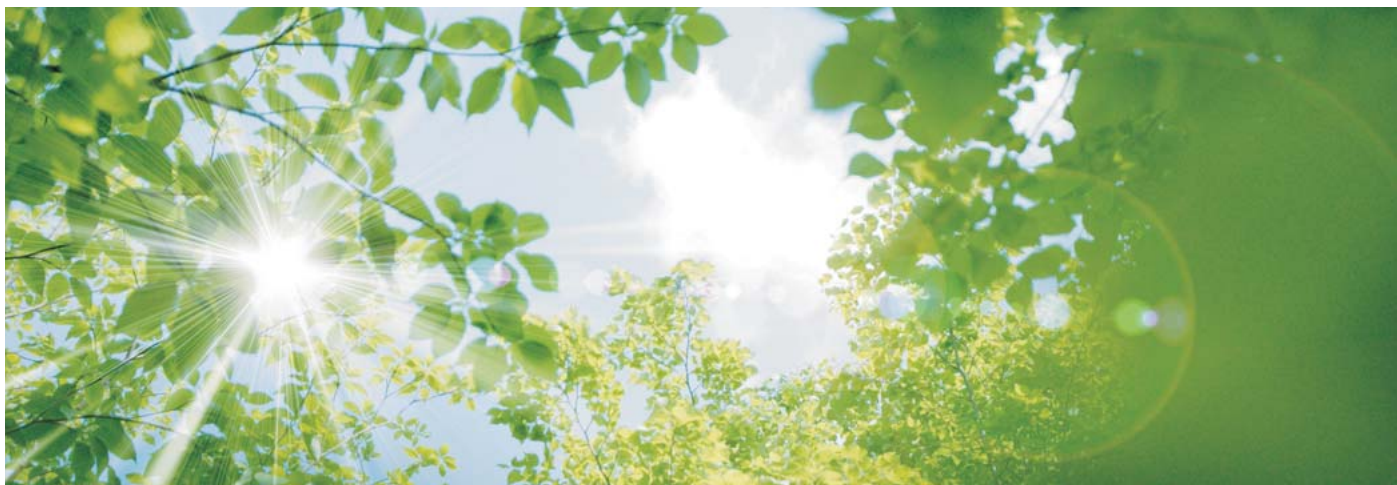


Takeda implements measures in all areas of its business, improving the controlling structure with the "Basic Principles on the Environment" as its benchmark.



## Basic Principles on the Environment

### 1. Overall Policy

Give serious consideration to the impact on the environment in every aspect of corporate activities, including R&D, production, distribution, marketing, procurement and clerical works, and make the best efforts to conserve and improve the environment.

### 2. Efficient Utilization of Resources and Minimization of Waste

Conserve energy and other resources, and actively pursue waste minimization and resource recycling.

### 3. Assessment of Environmental Impact from Products and Manufacturing Processes

When developing new products and processes, evaluate the impact on the environment in advance, during development, and periodically after commercialization. Consider the entire business cycle from procurement of raw materials and supplies through the use and the final disposal of products to reduce the impact on the global environment.

### 4. Development and Utilization of Environmental Technologies

Develop technologies for environmental protection and improvement, and actively pursue outside technologies when it is beneficial.

### 5. Response to Emergencies

When an adverse effect on the environment is foreseen, exercise the best possible contingent efforts to eliminate or minimize such adverse impact.

### 6. Clear Definition of Accountability and Responsibility

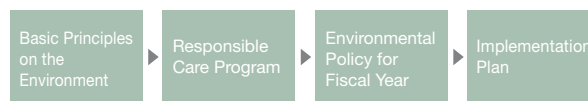
Appoint executives and managers in charge of environment-related activities and clearly define their authority.

### 7. Cooperation with the Community and Society at Large

Actively cooperate with the environmental efforts of local communities and provide fair and unbiased information.

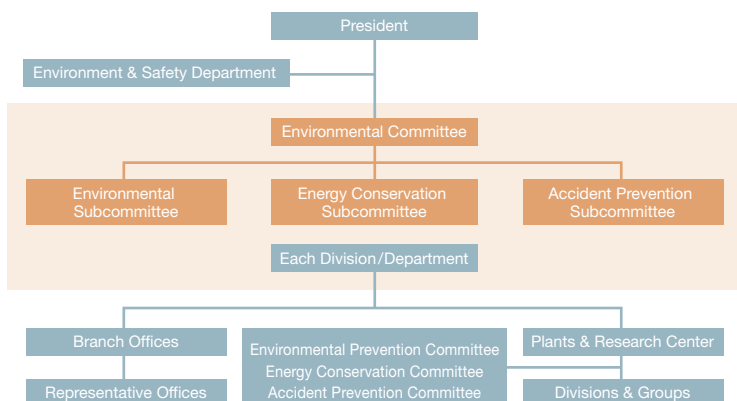
### 8. Education and Training

Educate and train each employee to understand and realize the importance of environmental issues and to act accordingly in his or her daily routine.



See Takeda's website for details. <http://www.takeda.com/csr/environment/principle.html>

## Environment and Safety Management Structure



Takeda has established the "Environmental Committee," consisting of managers in charge of environment-related activities from each division, to promote our business operations based on the "Basic Principles on the Environment." At the Environmental Committee, various issues regarding the environment, including company-wide environmental protection, energy conservation and accident prevention are deliberated and annual environmental policies are determined. Under the Environmental Committee, three subcommittees - the "environment," "energy conservation" and "accident prevention" - have been formed, whereby the promotion and implementation of measures for each issue are underway at the managers' level. Moreover, personnel in charge of environment-related activities are appointed at the manufacturing plants and research center, promoting activities based on the medium-term implementation plan, as well as the annual plan.

**Takeda's Major Environmental Protection Policies and Achievements in Fiscal 2006**

Theme	Policies	Achievements
Promotion of basic efforts to respond to environmental issues	Develop legal compliance systems and adherence to in-house standards.	Established in-house standards, which are more stringent than the legal requirements and maintained legal compliance systems through regular environmental monitoring based on in-house standards.
Energy conservation and reduction in greenhouse gas emissions	Reduce CO <sub>2</sub> emission by 40% compared to the fiscal 2005 level by fiscal 2010.	Achieved a reduction of CO <sub>2</sub> emission to 345K tons, a 4% decrease compared to the fiscal 2005 level.
Waste reduction	Taking fiscal 2004 as a benchmark of the final waste disposal amount, reduce this amount by 30% by fiscal 2010.	Achieved a reduction of the final waste disposal amount to 217 tons, a 25% decrease compared to the fiscal 2004 level.
Adequate management of chemical substances and reduction of their emissions into the environment	Reduce emissions of chemical substances into the environment.	Achieved reduction in toluene emissions into the air by introducing the catalytic combustor.
Implementation of educational and awareness raising activities	Promote compliance education in relation to environmental issues.	Disseminated case examples of accidents and provided compliance education in relation to environmental issues, utilizing a compliance status checklist.
Contribution to communities	Improve in communication with authorities and community members and strive toward the enhancement of living environmental sustainability.	Collected information from the "Sensing Monitors" from selected residents in the vicinities of the plant to ensure there is no problem.

**Takeda's Major Policies and Achievements on Accident Prevention in Fiscal 2006**

Theme	Policies	Achievements
Enhancement and improvement of accident prevention management	Prevent accidents and disasters by using the Manual for Intermittent Operation and Accident Prevention Manual.	Prevented any accidents and disasters by implementing revisions of the Manual for Intermittent Operation and Accident Prevention Manual.
	Implement periodical inspections and maintenance of facilities and piping, planned refurbishment of aging facilities and safety management of facilities out of operation.	Implemented the planned refurbishment of aging facilities and safety measures for facilities out of operation through the inspections to check their condition.
Enhancement of accident prevention measures	Prevent accidents by comprehensive implementation of measures against static electricity and confirmation of safety conditions.	Periodically conducted measurements to check the earthing resistance or leakage resistance, as well as the electric potential of charged equipment, in order to confirm the effectiveness of the implemented countermeasures, and to prevent any accidents caused by static electricity.
	Eliminate any danger of flammable substances and thoroughly confirm safety conditions.	Ensured the effectiveness of the countermeasures through periodic inspections of equipment sealed with nitrogen for safety, etc. and striving to avoid the occurrence of any accidents.
	Prevent damage caused by earthquakes from spreading, by strengthening anti-earthquake measures for important facilities and buildings.	Thoroughly implemented preventive measures to guard against overturning and falling, while the evaluation of earthquake-proof safety for important facilities was conducted.
Enhancement of education and training on accident prevention	Enhance the proficiency level of accident prevention techniques and its methods by providing education and training, in accordance with the specific characteristics of each business site and production site and inheriting such techniques to younger generation according to the plan.	Provided education and training using the Manual for Intermittent Operation and Accident Prevention Manual to learn accident prevention procedures in a well-planned manner and ensuring such techniques being inherited.

**ISO14001**

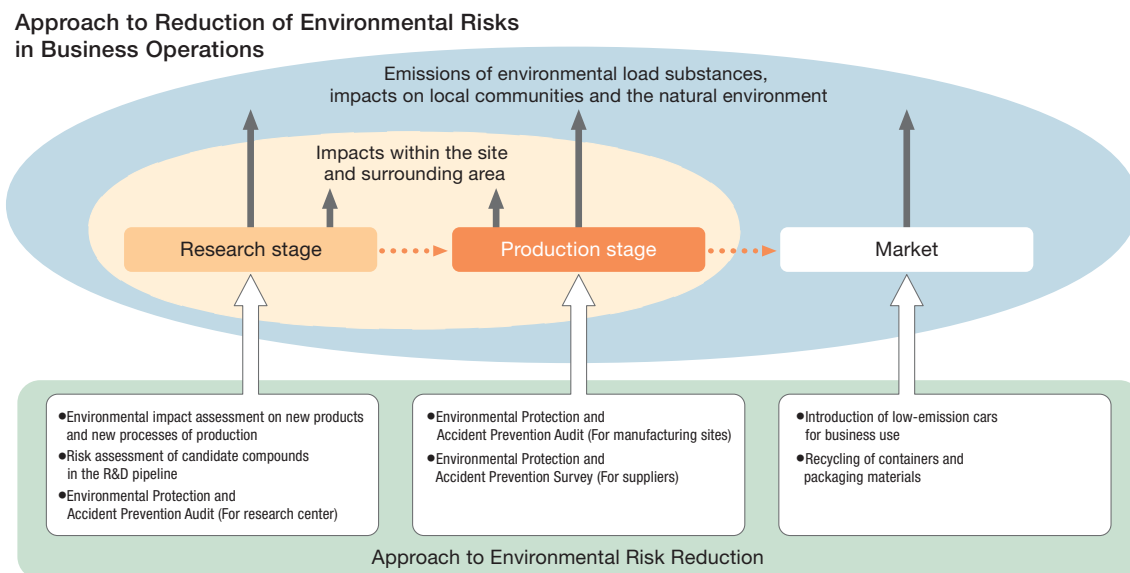
Takeda's main production facility - Hikari Plant - obtained ISO 14001 certification, a globally accredited authentication for an environmental management system, in December 1998. Currently, eight sites of the Takeda group are ISO 14001 certified.

**Responsible Care Activities**

Responsible Care is an international voluntary program dealing with the management of chemical substances by businesses, with activities now extending to 52 countries. The purpose of the program is to secure "environment," "safety" and "health" while handling chemical substances and Takeda has been implementing such activities since 1995, when the Japan Responsible Care Council was launched.



In order to reduce impacts on the environment, as well as risks related to accidents, we continue to implement the assessment and audit at each stage of the business activities.



## APPROACH TO ENVIRONMENTAL RISK REDUCTION

### ■Research and Development Stage

The volumes of materials used in pharmaceutical products are small relative to many consumer chemicals; meaning they are generally considered to have decreased environmental impacts. However, there is a need to recognize the effects that pharmaceutical products would have on the ecosystem, since they are biologically active agents and concerns about residual agents in the environment have become a significant issue to be highlighted with the development of analytical technology. Guidelines on environmental assessments for drugs were established in 1998 by the U.S. Food and Drug Administration (FDA) and in 2006 by the European Medicines Evaluation Agency (EMA) respectively. Since then applicants have been required to provide data on environmental assessments for drugs as well as data concerning the efficacy and safety in the process of the new drug application. Takeda implements appropriate actions in accordance with the guidelines of respective countries, regarding the new products in a phase of preparation for application. In addition, in the course of the development of new products and new production processes, Takeda evaluates their environmental impacts during cycle of manufacture, use, and disposal of the products according to the environmental evaluation list from the perspectives of environmental load, waste generation, energy conservation and the preventive depletion of natural resource conservation. In this way we develop products and production processes with minimal impacts on the environment.

### ■Production Stage

The production stage requires the greatest energy consumption and also discharges the most environmentally burdensome substances of all Takeda business activities. Therefore, we promote a reduction in the amount of environmental loads, based on the activity promotion program specifically formed by respective manufacturing sites, while accurately under-

standing the state of environmental loads, including energy usage, waste generation, etc. at the global production bases. As for the management of chemical substances, Takeda promotes the thorough storage management of hazardous materials and toxic substances, as well as improvement of the MSDS (Material Safety Data Sheet), while engaging in efforts toward the reduction of emissions of these chemical substances (in August 2006, catalytic combustor was introduced at the Hikari Plant to treat exhaust gas containing toluene) and reporting to government authorities in line with so-called PRTR (Pollutant Release and Transfer Register) Law in Japan. As for the global warming issue, Takeda set numerical goals in the 9th energy conservation program and as part of the efforts of the program, we have been promoting policies for fuel conversion to the one with less greenhouse gas emissions. In fiscal 2007, the fuel conversion from coal to gas is scheduled for implementation at Tianjin Takeda Pharmaceuticals Co., Ltd. in China. At each production base, we step up efforts to control any impacts on local communities and the natural environment by thoroughly implementing accident prevention measures, during both normal operation and emergency, including the occurrences of earthquake and fire.

### ■Market

Pharmaceutical products themselves cannot be either collected or recycled. However, we strive to ensure appropriate handling of the containers and packaging materials of pharmaceutical products after their administration to patients, in accordance with relevant laws and regulations such as the Containers and Packaging Recycling Law. In addition, we have proactively introduced low-emission vehicles to be used for business purposes, including sales activities, etc. in order to limit the impact on air pollution; and consequently, 96 percent of total vehicles were rendered the government accredited low-emission vehicle as of April 2007.

## ENVIRONMENTAL PROTECTION AND ACCIDENT PREVENTION AUDIT

Takeda's environmental protection and accident prevention measures attach the most importance to reduce any risks related to environmental protection, as well as safety and accident prevention activities, with efforts made in a step-by-step fashion, in addition to fully enforcing compliance with relevant laws and ordinances. Namely, we consider the impacts on the environment to be immeasurable when involving environmental pollution and/or the occurrence of any accident, even with an aggressive target. Takeda set up a full-time audit team, whereby expert auditors conduct an environmental protection and accident prevention audit, which is designed to implement periodic checkups on environmental protection and accident prevention, at all group production and research sites, including overseas subsidiaries. Through such efforts, Takeda promotes the reduction of potential risks in the course of environmental protection and accident prevention activities for the group as a whole.

The environmental protection and accident prevention audit is implemented for each site of the Takeda group, starting with an assessment of the environmental protection and accident prevention sheet, using uniform forms filled and submitted by each site. After such preparatory assessment, the auditors are dispatched at relevant sites, whereby they perform audit activities that require several days to complete.

The environmental protection and accident prevention audit consists of two aspects, namely the "system audit" and "process audit." The system audit confirms the regulatory compliance status in terms of environmental protection and accident prevention, as well as the operation status for the management system, while the process audit verifies the status of operation of the environmental facilities and safety measures in terms of the production procedures and the operation and maintenance of manuals, etc. In addition, the "Takeda Group's Standard for Environmental Protection and Accident Prevention Work" was established as a uniform criterion, whereby each site implements environmental protection and accident prevention operation and the operational status of each site is evaluated based on this criterion through the environmental protection and accident prevention audit.



System audit at Wako Pure Chemical Industries, Ltd.  
2nd from left Akihiro Tasaka, General Manager, Environment & Safety Department

## RISK MANAGEMENT STRUCTURE

Although it is indeed vital to discover problems through the environmental protection and accident prevention audit; it is also essential to build a structure to confirm the results and whether the reduction of any risks in the course of environmental protection and accident prevention activities has been accomplished after taking measures to improve the status. Takeda confirms the "corrective action plan" created by each site, in terms of problems highlighted through the environmental protection and accident prevention audit, and implements follow-up measures, aiming to further ensure Takeda's environmental protection and accident prevention measures by requiring a progress report for related problems, via the Monthly Report on Environmental Protection and Accident Prevention, which is submitted by each site. In addition, the audit results are combined and described in the audit report and then the report is issued to the management.



Process audit at Wako Pure Chemical Industries, Ltd.

## THE IMPLEMENTATION IN FISCAL 2006

In fiscal 2006, the environmental protection and accident prevention audits were implemented at six sites including U.S. and Indonesian sites. The audit requires a structure to focus on compliance issues, such as a double-check structure for measured data, and it was confirmed that operations were being conducted in line with the Takeda Group's Standard for Environmental Protection and Accident Prevention Work at each site. Furthermore, preparation for an "internal audit," scheduled for introduction in fiscal 2007, has been proceeding. This internal audit is designed to verify compatibility with the Takeda Group's Standard for Environmental Protection and Accident Prevention Work, which will be carried out by the sites themselves respectively. We aim to further improve our operations by implementing the environmental protection and accident prevention audit, as well as such self-reliant risk management conducted by each site.

### Items to be audited during the environmental protection and accident prevention audit

#### 1. System audit

- Environmental protection and accident prevention management
- Compliance assessments
- Waste
- Management of chemical substances
- Soil and groundwater contamination
- Equipment maintenance
- Accident prevention measures for manufacturing processes
- Antiearthquake measures
- Education and training
- Evaluation on progress of the corrective action plans provided at the previous audit

#### 2. Process audit

- Overall
- Environmental aspect
- Accident prevention aspect

Since 1974, Takeda has systematically implemented energy conservation programs and our group-wide efforts toward a reduction in CO<sub>2</sub> emissions are currently underway.

#### TOWARD GLOBAL WARMING PREVENTION

The Fourth Assessment Report has been released by the Intergovernmental Panel on Climate Change (IPCC), reporting that greenhouse gases due to human activities impact on global warming. The initial commitment period (2008-2012) of the Kyoto Protocol - an agreement which establishes goals for reducing greenhouse gas emissions - is going to become effective next year and Takeda considers that ensuring a steady implementation of these efforts toward the goal of reducing total greenhouse gas emissions is our responsibility for the next generation. Manufacturing pharmaceutical products requires less energy consumption compared to other industries and its percentage of total greenhouse gas emissions is relatively low. However, it is true that during each stage of our operations, including the procurement of raw materials, manufacture, distribution and disposal, we release greenhouse gases into the air, which has an impact on the global warming regardless of the volume. In accordance with global warming, an increase of tropical diseases and emerging infectious diseases has been predicted; therefore, as a pharmaceutical manufacturer, playing a role in the medical services domain, Takeda recognizes the significance of efforts to boost global warming prevention.

#### TAKEDA'S REDUCTION SCHEME

Takeda has developed the 9th five-year energy conservation program for the period 2006 - 2010 and our activities toward efficient energy use have been progressing. The 9th energy conservation program sets a target for reducing CO<sub>2</sub> emissions by 40 percent in fiscal 2010 compared to the fiscal 2005 level and we aim to promote our efforts toward reducing CO<sub>2</sub> emissions by implementing thorough energy conservation measures and converting fuels into those generating fewer CO<sub>2</sub> emissions, as well as improving the level of CO<sub>2</sub> emissions on a specific consumption basis.

Takeda group's CO<sub>2</sub> emissions in fiscal 2006  
**460K tons**



Hikari Plant: The plant is located on the Seto Inland Sea area, valuing the symbiosis with nature.

### ACHIEVEMENTS IN FISCAL 2006

Takeda group's CO<sub>2</sub> emissions in fiscal 2006 amounted to 460K tons, a 5.5 percent decrease over the previous year. This is considered to be due to our continued efforts to accomplish thorough energy saving measures; implemented mainly within Japan. To cite some examples, at the Hikari Plant where approximately half the CO<sub>2</sub> emissions of the overall Takeda group have been generated, meticulous energy saving activities have been implemented: a reduction in use of heavy oil by improving the operation efficiency of the operating power generation facilities, a weekly review of temperature and humidity control during non-operational period and focusing the compass of storage shelves in order to keep raw materials in a certain place, allowing a reduction in the power used for cranes. Takeda has accomplished an overall reduction in CO<sub>2</sub> emissions of approximately 27K tons on a group-wide basis.

### FUTURE EFFORTS

Takeda faces an issue of an increase in CO<sub>2</sub> emissions, along with an increased production volume at global production bases, including Takeda Pharma Ireland Limited, whereby its full-scale operation will shortly commence as the Takeda group's first global bulk compound production base.

As part of group-wide efforts to respond to such challenges, Takeda will strengthen the reduction in CO<sub>2</sub> emissions by establishing energy saving measures for the global production bases. In fiscal 2007, Takeda plans the conversion of coal into natural gas at Tianjin Takeda Pharmaceuticals Co., Ltd., which is our production base in China.

The Japan Pharmaceutical Manufacturers Association has set its voluntary action plan: "Reduction of CO<sub>2</sub> emissions of pharmaceutical companies in the fiscal 2010 to fiscal 1990 levels." Takeda's performance has been constantly maintained below 400K tons - the CO<sub>2</sub> emission levels for fiscal 1990 and we expect to attain the goal set for fiscal 2010.

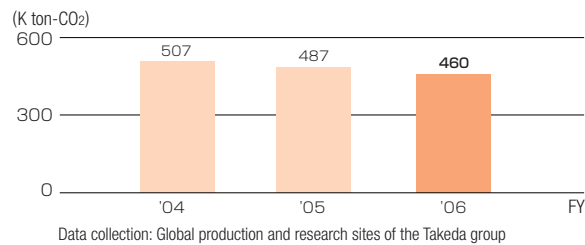


New Bulk Compound Facility of the Hikari Plant with Environmental Protection Equipment

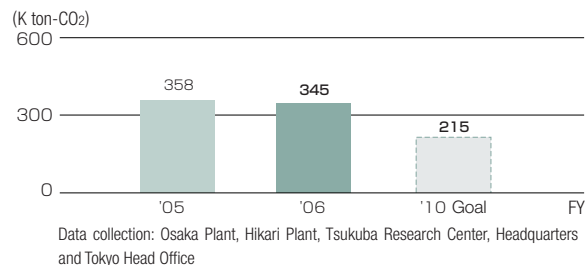
### CHALLENGES TOWARD ENERGY CONSERVATION STARTED SINCE THE 1970'S

The first oil crisis occurred in 1973 and Takeda established the energy conservation committee in the following year, in which the 1st five-year energy conservation program (1974 - 1979) was instituted. The challenges toward energy conservation, which have been continually implemented over thirty years, are currently still underway in the form of the 9th energy conservation program.

#### Trend of Takeda Group's CO<sub>2</sub> emissions



#### Trend of Takeda's CO<sub>2</sub> emissions



#### CALCULATION METHOD

##### ■ Calculation object

CO<sub>2</sub> emissions for calculation object refer to direct emissions generated by combustion of fossil fuels and indirect emissions from electricity use.

##### ■ CO<sub>2</sub> emissions factor

As for the results in Japan, they are calculated based on the "Law Concerning the Rational Use of Energy" and the CO<sub>2</sub> emissions factor for purchased electricity is used from default value (0.000555 t-CO<sub>2</sub>/kWh) designated by the ministry ordinance concerning calculation of greenhouse gas emissions associated with business activities by specific generator. As to the CO<sub>2</sub> emissions factor for purchased electricity outside Japan, country-specific factors are used from the GHG Protocol.

(Note) Previous data has been amended according to the change in the calculation method.

# Takeda is promoting global efforts related to air and water quality conservation while working on reducing waste and emissions of chemical substances.

## Waste Reduction

### BASIC STANCE ON WASTE REDUCTION

Practicing the 3Rs - reduce, reuse and recycle - is the key to establishing a recycling-oriented society, where the environment and the economy are compatible. The Takeda group's basic stance on waste reduction is reflected in effective re-utilization and volume reduction of waste within the sites, and promoting off-site recycling and suppression of waste generation, to reduce the amount of waste for final disposal. We aim to contribute to creating a recyclable society through these efforts.

### THE 4TH WASTE REDUCTION PROGRAM

Takeda has been continually promoting waste reduction activities since 1993. The 4th waste reduction program, which commenced in fiscal 2006, targets the following goal: "to reduce final disposal amount of industrial and non-industrial waste by 30 percent compared to the fiscal 2004 level by fiscal 2010," striving toward a reduction in the final disposal amount of waste. In order to attain this goal, we have been promoting efforts to reduce the final disposal amount of waste, such as via the intensive promotion of separate waste collection and recycling to the utmost extent at sites, while also preferentially selecting waste treatment companies who promote recycling and reutilization after the intermediate treatment of waste. Consequently, the final disposal amount of waste in fiscal 2006 amounted to 217 tons, 25 percent down from the fiscal 2004 level. We will continue to promote efforts toward accomplishing this goal.

**Takeda's 4th Waste Reduction Program**

Reducing final disposal amount of industrial and non-industrial waste by 30% compared to the fiscal 2004 level by fiscal 2010

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**Achievement in Fiscal 2006**

**Final disposal 217 tons**  
(a 25% decrease over the fiscal 2004 level)

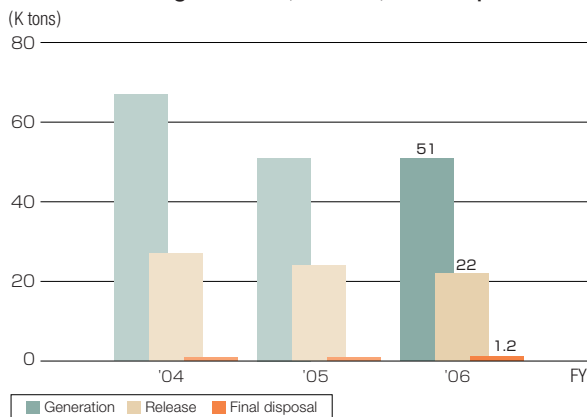
### ACHIVEMENTS IN FISCAL 2006

The final disposal amount of waste of the Takeda group was 1,188 tons. Although this amount represented a slight increase over the previous year because of expansion of our operations, we will advance activities such as the promotion of recycling. As for waste outsourced to external companies for treatment, Takeda appropriately manages the manifest of industrial waste to prevent illegal dumping or inappropriate handling of waste, while responsible persons of each site regularly visit commissioned waste treatment sites to ensure waste from the Takeda group is being properly handled. When conducting inspections at these external sites, we use checklist to ensure there is no problem.

### FUTURE EFFORTS

Toward the accomplishment of the goal set in the 4th waste reduction program, Takeda will continue to promote thorough waste reduction activities, including further review of recycling. In addition, we intend to expand our approach toward waste reduction via group-wide activities and set a group-wide goal, aiming to enhance the activities of the whole Takeda group.

### Trend of waste generation, release, final disposal



Data collection sites: Global production and research sites of the Takeda group  
Waste: The total sum of non-industrial and industrial waste and valuable resource

### Reduction in Emissions of Chemical Substances

Takeda has been using a wide variety of chemical substances in the course of manufacturing and the research & development of pharmaceutical products. Risky chemicals for human health and the environment may be included in these chemical substances. Takeda has been promoting efforts to reduce the amounts of these chemical substances released into the environment to the minimal level, while also managing them properly and ensuring full understanding of the actual state of release.

Takeda has implemented measures to reduce chemicals emissions, such as the installation of activated carbon adsorption equipment and combustor for exhaust gases, and a reduction in the on-site us-

age of chemical substances by outsourcing, and will continue to strive for the proper management of such chemical substances in order to maintain this reduction status.

59 substances were designated as the PRTR (Pollutant Release and Transfer Register)-reported substances in the overall Takeda group for fiscal 2007 because of the business diversity of the group. As to the amount of chemical substances released into the air, acetonitrile was the largest in quantity with 64.6 tons, a 12 percent decrease over the previous year. Following this, dichloromethane, toluene and 1,4-dioxane were released into the air in amounts exceeding 10 tons respectively. The overall total of the amount released into the air was 135 tons, a 5 percent decrease over the previous year.

### PRTR Data Reported (From April 2006 to March 2007)

(Unit : tons)

Chemical Substances	Releases				Transfers		
	Air	Publicly- owned water bodies	Land	Total	Sewerage	Off-site	Total
Acetonitrile	64.6	0.0	0.0	64.6	0.4	341.1	341.5
Dichloromethane	23.4	0.0	0.0	23.4	0.0	448.9	448.9
Toluene	14.8	0.0	0.0	14.8	0.0	333.2	333.2
1, 4- Dioxane	12.5	0.0	0.0	12.5	0.0	0.0	0.0
1, 2- Dichloroethane	8.8	0.0	0.0	8.8	0.0	0.8	0.8
Nickel compound	0.0	7.1	0.0	7.1	0.0	0.0	0.0
Benzene	5.6	0.0	0.0	5.6	0.0	0.1	0.1
Chloroform	2.7	0.0	0.0	2.7	0.0	1.3	1.3
Formaldehyde	1.1	0.5	0.0	1.6	0.0	0.0	0.0
Trichlorofluoromethane	1.6	0.0	0.0	1.6	0.0	0.0	0.0

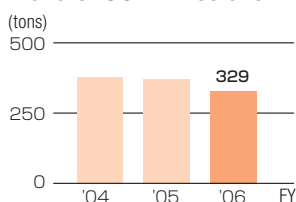
Data collection sites: Japanese production and research sites of the Takeda group Chemical substances are shown where the total amount of releases exceeded 1 ton.

### Air and Water Quality Conservation

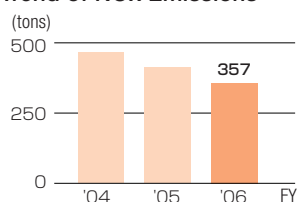
Takeda voluntarily establishes in-house standards, which are more stringent than those required by the Air Pollution Control Law and Water Pollution Control Law, regulations of local governments or regional agreement with local governments and through regular environmental monitoring, compliance with such standards is maintained. When a value exceeding the level of the in-house standard is found during regular

monitoring, we immediately determine and rectify the causes of the problem, striving to maintain the problem-free status. This is specified in the "Takeda Group's Standard for Environmental Protection and Accident Prevention Work," where similar management has been implemented at the global sites of the Takeda group. We also implement regular monitoring in terms of noise and unpleasant odor, confirming their compliance.

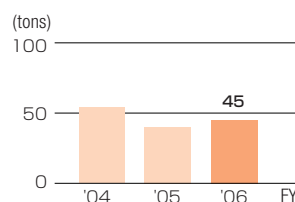
#### Trend of SOx Emissions



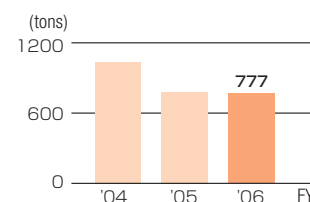
#### Trend of NOx Emissions



#### Trend of Dust Emissions



#### Trend of COD Release



Data collection sites: Global production and research sites of the Takeda group



## Accident Prevention

### APPROACH TO ACCIDENT PREVENTION

Takeda prepares "Policies on Accident Prevention" every fiscal year, based upon which each business unit establishes a concrete plan involving the adoption of approaches to both "hardware" and "software" for accident prevention.

As for accident prevention at a plant, we emphasize countermeasures against risks involving static electricity, which has often been reported on recently as a cause of fire and explosive accidents in other companies, as well as countermeasures against leakage of gasses and liquids and intensive inspections of equipment for the "hardware" aspect. Charging and discharging of static electricity is phenomenon often observed during winter; therefore, if it should lead to the ignition of flammable gases and powder dust, it may cause a major accident. Consequently, we continue to pursue work to eliminate any risk of static electricity.

#### Countermeasures against Static Electricity

- Earthing and bonding of facilities
- Measurement of electric potential of equipments in operation
- Making filters, hoses, etc conductive
- Wearing antistatic working clothes and shoes
- Floor coating with conductive resin, etc

In addition, as for countermeasures against earthquakes at important production facilities, we have promoted the use of equipment such as seismoscopes, which deliver a signal when a certain level of tremor is detected, as well as emergency shutdown valves, which are activated by the signal. In the case of an earthquake, this equipment works to cut off the supply of fuels, including gas and heavy oil, to prevent secondary disasters, such as fires. As for the software aspect, we have further promoted the enhancement of the "Accident Prevention Manual." In this manual, abnormal phenomena envisioned according to each manufacturing process and countermeasures against such matters are specifically described. Furthermore, regarding intermitting operation, which is considered to have a relatively higher potential for accidents, we have implemented the revision and fur-

ther improvement of the "Manual for Intermittent Operation." These are the set of materials used for various educational and training programs, while promoting prevention of accidents and disasters as well as striving to inherit accident prevention technology. These accident prevention measures are the efforts of the overall Takeda group production sites.

#### Intermittent Operation

Intermittent operation means operations involving work procedures which are not performed continually or repeatedly on a routine basis; namely - repair work on equipment, inspection tasks, troubleshooting and startup and ending operations of the production process, etc. Intermittent operation is characterized by the frequent occurrence of accidents compared to stationary operations, for reasons such as the fact these operations are less frequently conducted by the operators, and take place while being operated under conditions of methods, procedures, and a management structure lacking clear specification in general.

Meanwhile, Takeda considers it vital to understand the physicochemical properties of medicines, as well as establishing a proper manufacturing operation with the method best suited for properties of each medicine, in order to enhance safety against fire and explosion during the manufacturing process. For this reason, Takeda implements the risk assessment of both R&D pipelines and process at the initial stages of research and development, striving to establish a safer manufacturing process. In addition, based on the premise that a major accident never occurs unannounced, it is inevitable that some minor accidents will occur beforehand. Takeda considers sustained and committed efforts, such as the positive clarification of 'near miss' cases of accidents; and sharing accident information having previously occurred, both inside and outside the company, will help lead to safety and the promotion of such activities.

#### Risk assessment of candidate compounds and process

- Thermal hazard
- Chemical reaction hazard
- Chemical hazard by friction and impact
- Risk of dust explosion, etc.

## Environmental Accounting

Takeda has long assessed and managed the amount of investment and expenditure for environmental protection since fiscal 1980.

The total environmental protection costs: business area costs, upstream and downstream costs and administration costs were calculated in accordance with the "Environmental Accounting Guidelines 2005" by the Ministry of the Environment and "Accounting Guidelines for Chemical Companies" by the Japan Chemical Industry Association, with the results shown as indicated on the right.

In fiscal 2006, the amount of investment on environmental protection costs was approximately ¥300 million, with expenditure of ¥2.1 billion. As to the investment amount, it was largely dominated by the costs of renewing the aging equipment of the environmental protection facilities. The economic effect of the energy conservation was equivalent to ap-

proximately ¥220 million. In addition, the facility investment spent on renewing aging facilities and building construction work to enhance earthquake safety was implemented with expenditure of ¥2.2 billion.

#### Environmental Protection Costs (Unit: millions of yen)

Category		Investment	Expenditure
Business area costs	Pollution prevention costs	78	609
	Global environmental protection costs	5	3
	Resources circulation costs	213	1,062
Upstream/downstream costs		—	21
Administration costs		2	377
<b>Total</b>		<b>299</b>	<b>2,072</b>

● Data collection period: April 1, 2006 to March 31, 2007  
 ● Data collection sites: Osaka Plant, Hikari Plant and Tsukuba Research Center