SHIONOGI
Environment Report 2022

SHIONOGI

Capability and Vision, unified.

Shionogi & Co.,Ltd.

Environment Report 2022

February 2023

Contents

Message from the Leadership Team

EHS Policy and SHIONOGI's Approach to the Supply Chain

SHIONOGI Group EHS Policy

In support of SHIONOGI's mission to supply the best possible medicine to protect the health and well-being of the patients we serve and for "Engagement in environmental issues" and "Optimization of work practices and enhancement of the workplace environment" in the SHIONOGI Group Code of Conduct, SHIONOGI strives to conduct business activities in a manner that gives consideration to protection of the global environment, prevention of pollution, and support of the health and safety of our employees and the local communities in which SHIONOGI Group companies operate. In our activities, we will identify material issues related to EHS (materiality*) and focus on them. Specifically, Shionogi is committed to:

1 Confirming the organization's commitment to building a high-quality EHS management system.
2 Complying with all relevant laws and regulations related to environmental health and safety and strive to maintain and improve the EHS level.
3 Striving to continuously reduce environmental impact and hazardous factors of SHIONOGI Group business activities through collaborating with stakeholders, including impacts caused by research and development, production, distribution, and sale of SHIONOGI products.
4 Raising employees' awareness of EHS-related policies and topics through the prompt provision of information and regular training and practice.
5 Supporting the environmental protection and health and safety activities of the communities in which SHIONOGI Group companies are located, by acting in an environmentally-compatible way and by building a partnership of trust and accountability with the local community.

EHS: Environment, Health and Safety
*Materiality: https://www.shionogi.com/global/en/company/strategy/important-issues.html

Established on October 5,2015
Revised on January 1,2022

Isao Teshirogi, Ph.D.
President and CEO
Shionogi & Co., Ltd.

SHIONOGI's approach to the supply chain

We are keenly aware that our collaborations with suppliers, our valued business partners, are as essential as the SHIONOGI Group's actions in fulfilling our social responsibilities. We therefore join the Pharmaceutical Supply Chain Initiative (PSCI)*1 and require our suppliers to endorse the PSCI Principles for Responsible Supply Chain Management,a set of action principles established by the PSCI.

PSCI PHARMACEUTICAL SUPPLY CHAIN INITIATIVE
Building responsible supply chains

*1 The Pharmaceutical Supply Chain Initiative (PSCI) is a global non-profit organization that advocates CSR procurement in the pharmaceutical industry and requires pharmaceutical companies to have their business partners engage in CSR initiatives.
See this website for details. (External website)
https://pscinitiative.org/home

Commitment by the Officer-in-Charge

Noriyuki Kishida

Senior Executive Officer,
Senior Vice President,
Corporate Supervisory Unit

To create a sustainable society

First of all, I would like to express my deepest condolences to the many people who have lost their lives around the world due to the COVID-19 pandemic, and my heartfelt sympathies to those who are still suffering from the disease or suffering from the aftereffects. The SHIONOGI Group has adopted "Protect people worldwide from the threat of infectious diseases" as one of the material issues (materiality) on which it places particular emphasis, and has positioned infectious diseases as a priority disease area in research and development. Since 2020, when the COVID-19 pandemic began, we have focused on research and development of COVID-19 therapeutic drugs and preventive vaccines. We will continue to work together across the entire value chain, from research and development to the establishment of a manufacturing/distribution system, so that we can provide, as soon as possible, new products to society, which is still suffering from the COVID-19 pandemic.

In recent years, attention to the SDGs has been increasing, and companies are strongly required to contribute to resolving social issues through their business activities and to grow sustainably together with society. In particular, environmental issues are recognized as global issues that transcend generations and cannot be reversed. Initiatives related to climate change are being promoted on a global scale, including the conclusion of the Paris Agreement and the establishment of the Science Based Targets initiative (SBTi) and the Task Force on Climate-related Financial Disclosures (TCFD). In Japan, starting with the Japanese government's declaration of "Carbon Neutrality by 2050" in October 2020, the Corporate Governance Code was revised in June 2021, requiring companies listed on the Prime Market of the Tokyo Stock Exchange to disclose climate-related information in accordance with the TCFD or equivalent framework. Thus, corporate responsibility in relation to climate change continues to expand.

The SHIONOGI Group has identified "Protect the environment" as one of the material issues to realize a sustainable society and support SHIONOGI's growth, and is steadily advancing its efforts to address climate change in order to meet the demands of society. In fiscal 2021, we obtained approval from the SBTi for our medium- and long-term greenhouse gas (GHG) emissions reduction targets and announced our support for the TCFD recommendations to begin efforts to expand our information disclosure based on the TCFD framework. Furthermore, with the aim of expanding GHG emissions reduction activities to the entire supply chain, we participated in the Ministry of the Environment's "Fiscal Year 2021 Model Project for Supporting Achievement of the Decarbonization Targets of the Entire Supply Chain" to consider measures to reduce Scope 3 emissions. Thus, we are strengthening our efforts to reduce GHG emissions.

Some environmental issues are closely related to the infectious disease area, on which the SHIONOGI Group focuses on. Due to the global spread of COVID-19, we have experienced that once a pandemic occurs, society and the economy suffer great damage. If global warming advances due to climate change, it is said that the risk of new pandemic outbreaks will increase. For instance, it is expected that infectious diseases will spread over a wider area in the tropics. Accordingly, we believe that we need to seriously address climate change. The antimicrobials we sell also have the risk of causing the emergence of new AMR strains unless we properly handle them, starting from the manufacturing process, and control the release of them into the environment.

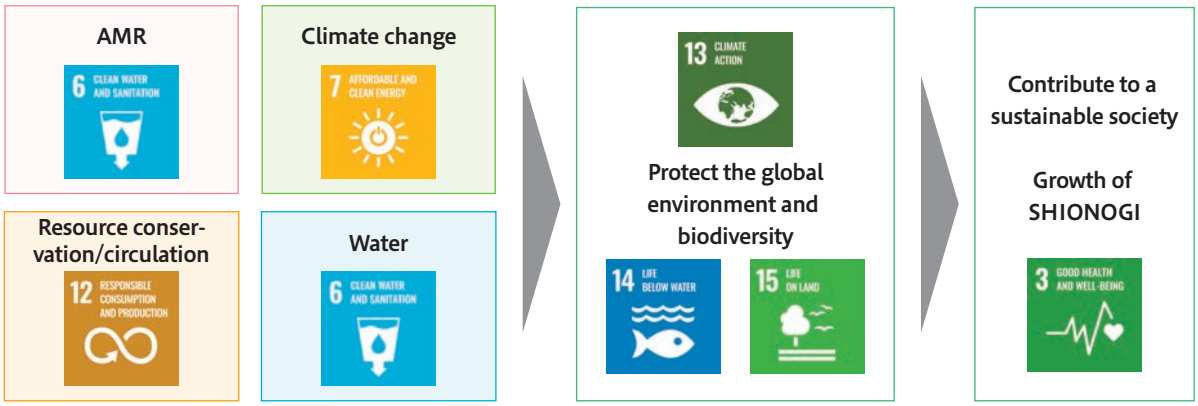
Considering the depth of the relationships with its businesses, the SHIONOGI Group has identified "AMR,"*1 "climate change," "resource conservation and circulation," and "water," which are environmental issues to be prioritized, as its Environmental Materiality. We have also adopted the medium- and long-term EHS Action Targets (2020–2024/2030/2050) to focus on reducing the environmental impact of our business activities.

The SHIONOGI Group contributes to the health of people and the maintenance of the global environment through its business activities, thereby achieving both the realization of a sustainable society and the growth of the Company. Furthermore, we will continue to take responsible action and enhance our information disclosure to strengthen our engagement with all of our stakeholders. We will also work to continuously improve corporate value so that we can become a company that is needed in the future.

*1 AMR: Antimicrobial Resistance

SHIONOGI Group EHS Action Targets (Environment)

As a drug discovery-based pharmaceutical company, our business activities incorporate initiatives dealing with environmental issues, and we are working to protect the global environment and biodiversity in order to create a sustainable society.



AMR

Relevant supplier initial audit	Relevant supplier follow-ups
FY2024	FY2030
100% implementation	100% implementation

Climate change

	FY2024 (FY2019 benchmark)	FY2030 (FY2019 benchmark)	FY2050
CO_2 emissions (Scope 1+2)	10% reduction	46.2% reduction	ZERO
CO_2 emissions (Scope 3)	10% reduction	Category 1 20% reduction	

Resources conservation and circulation

Waste generation	Waste plastic reuse and recycling	
FY2024 (FY2018 benchmark)	FY2024	FY2030
25% reduction	30%	65%

Water

Water consumption
FY2024
1,340 thousand m^3 or less

Topics

The SHIONOGI Group has been rated by CDP as A- for "Climate Change" and "Water Security" and selected for inclusion on the "Supplier Engagement Leaderboard," the highest rating in the "Supplier Engagement Rating"

The SHIONOGI Group received an A- rating in both categories of "Climate Change" and "Water Security" from CDP,*1 an international NPO promoting environmental information disclosure. Continuing from last year, the SHIONOGI Group was highly evaluated for its efforts to address climate change and water security. In addition, The SHIONOGI Group was selected for the second consecutive year for inclusion on the "Supplier Engagement Leaderboard", which is the highest rating in the CDP's Supplier Engagement Rating (SER), in the category of "Climate Change."

Under its Company Policy and its Code of Conduct, the SHIONOGI Group has identified "Protect the environment" as one of its material issues (materiality) to be addressed and promotes environmental initiatives in all business activities. We have also established the "SHIONOGI Group Business Partner Code of Conduct" and promote activities that encourage our business partners in the supply chain to comply with it. We believe that these continuous efforts were highly evaluated, as was the case last year.

CDP SUPPLIER ENGAGEMENT LEADER 2021

*1 CDP:
CDP is a non-profit organization whose main activities involve requesting corporations and municipalities to disclose information on their actions for climate change control, water resources protection, forest conservation, and other environmental issues, based on the request of institutional investors and major corporate clients that are particularly interested in environmental issues. Such information disclosure is expected to further prompt actions for the environment by the entities concerned. CDP is now one of the world's most useful information disclosure platforms on environmental issues. CDP is also a founding member of the We Mean Business Coalition.

See this website for details. (External website)
https://www.cdp.net/en

SHIONOGI Group expresses its support for the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) and its participation in the TCFD Consortium

In March 2022, SHIONOGI expressed its support for the recommendations of the Task Force on Climate-related Financial Disclosures ("TCFD")*1 and its participation in the TCFD Consortium.*2

TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

TCFD Consortium

Also, in June 2021, the SHIONOGI Group obtained approval from the Science Based Targets initiative (SBTi),*3 an international environmental body, for its science-based, medium- and long-term greenhouse gas (GHG) emissions reduction plans, which were formulated to contribute to global GHG emissions reduction toward net zero CO_2 emissions by 2050.

SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

Under the TCFD recommendations and framework, to minimize risks related to climate change, we will strengthen climate governance to extract risks and opportunities from climate change and understand its financial impacts, and improve and expand our disclosure.

*1 Task Force on Climate-related Financial Disclosures (TCFD):
TCFD is a private task force that was established in December 2015 by the Financial Stability Board (FSB), an international body in which central banks and financial regulators of major countries participate.

See this website for details. (External website)

https://www.fsb-tcfd.org/

*2 TCFD Consortium:
The TCFD Consortium is an organization established as a forum for companies and financial institutions in Japan that support the TCFD recommendations to discuss corporate disclosure of climate-related information and initiatives to use disclosed information for appropriate investment decisions.

See this website for details. (External website)

https://tcfd-consortium.jp/en

*3 Science Based Targets initiative (SBTi):
Established by the CDP, which is an international NGO operating information disclosure programs related to the environmental field, the United Nations Global Compact (UNGC), the World Resources Institute (WRI), and the World Wide Fund for Nature (WWF), the SBTi encourages companies to establish science-based GHG reduction targets (SBTs).

See this website for details. (External website)

https://sciencebasedtargets.org/

The SHIONOGI Group wins a Special Award in the Environmentally Sustainable Corporations section of the Ministry of the Environment's 3rd ESG Finance Awards Japan

The ESG Finance Awards Japan was established by the Ministry of the Environment for the purpose of sharing advanced initiatives in ESG finance and environmentally / socially sustainable business, and promoting and propagating ESG finance. The Environmentally Sustainable Corporations section was established to recognize companies that incorporate important environmental opportunities and risks into their management strategies and create positive effects for the environment while increasing corporate value, and to show investors and companies specific examples of "Environmentally Sustainable Corporations."

We believe that we were awarded this Special Award in high recognition of our steady efforts in environmental management related to the following points. As a company that has identified "Protect people worldwide from the threat of infectious disease" as a material issue, the SHIONOGI Group is not only involved in drug discovery but also in managing the impact of wastewater from the antimicrobial drug manufacturing process (both its own and its suppliers'), on the natural environment. Moreover, as a pharmaceutical company, we are actively working to reduce the negative impact of public and environmental health issues, including climate change, water resource management, and waste management, and transparently disclose the relevant information in an independent report.

2022 ESG FINANCE AWARDS JAPAN SPECIAL


賞状

特別賞
（環境サステナブル企業部門）
塩野義製薬株式会社 殿

貴社は第三回ESGファイナンス・アワード・ジャパンにおいて優良な取組と認められました特別賞として、これを賞します

令和四年二月二十八日

ESGファイナンス・アワード・ジャパン
選定委員長 北川 哲雄

Shionogi Pharma has signed a joint development agreement for demonstration of horizontal recycling of label backing paper

Shionogi Pharma Co., Ltd., together with four companies, NEION Film Coatings Corporation, Toyobo Co., Ltd., Toppan Infomedia Co., Ltd., and Mitsui Bussan Chemicals Co. Ltd., has signed a joint development agreement for the purpose of conducting demonstration experiments to realize horizontal resource recycling*1 of label backing paper*2 (“Resource Recycling Project”).

The amount of label backing paper used in the product labeling process has reached 116 million m^2 per month*3 in the domestic manufacturing industry as a whole, and most of it is discarded or incinerated without being collected or recycled. The Resource Recycling Project is an environmentally friendly initiative aimed at eliminating the disposal of label backing paper by collecting and recycling it. Shionogi Pharma will conduct demonstration experiments with the aim of putting this project into practical use in the manufacturing process of some products by the end of FY2022, and will consider extending the project to other products.

*1 Backing paper (release paper, separator) to protect the adhesive side of the label. It is generally difficult to recycle backing paper because it is coated with a resin material to prevent it from adhering to the label glue.
*2 Horizontal resource recycling refers to a manufacturing process in which used materials are recycled into the same product.
*3 Compiled from the Label Shimbun’s “Japanese Label Market 2021” (FY2019 shipment volume basis)

The SHIONOGI Group has been selected for the FY2021 Supply Chains Decarbonization Project of the Ministry of the Environment

The Fiscal Year 2021 Model Project for Supporting Achievement of the Decarbonization Targets of the Entire Supply Chain is a Ministry of the Environment (MOE) project aimed at helping companies formulate GHG emissions reduction measures for the entire supply chain so that they can achieve their GHG emissions reduction targets, including SBTs. With this project, the MOE aims to create corporate decarbonization role models in Japan and to expand this decarbonization expertise to a wide range of companies.

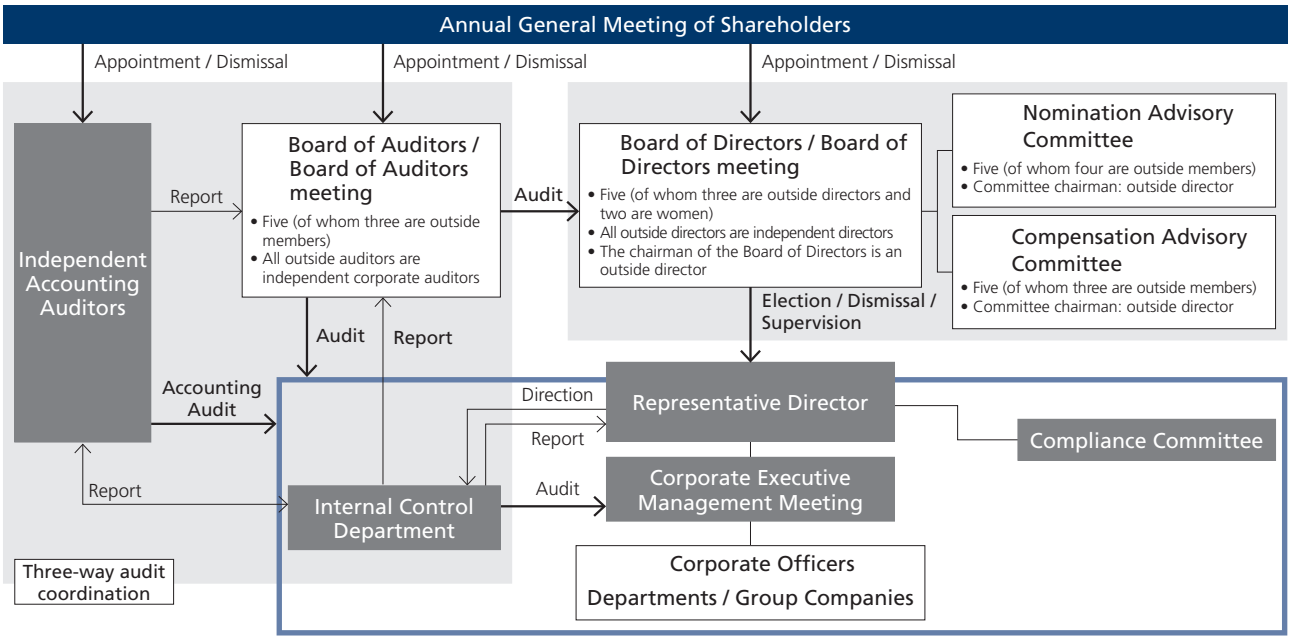
The SHIONOGI Group has built a system to promote supplier engagement and has implemented the supply chain engagement process*1 formulated in this project to achieve its SBTs.

*1 See this website for details. (External website) (Japanese version only)
https://www.env.go.jp/earth/datsutansokeiei_mat02_20220418.pdf

Environmental management

Governance

Governance structure

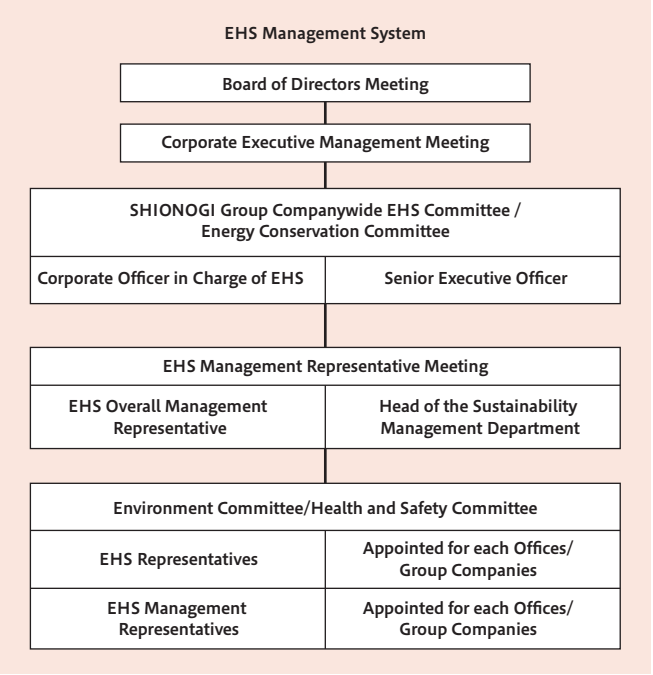


To ensure business execution based on appropriate management judgment, Shionogi has chosen to establish a company with a board of corporate auditors. This is because it will enhance the auditing function of the corporate auditors and the monitoring function of the Internal Control Department, which has an internal auditing function, and promote the smooth functioning of the management monitoring system through cooperation between them.

See the section "Corporate Governance" for details.
https://www.shionogi.com/global/en/company/cg.html

In the SHIONOGI Group, a system is in place that allows the Corporate Executive Management Meeting to deliberate on its initiatives for the environment ("E"), health ("H"), and safety ("S") before the Board of Directors makes final decisions about them. We have appointed the Senior Executive Officer in charge of EHS as a Corporate Officer who supervises overall EHS management in an integrated manner.

The Corporate Officer in charge of EHS heads the SHIONOGI Group Companywide EHS Committee, which comprises representatives from the group's respective operating sites, who are appointed as personnel in charge of EHS, and presidents from Group companies. The SHIONOGI Group Companywide EHS Committee sets targets for EHS, identifies Environmental Materiality, and conducts management reviews, thereby promoting EHS activities.



In addition, the Energy Conservation Committee, chaired by the Corporate Officer in charge of EHS and placed under the SHIONOGI Group Companywide EHS Committee, assumes duties such as setting medium- and long-term targets, managing progress, and assessing the status of legal and regulatory compliance regarding measures for energy conservation and global warming control. The operation of these two committees is under the jurisdiction of the Sustainability Management Department, which promotes the SHIONOGI Group's ESG initiatives and strengthens its ESH management system.

The results of deliberations by the above committees and matters related to EHS that have a large impact on management are reported to the Corporate Executive Management Meeting or the Board of Directors by the Senior Executive Officer in charge of EHS and the Head of the Sustainability Management Department, who is an EHS overall management representative.

■ Environmental / Occupational safety and health management systems

The SHIONOGI Group uses ISO 14001, ISO 45001, and in-house management systems established in conformity with them. The SHIONOGI Group's EHS activities, including risk management, are reviewed as a whole once a year by the SHIONOGI Group Companywide EHS Committee to verify the efficacy and suitability of its EHS initiatives. Matters that have a major impact on management are deliberated by the Corporate Executive Management Meeting before final decisions are made by the Board of Directors.

The acquisition status of certification of our management systems is summarized in the table below.

	Settsu Plant	Kanegasaki Plant	Tokushima Plant	Itami Plant
ISO14001	○	○	○	○
ISO45001	○	○	○	—

○:Acquired

■ Audits

The SHIONOGI Group conducts audits of each operating site of the group and its suppliers using multiple approaches to check their EHS promotion status, as shown in the table below.

External audits	Conducted by external accreditation organizations to verify that the group's ISO 14001- and ISO 45001-certified management systems are operated in conformity with the standards
Internal audits	In-house self-inspection required under ISO 14001 and ISO 45001 conducted to confirm system suitability and status of conformity
EHS audits	Conducted by the division that supervises the SHIONOGI Group's EHS initiatives, as directed by the management team, separately from internal audits, to check whether EHS activities in the SHIONOGI Group are appropriately implemented and maintained in compliance with the management systems while pursing continuous improvement
EHS audits of suppliers	Audits of the SHIONOGI Group's suppliers of raw materials, intermediates, APIs, products, etc. conducted in compliance with the PSCI Principles

In addition, as part of AMR Industry Alliance activities, we inspect our antimicrobial release control and management. See the section "AMR" on pp. 19–21 for details.

To enable a fairer and more objective CSR assessment, we implement "EcoVadis," a rating platform for assessing corporate social responsibility and sustainable procurement, and sequentially make an assessment of our business partners in order of priority.

See the section "Supply Chain Management" for details.

https://www.shionogi.com/global/en/sustainability/society/supply-chain-management.html

■ Emergency preparedness

The SHIONOGI Group Risk Management Policy stipulates that in the event of a crisis, we should place top priority on protecting human life and ensuring safety, promptly take measures to minimize damage and prevent recurrence, and continue business operations as principles of action. To respond to emergencies, such as earthquakes, pandemics, and corporate scandals, we have established emergency response guidelines and manuals with a focus on respect for human life, consideration for and contribution to local communities, and business continuity. In anticipation of emergencies, we have established communication and reporting systems and regularly carry out emergency responsiveness training and review response procedures. In FY2021, disaster drills were conducted at each operating site, following a simulated scenario of an earthquake-triggered fire or tsunami.

Comprehensive disaster drill (Shionogi Pharma Settsu Plant)

■ Education

In order to promote EHS activities, we believe it essential that individual employees be fully aware of environmental, health, and safety issues in connection with their own work and actively address them. In addition to EHS education for all employees, we provide environmental education and preliminary education related to operations with high environmental impact, such as waste management and the handling of chemical substances, at each operating site. We clearly inform employees of the targets and actual figures of CO_2 emissions and waste generation so as to effectively motivate their involvement in EHS activities.

In FY2021, an educational program was conducted in the form of video distribution for all employees of Group companies in Japan, numbering some 5,000.

Theme	SDGs, ESG investment, the environment
Results	FY2021: 6 videos distributed; 17,364 total views

Risk Management

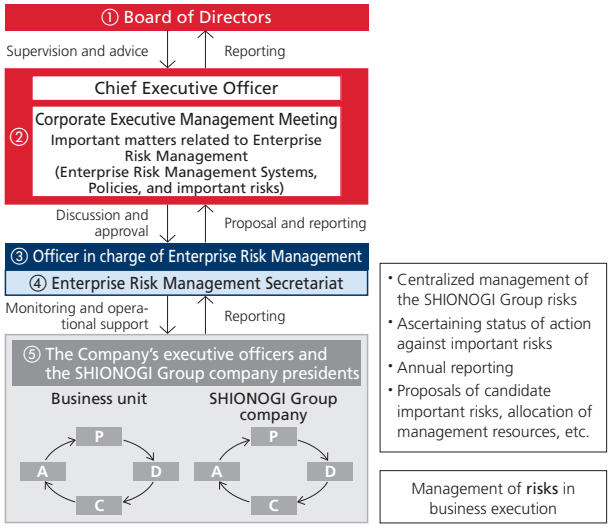
In this era, called the age of VUCA, business uncertainty is increasing amid accelerating social change. From the perspective of sustainability, the SHIONOGI Group appropriately manages business risks, including creating new business opportunities and taking risk avoidance and reduction measures. We have built and promoted an enterprise risk management (ERM) system, which manages the risks of the entire group, as an important system for our management strategy and management foundation.

Environmental risks are identified and placed on the agenda (setting targets for climate change-related issues, checking progress in achieving the targets, assessing compliance with laws and regulations, etc.) of the SHIONOGI Group Companywide EHS Committee and the Energy Conservation Committee, a subsidiary committee. These committees assess the timing of emergence, probability of occurrence, financial impact, and other factors of these risks, formulate measures to respond to them in order of priority, and check the implementation status of the measures. In particular, significant risks that could have a major impact on management are reported through the enterprise risk management function to the Corporate Executive Management Meeting and the Board of Directors, which deliberate and make decisions on how to respond to them.

See the section "Risk Management" for more information on risk management.
https://www.shionogi.com/global/en/sustainability/governance/risk-management.html

Enterprise Risk Management (ERM) System

■ Risk management structure



		Role
①	Board of Directors	Provides supervision, advice, etc. on the planning, progress, and results of ERM promotion activities
②	Chief Executive Officer, Corporate Executive Meeting	The Corporate Executive Meeting, chaired by the Representative Director, President discusses important matters concerning SHIONOGI's ERM, which are approved by the Representative Director, President
③	Officer in charge of Enterprise Risk Management	The Corporate Supervisor is Chief Risk Management Officer (CRO), overseeing SHIONOGI's risk management and assuming responsibility for the promotion and operation of the ERM system.
④	Enterprise Risk Management Secretariat	The enterprise risk management secretariat consists of the Sustainability Management Department, the General Administration Department, and the Corporate Planning Department.
⑤	The Company's executive officers and the SHIONOGI Group company presidents	Each business unit and Group company is responsible for the execution of risk management in the execution of its operations

Environmental risk management process

Identification	Extract challenges based on global frameworks, such as the SDGs and the World Economic Forum in Davos, the main items of external assessment, and trade organizations' policies and other external environmental changes.
Assessment	Identify the impact of each challenge on business and determine its importance in consideration of the scale of impact and the frequency of occurrence.
Response	Study possible measures in response to each challenge.
Assessment of efficacy	Review by the SHIONOGI Group Companywide EHS Committee. Deliberation and decision by the Board of Directors and the Corporate Executive Management Meeting.

Identification, assessment results, and responses

Materiality (risks and opportunities)	Impact	Frequency of occurrence		Assessment	Measures
	On the Company	Actual	Predicted		
AMR ・Lowered reputation due to pollution caused by wastewater	Large	Small	Large	◎	・Pollution control during production at SHIONOGI and suppliers ・Publication of AMR actions and measures
Climate change ・Discontinued operation due to extreme meteorological phenomena ・Increased capital investment in response to regulatory reinforcement ・Change in the market for tropical-infectious-disease-related products	Large	Small	Medium	○	・Information gathering from governmental agencies, trade organizations, etc. ・Setting of CO_2 emission reduction plans by the Energy Conservation Committee ・Setting of measures for stable supply
Resources conservation and circulation ・Lowered reputation due to increased plastic waste ・Elevated reputation due to resources conservation initiatives	Medium	Small	Medium	△	・Promotion of 3R initiatives ・Restricted use for products
Water ・Discontinued operation due to droughts, floods, and water quality deterioration	Large	Small	Medium	○	・Information gathering from governmental agencies, trade organizations, etc. ・Monitoring of waste water ・Water consumption control

Assessment criteria

Assessment criteria are provided in the table below. Assessment is finalized after detailed discussions by the SHIONOGI Group Companywide EHS Committee.

Level	Impact	Frequency of occurrence
Large	Discontinued operation	Frequent in the area/industry
Medium	Capital investment	Past incidents
Small	—	No past incidents

Environmental Materiality (Material Issues)

The SHIONOGI Group determines material issues to be addressed by drawing up a Materiality Map regarding management challenges in consideration of their relevance to its business and their importance in society. As a result, we have identified "Protect the environment" as one of the SHIONOGI Group's material issues (materiality).

Material issues

https://www.shionogi.com/global/en/company/strategy/important-issues.html

In addition, we identify environmental issues to be addressed through more detailed analysis of changes in the external environment and dialogue with external stakeholders, such as ESG investment institutions and external experts, and related organizations within the Company. We have identified these issues as "Environmental Materiality" by assessing their impact on the sustainability of global ecosystems and on stakeholders based on the Environmental Reporting Guidelines. To address the issues, we have also adopted the Environmental Materiality Targets (EHS Action Targets). Environmental Materiality and the Environmental Materiality Targets are determined through deliberation by the SHIONOGI Group Companywide EHS Committee, the Corporate Executive Management Meeting, and the Board of Directors.

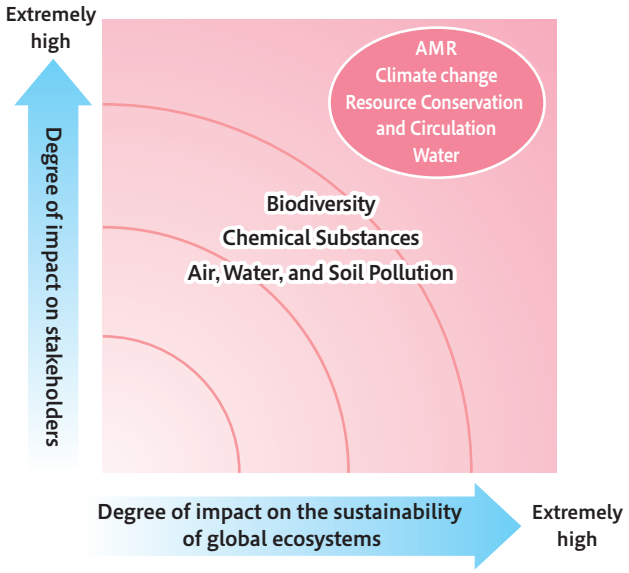
The SHIONOGI Group hopes to further deepen its activities by clarifying concrete steps toward handling material issues in the future and key performance indicators (KPIs) to offer value to society and meet our stakeholders' expectations.

Step 1 Extraction
Extract issues from global frameworks such as the SDGs and the World Economic Forum, principal items of external assessment, and external environmental changes as reflected in trade organization policies.

Step2 Assessment
Assess issues in terms of their impact on the sustainability of global ecosystems and on Shionogi's business and in terms of stakeholders' interest in the issues in connection with SHIONOGI's business.

Step3 Identification
Draw up a materiality map, and identify materiality.

Step4 Action
Make final decisions (the Board of Directors) regarding concrete measures, incorporate them into Action Targets, and take action.



Summary of identification of Environmental Materiality

Material issues	Summary of identification
AMR	This is a global issue that a pharmaceutical company manufacturing antimicrobials cannot ignore. The emergence of AMR impacts global ecosystems enormously.
Climate change	Responding to climate change is essential for the sustainability of global ecosystems. Meanwhile, stakeholders' demand for action in this regard is growing increasingly strong.
Resources conservation and circulation	Reducing waste and circulating resources mean effectively utilizing limited resources and are essential for the sustainability of global ecosystems. This is a part of the problem of marine plastic, and stakeholders' interest in this international issue has been growing in recent years.
Water	With the growing probability of occurrence of torrential rainfalls and floods, water risks (particularly physical risks) must be closely watched from the perspective of BCP. Water is an indispensable factor for the business continuity of pharmaceutical companies and essential for the sustainability of global ecosystems.

Environmental Materiality Targets (EHS Action Targets)

AMR

Relevant supplier initial audit
FY2024
100% implementation

Relevant supplier follow-ups
FY2030
100% implementation

Climate change

	FY2024 (FY2019 benchmark)	FY2030 (FY2019 benchmark)	FY2050
CO_2 emissions (Scope 1+2)	10% reduction	46.2% reduction	ZERO
CO_2 emissions (Scope 3)	10% reduction	Category 1 20% reduction	

Resources conservation and circulation

Waste generation
FY2024 (FY2018 benchmark)
25% reduction

Waste plastic reuse and recycling
FY2024 30% → FY2030 65%

Water

Water consumption
FY2024
1,340 thousand m^3 or less

See the sections"Action Targets" and "Results" for more information on the targets and activities.

Environmental Materiality and the value chain

	Purchase	R&D	Manufacturing	Distribution and sales	Use and disposal
AMR	Antimicrobial release management		Antimicrobial release management		Promotion of responsible antimicrobial use
Climate change	Introduction of energy-saving equipment Introduction of renewable energy	Introduction of energy-saving equipment Introduction of renewable energy	Introduction of energy-saving equipment Introduction of renewable energy	Introduction of hybrid vehicles Improvement of transportation efficiency	Change in or recycling of containers and packaging materials
Resources conservation and circulation	Green purchasing	Design of environmentally responsible products	3Rs of waste materials		Reuse and recycling of containers and packaging materials Responsible disposal
Water and water risks	Water risk assessment	Water risk assessment, water conservation, and wastewater management	Water risk assessment, water conservation, and wastewater management		

Action Targets

SHIONOGI Group EHS Action Targets (Environment) (2020–2024/2030/2050)

To contribute to global sustainability through biodiversity conservation and other initiatives, we work on formulating medium- and long-term targets for AMR, climate change, resource conservation and circulation, and water, which are the most important environmental challenges.

For other items, the SHIONOGI Group and each operating site / Group company set single-year targets and promote activities to achieve these targets.

Scope:
SHIONOGI Group companies in Japan (Global SHIONOGI Group for [GHG (CO_2) emissions reduction] and [Water risk mitigation])
Since FY2022, global targets have been set for [Waste and plastics] and [Water consumption reduction].

Item	Medium- and long-term targets (2020–2024/2030/2050)	FY2021 targets	FY2021 results	Achievement	FY2022 targets
AMR	[AMR control] • Maintain the management system at the Kanegasaki Plant. • By 2030, establish a responsible AMR management system, including the supply chain (complete post-audit follow-up).	[AMR control] • Maintain the management system at the Kanegasaki Plant.	[AMR control] • The management system was maintained.	○	[AMR control] • Maintain the management system at the Kanegasaki Plant and the Tokushima Plant.
	• Complete initial audits of 100% of relevant suppliers.	• Complete initial audits of 100% of relevant suppliers.	• Initial audits of 86% of relevant suppliers were completed (because the audits could not be carried out due to the COVID-19 pandemic, and the plan was changed to 100% completion in FY2022).	×	• Complete initial audits of 100% of relevant suppliers.
Climate change	[GHG (CO_2) emissions reduction] (FY2019 benchmark) • Reduce Scopes 1+2 by 10%. • Scope 3: Reduce Category 1 by 10%. • By 2030, reduce Scopes 1+2 by 46.2% and Scope 3 (Category 1) by 20%*1. • By 2050, achieve zero emissions.	[GHG (CO_2) emissions reduction] (FY2019 benchmark) • Reduce Scopes 1+2 by 5%. • Scope 3: Reduce Category 1 by 5%. (FY2019 benchmark)	[GHG (CO_2) emissions reduction] (FY2019 benchmark) • Scope 1+2 emissions increased by 2.4% (because CO_2 emissions increased due to factors such as COVID-19-related research and development and the advanced manufacturing of COVID-19 therapeutic drugs).	×	[GHG (CO_2) emissions reduction] (FY2019 benchmark) • Reduce Scope 1+2 emissions to the base-year level or less.
			• Scope 3: Reduce Category 1 by 6%. (FY2019 benchmark)	○	• Scope 3: Reduce Category 1 by 7%.

Item	Medium- and long-term targets (2020–2024/2030/2050)	FY2021 targets	FY2021 results	Achievement	FY2022 targets
Climate change	◦ Improve energy intensity by an annual average of 1%.	◦ Improve energy intensity by an annual average of 1%.	◦ Energy intensity fell by an annual average of 11% (because energy consumption increased due to factors such as COVID-19-related research and development and the advanced manufacturing of COVID-19 therapeutic drugs).	×	◦ Improve energy intensity by an annual average of 1%.
	◦ Promote the introduction of highly energy-efficient equipment and the electrification of equipment.	◦ Promote the introduction of highly energy-efficient equipment and the electrification of equipment.	◦ Highly energy-efficient equipment was introduced at the CMC Research Innovation Center, the Kanegasaki Plant, and the Tokushima Plant.	○	◦ Promote the introduction of highly energy-efficient equipment and the electrification of equipment.
Resource conservation and circulation	[Waste and plastics] ◦ Reduce the amount of waste generated by 25%. (FY2018 benchmark)	[Waste and plastics] ◦ Reduce the amount of waste generated to the FY2020 level or less.	[Waste and plastics] ◦ Waste generated: Increased by 24% (FY2020 benchmark) Increased by 35% (FY2018 benchmark) (due to changes in production volume and production items)	×	[Waste and plastics] ◦ Reduce the amount of waste generated to the FY2021 level (5,169 tons) or less. <Global> ◦ Reduce the amount of waste disposal to 4,793 tons or less (the FY2021 level or less). ◦ Reduce the amount of hazardous waste disposal to 1,434 tons or less (to the FY2021 level or less).
	◦ Reuse/recycle 80% of waste generated.	◦ Reuse/recycle 80% of waste generated.	◦ Reuse/recycle of waste generated: 89%	○	◦ Reuse/recycle at least 80% of waste generated.
	◦ Reuse/recycle 30% of waste plastics. ◦ **By 2030, reuse/recycle 65% of waste plastics.**	◦ Reuse/recycle 20% of waste plastics.	◦ Reuse/recycle of waste plastics: 28%	○	◦ Reuse/recycle 30% of waste plastics.
	◦ Restrict plastic use in products.	◦ Restrict plastic use in products.	◦ The adoption of biomass plastic for PTP sheets and thinner sheets were examined at Shionogi Pharma.	○	◦ Restrict plastic use in products.

Item	Medium- and long-term targets (2020–2024/2030/2050)	FY2021 targets	FY2021 results	Achievement	FY2022 targets
Water	[Water risk mitigation] • Complete thorough assessment of water risks at research laboratories, plants, and other major operating sites.	[Water risk mitigation] • Conduct water risk assessment using WRI Aqueduct, WWF Water Risk Filter, and in-house assessment at major operating sites in Japan.	[Water risk mitigation] • Water risk assessment using WRI Aqueduct, WWF Water Risk Filter, and in-house assessment was conducted at major operating sites in Japan.	○	[Water risk mitigation] • Conduct water risk assessment using WRI Aqueduct, WWF Water Risk Filter, and in-house assessment at major operating sites in Japan.
	[Water consumption reduction] • Keep water consumption at or less than 1,340 thousand m^3 (keep at the FY2018 level).	[Water consumption reduction] • Keep water consumption at or less than 1,570 thousand m^3.	[Water consumption reduction] • Water consumption: 1,366 thousand m^3	○	[Water consumption reduction] • Keep water consumption at or less than 1,366 thousand m^3 (because production is expected to increase). <Global> • Keep water consumption at or less than 1,517 thousand m^3 (at or less than the FY2021 level).
Chemical substances	[Appropriate management of chemical substances] • There are no medium-term targets because issues identified in the previous fiscal year should be addressed.	[Appropriate management of chemical substances] • Recheck the handling of chemical substances (risk assessment, legal compliance status), regarding their storage (including temporary storage and storage before disposal), transfer, and use.	[Appropriate management of chemical substances] • A re-check was not conducted at some operating sites. (Operating sites where a re-check was not conducted: Itami Plant, UMN Pharma Akita Plant, UMN Pharma Yokohama Research Center)	△	[Appropriate management of chemical substances] • Recheck the handling of chemical substances (risk assessment, legal compliance status), regarding their storage (including temporary storage and storage before disposal), transfer, and use.
	[Responsible management of PCB and fluorocarbons] • Reinvestigate PCB-containing waste, and complete responsible disposal/treatment (FY2022 target).	[Responsible management of PCB and fluorocarbons] • Execute 100% disposal/treatment of currently known PCB-containing equipment.	[Responsible management of PCB and fluorocarbons] • Disposal/treatment of high-concentration PCB waste was 100% completed (Kuise, Settsu, Aburahi).	○	[Responsible management of PCB and fluorocarbons] • Execute 100% disposal/treatment of currently known PCB-containing equipment.
	• Fluorocarbons: Manage equipment using fluorocarbons responsibly, and promote the introduction of fluorocarbon-free or low-GWP*2 equipment.	• Fluorocarbons: Manage equipment using fluorocarbons responsibly, and promote the introduction of fluorocarbon-free or low-GWP equipment.	• Although no fluorocarbon-free or low-GWP equipment was introduced this fiscal year, equipment using fluorocarbons was properly managed.	○	• Fluorocarbons: Manage equipment using fluorocarbons responsibly, and promote the introduction of fluorocarbon-free or low-GWP equipment.

The underlined targets are long-term targets for FY2030 and FY2050.

*1 Since we obtained SBTi certification in June 2021, the FY2024 and FY2030 targets were modified to aim for science-based targets.

*2 GWP: Global Warming Potential

Results

AMR

Approach to AMR

AMR (antimicrobial resistance) refers to the phenomena in which pathogenic microorganisms, such as bacteria, acquire drug resistance to antimicrobials and become immune to them. AMR is believed to be principally caused by inappropriate or excessive administration of antimicrobials. It is also attributed to release from antimicrobial-manufacturing plants as another factor. Therefore, taking action from various aspects is essential for effective AMR control.

The SHIONOGI Group has provided antimicrobials to society for many years. As a natural responsibility of a company that handles antimicrobials, we strictly control the release of antimicrobials into the environment during the manufacturing process. Since AMR is a global threat, it is necessary to manage the release of antimicrobials not only within the Company but also throughout the entire supply chain.

Medium- and long-term targets and response

To reduce the environmental impact of antimicrobials during the manufacturing process, the SHIONOGI Group plans to achieve proper management of the release of antimicrobials into the environment throughout the supply chain by 2030 through audits of and feedback from its plants and suppliers. To this end, we aim to maintain and improve the antimicrobial management system at our plants and to complete the first AMR audits of all related suppliers by FY2024.

AMR audits have so far been conducted based on the Common Antibiotic Manufacturing Framework ("Framework")*1 stipulated by the AMR Industry Alliance.*2 However, in response to the issuance of the Antibiotic Manufacturing Standard*3 in June 2022, we will control and manage the release of antimicrobials into the environment based on this standard.

SHIONOGI's medium- and long-term AMR control targets

FY2020	FY2024	FY2030
Maintain the management system at the Kanegasaki Plant. **Complete audits of 50% of relevant suppliers.**	**Maintain the management system at the Kanegasaki Plant.** **Complete audits of 100% of relevant suppliers.**	**Responsible management in practice, including the supply chain (complete post-audit follow-up).**

*1 Common Antibiotic Manufacturing Framework (External website)

https://www.amrindustryalliance.org/wp-content/uploads/2018/02/AMR_Industry_Alliance_Manufacturing_Framework.pdf

*2 AMR Industry Alliance
Shionogi signed the AMR Industry Roadmap with 12 other leading companies and organizations at the World Economic Forum in Davos held in September 2016, thereby taking the lead in fighting AMR. The signatory companies and organizations commit themselves to the strict management of antimicrobial release both by themselves and throughout their supply chains, through such measures as specifying their release management techniques in the form of a roadmap to be offered to all antimicrobial manufacturers so that they will also join in this worldwide effort to combat AMR. This movement has now developed into a major campaign called the "AMR Industry Alliance," involving an increasing number of companies handling antimicrobials.

Joint declaration at the World Economic Forum in Davos (External website)

https://www.ifpma.org/wp-content/uploads/2018/06/Roadmap-for-Progress-on-AMR-FINAL.pdf

*3 Antibiotic Manufacturing Standard (External website)

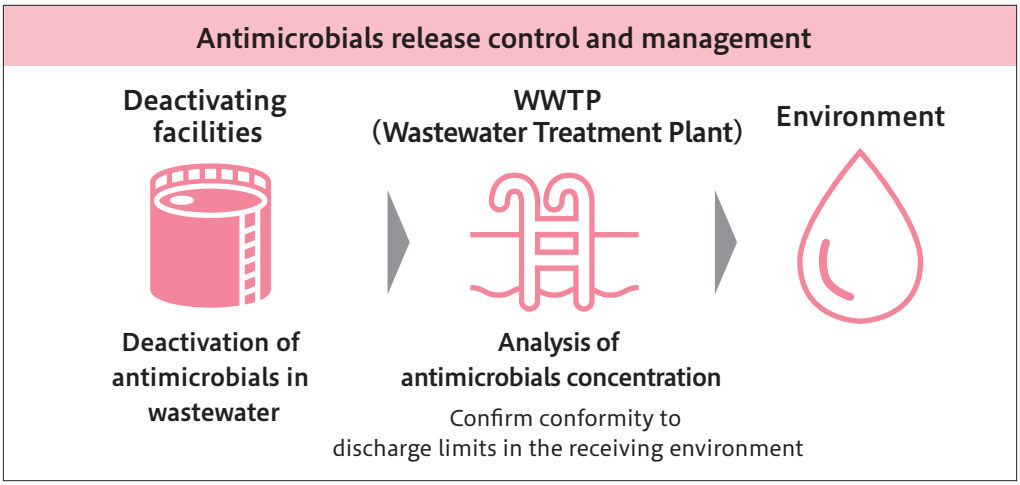
https://www.amrindustryalliance.org/wp-content/uploads/2022/06/AMRIA_Antibiotic-Manufacturing-Standard_June2022.pdf

AMR Benchmark*1 2021

The SHIONOGI Group has been selected for AMR Benchmark 2021 in recognition of its excellent overall AMR control activities. In the manufacturing category, in particular, the SHIONOGI Group obtained 93, the highest score.

*1 AMR Benchmark is the world's first report in which companies' AMR control efforts are analyzed and evaluated by the NGO Access to Medicine Foundation, based in the Netherlands.
See this website for details. (External website)
https://accesstomedicinefoundation.org/resource/2021-antimicrobial-resistance-benchmark

Antimicrobials release control and management



SHIONOGI Group

Kanegasaki Plant*2 Audit: 2018 2019	All antimicrobial products (five) Conformity to discharge limits in the receiving environment was confirmed.
Tokushima Plant*2 Audit: 2021	One product EHS audit confirms compliance with wastewater limits. (AMR audit scheduled for FY2022)

Suppliers

In Japan Audit: 2018	The status of conformity was checked at four companies. ▶ Conformity was confirmed at three companies. ▶ Remedial measures are currently being implemented at one company.
Outside Japan Audit: 2019	The status of conformity was checked at two company. ▶ Remedial measures are currently being implemented at one company. Confirmation of conformity will be continued in the future.

*2 The Kanegasaki Plant and the Tokushima Plant are the only sites that manufacture antimicrobials within the SHIONOGI Group.

The SHIONOGI Group controls and manages the release of antimicrobials in compliance with the Framework stipulated by the AMR Industry Alliance and conducts audits of all antimicrobial-manufacturing plants of the SHIONOGI Group as well as all of its suppliers in Japan. Since FY2019, we have conducted audits of our suppliers outside Japan (see tables 1 and 2).

As an antimicrobial release control and management initiative at the Kanegasaki Plant, a SHIONOGI Group's flagship plant that manufactures antimicrobials, antimicrobials contained in wastewater are deactivated in each manufacturing building before the wastewater is discharged outside via in-house treatment facilities. According to the Framework, we analyze the concentration of antimicrobials in actual wastewater from the plant to confirm whether the wastewater is harmless when discharged into the natural environment. Recently, it has been confirmed that wastewater from the manufacturing process of all five items at the Kanegasaki Plant complies with the discharge limits in the receiving environment.*3 Solid waste materials, generated from antimicrobial manufacturing at the Kanegasaki Plant, are entirely entrusted to an external service provider (Eco-system Akita Co., Ltd.) for disposal by incineration, with no antimicrobial release into the environment via solid waste materials.

As for suppliers, we have confirmed that three of the four drug products, whose manufacturing is commissioned to four suppliers in Japan (one drug product per supplier), conform to the discharge limits in the receiving environment. For the remaining drug product for which conformity has not been confirmed, we are currently taking corrective measures. We also commission the manufacturing of two types of active pharmaceutical ingredients (APIs) to three suppliers outside Japan, and we have confirmed that two of them comply with the discharge limits in the receiving environment. For the remaining supplier for which compliance with the discharge limits in the receiving environment has not been confirmed, we continue to conduct surveillance and take necessary remedial measures. Although we were unable to make progress with our audit plans in FY2020 and FY2021 as a result of travel restrictions due to the COVID-19 pandemic, we intend to conduct audits of our suppliers with regard to compliance with the discharge limits in the receiving environment, each year choosing approximately two to three suppliers within Japan and one to two suppliers outside Japan.

*3 As discharge limits in the receiving environment, the SHIONOGI Group adopts "Predicted No-Effect Concentrations (PNECs)" mentioned in the document*4 published by the AMR Industry Alliance or the action limit (0.01 μg/L) stated in the European Medicines Agency (EMA)*5 Guidelines.
*4 Science - based Targets for Antibiotics in Receiving Waters from Pharmaceutical Manufacturing Operations (External website)
https://setac.onlinelibrary.wiley.com/doi/pdf/10.1002/ieam.4141
*5 EMA: European Medicines Agency

Discharge limits in the receiving environment for active pharmaceutical ingredients (APIs)*6 of antimicrobials handled by the SHIONOGI Group and audited items (those in color have been audited by FY2021)*7

APIs of antimicrobials handled by SHIONOGI	Discharge limits in the receiving environment (μg/L)	SHIONOGI Group		Suppliers	
		Drug products	APIs	Drug products	APIs
Flomoxef	0.01	○	○	Company A	
Cefcapene pivoxil hydrochloride	0.01	○	○		
Latamoxef	0.01	○	○		
Doripenem	0.11	○	○	Company B	
Cefiderocol	0.01	○	○		
Sulfamethoxazole/trimethoprim	0.60/0.50			Company C	Company F, Company G
Metronidazole	0.13			Company D	Company H

Companies F, G, and H: Suppliers outside Japan. An audit is scheduled in the future for Company G, which has not yet been audited.
*6 Although contract manufacturing products are not listed, they conform to discharge limits in the receiving environment.
*7 Due to the transfer of vancomycin hydrochloride operations in April 2020, the relevant suppliers (Companies E and I) were excluded from the audits.

Supplier auditing results (by FY2021)

Supplier	Country of location	Management system	Wastewater management	Solid waste material management	Conformity to discharge limits
Company A	Japan	○	○	○	○
Company B	Japan	○	○	○	○
Company C	Japan	○	○	○	○
Company D	Japan	△	○	○	△
Company F	India	○	○	△	○
Company H	Italy	○	○	○	○

○: Conforming to the criteria of the Common Antibiotic Manufacturing Framework
△: Conforming to the criteria of the Common Antibiotic Manufacturing Framework, except in a small number of aspects; remedial measures being implemented
×: Not fully conforming to the criteria of the Common Antibiotic Manufacturing Framework; remedial measures being implemented

Climate Change

Approach to climate change

In October 2020, the Japanese government declared its goal to achieve carbon neutrality by 2050. With this as a starting point, the movement toward decarbonization is accelerating in Japan. Companies are required to incorporate environmental factors, such as climate change, into their business strategies, aiming for decarbonization. This is essential for companies to contribute to the achievement of the SDGs and continue to grow together with society. The SHIONOGI Group has built a company-wide governance system to respond to climate change and works to assess and reduce climate change risks.

Support for the TCFD recommendations and participation in the TCFD Consortium

Institutional investors and financial institutions engaged in ESG investment and financing are showing growing interest in companies that recognize the risks and opportunities of climate change and take countermeasures. The importance of doing so is also mentioned in the TCFD recommendations. In addition, the Corporate Governance Code, revised in June 2021, requires companies listed on the Prime Market of the Tokyo Stock Exchange to disclose climate-related information in accordance with the TCFD or equivalent framework. Thus, it has become increasingly important to disclose information related to climate change.

In March 2022, the SHIONOGI Group announced its support for the TCFD recommendations and participated in the TCFD Consortium, in which companies and financial institutions in Japan that support the TCFD recommendations work together to promote initiatives related to climate-related information disclosure. With the aim of disclosing the information by the end of FY2022, the Corporate Planning Department, the Procurement Section, the Sustainability Management Department, and other related organizations are working together to conduct a detailed assessment of the impact of climate change on the SHIONOGI Group's business with reference to the TCFD framework and to consider strategies and specific countermeasures against climate change. By continuing to focus on addressing climate change issues, we will increase the resilience of the SHIONOGI Group. We will also meet the demands of society by disclosing climate-related information appropriately.

Press release on April 11, 2022: Shionogi expresses its support for the recommendations of Task Force on Climate-related Financial Disclosures (TCFD) and its participation in the TCFD Consortium

https://www.shionogi.com/global/en/news/2022/04/e20220411.html

Governance

The SHIONOGI Group has established the SHIONOGI Group Companywide EHS Committee as an organization that deliberates on important EHS subjects for eventual decision making, such as environmental policies, medium- and long-term targets, performance reviews, identification of environmental challenges, and environmental risk assessment. The Energy Conservation Committee is more narrowly specialized in issues relating to climate change and energy conservation. The Corporate Executive Management Meeting deliberates on risks and opportunities relating to climate change, before the Board of Directors makes final decisions about them.

Strategies

The SHIONOGI Group views global warming and other climate change-related issues as management challenges that it should tackle in earnest and incorporates its understanding of climate change risks and opportunities into its business strategies. Using the scenarios of RCP*1 2.6 and RCP8.5 of the IPCC*2 Fifth Assessment Report (AR5) as a reference, we measure the financial impact of climate change risks and assess the SHIONOGI Group's resilience.

*1 RCP: Representative Concentration Pathways
*2 IPCC: Intergovernmental Panel on Climate Change

Summary of climate change risk and opportunity assessment

	Description	Financial impact	Probability of occurrence	Remarks
Transition risk (regulatory reinforcement)	Additional investment for energy conservation	Medium (capital investment)	Intermediate	Assuming the tightening of laws and regulations to the level of the SBT*3 criteria
Physical risk (extreme meteorological phenomena)	Discontinued operation due to damage to plants	Large (discontinued operation)	Low	Assuming damage to plants due to an extreme meteorological phenomenon equivalent to the July 2018 torrential downpours
Physical risk (extreme meteorological phenomena)	Discontinued operation due to damage to the supply chain	Large (discontinued operation)	Low	Assuming an increase in extreme meteorological phenomena in Asia affecting the supply chain
Opportunity (improved external assessment)	Increased investment by investors	Medium (investment opportunity)	Intermediate	Assuming improvement in ESG assessment resulting from active information disclosure via Integrated/Environment Reports
Opportunity (energy cost reduction)	Reduced electricity and fuel costs through further energy conservation	Medium (lower operating costs)	Intermediate	Assuming power and fuel consumption upon attaining conformity to the SBT criteria
Opportunity (new market entry)	Profit increase from climate change-related drug discovery	Medium (profit)	Low	Assuming a change in the market for tropical infectious disease (malaria) drugs

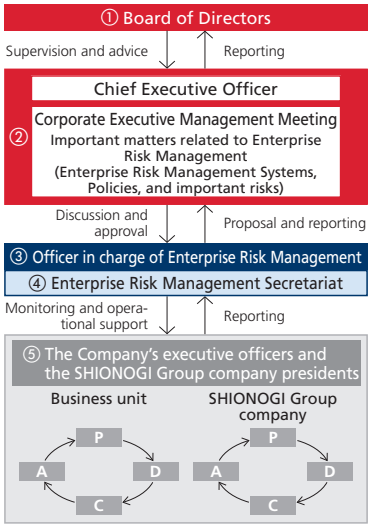
*3 SBT: Science Based Target, that is, CO_2 emissions reduction target based on scientific data

■ Risk management

The SHIONOGI Group's risk management is systematized in the following manner: Climate change risks for each operating site and Group company, which are identified from the agenda (setting targets for climate change-related issues, checking progress in achieving the targets, assessing compliance with laws and regulations, etc.) of the SHIONOGI Group Companywide EHS Committee and the Energy Conservation Committee, are reported to the Enterprise Risk Management Group. Important risks that may affect management and policies to respond to them are determined through deliberation by the Corporate Executive Management Meeting and the Board of Directors. The importance of the identified risks is determined by assessing the timing of emergence, the probability of occurrence, and the financial impact when a risk becomes apparent. We take appropriate measures according to the level of the risks while allocating management resources in descending order of priority. Thus, we are working to reduce climate change impacts.

■ Enterprise Risk Management (ERM) System

■ Risk management structure



- Centralized management of the SHIONOGI Group risks
- Ascertaining status of action against important risks
- Annual reporting
- Proposals of candidate important risks, allocation of management resources, etc.

Management of risks in business execution

	Role	
①	Board of Directors	Provides supervision, advice, etc. on the planning, progress, and results of ERM promotion activities
②	Chief Executive Officer, Corporate Executive Meeting	The Corporate Executive Meeting, chaired by the Representative Director, President discusses important matters concerning SHIONOGI's ERM, which are approved by the Representative Director, President
③	Officer in charge of Enterprise Risk Management	The Corporate Supervisor is Chief Risk Management Officer (CRO), overseeing SHIONOGI's risk management and assuming responsibility for the promotion and operation of the ERM system.
④	Enterprise Risk Management Secretariat	The enterprise risk management secretariat consists of the Sustainability Management Department, the General Administration Department, and the Corporate Planning Department.
⑤	The Company's executive officers and the SHIONOGI Group company presidents	Each business unit and Group company is responsible for the execution of risk management in the execution of its operations

See the section "Risk Management" for more information on enterprise risk management.
https://www.shionogi.com/global/en/sustainability/governance/risk-management.html

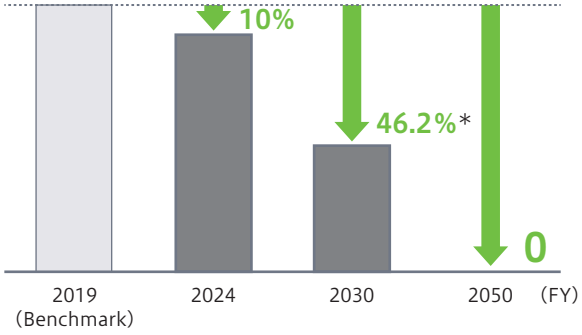
Targets and results

In response to the Japanese government's declaration of "Carbon Neutrality by 2050" and the worldwide movement toward GHG emissions reduction, SHIONOGI set science-based targets (SBTs) as the 2030 GHG emissions reduction targets, aiming to achieve carbon neutrality by 2050, and obtained approval from the SBTi in June 2021. To achieve our FY2030 targets, we will work to reduce CO_2 emissions by gradually introducing electricity derived from renewable energy mainly to the SHIONOGI Group's major sites, such as plants and research laboratories. We also aim to improve energy intensity by 1% per year and introduce equipment with high energy consumption efficiency. In addition to promoting the introduction of highly energy-efficient equipment, we continuously review our operational modes to reduce energy consumption.

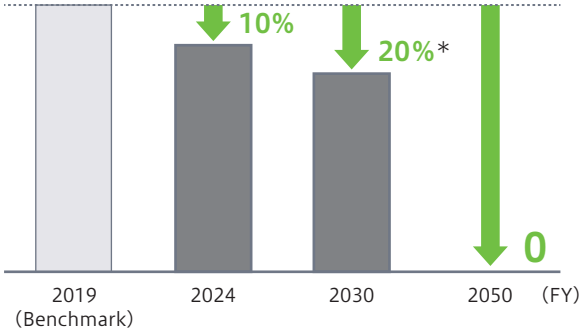
Medium- and long-term targets

【Medium- and long-term CO_2 emissions targets】

Company's emissions (Scopes 1+2)

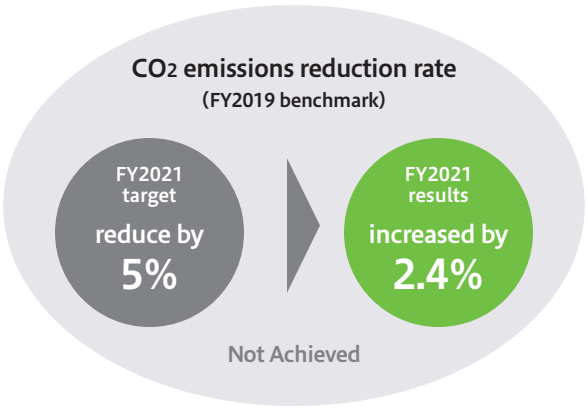


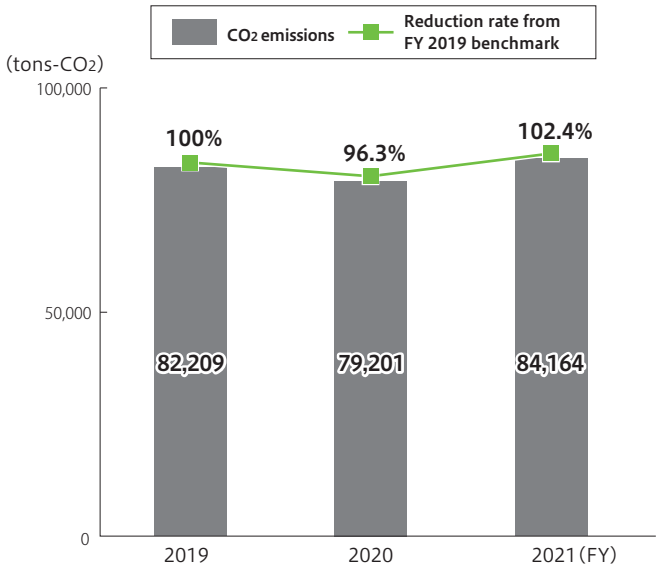
Supply chain emissions (Scope3 Category 1)



* Target approved by the SBTi

FY2021 target and result





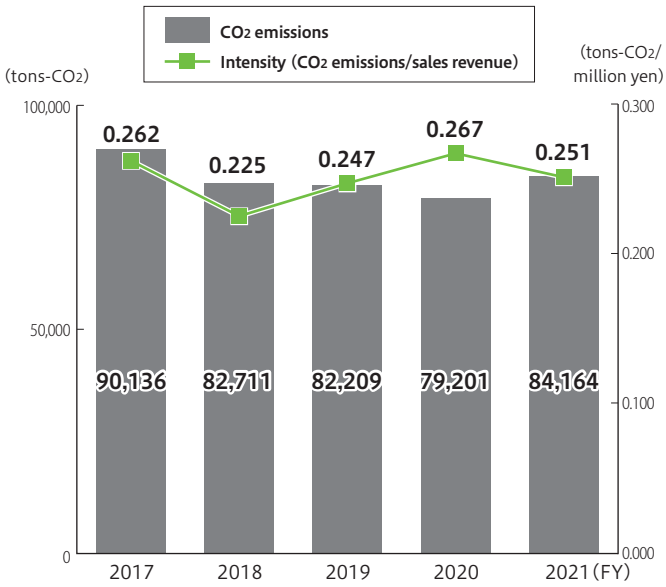
Emissions from UMN Pharma, Inc. and Nagase Medicals Co., Ltd. (currently Shionogi Pharma Co., Ltd., Itami Plant), which constitute the boundary for SBT targets, included as of FY2019

CO_2 emissions / Energy consumption

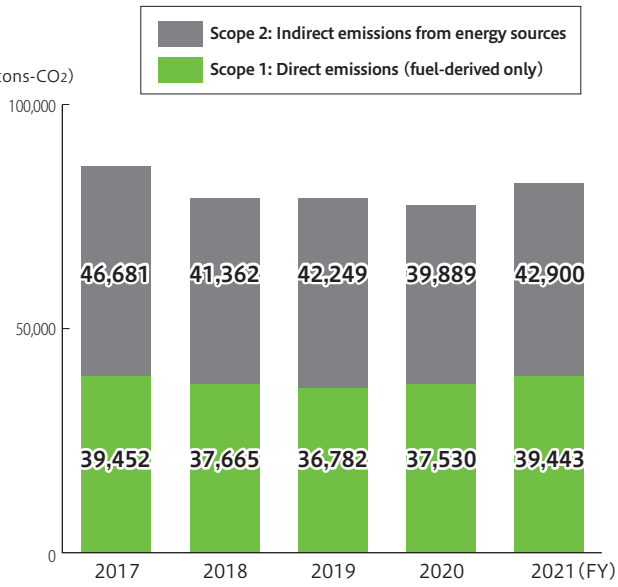
To achieve our FY2030 targets, we have completed the introduction of electricity derived from renewable energy to the head office building in FY2021 and to the Aburahi Research Center in FY2022 based on a plan to switch to renewable energy-derived electricity for the SHIONOGI Group's major sites.

Meanwhile, in FY2021, we were unable to achieve our FY2021 targets due to an increase in CO_2 emissions and energy consumption because we not only actively worked on COVID-19-related research and development, but also implemented the advanced manufacturing of COVID-19 therapeutic drugs with the aim of promptly supplying them after approval. We will continue to consider and implement further measures to reduce CO_2 emissions, including the active introduction of renewable energy-derived electricity, in order to achieve our SBTs.

CO_2 emissions and intensity



CO_2 emissions by Scope

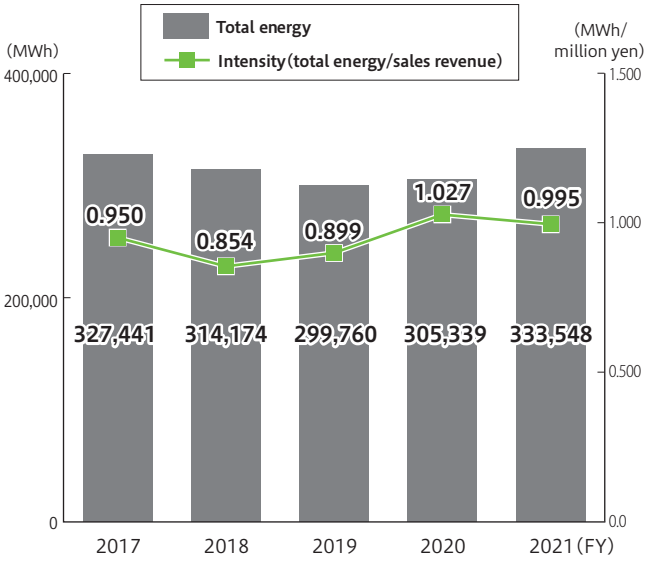


Calculated based on the International Financial Reporting Standards (IFRS) from FY2018

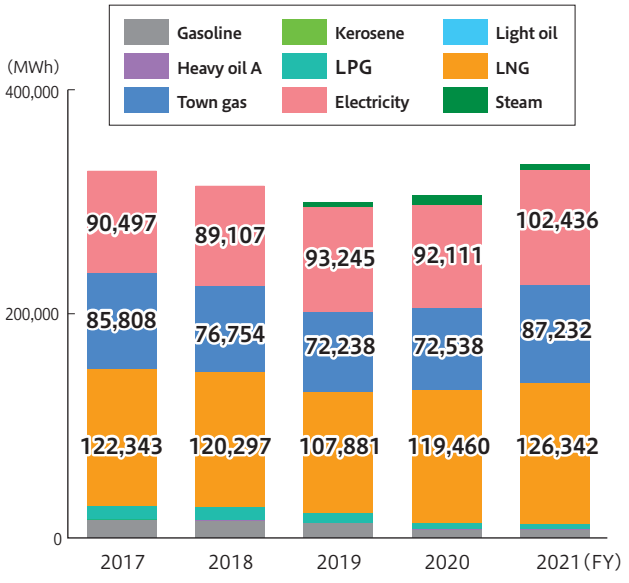
Emissions from UMN Pharma, Inc. and Nagase Medicals Co., Ltd. (currently Shionogi Pharma Co., Ltd., Itami Plant), which constitute the boundary for SBT targets, included as of FY2019

Energy consumption

Total energy and intensity



Consumption by energy



Calculated based on the International Financial Reporting Standards (IFRS) from FY2018

■ Scope 3 (GHG emissions throughout the supply chain)

Scope 3 emissions of the SHIONOGI Group account for about 60% of total emissions. It is essential to work with suppliers to reduce CO_2 emissions throughout the supply chain in order to achieve its SBTs.

The SHIONOGI Group also participated in the Fiscal Year 2021 Model Project for Supporting Achievement of the Decarbonization Targets of the Entire Supply Chain, which is a project of the Ministry of the Environment aimed at helping companies achieve their GHG emissions reduction targets for the entire supply chain, and formulated measures to reduce CO_2 emissions throughout the supply chain. We have built a collaborative system, including Group companies, to promote supplier engagement, and have implemented the supply chain engagement process*1 formulated in this project to achieve our SBTs.

As of June 2022, we have conducted supplier engagement activities for our top 21 suppliers by purchase amount, including checking the status of their efforts to reduce CO_2 emissions and holding briefing sessions to promote their understanding of the SHIONOGI Group's policy on climate change. In the future, we will select important suppliers for CO_2 emissions reduction to ask them to reduce their CO_2 emissions and support their efforts on a priority basis.

Supplier engagement implementation process

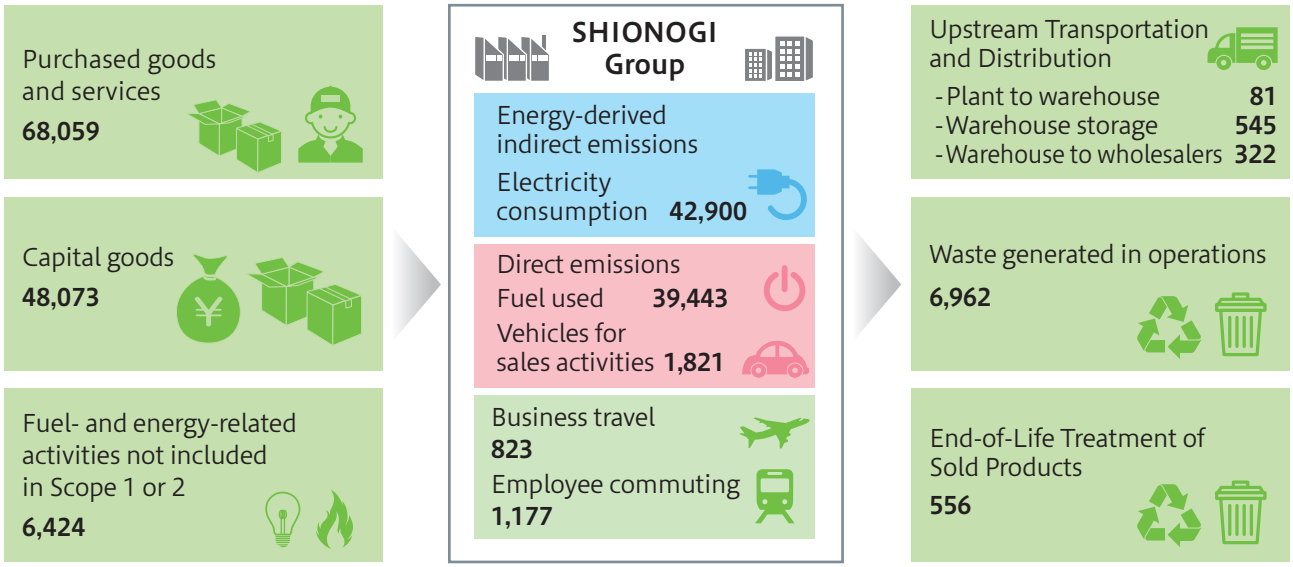
STEP1
Understand suppliers' CO_2 emissions and the current status of their reduction efforts (the setting of reduction targets, implementation of reduction activities, etc.) through interviews, etc.

STEP2
Hold briefing sessions to share the SHIONOGI Group's policies and useful information for CO_2 reduction.

STEP3
Conduct individual negotiations with important suppliers (CO_2 emissions reduction request, individual support).

*1 See the link below for more information on the supplier engagement process created under this project.
Guidebook for Formulating a GHG Emissions Reduction Plan to Achieve the SBTs (Japanese version only) (External website)
https://www.env.go.jp/earth/datsutansokeiei_mat02_20220418.pdf

(Unit: tons-CO_2)



Scope1 : Direct emissions from the company's fuel use and industrial processes
Scope2 : Indirect emissions accompanying the consumption of electricity and thermal energy purchased by the company
Scope3 : Indirect emissions from the supply chain other than those under Scope 1 or 2

(Unit: tons-CO_2)

	Category	FY2019 results	FY2020 results	FY2021 results	Calculation methods (based on the Guidelines)
Scope1	Direct emissions Fuel used	34,340	35,755	39,443	Amount of fuel used as defined under the Energy Conservation Act
	Vehicles for sales activities	3,178	1,782	1,821	Amount of fuel used for vehicles for sales activities
Scope2	Energy-derived indirect emissions	39,421	37,802	42,900	Amount of electricity purchased as defined under the Energy Conservation Act
Scope3	Purchased goods and services	98,894	86,432	68,059	Purchase price of raw materials and merchandise purchased
	Capital goods	29,343	17,449	48,073	Acquisition price of fixed assets newly acquired in the year
	Fuel- and energy-related activities not included in Scope 1 or 2	5,732	5,710	6,424	Amount of electricity purchased
	Upstream Transportation and Distribution				・Upstream Transportation and Distribution of raw materials not included ・Downstream transportation and delivery of products (weight and distance)
	-Plant to warehouse	98	96	81	-Plant to warehouse
	-Warehouse storage	574	512	545	-Warehouse storage
	-Warehouse to wholesalers	377	348	322	-Warehouse to wholesalers
	Waste generated in operations	3,905	5,468	6,962	Weight of waste materials classified by type
	Business travel	814	820	823	Number of employees
	Employee commuting	1,398	1,449	1,177	Travel expenses calculated for each means of transportation
	End-of-Life Treatment of Sold Products	540	507	556	Amount used by type as classified under the Containers and Packaging Recycling Act

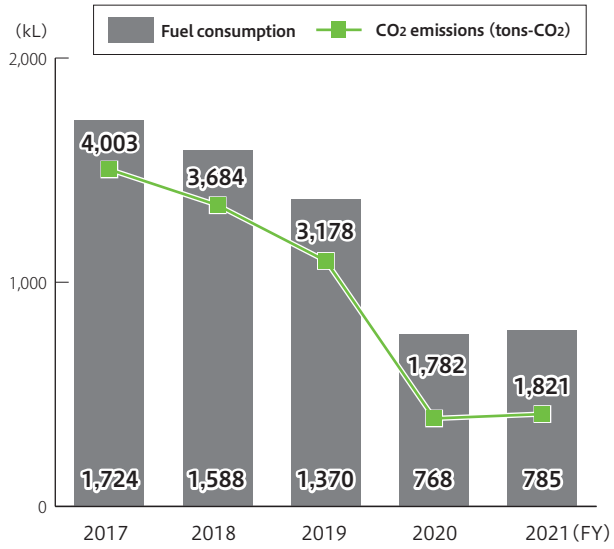
The calculation methods are as indicated in the "Basic Guidelines on Accounting for Greenhouse Gas Emissions Throughout the Supply Chain (Ver. 2.3)" of the Ministry of the Environment and the Ministry of Economy, Trade and Industry of Japan.
In FY2018, the calculations only concerned Shionogi & Co., Ltd.

Vehicles for sales activities

Shionogi is striving to reduce CO_2 and exhaust gas emissions by improving fuel efficiency through promoting the introduction of more fuel-efficient hybrid vehicles (HVs) to be rented for our medical representatives (MRs). All vehicles for use by our MRs in Japan are now HVs, except in the colder regions. Starting from 2020, we are gradually introducing HVs also in the colder regions toward complete replacement by 2024.

In FY2021, continuing on from FY2020, fuel consumption decreased due to the effect of curbing face-to-face medical information provision activities and shifting to online activities in association with the spread of the COVID-19 pandemic.

Fuel consumption by and CO_2 emissions from vehicles for sales activities



Fluorocarbons

In compliance with the Act on Rational Use and Proper Management of Fluorocarbons, the SHIONOGI Group identifies the relevant refrigeration, air-conditioning, and other types of applicable equipment that it possesses and operates, carries out simplified and periodic inspections, keeps related records, and calculates the amount of leakage. In FY2021, the SHIONOGI Groups calculated fluorocarbons leakage was 355 tons-CO_2. In compliance with the Kigali Amendment to the Montreal Protocol,*1 we are promoting a switch to fluorocarbon-free or low-GWP*2 equipment at the time of renewal.

*1 The Montreal Protocol on Substances that Deplete the Ozone Layer, based on the Vienna Convention for the Protection of the Ozone Layer, restricts substances likely to destroy the ozone layer, namely chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs). The Kigali Amendment to the Montreal Protocol includes the restriction of production and consumption of hydrofluorocarbons (HFCs), a non-ozone-depleting fluorocarbon alternative with a high greenhouse effect.

*2 GWP: Global Warming Potential

Carbon pricing

Internal carbon pricing will be applied to our medium- and long-term CO_2 emissions reduction plans and used as criteria for investment decision making.

Support for the messages from the Japan Climate Initiative (JCI)

The Japan Climate Initiative (JCI) is a network aimed at realizing a decarbonized society by enhancing information dissemination from and exchange of views between companies, local governments, and NGOs that are actively involved in climate change initiatives in Japan. The SHIONOGI Group participated in the JCI in April 2021. As a member company, SHIONOGI expressed its support for the messages published by the JCI to the Japanese government in April 2021 and June 2022.

"Now is the time to accelerate renewable energy deployment:
Calling for stronger climate change action in the midst of the fossil energy crisis" (External website)

https://japanclimate.org/english/news-topics/jci-message-re-release/

The SHIONOGI Group has set its SBTs as medium- and long-term targets and is working daily to reduce CO_2 emissions. Believing that expanding access to renewable energy will be an effective means of achieving the targets, we strongly support the JCI messages.

■ Participation in a panel session held as part of the Japan Climate Action Summit（JCAS）2021

In October 2021, the Head of the Sustainability Management Department participated in Panel Session 2, titled “New challenges of addressing the climate crisis,” at the Japan Climate Action Summit（JCAS）, which was hosted by the Japan Climate Initiative（JCI）.

Today, the distribution of infectious diseases in tropical regions has expanded with climate change. As a representative of a leading company in the field of infectious diseases that has set “Protect people worldwide from the threat of infectious diseases” as one of its material issues（materiality）, she introduced how preparing for the next pandemic would also serve as an adaptation strategy for climate change. She also explained our medium- and long-term targets for reducing GHG emissions and the acquisition of approval from the SBTi for the targets.

“Japan Climate Action Summit 2021” | Japan Climate Initiative – JCI（External website）

https://japanclimate.org/english/news-topics/jcas2021/

■ SHIONOGI’s efforts against AMR, which could spread further due to climate change

The SHIONOGI Group’s efforts against AMR（antimicrobial resistance）is presented on the website “Climate Change Adaptation Information Platform（A-PLAT）” operated by the National Institute for Environmental Studies, Japan.

Shionogi & Co., Ltd. | Examples of adaptation business | Adaptation for Private Sector | Climate Change Adaptation Information Platform（A-PLAT）(nies.go.jp)（External website）

https://adaptation-platform.nies.go.jp/en/private_sector/database/opportunities/report_057.html

Resource Conservation and Circulation

Approach to resource conservation and circulation

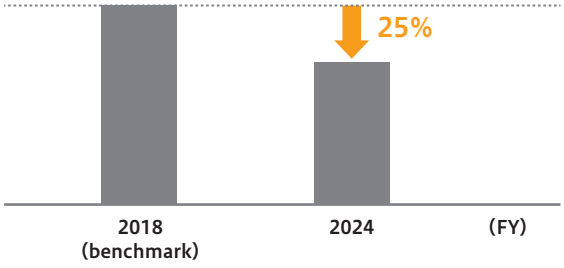
The problem of environmental pollution has been growing on a global scale. A report by the World Economic Forum stated that by 2050 there could be more plastic in the ocean than fish by weight. Under these circumstances, companies are strongly required to address the issue of plastic waste. The SHIONOGI Group promotes the reduction, reuse, and recycling of waste in corporate activities.

We also work to ensure the responsible disposal of plastics and implement measures to reduce the amount of plastics used in product manufacturing processes and packaging. In addition to modifying container and packaging materials and reducing the volume of containers and packaging (“reduce”), we promote a switch to biomass plastics with less environmental impact and the adoption of high-quality recycled plastics (“reuse/recycling”) while considering product quality and stable supply.

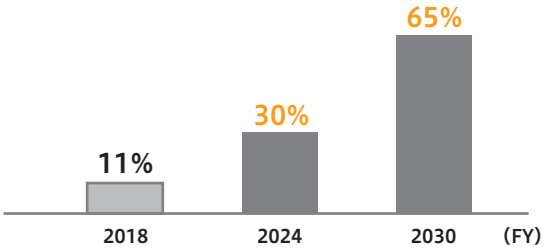
Targets and results

Medium- and long-term targets

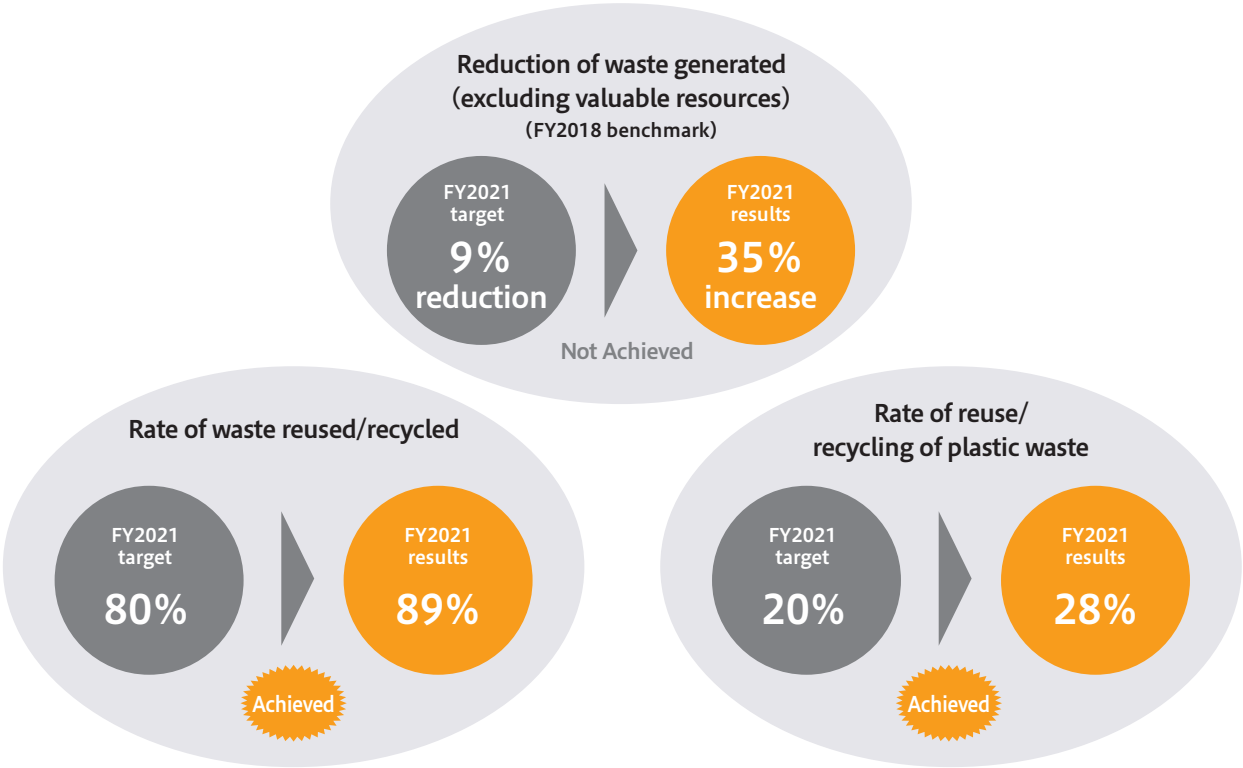
Amount generated (excluding valuable resources)



Rate of reuse/ recycling of plastic waste



FY2021 target and result

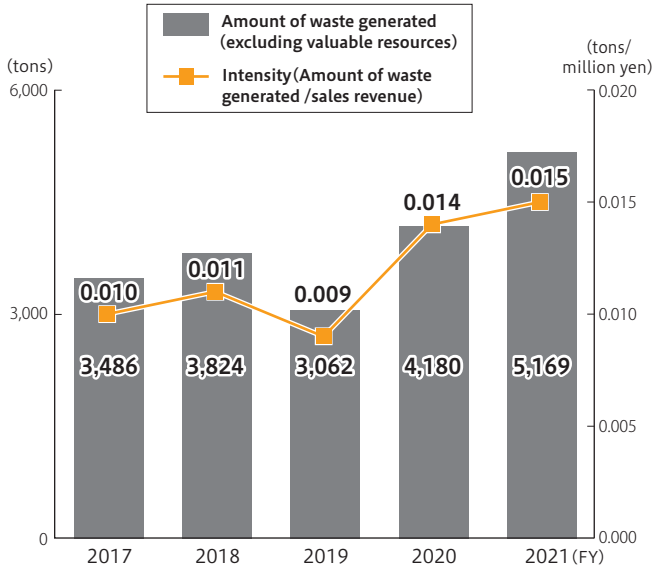


Waste generation, reuse and recycling, and disposal by landfill

As part of its voluntary action plan to realize a reuse- and recycling-oriented society, the Federation of Pharmaceutical Manufacturers' Associations of Japan (FPMAJ) has adopted the goals of reducing the amount of industrial waste disposed of as landfill by about 75% from the FY2000 level by FY2025, of reusing or recycling at least 60% of waste by FY2025, and of reusing or recycling at least 65% of plastic waste by FY2030. As an FPMAJ member, the SHIONOGI Group has also set the same or higher level targets for waste reduction, reuse, and recycling. The SHIONOGI Group obtains its rate of reuse and recycling by taking the amount of waste sold plus the amount reused/recycled and dividing it by the amount of waste generated. The landfill rate is defined as the amount disposed of as landfill divided by the amount of waste generated.

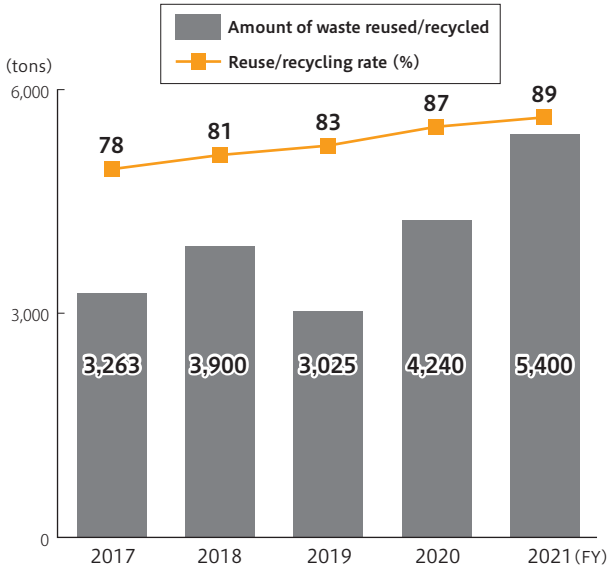
In FY2021, we were unable to achieve the fiscal year target for the amount of waste generated due to an increase in production activities, such as the advanced manufacturing of COVID-19 therapeutic drugs with the aim of promptly supplying them after approval. Waste materials generated within the SHIONOGI Group mainly include waste oils resulting from the various manufacturing processes, sludge from wastewater treatment, and plastics used in product containers. We will work to achieve our medium- and long-term targets by continuing to promote various measures, such as improving the manufacturing processes, selling waste liquids, plastics, and metals, and reducing the amount of waste liquids generated.

Amount of waste generated and intensity

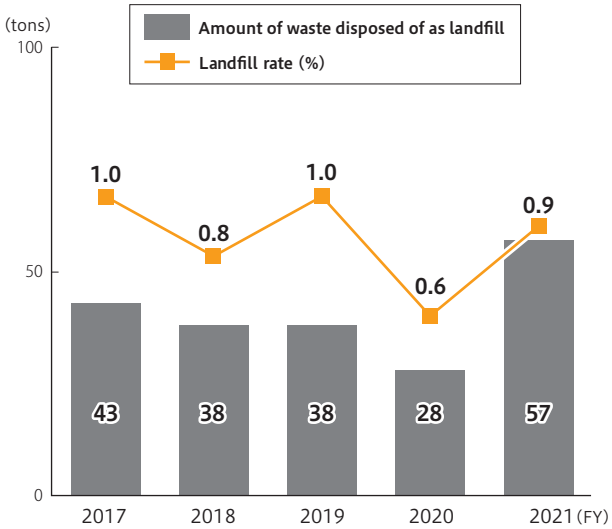


Calculated based on the International Financial Reporting Standards (IFRS) from FY2018

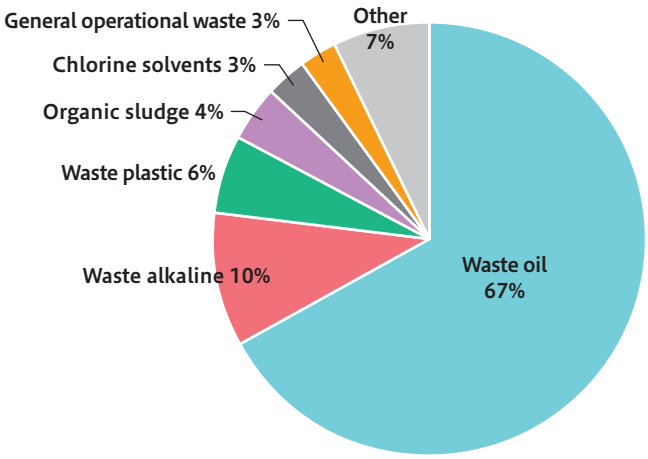
Amount and rate of waste reused/recycled



Waste disposed of as landfill and landfill rate



Amount of waste generated (excluding valuable resources) by type (FY2021results)



Reuse and recycling of product containers and packaging materials

In compliance with the Containers and Packaging Recycling Act, a certain portion of the containers and packaging materials used for the products we sell are reused and recycled. We are also striving to reduce our environmental impact by modifying container materials and packaging forms while making sure to maintain and improve product quality.

Containers and packaging materials used and amount consigned for reuse/recycling (FY2021 results) (tons)

	Containers and packaging materials used	Amount consigned for reuse/recycling
Plastic	51.5	12.8
Paper	56.5	1.4
Glass (transparent)	38.3	12.7
Glass (brown)	0	0

Reuse/recycling consignment fee: 764 thousand yen

Strategies for controlling plastic waste

3R (Reduce, Reuse, and Recycle) + Renewable initiative concerning containers and packaging materials

As a result of the following efforts in FY2021, we reduced the amount of plastic used by 2.2 tons compared to the conventional methods.

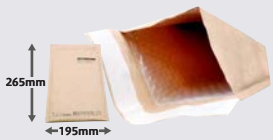
Measures	Item	Products concerned
Reduce	Change of packaging materials used for the delivery of products by mail order (from plastic to paper)	All healthcare goods through Shionogi Healthcare mail order service
	Change of material for trays (from plastic to paper)	All drugs provided in ampoules, vials, and tubes
	Change of thickness of eye drop containers (made thinner)	All eye drops
	Change of thickness of PTP packaging materials (made thinner)	*Flomox*, etc.
	Discontinuation of use of plastic cushioning materials for bottles	*Irbetan*, etc.
Reuse Recycle	Inscription of plastic container/packaging material identification marks	All products
	Adoption of mechanically recycled PET film	*Intuniv*
Renewable	Adoption of biomass bottles (plant-derived polyethylene bottles)	*Cymbalta*, *Irbetan*, *Pirespa*, *Cinal EX Pro* chewable tablets

Initiative by Shionogi Healthcare Co., Ltd.

For its mail order service “Shionogi Healthcare ONLINE,” Shionogi Healthcare Co., Ltd. has changed all of the plastic materials used for product delivery to paper-based packaging since FY2019. Through this initiative, we have realized packaging that is not only environmentally friendly but also helps eliminate the need for customers to separate waste.

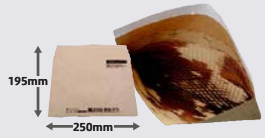
Change 1

Conventional padded envelopes



We used to use envelopes padded with protective plastic bubble wrap.

Paper padded envelopes



We replaced plastic bubble wrap with corrugated paper padding.

Change 2

Air bubble bags

We used to put goods in plastic air bubble bags.

Corrugated cardboard boxes

We replaced air bubble bags with cardboard boxes with corrugated sides.

Change 3

Air cushions

We used to use plastic air cushions.

Recycled paper

We replaced plastic air cushions with recycled paper fillers.

Mechanically recycled PET film

The SHIONOGI Group uses mechanically recycled PET (polyethylene terephthalate) film in the packaging (aluminum bags) of *Intuniv*.

Mechanically recycled PET film derives from used PET bottles that undergo several steps: selection, crushing, cleansing, and high-temperature decompression.

The replacement of virgin PET film in the outermost layer of the aluminum bags with mechanically recycled PET film results in reduced CO_2 emissions and fossil fuel conservation while maintaining the quality of the packaged products. This contributed to reducing CO_2 emissions by 0.01 tons compared to conventional film in FY2021. We are currently conducting a technical study to gradually expand the use of mechanically recycled PET film to other product packaging materials.

"FUROSHIKI" garbage bag made from 99% recycled materials

The SHIONOGI Group uses "FUROSHIKI," a garbage bag made from used stretch film as a raw material. Since FUROSHIKI is made using plastic used and discarded in Japan as a raw material, the use of FUROSHIKI contributes to the control of domestic waste generation.

See the website of K.K. Satisfactory for details. (Japanese version only) (External website)

https://www.sfinter.com/information/post-1891/

Biomass bottles

The SHIONOGI Group uses biomass bottles for *Cinal EX Pro* chewable tablets, *Cymbalta*, *Irbetan*, and *Pirespa*. Biomass bottles (plant-derived polyethylene bottles) are packaging containers made of polyethylene derived from materials left over from sugarcane processing. Renewable polyethylene derived from sugarcane accounts for more than 90% of the raw material of our biomass bottles, which conform to the standards established by the Japan BioPlastics Association for biomass plastic identification labeling. (The biomass plastic symbol mark is displayed on the product containers.)* By switching from conventional petroleum-derived polyethylene bottles to biomass bottles, we can reduce CO_2 emissions and conserve fossil fuel resources. This contributed to reducing CO_2 emissions by 2.7 tons compared to conventional bottles in FY2021. We are currently conducting a technical study to gradually expand the use of biomass polyethylene to other product packaging.

* Biomass plastic identification labeling: Biomass plastic products (biomass plastics) are those that contain organic (such as plant-derived) materials in excess of a specified percentage as their plastic component. The Japan BioPlastics Association certifies products that meet its criteria and permits the use of its symbol mark on them so that consumers can easily identify biomass plastics.

In-house reuse/recycling of resources

We collect organic solvents used during the manufacturing process of active pharmaceutical ingredients (APIs) at the Kanegasaki Plant, such as dichloromethane, ethyl acetate, and methanol, in-house for reuse, thereby effectively using resources and controlling waste generation.

Reduction of paper resources

The SHIONOGI Group's administrative offices, Shionogi Business Partner Co., Ltd., and the labor union of Shionogi & Co., Ltd. are working to conserve paper resources. For instance, in the bulk recruitment of policyholders for SHIONOGI's group insurance contracts conducted by Shionogi Business Partner, we have abolished the group insurance guide (approximately 70 pages) and various insurance application forms, which were distributed to approximately 5,000 SHIONOGI Group employees every year, and have shifted to online application. This has resulted in savings of about one ton of paper resources, and a reduction in tasks, such as the creation and shipping of the guide and application forms.

Prevention of illegal dumping

To prevent illegal dumping of industrial waste, the SHIONOGI Group takes great care in selecting business operators to whom we consign waste transportation and treatment/disposal, giving priority to those who are certified by the Ministry of the Environment's Excellent Industrial Waste Disposal Operator Certification System for their quality services. For other business operators, we verify the quality of their operation by checking their business licenses, treatment/disposal facilities, operational status, document management status, and implementation of emergency drills, using our contractor evaluation sheet. After selecting business operators, we ensure the appropriate management of contractual documents, licenses, and manifests (waste management sheets) and conduct at least one on-site inspection per year for each operator.

Clean-up activities

Environmental pollution caused by marine plastic waste has become a major global issue. Marine plastic waste can partly be traced back to plastic waste generated overland and carried into the sea by rain and wind via rivers. Employees at the SHIONOGI Group's respective operating sites participate in clean-ups along the surrounding roads and other such initiatives organized in the local communities. Thus, we are working to contribute to the beautification of local areas and raise employee awareness of the environment and resource circulation.

Cleanup activities around the plant

Water

Approach to water

Water is the source of life, which nurtures diverse ecosystems while circulating and interacting with the atmosphere, soil, oceans, and rivers on the earth, and is also an important resource indispensable for people's lives and economic activities. Water shortages, water pollution, and the rising risk of flooding, which are caused by global population growth, economic development, and climate change, have become social issues, raising concerns about their serious impact on ecosystems and people's lives.

For the SHIONOGI Group, water is an essential resource for business continuity. We have identified water risks and water resources as one of the environmental material issues. We not only assess the impact of water risks on our business and work to reduce them, but also promote appropriate management of the impact of our business activities on the environment.

Water risk assessment

Quality water is essential for the manufacturing of pharmaceutical products. Water depletion or flooding in the catchment areas where we operate can seriously impact our business continuity. Therefore, we have assessed the water risks facing each operating site engaged in manufacturing and research, using the internationally recognized WRI Aqueduct *1 and WWF Water Risk Filter,*2 so as to have a better understanding of the water supply necessary for present operations and future business continuity, clarify water risks such as the increased probability of floods, and draw up preventive measures.

In-house deliberations based on the risk assessment results and past experience and knowledge have led us to conclude that the SHIONOGI Group is exposed to relatively low water risks for the moment compared to other environmental risks. Meanwhile, the risk level of future water stress*3 has been on the rise. Accordingly, we will further reinforce our efforts to conserve water from the perspective of preventing water risks from materializing. We are considering consulting with experts on water risk assessment to prepare for future risks by gaining a better understanding of the water risks unique to the catchment area of each operating site and identifying water issues.

We have incorporated risk assessment based on the WRI Aqueduct into the selection of our suppliers to clarify and minimize their latent risks.

*1 Water risk assessment tool developed and published by the World Resources Institute (WRI)
Aqueduct | World Resources Institute (wri.org) (External website)
https://www.wri.org/aqueduct

*2 Water risk assessment tool developed and published by the World Wide Fund for Nature (WWF)
WWF Water Risk Filter (External website)
https://waterriskfilter.org/

*3 Condition of strained water supply and demand

WRI Aqueduct assessment results (baseline water stress)

Country (operating site location)	No. of operating sites	Risk level/Number of operating sites					Future water stress change
		High	High to medium	Medium	Medium to low	Low	
Japan (Iwate, Shiga, Osaka, Hyogo, Tokushima, Akita, and Yokohama)	9	–	1	–	7	1	Change to medium to very high levels by 2040
China (Jiangsu)	1	–	–	–	–	1	No major change until 2040

WWF Water Risk Filter assessment (baseline water stress)

Country (operating site location)	No. of operating sites	Risk level/Number of operating sites				
		High	High to medium	Medium	Medium to low	Low
Japan (Iwate, Shiga, Osaka, Hyogo, Tokushima, Akita, and Yokohama)	9	–	–	6	2	1
China (Jiangsu)	1	–	–	1	–	–

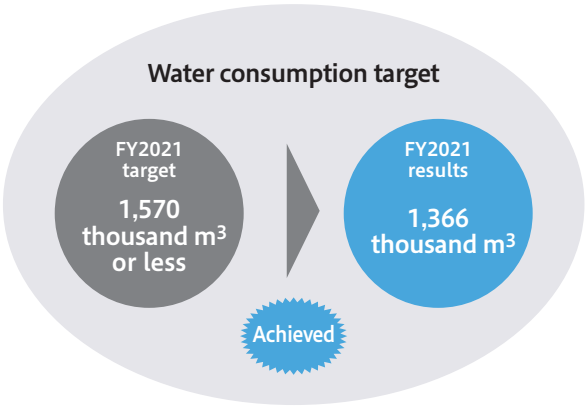
In-house assessment

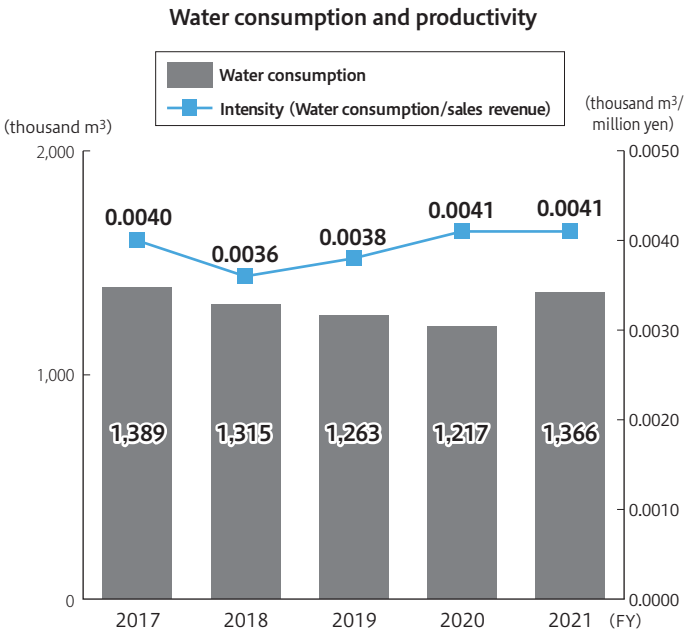
(Shionogi's self-assessment based on hazard maps and other documents and data published by the Ministry of Land, Infrastructure, Transport and Tourism and other entities)

Water risk category		Risks and opportunities	Financial impact	Probability	Remarks
Physical risk	Water shortage	Discontinued operation due to droughts	Large (discontinued operation)	Low	Has not occurred in at least the last 30 years
	Water excess	Discontinued operation due to floods	Large (discontinued operation)	Low	Has not occurred in at least the last 30 years
	Water quality deterioration	Site operation suspended due to water quality deterioration	Large (discontinued operation)	Low	Has not occurred in at least the last 30 years
Regulatory risk		Additional investment in wastewater treatment following reinforced wastewater quality criteria	Medium (capital investment)	Intermediate	Respond to applicable administrative policies in all sincerity
Reputation risk		Compromised public confidence due to environmental pollution by wastewater from the site	Large (compromised confidence)	Low	Recovering public confidence is difficult; must address this risk item with special focus

Targets and results

FY2021 target and result





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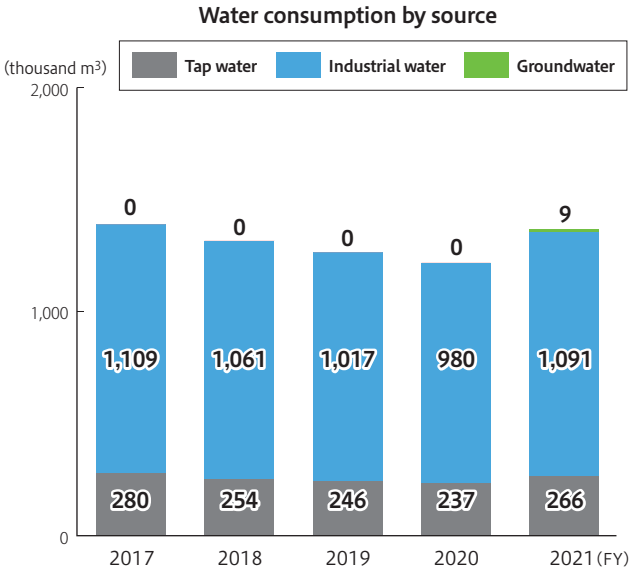
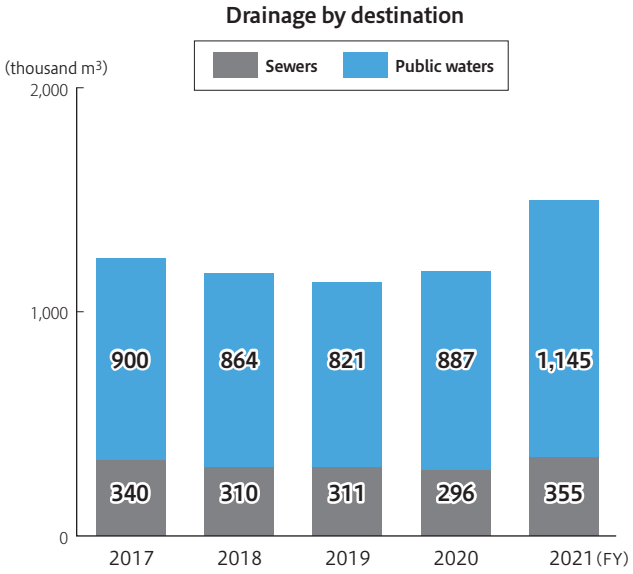




Water consumption

To protect water resources, the SHIONOGI Group works to control water consumption at each operating site by working to raise employee awareness of water conservation, thoroughly managing the consumption of tap water and industrial water, and reviewing manufacturing equipment operation and cleaning plans. Most of our water resources are obtained through government water supply facilities, with the exception of some plants using groundwater for greening, and we do not take water directly from rivers or the sea. We also do not obtain water from areas where the level of water stress is found to be high in risk assessments.

We release most of our wastewater into sewers or rivers, not into the sea. Regarding the quality of wastewater at each operating site engaged in manufacturing and research, we thoroughly manage the chemical substances in wastewater and constantly monitor wastewater for any abnormalities at in-house treatment facilities in line with our voluntary criteria, which are stricter than those imposed by related laws and regulations.

The quantity of actual water consumption at the operating sites corresponds to about 10% of the quantity of water taken in, with a large part of the water used for our activities eventually returned to the aquatic environment. We will continue to strive to reduce water consumption at each operating site, and our medium-term target for water consumption keeps it at or less than 1,340 thousand m^3 in FY2024 (the FY2018 consumption level).

Pharmaceuticals in the environment

Pharmaceuticals released into the environment are drawing an increasing amount of attention worldwide, as attested to by the report*1 published by the Organization for Economic Cooperation and Development (OECD) regarding pharmaceuticals in the environment (PiE). To responsibly handle pharmaceuticals during release from its plants as well as during manufacturing processes, when starting new product manufacturing processes, the SHIONOGI Group confirms that drug concentration in wastewater is designed to be at a level that does not have any impact on the natural environment. Moreover, as the responsibility of a company that handles antimicrobials, we confirm that the level of antimicrobial content in wastewater has no environmental impact if released into the natural environment by deactivating antimicrobials contained in wastewater in each manufacturing building before discharging the wastewater outside via in-house treatment facilities. Thus, we are striving to control the emergence of new antimicrobial resistance (AMR).

*1 OECD "Pharmaceutical Residues in Freshwater" (External website)
https://www.oecd.org/publications/pharmaceutical-residues-in-freshwater-c936f42d-en.htm

Participation in the awards ceremony of Japan's A List companies

In the CDP Water Security 2020 survey conducted by the CDP, an international NPO promoting environmental information disclosure, Shionogi received the highest rating *A*. Shionogi was invited to attend the awards ceremony of Japan's A List companies held online on Thursday, January 14, 2021, at which President and CEO Isao Teshirogi delivered a speech.

Click here for the video of the speech. (External website) (Japanese version only)
Approximately two minutes from 4:05 minutes after the beginning of the video.
https://vimeo.com/504965091

In his speech, he identified "Protect people worldwide from the threat of infectious diseases" as a material issue that the SHIONOGI Group should tackle and introduced its various efforts. Specifically, we are promoting our initiatives for total care for infectious diseases, including research and development of therapeutic drugs, promotion of disease awareness, prevention, and diagnosis, and suppression of exacerbation in patients. We are also focusing on securing sound water resources by saving water and preventing water pollution and on managing the release of antimicrobials.

Chemical Substances

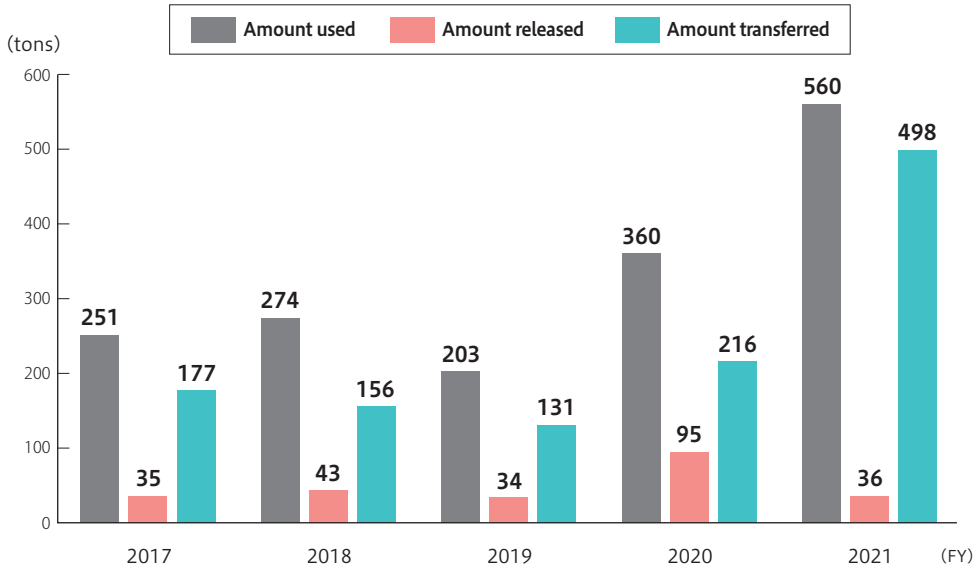
Approach to chemical substances

The research, development, and manufacturing of pharmaceutical products involve the use of numerous types of chemical substances. Some of them can adversely impact human health, ecosystems, and the global environment. The handling of chemical substances is governed by the Pollutant Release and Transfer Register (PRTR) Act and various other laws and regulations. It goes without saying that the SHIONOGI Group strictly adheres to these rules. We also make sure to appropriately manage chemical substances by controlling their release into the atmosphere, sewers, and public waters in accordance with our voluntary criteria, which are stricter than those imposed by related laws and regulations. We believe that these actions are the most important responsibilities of a company that handles chemical substances.

PRTR

In compliance with the PRTR Act, under which it is mandatory to record, calculate, and publish the status of release of chemical substances into the environment, the SHIONOGI Group submits relevant data to the authorities and also manages the amounts of volatile organic compounds (VOCs) we use, release, and transfer. Under the PRTR Act, business operators are required to record and report to the authorities the amounts of chemical substances that are released into the atmosphere and rivers, disposed of, and recycled in their operations. The table on the following page lists the headings under which this reporting is made. The “amount transferred” to “outside operating sites” refers to the amount handled as waste.

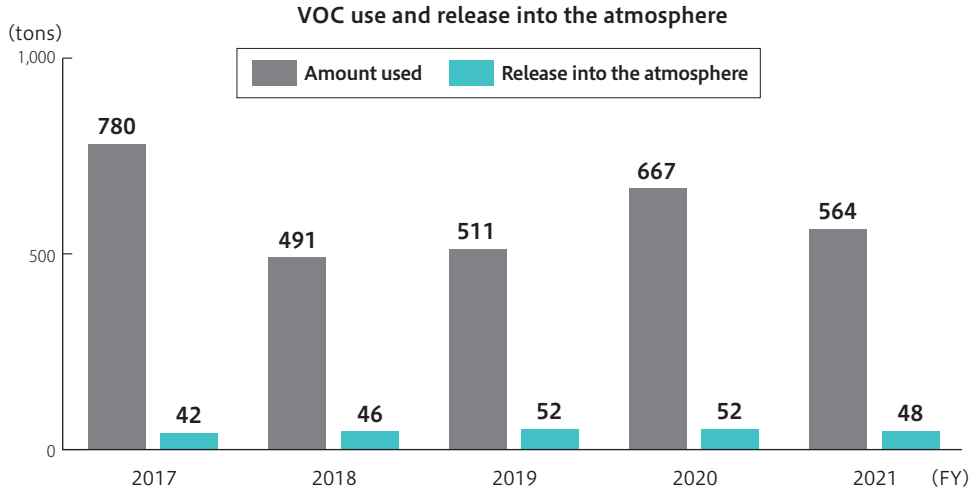
Class 1 designated chemical substances under the PRTR Act



Substances subject to the PRTR Act

(Unit: kg)

Substance name	Amount used	Amount released			Amount transferred	
		Atmosphere	Public waters	Soil	Outside operating sites	Sewers
N,*N*−Dimethylacetamide	17,384	18	0	0	17,366	0
N,*N*−Dimethylformamide	12,865	67	0	0	6,475	0
Acetonitrile	307,298	1,818	0	0	305,480	0
Chloroform	8,968	374	0	0	8,594	0
Dichloromethane (methylene chloride)	193,568	32,933	1	0	146,628	0
Tributylamine	4,128	0	0	0	0	0
Toluene	5,844	40	0	0	5,805	0
n-Hexane	5,918	521	0	0	5,397	0
Pyridine	4,484	0	0	0	1,931	0



The amount of VOCs handled by us increased temporarily due to a dichloromethane leak that occurred in FY2020. Although it decreased again in FY2021, it was higher compared to the FY2018 and FY2019 levels due to an increase in plant production volume. Meanwhile, the amount released into the atmosphere was below the FY2019 level due to appropriate management. We will continue our responsible management of the use, release, and transfer of chemical substances, controlling their release into the atmosphere, sewers, and public waters, to reduce the impact that our operations may have on the environment.

PCB

Polychlorinated biphenyls (PCBs) are mainly oily chemical substances made artificially. It has been reported that when they accumulate in the bodies of living organisms, they cause various symptoms. PCBs are a cause of great concern in terms of global-scale contamination because they are resistant to decomposition in the environment but soluble in fat, resulting in the tendency to accumulate in the bodies of living organisms through the food chain. In the past, PCBs were used in numerous items, such as condensers, transformers, and fluorescent light ballasts. It is therefore imperative that all equipment containing PCBs, whether being replaced or still in use, be appropriately managed to contain the impact of these substances.

At the SHIONOGI Group, appropriate management of PCB-containing equipment is assured by personnel specifically appointed for this task. At the same time, the treatment and disposal of PCB-containing equipment are proceeding. In FY2021, we checked all buildings and premises we owned, and disposed of all equipment containing high concentrations of PCBs installed in the buildings and premises in the Kansai area and farther west. Since the disposal deadline for PCB-containing equipment in the Kanto and other areas is the end of FY2022, we plan to complete its disposal by the end of FY2022.

Environmental and safety consideration of chemical processes

The SHIONOGI Group performs preliminary assessments of the safety of chemical substances and the danger of reactions and incompatibilities in the development stage of manufacturing and testing methods for pharmaceutical compounds and candidate compounds and in the design stage of related equipment. We also examine production processes so as to enhance efficiency in terms of waste reduction, energy conservation, and the like in the manufacturing stage.

See the section “AMR” on pp. 19–21 for more information on environmental release management of antimicrobials.
https://www.shionogi.com/global/en/sustainability/environment/results/amr.html

Pollution Prevention

Approach to pollution prevention

Environmental pollution caused by exhaust gas, wastewater, and waste materials containing toxic substances resulting from business activities adversely impacts human health and ecosystems. Pollution can also be caused by the use of products and by the disposal of products that are no longer needed. In Japan, various cases of serious pollution harming human health emerged during its high economic growth period due to the country's industrialization and economic development, which dramatically increased the amounts of waste materials and toxic substances contaminating the atmosphere, aquatic areas, soil, and underground water. Environmental pollution, once it occurs, has a serious impact on local communities and biodiversity, which can only be restored to their original state—if it is possible to do so at all—by spending a great deal of time and money. We recognize that preventing pollution is an important issue in protecting the health and living environment of people.

The SHIONOGI Group stipulates in the SHIONOGI Group EHS Policy that we will comply with laws and regulations related to the environment, health, and safety, and strive to maintain and improve EHS standards. We have established an EHS management system, in which we thoroughly comply with laws and regulations related to air, water, and soil pollution and assess the status of compliance, thereby working to prevent pollution throughout the group.

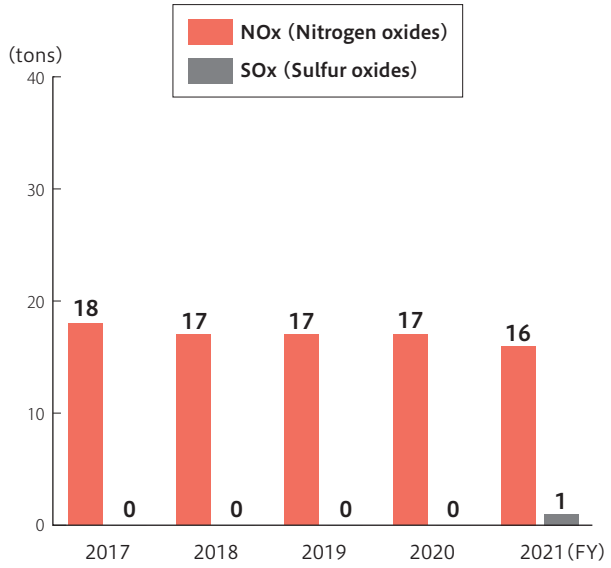
Prevention of air, water, and soil pollution

To prevent air pollution, the SHIONOGI Group strictly observes the regulatory values for NOx, SOx, and particulate matter while reducing SOx generation through fuel conversion from heavy oil, which contains many impurities, to liquefied natural gas. To prevent contamination in sewers and rivers, we set voluntary criteria for pollutants, which are stricter than those imposed by related laws and regulations, and carry out round-the-clock monitoring with the use of TOC*1 meters and oil content monitoring devices. At the Kanegasaki Plant, the Tokushima Plant, and the Aburahi Research Center, where wastewater is released into rivers from operating sites, wastewater is treated and purified at the facilities on their premises before it is released into nearby rivers.

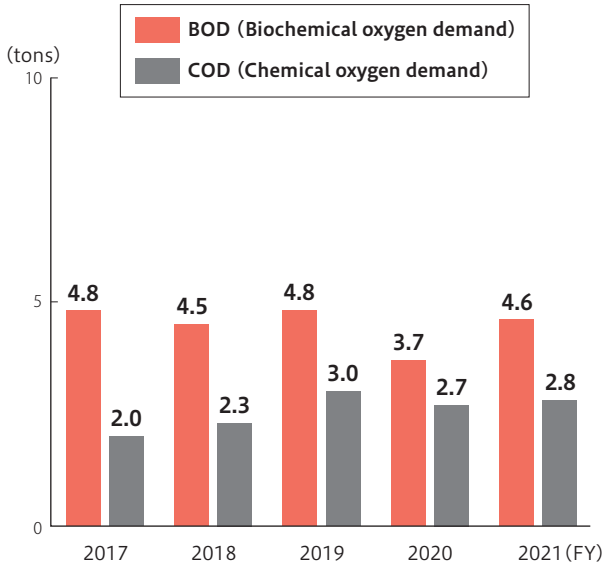
The Kanegasaki Plant, which handles large quantities of chemical substances, sets voluntary criteria for soil and takes measurements periodically. It is confirmed that the measurements have constantly been below the applicable environmental criteria.

*1 TOC: Total Organic Carbon

Air pollutant (SOx and NOx) emissions



Drainage load (BOD, COD)



Compliance with related laws and regulations

Environment-related laws and regulations cover a wide range of issues, including waste and energy management, the prevention of air and water pollution, and the management of chemical substances. To ensure thorough compliance, we share information on legal and regulatory revisions with each operating site, organize educational programs, and compile relevant information and knowledge in manuals. We also conduct a periodic assessment of the status of legal and regulatory compliance. As with environmental matters, we also ensure legal and regulatory compliance and assessment with regard to health and safety affairs.

To date, we have never been subject to litigation or penalties for EHS-related violations.

In March 2021, it was found that the Kanegasaki Plant had failed to report the use of fluorine in the facilities specified for the use of toxic substances prescribed by the Water Pollution Control Act. Regarding this matter, we promptly consulted with the Iwate Prefectural Government, took measures according to its instructions, and conducted a re-inspection to ensure that there were no similar omissions.

Number of incidents of excess emissions (exceeding legal restrictions) (cases)

FY	2017	2018	2019	2020	2021
Shionogi & Co., Ltd.	1	0	0	0	0
Group companies	0	0	0	0	0

Number of complaints relating to the environment (cases)

FY	2017	2018	2019	2020	2021
Shionogi & Co., Ltd.	2	1	0	0	2
Group companies	0	0	0	0	1

Biodiversity

Approach to biodiversity

The SHIONOGI Group appreciates the benefits of biodiversity in all of its business activities, including pharmaceutical research, development, manufacturing, and marketing, and strives to reduce the negative impacts of its business activities on biodiversity. Specifically, we will contribute to the conservation of biodiversity by working with our suppliers on the four material issues of "AMR", "climate change", "resource conservation and circulation", and "water", which are material environmental issues for our business, over the medium to long term. The conservation of biodiversity is not an issue that can be resolved by one company alone. We will expand our environmental initiatives to our employees, local communities, and many other stakeholders to contribute to the sustainability of the earth.

SHIONOGI is committed to protecting biodiversity. We endorse the "Keidanren Declaration on Biodiversity and Action Guidelines (revised version)", and have published our ambitious action policies for and specific activities on biodiversity as part of the "Initiative based on the Declaration of Biodiversity by Keidanren".

Keidanren: Initiative based on the Declaration of Biodiversity (External website)

https://www.keidanren-biodiversity.jp/logo_en.php

Consideration for ecosystem diversity

Quality water brought about by the diversity of ecosystems is an important resource that is indispensable for pharmaceutical manufacturing. The SHIONOGI Group works to decrease the impact of soil contamination on the ecosystem by setting criteria for the quality of wastewater, which are stricter than those imposed by related laws and regulations, and to reduce the consumption of limited water resources by recycling most of the water we use back into the environment.

* See the section "Water" on pp. 35–38 for details.

As a countermeasure against AMR, which has become a global issue, we inactivate antimicrobials in wastewater discharged from antimicrobial-manufacturing plants and confirm that the level of antimicrobial content in the wastewater has no environmental impact. We require our suppliers both in Japan and overseas to thoroughly manage antimicrobials in wastewater to contribute to the resolution of the AMR issue and the conservation of the ecosystem.

* See the section "AMR" on pp. 19–21 for details.

Initiatives at the Aburahi Botanical Gardens

There are many pharmaceuticals of plant origin. Even today, plants are important specimens for pharmaceutical research and are used as raw materials for pharmaceuticals.

The Aburahi Botanical Gardens was established in 1947 within the Aburahi Research Center located in Koka City, Shiga Prefecture. Initially, plant cultivation was carried out for the purpose of cultivating origin plants and searching native origin plants for pharmaceutical drug discovery. However, it has now been refurbished as a facility for promoting environmental initiatives and conducting community and social contribution activities. At the Gardens, more than 1,000 species of plants, including threatened and rare species, are managed and maintained.

Contribution to the conservation of threatened species

At the Aburahi Botanical Gardens, we are involved in conserving threatened species and rare plants. We are also attempting to breed species of plants that are in danger of extinction ex-situ or at the Gardens and then return them to their own habitat.

Conservation status of threatened species by category

	Threatened species
Categories specified by the Ministry of the Environment (Endangered Class IA, Endangered Class IB, Endangered Class II, Near Threatened Class)	76 species
Categories specified by Shiga Prefecture (Endangered species, vulnerable species, rare species, species requiring attention, important species in terms of distribution, other important species)	71 species
Categories specified by Koka City (Endangered species, vulnerable species, species requiring attention, local species)	43 species

Tatarian aster (Endangered Class II)

Environmental education for stakeholders

As part of our social contribution activities for the local community through the Aburahi Botanical Gardens, we invite experts from Kyoto Pharmaceutical University and Kobe Pharmaceutical University to provide educational support to local elementary and high school students, who will lead the next generation. We also provide opportunities to learn about the environment by holding garden tours, targeting new employees and those enrolled at Shiga Lacadia University. Although we were sometimes forced to refrain from these activities due to the impact of the COVID-19 pandemic in FY2021, we continued our activities while paying close attention to infection prevention measures.

Results

Educational support for the next generation (total number of students)	185 people
Number of garden tours	7 times



Educational support for local school children

Aburahi Botanical Gardens has received three stars in the Shiga Prefecture Certificate of Biodiversity Initiatives

The Aburahi Botanical Gardens received three stars, the highest rank, in the 2021 Shiga Prefecture Certificate of Biodiversity Initiatives because its community and social contribution activities, stated above, were evaluated as effective initiatives for the conservation of biodiversity and the sustainable use of natural resources.

Reforesting Kombu Project

Shionogi Healthcare Co., Ltd., our Group company, manufactures and sells health foods that use fucoidan, a component extracted from Gagome kombu (kelp). However, due to a combination of reasons, such as an imbalance of supply and demand in the sea caused by the recent increase in sea urchins and abalones that feed on seaweed, and overfishing caused by the Gagome kombu boom, natural Gagome kombu, which mainly inhabits the waters near Hakodate, Hokkaido Prefecture, is facing a crisis of possible extinction in the area.

As a company that handles products using Gagome kombu, we have started the Reforesting Kombu Project to restore natural Gagome kombu to its former state in which it grew thickly like a forest. The purpose of the project is to switch its use from natural to farmed. To this end, we are collaborating with Hakodate City and local universities and companies to establish a stable supply system for farmed Gagome kombu, as well as a system to grow Gagome kombu while improving its quality. By expanding our project to other areas, we aim to promote the spread of farmed Gagome kombu, and conserve and restore natural Gagome kombu. Shionogi Healthcare has begun switching its product raw materials from natural to farmed Gagome kombu since 2019, aiming to reduce the use of natural Gagome kombu to zero by 2024.

This project is conducted under the “Project for Promoting the Launch of Business Based on Local Community-Company Partnership” subsidized by the Ministry of Economy, Trade and Industry, and we intend not only to create a production system and improve work efficiency for the kombu farming business but also to contribute to the revitalization of the area by encouraging job creation there.

Gagome kombu being farmed

Click here for the Project website
(External website) (Japanese version only)

https://www.shionogi-hc.co.jp/konbu-mori.html

Editorial Policy

■Periods

The present Environment Report covers results achieved during the period of the fiscal year 2021 (from April 1, 2021 through March 31, 2022) in Japan and the calendar year 2021 (from January 1 through December 31, 2021) outside Japan. The report also covers our activities conducted immediately before or after these periods.

■Organizations

The report covers the environmental activities of Shionogi & Co., Ltd. and the SHIONOGI Group companies in the table below. Sections of the report that concern a different set of organizations are clearly indicated as such in each instance. With regard to Nanjing Chang'ao Medicine Technology Co., Ltd. (Nanjing Factory, China), a non-Japanese SHIONOGI Group company and manufacturing base, the relevant data, excluding data on climate change, are disclosed separately from those of the SHIONOGI Group under "Site Data."

Category	Companies/Operating sites	
Shionogi & Co., Ltd.	Head Office	Shionogi CMC Research Innovation Center (Hyogo Prefecture)
	Tokyo Branch Office (Tokyo)	Shionogi Pharmaceutical Research Center (SPRC)
	Pharmaceutical Commercial Division (including its sales offices across Japan)	Aburahi Research Center (Shiga Prefecture)
Group companies	Shionogi Healthcare Co., Ltd.	
	Shionogi Pharma Co., Ltd. Settsu Plant, Kanegasaki Plant (Iwate Prefecture), Tokushima Plant (Tokushima Prefecture)	
	Shionogi Techno Advance Research Co., Ltd. *1	
	Shionogi Administration Service Co., Ltd.	
	Shionogi Business Partner Co., Ltd.	
	Shionogi Marketing Solutions Co., Ltd. *1	
	Shionogi Career Development Center Co., Ltd. (Hyogo Prefecture)	
	Shionogi Digital Science Co., Ltd. *2	
	Shionogi Pharmacovigilance Center Co., Ltd.*1	
	Aburahi AgroResearch Co., Ltd. (Shiga Prefecture) *1	
	Shionogi Smile Heart Co., Ltd. *1	
	UMN Pharma Inc. (Akita Prefecture, Kanagawa Prefecture)	
	Nagase Medicals Co., Ltd. (Hyogo Prefecture) *3	
	Nanjing Chang'ao Medicine Technology Co., Ltd. (Nanjing Factory, China)	

Companies and operating sites with no location indicated are all situated in Osaka Prefecture.
*1 Company on the premises of an operating site of Shionogi & Co., Ltd.
*2 Shionogi Digital Science Co., Ltd. was dissolved on December 31, 2021.
*3 Converted to a subsidiary of Shionogi Pharma Co., Ltd. on October 1, 2020.

■Numerical data and graphs

The numerical data provided in the report are rounded off to the nearest whole number. Accordingly, the totals in the graphs and charts do not necessarily correspond to the sum of the individual figures.

■Environmental performance data related to energy and CO_2

The data is calculated based on the following calculation methods.

Calculation methods for environmental performance data

Boundary of calculation

Scope 1 and 2	SHIIONOGI Group (excluding Group companies outside Japan [administrative offices]): SHIONOGI Group companies in Japan and Nanjing Chang' ao Medicine Technology Co., Ltd. (Nanjing Factory, China)
Scope 3	
Category 3	SHIONOGI Group companies in Japan (Shionogi & Co., Ltd. in or before FY2018)
Other categories	SHIONOGI Group companies in Japan (Shionogi & Co., Ltd. in or before FY2018) (UMN Pharma Inc. and Nagase Medicals Co., Ltd. [currently the Itami Plant of Shionogi Pharma Co., Ltd.] are not included in "Other categories" except "Category 5.")
Energy consumption	SHIONOGI Group (excluding Group companies outside Japan [administrative offices]): SHIONOGI Group companies in Japan and Nanjing Chang' ao Medicine Technology Co., Ltd. (Nanjing Factory, China)

Calculation methods

Indicators	Calculation methods
Scope 1	CO_2 emissions resulting from fuel use [Calculation methods] Based on the "Greenhouse Gas Emissions Accounting and Reporting Manual (Ver. 4.8)" of the Ministry of the Environment and the Ministry of Economy, Trade and Industry of Japan [CO_2 emission factors] Emission factors from the "Greenhouse Gas Emissions Accounting and Reporting Manual (Ver. 4.8)" of the Ministry of the Environment and the Ministry of Economy, Trade and Industry of Japan
Scope 2	CO_2 emissions resulting from the purchase of electricity and steam [Calculation methods] Based on the "Greenhouse Gas Emissions Accounting and Reporting Manual (Ver. 4.8)" of the Ministry of the Environment and the Ministry of Economy, Trade and Industry of Japan [CO_2 emission factors] Electricity (Japan) (location-based): National average emission factors from the "Emission Factors by Power Suppliers (for the calculation of GHG emissions by specified emitters) (FY2020 results)" published by the Ministry of the Environment and the Ministry of Economy, Trade and Industry of Japan (February 17, 2022) Electricity (Japan) (market-based): Adjusted emission factors from the "Emission Factors by Power Suppliers (for the calculation of GHG emissions by specified emitters) (FY2020 results)" published by the Ministry of the Environment and the Ministry of Economy, Trade and Industry of Japan (February 17, 2022) Electricity (overseas) (both location-based and market-based): Emission Factors (2019) of the International Energy Agency (IEA) Steam (both location-based and market-based): Emission factors from the "Greenhouse Gas Emissions Accounting and Reporting Manual (Ver. 4.8)" of the Ministry of the Environment and the Ministry of Economy, Trade and Industry of Japan
Scope 3	
Category 3	CO_2 emissions resulting from procurement of fuels required for the generation of electricity purchased [Calculation methods] Based on the "Basic Guidelines on Accounting for Greenhouse Gas Emissions Throughout the Supply Chain (Ver. 2.4)" of the Ministry of the Environment and the Ministry of Economy, Trade and Industry of Japan, calculated using "7. Emission Unit Values per Use of Electricity and Heat" in the "Database on Emissions Unit Values for Calculation of Greenhouse Gas Emissions, etc., by Organizations Throughout the Supply Chain (Ver. 3.2)" of the Ministry of the Environment of Japan
Other categories	Total of Categories 1, 2, 4, 5, 6, 7, and 12, excluding Categories 8, 9, 10, 11, 13, 14, and 15, which are not included in our own corporate activities or reported under "Other categories" [Calculation methods] Based on the "Basic Guidelines on Accounting for Greenhouse Gas Emissions Throughout the Supply Chain (Ver.2.4)" of the Ministry of the Environment and the Ministry of Economy, Trade and Industry of Japan
Energy consumption	
Total energy consumption	Total calorie-converted values for purchased energy (gasoline, other fuel oils, LPG, LNG, town gas, electricity, steam) [Calculation methods] For fuel, the calorific values calculated using the calorie conversion factors from the "Regulations for Enforcement of the Act on the Rational Use of Energy" are converted into MWh at 3.6 GJ/MWh and totaled. For town gas, calorie conversion factors announced by suppliers are used. For electricity, the purchased amount (MWh) is totaled without converting it into primary energy.
Gasoline	Amount of gasoline purchased, including fuel for sales force vehicles
Other fuel oils	Amount of kerosene, light oil, heavy oil A purchased
Liquefied petroleum gas (LPG)	Amount of LPG purchased from gas suppliers
Liquefied natural gas (LNG)	Amount of LNG purchased from gas suppliers
Town gas	Amount of town gas purchased from gas suppliers
Electricity	Amount of electricity purchased from power suppliers
Steam	Amount of steam purchased from steam suppliers

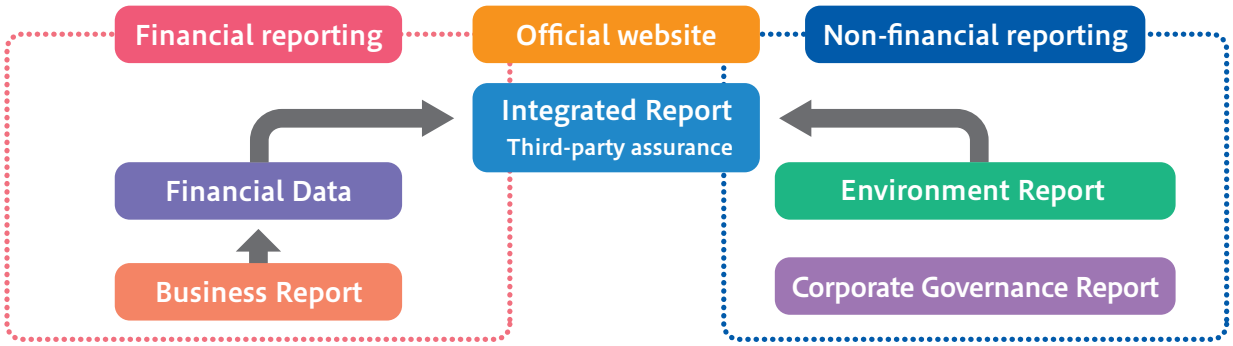
Reporting guidelines

The Environmental Reporting Guidelines 2018 of the Ministry of the Environment of Japan are used as a reference.

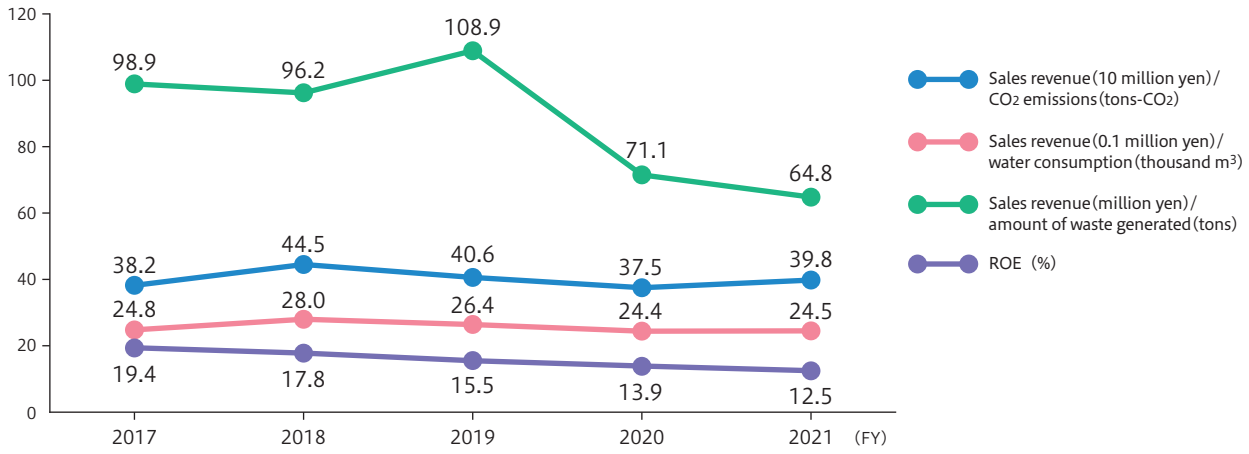
Overall reporting view

A copy of this report is made available on SHIONOGI's official website, while excerpts from the report are included in the SHIONOGI Integrated Report.

The environmental data of FY2021 marked in red on Page 98 of "SHIONOGI Integrated Report 2022," published separately from the present report, was subjected to third-party assurance by KPMG AZSA Sustainability Co., Ltd.



Trends of major performance assessment indicators



Calculated based on the International Financial Reporting Standards (IFRS) from FY2018

(FY2017 is calculated based on JGAAP.)

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