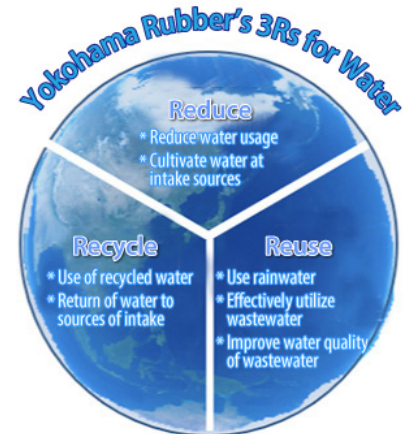
Water risk assessments

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.



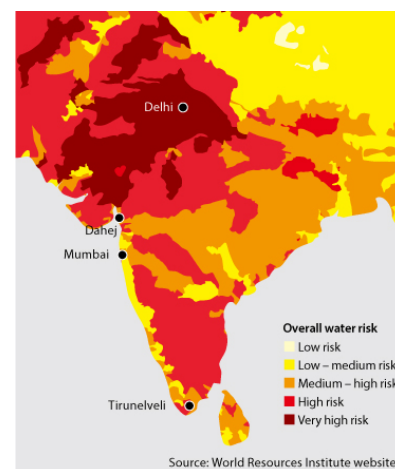
Measures for vision achievement

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 2021 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 2021, and reported to suppliers. The breakdown of water withdrawal is 65% domestically and 35% internationally.
- 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.
- We regularly check wastewater to ensure that there are no water quality problems.
We meet the water quality standards of the countries and regions where our bases are located.

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

On the other hand, we are conducting "[biodiversity conservation activities](#)" in Mie, Shinshiro, Mishima, and Ibaraki to investigate the impact on the rivers where the water is discharged, and in Hiratsuka to investigate the impact on the rivers where the well water comes from.

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 2020 results	FY 2021 results
Implementation rate of biodiversity conservation activities for ecosystems near production facilities	(Consolidated) 49% (13 domestic business locations, and 9 overseas locations)	(Consolidated) 50% (13 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 Co., Ltd. (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 <i>Caretta caretta</i> (Loggerhead turtle) egg-laying sites along the Ominato Coast in Ise City, Mie Prefecture, and conservation of breeding grounds of <i>Sialia sialis</i> (Eastern bluebird) at Virginia Plant	Satoyama (traditional community-managed forest) conservation in Toyooka Village, Nagano Prefecture; Satoyama conservation in Tsuchiya district, Hiratsuka City, Kanagawa Prefecture; conservation of <i>Caretta caretta</i> (Loggerhead turtle) egg-laying sites along the Ominato Coast in Ise City, Mie Prefecture, and conservation of breeding grounds of <i>Sialia sialis</i> (Eastern bluebird) at 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	Rivers receiving wastewater CR+EN: Two species: <i>Chara</i> sp. (Stonewort), <i>Anguilla japonica</i> (Japanese eel) (Kaname River, Hinokijiri River) VU: Two species: <i>Oryzias latipes</i> (Japanese rice fish) (each river) and <i>Liobagrus reinii</i> (Torrent catfish) (Tenryu River) NT: Six species: <i>Veronica undulata</i> (Kaname River), <i>Macromia daimoji</i> (Sonobe River), <i>Diplonychus japonicus</i> (Ferocious water bug) (Sonobe River), <i>Cottus pollux</i> (Japanese fluvial sculpins) (Kuroda River), <i>Pelophylax nigromaculatus</i> (Black-spotted Pond Frog) (Tenryu River), <i>Mauremys japonica</i> (Japanese pond turtle) (Goten River)	Rivers receiving wastewater CR+EN: One species: <i>Anguilla japonica</i> (Japanese eel) (Kaname River, Hinokijiri River) VU: Two species: <i>Oryzias latipes</i> (Japanese rice fish) (each river) and <i>Liobagrus reinii</i> (Torrent catfish) (Tenryu River) NT: Five species: <i>Veronica undulata</i> (Kaname River), <i>Diplonychus japonicus</i> (Ferocious water bug) (Sonobe River), <i>Cottus pollux</i> (Japanese fluvial sculpins) (Kuroda River), <i>Pelophylax nigromaculatus</i> (Black-spotted Pond Frog) (Tenryu River), <i>Mauremys japonica</i> (Japanese pond turtle) (Goten River)
<Categories of threatened species>	On premises of plants and satoyama VU: One species: <i>Cephalanthera falcata</i> NT: Four species: <i>Sasakia charonda</i> (Great purple emperor), <i>Psilotum nudum</i> (Whisk fern), <i>Calanthe discolor</i> , <i>Cynops pyrrhogaster</i> (Japanese fire belly newt) Least concern: One species: <i>Vanellus cinereus</i> (Grey-headed lapwing)	On premises of plants and satoyama VU: One species: <i>Cephalanthera falcata</i> NT: Four species: <i>Sasakia charonda</i> (Great purple emperor), <i>Psilotum nudum</i> (Whisk fern), <i>Calanthe discolor</i> , <i>Cynops pyrrhogaster</i> (Japanese fire belly newt) Least concern: One species: <i>Vanellus cinereus</i> (Grey-headed lapwing)
	Beaches near to where wastewater flows out EN: One species: <i>Caretta caretta</i> (Loggerhead turtle) (Ominato coast)	Beaches near to where wastewater flows out EN: One species: <i>Caretta caretta</i> (Loggerhead turtle) (Ominato 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. The very existence of our business sites itself causes disturbance and fragmentation of the local ecosystem through land modification and changes in the microclimate.

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

Short-term and medium-term goals

1.Sustainable Natural Rubber Procurement

Item	Targets	Achieved year
Number of natural rubber plantations surveyed	Cumulative total of 500	FY2023
Percentage of natural rubber suppliers surveyed (Tier1)	100%	FY2023
Implemented grievance mechanisms	Completed	FY2023

2.Promoting Agroforestry (※)

Item	Targets	Achieved year
Number of saplings provided to natural rubber plantations for agroforestry	Cumulative total of 130,000 trees	FY2030
Number of farmers introducing agroforestry	Cumulative total of 170	FY2030

※Agroforestry is a term created from the words agriculture and forestry, and refers to the grazing of livestock and cultivation of crops between planting trees. Yokohama Rubber is promoting agroforestry in natural rubber plantations.

3.YOKOHAMA Forever Forest Activities

Item	Targets	Achieved year
Number of trees planted and saplings provided	Cumulative total of 1.3 million trees	FY2030

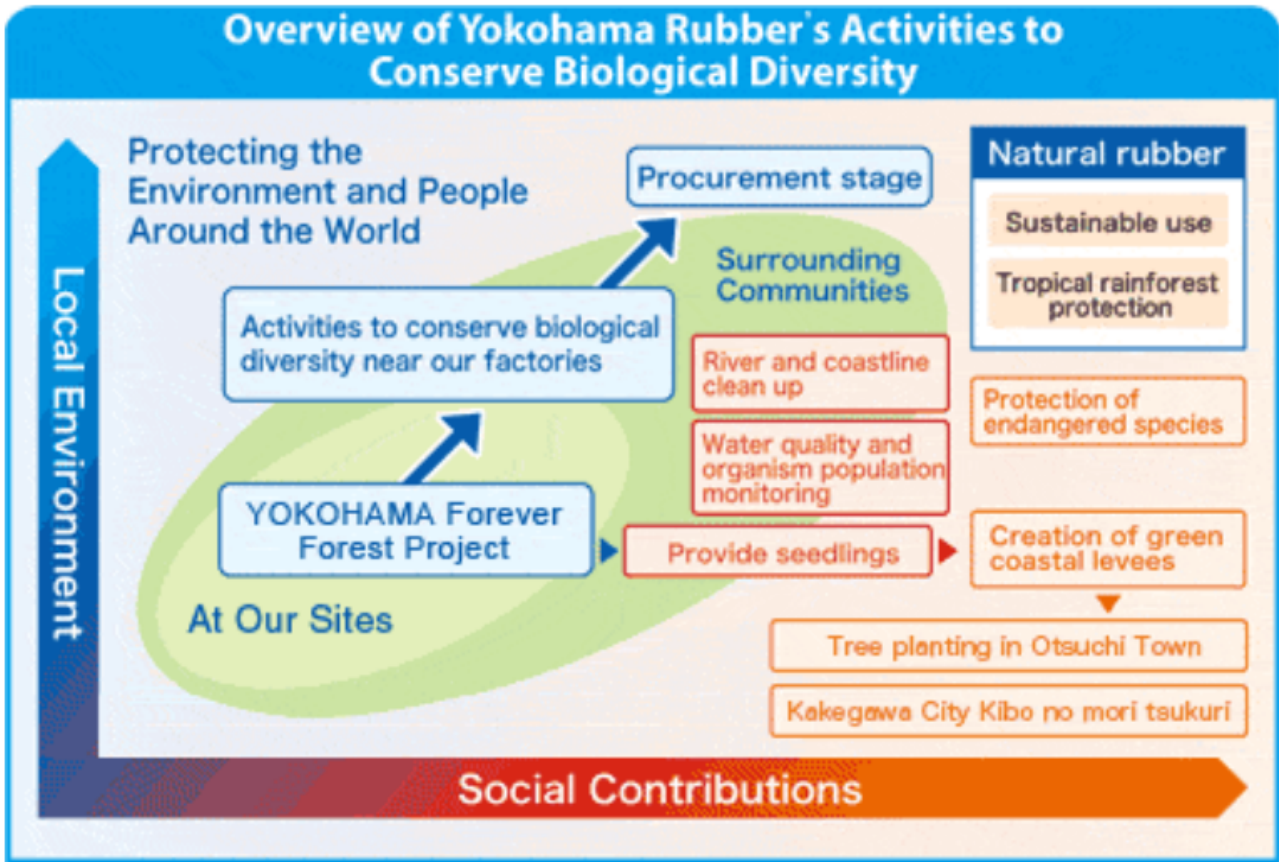
Yokohama Rubber's business activities depend on ecosystem services generated from natural capital such as forests, soil, water, air, and biological resources, including natural rubber. We recognize that management that takes natural capital into consideration and biodiversity conservation are important issues for sustainable business activities.

Yokohama Rubber is committed to the realization of a society that coexists in harmony with nature through its business activities.

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

We believe that business risks to biodiversity are particularly high in the raw material procurement and production stages of our business activities.

In the raw material procurement stage, the procurement of natural rubber is considered to have a particularly high business impact, while in the production stage, the business impact of water intake and discharge associated with land use and water use at our business sites is considered to be high.

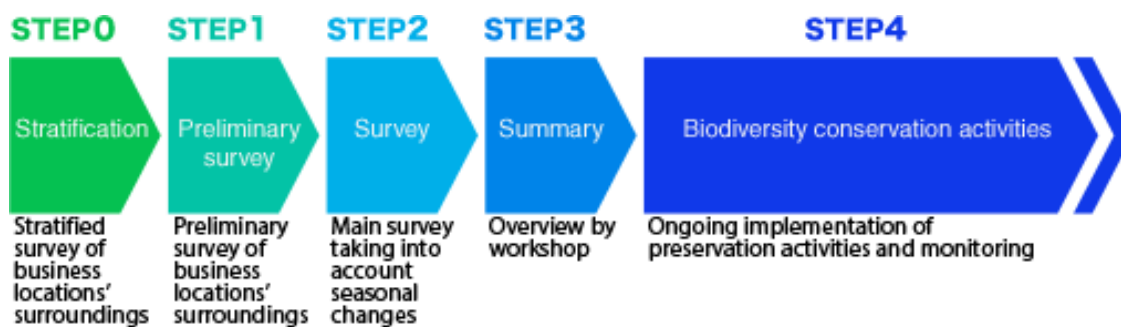
The locations of our offices differ in terms of geography, history, and culture. Because the living things that live at these locations also differ, we believe that it is necessary to assess the situation and establish issues for each office, and based on this we deploy our biodiversity conservation 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	○			○	○	○	Creating an environment for Grey-faced buzzard (Amphibians, Reptiles)
		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	○	○		○			
	Y-CH (China)	Outside premises						Laojunshan Project	
	CHZY (China)	Within premises				○	○	○	
		Outside premises	○	○	○	○	○		
	CSZY (China)	Within premises				○	○	○	
	YTPI (Philippines)	Within premises				○	○	○	
		Outside premises				○	○	○	Watershed conservation
	YTMV (United States)	Within premises				○	○	Mammals	
	YRPZ (Russia)	Within premises						Growth of pine trees	
YTVI (Vietnam)	Outside premises				○				

※Presence or absence of biodiversity activities



YOKOHAMA Forever Forest Activities

A cumulative total of 628,000 trees have been planted as of the end of 2021. The cumulative total including the number of seedlings provided equates to 1,090,000 trees. This marks an 84% achievement rate for the target of 1.3 million trees by 2030. In order to assess the growth and environmental changes of the Forever Forest, 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 amount of carbon dioxide fixed by the YOKOHAMA Forever Forest Activities.

We estimate that by the end of 2021, the entire YOKOHAMA Forever Forest will have absorbed 1,576 tons of CO₂.

In wild bird surveys at the Hiratsuka Factory, 61 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.

Furthermore, it has been confirmed that the forest is used for nesting white-eyes and for raising a variety of birds, suggesting that the forest contributes to the breeding of wild birds.



Continued observation with limited number of people under COVID-19

Review of FY 2021 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 as a founding member of the international platform GPSNR (Global Platform for Sustainable Natural Rubber) and started activities.

Furthermore, we revised our procurement policy in September 2021 to incorporate GPSNR's policy framework into our procurement policy, and have clarified our will to achieve a higher level of sustainability for natural rubber.

In 2019, Yokohama Rubber started surveying farms in Surat Thani district, Thailand and visited 250 farms by the end of June 2022.

So far, we have not found any human rights violations or deforestation, but through the survey, we have learned about the issues faced by farmers and the problems to be solved. This survey will be continued and we plan to survey 500 households in total by the end of 2023.

In January 2020, Yokohama rubber signed a Memorandum of Understanding (MOU) with the Rubber Authority of Thailand (RAOT) to provide economic support for natural rubber farmers and improving traceability to ensure the transparency and soundness of the supply chain.

Under the MOU, seminar events for natural rubber farmers have been held since December 2020. Three such events have been held to date, attended by a total of 150 farmers, and a total of 50 tons of fertilizer has been provided free of charge based on RAOT's findings.

Communication with communities

Hiratsuka Factory has been holding open-house event "Think Eco Hiratsuka". One of the programs was a biodiversity panel discussion held online from 2020.

In March 2022, Mr. Masato Ohno, Director of the Conservation Division of the Nature Conservation Society of Japan, gave a keynote speech on the theme of "Biodiversity Conservation Protected in Watersheds," which was followed by an introduction and discussion of initiatives at our plants.

The event was attended by employees of production sites including group companies, relevant government officials, local residents, and environmental NPOs.

Employee education

We are working on biodiversity conservation through our business activities. In order to ensure that all employees are aware of the blessings of biodiversity and act accordingly, we are working to spread awareness of biodiversity among employees through personnel training.

One of the mandatory training courses for young employees covers biodiversity; in fiscal 2021, it was conducted via video-on-demand due to the spread of the COVID-19.

Introduction of Initiatives

Hiratsuka Factory

Since fiscal 2013, the Hiratsuka Factory has been engaged in biodiversity conservation activities aimed at protecting the water resources of the Kaname River system that flows through the region.

Employees have participated in a series of hands-on monitoring activities to examine the environment of the Kaname River, with a cumulative total of 346 employees taking part.

Currently, we are working in a satoyama in the city located upstream of the Kaname River.

Specifically, we are working with people from local groups and university laboratories to carry out conservation activities, including the installation of handmade biotopes, with the aim of recharging the water source of the Kaname River and restoring the original landscape of the satoyama, and monitoring changes in the ecosystem.

As a result of the above activities, we were able to reduce the amount of specified alien plants, but the conservation effect, i.e., whether biodiversity was protected by reducing the number of non-native plants, was not clear.

Based on the review, we have decided to put an end to the conservation activities in the Kaname River.

(Monitoring will be continued)



Vegetation survey at Kaname River



Aquatic life survey 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.

In 2020, this event was cancelled due to the effects of the COVID-19.

In addition, We started activities to create a handmade biotope in a valley field by borrowing fallow land near Komagataki Falls in Tsuchiya district of Hiratsuka City and restore the neglected cedar forest around the valley in 2015.

With the cooperation of Kanagawa University, we have also started to conduct surveys on changes in illumination level due to cedar thinning in the same area.

We zoned the field into several plots, and decided on target species, activities, and the target image, so that we can understand the effects and goals of the activities.



Forest floor change in cedar forest and seedlings of deciduous tree



Trail camera set up in the forest



A Japanese raccoon appeared in the survey area

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 CO₂ 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.



ABINC certification

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.

Mie Plant

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

- “Black Team”: Surveying water quality and aquatic organisms such as Japanese Ricefish in rivers discharged from the plant (Hinokijiri River and Hotosu River)
- “Noppo Team”: Removing alien species and measuring the number of native plants, and surveying the spawning of loggerhead turtles (*Caretta caretta*) on the coast (Ominato Coast) where the water flows downstream
- “Chibikko Team”: Creating a biotope in the plant's regulating pond, surveying water quality, insects such as dragonflies, aquatic organisms, and vegetation

In FY2021, Ominato Elementary School was closed and Minato Elementary School was opened, and we resumed delivery classes for the first time in two years. We presented a picture-story show about why we planted trees, held a competition to remove invasive alien plant, Komatsuyosigusa, and cleaned up trash on the beach at the request of the school.

Due to COVID-19, the annual tree-planting and biodiversity conservation activities could not be held, and the environmental education program is now in jeopardy.

In March 2022, we acquired Association for Business Innovation in Harmony with Nature and Community (ABINC) certification as a biodiversity-conscious factory.



Aquatic life survey at Hinokijiri River



A school teacher explained the meaning of tree planting using a picture-story show at Ominato Beach.



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.

In the Goten River, there are dragonfly and damselfly yagos, fish such as oikawa and kawamatsu, reptiles such as spoonbills

and red-eared turtles, and kingfishers, the symbol of Mishima City, which are rare in a factory, have taken up residence. On the other hand, there is a lot of garbage dumped in the river, and we have been cleaning the river after monitoring in order to contribute in some small way to keep the Goten River beautiful.

Therefore, in May 2019, the Numazu Civil Engineering Office of Shizuoka Prefecture, Mishima City, and Mishima Plant signed a "River Friendship Agreement".

Three teams from the Mishima Plant then worked with the Numazu Civil Engineering Office of Shizuoka Prefecture to install the "barbed construction method".

Under the guidance of Dr. Kitazawa of Ecology Path, in 2021, we conducted a post-implementation check of the "barbed construction" and biological observation, which confirmed that the creatures that had almost disappeared after the river dredging had started to return again.



Construction of "barbed construction" in collaboration with river jurisdiction



Spoons, loggerhead turtles, and catfish observed during monitoring



Shinshiro Plant

In 2021, biodiversity conservation activities kicked off with a total of 75 people in three teams working at three sites in the water source area. These are the terraced rice paddies in Yotsuya, the Noda River, the Kuroda River, and the biotope in the factory.

However, due to the prevention of the spread of COVID-19 infection, each team leader and secretariat member had to conduct only water quality surveys and some biological monitoring in a limited number of people and in a limited time, and could not conduct the conventional activities as in 2020.

<Yotsuya Rice Terraces, Shinshiro City: One of the water source areas of the Toyokawa River>

As a water source for the industrial cooling water, we are working to secure a habitat for biotic communities, help maintain clear streams and near threatened species, protect and restore water-related ecosystems, and support a desirable ecological habitat in the rice terraces.

Creatures to be protected: Near Threatened (NT) species such as Japanese fire belly newt (*Cynops pyrrhogaster*) and Forest Green Tree Frog (*Zhangixalus arboreu*).



Conservation activities at Yotsuya Senmaida





Red-bellied newt identified during monitoring

<Noda River and Kuroda River: Water Quality and Aquatic Life Monitoring Survey>

We confirmed that wastewater discharged from the Shinshiro and Shinshiro-Minami plants did not adversely affect water quality and aquatic life in the local rivers, and carried out activities to maintain and sustain this status.



Monitoring of living creatures in the Noda River



Aquatic organisms identified during monitoring



<Biotope in the plant>

The Shinshiro Plant takes cooling water used in the plant from a river near the plant.

Since 2010, we have been observing whether we can create an environment where living creatures can live even with plant wastewater by filtering the wastewater used and introducing it to the biotope inside the plant as a theme of our biodiversity conservation activities.

We also conduct maintenance and restoration work around the biotope every year.



Yago (dragonfly) and tadpoles observed in the biotope inside the plant





Maintenance and restoration activities around the biotope



Signboard installed in the biotope

Thirteen employees from the Shinshiro Plant participated in a tree-planting bus tour organized by the Shinshiro Shitara Ecosystem Network Council. The Shinshiro Plant provided 650 seedlings and supported tree planting by the general public.



Tree planting bus tour (Toei-cho, Kitashitara-gun, Aichi Prefecture, Japan)



Onomichi Plant

At the Onomichi Plant, we began in 2013 to conduct water quality surveys and surveys of aquatic organisms, birds, and plants at the Nishifuji Water Park on the Fujii River, and to observe wild birds and insects on the plant premises. Surveys of aquatic life in the Fujii River found aquatic insects including *Ephemera strigata*, dragonfly nymphs such as *Mnais costalis*, and *Asiagomphus melaenops*, fish such as *Gnathopogon elongatus* and *Rhinogobius nagoyae* and crustaceans such as *Eriocheir japonica* and *Palaemon paucidens*.

Due to COVID-19, only bird watching and river cleanup activities were conducted in 2021.

Within the plant premises, a mosaic of different environments for living creatures is provided by the growth of the Forever Forest, bushes, grassland, rain fed ponds and wetlands, which provide habitats for dragonflies, butterflies, crickets and

grasshoppers. It was also shown that the factory site contributes to the nesting of larks, the formation of territories of *Lanius bucephalus* and *Phoenicurus aureus*, and the wintering of *Horornis diphone*.

The Fujii River Evening, which was to be held in June 2021, was cancelled due to COVID-19. However, at the Children's Environmental Festival held in July 2021 at the Onomichi City Environmental Resource and Recycling Center, we exhibited our conservation activities on the Fujii River, fixed-point observation of inhabiting organisms, and activities at the Onomichi Plant, among other things.

In addition, in 2020, we submitted an application for the renewal of the Certification of Association for Business Innovation in harmony with Nature and Community (ABINC), and received the renewal of the certification in February 2021.

We received the 2nd ABINC Award Special Prize for our efforts in environmental communication between local residents and employees using local seeds and seedlings.



Received the 2nd ABINC Award Special Prize



Bird watching at the plant



Bird watching at the Nishifuji Shinsui Park

Nagano Plant

The Nagano Plant is located in an area that is highly natural compared to other Yokohama Rubber plants. As there is almost no drainage other than rainwater, we believe the environmental impact of this plant is low compared to other plants of Yokohama Rubber.

Since the Nagano Plant is located on a river terrace of the Tenryu River, we started biodiversity conservation activities in the plant's adjustment pond in 2021 with the aim of restoring the hinterland wetland ecosystem of the Tenryu River within the plant site.

For this purpose, we have decided to exterminate the Japanese knotweed and variegated nasturtium found in the monitoring activities, and each section is in charge of this activity from June to September.

We are also monitoring living creatures, exterminating invasive alien species, and conducting cleanup activities in the irrigation canal on the south side of the plant where rainwater is discharged.



Extermination of invasive alien species in the plant's adjustment pond

In accordance with the "Forest Foster Parent Promotion Project" promoted by Nagano Prefecture, we have signed a "Forest Foster Parent Agreement" with Toyooka Village to cooperate in the maintenance of the village forest in Toyooka Village, and are carrying out conservation activities.

The project was suspended for two years due to COVID-19, but resumed in June 2022, with the clearing of undergrowth in the satoyama near the village ground of Toyooka Village.



Conservation activities in village forests in Toyooka Village

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. In the vegetation survey, *Ainae*, a species designated as semi-endangered by Ibaraki Prefecture, were confirmed in the plant.

We started surveying birds at the plant in 2015, and have been continuing our survey activities as well as conservation activities at Sonobe river. By comparing the results of our observations with those of the Sonobe River and considering the differences in the environment, we have become more familiar with the creatures around us.

Starting in 2019, we have organized a new "Survey on the Living Environment of the Grey-faced buzzard(*Butastur indicus*)" to survey the vegetation and small animals (amphibians and reptiles) in the plant, focusing on the Grey-faced buzzard, which is as a Vulnerable, as one of the indicators for environmental conservation.

In 2020, we installed a perching tree for the sasiba (*Cervus nippon yesoensis*) in the plant.

We have confirmed that the sasiba has used the tree several times.

We have also observed the sasiba flying over the area around the plant.

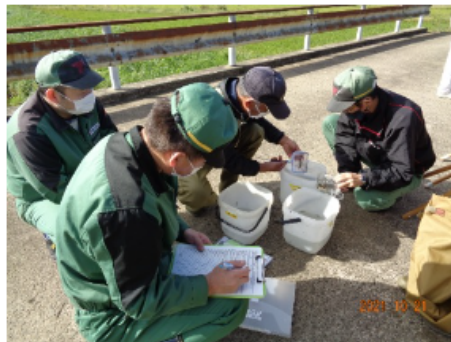
These activities have been carried out with guidance from the Wild Bird Society of Japan (Ibaraki Office), and from the Omitama Wildlife Association. The activities implemented at the Ibaraki Plant to safeguard biodiversity have been featured on the Omitama Wildlife Association's website.

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.

In 2021, we are continuing the activity while taking measures to prevent COVID-19 infection.



Wild bird survey at Sonobe River



Aquatic life survey at Sonobe River



Rare plant (*Ainae*)

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.

To preserve this precious place, we have continued cleanup activities around Lake Utonai and the Nature Center since 2017. In recent years, together with the City of Tomakomai, we have been conducting cleanups twice a year in the spring and fall as "Zero Garbage Days."

In the summer, we also conduct the "Invasive Species Extraction Activity," which has been a regular event since 2017. The activity started with 8 participants, then the number of CSRs, YJT dealers, sales warehouses, and their families... and each year the number of volunteers has increased to nearly 20, making the activity more dense.

Unfortunately, due to COVID-19, the gathering of volunteers was discontinued, and the entire YTRH (12 members) switched to a reduced activity.

The area had been filled with non-native plants, but thanks to annual activities that take into account the timing of removal and other factors, the non-native grasses are now almost invisible, and many native plants such as mugwort have grown up.

◆Non-native plant "Solidago gigantea var. leiophylla" removal Friday, July 9, 2021

At first, the fixed-point observation site where we have been removing the plants every year was occupied by "non-native" plants, and when we finished removing the plants, there was nothing but grass all around the area. As a result of the continued removal activities, many "native plants" grew wild, and it became difficult to find non-native plants. After the removal work was completed, there were still many native plants, and the situation did not change much.

It was good that we continued to remove the plants at the time when we could expect the best results, and the Wild Bird Society of Japan gave us a high evaluation, saying, "This is a good model for other groups to follow."

We finished our work at the fixed observation point early and moved to a location that could be seen from the window of the Nature Center. This will be the site of our activities from now on.

We will continue to work toward the goal of having more of the "Spiraea salicifolia," previously listed as an "endangered species," growing wild!

<Events in Tomakomai City>

◆Spring Cleanup Month "Zero Garbage Day" on Sunday, April 18, 2021

Together with Tomakomai City, all YTRH employees cleaned up a large area, including walking paths around Lake Utonai Sanctuary.

After the snow melts, we always find a large amount of sake bottles and other household trash, which is very disappointing.

◆Fall Cleaning Month "Day of Zero Garbage" on Sunday, October 18, 2021

All YTRH employees together with Tomakomai City cleaned up the area around Lake Utonai Sanctuary. The rain from the previous day had stopped, and although it was a chilly day, we were able to complete the activity without incident.

Although only half a year had passed since the last time, there was still household garbage and many masks were seen because of the corona disaster.

The area around Lake Utonai was also cleaned up during this time of the year when the leaves are turning red.

◆Spring Cleanup "Zero Garbage Day" on Sunday, April 17, 2022

All YTRH members (12 people) conducted a spring cleaning around Lake Utonai Sanctuary.

Every year after the snow melts, a large amount of garbage is collected for the cleanup.

Unfortunately, we collected a large amount of trash again this year, including waste tires.

Although it was still cold, the area around Lake Utonai Sanctuary became very clean for the summer.

The year of 2021 marks the 40th anniversary of the opening of the Lake Utonai Sanctuary by the Wild Bird Society of Japan. According to the rangers of the Lake Utonai Sanctuary, the Conservation Project Office of the Wild Bird Society of Japan, there are plans for activities such as the "Calling Blakiston's Fish Owl (*Ketupa blakistoni*) Project" and the "Calling Japanese crane (*Grus japonensis*)Tanager Project".

All employees will continue to work together on environmental activities and sanctuary support activities at Lake Utonai, and will also continue to engage in meaningful activities together with their families, people from affiliated companies, and the Wild Bird Society of Japan.



Pulling out giant goldenrod(*Solidago gigantea* var. *leiophylla*) around Lake Utonai



Cleanup work around Lake Utonai

Yokohama Tire Retread Co., Ltd. Saitama Plant(YTRS)

Yokohama Tire Retread Saitama Plant has been participating in the activities of Miyoshi Green Support Team since November 2015. The Miyoshi Green Support Team is working under the slogan of "Creating a livable city through the conservation and maintenance of flatland forests, with the aim of building a rich rapport. Activities are held on the third Sunday of every month, with about 20 local residents and companies participating each time. In the "Fujikubo Flatland Forest," the recycling method of making compost from fallen leaves that has continued since the Edo era (environment with historical value) and biodiversity (rich natural environment) are present to today. In 2015, a part of the activity area was certified as the Green Trust Conservation Area No. 14 of Saitama Prefecture. The Green Trust is an initiative to preserve the outstanding natural and historical environment of Saitama Prefecture by converting it into public land with the cooperation of residents, companies, and organizations in order to preserve it for future generations.



Cutting down and clearing away dead trees
(July 19, 2020)



Pulling weeds and picking up litter in Satoyama
(April 18, 2021)



Making compost from fallen leaves... Many
beetle larvae are living in the compost.

Yokohama Tire Retread Co., Ltd. Nagoya Plant(YTRN)

While many of our activities in FY2021 are limited by COVID-19, we have been engaged in the 6th phase tree planting of the Forever Forest Activities, environmental conservation activities, and biodiversity conservation activities. Trees planted in the Forever Forest have grown to a size where nest boxes can be hung, and we are planning to install nest boxes on a trial basis in FY2022.

In the restoration of fallow rice fields in the external activity area, we planted rice again in 2022. While preserving precious ecosystems, we also incorporate innovations that participants can enjoy, and continue ecosystem observation activities with local residents, observing insects, plants, birds, etc., summarizing the results, and learning and being moved by the various changes in spring, summer, fall, and winter with participants, with the aim of establishing this activity as a place to experience the importance of nature that must be preserved. We are aiming to make the event a place where participants can learn and experience the importance of nature that must be preserved.

In 2022, we are planning to hold a commemorative event to celebrate our 10th anniversary, and we would like to introduce our activities to as many people as possible and expand the circle of our activities.

We, the employees, will continue to share what we have learned from our activities with many people, aiming to develop human resources who can contribute to biodiversity activities and environmental preservation, as well as to develop our business sites.



Illustration of activity area



Restoration of fallow rice fields (rice planting)



Biotope observation meeting



Endangered *Nannophya pygmaea*

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



Acraea violae

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

YTRC is located in Surat Thani Province in southern Thailand, and is the only natural rubber processing plant in the Yokohama Rubber Group. A lot of water is used in the natural rubber manufacturing process, but YTRC has realized the effective use of water resources by 100% water recycling. We have also reduced the total amount of water usage by automating the appropriate adjustment of water usage according to the increase and decrease of production volume, and at the same time, we are striving to reduce energy consumption, as well as improving the efficiency of sedimentation and purification ponds to maintain the water quality at the same level as that of nearby rivers.

There is a large buffer pond on the site, and including the surrounding area, we are striving to maintain the natural environment that existed before the plant was built. Since November 2014, we have been monitoring the fish habitat and water quality in the pond on a monthly basis. When the water level rises during the rainy season, the pond is connected to the nearby Tapi River. In a recent survey, we found 23 species of fish breeding in the area.

In the forest surrounding the reservoir and the area where the trees planted as part of the Forever Forest activities are growing, 21 species of birds have been observed so far, and in the evenings, the sound of lively birdsong can be heard. We will continue to maintain the trees and the environment of the reservoir in the future. In particular, the community will continue to maintain and improve the water quality of the reservoir and, with the cooperation of the local government, carry out activities to improve biodiversity, including the release of appropriate species of fish.



Biodiversity survey activities at buffer ponds



Fish catching research activities using cast nets



Bird habitat survey activities



Release of 30,000 fry provided by the Thai Department of Fisheries into ..

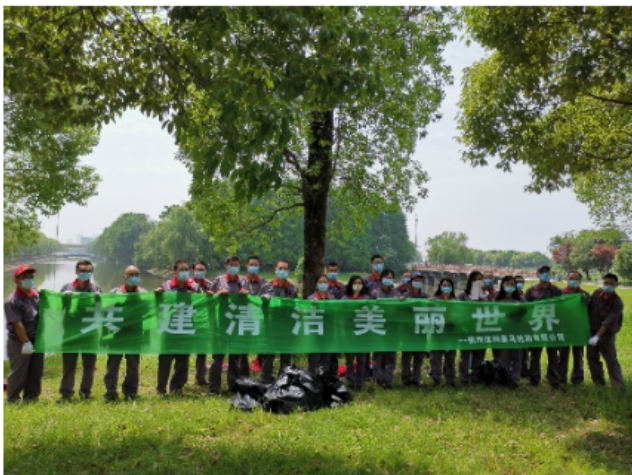
Hangzhou Yokohama Tire Co., Ltd. (CHZY)

CHZY is located in an industrial park in Hangzhou, China. Although the industrial park has a green belt, it is not rich in diversity due to the small number of tree species. For this reason, we are conducting a survey to evaluate the Forever Forest and its inhabitants in the hope that CHZY's Forever Forest will become a habitat for forest creatures. In order to create a more favorable ecological environment, on March 12, 2020 (the day of the tree-planting ceremony), the company managers participated as team members to go around the perimeter of the company to pick up litter.

We will continue these activities in fiscal 2021.

In addition, we pick up trash in the river around the plant once every six months.

As part of the government's environmental protection program, CHZY has been entrusted with the management of a 2,000-square-meter plot of land in the vicinity of the CHZY site as the "Yokohama Reserved Forest". A total of 30 trees were planted in 2021, bringing the total number of trees planted so far to 150.



Picking up trash in the river around the plant

Yokohama Tire Philippines, Inc. (YTPI)

YTPI, which operates within the Clark Special Economic Zone in Pampanga, Republic of the Philippines, has been promoting biodiversity and environmental conservation through a series of activities involving its employees and neighboring communities. These activities include ongoing Millennium Woods activities, ongoing tree surveys, wildlife surveys, and the provision of seedlings and support for activities, as well as the launch of a new initiative called "Green Space" activities. In 2022 alone, YTPI has already donated 100 saplings and plans to plant 400 trees inside and outside the plant. YTPI has also confirmed that the site is home to 43 species of wildlife, including four bird species and one reptile species of "Least Concern" on the Red List of the International Union for Conservation of Nature (IUCN).



Observed lizards (*Urosaurus ornatus*) and wild birds (*Rhipidura nigritorquis*)



The Green Space initiative encourages employees to plant vegetables in open spaces within the company to increase their independence in food sustainability, raise public health awareness for more nutritious eating habits, increase biodiversity by increasing the number of plant species, and finally, by promoting an environmentally friendly lifestyle. The goal is to support carbon neutrality. As a result, in one year, 10 departments have initiated this activity within their respective areas and have already cultivated and distributed their harvests. In addition, "YTPI Vegetables for Life" was conceived and implemented to expand this activity. This expansion expanded community outreach by adopting a school vegetable garden, providing vegetable garden supplies as support, and coordinated the harvest to be provided to the cafeteria concessions as a source of vegetables.



Harvest from Green Spaces



Through these activities, YTPI will reduce its carbon footprint to mitigate global warming and climate change and help neighboring communities with their environmental concerns and issues.

It is hoped that YTPI's activities will raise awareness of the importance of the affected ecosystems and promote proactive conservation efforts in the community.

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. We are carrying out activities to balance conservation of this natural environment and our production activities.

Since 2015, we have set up nest boxes to protect the breeding of the Eastern bluebird (*Sialia sialis*), and all employees watch over the baby birds as they grow.



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. In 2019-2020, CSZY was recognized by Jiangsu Province as a "Provincial Environmental Protection Credential Enterprise".

In 2021, we held four joint biodiversity survey activities (two in February, one in May, one in October, and one in November) based on the environmental education base in the plant, with the participation of students, their families and teachers from Suzhou Wenxing Center Elementary School, Tong'an Center Elementary School, Dongshu Experimental Elementary School, and Yangshan Experimental Elementary School, and CSZY employees (190 people on four occasions). Biodiversity survey activities enable us to understand the status of the biological environment within the plant site, and also help us to preserve the local ecosystem and harmonize with the local community while conducting business activities at the plant.

In these activities so far, we have observed birds such as sparrows and egrets, plants such as Chinese tallow trees, hall's crabapples, border privets, dandelions, morning glories, and daisies, insects such as bees and butterflies, and earthworms. We also picked up tree seeds in the activities and grew them as seedlings for our Forever Forest activities. In these survey activities, we not only observed these living creatures, but also learned about the growth of the Forever Forest, which was a good opportunity to deepen our understanding of how the growth of the forest has a positive impact on the local ecosystem.



Everyone who participated in biodiversity activities



Children from Yangshan Central Elementary School and Tongan Experimental Elementary School observing living creatures



LLC Yokohama R.P.Z.(YRPZ)

In 2017, we collaborated with Voronezh State University of Forest Technology to plant one pine species (*Pinus Sylvestris*L.) on our plant site. The purpose of this activity was 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 researched the ideal conditions for the growth of trees. In May 2021, he participated in the Green Wave Project and planted 22 seedlings of "Tilia miqueliana" and "Sorbus commixta".



Tree planting at the Green Wave Project

Yokohama Tyre Vietnam Inc. (YTVI)

YTVI started an internal tree planting project with the Southern Institute of Ecology (SIE) at Lo Go - Xa Mat (LGXM) National Park in 2018, utilizing the expertise of the Forever Forest activities at the plant site. We have planted 500 trees of 7 different indigenous species on 1 hectare of land. It has been confirmed that the planted trees have formed a canopy over the past three years and the number of animal species living in the forest has been increasing every year (2018-2021). A total of 68 employees, from YTVI executives to new hires, have worked to protect and survey the trees planted over the past four years.

In June 2022, a closing ceremony for biodiversity conservation activities in LGXM National Park was held with the participation of key partners SEE and the LGXM National Park Board.

During the closing ceremony, a Memorandum of Understanding (MOU) was signed between YTVI and the LGXM National Park Board of Trustees to implement the necessary measures for future forest protection and fire prevention and to continue the management authority.



Closing remarks by YTVI President Yasuhiro Kurokawa



Group photo of project members in the forest



Organisms captured during the nighttime survey (gecko: scientific name *Dixonius siamensis*, spider: scientific name unconfirmed)



Issues and Future Improvement Measures

Biodiversity is now recognized as a serious environmental risk as well as climate change.

In particular, we recognize the importance of initiatives and information disclosure that are consistent with the goals and approaches that are being identified in the process of developing the Post-Aichi Targets and the Task Force on Nature-related Financial Disclosures (TNFD).

In order to make efforts in line with the progress of these discussions and their penetration into the world, we will organize the key issues in the overall business activities of the Yokohama Rubber Group.

We will then promote activities in response to these issues and actively share information to deepen the understanding of our employees and stakeholders.

Effluent and waste

KPI

Item	FY 2020 results	FY 2021 results
Achievement of total zero-emissions	Landfill rate 1.40% Percentage of bases achieving target 80.0%	Landfill rate 1.63% Percentage of bases achieving target 84.4%
Water quality and total wastewater emissions by type of discharge	Surface water 4,712,000 m ³ Groundwater 0.0 m ³ Sewerage 1,198,000 m ³ Others 407,000 m ³	Surface water 4,838,000 m ³ Groundwater 0.0 m ³ Sewerage 1,226,000 m ³ Others 398,000 m ³
Total number of serious leaks and amount of wastewater leaked	None	None
Number of incidents of non-compliance with water quality/quantity permits, standards and regulations	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 2021 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.

Effluent volume was 6,463,000 m³ (up 2.3% from the previous year). Domestic effluent increased 2.4% over the previous year due in part to increased production, although leakage countermeasures were also taken.

Overseas wastewater discharged increased 12.6% over the previous year, due in part to the expansion of the scope of calculation, plant expansion, and increased production.

Non-compliance with water quality/quantity permits, standards, and regulations

	FY 2020	FY 2021
Number of non-compliance incidents	0	0
Penalties (financials and/or operational)	None	None
Fines	None	None
Guidance/Enforcement orders	None	None

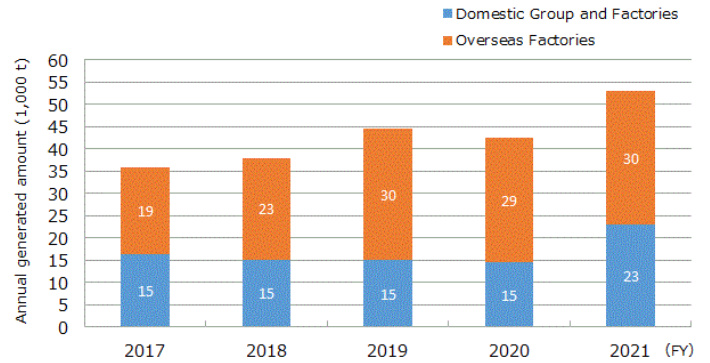
Amount of waste material generated at Group companies in Japan and overseas

In FY2021, the total waste disposal volume for the entire domestic and overseas group increased by 8.9% from the previous year to 52,558 tons, due to an expansion of the scope of calculation, an increase in the number of plants and production volume, and partial revision of the calculation method.

In FY 2019, 875 tons (1.66%) and in FY 2020, 677 tons (1.40%) were landfilled.

In FY2021, we increased to 857 tons (1.63%) due to increased production and expansion.

We will continue our efforts to achieve complete zero emissions and recycling treatment.



PCB waste storage and management

Used PCB-containing devices are properly stored and processed according to relevant laws and regulations. During fiscal year 2021, 18.0 tons of PCB-containing devices were processed.

This includes the processing of stabilizers registered and stored since FY2016.

Partial processing was implemented in fiscal year 2021.

Additionally we will proceed with implementing proper processing of PCB-containing devices in use.

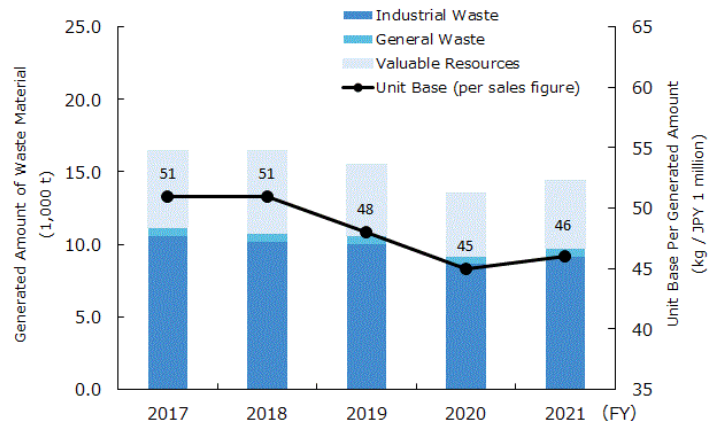
Introduction of Initiatives

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

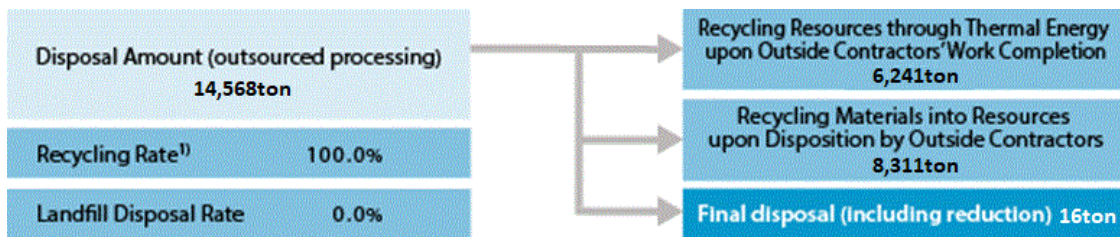
Amount of waste material generated at production bases in Japan

The amount of waste generated in FY2021 was 14,389 tons, an increase of 6.3% from the previous year, and the waste generation per unit of sales (per net sales) also worsened by 9.5% from the previous year.

This was due to an increase in production volume and higher treatment costs.



The processing flow for waste materials at production bases in Japan during fiscal year 2021 was as follows.



1) Including 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 2021, although under COVID-19, we conducted 87 audits in Japan, including Group companies, and 94 audits at overseas factories to confirm 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 2020 results	FY 2021 results
Emissions of greenhouse gases	(Consolidated) Scope1 535 thousand tons Scope2 451 thousand tons Scope3 22,580 thousand tons	(Consolidated) Scope1 613 thousand tons Scope2 486 thousand tons Scope3 25,701 thousand tons
Ozone-depleting substances	Emissions of CFCs (Domestic) 309.5 tons	Emissions of CFCs (Non-consolidated) 617.8 tons
HAPs (Hazardous Air Pollutants)	(Domestic) 17.3 tons	(Domestic) 12.3 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.

※In 2022, the Global Warming Countermeasures Committee has been reorganized into the Carbon Neutral 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:
 - Achieve net zero CO₂ emissions (carbon neutrality) in our activities by 2050
- Mid-term target:
 - Reduce CO₂ emissions from company activities by 38% by 2030 compared to fiscal 2013
*This activity is on the same level as our goal of a 28% reduction by 2030 (compared to 2019).
 - Encourage suppliers to collaborate with us in meeting our targets.

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.

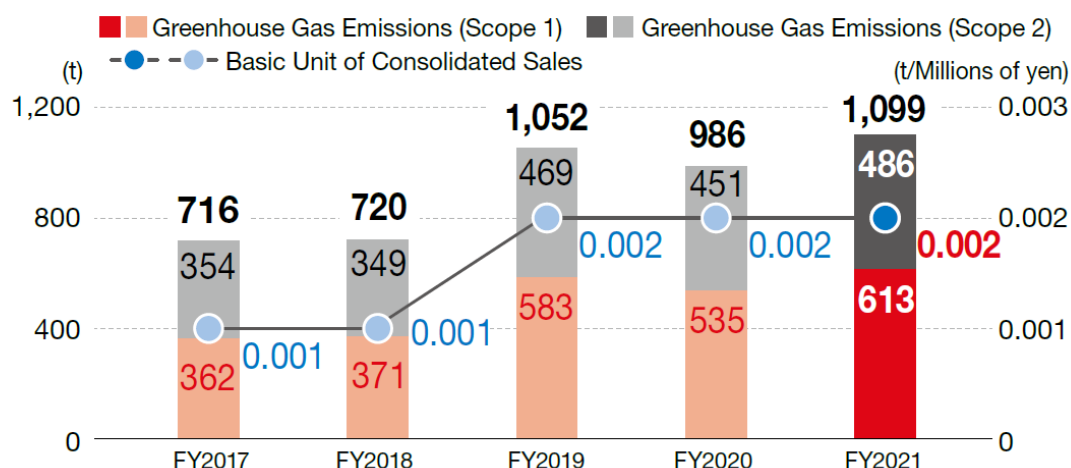
Review of FY 2021 Activities

Greenhouse Gas (GHG) Emissions

Response to climate change (Disclose information on TCFD)

Greenhouse Gas Emissions (Scope 1-2) (Consolidated)

1,099 tons

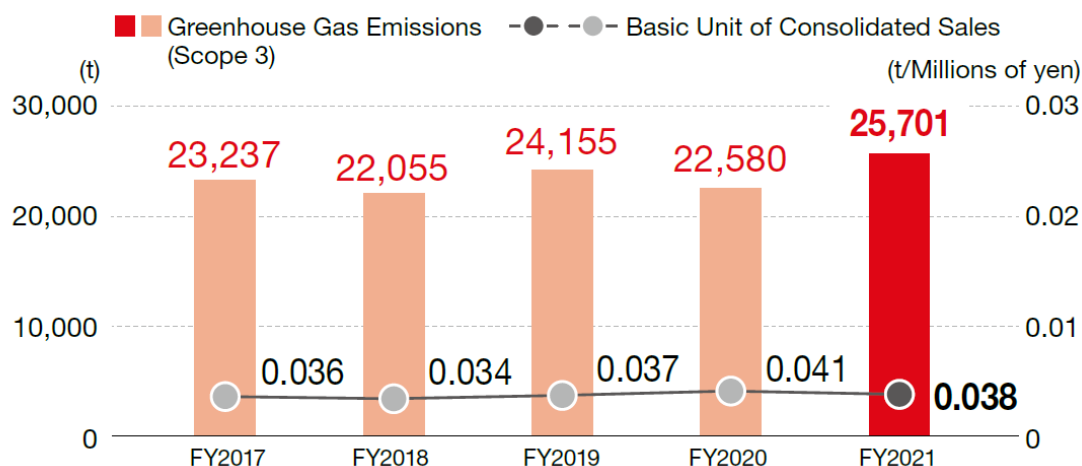


Greenhouse gas emissions (Scope 1 and Scope 2) increased year on year, with Scope 1 emissions rising 15% and Scope 2 emissions rising 8% due to growth in production and sales overseas in particular. Emissions per unit of sales improved 8% year on year for Scope 1 + Scope 2.

Scope 3 estimation

Greenhouse Gas Emissions (Scope 3) (Consolidated)

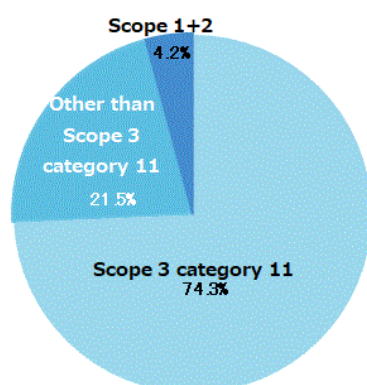
25,701 tons



Greenhouse gas emissions (Scope 3) increased 14% year on year due to growth in production and sales overseas in particular. Emissions per unit of sales improved 6% year on year.

Scope 3 accounted for 95.8% of this, and use of products accounted for 74.3% 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.

(Emissions Unit: thousand t-CO₂)



Cat	Scope 3 category	FY2019	FY2020	FY2021
1	Purchased products and services	3,173	2,924	4,031
2	Capital goods	58	52	152
3	Fuel and energy	106	135	147
4	Transportation and distribution (upstream)	141	167	154
5	Waste	2	16	50
6	Business travel	11	3	5
7	Commuting employees	25	20	21
8	Upstream lease assets	NA	NA	NA
9	Downstream transportation and distribution	54	59	72
10	Processing of sold products	11	11	10
11	Use of products	19,515	18,259	19,940
12	Disposal of products	923	822	875
13	Downstream lease assets	NA	NA	NA
14	Franchise	NA	NA	NA
15	Investment	135	114	246
SUM		24,155	22,580	25,701

※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 (4,147KB)
 -  English version (5,520KB)

Emissions of NOx, SOx, etc.

(Domestic) (Unit: tons)

Cat	NOx	SOx
FY 2020	115.1	2.3
FY 2021	111.8	3.3

We do not use or emit any ozone-depleting substances. There were no cases of dioxin use.

The overall VOC emissions increased by 21.0% from the previous year.

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 CO₂ 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 cylinders in 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 CO₂ 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 CO₂ 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.



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 2020 results	FY 2021 results
Total volume of raw materials used	(Consolidated) 899,000 tons	(Consolidated) 1,068,000 tons
Ratio of renewable/recycled raw material	(Consolidated) 25.8%	(Consolidated) 25.5%

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 Basic 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

Long-term target: 100% sustainable raw materials usage by 2050

Mid-term target: At least 30% renewable/recycled raw material usage by 2030

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.

We will also establish a procurement system for sustainably available raw materials with the lowest environmental and social impact throughout their life cycles.

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 2021 Activities

Expanding the Use of Renewable Raw Materials Toward a Recycling-Oriented Society

We have long been promoting the use of renewable and recycled raw materials as part of our efforts to realize a recycling-oriented society (circular economy).

In addition to the use of recycled rubber, which we have been working on, we are expanding the use of a wide variety of renewable and recycled raw materials, such as silica made from plant-derived and inedible rice husks, resins derived from natural materials, and wires made by melting and reusing scrap iron.

The weight of conventional recycled rubber and non-petroleum-derived polymers used has increased by more than 110% compared to last year. The use of silica made from rice husks increased by 200% compared to last year.

In 2021, we will use 264,000 tons of renewable raw materials worldwide, which is 25.5% of our total raw material usage.

We will further increase the ratio of renewable raw materials we have been using so far to reach our goal of more than 30% renewable raw material use by 2030.

We will also strive to solve environmental issues facing the earth through the search for and use of new renewable raw materials.

Usage ratio of regenerated rubber in Tire products*1

We are conducting joint research with the New Energy and Industrial Technology Development Organization (NEDO), the National Institute of Advanced Industrial Science and Technology (AIST), and the Advanced Materials and High-Speed Development Technology Research Association (ADMAT).

We have succeeded in mass synthesizing butadiene from bioethanol, producing a prototype automobile tire with the same performance as conventional tires, and demonstrating a series of processes.

Butadiene is currently produced from petroleum as an important chemical raw material for synthetic rubber, the main raw material for tires. The establishment of technology to produce tires from butadiene generated from biomass (biological resources) will promote CO2 reduction and sustainable raw material procurement by reducing dependence on petroleum.



BluEarth-GT

Prototype tire made with biomass-derived butadiene rubber

The prototype tire is the BluEarth-GT AE51 grand touring tire in size 185/60R15. The cap tread and sidewalls of this tire were previously made from petroleum-derived rubber, but in this prototype tire, all petroleum-derived rubber has been replaced with bioethanol-derived butadiene rubber and natural rubber, so the rubber in both parts is composed entirely of sustainable rubber materials. In addition, the prototype tire has the same material performance as when conventional petroleum-derived rubber was used.

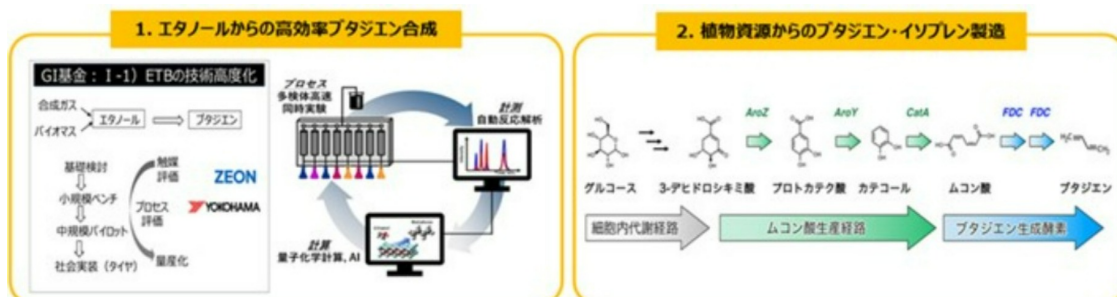
ZEON Corporation and our company's "Development of Manufacturing Technology for Synthetic Rubber Core Chemicals with Carbon Resource Recycling" have been adopted by NEDO as a "Green Innovation Fund Project / Development of Manufacturing Technology for Plastic Raw Materials Using CO2, etc.".

The Green Innovation Fund Project is a program established by the Ministry of Economy, Trade and Industry (METI) to accelerate innovation through structural transformation of energy and industrial sectors and bold investment in order to achieve the national goal of "reducing overall greenhouse gas emissions to zero by 2050."

The program provides continuous support for 10 years to companies and others that address this goal as a management issue, from research and development and demonstration to social implementation.

This demonstration project aims to establish two advanced technologies to produce butadiene and isoprene, which are key synthetic rubber chemicals based on carbon resource recycling, from renewable carbon resources such as used tires and biomass at high yield rates, and to implement them in society in the 2030s.

This will contribute to the improvement of resource recycling and carbon neutrality in the tire and rubber industries.



Outline of the Project for Development and Demonstration of Carbon-Resource-Recirculating Synthetic Rubber Core Chemicals Manufacturing Technology

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 2021.

In addition, we are working to promote the adoption of recycled carbon and rubber raw materials recycled from waste tires and other rubber waste.

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, the recycling rate is now over 90%, and the annual usage of resin mold material has been reduced by 4.8 tons in 2020 and by 6.6 tons in 2021.

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 2020 results	FY 2021 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 70% MB 77% Packaging materials 83%	(Consolidated) Used products Tires 67% MB 85% Packaging materials 84%

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 (CO₂ 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 CO₂ 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.

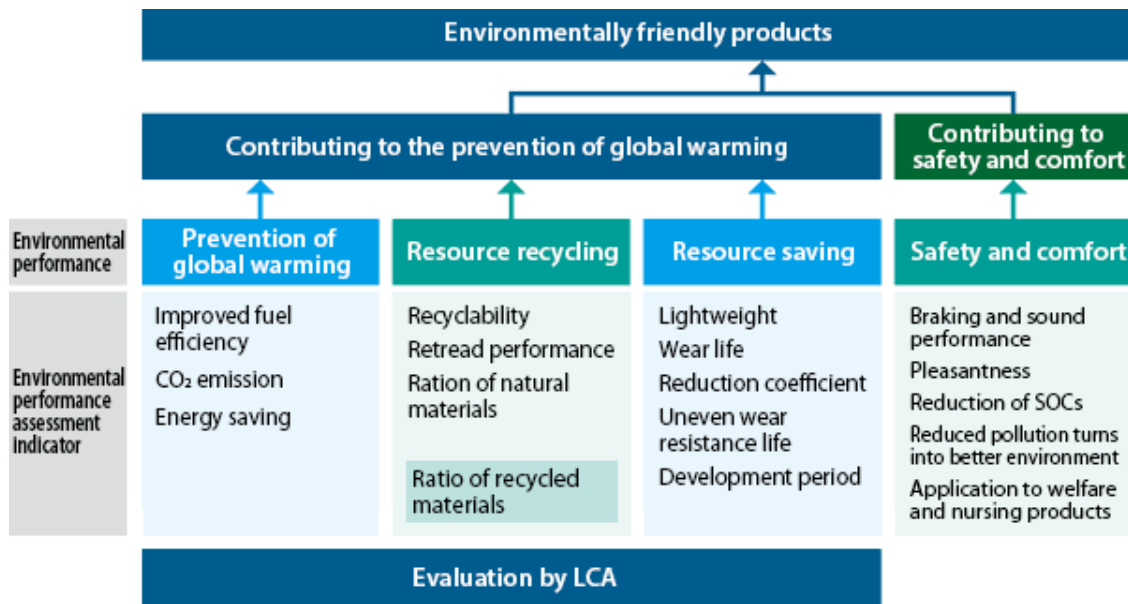
Measures for vision achievement

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 2021 Activities

Results for the environmental contribution ratio (overall)

The ratio of environmentally friendly products in the Yokohama Rubber Group has remained at 100.0% since 2017.

The ratio of fuel-efficient tires sold in fiscal 2021 was 45.1%.

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 "GHG emissions at the product use stage" (Scope 3), which are indirectly emitted in the supply chain, we calculate that the reduction in emissions will be approximately 1,832 thousand t-CO₂.

Introduction of Initiatives

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.



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.



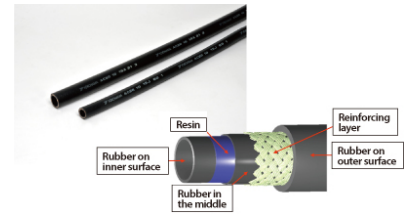
ECOTEX energy-saving conveyor belt

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.

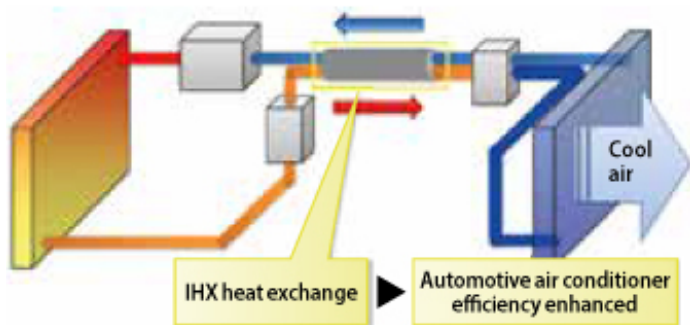


IHX that improves cooling efficiency of car air conditioners

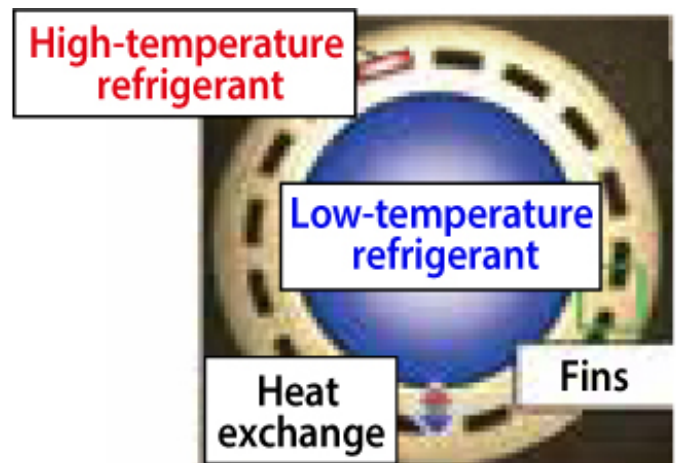
We have developed a double-tube IHX^{*1} that improves the cooling efficiency of car air conditioning systems. Currently, HFC-134a, which is widely used as a coolant in car air conditioners, has a high GWP^{*2} of 1,430, so the switch to HFO-1234yf (GWP = 4) with a low coefficient is progressing to prevent 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

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.

This performance has been inherited by the BluEarth-1 EF20.



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.