

Environment

JSR's Outlook on the Environment

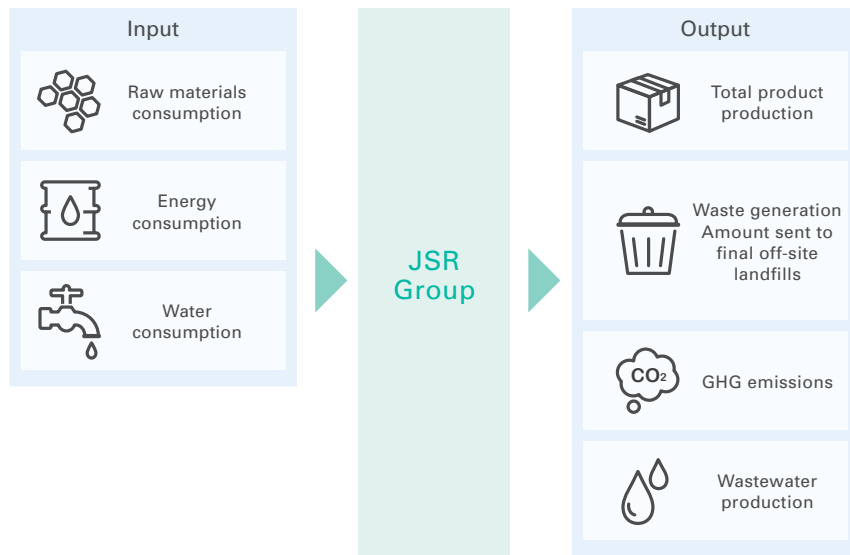
As a company that deals in chemical substances, JSR Group recognizes that it has a duty to help bring about a sustainable global environment and society.

Consequently, JSR considers reducing the environmental impact of business activities and managing chemical substances to be top priorities and strives to properly manage waste and greenhouse gas (GHG) emissions arising from energy consumption. Climate change in particular is expected to have a major impact on businesses due to the growing frequency of natural disasters and risks associated with future environmental regulations. For this reason, JSR has positioned the reduction of GHG emissions as a medium- to long-term management issue.

Reducing Environmental Impact: Material Balance

JSR Group strives to reduce its environmental impact in a comprehensive, efficient way by quantitatively ascertaining and closely analyzing the consumption of energy and resources in its business activities (input) as well as its product production, emissions into the environment, waste production, and other data (output).

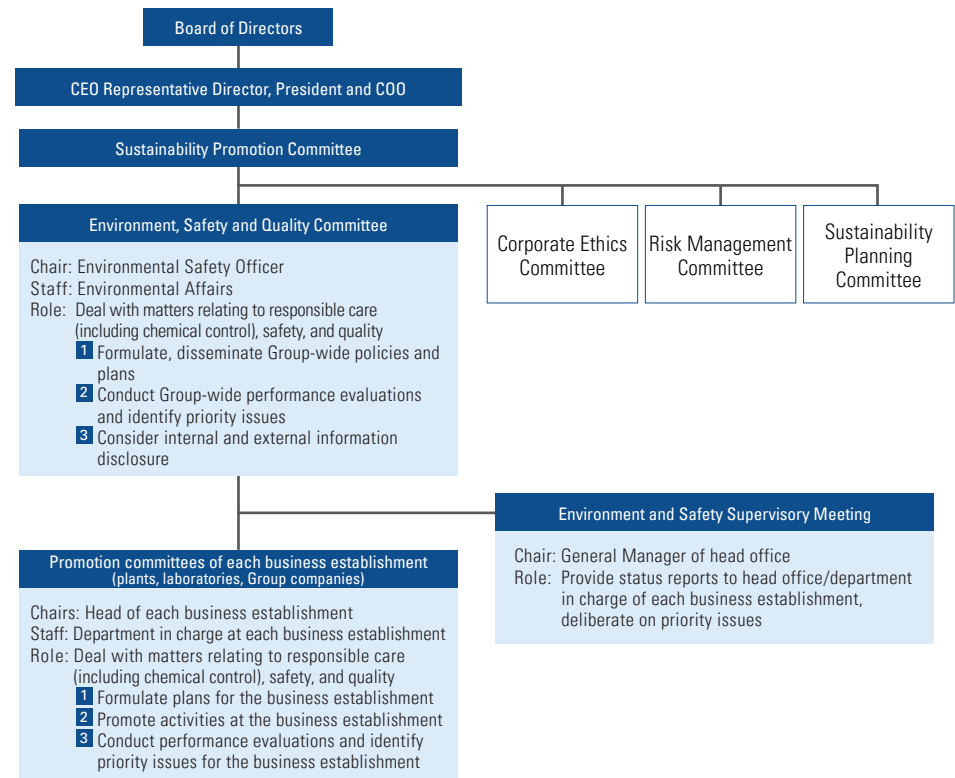
The chart provides an overview of JSR Group's environmental impact (material balance). It presents totals for three items as input (raw materials consumption, energy consumption, and water consumption) and five items as output (total product production, waste generation, amount sent to final off-site landfills, greenhouse gas (GHG) emissions, and wastewater production).



JSR's Approach to the Environment

JSR Group sets environmental targets based on its Environmental Safety Management Policy with the aim of integrating responsible care activities into corporate management. The Environmental Supervisory Department formulates initial targets, which are reviewed and approved by the Environment, Safety and Quality Committee chaired by the Environmental Safety Officer, and reported to the Sustainability Promotion Committee. The environmental affairs departments of each business play a central role in meeting established targets through responsible care activities in compliance with ISO 14001 environmental management system standards. JSR is also taking proactive responsible care measures such as the introduction of state-of-the-art equipment and technological development.

Environmental Management System Promotion Framework



Environment

JSR Group Response to TCFD Recommendations

JSR Group sees the problem of climate change as one of the most important issues facing society. We are therefore vigorously implementing activities to reduce GHG emissions by applying the technical strengths we have cultivated over the years. In such circumstances, we view the TCFD*1 Recommendations as contributing to the development of a sustainable society transitioning toward a low-carbon economy, and we have begun implementing initiatives that are in step with these recommendations.

First of all, we are further reinforcing our governance system by providing oversight by the Board of Directors and are beginning scenario analyses for the formulation of concrete management strategies, risk management plans, indices, and future targets.

Earnestly confronting climate change as a chemical company, we are deepening our understanding of the opportunities and risks brought about by our Group's corporate activities, taking action accordingly, and striving to proactively disclose our initiatives to the public.

*1 TCFD: The Task Force on Climate-related Financial Disclosures, established by the Financial Stability Board (FSB). In June 2017, the TCFD presented recommendations for the disclosure of the effects that climate change risk has on financial institutions, companies, and governments in financial reports. More than 1,000 organizations around the world have endorsed the recommendations (as of February 2020; published data of the TCFD).

Reducing GHG Emissions

The JSR Group is working to lower GHG emissions and support the realization of a low-carbon society by reducing the amount of energy used in various stages of manufacturing and through the products we provide to customers.

For information on how JSR products reduce GHG emissions, refer to the business impact data on page 7, "JSR Sustainability Challenge."

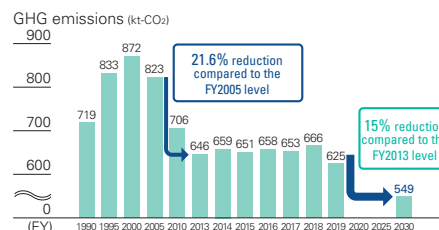
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- Since FY2005, we have strived to upgrade our energy-saving technologies through various approaches, including installing fuel conversion facilities at the Kashima Plant (South Kashima Power Plant, Inc.) and introducing cogeneration facilities and a sludge dryer system at the Yokkaichi Plant. We thus achieved a significant GHG emissions reduction of 21.6% in FY2013 compared to FY2005.
- Although we have continued efforts to conserve energy since FY2013, our emissions have remained about the same. For this reason, in FY2019, we set a long-term goal of reducing emissions by 15% by FY2030 compared to FY2013. In addition to our energy conservation activities, we are endeavoring to further reduce GHG emissions by introducing highly-efficient equipment and using renewable energy.
- In FY2019, emissions fell by 3.2% compared to the FY2013 level, in part due to production volume.

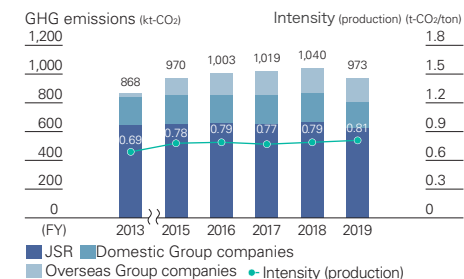
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- In FY2019, GHG emissions were down 6% from the previous year due to a slowdown in production. Globally, emission volume is increasing due to the expansion of production bases. In response to the growing proportion of overseas emissions, JSR will work to implement TCFD recommendations worldwide.

Trend for JSR and Reduction Targets for 2030



Trend for JSR Group



Efforts to Conserve Water

Water is an essential resource. Globally, freshwater in particular is a limited and valuable resource. In Japan, as in other countries, water resources are being affected by natural disasters caused by abnormal weather events, some of which are a result of climate change. This makes the appropriate management of water resources a necessity.

JSR Group uses such water resources as a raw material and coolant in its manufacturing processes. We strive to recycle water in our processes and, after it is used, appropriately purify it before discharging it into rivers.

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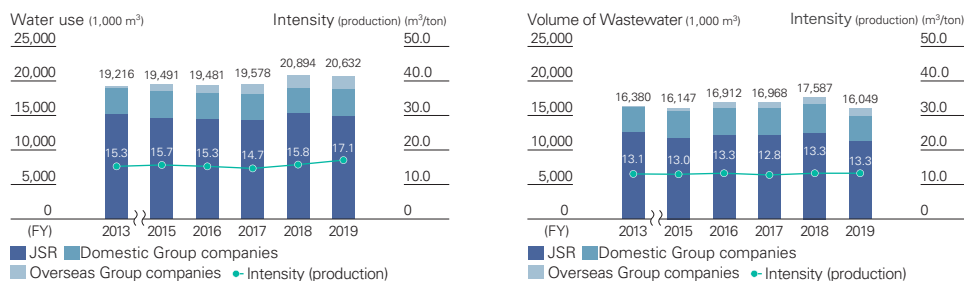
Breakdown of water use (by intake source) and recycling rate

JSR used 14,888,000 m³ of industrial water, groundwater* and tap water in FY2019. Of this amount, 29.3% was recycled in plant processes. We will endeavor to manage our water resources by continuing this effort with the goal of maintaining the current recycling rate.

* Groundwater is not used at the Yokkaichi and Chiba Plants.

Global Trend for JSR Group water use and total wastewater

Water use has been rising due to the expansion of overseas production bases, but in FY2019 it was down 1% from the previous year to 20,632,000 m³, while the total volume of wastewater was 16,049,000 m³, down 9%. Recognizing the growing attention paid to water resources, JSR will continue to pursue appropriate water resource management.



Efforts and Progress in Chemicals Management

Globally, regulations are tightening to minimize the hazard risks of chemical substances. From the perspective of ensuring product safety, JSR develops products in line with trends in chemical risk evaluations of each country from the design stage onward.

In addition, starting with Europe, legislation is being enacted in various countries to require existing substances to be registered including safety data.

New regulations went into effect in South Korea, Taiwan, and other regions in 2019, but by collaborating with local subsidiaries, JSR has been able to smoothly and effectively respond.

Building a Recycling-Oriented Society: Environmental Efforts to reduce industrial waste

Due to changing waste import regulations in many Asian countries, waste disposal has become a pressing issue in Japan. Meanwhile, the outflow or discharge of waste plastic into the ocean, which causes deterioration of the marine environment and ecosystem, has become a major environmental issue worldwide and demands are growing to build a recycling-oriented society. JSR Group is taking measures to reduce waste generation, thoroughly separate different types of waste, and seek proper recycling destinations, among other steps.

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JSR's efforts to form a recycling-oriented society include the following.

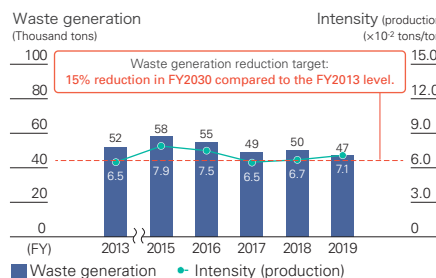
- In FY2018, JSR set a long-term target of reducing the volume of waste generated by 15% in FY2030 compared to FY2013 and is taking steps to generate less waste and promote recycling. The volume of waste generated in FY2019 was down 10.2% compared to FY2013. Efforts to meet this target are ongoing.
- Regarding waste recycling, in addition to promoting the use of cement as a raw material and other recycling approaches in FY2018, JSR also began operation of a new recycling center in the Yokkaichi Plant and is working to separate and recover composite waste.
- Marine waste plastic has become a global environmental issue in recent years. In response to the Japanese government's Resource Circulation Strategy for Plastics, JSR is working to further advance the recycling of waste plastics, in FY2019 setting long-term targets for FY2030 of: 1) 100% recycling (including heat recovery), and 2) 60% recycling (not including heat recovery). JSR will also take other measures to contribute to society, such as raising awareness and promoting the 3Rs in daily life through in-house seminars and road shows, and participating in coastal cleanup activities. In FY2018, JSR helped found the Japan Initiative for Marine Environment (JaIME).
- In FY2019, the waste plastic recycling rate (including heat recovery) was 100% for JSR and 67% for the domestic JSR Group as a whole. Going forward, JSR will continue to promote activities to further improve the recycling rate to achieve its targets.
- Regarding final off-site landfills, JSR has been working toward the target of "zero emissions" set in FY2000 and efforts have been ongoing since 2003.

* JSR's definition of zero emissions is final off-site landfill volume of 0.1% or less of total generated waste volume

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In FY2019, global waste generation was 70,000 tons, a decrease of 3% from the previous year, with a recycling rate of 86%. JSR will pursue waste reduction activities from a long-term perspective.

Trend for JSR and Reduction Targets for 2030



Industrial Waste Trend for JSR Group

