



# EHS Report 2019

[www.astellas.com/en/responsibility/Environment](http://www.astellas.com/en/responsibility/Environment)



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### Abbreviation list

Abbreviation	Explanation
EHS	Abbreviation for "Environment, Health & Safety"
GHG	Greenhouse gases. There are seven categories of greenhouse gases: carbon dioxide, methane, nitrous oxide, hydro fluorocarbons, per fluorocarbons, sulfur hexafluoride and nitrogen trifluoride. Non-energy-related GHG emissions are not included. In this report, the term GHG is used for all types of gas.
CO <sub>2</sub>	Abbreviation for carbon dioxide.
Scope 1	GHGs emitted directly from Company premises as a result of the burning of fuels (city gas, kerosene, diesel oil, gasoline, LPG, LNG)
Scope 2	GHGs emitted indirectly in the use of electric power or heat supplied to the Company from outside
Scope 3	GHGs emitted indirectly at some point on the Company's value chain (production, transportation, business trips, commuting, etc.)
SBT	Science Based Targets
SO <sub>x</sub>	Sulfur oxides-emitted by the burning of fossil fuels containing sulfur
NO <sub>x</sub>	Nitrogen oxides-formed through the combination of nitrogen and oxygen in the atmosphere during the combustion of substances
BOD	Biochemical oxygen demand. Used as a benchmark for indicating extent of water pollution by organic matter in rivers.
COD	Chemical oxygen demand-indicates the amount of water pollution due to the presence of organic compounds in seas or lakes
VOC	Volatile organic compounds-organic chemical compounds that are volatile in the atmosphere at standard ambient temperatures and pressures
Frequency rate of work-related injuries	This rate shows the number of employee deaths or injuries resulting from work-related accidents causing leave of absence per million hours of work. The larger the number, the more frequently work-related injuries occur.
Severity rate of work-related injuries	This rate shows the number of days absent from work due to work-related injuries per thousand hours worked. The higher the number, the more serious the injury.

## Corporate Data, Editorial Policy

### ■ Corporate Data

Company Name	Astellas Pharma Inc.
Headquarters	2-5-1, Nihonbashi-Honcho, Chuo-ku, Tokyo 103-8411, Japan
Capital	¥103,001million (As of March 31, 2019)
Representative Director	Kenji Yasukawa (President and CEO)
Foundation	1923
Revenue	¥1,306,348 million (consolidated basis, as of March 31, 2018)
Employees	16,243 (consolidated basis, as of March 31, 2019)
Professional institution affiliation	<ul style="list-style-type: none"> <li>• Japan Business Federation</li> <li>• The Federation of Pharmaceutical Manufacturers' Association of Japan</li> <li>• Japan Pharmaceutical Manufacturers association, etc.</li> </ul>

### ■ Reporting Period

As a general rule, this Report covers the activities of business sites in Japan from April 1, 2018 to March 31, 2019, and the activities of overseas business sites from January 1, 2018 to December 31, 2018. (Certain sections of this Report contain details of activities and initiatives both prior to and after these identified reporting periods.)

### ■ Reporting Coverage

This report covers the following companies, including head office functions, plants, research functions, and sales affiliates. Moreover, the report also covers the activities of Astellas subsidiaries that are included in these companies

#### Japan

- Astellas Pharma Inc.
- Astellas Pharma Tech Co., Ltd.

#### Americas

- Astellas US LLC
- Agensys, Inc.
- Astellas Research Institute of America LLC
- Astellas Institute for Regenerative Medicine
- Astellas Innovation Management LLC
- Mitobridge
- Universal Cells
- Various sales affiliates

#### EMEA

- Astellas Pharma Europe Ltd.
- Astellas Pharma Europe B.V.
- Astellas Ireland Co., Limited
- Various sales affiliates

#### Asia/Oceania

- Astellas Pharma China, Inc.
- Various sales affiliates

Certain EHS data includes the results of activities of contractors because the environment and society is affected not only by the Company's own activities but also via the value chain.

### ■ Editorial Policy

In publishing this "EHS Report", Astellas has worked to provide a more detailed account of its activities in an easy-to-understand manner to all those who are affected by its environmental initiatives and the various stakeholders.

Among the fields of Astellas' CSR activities, the report specifically introduces issues, goals, and activities that Astellas actively implements in the environment and employee fields, and explains them using figures and tables.

In the Environmental Action Plan (Climate Change) report, the scope of aggregation covers all business sites as of the final day of the reporting periods in and outside Japan.

### ■ Important Changes in Organization during the Reporting Period

Work to terminate the research activities of Agensys, Inc. was completed in the first quarter of fiscal 2018. In November 2018, Astellas Analytical Science Laboratories Co., Ltd. was succeeded to Eurofins Pharma Services LUX Holding Sarl.

### ■ Guidelines

The Environmental Reporting Guidelines (2018 edition) issued by Japan's Ministry of the Environment.

### ■ Notational System of Numerical Results

Totals and tallies of shares may not always match due to the effect of rounding.

### ■ Information regarding Publication

Date of issue: June 2019  
Next scheduled issue: June 2020

There is no printed version of the EHS report.

## In Search of EHS EXCELLENCE

Astellas has embraced the sustainable enhancement of enterprise value as its corporate mission. To fulfill this mission, Astellas seeks to be a chosen and trusted enterprise by all stakeholders, including customers, shareholders, employees, and the global community. The Astellas Charter of Corporate Conduct contains the following principles on Environment, Health and Safety (EHS): “We shall respect our employees’ human rights, individuality, and differences, promote diversity in the workplace, and provide a safe and rewarding work environment,” and “Recognizing that harmony between the global environment and our business activities is a prerequisite to our corporate existence, we shall take proactive measures to conserve the global environment.” These principles require employees to conduct themselves based on high ethical standards in EHS fields, among other areas. In the fields of the environment and employees (occupational health and safety), Astellas will disclose information on its measures to sustainably enhance enterprise value through EHS.

### Top Message

Astellas has adopted “Turning innovative science into VALUE for patients” as its VISION. In order to continuously achieve sustainable growth, Astellas will need to sensitively grasp changes in the environment and continuously evolve in step with those changes. We will need to address changes in the environment, such as energy trends and climate change, the effective use of resources, and the prevention of pollution. We will also need to implement appropriate management of occupational health and safety in step with changes in modalities, which we will need to handle in many more different ways due to Astellas’ Focus Area approach. In the EHS field, we will be constantly called upon to address changes. Here, Astellas will advance EHS activities based on high ethical standards, in accordance with the Astellas EHS Policy and Guidelines.

In the previous fiscal year, there was an important development concerning our activities in the environmental field. In measures to address climate change, one of Astellas’ key priorities, our target for reducing greenhouse gas (GHG) emissions obtained Science Based Targets (SBT) certification from the SBT Initiative in November 2018. We believe that this target represents our commitment to stakeholders, while setting a clear course for reducing GHG emissions for Astellas’ employees. We will continue to implement measures to reach our goal based on our medium- and long-term scenario.

Moreover, it is absolutely essential for management to ensure the safety of employees as they engage in corporate business activities. In order to remove hazards that could lead to work-related accidents at an early stage, it is crucial to continuously undertake broad-based risk assessments and develop a sharp eye for assessing hazards. We will continuously implement training and risk mitigation activities in order to prevent work-related accidents in all business areas, including research, production and sales.



Chief Administrative Officer  
& Chief Ethics & Compliance Officer  
Fumiaki Sakurai

Modality: Material classifications and methods such as small-molecule compounds, peptides (middle molecules) and other protein medicines; nucleic acid medicines; therapeutic antibodies; and cell medicines  
 SBT initiative: A group jointly established in 2015 by CDP, United Nations Global Compact (UNGC), World Resources Institute (WRI), and World Wide Fund for Nature (WWF). An international initiative that encourages countries and companies to set GHG reduction target to achieve the goal of the Paris Agreement—to limit global warming to below 2°C above pre-industrial levels.

## EHS Management

Astellas' basic stance toward the environment as well as the health and safety of its employees is outlined under the Astellas EHS Policy. Moreover, Astellas is working organizationally and continuously toward achieving this stance as described in the Astellas EHS Guidelines. In addition, Astellas has set medium-term targets for its key priorities in its EHS Action Plan and is working to achieve those targets.

### ■ EHS Management System

Fundamental policies and action plans relating to EHS matters are positioned as an important issue in CSR management, and are discussed and determined by the CSR Committee. (The committee is chaired by the Chief Administrative Officer & Chief Ethics & Compliance Officer.) Measures for implementing these decisions in specific form are then examined by the Global EHS Sub-committee, which is a subordinate organization under the CSR Committee. Moreover, the CAO & CECO directly receives periodic reports regarding risk management related to EHS, and issues any necessary instructions. In addition, cases such as investment in Climate Change Mitigation Measures and risk response related to EHS are discussed and decisions are made by the Executive Committee\* or a meeting of the Board of Directors.

\*) An advisory body that discusses important matters related to management of the entire Astellas Group, and makes decisions.

### ■ Astellas EHS Guidelines

The Astellas EHS Guidelines set forth unified standards that identify Astellas' aspirations in its EHS activities.

The guidelines qualitatively describe our aims, and concrete numerical targets, including their deadlines, will be stipulated through short- and medium-term action plans that will be updated every fiscal year.

In addition, we are also requesting the cooperation of supply chain companies in accordance with the guidelines through audits and other means.

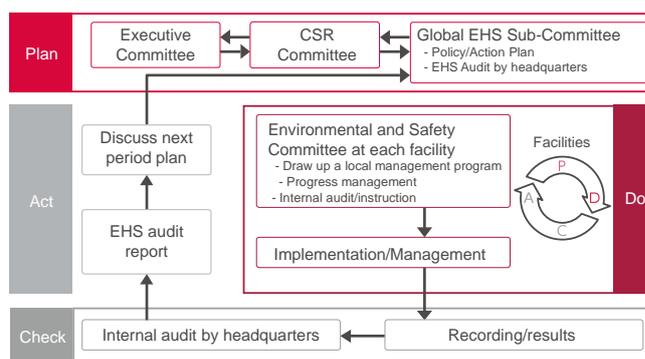
### ■ EHS Audits

Astellas conducts a company-wide EHS audit every fiscal year, in line with the Astellas EHS Guidelines, in order to evaluate the progress of EHS activities throughout the Astellas Group. The status of actions taken to resolve the issues identified in the audits are confirmed through follow-up audits in writing and the audit in the following fiscal year. Societal demands and problem awareness at each site are shared through an exchange of opinions between the EHS Management Department and each site. In this manner, one objective of audits is to ensure that Astellas' aspirations are aligned in the same direction. In addition, Astellas conducts audits of Contracted Manufacturing Organizations (CMOs) in the value chain based on the same guidelines and requests their cooperation on making continuous improvements.

### ■ EHS Assessment System

The total environmental load resulting from the production, sale, distribution and disposal of products is determined almost entirely at the research and development stages.

With regard to the production and sales of pharmaceutical products, it is necessary to obtain government approval for each product. Since government approval also covers production methods and packaging specifications, when there are changes in either approved production methods or packaging, new approval must be obtained even if the changes are related to work safety or reducing the



environmental impact. Therefore, these changes are very time consuming and costly. Astellas has introduced an EHS assessment system as a tool that requires efforts to minimize the environmental load at every stage, particularly research and development, production, distribution, and disposal.

Under this assessment system, we examine issues such as the reduction of air pollutant emissions and the excessive use of packaging, safety measures at production sites, and the prevention of exposure of employees to hazardous substances prior to the commencement of mass production, including development based on green chemistry.

### ■ Operation of the EHS assessment system

An assessment team conducts EHS assessments in stages for the development of products. The results determine whether development of the product can move on to the next stage.

Specifically, the assessment must identify raw materials or processes that might have a negative impact on the environment and/or employee health and safety. The progress on remedial measures must be assessed, and action plans evaluated. Countermeasures being considered are evaluated in the subsequent stages of the assessment.

### ■ Education and Training

In order to promote further improvements in its EHS activities, the Company acknowledges the critical need to ensure that all employees have a correct understanding of their own roles and responsibilities.

To this end, we are working to develop employees professionally qualified in EHS matters and improve our skill base through a wide variety of training programs, including specialized education for employees engaged in roles requiring specialist knowledge and skills in areas such as environmental conservation or hazardous operations.

We also explain our policies and site rules to construction workers at our business sites, raw materials suppliers and waste transport and disposal contractors, and request cooperation with our EHS activities.

## Environment Initiatives

Astellas believes that maintaining a healthy global environment is an essential theme for building a sustainable society, and it is also an important element in ensuring the continuation of business activities. In order for Astellas to achieve sustainable growth, Astellas must fulfill its corporate social responsibilities regarding issues that impact on the local environment, including climate change problems, environmental pollution, and waste disposal. Astellas will strive to develop its aspirations for the company based on a long-term timeframe and global perspective. At the same time, we will continue efforts to address regional social issues and pursue corporate activities in harmony with the global environment.

### Interaction between Astellas and the Environment

INPUT		
Energy	Electricity	253,441 MWh
	(Renewable sourced)	29,583 MWh
	City gas	21,285 thousand m <sup>3</sup>
	LPG	1,491 tons
	LNG	2,197 tons
	Kerosene	1 kiloliters
	Diesel oil	2,826 kiloliters
	Gasoline	7,201 kiloliters
	Purchased heat (hot/cold water)	3,791 GJ
	Purchased heat (steam)	21,820 GJ
Other renewable energy	46,862 GJ	
Resources	Water	8,501 thousand m <sup>3</sup>
	Raw materials (by weight)*1	5,111 tons
	Raw materials (by volume)*1	1,001 kiloliters

OUTPUT		
GHGs	Scope 1 *2	82,093 tons
	(Sales fleets)	23,725 tons
	Scope 2	112,280 tons
Pollutants (atmosphere)	NOx	28 tons
	VOC *3	44 tons
Pollutants (water bodies)	BOD	10 tons
	COD	36 tons
Discharge *4	Water discharge	8,246 thousand m <sup>3</sup>
Waste material	Waste generated	14,820 tons
	Landfill volume *5	103 tons

- \*1 all Japanese business premises
- \*2 non-energy-related GHG emissions are not included.
- \*3 all production facilities and R&D sites in Japan
- \*4 volume of water discharge from non-Japanese production facilities was equivalent to withdrawal amount.
- \*5 all Japanese facilities excluded sales branched

### Scope3 Indirect GHG

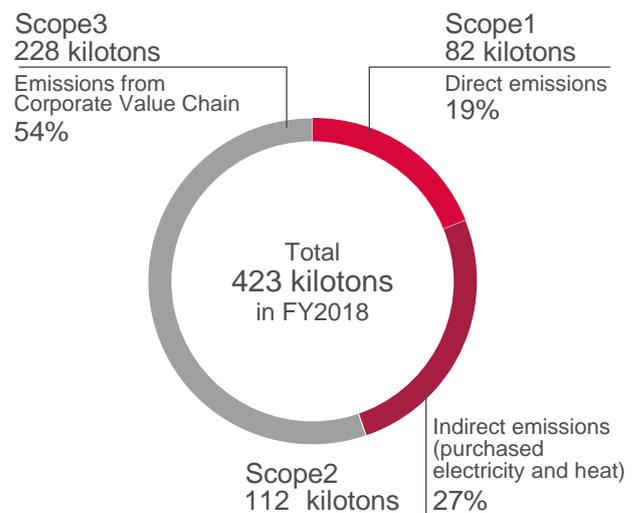
Upstream GHG emissions		
1	Purchased goods and services	80,344 tons
2	Capital goods	78,527 tons
3	Fuel and energy related activities (not included in Scope1 and Scope2)	24,486 tons
4	Transportation and distribution	3,475 tons
	Truck transportation of raw materials	(252 tons)
	Plant → warehouse	(292 tons)
	Warehouse	(849 tons)
	Warehouse → wholesalers	(2,083 tons)
5	Waste generated in operation	2,898 tons
6	Business travel (by airplane)	35,454 tons
7	Employee commuting	2,409 tons
8	Leased assets	Not relevant
Downstream Scope3 emissions		
9	Transportation and distribution	Not relevant
10	Processing of sold products	Not relevant
11	Use of sold products	No emissions' results
12	End-of-life treatment of sold products	590 tons
13	Leased assets	Not relevant
14	Franchises	Not relevant
15	Investments	Not relevant

Remark: The calculation method for Scope3 emissions is mentioned on page 18

### GHG Emissions Throughout the Value Chain

GHG emissions associated with Astellas' business activities amounted to 423 kilotons globally. Astellas is monitoring the greenhouse gas emissions associated with the use of almost all its facilities and sales fleets. In addition to Scope 1 and Scope 2 emissions, Astellas continues working to monitor Scope 3 emissions.

GHG emission breakdown (fiscal 2018)



## Environment Initiatives

### ■ Environmental Action Plan

Our Environmental Action Plan sets out short-term and medium-term targets for our activities regarding the key points of the Astellas Environment, Health & Safety Guidelines. We renew our action plans on a rolling basis, by reviewing progress and conditions during the previous year and incorporating our findings into our action plan for the following year. We are always working to achieve the targets set out in our Environmental Action Plan, which are also reflected in individual action plans drawn up by Japanese and overseas group companies.

### ■ Results of fiscal 2018 (summary)

Goal of Environmental Action Plan	Fiscal 2018 Results
1. Measures to Address Climate Change - Reduce GHG emissions (Scope 1 + 2) by 30% by fiscal 2030 (Emissions in the base year: 211 kilotons) - Reduce GHG emissions (Scope 3) by 20% per unit of revenue by fiscal 2030	[Base year: fiscal 2015] Ratio to fiscal 2015 level 8.5% (Emissions: 193 kilotons) 10.1%
2. Measures for the Conservation of Natural Resources Enhance water resource productivity by around 2.5 times the fiscal 2005 result by the end of fiscal 2020 (For research and production sites in Japan and overseas) Indicator: <b>Revenue (¥ billion)/Water resources withdrawn (1,000 m<sup>3</sup>)</b>	[Base year: fiscal 2015] Ratio to fiscal 2005 level 3.0 times
3. Waste management Improve waste generated per unit of revenue to around 20% of the fiscal 2005 result by the end of fiscal 2020 (For research and production sites in Japan and overseas) Indicator: <b>Volume of waste generated (tons)/Revenue (¥ billion)</b>	[Base year: fiscal 2005] Ratio to fiscal 2005 level 22%
4. Biodiversity Triple the biodiversity index by fiscal 2020 from the fiscal 2005 level	[Base year: fiscal 2005] Ratio to fiscal 2005 level 2.7 times

In November 2018, the Environmental Action Plan involving Climate-Related Measures obtained Science Based Target (SBT) certification from the SBT Initiative, which recommends that private companies set reduction targets aligned with the Paris Agreement, which entered into force in 2016. Our environmental action plans for natural resource conservation measures and waste management have been consistently managed well. We are continuously implementing measures eyeing the target fiscal years of each plan.

Results for fiscal 2018 are as follows:

### ■ Response to Accidents and Emergencies

Being prepared for emergency situations caused by an accident or natural disaster can help to prevent an environmental catastrophe and minimize damage. Accordingly, we have developed specific measures and procedures. Moreover, we conduct regular education sessions and training drills, and reconfirm and test the validity of our procedures, communication networks and the division of roles focusing on risks that are recognized as a high priority. In this manner, we continue to work diligently to reduce environmental risk.

In particular, the discharge of harmful substances could lead to the pollution of rivers as well as cause problems at public sewage treatment plants. This in turn could have a grave impact on regional communities. In preparation for accidents and emergency situations, we are therefore systematically implementing measures for the prevention of environmental pollution, including the installation of backup equipment, while working to reduce the risk of pollution. In addition, in order to avoid accidents and other problems, we are bolstering efforts to optimize the operation and management of wastewater treatment systems, and to monitor and measure the quality of water draining out of our plants to confirm compliance with relevant effluent standards.

### ■ Compliance with Environmental Laws and Regulations

Over the past five years, there were no infractions of laws or regulations, and no lawsuits, related to environmental issues that were identified at Astellas' business sites. However, over the past five years, there was an incident in which Astellas exceeded the upper limit of agreed values specified in a pollution prevention agreement with a local government. However, Astellas reported the incident to the local government and is implementing response measures based on its instructions.

- Tsukuba Biotechnology Research Center: Noise (fiscal 2017)
- Tsukuba Research Center: Noise (fiscal 2017)

### ■ Environment-Related Accidents and Complaints

In fiscal 2018, there were no environment-related accidents in Japan. In fiscal 2015, there was an accident in which the pressure in the reaction vessel became higher than normal, and a part of the gas being generated was released into the atmosphere, in the pharmaceutical manufacturing process at the Takahagi Facilities. Because exhaust gas falls under the scope of the specific substances of the Air Pollution Control Law, we submitted an accident report, including the measures taken to prevent recurrence.

Except for this accident, Astellas has not recorded an environment-related accident in Japan over the past five years.

With regard to environment-related complaints associated with facilities operations, Astellas received complaints on nighttime noise from neighboring residents of the Tsukuba Research Center. Astellas has continued to implement measures to improve the situation.

### ■ Soil Contamination Assessments

In fiscal 2018, the Toyama Technology Center was designated as a contaminated area on the basis of the Soil Contamination Countermeasures Act. In the construction of new facilities, Astellas has taken appropriate action to prevent the spread of pollution in consultation with the governmental authorities.

The substances that were discovered to be present in levels that exceeded the standards are as follows:

- Arsenic and its compounds
- Fluorine and its compounds

Drawing on the results of soil contamination assessments completed over the past five years, sites other than the above where contamination has been found are as follows:

- Former Kashima R&D Center: Designation as a contaminated area (fiscal 2016)

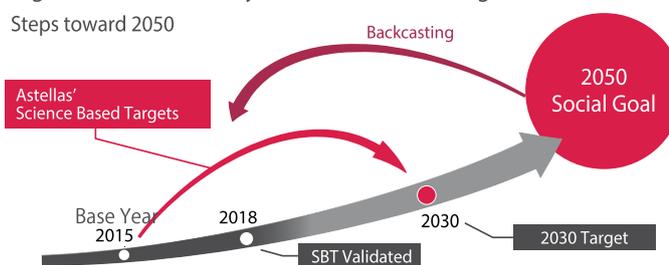
## Climate Change mitigation measures

Mitigating and adapting to the threat posed by climate change requires active involvement by national governments, local governments, corporations, citizens, and others. Astellas recognizes that climate change will become a constraint on conducting sustained corporate activity, and considers it one of management's most important problems to address.

Astellas has adopted the method for setting reduction targets recommended by the Science Based Targets (SBT) Initiative. This

method is designed to achieve the 2°C target of the Paris Agreement, which entered force in 2016. In November 2018, the SBT Initiative certified the targets laid out in Astellas' Environmental Action Plan.

In the review of risks and opportunities that the SBT target setting process and climate change will present to businesses, we have adopted the 2°C Scenario of the International Energy Agency (IEA 2DS). Guided by IEA 2DS, we will promote measures from a medium- to long-term perspective.



### Environmental Action Plan (Climate Change Mitigation Measures) (SBT approved)

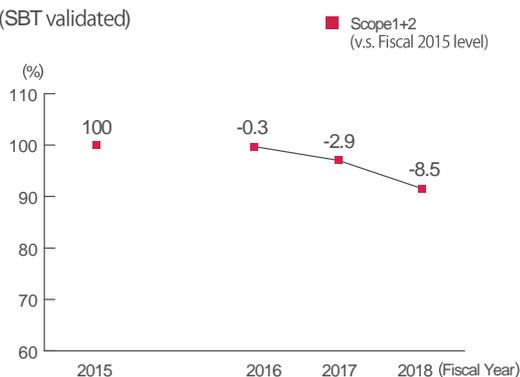
- Reduce GHG emissions (Scope 1 + Scope 2) by 30% by fiscal 2030 (Base year: fiscal 2015)
- Reduce GHG emissions (Scope 3) by 20% per unit of revenue by fiscal 2030 (Base year: fiscal 2015)

### ■ Progress on Action Plan (SBT)

Our progress toward SBT targets calculated based on the GHG Protocol is as follows:

#### Environmental Action Plan (Scope1+2)

(SBT validated)



#### Environmental Action Plan (Scope 3 / revenue)

	Fiscal 2015	Fiscal 2016	Fiscal 2017	Fiscal 2018
<b>GHG emissions (Scope 3) (tons)</b>	<b>266,637</b>	<b>253,613</b>	<b>254,991</b>	<b>228,183</b>
<b>Revenue (¥ billion)</b>	<b>1,373</b>	<b>1,312</b>	<b>1,300</b>	<b>1,306</b>
<b>Emissions per unit of revenue (tons / ¥ billion)</b>	<b>194</b>	<b>193</b>	<b>196</b>	<b>175</b>
<b>Ratio to Base-year(%)</b>	-	<b>-0.5</b>	<b>1.0</b>	<b>-10.1</b>

### ■ Changes in Actual GHG Emissions Volume

The actual volume of GHG emissions in fiscal 2018 was 194 kilotons (Scope 1: 82 kilotons, Scope 2: 112 kilotons).

#### Changes in Actual GHG Emissions Volume by Area

	Fiscal 2015				Fiscal 2016				Fiscal 2017				Fiscal 2018			
	Volume (Tons)	Ratio (%)	Volume (Tons)	Ratio (%)	Volume (Tons)	Ratio (%)	Volume (Tons)	Ratio (%)								
<b>Japan</b>	<b>166,857</b>	75	<b>166,644</b>	77	<b>162,680</b>	79	<b>155,379</b>	80								
Scope 1	61,036		61,160		60,804		56,422									
Scope 2	105,821		104,484		101,875		98,957									
<b>Americas</b>	<b>31,837</b>	14	<b>26,702</b>	12	<b>23,668</b>	11	<b>17,505</b>	9								
Scope 1	21,329		15,996		12,805		10,205									
Scope 2	10,508		10,707		10,863		7,300									
<b>EMEA</b>	<b>19,970</b>	9	<b>18,823</b>	9	<b>16,759</b>	8	<b>17,450</b>	9								
Scope 1	16,093		16,368		13,803		15,415									
Scope 2	3,877		2,455		2,955		2,035									
<b>Asia/Oceania</b>	<b>4,080</b>	2	<b>3,861</b>	2	<b>3,823</b>	2	<b>4,039</b>	2								
Scope 1	41		23		17		51									
Scope 2	4,039		3,837		3,807		3,988									
<b>Total</b>	<b>222,744</b>	-	<b>216,030</b>	-	<b>206,929</b>	-	<b>194,373</b>	-								
Scope 1	98,500		94,547		87,429		82,093									
Scope 2	124,244		121,483		119,500		112,280									

\* Non-energy-related GHG emissions are not included.

## Our efforts to reduce GHG emissions

In order to reduce GHG emissions, Astellas must implement management practices that involve the entire Group from a medium-term perspective. Astellas' manufacturing plants, research centers, sales and marketing divisions, and offices are implementing a variety of initiatives with the aim of mitigating climate change.

Regarding tangible elements, efforts to improve facilities, which include the introduction of high-efficiency equipment and the conversion to alternative fuels, are expected to make a significant contribution to reducing the level of GHG emissions generated by energy sources. Regarding intangible aspects, employees' participation in energy saving through improvements of daily work is also important. To this end, each facility adopts a two-pronged approach, comprising measures related to both tangible and intangible elements.

### ■ Promotion Framework and Initiatives for Climate Change Mitigation Measures

Astellas has established the Global EHS Sub-Committee (GEHSSC) as a special task force under the CSR Committee to discuss measures to deal with various environmental issues, including climate change mitigation measures. Members from regional bases participate in discussions on methods to save energy and reduce GHG emissions throughout the Group based on an analysis of the risks and opportunities that climate change presents to our business, and so forth.

Matters are discussed and decided in GEHSSC and are referred to the Executive Committee and the Board of Directors for discussion depending on their importance. Through this process, Astellas decides on these matters.

### ■ Analysis of the Risks and Opportunities That Climate Change Presents to Our Business

Based on IEA 2DS, we carry out scenario analysis regarding changes in the external environment due to such factors as international policy trends and emissions trading systems, the impact on work operations of physical changes caused by climate change, and assessments by stakeholders concerning our measures to mitigate and adapt to climate change. We believe that understanding the conceivable risks and moving forward with medium- to long-term measures to minimize risk will lead to opportunities for our business to be sustainable.

### ■ Investment Plan for Climate Change Mitigation Measures

In fiscal 2018, Astellas planned to invest approximately ¥750 million in mainly energy-saving measures at each business facility, the renewal of air conditioning equipment, and the introduction of LED lighting. An investment of ¥450 million was actually completed, resulting in reduction of 4,019 tons of GHG.

In addition, we are investigating feasibility of introducing renewable energy at each site.

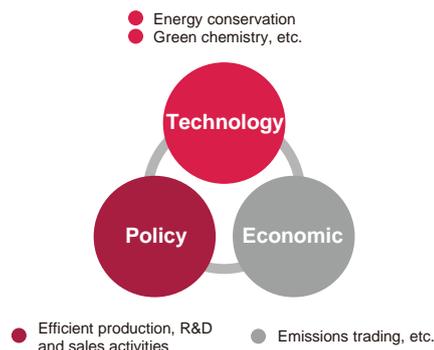
### ■ Participation in the Federation of Economic Organizations' Commitment to a Low-Carbon Society

Astellas is participating in the commitment to a low-carbon society\* formulated by the Federation of Pharmaceutical Manufacturers' Associations of Japan, which is based on requests from the Federation of Economic Organizations.

\*To reduce the amount of carbon dioxide emissions from pharmaceutical manufacturers in fiscal 2020 by 23% based on the amount of emissions in fiscal 2005.

### ■ Understanding GHG Emissions in the Supply Chain

Although the Environmental Action Plan concerning climate change is targeting emissions directly generated by business activities (Scope 1 and Scope 2), Astellas is also striving to assess emissions produced throughout the entire



supply chain (Scope 3). We have also set SBTs for GHG emissions from major categories within Scope 3, and are striving to reduce them. In addition, we encourage our production contractors to support and cooperate with our measures to reduce GHG emissions.

### ■ Priority Use of Gaseous Fuel

At Astellas' research and production bases, we use boilers fueled by city gas, LPG and LNG (liquefied natural gas), all of which generate low GHG emissions during combustion. These boilers not only contribute to reducing GHG emissions but also to reducing SOx emissions, another air pollutant.

### ■ Introduction of Energy Monitoring Systems

Knowing exactly how much energy we use is useful for the formulation of new strategies. We have introduced energy monitoring systems that can visually monitor energy usage at our facilities.

### ■ Reduction of GHG Emissions Generated by Sales Activities

Since fiscal 2008, Astellas has been striving to reduce GHG emissions associated with the use of sales fleets. In each region, we are continuously switching over to vehicles with low environmental impact (e.g. hybrid cars). In Japan, where the rate of introducing hybrid vehicles is high, the volume of GHG emissions relative to the number of vehicles has been reduced more than in other regions.

GHG emissions associated with the use of sales fleets are reported under Scope 1.

### Changes in GHG Emissions Volume (Tons)

	Fiscal 2016	Fiscal 2017	Fiscal 2018
<b>Total</b>	<b>27,287</b>	<b>24,203</b>	<b>23,725</b>
Japan	4,733	4,316	4,114
Americas	10,782	10,760	9,172
EMEA	11,772	9,127	10,439

When it cannot be directly measured, the actual fuel usage is estimated from mileage and fuel efficiency (catalog value).

## Our efforts to reduce GHG emissions

### ■ Using Renewable Energy

The use of renewable energy is one of the most effective climate change countermeasures. Astellas is proactively introducing photovoltaic panels and wind power, and such equipment as biomass boilers, to its facilities. All energy generated through these means is consumed at these

facilities.

Moreover, we purchase electricity generated by renewable energy sources. As a result, we are indirectly suppressing GHG emissions.

#### Usage of Renewable Energy (Fiscal 2018)

Offices	Type of renewable energy	Energy consumed
Kerry Plant	Wind turbine generation (Power capacity 800 kW)	1,688 MWh
	Wood chip biomass boiler (Power capacity 1.8 MW)	38,794 GJ
	Purchase of electricity generated by renewable energy sources	6,827 MWh
Dublin Plant	Purchase of electricity generated by renewable energy sources	4,993 MWh
Meppel Plant	Purchase of electricity generated by renewable energy sources	12,908 MWh
Leiden	Purchase of electricity generated by renewable energy sources	3,120 MWh
	Use of geothermal heat	1,665 GJ
US HQs	Use of geothermal heat	3 GJ
Tsukuba Research Center	Photovoltaics	48 MWh
Yaizu Facilities	Use of geothermal heat (cannot be measured)	-

### ■ Breakdown of Energy Consumption

Global energy usage in fiscal 2018 by the Astellas Group amounted to 4,099 terajoules (TJ), for a decrease of 4.3% (183 TJ) over the previous year. The percentage of total energy consumption accounted for by electricity is high because in each region a large amount of electricity is consumed by the

operation of air conditioning equipment.

Astellas strives to reduce its energy consumption, including through the continued implementation of energy-saving measures and the introduction of highly efficient equipment.

(Unit: TJ)

Japan	Fiscal 2015	(%)	Fiscal 2016	(%)	Fiscal 2017	(%)	Fiscal 2018	(%)
<b>Liquide fuel</b>	<b>80</b>	3	<b>72</b>	2	<b>65</b>	2	<b>62</b>	2
<b>Gaseous fuel</b>	<b>1,098</b>	35	<b>1,133</b>	35	<b>1,119</b>	36	<b>1,036</b>	34
<b>Heat purchased</b>	<b>8</b>	0	<b>8</b>	0	<b>7</b>	0	<b>5</b>	0
<b>Electricity purchased</b>	<b>1,962</b>	62	<b>1,986</b>	62	<b>1,960</b>	62	<b>1,964</b>	64
<b>Natural energy</b>	<b>0.2</b>	0	<b>0.2</b>	0	<b>0.2</b>	0	<b>0.2</b>	0
Photovoltaic	0.2		0.2		0.2		0.2	
<b>Total</b>	<b>3,149</b>	100	<b>3,199</b>	100	<b>3,150</b>	100	<b>3,068</b>	100

Americas	Fiscal 2015	(%)	Fiscal 2016	(%)	Fiscal 2017	(%)	Fiscal 2018	(%)
<b>Liquide fuel</b>	<b>188</b>	24	<b>169</b>	27	<b>168</b>	37	<b>143</b>	43
Renewable energy sourced	5		9		8		6	
<b>Gaseous fuel</b>	<b>183</b>	23	<b>104</b>	17	<b>41</b>	9	<b>21</b>	6
<b>Heat purchased</b>	-	-	-	-	-	-	-	-
<b>Electricity purchased</b>	<b>422</b>	53	<b>345</b>	56	<b>241</b>	54	<b>171</b>	51
Renewable energy sourced	205		122		-		-	
<b>Natural energy</b>	-	-	-	-	<b>0</b>	0	<b>0</b>	0
Geothermal heat	-		-		0		0	
<b>Total</b>	<b>793</b>	100	<b>618</b>	100	<b>450</b>	100	<b>335</b>	100

EMEA	Fiscal 2015	(%)	Fiscal 2016	(%)	Fiscal 2017	(%)	Fiscal 2018	(%)
<b>Liquide fuel</b>	<b>167</b>	26	<b>177</b>	27	<b>137</b>	22	<b>156</b>	24
<b>Gaseous fuel</b>	<b>95</b>	15	<b>95</b>	15	<b>97</b>	15	<b>96</b>	15
Renewable energy sourced	-		8		7		-	
<b>Heat purchased</b>	-	-	-	-	-	-	-	-
<b>Electricity purchased</b>	<b>346</b>	53	<b>337</b>	52	<b>352</b>	56	<b>341</b>	53
Renewable energy sourced	258		278		276		278	
<b>Natural energy</b>	<b>43</b>	7	<b>41</b>	6	<b>45</b>	7	<b>47</b>	7
Wind	7		6		6		6	
Wood chip biomass	36		35		37		39	
Geothermal heat	-		-		1		2	
<b>Total</b>	<b>651</b>	100	<b>650</b>	100	<b>631</b>	100	<b>640</b>	100

Asia/Oceania	Fiscal 2015	(%)	Fiscal 2016	(%)	Fiscal 2017	(%)	Fiscal 2018	(%)
<b>Liquide fuel</b>	<b>0.1</b>	0	<b>0.1</b>	0	<b>0.1</b>	0	<b>0.6</b>	1
<b>Gaseous fuel</b>	<b>0.7</b>	1	<b>0.2</b>	0	<b>0.2</b>	0	<b>0.2</b>	0
<b>Heat purchased</b>	<b>18</b>	34	<b>19</b>	37	<b>20</b>	40	<b>22</b>	40
<b>Electricity purchased</b>	<b>34</b>	65	<b>32</b>	62	<b>30</b>	59	<b>32</b>	59
<b>Natural energy</b>	-	-	-	-	-	-	-	-
<b>Total</b>	<b>53</b>	100	<b>51</b>	100	<b>51</b>	100	<b>55</b>	100

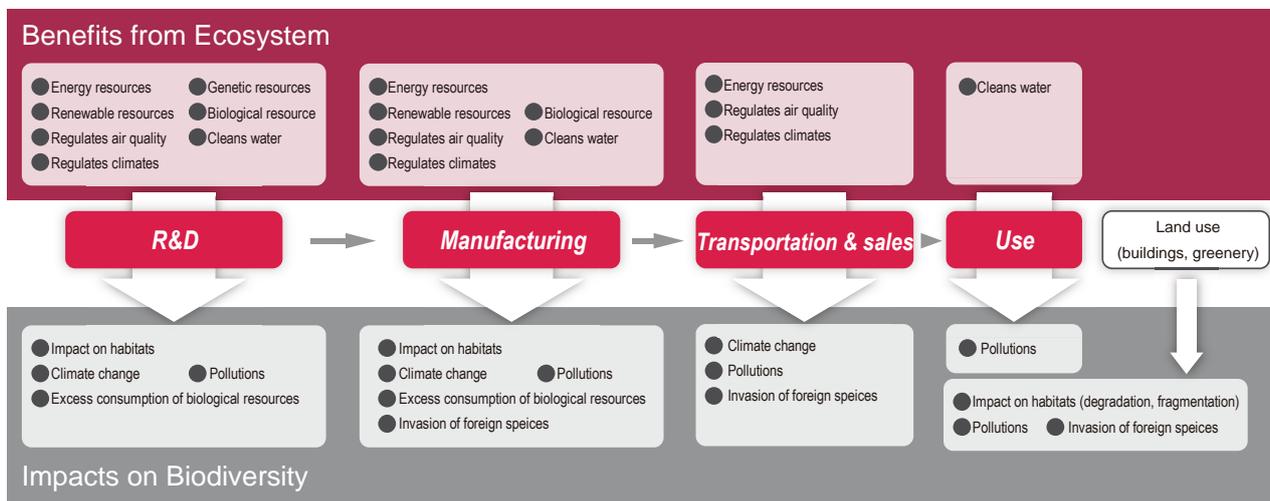
## Sustainable biodiversity initiatives

Astellas is thankful for the benefits brought about by biological diversity, and understands its business activities in all fields have an impact on ecosystems. We will make a positive contribution to the preservation of biodiversity by working to lessen that impact. Furthermore, we will actively contribute to the creation of a society that coexists with the natural world, enabling the preservation of biodiversity and the sustainable use of the benefits of healthy ecosystems.

### Basic Policy on Biodiversity

- We will endeavor to lessen our overall environmental impact on biodiversity by working to implement Climate Change Mitigation Measures, minimize environmental pollution, and promote resource recycling.
- We will endeavor to develop technologies that lessen the impact on ecosystems by lowering the burden we place on the environment and using as few natural resources as possible.
- We will endeavor to handle genetic resources in accordance with international standards and the regulations of producing nations.
- We will endeavor to broaden our efforts to preserve biodiversity with the aim of creating a sustainable society that coexists in harmony with nature. To this end, we will promote discussion within society and among affected parties, while reaching across national and geographical borders.
- We will endeavor to foster a corporate culture that will always act with respect for biodiversity and in a manner that is harmonious with our business activities, grateful for the benefits obtained from healthy ecosystems.

### ■ Biodiversity and Astellas



### ■ Biodiversity Index

Astellas assesses the three main factors that are causing the deterioration of biodiversity as being environmental pollution, resource consumption, and climate change, and has created a Biodiversity Index to evaluate the impact of its business activities on biodiversity.

The environmental burden for each sub-category in the assessment fiscal year is divided by the corresponding burden in the base-year and then multiplied by the weight to derive the “biodiversity burden index.” The “biodiversity index” is calculated by dividing Astellas’ consolidated revenue in the assessment fiscal year by the total of all the biodiversity burden index figures. Improvement can be determined by comparing this index to the base year.

Category	Sub-Categories	Weight (%)
Environmental pollution	NOx, SOx emissions	10
	Chemical substances emissions	10
	BOD load, COD load	10
	(subtotal)	(30)
Resource consumption	Water withdrawal (Global)	20
	Biological raw material usage	10
	Landfill waste volume	10
	(subtotal)	(40)
Climate change	GHG emissions (global)	30
	(subtotal)	(30)
<b>Total</b>		<b>100</b>

$$\text{Biodiversity Index} = \frac{\text{Consolidated revenue in assessment fiscal year}}{\sum \left( \frac{\text{Burden in assessment fiscal year}}{\text{Burden in the base year}} \times \text{Weight} \right)}$$

**Environmental Action Plan (Biodiversity)**

■ Raise the Biodiversity Index to triple the fiscal 2005 level by fiscal 2020. (Global)

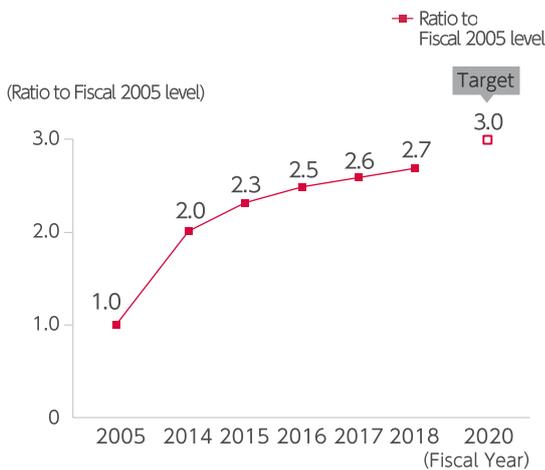
■ **Progress of Action Plan (Biodiversity)**

The Biodiversity Index for fiscal 2018 came in at 2.7 times the figure recorded in fiscal 2005. As the scope of the Environmental Action Plan has expanded regarding climate change, so has the scope of each index used to calculate the Biodiversity Index. The following graph has been recalculated from past indices. We will continue our current activities aiming to achieve our targets by the end of fiscal 2020.

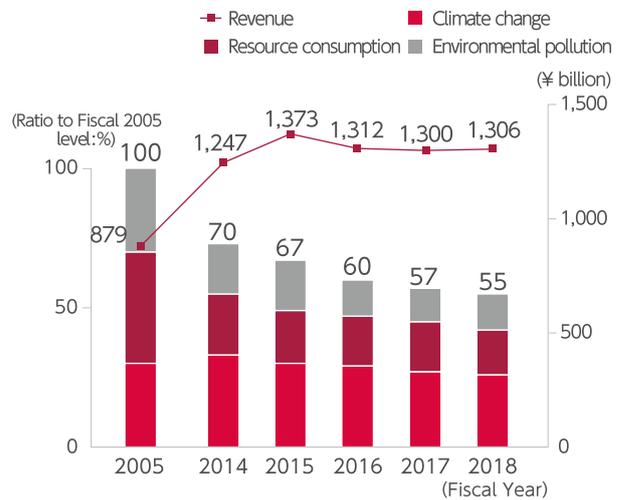
Beyond the region, Astellas believes that by minimizing the

impact of its business activities on the environment, the Company will help suppress the deterioration of biodiversity and realize an environment in which sustainable business activities may be continued.

**Biodiversity Index**



**Biodiversity Burden Index and Revenue**



■ **Sustainable Biodiversity Initiatives through Social Contribution Activities**

Among the principal factors responsible for the deterioration of biodiversity, degradation of satochi-satoyama natural rural area is said to be caused by the loss of human intervention coupled with modernization. Astellas recognizes the difficulty in direct involvement with this issue in the course of our business activities. Despite this difficulty, we are keen to pursue initiatives through our social contribution activities in cooperation with external organizations.

In fiscal 2018, we held our seventh tree planting event on the slopes of Mount Tsukuba. More than 100 participants, including Astellas employees together with their family members on a volunteer basis, planted around 600 seedlings on Mount Tsukuba. Of these, roughly 105 had been grown from acorns collected by members of staff of the Tsukuba Research Center within the center's grounds.



## Initiatives for Resource Recycling

Astellas recognizes that since the use of sustainable resources is essential for continuing its business activities, it must play an active role in the creation of a recycling-oriented society. We have established an Environmental Action Plan and are moving forward with steps to effectively use water resources and recycle waste materials (reuse, recycling, and use of all thermal energy) as initiatives contributing to a recycling-oriented society.

### Environmental Action Plan (Measures for the Conservation of Resources)

- Enhance water resource productivity by around 2.5 times the fiscal 2005 result by the end of fiscal 2020.

Applicable area: Research and production site

Indicator :  $\frac{\text{Revenue (¥ billion)}}{\text{Water resources withdrawn (thousand m}^3\text{)}}$

### ■ Effective Use of Water Resource

The effective use of water resources serves as a useful indicator for gauging society's impact on biodiversity. Astellas assesses the relationship between water resources and economic activity using a water resource productivity index, and has been striving to improve this index. Water resource productivity for fiscal 2018 improved 3.0 times compared with the base year of fiscal 2005.

#### Changes in Water Resources Withdrawn and Revenue

	Fiscal 2005	Fiscal 2017	Fiscal 2018
<b>Water resource withdrawn (thousand m<sup>3</sup>)</b>	<b>17,055</b>	<b>8,821</b>	<b>8,501</b>
Japan			
Surface water	14,012	7,738	7,503
Ground water	2,479	853	810
Americas			
Surface water	289	61	18
Ground water	-	-	-
EMEA			
Surface water	235	150	149
Ground water	16	-	-
Asia/Oceania			
Surface water	24	20	21
Ground water	-	-	-
Among them, research and production site	<b>16,990</b>	<b>8,813</b>	<b>8,490</b>
<b>Revenue (¥ billion)</b>	<b>879</b>	<b>1,300</b>	<b>1,306</b>
<b>Water resource productivity (¥ billion/thousand m<sup>3</sup>)</b>	<b>0.05</b>	<b>0.15</b>	<b>0.15</b>
<b>Ratio to Base-year (Times)</b>	-	<b>2.9</b>	<b>3.0</b>

### ■ Recycling of Water

At Astellas, water used in work operations is treated in accordance with wastewater discharging standards and returned to an aquatic environment. The amount of water recycled is almost equivalent to the entire amount of water intake.

### ■ Risk Assessments

Astellas uses the Global Water Tool™ provided by the World Business Council for Sustainable Development (WBCSD) to analyze water risks specific to the operating regions where its plants and other facilities are located.

The Astellas Group on a global basis does not currently withdraw water from water bodies in areas concerned with water resource depletion. As water risks may emerge in the future as a result of climate change, we are taking steps to minimize our dependence on such resources, and also regard this as an effective means of ensuring business continuity.

### Environmental Action Plan (Waste Management)

- Improve waste generated per unit of revenue to around 20% of fiscal 2005 result by the end of fiscal 2020

Applicable area: Research and Production site

Indicator:  $\frac{\text{Waste generated (tons)}}{\text{Revenue (¥ billion)}}$

### ■ Waste Management

Astellas is promoting efforts to reduce the waste landfill volume to as close to zero as possible through the proactive recycling and reuse of waste materials. Moreover, Astellas also evaluates the relationship between the waste generation volume and economic activities with the index known as the Waste generated per unit, and the Company is making efforts to improve it.

In fiscal 2018, the waste generated per unit improved 22% over the base year (fiscal 2005).

#### Changes in Waste Generation Volume and Revenue

	Fiscal 2005	Fiscal 2017	Fiscal 2018
<b>Waste generated (tons)</b>	<b>44,771</b>	<b>13,964</b>	<b>14,775</b>
Japan	38,476	11,565	12,366
Americas	551	1	59
EMEA	5,621	2,339	2,237
Asia/Oceania	123	59	114
<b>Revenue (¥ billion)</b>	<b>879</b>	<b>1,300</b>	<b>1,306</b>
<b>Waste generated per unit (tons/¥ billion)</b>	<b>51</b>	<b>11</b>	<b>11</b>
<b>Ratio to Base-year(%)</b>	-	<b>21</b>	<b>22</b>

### ■ Waste management in the value chain

In waste management, it is also important to prevent environmental pollution being caused by hazardous waste generated by research centers and manufacturing plants and the illegal disposal of that waste. As a means of prevention, we first examine appropriate methods of waste disposal, and then conduct regular on-site assessment that waste treatment contractors are using appropriate waste treatment methods.

### ■ State of PCB-contaminated Waste Storage

We have been systematically conducting detoxification of any PCB-contaminated equipment that is stored by Astellas. Load-figure registrations for all items stored at each of our business facilities have been completed. In fiscal 2017, we conducted waste disposal at multiple business facilities, and the waste storage situation at the end of March 2019 was as follows.

#### State of PCB-contaminated Waste Storage

Load-figure	Weight (kg)
Drum	9,995
Pail	37
Glass container	0.3

## Initiatives for Preventing Pollution

Astellas promotes activities to prevent global environmental pollution. For major environmental management indicators for air and water quality, we have set and managed stricter voluntary control values than the values stipulated by laws and regulations and agreed values. In addition, we are promoting voluntary activities to reduce atmospheric emissions of chemical substances.

### ■ Air Pollution—Reduction of VOC emissions

Astellas sets voluntary numerical targets for reducing the amount of volatile organic compounds (VOCs) it discharges accompanying the use of solvents in production and research activities, and makes efforts to reduce emissions. Moreover, we have taken steps to minimize the impact of our business operations on our employees, the regional communities in which we work, and the global environment. Such steps include measures to prevent environmental pollution by chemical substances as well as workplace accidents and health hazards, and take the form of adopting new production methods that do not employ high-risk chemicals.

### ■ Air Pollution—Reduction of NOx emissions

To reduce the emission of NOx into the atmosphere, Astellas has installed boilers that use gaseous fuels (city gas, LNG, and LPG). The NOx emissions from all business sites in Japan are as shown in the table below. The NOx emissions from non-Japanese production sites in fiscal 2018 amounted to 6 tons.

Astellas does not use equipment that runs on fuel oil, and thus SOx (sulfur oxide) emissions are not discharged.

Substance	Fiscal 2014	Fiscal 2015	Fiscal 2016	Fiscal 2017	Fiscal 2018
VOC	44	42	49	34	44
NOx	26	24	27	21	22

VOC: Plants and research facilities in Japan

NOx: All business facilities in Japan (excluding branches and sales offices)

### ■ Further Information on the PRTR System

Japan's PRTR Act designates substances harmful to human beings and recognized to widely exist in the environment. The main aim of the act is to confirm the nature of the emissions and transfers of a company and link the results to independent assessments and improvement of voluntary chemical substance management. The table below shows the release and transfer of PRTR-designated substances that we identified and reported on in fiscal 2018. Our total amount of designated chemical substances released into the environment in fiscal 2018 was 6 tons, representing a continuing decrease.

PRTR: Refers to chemical substances designated under Japan's Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof (Pollutant Release and Transfer Register Law)

Substance name	Volume handled	Volume released			Volume transferred	
		Air	Water	Soil	Waste	Sewerage
Acetonitrile	24.658	0.426	0.000	0.000	8.950	0.000
Chloroform	11.754	1.854	0.000	0.000	9.900	0.000
Dichloromethane (Methylene chloride)	45.282	3.629	0.000	0.000	5.824	0.000
N,N-dimethylformamide	13.760	0.000	0.000	0.000	7.271	0.000
Sodium Dodecyl Sulfate	14.436	0.000	0.000	0.000	0.000	0.000
Toluene	2.080	0.000	0.000	0.000	2.080	0.000
n-Hexane	3.076	0.554	0.000	0.000	2.523	0.000

Target: Plants and research facilities in Japan

### ■ Water Pollution

Astellas measures the extent of its impact on aquatic environments using the biochemical oxygen demand (BOD) load as an index in Japan and the chemical oxygen demand (COD) load as an index in other countries, and makes the data available to the public. In Japan, the BOD load in fiscal 2018 was 9 tons, slightly down from the previous fiscal year. Outside Japan, the COD in fiscal 2018 was 26 tons, slightly up from the previous year.

Since the discharge into water of chemical substances used in manufacturing processes can have a negative impact on ecosystems, we are examining ways of reducing such discharges as much as possible at all stages from R&D onward. With respect to future drug candidate substances discovered and developed by Astellas, we are examining the impact pharmaceuticals would have on ecosystems through the evaluation of their biodegradability in the natural environment. In addition, from fiscal 2015 we evaluated our wastewater management method by using bioassays targeting business facilities that were releasing wastewater into rivers after treatment. We confirmed that they are now less likely to have a significant impact on the ecosystem.

### Changes in BOD Load (tons)

Substance	Fiscal 2014	Fiscal 2015	Fiscal 2016	Fiscal 2017	Fiscal 2018
BOD	12	12	13	12	10
Drainage into rivers	10	10	11	9	8
Drainage into sewer system	2	2	2	3	2

Target: All Japanese production facilities and R&D centers

Some data of BOD load of public rivers were revised retroactively.

### Changes in Drainage Volume (thousand m<sup>3</sup>)

Destination	Fiscal 2014	Fiscal 2015	Fiscal 2016	Fiscal 2017	Fiscal 2018
Drainage Volume	8,600	8,220	8,194	8,293	8,058
Drainage into rivers	8,240	7,902	7,969	8,066	7,820
Drainage into sewer system	360	318	225	227	238

Target: All business facilities in Japan (excluding branches and sales offices)

Some data of drainage into rivers were revised retroactively.

## Environmental impact of products and countermeasures

### ■ Greenhouse Gases

Although Astellas sold one pharmaceutical product that uses hydrofluorocarbons (HFCs) as a filler agent, from fiscal 2015 Astellas has not sold any products that emit GHG during use phase because at the end of March 2015 we ceased selling said products in line with our sales strategy concerning related products.

We have introduced technology that enables fine-powdered agents to be easily quantitatively inhaled by newly developed inhalation device products. In this manner, we are striving to reduce the environmental impact.

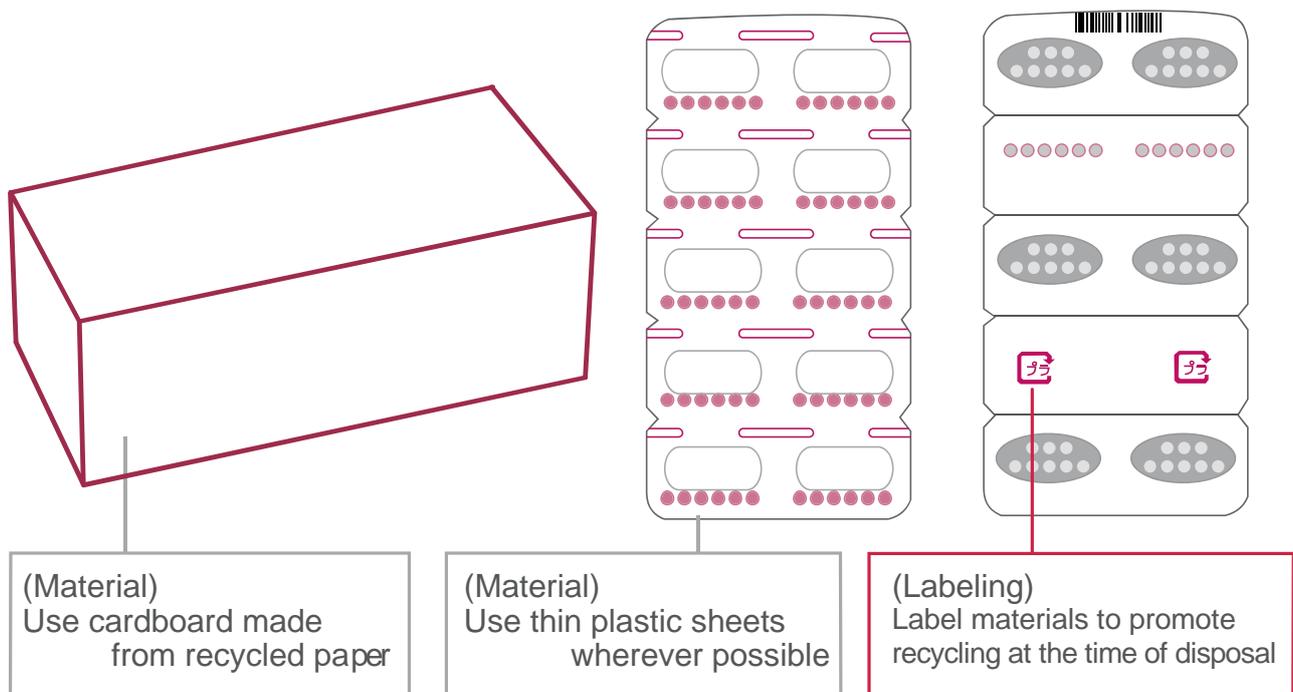
### ■ Containers and Packaging Recycling

The products manufactured and marketed by the Company are administered to patients through medical institutions. After their use, packaging materials are disposed of by hospitals, pharmacies, and general households. The waste discarded by general households is mainly comprised of PTP (plastic) packaging used for tablets and capsules. Hospitals and pharmacies discard PTP packaging as well as various types of plastics including bottles and tubes, metals, glass materials used in injectable solutions products, and such paper items as individual packaging and cardboard boxes.

and Packaging Recycling Law (which mandates the sorted collection of containers and packaging, and promotes their reuse in commercial products) sellers of products are responsible for defraying the costs of recycling of such waste products. The estimated total amount of plastic and paper containers and packaging used in Astellas products in fiscal 2018 is 479 tons, and the Company was requested to pay ¥14.28 million in recycling costs.

In the case of pharmaceutical packaging, certain functions remain essential to ensure the safe storage of products as well as compliance with the provisions stipulated under the Pharmaceutical and Medical Device Act of Japan. In addition to these functions and requirements, Astellas selects environmentally friendly materials for use in its packaging while engaging in a variety of initiatives including the labeling of materials to promote recycling at the time of disposal.

To encourage the recycling of containers and packaging for household use in Japan, in accordance with the Containers



## Environmental Accounting

Astellas calculates the costs of investment and expenses related to environmental conservation for its facilities in Japan and their outcomes based on the Ministry of the Environment's "Environmental Accounting Guidelines."

Environmental conservation costs in fiscal 2018 comprised ¥1,578 million in investments and ¥2,185 million in expenses (including depreciation costs). The main investments for preventing pollution were in the maintenance of wastewater treatment plants and the repair of underground water-supply pipelines. Among investments in global environmental protection, devices scheduled for servicing, including a small

reflux boiler and refrigeration equipment, were updated. The economic benefits generated through environmental protection activities amounted to ¥19 million, which includes lower costs owing to energy savings, the sale of waste organic solvents and waste metals, lower costs of treating waste materials and the purchase of regenerated organic solvents. In fiscal 2016, we completed all the load-figure registrations of high-concentration PCBs and calculated the cost based on the weight, including the containers. As a result of the PCB disposal having progressed in part, the allowance for the current PCB treatment amounted to ¥255 million.

### ■ Total environmental conservation costs in fiscal 2018

Category		Environmental Conservation Costs (¥ million)				
		Investments	Costs			
			Total	Expense	Depreciation	
Business Area Cost		1,526	1,828	1,153	675	
Breakdown	Pollution Prevention	Prevention of atmospheric pollution	22	191	183	7
		Prevention of water pollution	138	450	311	139
		Prevention of soil contamination	0	6	4	3
		Prevention of noise, bad odor and vibrations	13	6	2	4
		Other	0	3	2	1
		Subtotal	172	656	502	154
	Global Environmental Conservation	Mitigation of climate change	806	379	75	305
		Prevention of ozone layer depletion	477	300	143	157
		Management of chemical substances	0	81	74	7
		Other	71	30	11	20
	Subtotal	1,354	790	302	489	
	Resource circulation	Efficient use of wastes	0	198	198	0
		Conservation of water	0	0	0	0
		Treatment of wastes	0	162	130	32
		Other	0	22	21	1
Subtotal	0	382	350	32		
Upstream/Downstream costs		0	45	45	0	
Administration costs		0	261	261	0	
R&D costs		52	49	23	26	
Social activity costs		0	1	1	0	
Environmental remediation costs		0	256	256	0	
Total		1,578	2,441	1,740	701	
Total environmental conservation costs, excluding environmental remediation costs		1,578	2,185	1,484	701	

### Economic Benefit Related to Environmental Conservation (Quantifiable items only included in calculation)

Measures taken	Economic Benefit Related to Environmental Conservation
Cost reductions through energy conservation	14 million
Sludge drying, reduction in amount of waste liquid disposal contracted out (through increased disposal in-house)	0.3 million
Conservation of resources through reuse of solvents, and reduction in fuel purchases through conversion of solvents to fuel	0 million
Sale of waste solvents	5 million
Total	19 million

### ■ Changes in Environment-related Investment and Expensed

Categories	Fiscal 2014		Fiscal 2015		Fiscal 2016		Fiscal 2017		Fiscal 2018	
	Investments	Expenses	Investments	Expenses	Investments	Expenses	Investments	Expenses	Investments	Expenses
Pollution Prevention	146	303	313	324	588	457	229	478	172	502
Global Environmental Conservation	206	113	256	84	330	354	264	431	1,354	302
Resource Circulation	8	462	64	431	159	322	0	345	0	350
Upstream/downstream costs	0	53	0	53	0	53	0	53	0	45
Administration costs	28	295	0	283	1	246	1	217	0	261
R&D costs	0	63	24	22	55	83	30	61	52	23
Social activity costs	0	6	0	5	0	3	0	1	0	1
Environmental remediation costs	0	363	0	362	0	293	0	293	0	256
<b>Total</b>	<b>387</b>	<b>1,657</b>	<b>657</b>	<b>1,565</b>	<b>1,134</b>	<b>1,812</b>	<b>523</b>	<b>1,879</b>	<b>1,578</b>	<b>1,740</b>

## Occupational Health & Safety

Ensuring employee safety in the workplace is a crucial component of Astellas' management philosophy. Along with providing a pleasant workplace for its employees, who are key Company stakeholders, Astellas believes that one of its major responsibilities is to ensure employee safety.

Since its inception in 2005, Astellas has not experienced any accidents leading to the loss of life among employees (including contract employees and business contractors). However, there have been more than a few incidents with the potential to cause a major accident. In order to prevent such work-related accidents and minimize the impact when such

accidents occur, Astellas is promoting initiatives to ensure the safety of its working environments. These initiatives include activities based on knowledge obtained from past experience and consideration of measures to identify and address work-related risks.

The Company will continue to share information regarding occupational safety and accident prevention throughout the Group, based on the belief that business sites will be able to utilize this information including case examples of work-related accidents to lower risk on an ongoing basis.

### Occupational Health & Safety Action Plan

Astellas has drawn up an Occupational Health & Safety Action Plan for the purpose of maintaining and securing a safe work environment, preventing work-related accidents, and minimizing accidents caused by workplace mishaps. The Astellas Environment, Health & Safety (EHS) Policy and Guidelines set forth unified standards that identify Astellas' aspirations in its EHS activities. Based on this policy and guidelines, Astellas is building an EHS management system at each business site and promoting related activities.

### Incidence of Work-Related Injuries

To prevent work-related accidents, we share information on work-related accidents and near-misses that have occurred at business sites in Japan and overseas, without identifying any individuals involved. We are striving from more diverse perspectives to ensure a safe work environment.

From 2017, Astellas began consolidating occupational

### Severity Rate of Work-Related Injuries

Prevent the incidence of major occupational accidents while maintaining a severity rate of work-related injuries at or below 0.005 at all business sites

### Risk Assessment

Assess all business operations to identify risks in all areas as well as establish self-regulations to reduce such risk

health & safety data for offices and research bases outside Japan. From January to December 2018, there were no work-related fatalities, while there were 19 cases of injuries requiring leaves of absence. The longest leave of absence was 125 days due to a traffic accident. We are working to further reduce risks in the future with the goal of achieving a global severity rate of work-related injuries of less than 0.005.

		2016	2017	2018
<b>Global</b>	Number of work-related injuries (leave of absence)	-	11	19
	Frequency rate of work-related injuries *	-	0.32	0.55
	Severity rate of work-related injuries *	-	<b>0.007</b>	<b>0.009</b>
<b>Japan</b>	Number of work-related injuries (leave of absence)	5	2	5
	Frequency rate of work-related injuries *	0.34	0.13	0.35
	Severity rate of work-related injuries *	<b>0.001</b>	<b>0.001</b>	<b>0.003</b>
<b>Americas</b>	Number of work-related injuries (leave of absence)	-	5	4
	Frequency rate of work-related injuries *	-	0.83	0.62
	Severity rate of work-related injuries *	-	<b>0.020</b>	<b>0.004</b>
<b>EMEA</b>	Number of work-related injuries (leave of absence)	-	4	8
	Frequency rate of work-related injuries *	-	0.51	0.89
	Severity rate of work-related injuries *	-	<b>0.014</b>	<b>0.025</b>
<b>Asia/Oceania</b>	Number of work-related injuries (leave of absence)	-	0	2
	Frequency rate of work-related injuries *	-	0	0.40
	Severity rate of work-related injuries *	-	<b>0</b>	<b>0.002</b>

\* Please refer to the abbreviation table for details

\* Global and non-Japanese regional aggregates are disclosures from 2017.

\*Frequency rate of work-related injuries of EMEA has been revised in 2017 as working hours have been revised.

Severity rate of work-related injuries of EMEA has been revised in 2017 as working hours have been revised and the number of days of injury leave was fixed in 2018.

### Safety Initiatives

Astellas is building management systems related to occupational health and safety, security, accident prevention and other priorities, and is making well-organized and systematic efforts to implement occupational health and safety management activities. Astellas employees are required to give top priority to safety in all business operations, as confirmed by both management and labor. Moreover, Astellas strives to ensure the safety of all of its workers. For example, with regard to safety management of business contractors, Astellas provides regular safety education and requires business contractors to obtain permission to perform certain tasks, as necessary.

In addition, it will be crucial to continuously develop occupational health and safety managers with specialized

skills, and provide the training needed to integrate the approved procedures into day-to-day activities. Accordingly, Astellas has been improving skills by fostering collaboration between business sites and divisions, along with enhancing various safety education initiatives.

At business sites that must be established under laws and regulations, Astellas has set up occupational health and safety committees led by the business site manager and attended by representatives of labor and management. These committees meet on a regular basis to hold discussions on maintaining occupational health and safety, and safe workplace environments. The committees conduct activities such as identifying hazards, performing risk assessments and sharing information on occupational health and safety.

## Methods for calculating performance data

### ■ Methods for Calculating Energy Consumption and GHGs

Type	Conversion Coefficients	
	Calorific value	CO <sub>2</sub> emissions
Electricity	9.97 GJ/MWh	--*1 tons/MWh
Kerosene	36.7 GJ/kiloliter	2.49 tons/kiloliter
LPG	50.8 GJ/tons	3.00 tons/tons
LNG	54.6 GJ/tons	2.70 tons/tons
City gas	45.0 GJ/thousand m <sup>3</sup> N	2.24 tons/thousand m <sup>3</sup> N
Diesel	37.7 GJ/kiloliter	2.58 tons/kiloliter
Gasoline	34.6 GJ/kiloliter	2.32 tons/kiloliter
Purchased thermal energy	1.36 GJ/GJ	0.057 tons/GJ
Steam	2.8 GJ/tons	0.091 tons/GJ

\*1 To calculate the CO<sub>2</sub> emissions resulting from electricity usage, Astellas uses CO<sub>2</sub> emission coefficients provided by the electric power companies that supply each business facility (market-based method). In the case of Japan, we use the most recent emission coefficient of each electric power company announced by the Ministry of the Environment and the Ministry of Economy, Trade and Industry. In other regions where individual coefficients cannot be obtained, we use the latest country-specific coefficients provided in IEA *Emissions Factors* (2018 edition) published by the International Energy Agency (IEA).

\*2 In converting the amount of power generated by renewable energy sources such as photovoltaics and wind into energy value in Joule, we have used a conversion rate of 3.6 MJ per 1 kWh.

### ■ Calculation Method for Scope 3 Emissions

Categories	Basis for calculation and calculation method	Emission source unit
1 Purchased goods and services	<b>Based on: Purchase price (¥ million)</b> Purchase monetary amount of raw material x emission source unit of each raw material	Target: Production bases in Japan Emission source unit: • Source: The Ministry of the Environment's database*[5]; emission source units based on the industry-related table Emission source unit on monetary basis for each raw material (purchaser price basis)
2 Capital goods	<b>Based on: Capital expenditures (¥ million)</b> Facility investment amount (consolidated) x emission source unit per price of capital goods	Target: Global Emission source unit: • Source: The Ministry of the Environment's database*[6]; emission source units per price of capital goods (Secretariat) Pharmaceuticals 2.83 t-CO <sub>2</sub> equivalent / million yen
3 Fuel and energy related activities (not included in Scope 1 and Scope 2)	<b>Based on: Consumption of each type of energy (GJ)</b> Usage amount of purchased fuel, electricity, heat, etc. x emission source units per usage amount for each energy type	Target: Global Emission source unit: • Source: The Ministry of the Environment's database*[7]; emission source units per usage amount of electricity and heat (Secretariat) • Source: "Carbon footprint communications program, Basic database Ver. 1.01"
4 Transportation and distribution	<b>Based on: Fuel usage (kiloliter), Energy consumption (MWh)</b> CO <sub>2</sub> emissions during transportation: Calculation method for CO <sub>2</sub> emissions from energy sources related to cargo transportation by transportation carrier stipulated by Act on the Rational Use of Energy CO <sub>2</sub> emissions at distribution warehouses: Electricity usage amount x emission source unit	Target: Transport in Japan Emission source unit during transportation: • Source: Calculation of Greenhouse Gas Emissions Calculation: Reporting Manual (Ver4.3.1) Electricity emissions intensity: • The latest adjusted emission coefficient for each power supplier
5 Waste generated in operation	<b>Based on: Shipping weight and distance (tons*kilometer)</b> CO <sub>2</sub> emissions generated during industrial waste transportation: Calculation method for CO <sub>2</sub> emissions from energy sources related to cargo transportation by transportation carrier stipulated by Act on the Rational Use of Energy CO <sub>2</sub> emissions generated during industrial waste treatment: Amounts of recycled industrial waste, incineration processing, and direct landfill processing x waster type/emission source unit by processing method	Target: Production bases in Japan Emission source unit during industrial waste transportation: • Source: Calculation of Greenhouse Gas Emissions: Reporting Manual (Ver4.3.1) Emission source unit during industrial waste transportation: • Source: The Ministry of the Environment's database*[8]; emission source units by waste type (Secretariat) (excluding waste transportation stage)
6 Business travel (by airplane)	<b>Based on: Distance traveled (1,000 people*kilometer)</b> Number of persons using airplanes x distance between airports for each flight x emission source unit	Target: Global (Results compiled from all airplane flights except for Asia (excluding China) and Oceania regions) Flight distance between airports: Calculated by assuming flight is a straight line connecting two points on the earth's surface Emission source unit: • Source: A calculation sheet made public by Defra (The Department for Environment, Food and Rural Affairs, UK) Emission source unit by flight class and distance
7 Employee commuting	<b>Based on: Distance traveled (1,000 people*kilometer)</b> Train: Number of persons commuting by train x distance x emission source unit Bus: Number of persons commuting by bus x distance x emission source unit Car: Number of persons commuting by car x distance x emission source unit	Target: Japan (Number of commuting days per year: 236 days) Emission source units of trains and buses: • Source: The Ministry of the Environment's database*[10]; emission source units per traveler-kilometer (Secretariat) Emissions source unit of cars: Cars: Astellas internal regulations for private-use car commuting expenses • Source: Ministry of Land, Infrastructure, Transport and Tourism's "Survey on Motor Vehicle Fuel Consumption Statistics for 2017" Fuel consumption rate of gasoline by private-use car (12.0 km/L)
11 Use of sold products	<b>Based on: Shipment volume (Number of shipments x volume containing HFC/shipment) (Tons-HEC)</b> Amount of HFC used as fillers in inhalation-type medical drugs x GWP	Target: Japan Targets sold inhalation-type medical drugs (HFC specification products)
12 End-of-life treatment of sold products	<b>Based on: Weight of containers and packaging (Tons)</b> Usage volume of sold products when end-of-life treatment is approached in line with the laws on recycling containers and packaging x emission source unit	Target: Japan Emission source unit: • Source: The Ministry of the Environment's database*[9]; emission source units by waste type (Secretariat) (including waste transportation stage)

The Ministry of the Environment's database: The Ministry of the Environment's emission source unit database (ver. 2.6) for calculating greenhouse gas emissions through the supply chain (March 2019)

## Site data (major facilities)

### Nishine Plant

INPUT		
Energy	Electricity	10,114 MWh
	Kerosene	0 kiloliter
	LPG	2 tons
	LNG	1,113 tons
	City gas	- thousand m <sup>3</sup>
	Diesel	1 kiloliter
	Gasoline	1 kiloliter
Water	Surface water	- thousand m <sup>3</sup>
	Groundwater	405 thousand m <sup>3</sup>
OUTPUT		
Air	GHG	8 kilotons
	NOx	1 tons
	VOC	18 tons
Water bodies	into rivers	405 thousand m <sup>3</sup>
	Sewerage system	- thousand m <sup>3</sup>
	BOD load	0 tons
	COD load	0 tons
Waste	Generated	394 tons
	Landfill	6 tons

### Takahagi Facilities

INPUT		
Energy	Electricity	22,762 MWh
	Kerosene	- kiloliter
	LPG	- tons
	LNG	1,084 tons
	City gas	- thousand m <sup>3</sup>
	Diesel	0 kiloliter
	Gasoline	- kiloliter
Water	Surface water	2,447 thousand m <sup>3</sup>
	Groundwater	- thousand m <sup>3</sup>
OUTPUT		
Air	GHG	13 kilotons
	NOx	3 tons
	VOC	0 tons
Water bodies	into rivers	2,447 thousand m <sup>3</sup>
	Sewerage system	- thousand m <sup>3</sup>
	BOD load	3 tons
	COD load	7 tons
Waste	Generated	1,822 tons
	Landfill	34 tons

### Yaizu Facilities

INPUT		
Energy	Electricity	55,184 MWh
	Kerosene	- kiloliter
	LPG	0 tons
	LNG	- tons
	City gas	6,807 thousand m <sup>3</sup>
	Diesel	1 kiloliter
	Gasoline	0 kiloliter
Water	Surface water	293 thousand m <sup>3</sup>
	Groundwater	367 thousand m <sup>3</sup>
OUTPUT		
Air	GHG	41 kilotons
	NOx	5 tons
	VOC	0 tons
Water bodies	into rivers	595 thousand m <sup>3</sup>
	Sewerage system	- thousand m <sup>3</sup>
	BOD load	0 tons
	COD load	0 tons
Waste	Generated	1,181 tons
	Landfill	1 tons

### Toyama Technology Center

INPUT		
Energy	Electricity	36,546 MWh
	Kerosene	- kiloliter
	LPG	0 tons
	LNG	- tons
	City gas	4,068 thousand m <sup>3</sup>
	Diesel	7 kiloliter
	Gasoline	1 kiloliter
Water	Surface water	2,426 thousand m <sup>3</sup>
	Groundwater	16 thousand m <sup>3</sup>
OUTPUT		
Air	GHG	30 kilotons
	NOx	2 tons
	VOC	11 tons
Water bodies	into rivers	2,418 thousand m <sup>3</sup>
	Sewerage system	- thousand m <sup>3</sup>
	BOD load	3 tons
	COD load	8 tons
Waste	Generated	7,213 tons
	Landfill	26 tons

**Takaoka Plant**

INPUT		
Energy	Electricity	12,399 MWh
	Kerosene	- kiloliter
	LPG	1484 tons
	LNG	- tons
	City gas	- thousand m <sup>3</sup>
	Diesel	0 kiloliter
	Gasoline	1 kiloliter
Water	Surface water	1,986 thousand m <sup>3</sup>
	Groundwater	22 thousand m <sup>3</sup>
OUTPUT		
Air	GHG	12 kilotons
	NOx	3 tons
	VOC	6 tons
Water bodies	into rivers	1,954 thousand m <sup>3</sup>
	Sewerage system	- thousand m <sup>3</sup>
	BOD load	1 tons
	COD load	4 tons
Waste	Generated	128 tons
	Landfill	0 tons

**Tsukuba Research Center**

INPUT		
Energy	Electricity	41,637 MWh
	Photovoltaics	48 MWh
	Kerosene	- kiloliter
	LPG	- tons
	LNG	- tons
	City gas	7,028 thousand m <sup>3</sup>
	Diesel	0 kiloliter
	Gasoline	2 kiloliter
Water	Surface water	303 thousand m <sup>3</sup>
	Groundwater	0 thousand m <sup>3</sup>
OUTPUT		
Air	GHG	35 kilotons
	NOx	8 tons
	VOC	6 tons
Water bodies	into rivers	- thousand m <sup>3</sup>
	Sewerage system	191 thousand m <sup>3</sup>
	BOD load	2 tons
	COD load	2 tons
Waste	Generated	856 tons
	Landfill	31 tons

**Tsukuba Bio Research Center**

INPUT		
Energy	Electricity	6,668 MWh
	Kerosene	- kiloliter
	LPG	- tons
	LNG	- tons
	City gas	358 thousand m <sup>3</sup>
	Diesel	- kiloliter
	Gasoline	0 kiloliter
Water	Surface water	31 thousand m <sup>3</sup>
	Groundwater	- thousand m <sup>3</sup>
OUTPUT		
Air	GHG	4 kilotons
	NOx	0 tons
	VOC	1 tons
Water bodies	into rivers	- thousand m <sup>3</sup>
	Sewerage system	31 thousand m <sup>3</sup>
	BOD load	0 tons
	COD load	- tons
Waste	Generated	703 tons
	Landfill	4 tons

**Kyoto Suzaku Office**

INPUT		
Energy	Electricity	1,596 MWh
	Kerosene	- kiloliter
	LPG	- tons
	LNG	- tons
	City gas	132 thousand m <sup>3</sup>
	Diesel	- kiloliter
	Gasoline	- kiloliter
Water	Surface water	5 thousand m <sup>3</sup>
	Groundwater	- thousand m <sup>3</sup>
OUTPUT		
Air	GHG	1 kilotons
	NOx	- tons
	VOC	- tons
Water bodies	into rivers	- thousand m <sup>3</sup>
	Sewerage system	5 thousand m <sup>3</sup>
	BOD load	0 tons
	COD load	- tons
Waste	Generated	16 tons
	Landfill	0 tons