Environment Report 2017

www.astellas.com/en/csr/environment

Astellas Pharma Inc.

Wind turbine system at Kerry Plant, Ireland
Photo: Gina Halliday (Health & Safety Manager)

1. Editorial Policy

In publishing this "Astellas Environmental Report 2017," Astellas Pharma Inc. 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 who have an invested interest. The environment is one of the CSR fields in which Astellas actively tackles issues, sets targets, and undertakes initiatives. When preparing this Report, every effort was made to include easy-to-understand explanations using specific examples, numerical data, and graphs and charts. Readers are asked to take note of the fact that due to the rounding up of figures used in numerical environmental performance data, there may be cases where the total figure given does not tally precisely with the aggregated value.

An overall picture of CSR-based management at Astellas and activities in the five fields of compliance, employees, the economy, society, and the environment is contained in the Astellas Annual Report 2017, a printed publication that is scheduled for release in August 2017. Accordingly, excerpts from the Astellas Environment Report 2017 can be found in the Environment Section of the Annual Report 2017.

1.1. Reporting Period

As a general rule, this Report covers the activities of facilities in Japan from April 1, 2016 to March 31, 2017, and the activities of overseas facilities from January 1, 2016 to December 31, 2016. (Certain sections of this Report contain details of activities and initiatives both prior to and after these identified reporting periods.)

1.2. Reporting Coverage

This Report covers the operations of all the production facilities of Astellas group worldwide and non-production sites in Japan included in the Company's consolidated financial statements. However, the scope covered may differ depending on the item. Accordingly, details of the scope covered are identified on an individual basis in instances where a discrepancy arises.

In addition, certain environmental data includes the results of activities of subcontractors because the environment and society is affected not only by the Company's own activities but also via the supply chain.

1.3. Important Changes in Organization during the Reporting Period

The Kashima R&D Center closed at the end of fiscal 2015 after completion of transferring its operational functions to the Tsukuba Research Center and the Kyoto Suzaku Office. And the operations of the Kiyosu Research Office were transferred to another company. This report does not contain their environmental performance data for fiscal 2016.

In August 2016, the operations of the Norman Plant were transferred to another company. However, the environmental performance track record of this plant is included in this report.

1.4. Guidelines

This report has been prepared with reference to the Environmental Reporting Guidelines (2012 edition) issued by Japan’s Ministry of the Environment.

1.5. Notational System of Numerical Results

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

Information regarding publication:
Date of issue : June 2017 (available on the Company’s website)
Next scheduled issue : June 2018 Copy to be posted on the Company’s website

Please note there is no printed version of the Astellas Environment Report 2017.

2. Abbreviation List

Abbreviation	Explanation
GHG	Greenhouse gases. There are seven categories of greenhouse gases: carbon dioxide, methane, nitrous oxide, hydro fluorocarbons, per fluorocarbons, sulfur hexafluoride, and Nitrogen trifluoride. Carbon dioxide itself can be divided into energy source and non-energy source types. Greenhouse gases other than energy-source carbon dioxide are known in Japan as the 5.5 gases. At Astellas, non-energy source CO_2 was discharged from waste fluids from our incinerators before, but only energy-source CO_2 is emitted now. In this report, GHG is used for all types of gas.
CO_2	Abbreviation for carbon dioxide.
Scope1	Volume of GHGs emitted directly from Company premises as a result of the burning of fuels (city gas, fuel oil, kerosene, diesel oil, gasoline, LPG, LNG)
Scope2	Volume of GHGs emitted indirectly in the use of electric power or heat supplied to the Company from outside
Scope3	GHGs emitted indirectly at some point on the Company's value chain (production, transportation, business trips, commuting, etc.)
SOx	Sulfur oxides – emitted by the burning of fossil fuels containing sulfur
NOx	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
EHS	Environment, Health & Safety

3. Environmental Initiatives

Astellas recognizes that maintaining a healthy global environment is important both for building a sustainable society and engaging in business activities on an ongoing basis.

At the same time, the Company is cognizant of the growing gravity of threats to the ecosystem and such environmental issues as GHG emissions attributable to the mass consumption of fossil fuels and deterioration of the natural environment due to the excessive extraction of resources. Other issues that impact the regional environment include air and water pollution, soil contamination, the emission of chemical substances, and industrial waste.

In order to ensure sustainable growth, Astellas is conscious of the need to adhere strictly to all statutory and regulatory requirements as they relate to wide-ranging environmental issues. At the same time, the Company recognizes the critical importance of fulfilling its corporate responsibilities toward society with the understanding that any failure to do so will lead to a deterioration of its standing in society and ultimately corporate value. Because of the inherent risk that expenditure will directly impact the Company's operations, consideration must also be given to increases in energy and raw material costs reflecting the sharp rise in resource prices, as well as expenses incurred in responding to new environment-related regulations including taxes.

Accounting for each of the aforementioned, positive steps toward the effective use of energy and resources will not only reduce environmental load, but also bolster business operations.

Moving forward, Astellas will accordingly engage in activities that are in harmony with the global environment. We will put in place an ideal image of the Company from a long-term and global perspective while continuously implementing initiatives that address issues in the regional community with an eye toward tomorrow's generation.

Main Environmental Targets Achieved in Fiscal 2016(Summary)

Environmental Action Plan Numerical Targets	Fiscal 2016 Performance
[Fiscal 2005 as the base year] 1. Measures to Address Climate Change Reduce GHG emissions by 35% or more compared with fiscal 2005 levels by fiscal 2020 (Global) ・Japan : Reduce by 30% or more ・Overseas production facilities : Reduce by 45% or more	1. Ratio to FY2005 level : -33.3% Japan : -27.5% Overseas : -51.2%
[Fiscal 2005 as the base year] 2. (Global) Enhance water resource productivity by around 2.5 times the fiscal 2005 result by the end of fiscal 2020. Applicable areas: Research and production sites in Japan and overseas Indicator: **Sales (Bill. Yen)/Volume of water resource withdrawn (1000m^3)**	2. Ratio to FY2005 level : 2.89 times
[Fiscal 2005 as the base year] 3. (Global) Improve waste generated per unit of sales to approx. 20% of fiscal 2005 by the end of fiscal 2020. Applicable areas: Research and production sites in Japan and overseas Indicator: **Volume of waste generated (tons)/Sales (Billion Yen)**	3. Ratio to FY2005 level : 20.7%
[Fiscal 2005 as the base year] 4. (Global) Triple the biodiversity index from the fiscal 2005 level by fiscal 2020	5. Ratio to FY2005 level : 3.12 times

4. Environmental Management

Astellas' basic stance toward the environment as well as the health and safety of its employees is outlined under the Astellas EHS Policy. The goals to which the Company aspires are also presented in Astellas EHS Guidelines. Both on a continuous and organizational basis, Astellas is engaging in activities that are designed to fulfill its obligations in each area.

4.1. Astellas EHS Guidelines

Astellas EHS Guidelines provide unified standards to be upheld in our implementation of environmental and safety measures. These guidelines indicate the stance Astellas should aim for in the future.

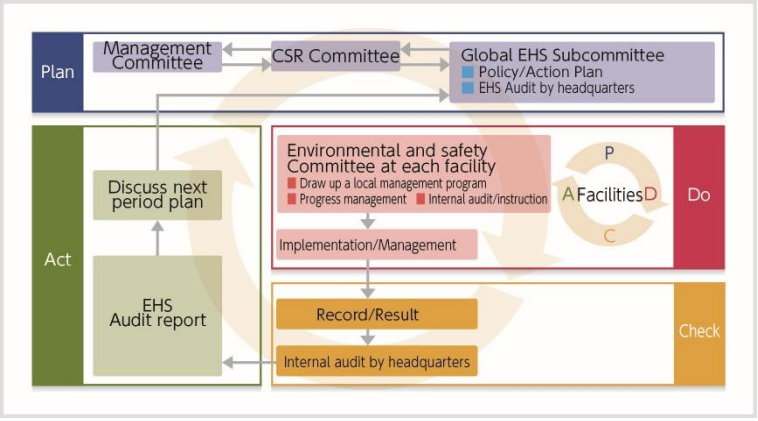
In fiscal 2016, we revised the contents of the guidelines based on the results of our initiatives to date, and added the "Supply Chain Management" section. The guidelines qualitatively describe our aims, and concrete numerical targets, including their deadlines, will be stipulated through short- and medium-term action plans that will be updated every fiscal year.

4.2. EHS Management System

Fundamental policies and action plans relating to environmental and safety matters are positioned as an important issue in CSR management, and are discussed and determined by the CSR Committee. Measures for the implementation of these decisions in specific form are then examined by the Global EHS Sub-committee, which is a subordinate organization under the CSR Committee. Moreover, a director in charge of business management directly receives reports about 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. Each business facility formulates their own action plan taking into account such factors as the status of the facility. The facilities conduct activities in accordance with the PDCA cycle, carrying out evaluations by company-wide EHS audits, and the results are reflected in the following fiscal year’s plans and policies. Through this system, Astellas’ own PDCA cycle is rotated.

Astellas has acquired ISO 14001 certification covering all its production sites in Japan and overseas. In fiscal 2017, we plan to shift to the revised ISO 14001 standard.

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



4.3. EHS Audits

An audit team led by the officer in charge of CSR is organized and the team conducts a company-wide EHS audit every fiscal year, in order to evaluate the progress of environmental and safety activities throughout the Astellas Group.

The audit sets items to be audited according to the Astellas EHS Guidelines and evaluates their level of conformity to the Guidelines. It also identifies issues to be resolved and promotes efforts for continuous improvement.

4.4. EHS Assessment System

The total environmental load resulting from the production, sale, distribution and disposal of products can usually be approximated 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. This entails substantial time and costs.

Therefore, Astellas has introduced an EHS assessment system as a tool that requires efforts to minimize the environmental load at all stages, including 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 and various safety measures prior to the commencement of commercial-scale production.

4.5. Operation of 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.

4.6. 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 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, and the development of employees professionally qualified in EHS matters.

We also explain our policies and site rules to construction workers at our plants, raw materials suppliers and waste disposal contractors, and request for cooperation with our EHS activities. In addition, we also devised various ways to raise awareness of environmental issues among employees at each workplace. From fiscal 2014 to fiscal 2016, the Tsukuba Research Center held the Environment Forum for employees, and a total of 958 people have participated over the three years. In addition, participants were given their own environmental supporter certification according to the number of times they participated.

4.7. 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 develop specific measures and procedures, conduct regular education sessions and training drills, and reconfirm and test the validity of our procedures, communication networks and the division of roles focusing particularly on risks that are recognized as a high priority. In this manner, we continue to work diligently to reduce environmental risk.

The discharge of harmful substances could lead to the pollution of rivers and seas as well as cause problems at 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, we are bolstering efforts to monitor operations and to measure the quality of water draining out of our plants to confirm compliance with relevant effluent standards.

4.8. Compliance with Environmental Laws and Regulations

Over the past five years, there were no infractions of laws or regulations related to environmental issues that were identified at our business sites in Japan or overseas.

4.9. Environment-Related Accidents and Complaints

In fiscal 2016, 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.

We received no environmental-related complaints associated with facilities operations.

4.10. Soil Contamination Assessments

Under the Soil Contamination Countermeasures Act of Japan and prefectural ordinances, soil contamination assessments are mandatory where projects for building or demolishing facilities exceeding a certain scale are undertaken and collectively there is a change in the characteristics of the land. To date, Astellas has undertaken soil contamination assessments based on relevant laws and ordinances as well as related voluntary evaluation to determine the existence or otherwise of contamination. In the event contamination is identified, the Company has taken purification and other remedial measures.

In fiscal 2016, we conducted a soil contamination survey at the closed Kashima R&D Center, and reported to the city of Osaka that soil contamination had been discovered. Based on these reported results, in April 2017 the plant was designated as a contaminated area on the basis of the Soil Contamination Countermeasures Act. Astellas will demolish the center and take other appropriate action in consultation with the governmental authorities.

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

- □Trichloroethylene
- □Benzene
- □Hexavalent chromium compound
- □Mercury and its compounds
- □Selenium and its compounds
- □Lead and its compounds
- □Arsenic and its compounds
- □Fluorine and its compounds

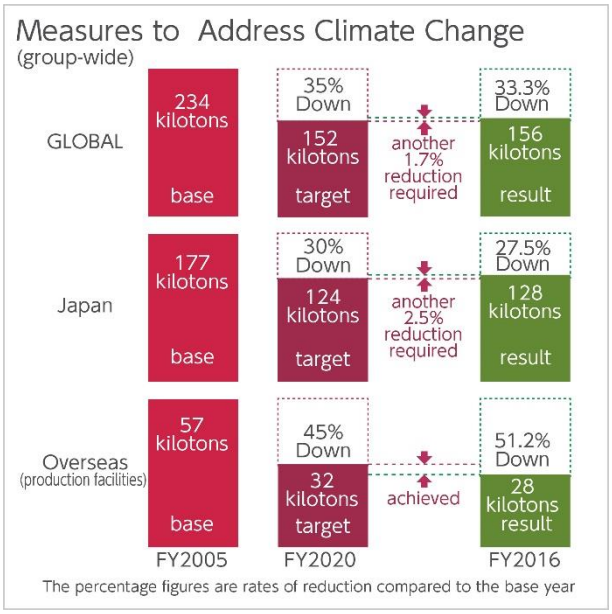
Drawing on the results of soil contamination assessments completed over the past five years, no instances of contamination were detected other than the case mentioned above.

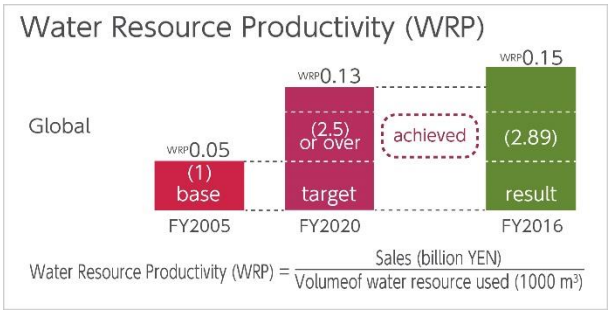
5. Environmental Action Plan

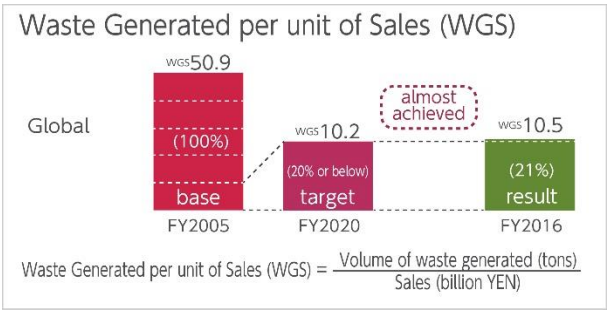
Our Environmental Action Plan sets out short-term and medium-term targets for our activities. We renew our action plans on a rolling basis, by reviewing progress and conditions during the previous year and incorporating our findings into our action plan for the following year. We are always working to 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.

Currently, depending on each action plan, the activities of all the production facilities of the Astellas group worldwide and non-production sites in Japan, overseas R&D centers etc. fall within the scope of the Environmental Action Plan. At the same time, the activities of overseas R&D centers, offices, and other bases of operation continue to increase in line with the Group's efforts to further expand and develop its business globally. As a result, steps are being taken to keep track of the performance of overseas facilities and bases that fall outside the scope of the Environmental Action Plan, focusing particularly on energy consumption.

The results of the Environmental Action Plan for fiscal 2016 are below. To evaluate the Environmental Action Plan, we have used a coefficient of 0.330 kg-CO_2/kWh to calculate CO_2 from electricity use in Japan in fiscal 2016. Please note that these figures differ from those used in calculation of actual emissions. The figures used in calculation of actual emissions are shown in the item “Climate Change Mitigation Measures.”







5.1. Review of the Environmental Action Plan

Based on the results of fiscal 2016, we confirmed achievement of the following targets. However, we decided not to change our Environmental Action Plan, including the achieved targets.

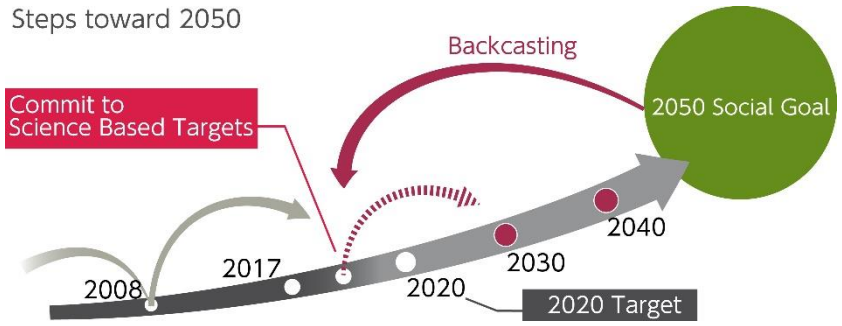
- Biodiversity

The targets for water resources productivity and waste generated per unit of sales have essentially been achieved, but because there are various uncertainty factors, including a projected decline in net sales in fiscal 2017. The Environmental Action Plan has not been revised.

5.2. Making Progress toward 2050

We plan to review our numerical targets for Climate Change Mitigation Measures in fiscal 2017 as the coefficient used in calculating CO_2 emissions from electricity use in Japan is different from the actual situation.

We are aware of the international community's approach to 2050, and we want to set numerical targets as signposts pointing toward it.



6. Interaction Between Astellas and the Environment

Japan (all business premises, Sales fleets)

INPUT			OUTPUT		
Energy	Electricity	198,911 MWh	GHGs (Scope1, 2)	Facilities	163,387 tons
	City gas	19,822 thousand m³		Sales fleets	4,733 tons
	LPG	2,102 tons	Pollutants	SOx	0 ton
	LNG	2,459 tons		NOx	29 tons
	Fuel oil	0 kiloliter		VOC	54 tons
	Kerosene	8 kiloliters	Pollutants (water body)	BOD	12 tons
	Diesel oil	26 kiloliters		COD	20 tons
	Gasoline	2,057 kiloliters		Water discharge (Drainage into rivers)	6,984 thousand m³
	Purchased heat energy (hot/cold water)	6,029 GJ		Water discharge (Drainage into sewerage system)	225 thousand m³
Resources	Water	8,477 thousand m³	Waste material	Waste generated	11,836 tons
	Raw materials (by weight)	5,121 kiloliters		Waste discharged	11,737 tons
	(by volume)	732 kiloliters		Landfill volume	138 tons
	Copier paper	209 tons			

Overseas (all production facilities)

INPUT			OUTPUT		
Energy	Electricity	39,804 MWh	GHGs (Scope1, 2)	Facilities	10,526 tons
	City gas	3,201 thousand m³			
	LPG	6 tons	Pollutants (atmosphere)	SOx	0 ton
	Diesel oil	96 kiloliters		NOx	3 tons
	Gasoline	12 kiloliters		VOC	4 tons
	Purchased heat energy (steam)	19,123 GJ	Pollutants (water body)	BOD	5 tons
Resource	Water	246 thousand m³	Waste water discharge	(into sewerage system)	246 thousand m³
			Waste material	Volume of waste generated	2,010 tons
				Landfill volume	262 tons

Overseas (principal office buildings, R&D centers, sales offices and sales fleets of Astellas affiliates outside Japan)

INPUT			OUTPUT		
Energy	Electricity	31,774 MWh	GHGs (Scope1, 2)	Facilities	15,100 tons
	City gas	1,232 thousand m³		Sales fleets	22,555 tons
	Diesel oil	3,248 kiloliters			
	Gasoline	6,079 kiloliters			
	Bioethanol	379 kiloliters			

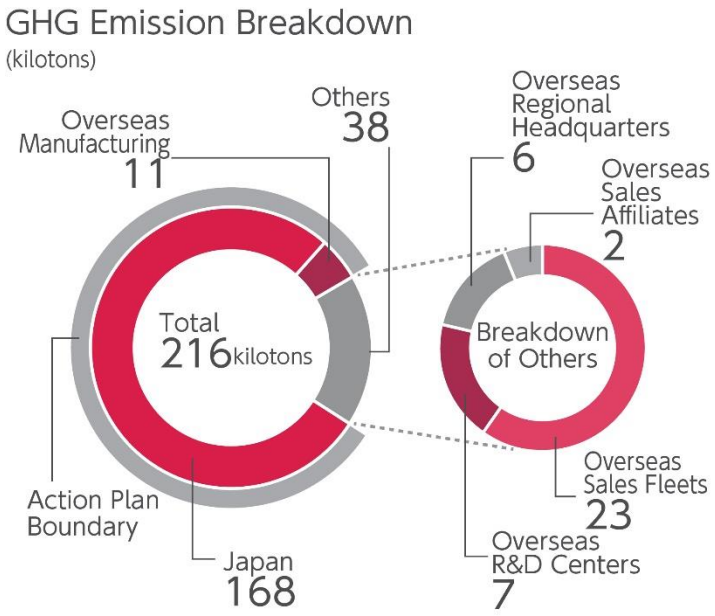
Indirect GHGs (Scope 3)

Category		Upstream GHGs	Category		Downstream GHGs
1	Purchased products & services	111,352 tons	9	Transportation and distribution (Downstream)	Not relevant
2	Capital goods	67,645 tons	10	Processing of sold products	Not relevant
3	Fuel and energy related activities (not included in scope 1 and scope 2)	27,464 tons	11	Usage of sold products	No Emissions' results
4	Transportation and distribution	4,040 tons	12	End-of-life treatment of sold products	705 tons
	Truck transportation of raw materials	(237 tons)	13	Lease assets	Not relevant
	Plant → warehouse	(228 tons)	14	Franchise	Not relevant
	Warehouse	(955 tons)	15	Investment	Not relevant
	Warehouse → wholesalers	(2,620 tons)			
5	Waste generated in operation	4,461 tons			
6	Business trips (By airplane)	37,933 tons			
7	Employee commuting	2,567 tons			
8	Lease assets	Not relevant			

Remark: GHG emissions (actual emissions) decreased significantly in fiscal 2015 following a review of GHG emissions accompanying the end-use electricity at overseas plants conforming to the GHG Protocol, international guidelines for calculating GHG emissions. Evaluation under an action plan for self-reliant evaluation used the IEA coefficient for each country.

Understanding GHG Emissions

GHG emissions resulting from the business activities of Astellas is reported to be 216 thousand tons globally. Among these, approximately 83% are from business sites that are understood to fall within the scope of the Environmental Action Plan. (Other than “Other” in the graph below).



The above breakdown of energy consumption is based on below table. The NOT covered by Environmental Action Plan expressed as “Other” contains the principal office buildings, R&D centers and Sales fleets of Astellas affiliates outside Japan.

Breakdown of Energy consumption at facilities covered and NOT covered by Environmental Action Plan (Fiscal 2016)

Covered: Japan: all business locations and sales fleets, overseas: all production facilities
Not Covered: principal office buildings, R&D centers and Sales fleets of Astellas affiliates outside Japan

(Unit: terajoule)

Action Plan	Total	Liquid fuel		Gaseous fuel		Heat purchase	Electricity		Renewable energy			
		Fuel oil	Gasoline etc.	City gas	LPG LNG		Total	Renewable energy source	Total	Wind power source	Wood chip source	Photovoltaic panes
Covered	3,801	0	76	1,036	241	27	2,380	377	41	6	35	0.2
NOT covered	714	0	342	55	0	0	317	0	0	0	0	0

7. Climate Change Mitigation Measures

Mitigating and adapting to the threat posed by climate change requires active involvement on all levels including national governments, local governments, corporations and citizens. Astellas understands that climate change could become a major constraint on the continuation of corporate activity, and considers it one of management's most important problems to address.

Tackling the problem of climate change with our Climate Change Mitigation Measures will require a prolonged and sustained effort. The international community has agreed that industrialized countries should target a reduction in GHGs of at least 80% compared with current levels by the year 2050. As stepping stones toward achieving these targets, the Astellas Group is setting medium-term targets for the reduction of GHGs in its Environmental Action Plan.

Regarding the CO_2 emission coefficient accompanying the end-use electricity

Regarding the CO_2 emission coefficient accompanying the end-use electricity, we are employing two types of coefficient: a coefficient for calculating the results needed to evaluate progress against the Environmental Action Plan and make investment decisions and implement countermeasures to bridge the gap between results and targets, and a coefficient to calculate GHG emissions (actual emissions) for each fiscal year presented in series.

Calculation of GHG Emissions in Japan

1. Evaluation of progress against the Environmental Action Plan 0.330kg-CO_2/kWh
2. Actual emissions
   The Electric Power Council for a Low Carbon Society's actual end-use CO_2 emissions/unit in previous fiscal year (Through to the previous fiscal year, Federation of Electric Power Companies of Japan's actual end-use CO_2 emissions/unit in previous fiscal year were used)

Calculation of GHG Emissions Overseas

1. Evaluation of progress against the Environmental Action Plan

   We are employing coefficients listed in "CO_2 EMISSIONS FROM FUEL COMBUSTION 2016 EDITION" published by the International Energy Agency ("IEA").

2. Actual emissions

   In accordance with GHG Protocol Scope 2 Guidance, GHG emissions emanating from electricity derived from renewable energies have been from fiscal 2015 counted as zero.

7.1. Reducing GHGs emissions

Environmental Action Plan (Climate Change)

Reduce GHG emissions by 35% or more compared with fiscal 2005 levels by the end of fiscal 2020 (Global)

- Reduce GHG emissions in Japan by 30% or more compared with fiscal 2005 levels by the end of fiscal 2020.
- Reduce GHG emissions at overseas production facilities by 45% or more compared with fiscal 2005 levels by the end of fiscal 2020.

Progress in Implementation of Environmental Action Plan

The GHG emissions volume for fiscal 2016, used in evaluating the action plan, came to 156 kilotons globally, for a decrease of 78 kilotons (33.3%) from the base year. A further reduction of 4 kilotons is required to reach the target.

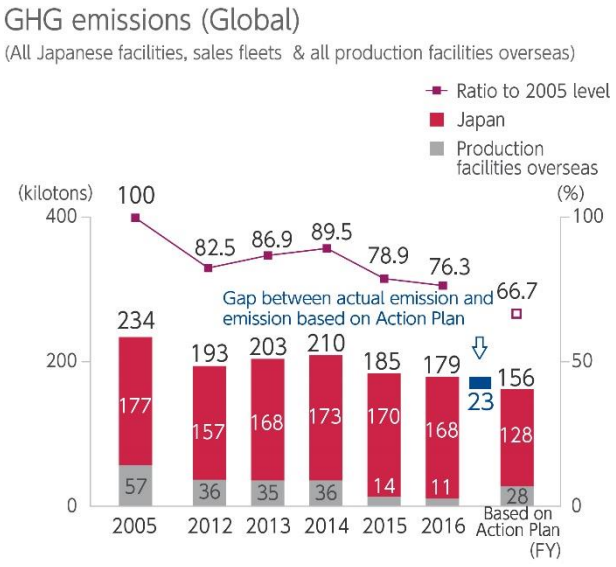
◆ **GHG emissions in Japan: 128 kilotons** — Down 49 kilotons (27.5%) from base year
Further reduction of 4 kilotons needed to reach target

◆ **GHG emissions overseas: 28 kilotons** — Down 29 kilotons (51.2%) from base year, thereby reaching the target.

Trend of actual emissions

(below figures indicate actual emissions trends)

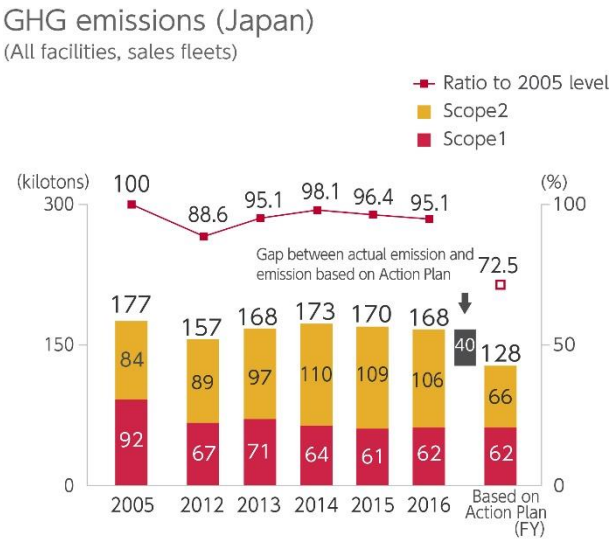
The actual emissions volume of GHGs globally in fiscal 2016 came to 179 kilotons, down 55 kilotons (23.7%) from fiscal 2005. The emissions volume generated through business activities in Japan amounts to approximately 94% of the global total.



* The difference between the actual emissions volume and the emissions volume assessed by the Action Plan arises from being calculated by using the difference of two CO2 emission coefficients accompanying the end-use electricity in Japan (0.531-0.330=0.201 kg-CO2/kWh). Moreover, since fiscal 2015 the calculation of the actual emissions volume of GHGs accompanying end-use electricity generated by renewable energy sources to be purchased by overseas plants has resulted in zero.

◆ **GHG emissions in Japan: 168 kilotons**

Down 9 kilotons (4.9%) from base year,
Also down by 2 kilotons from the previous fiscal year



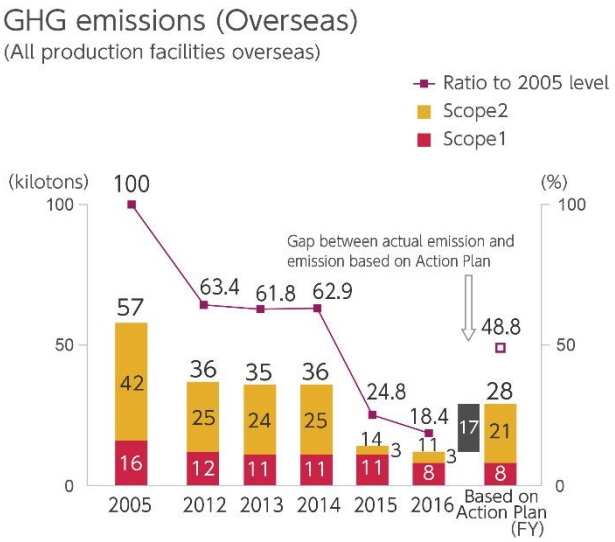
*Scope 1: Volume of GHG directly emitted as a result of the burning of fuels
*Scope 2: Volume of GHG emitted in the use of electric power or heat supplied from outside

*The difference between the actual emissions volume and the emissions volume assessed by the Action Plan is calculated by using the difference of two CO_2 emission coefficients accompanying the end-use electricity in Japan (0.531-0.330=0.201 kg-CO_2=/kWh)

Turning to a breakdown of emissions by scope, Scope 1* emissions increased 1 kiloton from the previous fiscal year, but Scope 2* emissions decreased 3 kilotons from the previous fiscal year. There was a reduction of 5 kilotons in Scope 2 emissions due to improvement in the coefficient used to calculate CO_2 emissions for electricity use compared to the previous fiscal year. A decrease of 13 kilotons in the total amount of Scope 1 and Scope 2 emissions, due to the closure of the Kashima R&D Center and the transfer of the Kiyosu Research Office, was partially offset by an increase of 10 kilotons, due to commencing full-scale operations of the new facility in fiscal 2015. In comparison with fiscal 2005, Scope 1 emissions are down 30 kilotons (32.8%) and Scope 2 emissions are up 22 kilotons (25.7%). We intend to continue taking effective steps to implement our Climate Change Mitigation Measures, while keeping a close watch on the balance between positive and negative factors.

◆ **GHG emissions overseas: 11 kilotons**

Down 47 kilotons (81.6%) from base year,
Also down by 4 kilotons from the previous fiscal year



Turning to a breakdown of emissions by Scope, Scope 1 emissions decreased 4 kilotons from the previous fiscal year as a resulting impact from the Norman Plant being transferred in August 2016. Scope 2 emissions were approximately the same as the previous fiscal year, due to a revision of emissions from overseas plants in accordance with GHG Protocol Scope 2 Guidance, and were not impacted by the transfer of the Norman Plant.

The difference between the actual emissions volume and the emissions volume assessed by the Action Plan arises from the actual emissions of GHG being recalculated as zero in accordance with the use of electricity derived from the purchase of renewable energies for use at overseas plants from fiscal 2015.

7.2. Breakdown of Scope 1 and Scope 2 for GHG Emissions

Details regarding Scope 1 - volume of greenhouse gases (GHG) directly emitted from Company premises as a result of the burning of fuels (city gas, kerosene, diesel oil, gasoline, LPG, LNG) - and Scope 2 - volume of GHGs emitted in the use of electricity or heat energy supplied to the Company from outside - are shown below.

GHG emission volumes from the use of electricity were calculated using the adjusted emission coefficients of Electric power Council for a Low Carbon Society (ELCS). Moreover, a review of GHG emissions accompanying electricity use at overseas plants conforming to the GHG Protocol, international guidelines for calculating GHG emissions, showed that the Norman Plant purchased electricity from wind power, the Meppel Plant from hydro power and the Dublin and Kerry plants from electricity generated from renewable energy sources so GHG emissions became zero, which drastically reduced Scope 2 from fiscal 2015.

GHG emission volumes

(global / Japan: all business locations and sales fleets; overseas: all production facilities)

(Unit: kilotons)

Fiscal year	Totaled emission volume	Scope 1 (direct emissions)			Scope 2 (indirect emissions) Emission volume	GHG equivalent from electricity generated by renewable energy sources
		Emission volume	Breakdown			
			Energy sources	Non-energy-related sources		
2005	234	108	101	7	126	0
2012	193	79	79	0	114	10
2013	203	82	82	0	121	10
2014	210	75	75	0	134	9
2015	185	72	72	0	112	22
2016	179	70	70	0	109	17

GHG emission volumes

(Japan: all business locations and sales fleets)

(Unit: kilotons)

Fiscal year	Totaled emission volume	Scope 1 (direct emissions)			Scope 2 (indirect emissions) Emission volume	GHG equivalent from electricity generated by renewable energy sources
		Emission volume	Breakdown			
			Energy sources	Non-energy-related sources		
2005	177	92	85	7	84	0
2012	157	67	67	0	89	0
2013	168	71	71	0	97	0
2014	173	64	64	0	110	0
2015	170	61	61	0	109	0
2016	168	62	62	0	106	0

Non-energy-related sources: Waste liquid from incinerators at the Takaoka Plant and Takahagi Facilities are regarded as non-energy sources of CO_2.

GHG emission volumes

(overseas: all production facilities)

(Unit: kilotons)

Fiscal year	Totaled emission volume	Scope 1 (direct emissions)			Scope 2 (indirect emissions) Emission volume	GHG equivalent from electricity generated by renewable energy sources
		Emission volume	Breakdown			
			Energy sources	Non-energy-related sources		
2005	57	16	16	0	42	0
2012	36	12	12	0	24	10
2013	35	11	11	0	24	10
2014	36	11	11	0	25	9
2015	14	11	11	0	3	22
2016	11	8	8	0	3	17

Purchases of renewable electricity: Electricity purchased at the Norman Plant (wind power), the Meppel Plant (hydro power), and the Dublin and Kerry Plants have been deemed to be generated by renewable energy sources.

7.3. GHG emissions from facilities not covered by the Environmental Action Plan

Although the current Environmental Action Plan covers only all facilities and sales fleets in Japan and all production facilities overseas, we are also working to keep track of energy usage at the group's principal office buildings and research facilities overseas, which are not currently within the scope of the plan.

If GHGs emitted by these facilities and associated sales fleets are included, total GHG emissions globally in fiscal 2016 amounted to 216 kilotons, of which the current Environmental Action Plan accounts for 82.6% (179 kilotons out of a total of 216 kilotons.)

From here onward, we intend to examine options for setting new targets, depending on the amount of environmental impact of these facilities.

Energy usage and GHG emissions by principal office buildings and R&D Centers outside Japan

Facilities	Energy consumed (GJ)		GHG emissions (tons)	
	Electricity	City gas, etc.	Scope 1	Scope 2
Astellas US LLC	95,018	1,009	50	4,632
Astellas Pharma Europe Ltd.	17,800	6,718	334	737
Astellas Pharma Europe B.V.	34,584	7,876	392	1,641
Agensys Inc.	104,705	35,839	1,784	2,415
Astellas Research Institute of America LLC	6,833	0	0	333
Total	258,940	51,442	2,561	9,758

Energy usage and GHG emissions by sales affiliate office buildings of outside Japan

Facilities	Energy consumed (GJ)		GHG emissions (tons)	
	Electricity	City gas, etc.	Scope 1	Scope 2
Americas	5,740	0	0	137
EMEA *	29,564	3,586	178	1,167
Asia/Oceania	12,271	52	3	776
Total	47,575	3,638	181	2,079

* EMEA: Europe (including NIS countries), the Middle East and Africa

Breakdown by region of number of Sales fleets, amount of fuel consumed, and GHG emissions

Region	Number of cars			Fuel consumption (kiloliters)			GHG emissions (tons)
	Gasoline	Diesel	Flex fuel **	Gasoline	Diesel	Bioethanol	
Americas	1,189	32	125	4,507	99	379	10,782
EMEA *	912	1,423	0	1,573	3,148	0	11,772
Total	2,101	1,455	125	6,079	3,247	379	22,555

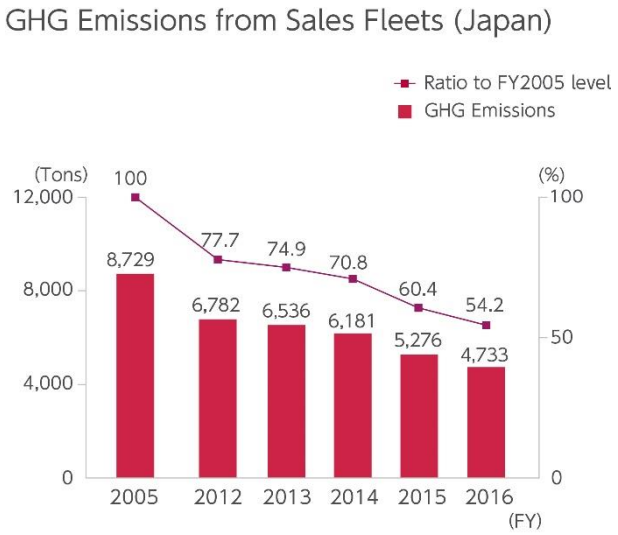
* Europe (including NIS countries), the Middle East and Africa

** Vehicles that can run on gasoline or a mixture of gasoline and methanol/ethanol. Flex fuel vehicles are used by a sales affiliate in Brazil and Astellas US LLC. Because fuel in Brazil is 100% bioethanol and fuel in the US is an E85 code fuel, the GHG emissions coefficients are zero and 0.348 t-CO_2/kiloliter, respectively.

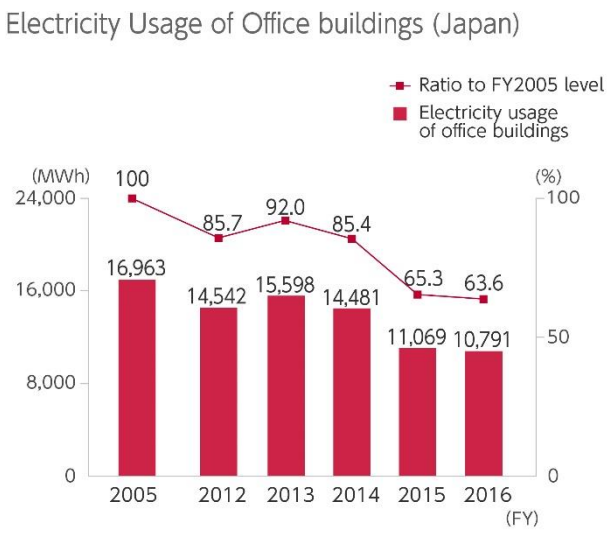
7.4. Reduction of Greenhouse Gas Emissions from Sales Activities and Offices

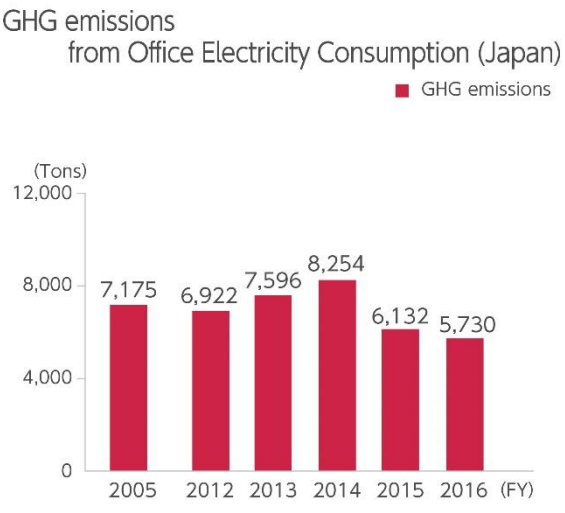
Since fiscal 2008, Astellas has been engaged in reducing GHG emissions associated with sales fleets. For 2015, the final year of the Environmental Action Plan, we have achieved our target to reduce emissions by more than 30% compared to fiscal 2005. We have been continuing our efforts even though we have not set numerical targets since fiscal 2016.

In fiscal 2016, GHG emissions from gasoline used in our sales fleets amounted to 4,733 tons. This was a 45.8% decrease compared with fiscal 2005. As of the end of fiscal 2016, some 1,676 vehicles (77.0%) of our 2,176 fleets were hybrid vehicles.



GHG emissions associated with electricity use at the Group's office buildings in Japan, including the head office and all branch and sales offices, amounted to 5,730 tons.



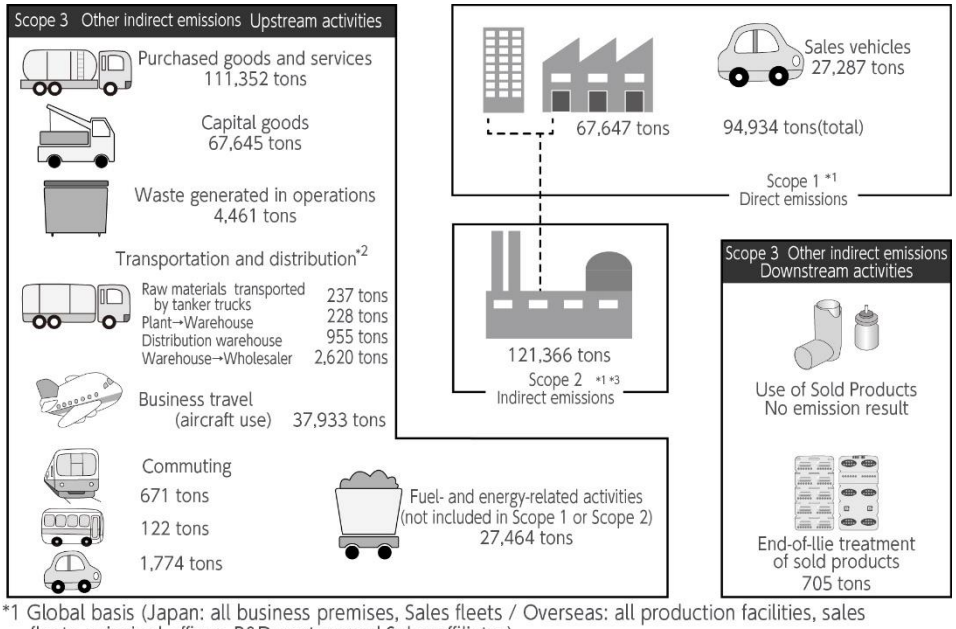


7.5. GHG Emissions Resulting from Supply Chain Activities

Our Environmental Action Plan contains targets related to our Climate Change Mitigation Measures. The plan focuses on GHG emissions generated by Group facilities and CO_2 emissions from energy sources through electricity use and heat supplied by outside sources.

In addition to knowing and publicizing their own GHG emissions, in recent years there has been more and more emphasis on emissions produced along the entire supply chain - including raw materials procurement, product distribution, employee commuting and business trips, and waste treatment. Following this trend, standards are being reviewed and developed to reflect this broader Scope, including the Greenhouse Gas Protocols, ISO standards, and guidance issued by Japan's Ministry of the Environment.

Recognizing these social implications, we included some supply chain GHG emissions for the first time when ascertaining our environmental performance in fiscal 2011. We intend to continue taking effective steps to expand the reporting boundary.



*1 Global basis (Japan: all business premises, Sales fleets / Overseas: all production facilities, sales fleets, principal offices, R&D centers and Sales affiliates)
*2 Product shipments are handled by outside contractors
*3 Emissions indicate actual emissions volume

Assumptions used to estimate GHG emissions (Scope 3)

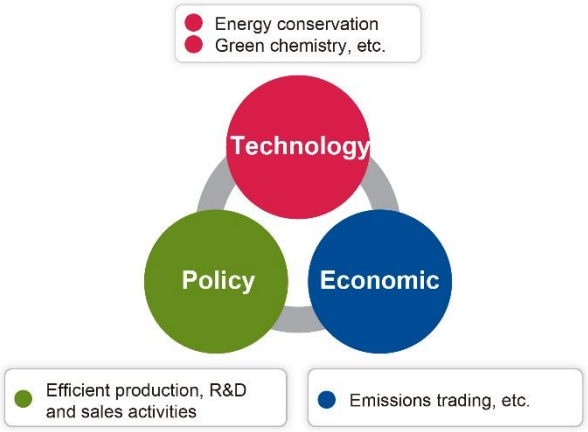
	Category	Assumption used to estimate GHG emissions	
1	Purchased goods and services	Purchase monetary amount	(Million yen)
2	Capital goods	Facility investment amount	(Million yen)
3	Fuel and energy related activities (not included in Scope 1 and Scope 2)	Usage amount of purchased energy sources	(GJ)
4	Transportation and distribution (Upstream)		
	Truck transportation of raw materials	Fuel consumption	(kiloliters)
	Plant → warehouse	Fuel consumption	(kiloliters)
	Warehouse	Energy consumption	(MWh)
	Warehouse → wholesalers	Fuel consumption	(kiloliters)
5	Waste generated in operation	Shipment weight x distance	(tons-km)
6	Business travel (by airplane)	Travel distance	(thousand passenger-km)
7	Employee commuting	Travel distance	(thousand passenger-km)
8	Use of sold products	Volumes shipped	(tons-HFC)
9	End-of-life treatment of sold products	(Shipments x HFC content/unit)	(tons)

7.6. Promotion Framework and Initiatives for Climate Change Mitigation Measures

Astellas believes that it will not be possible to achieve the level of GHG emission reductions demanded of private enterprises by simply continuing the existing energy conservation measures implemented independently by each facility. Consequently, in fiscal 2009, Astellas established the Global Warming Prevention Committee, chaired by a member of top management, as a special task force under the CSR Committee.

Astellas was pursuing measures to achieve medium to long-term numerical targets set in accordance with a group-wide strategy formulated by the Global Warming Prevention Committee. In addition to considering technological means to lower energy consumption, the Committee was also tasked with examining policy measures, such as efficient production and research systems, and utilizing economic measures, including emissions trading and a carbon credit system.

To develop our environmental protection measures on a more global scale, including our Climate Change Mitigation Measures, we set up the Global EHS Subcommittee in 2014 as a specialist subordinate unit under the CSR Committee.



Investment Plan for Climate Change Mitigation Measures

In fiscal 2016, separate from our energy conservation measures at each facility, the Global EHS Sub-Committee decided to invest roughly ¥110 million to study introducing biomass boilers and more efficient truck-driving management operation. However, the actual investment came to only ¥68 million, and the benefit was a reduction of GHG emissions of 367 tons.

We will continue to study the introduction of biomass boilers, despite concerns such as their degree of cost effectiveness.

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.

7.7. Our Efforts to Reduce GHG Emissions

Astellas' manufacturing plants, research centers, and offices are implementing a variety of initiatives with the aim of reducing GHG emissions. 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. 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 equipment and energy-saving activities.

Fuel Conversion

Different fuels (e.g. fuel oil, city gas, LPG) used in steam boilers and other combustion equipment emit different amounts of GHG per unit of heating value.

Therefore, switching to a fuel that generates less GHG is one of our Climate Change Mitigation Measures. Because fuel oil and kerosene generally produce more GHG than city gas, Astellas has been actively converting its steam boilers so that they run on city gas, LPG, and LNG instead of fuel oil and kerosene. This conversion of steam boilers at research and production bases was completed by fiscal 2011. These fuel conversions contribute the GHG emission reduction but also reducing SOx emissions that is one of the air pollutant substances.

Installation of Heat Pump Devices

Astellas is actively introducing heat pump technology that makes effective use of heat in the air when upgrading existing air conditioning equipment or installing new equipment. Going forward, we will pursue the introduction of heat pump technology after securing a stable supply of electricity.

Introduction of Energy Monitoring Systems

Knowing exactly how much energy we use does not directly lead to lower energy consumption. However, the ability to confirm the status of energy usage can assist the elimination of wasteful practices and the formulation of new strategies. For these reasons, we have instituted a program to introduce energy monitoring systems at our facilities.

Using Renewable Energy

The direct use of renewable energy sources, such as the solar energy and wind, is the most effective method of mitigating climate change issues. Accordingly, Astellas hopes to actively introduce renewable energy technology where feasible.

The Group's Kerry Plant in Ireland brought online a wind turbine power generation station with a maximum output of 800 kW and a wood chip biomass boiler system with a maximum output of 1.8 MW from March 2012. In fiscal 2016, the full amount of 1,607 MWh produced by the wind turbine power generation station was used to power the facility. In addition, the wood chip biomass boiler also used 34,984 GJ of heat. Through these means, the total amount of GHG emission reduction came to 3,093 tons.

In Japan, the Tsukuba Research Center has installed photovoltaic generation systems. In fiscal 2016, the full amount of 47 MWh generated was used to power the facility. As a result of this initiative, the amount of GHG emission reduction came to 25 tons.

Overseas plants are engaged in an initiative to purchase electricity designated as being generated from renewable energies such as wind power or hydroelectricity, and of the electricity purchased in fiscal 2016, the Norman Plant purchased 12,237 MWh, the Meppel Plant 12,603 MWh, the Dublin Plant 6,200 MWh and the Kerry Plant 6,815 MWh of electricity generated by renewable energy sources. In addition, geothermal energy is being used in part of the Yaizu Pharmaceutical Research Center, in Northbrook (US), and in Leiden, the Netherlands. Leiden, which can quantify geothermal energy, used 1,236 GJ of geothermal heat, resulting in a reduction of 146 tons in GHG emissions.

7.8. Breakdown of Energy Consumption

Global energy usage in fiscal 2016 by the Astellas Group amounted to 3,801 terajoules (TJ), for a decrease of 115 TJ (2.9%) over the previous year. This breaks down to energy usage in Japan amounting to 3,196 TJ, for a year-on-year increase of 1.5% (47 TJ), and 605 TJ for overseas operations, down 163 TJ (21.2%) year on year.

In Japan, the proportion of total energy usage occupied by electricity is gradually increasing, having risen from 57.9% in fiscal 2005 to 62.1% in fiscal 2016. Use of renewable energy sources includes electricity generation from photovoltaic panels at the Tsukuba Research Center amounting to 169 GJ (47 MWh), all of which was used in business operations at each facility. A co-generation system generated 7,976 MWh of electricity, which was not counted toward electricity usage volume, but the pipelined city gas consumed as fuel in the system was counted as energy consumption.

Overseas, our plant at Killorglin in County Kerry in the Republic of Ireland used 35 TJ of heat produced by a woodchip boiler, and 6 TJ (1,607 MWh) was generated by wind turbine system. The combined power generated by these two forms of renewable energy fell by 2 TJ over the previous year. Overseas plants are engaged in an initiative to purchase electricity designated as being generated from renewable energies such as wind power or hydroelectricity, and of the electricity purchased in fiscal 2016, the Norman Plant purchased 12,237 MWh, the Meppel Plant 12,603 MWh, the Dublin Plant 6,200 MWh and the Kerry Plant 6,815 MWh of electricity generated by renewable energy sources. The percentage of total energy accounted for by electricity increased from 64.9% in fiscal 2005 to 66.5% in fiscal 2016.

Breakdown of Energy consumption
(global / Japan: all business locations and sales fleets; overseas: all production facilities) Unit: terajoule

Fiscal year	Total	Liquid fuel		Gaseous fuel		Heat purchase	Electricity		Renewable energy			
		Fuel oil	Gasoline etc.	City gas	LPG, LNG		Total	Renewable energy source	Total	Wind power source	Wood chip source	Photovoltaic panels
2005	4,447	350	228	942	226	55	2,648	0	0	0	0	0
2012	3,950	2	112	1,178	240	22	2,359	203	38	5	32	0.3
2013	4,127	1	103	1,230	259	21	2,472	196	42	6	35	0.3
2014	3,923	0	96	1,118	241	21	2,403	195	43	6	37	0.3
2015	3,917	0	83	1,083	239	26	2,443	463	43	7	36	0.3
2016	3,801	0	76	1,036	241	27	2,380	377	41	6	35	0.2

Purchases of renewable electricity: Electricity purchased at the Norman Plant (wind power), the Meppel Plant (hydro power), and the Dublin and Kerry Plants have been deemed to be generated by renewable energy sources.

Breakdown of Energy consumption (Japan: all business locations and sales fleets) Unit: terajoule

Fiscal year	Total	Liquid fuel		Gaseous fuel		Heat purchase	Electricity		Renewable energy			
		Fuel oil	Gasoline etc.	City gas	LPG, LNG		Total	Renewable energy source	Total	Wind power source	Wood chip source	Photovoltaic panels
2005	3,425	350	225	639	226	2	1,984	0	0	0	0	0
2012	3,170	2	104	951	240	2	1,870	0	0.3	0	0	0.3
2013	3,358	1	99	1,011	259	2	1,985	0	0.3	0	0	0.3
2014	3,149	0	93	898	241	3	1,913	0	0.3	0	0	0.3
2015	3,149	0	80	859	239	8	1,962	0	0.3	0	0	0.3
2016	3,196	0	72	892	241	8	1,983	0	0.2	0	0	0.2

Breakdown of Energy consumption (overseas: all production facilities) Unit: terajoule

Fiscal year	Total	Liquid fuel		Gaseous fuel		Heat purchase	Gaseous fuel		Renewable energy			
		Fuel oil	Gasoline etc.	City gas	LPG, LNG		Total	Renewable energy source	Total	Wind power source	Wood chip source	Photovoltaic panels
2005	1,022	0	3	303	0.0	52	663	0	0	0	0	0
2012	781	0	7	227	0.1	20	489	203	37	5	32	0
2013	769	0	4	218	0.2	18	486	196	41	6	35	0
2014	775	0	3	221	0.1	18	490	195	43	6	37	0
2015	768	0	2	223	0.3	18	481	463	43	7	36	0
2016	605	0	4	144	0.3	19	397	377	41	6	35	0

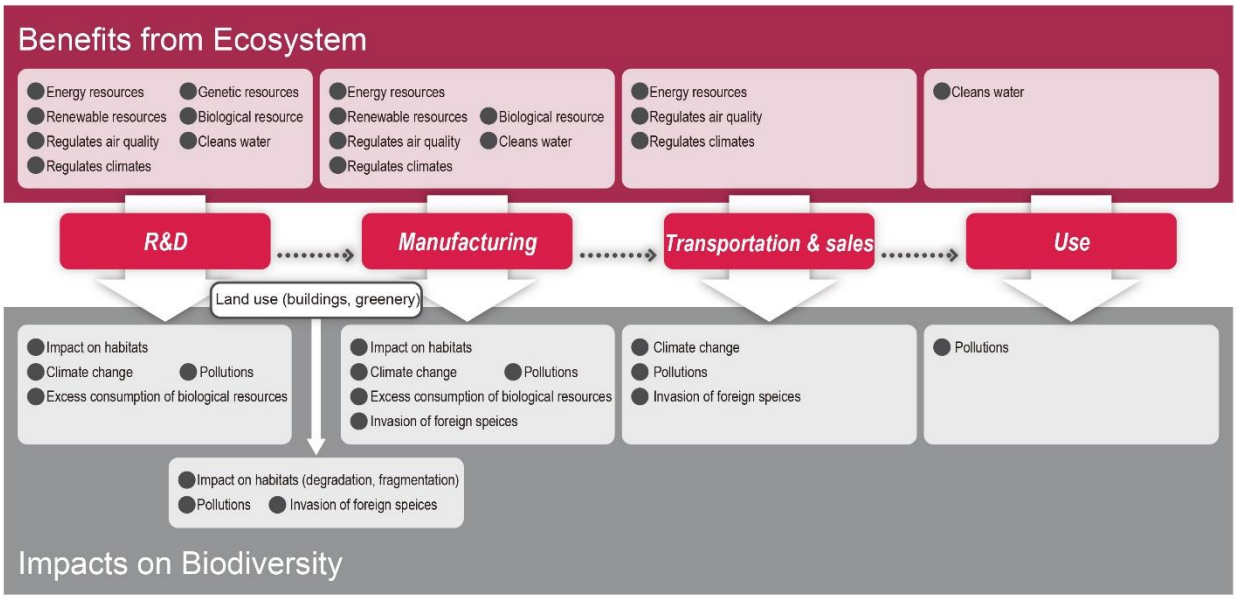
8. Sustainable Biodiversity Initiatives

Astellas has always focused on the importance of biodiversity and has promoted the preserving activities positively. For our business benefit from the blessing of Nature, biodiversity conservation is a very important issue. Through the efforts to deal with the biodiversity issues, Astellas makes contributions to tomorrow's Nature.

8.1. Basic Policy on Biodiversity

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.

- 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.



8.2. Biodiversity Index

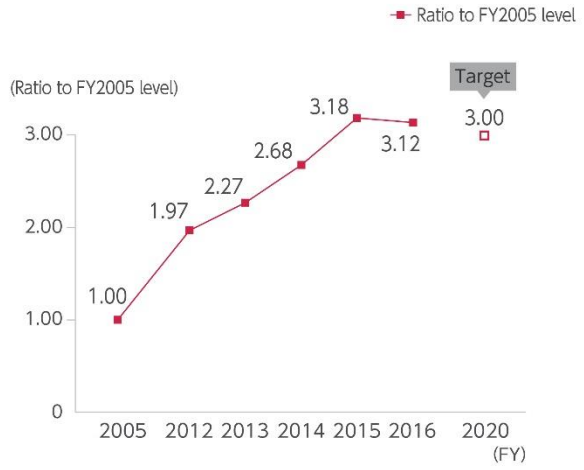
The government's National Biodiversity Strategy of Japan 2010 identified the challenges the country faces due to four crises affecting biodiversity. They are (1) species and habitat degeneration due to excessive human activities and development; (2) degradation of *satochi-satoyama* natural rural areas due to insufficient management; (3) ecosystem disturbances caused by the introduction of alien species by human activity and chemical contamination; and (4) climate change.

We believe it is difficult for Astellas to participate directly in the prevention of *satochi-satoyama* degradation in the course of its business activities. Accordingly, we have excluded this crisis from the scope of our biodiversity strategy. We have created an index by reclassifying the three main factors responsible for the deterioration of biodiversity, namely environmental pollution, resource consumption, and climate change.

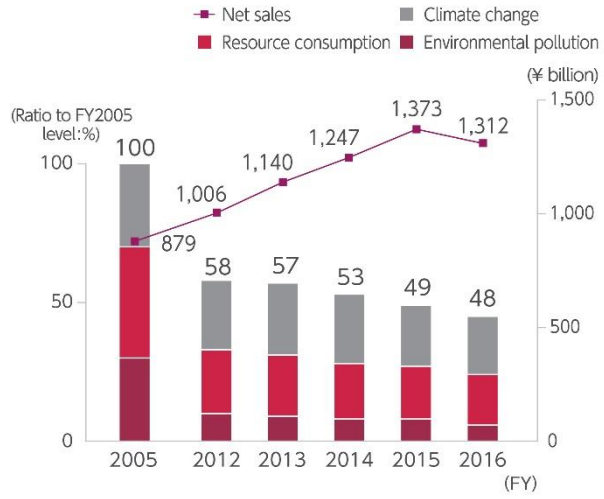
Environmental Action Plan (Biodiversity)
Raise the Biodiversity Index to triple the fiscal 2005 level by fiscal 2020. (Global)

The Biodiversity Index for fiscal 2016 came in at 3.12 times the figure recorded in fiscal 2005, with the result that we achieved the target. Led by a reduction in GHG emissions, pollution and resource consumption, the biodiversity burden index declined, and net sales of the entire Group also decreased. As a result, the overall Biodiversity Index fell 0.06 points from the previous year. Because the review was conducted shortly after the revised Action Plan, we will not change the numerical targets as we continue to improve the overall Biodiversity Index.

Biodiversity Index



Biodiversity Burden Index and Sales



Notes: Consolidated sales figures were used for computing the biodiversity index, but from fiscal 2013, consolidated sales computations are based on International Financial Reporting Standards (IFRS)

(Calculation method)
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 sales 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.

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

Categories	Sub-Categories	Weight(%)
Environmental pollution	NOx, SOx emissions	10
	Chemical substances emissions	10
	BOD 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)
Total		100

8.3. 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 2016, we held our fifth event of tree planting 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 100 had been grown from acorns collected by members of staff of the Tsukuba Research Center within the center's grounds.

9. Cyclic Use of Resources

Resolving the issues of climate change and biodiversity requires changing the existing style of economic development. Namely, the whole of society must pursue a sustainable society and economy while reducing the volume of resources it consumes. Astellas too recognizes that since the use of sustainable resources is essential for continuing its business activities, it must play an active role toward the creation of a recycling-oriented society.

Astellas is 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.

9.1. Effective Use of Water Resources

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.

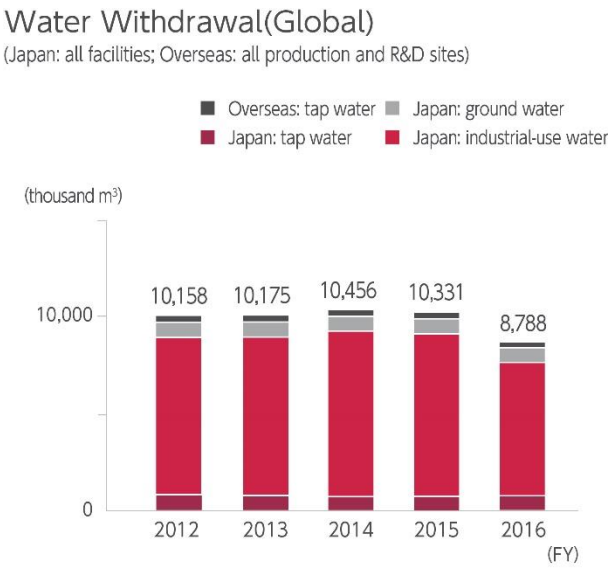
  Applicable areas: Research and production sites in Japan and overseas

  Indicator:

  Sales (billion yen) /Volume of water resource withdrawn (1,000 m^3)

The Astellas Group on a global basis does not currently draw water from river systems in areas where depletion of water resources is a concern, but as water shortages may become a problem in the future, owing to 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. Moreover, since the effective use of water resources serves as a useful indicator for gauging society's impact on biodiversity, Astellas is engaged with reducing water withdrawal.

From fiscal 2016, we set the relationship between water resources and economic activity as a "water resource productivity" indicator, and have been striving to improve this indicator. The water resource productivity of fiscal 2016 has improved 2.89 times compared with the base year of fiscal 2005.



9.2. Waste Management

Environmental Action Plan (Waste Management)
Improve waste generated per unit of sales to around 20% of fiscal 2005 result by the end of fiscal 2020.

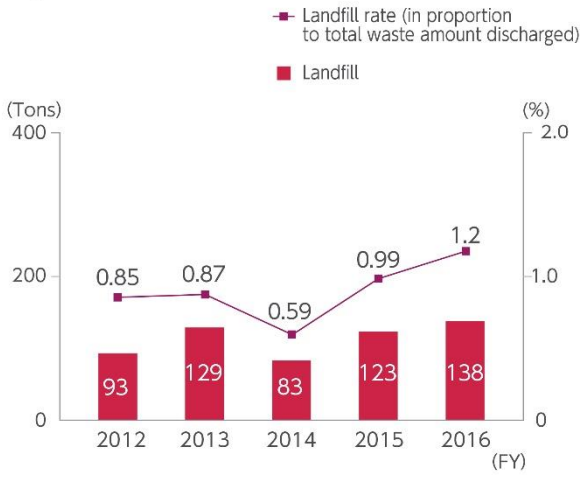
Applicable areas:	Research and production sites in Japan and overseas
Indicator:	Volume of waste generated (tons)/Sales (billion yen)

Astellas believes that efforts to reduce waste landfill volume to as close to zero as possible will encourage the recycling and reuse of waste materials. In line with this, we have achieved our goal of reducing the waste landfill volume to less than 2% of the total discharged volume at our business facilities in Japan. From fiscal 2016, in addition to continuing our efforts to reduce the amount of landfill waste, we have also been striving to newly improve the amount of waste generated per unit.

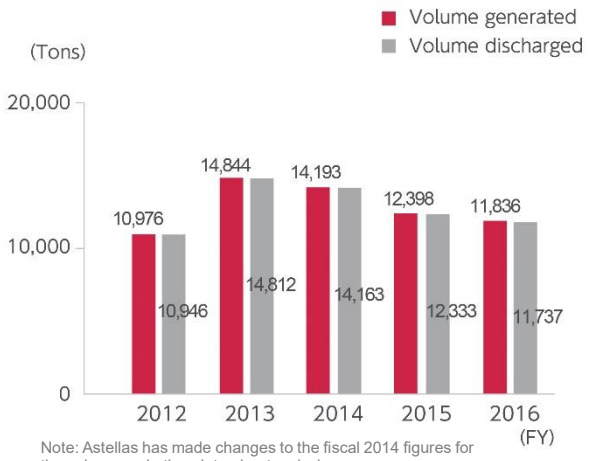
In waste management, it is also important to prevent the illegal disposal of waste and environmental pollution caused by hazardous waste generated by research centers and plants. To prevent this from happening, we first examine appropriate methods of waste disposal, and check regularly that the waste disposers selected use appropriate waste disposal methods.

The waste volume generated in fiscal 2016 was 13,810 tons. The amount of waste generated per unit was 10.5 tons/billion yen, an improvement of 21% compared with the base year.

Landfill rate and landfill volume
(All Japanese facilities excl. sales branches)

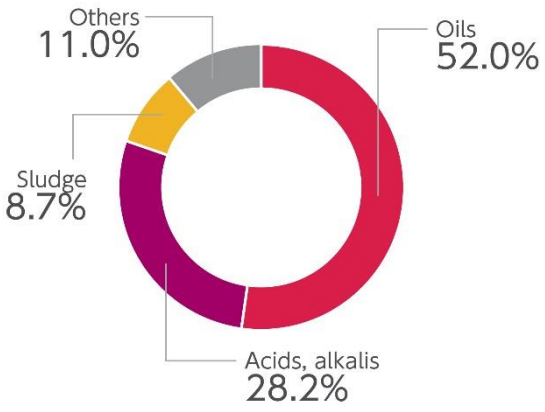


Volume of Waste Generated and Discharged
(All Japanese facilities excl. sales branches)

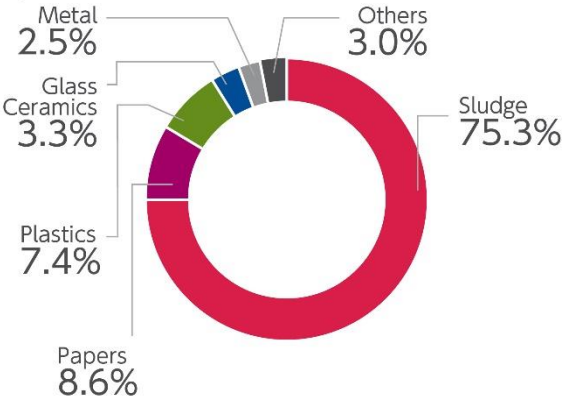


Note: Astellas has made changes to the fiscal 2014 figures for the volume and other data about emissions.

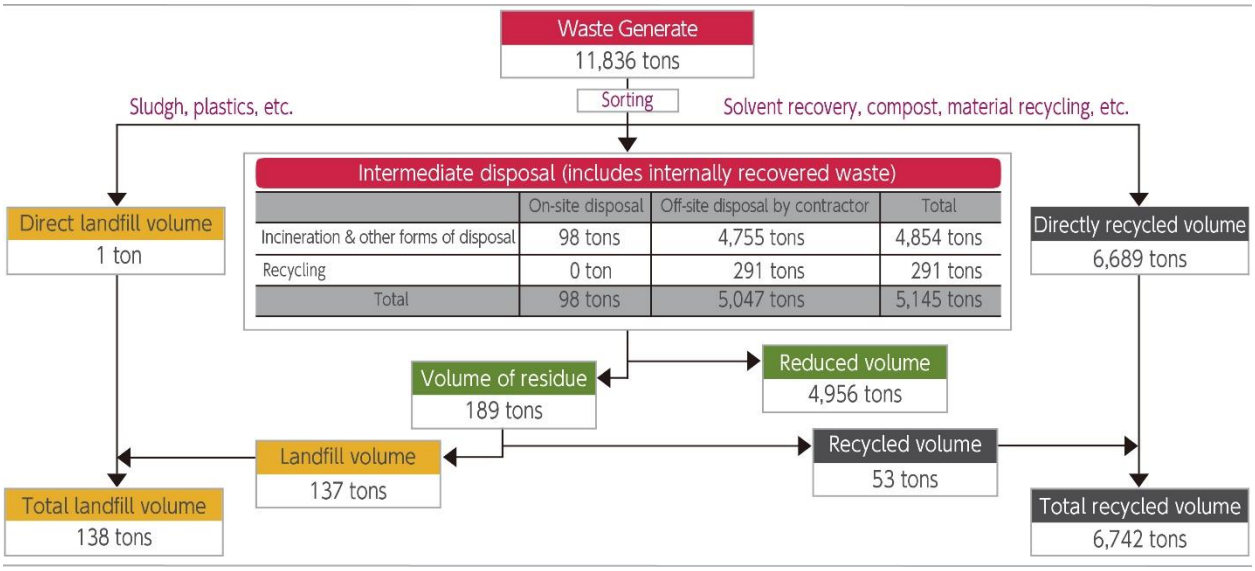
Breakdown of waste discharged
(All Japanese facilities excl. sales branches)



Breakdown of landfill waste
(All Japanese facilities excl. sales branches)



Waste Processing Flow Chart



9.3. State of PCB-contaminated Waste Storage

We have been systematically conducting detoxification of any equipment that is contaminated with PCBs stored by Astellas.

In fiscal 2016, we disposed of a low-concentration small container that had been stored in the Takaoka Plant. In addition, the load-figure registrations for all items stored at each of our business facilities have been completed.

Status	Load-figure	Weight (kg)
Stored	Drum	11,096
	Pail	37
	Glass container	0.3
	Device	26
	Metal tray	11

10. Initiatives for Preventing Pollution

Among environmental initiatives, the prevention of environmental pollution in local communities is just as important as global environmental issues. In recent years, there has also been a strengthening of various laws and regulations, including the strengthening of measures to prevent any increase of damage in the case of water pollution accidents. Meanwhile, the international community has reached an agreement on minimizing the adverse effects that the production and use of chemical substances have on human health and the environment by the year 2020. Each country is, therefore, implementing its own initiatives on the control of chemical substances.

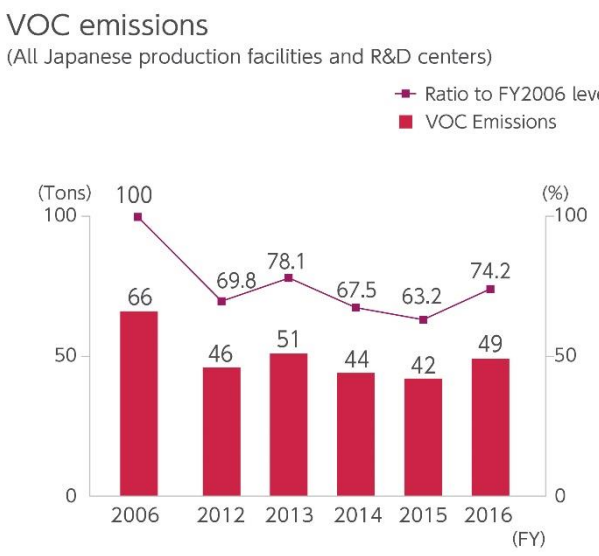
Astellas sets its own levels which are stricter than legal standards and pollution control agreements for the major environmental management indicators used to measure air quality and water quality. In addition to reducing the discharge of contaminants, we are also promoting voluntary activities to reduce the discharge of chemical substances into the atmosphere.

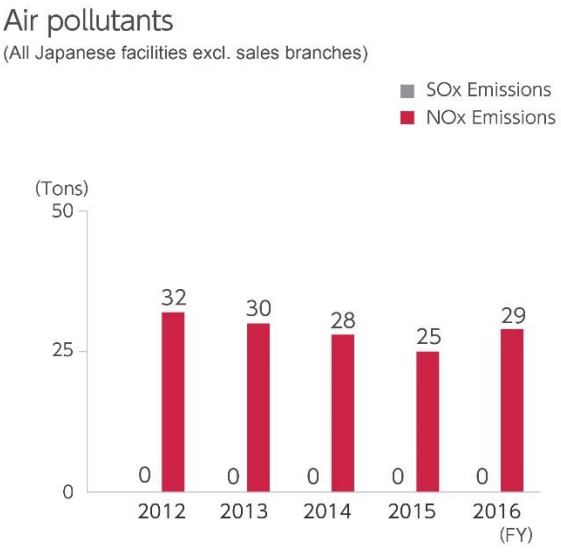
10.1. Air Pollution

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. In fiscal 2015, the final fiscal year of our Environmental Action Plan, we achieved our target to reduce VOCs by more than 25% compared to fiscal 2006. From fiscal 2016 onward, we have continued our reduction efforts without setting any numerical targets.

In emissions of VOCs into the atmosphere, the figure for fiscal 2016 was 49 tons, an increase of 7 tons over the previous year. Compared with fiscal 2006, this was a decrease of 17 tons (25.8%). Moreover, in addition to reducing atmospheric pollution, we have taken other 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.

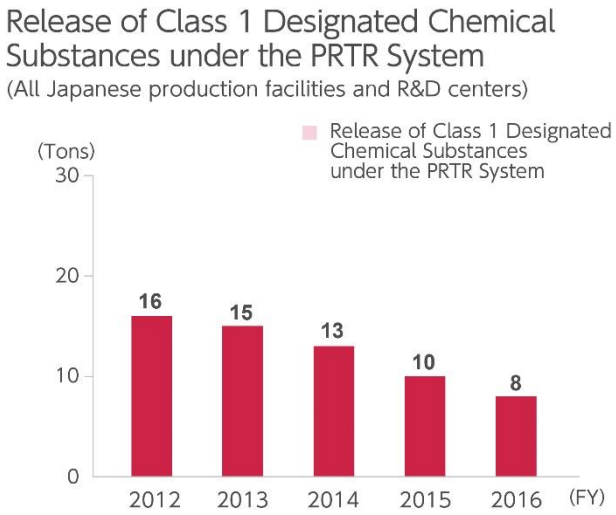
To reduce the atmospheric emissions of sulfur oxides (SOx) and nitrogen oxides (NOx), we completed the shutdown of incinerators and shifting from liquid fuel such as fuel oil to city gas. In addition, we are proceeding to replace boilers using city gas with low-NOx-type boilers. As a result, SOx emissions were zero, and NOx emissions increased by 4 tons from the previous fiscal year, to 29 tons.





10.2. Emission of PRTR* Chemical Substances

Japan's PRTR Act designate substances harmful to human beings and recognized to widely exist in the environment. The main aim of these laws is to confirm the nature of the emissions and movement-generated materials of a company, and to result in the company's independent assessment and improvement of its management of chemical substances. The table below shows the release and transfer of PRTR-designated substances that we identified and reported on in fiscal 2016. Our total amount of release into the environment of designated chemical substances in fiscal 2016 was 8 tons.



*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)

Releases and transfers of PRTR chemical substances in fiscal 2016 (Unit: tons)

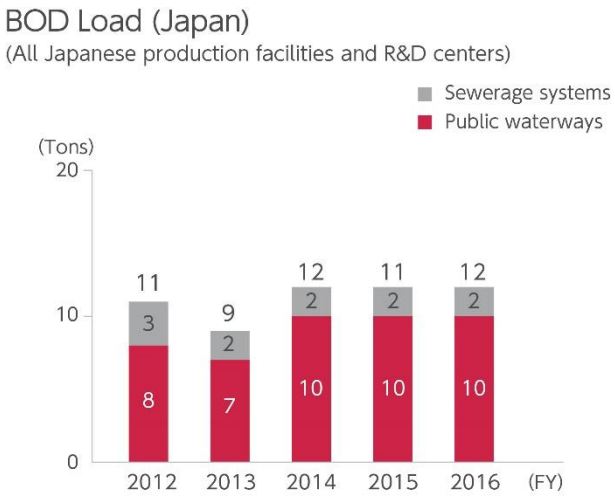
Substance name	Volume handled	Volume Released			Volume transferred	
		Air	Water	Soil	Waste	Sewerage
Acetonitrile	26.638	0.587	0.000	0.000	4.068	0.000
Chloroform	20.805	3.745	0.000	0.000	17.060	0.000
Dichloromethane (also known as methylene chloride)	31.912	2.260	0.000	0.000	0.043	0.000
N, N-dimethylformamide	11.728	0.004	0.001	0.000	4.376	0.000
Toluene	1.751	0.011	0.000	0.000	1.740	0.000
n-Hexane	5.843	1.052	0.000	0.000	4.792	0.000

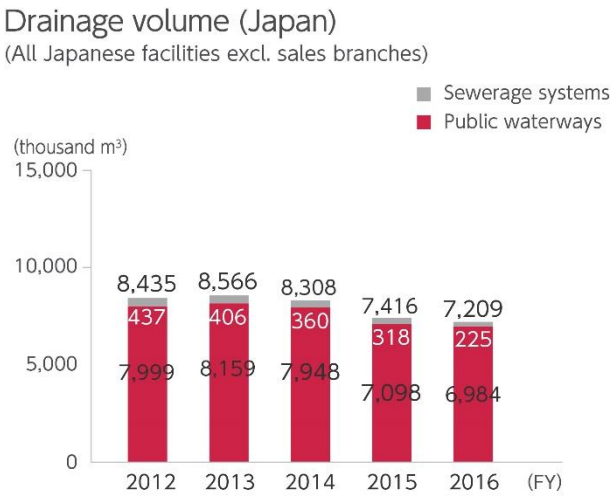
10.3. Water Pollution

Astellas measures the extent of its impact on aquatic environments by adopting the biochemical oxygen demand (BOD) load as an index, and makes the data available to the public.

In Japan, the BOD load in fiscal 2016 was 12 tons, slightly up from the previous fiscal year. Outside Japan, the BOD in fiscal 2016 was 5 tons (excluding Meppel Plant), down 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, and will take action as appropriate. In addition, in fiscal 2016 we evaluated our wastewater management method by using bioassays targeting 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.





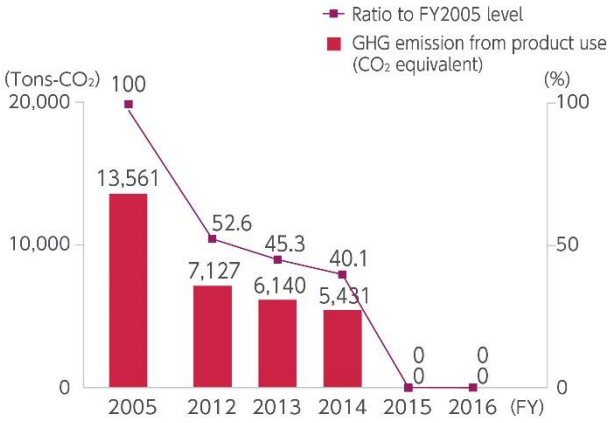
11. Environmental Impact of Products and Countermeasures

11.1. 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.

GHG emissions from product use

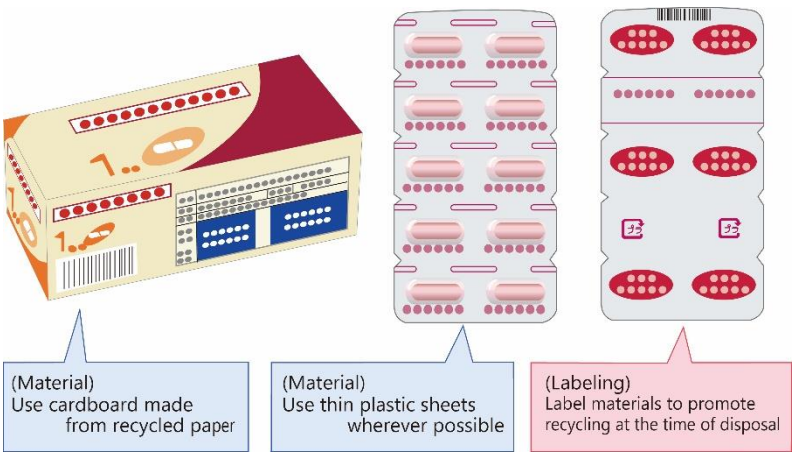


11.2. Containers and Packaging Recycling

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.

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 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 2016 is 544 tons, and the Company was requested to pay ¥15.83 million in recycling costs.



12. 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 2016 comprised ¥1,134 million in investments and ¥1,182 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, there were updates made to such devices as a small one-through boiler which had reached its update time and to the latest model of chiller. The economic benefits generated through environmental protection activities amounted to ¥57 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, the allowance for PCB treatment was increased and amounted to approx. ¥300 million.

Total environmental conservation costs in fiscal 2016

(Unit: ¥ million)

Category			Environmental Conservation Costs			
			Investments	Costs		
				Total	Expense	Depreciation
Business Area Cost			1,078	1,133	770	363
Breakdown	Pollution Prevention	Prevention of atmospheric pollution	23	209	195	14
		Prevention of water pollution	557	231	152	79
		Prevention of soil contamination	8	8	3	5
		Prevention of noise, bad odors and vibrations	0	3	3	1
		Other	0	6	3	3
		Subtotal	588	457	355	102
	Global Environmental Conservation	Mitigation of climate change	170	241	44	197
		Prevention of Ozone layer depletion	161	7	7	0
		Management of chemical substances	0	70	67	3
		Other	0	36	0	36
		Subtotal	330	354	118	236
	Resource Circulation	Efficient use of wastes	0	146	146	0
		Conservation of water	0	0	0	0
		Treatment of wastes	159	150	126	23
		Other	0	26	24	1
		Subtotal	159	322	297	25
Upstream/Downstream costs			0	53	53	0
Administration costs			1	246	246	0
R&D costs			55	83	71	12
Social activity costs			0	3	3	0
Environmental remediation costs			0	293	293	0
Total			1,134	1,812	1,437	375
Total environmental conservation costs, excluding environmental remediation costs			1,134	1,519	1,144	375

Economic Benefit Related to Environmental Conservation

(Unit: ¥ million)

Measures taken	Economic Benefit Related to Environmental Conservation ※
Cost reductions through energy conservation	25
Sludge drying, reduction in amount of waste liquid disposal contracted out (through increased disposal in-house)	0
Conservation of resources through reuse of solvents, and reduction in fuel purchases through conversion of solvents to fuel	37
Sale of waste solvents	5
Total	67

* Quantifiable items only included in calculations

Environment-related Investments and Expenses

(¥ million)

Categories	FY2012		FY2013		FY2014		FY2015		FY2016	
	Investment	Expenses	Investment	Expenses	Investment	Expenses	Investment	Expenses	Investment	Expenses
Pollution Prevention	177	687	225	489	146	303	313	324	588	457
Global Environmental Conservation	403	287	730	413	206	113	256	84	330	354
Resource Circulation	6	344	0	432	8	462	64	431	159	322
Upstream / Downstream costs	0	67	0	65	0	53	0	53	0	53
Administration costs	18	364	0	331	28	295	0	283	1	246
R&D costs	13	37	7	36	0	63	24	22	55	83
Social activity costs	0	3	0	2	0	6	0	5	0	3
Environmental remediation costs	0	76	0	255	0	363	0	362	0	293
Total	616	1,865	963	2,023	387	1,657	657	1,565	1,134	1,812

13. Methods for Calculating Performance Data

13.1. Methods for Calculating Energy Consumption and GHGs

Astellas' overseas facilities use the CO_2 emission coefficients in the Conversion Coefficients table below except for electricity and steam use of the overseas plants shown in the second table.

Type	Conversion Coefficients	
	Calorific value	CO_2 emissions
Electricity	9.97 GJ/MWh	0.531 tons/MWh *1
Fuel oil	39.1 GJ/kiloliter	2.71 tons/kiloliter
Kerosene	36.7 GJ/kiloliter	2.49 tons/kiloliter
LPG	50.8 GJ/tons	3.00 tons/ton
LNG	54.6 GJ/tons	2.70 tons/ton
City gas	45.0 GJ/1000 m^3N	2.24 tons/1000 m^3N
Diesel oil	37.7 GJ/kiloliter	2.58 tons/kiloliter
Gasoline	34.6 GJ/kiloliter	2.32 tons/kiloliter
Purchased thermal energy	1.36 GJ/ton	0.057 tons/GJ

	Electricity *2	Steam
Norman Plant	0.486 tons/MWh	-
Dublin Plant Kerry Plant	0.425 tons/MWh	-
Meppel Plant	0.473 tons/MWh	-
Shenyang Plant	0.681 tons/MWh	0.091 tons/GJ

*1 For CO_2 emissions calculations in fiscal 2016, we have used the coefficient for fiscal 2015, because at the time of the release (June 2016) of our Japanese Environmental Report, the Electric Power Council for a Low Carbon Society's latest CO_2 emission coefficient was unavailable.

*2 The coefficient by country is announced by the International Energy Agency (IEA). It is used to evaluate the Environmental Action Plan. For details of the coefficients used to calculate GHG emissions, see the CO_2 emission coefficient accompanying the end-use electricity under Climate Change Mitigation Measures.

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

13.2. Calculation Method for Scope 3 Emissions

Category	Calculation method	Emission source unit
1 Purchased goods and services	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 of each raw material (purchaser price basis) Example: Starch 9.07 t-CO_2 equivalent/¥million
2 Capital goods	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) Pharmaceutical products 2.83 t-CO_2 equivalent/¥million
3 Fuel and energy related activities (not included in Scope 1 and Scope 2)	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) Electricity: 0.0354 t-CO_2/MWh Steam: 0.0139 t-CO_2/GJ **Source**: Carbon footprint communication program: Basic database Ver.1.01 Fuel oil: 0.214 t-CO_2/kiloliter LPG : 0.537 t-CO_2/ton Kerosene: 0.121 t-CO_2/kiloliter LNG : 0.554 t-CO_2/ton Diesel oil: 0.152 t-CO_2/kiloliter City gas: 0.484 t-CO_2/thousands Nm^3 Gasoline: 0.343 t-CO_2/kiloliter
4 Transportation and distribution	CO_2 emissions during transportation: Calculation method for CO_2 emissions from energy sources related to cargo transportation by transportation carrier stipulated by Act on the Rational Use of Energy CO_2 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: reporting manual (Ver.4.0) Electricity emissions intensity: Actual fiscal 2015end-use emission source units of the Electric Power Council for a Low Carbo Society 0.531 t-CO_2/MWh
5 Waste generated in operation	CO_2 emissions generated during industrial waste transportation: Calculation method for CO_2 emissions from energy sources related to cargo transportation by transportation carrier stipulated by Act on the Rational Use of Energy	Target: Production bases in Japan Emission source unit during industrial waste transportation **Source**: Calculation of greenhouse gas emissions: reporting manual (Ver.4.0)
	CO_2 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	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) Example: Sludge (incineration) 0.1731 t-CO_2/t
6 Business travel (by airplane)	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 Example: Economy class on domestic flight. 0.14735 kg-CO_2/passenger-km
7 Employee commuting	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 Emission source units of trains and buses **Source**: The Ministry of the Environment's database*10; emission source units per traveler-km (Secretariat) Train: 0.0236 kg-CO_2/passenger-km Bus: 0.0836 kg-CO_2/passenger-km Emission source unit of cars: Car: 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 2015" Fuel consumption rate of gasoline by private-use car (11.6 km/Liter) ● Number of commuting days per year: 238 days
8 Use of sold products	Amount of HFC used as fillers in inhalation-type medical drugs x GWP	Target: Japan Targets sold inhalation-type medical drugs (HFC specification products)
9 End-of-life treatment of sold products	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*8; emission source units by waste type (Secretariat) (including waste transportation stage) Example: Waste plastics 0.8214 t-CO_2 equivalent/ton

The Ministry of the Environment's database: The Ministry of the Environment's emission source unit database (ver. 2.4) for calculating greenhouse gas emissions through the supply chain (March 2017)

14. Corporate Data

Company Name	Astellas Pharma Inc.
Headquarters	2-5-1, Nihonbashi-Honcho, Chuo-Ku, Tokyo 103-8411, Japan
Capital	¥103,001 million (as of March 31, 2016)
Representative Director	Yoshihiko Hatanaka (President and Chief Executive Officer)
Foundation	1923

Net Sales	¥1,311,665 million (Consolidated basis, as of March 31, 2017)
Employees	17,202 (Consolidated basis, as of March 31, 2017)
Professional institution affiliation	・Japan Business Federation ・The Federation of Pharmaceutical Manufacturers' Associations of Japan ・Japan Pharmaceutical Manufacturers Association, etc.

■ Scope of environmental information report

1. Coverage of the Environmental Action Plan

Company name	Facility	Location	Function
Astellas Pharma Inc.	Nihonbashi Office	Chuo-ku, Tokyo	Headquarters, Development
	Takahagi Chemistry & Technology Development Center	Takahagi, Ibaraki	Research
	Tsukuba Research Center	Tsukuba, Ibaraki	
	Tsukuba Biotechnology Research Center	Tsukuba, Ibaraki	
	Yaizu Pharmaceutical Research Center	Yaizu, Shizuoka	
	Kyoto Suzaku Office	Shimogyo-ku, Kyoto	
	Branches/Sales Offices	14 branches, 109 sales offices	Sales & Marketing
Astellas Pharma Tech Co., Ltd.	Nishine Plant	Hachimantai, Iwate	Manufacturing
	Takahagi Technology Center	Takahagi, Ibaraki	
	Yaizu Technology Center	Yaizu, Shizuoka	
	Toyama Technology Center	Toyama, Toyama	
	Takaoka Plant	Takaoka, Toyama	
Astellas Pharma Technologies Inc.	Norman Plant	U.S.A	
Astellas Ireland Co., Ltd.	Dublin Plant	Ireland	
	Kerry Plant		
Astellas Pharma Europe B.V.	Meppel Plant	Netherlands	
Astellas Pharma China, Inc.	Shenyang Plant	China	

Note 1) Operating sites throughout this report are in principle identified according to the name of each facility. In instances where there are multiple facilities on the same site, the following names may be applied.
- Takahagi Facilities (Takahagi Chemistry & Technology Development Center and Takahagi Technology Center)
- Yaizu Facilities (Yaizu Pharmaceutical Research Center and Yaizu Technology Center)

Note 2) Because of the succession to another company of the business done at the former Fuji Plant on April 1, 2014, we have changed the boundary of reporting from fiscal 2014. In this report, we have deducted all the past data corresponding to the environmental burden of the former Fuji Plant, but have included the former Fuji Plant in calculating the Company's biodiversity index because we cannot deduct the former Fuji Plant's contribution to net sales from the total. To confirm the accumulated data up to fiscal 2013, which includes the performance of the former Fuji Plant, please refer to the past environmental reports available on the Astellas website. (http://www.astellas.com/en/csr/environment/report.html)

2. Facilities Outside the Coverage of Environmental Action Plan

Principal office buildings and R&D Centers operated by the consolidated subsidiaries listed below:
- Astellas US LLC (U.S.A.)
- Astellas Pharma Europe Ltd. (U.K.)
- Astellas Pharma Europe B.V. (Netherlands)
- Agensys, Inc. (U.S.A.)
- Astellas Research Institute of America LLC (U.S.A.)
- and office buildings used by sales companies in the Americas, EMEA (Europe, the Middle East and Africa including NIS countries), and the Asia and Oceania regions

15. Site Data

Nishine Plant

	Item	Unit	FY2016
Energy	Electricity	MWh	10,155
	Fuel oil	kiloliter	-
	Kerosene	kiloliter	0
	LPG	tons	2
	LNG	tons	1,234
	City gas	thousand m^3	-
	Diesel oil	kiloliter	1
	Gasoline	kiloliter	1
	Total	TJ	169
CO_2 emission from energy use		kilotons	9
Air pollutants	NOx	tons	1
	SOx	tons	-
Chemical substance	VOC	tons	21
Water withdrawal	Tap water	thousand m^3	-
	Industrial-use water	thousand m^3	-
	Ground water	thousand m^3	396
	Total	thousand m^3	396
Drainage volume	into rivers	thousand m^3	396
	Sewerage system	thousand m^3	-
Water pollution	BOD load	tons	0
	COD load	tons	0
Waste	Generated	tons	274
	Landfill	tons	7

Takahagi Facilities

	Item	Unit	FY2016
Energy	Electricity	MWh	21,846
	Fuel oil	kiloliter	-
	Kerosene	kiloliter	-
	LPG	tons	-
	LNG	tons	1,225
	City gas	thousand m^3	-
	Diesel oil	kiloliter	0
	Gasoline	kiloliter	-
	Total	TJ	285
CO_2 emission from energy use		kilotons	15
Air pollutants	NOx	tons	7
	SOx	tons	-
Chemical substance	VOC	tons	0
Water withdrawal	Tap water	thousand m^3	43
	Industrial-use water	thousand m^3	2,390
	Ground water	thousand m^3	-
	Total	thousand m^3	2,433
Drainage volume	into rivers	thousand m^3	2,433
	Sewerage system	thousand m^3	-
Water pollution	BOD load	tons	3
	COD load	tons	7
Waste	Generated	tons	1,334
	Landfill	tons	54

Yaizu Facilities

	Item	Unit	FY2016
Energy	Electricity	MWh	55,549
	Fuel oil	kiloliter	-
	Kerosene	kiloliter	-
	LPG	tons	0
	LNG	tons	-
	City gas	thousand m^3	6,908
	Diesel oil	kiloliter	0
	Gasoline	kiloliter	2
	Total	TJ	865
CO_2 emission from energy use		kilotons	45
Air pollutants	NOx	tons	8
	SOx	tons	-
Chemical substance	VOC	tons	0
Water withdrawal	Tap water	thousand m^3	377
	Industrial-use water	thousand m^3	-
	Ground water	thousand m^3	319
	Total	thousand m^3	696
Drainage volume	into rivers	thousand m^3	696
	Sewerage system	thousand m^3	-
Water pollution	BOD load	tons	1
	COD load	tons	2
Waste	Generated	tons	1,025
	Landfill	tons	2

Toyama Technology Center

	Item	Unit	FY2016
Energy	Electricity	MWh	35,575
	Fuel oil	kiloliter	-
	Kerosene	kiloliter	-
	LPG	tons	0
	LNG	tons	-
	City gas	thousand m^3	4,470
	Diesel oil	kiloliter	4
	Gasoline	kiloliter	2
	Total	TJ	556
CO_2 emission from energy use		kilotons	29
Air pollutants	NOx	tons	2
	SOx	tons	-
Chemical substance	VOC	tons	13
Water withdrawal	Tap water	thousand m^3	213
	Industrial-use water	thousand m^3	2,275
	Ground water	thousand m^3	13
	Total	thousand m^3	2,500
Drainage volume	into rivers	thousand m^3	2,500
	Sewerage system	thousand m^3	-
Water pollution	BOD load	tons	3
	COD load	tons	5
Waste	Generated	tons	6,981
	Landfill	tons	41

Takaoka Plant

	Item	Unit	FY2016
Energy	Electricity	MWh	13,454
	Fuel oil	kiloliter	-
	Kerosene	kiloliter	-
	LPG	tons	2,099
	LNG	tons	-
	City gas	thousand m^3	-
	Diesel oil	kiloliter	0
	Gasoline	kiloliter	1
	Total	TJ	241
CO_2 emission from energy use		kilotons	13
Air pollutants	NOx	tons	3
	SOx	tons	-
Chemical substance	VOC	tons	0
Water withdrawal	Tap water	thousand m^3	60
	Industrial-use water	thousand m^3	2012
	Ground water	thousand m^3	31
	Total	thousand m^3	2,103
Drainage volume	into rivers	thousand m^3	2,103
	Sewerage system	thousand m^3	-
Water pollution	BOD load	tons	3
	COD load	tons	4
Waste	Generated	tons	173
	Landfill	tons	1

Tsukuba Research Center

	Item	Unit	FY2016
Energy	Electricity	MWh	*1) 42,154
	Fuel oil	kiloliter	-
	Kerosene	kiloliter	8
	LPG	tons	-
	LNG	tons	-
	City gas	thousand m^3	7,460
	Diesel oil	kiloliter	0
	Gasoline	kiloliter	2
	Total	TJ	756
CO_2 emission from energy use		kilotons	39
Air pollutants	NOx	tons	8
	SOx	tons	-
Chemical substance	VOC	tons	13
Water withdrawal	Tap water	thousand m^3	59
	Industrial-use water	thousand m^3	238
	Ground water	thousand m^3	-
	Total	thousand m^3	297
Drainage volume	into rivers	thousand m^3	-
	Sewerage system	thousand m^3	297
Water pollution	BOD load	tons	2
	COD load	tons	2
Waste	Generated	tons	883
	Landfill	tons	26

*1) 47 MWh generated by photovoltaic panels contained

Tsukuba Bio Research Center

	Item	Unit	FY2016
Energy	Electricity	MWh	6,702
	Fuel oil	kiloliter	-
	Kerosene	kiloliter	-
	LPG	tons	-
	LNG	tons	-
	City gas	thousand m^3	369
	Diesel oil	kiloliter	-
	Gasoline	kiloliter	0
	Total	TJ	83
CO_2 emission from energy use		kilotons	4
Air pollutants	NOx	tons	0
	SOx	tons	-
Chemical substance	VOC	tons	1
Water withdrawal	Tap water	thousand m^3	31
	Industrial-use water	thousand m^3	-
	Ground water	thousand m^3	-
	Total	thousand m^3	31
Drainage volume	into rivers	thousand m^3	-
	Sewerage system	thousand m^3	31
Water pollution	BOD load	tons	0
	COD load	tons	-
Waste	Generated	tons	1,028
	Landfill	tons	3

Kyoto Suzaku Office

	Item	Unit	FY2016
Energy	Electricity	MWh	3
	Fuel oil	kiloliter	-
	Kerosene	kiloliter	-
	LPG	tons	-
	LNG	tons	280
	City gas	thousand m^3	-
	Diesel oil	kiloliter	4
	Gasoline	kiloliter	5
	Total	TJ	47
CO_2 emission from energy use		kilotons	2
Air pollutants	NOx	tons	0
	SOx	tons	-
Chemical substance	VOC	tons	0
Water withdrawal	Tap water	thousand m^3	9
	Industrial-use water	thousand m^3	-
	Ground water	thousand m^3	-
	Total	thousand m^3	9
Drainage volume	into rivers	thousand m^3	-
	Sewerage system	thousand m^3	9
Water pollution	BOD load	tons	0
	COD load	tons	-
Waste	Generated	tons	28
	Landfill	tons	0

(English version edited: JULY 14th. Japanese original version issued on JUNE 14th, 2017)