The Earth

Value created

- Achieving a decarbonized society
- Achieving a recycling-oriented society
- Securing stable and sustainable raw materials

Environment-related Initiatives

- Energy
- Water and Wastewater
- Biodiversity
- Effluent and waste
- Emissions

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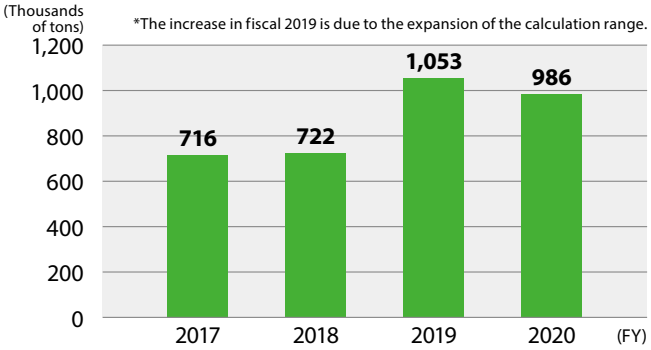
Working Toward Carbon Neutrality

Global warming is giving rise to natural disasters, including abnormal weather conditions such as heavy rain and typhoons and extreme changes in the climate such as heavy snowfall and long stretches of hot days. This is also having a major impact on ecosystems and our daily lives. If economic activity continues to expand at the rate it has been expanding at since the Industrial Revolution, the average temperature is expected to rise by up to 4.8 degrees Celsius by 2100. This brings with it a significant risk of ecosystems being destroyed due to rising sea temperatures and the disappearance of land due to rising sea levels, as well as widespread wind and flood damage. To prevent this, the international community has set a common goal of achieving carbon neutrality (zero effective CO_2 emissions based on the amount of CO_2 emitted and absorbed) by 2050.

Yokohama Rubber will continue advancing the following initiatives to achieve carbon neutrality while also pursuing its economic activities. We will also address customer 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.

- Environment-related social contribution activities (in cooperation with local communities)
- Environmental risk prevention and countermeasures
- Energy-saving activities (including the use of renewable energy)
- Resource recycling activities (reduce, reuse, and recycle)
- Promoting efficiency as part of new lifestyles

Changes in CO_2 Emissions (Scope 1+2)



Development of wave-receiving plates for wave power generation

Wave power generation is a marine-based renewable energy system that uses the power of waves to generate electricity. It has been attracting increased attention in recent years because it has almost no impact on nature or ecosystems and is expected to generate power more efficiently than solar and wind power. Our company was in charge of the rubber plate portion of the wave-receiving plate attached to the lower part of the power generation equipment in the demonstration experiment conducted by the Hiratsuka Marine Energy Study Group, a joint research project between the public, private, and academic sectors. The rubber plate is able to swing back and forth in large arcs by creating an appropriate "deflection" according to the size of the waves, thus achieving high energy efficiency.

Power-generating equipment being installed

Working Toward a Circular Economy

Achieving a sustainable society requires establishing a circular economy as well as carbon neutrality. Instead of the conventional economic system in which we extract resources, use them to make things, and then throw them away, our goal is to utilize discarded products and raw materials as new resources and eliminate waste. To achieve this goal, we will promote the sustainable use of materials derived from natural resources, the development of new types of biomasses and other raw materials, and the expansion of the use of renewable and recycled raw materials in cooperation with suppliers. Our goal is to achieve a usage rate of 30% or more of those raw materials by 2030.

Developing the world's first new technology to produce butadiene from biomass

Our company developed the world's first new technology capable of efficiently producing butadiene from biomass (biological resources) through joint research by the Bio-monomer Production Laboratory with the Institute of Physical and Chemical Research (RIKEN) and Zeon Corporation. We were able to do so by discovering a metabolic pathway that can produce butadiene via less expensive intermediates, then creating and incorporating into cells a new enzyme to achieve this. Butadiene is used as the primary raw material for the synthetic rubber in automobile tires. Butadiene is currently produced industrially as a byproduct of naphtha pyrolysis, but the creation of this technology allows us to reduce our dependence on petroleum and reduce carbon dioxide emissions.

Butadiene rubber created from butadiene through new fermentation production technology

Sustainable procurement initiatives for natural rubber

Tires, hoses, and industrial products, which are our main products, require resilience, and natural rubber is widely used for this purpose.

However, most natural rubber is produced from the sap of a single species of rubber tree (*Hevea brasiliensis*), which is grown on rubber farms. This comes with risks, such as reduced production due to disease, illegal labor and child labor, and destruction of ecosystems caused by deforestation. To ensure stable procurement for the future, we are working with local government and suppliers to conduct surveys and lend our support to natural rubber farms. In fiscal 2020, we visited and interviewed 128 farms (179 in total) in the Surat Thani district of Thailand. We also collaborated with the Rubber Authority of Thailand (RAOT) to provide agroforestry seedlings for planting in natural rubber farms.

We also participated in industry activities through the TIP*2 being led by the WBCSD*1, which we identified as an important initiative in our SDGs roadmap, as well as worked to protect tropical rainforests and the working environments and livelihoods of rubber farmers in accordance with the policies set by the GPSNR*3, a group consisting of natural rubber producers, related organizations, tire manufacturers, automobile manufacturers, and so on.

*1 WBCSD: World Business Council for Sustainable Development.
*2 TIP: Tire Industry Project (subcommittee).
*3 GPSNR: Global Platform for Sustainable Natural Rubber.

Carbon-positive Initiatives: Yokohama Forever Forest Activities

Under the Yokohama Forever Forest Activities initiative, we have been planting trees at 14 sites in Japan and 21 sites in 8 countries overseas since 2007. By fiscal 2020, a cumulative total of 1.04 million saplings were provided to local communities and trees planted. To date, the amount of CO_2 absorbed by planted trees has increased to an estimated 1,300 tons.

Contributing to our SDGs

Here's what one person involved in wave power generation said

Wave power generation systems that utilize wave energy have a low impact on the environment, and the pendulum-type wave power generation system installed on the coast of the Hiratsuka Wave Power Station can be installed on many coasts throughout Japan. Because it can coexist with fisheries, regional revitalization efforts, and industrialization, it is the closest thing we have to a practical solution. To integrate this wave power generation system into society, it is important to harmonize and combine a number of fields, including environmental studies, regional sociology, ocean engineering, coastal engineering, mechanical engineering, electrical engineering, and ocean observations.

Dr. Rheem Changkyu
Professor, Institute of Industrial Science, The University of Tokyo