ENVIRONMENTAL REPORT
2015

Japan Pharmaceutical Manufacturers Association
Message from the President, Japan Pharmaceutical Manufacturers Association

The Japan Pharmaceutical Manufacturers Association (JPMA) is an organization of R&D oriented pharmaceutical manufacturers. We strive to contribute to improve the health and welfare of the people in Japan and the world through the development of innovative and useful pharmaceutical products and sound advancement of the pharmaceutical industry.

Recent years we have seen a remarkable advancement in science and technology, including pharmaceutical products that have made a significant contribution to improve people’s health and quality of life. Meanwhile, the year 2014 reminded us of the importance of continued advancement in life science and the development of innovative new drugs, as the spread of Ebola virus disease became a global concern, and as dengue fever cases were confirmed in Japan for the first time in 70 years.

There are still many diseases in the world with no diagnostic methods or effective, established therapies. For R&D oriented pharmaceutical manufacturers who belong to JPMA, the most important mission is to develop safe and efficacious innovative new drugs that will meet unmet medical needs, and to deliver them to patients via medical institutions.

The pharmaceutical industry has been identified as one of the strategic industries under the Government’s “Japan Revitalization Strategy.” The Japan Agency for Medical Research and Development (AMED) was founded in April 2015, as an organization that supports R&D in the field of medicine all the way from basic research to practical application. Also the “Comprehensive Drug Industry Reinforcement Strategy” developed in September 2015, carries high expectations of the pharmaceutical industry in Japan, one of the few countries where new drug are actively developed, to produce innovative new drugs that can be launched globally.

In light of the above-mentioned circumstances, the overriding objective of JPMA for FY 2015 is to assure that JAPA is transferring responsibilities related to follow-up surveys concerning Keidanren’s Commitment to a Low-Carbon Society to the Federation of Pharmaceutical Manufacturers’ Associations of JAPAN (FPMAJ), which serves as the point of contact for the industry. In this way, we have reduced the number of expert subcommittees from the former three (Environment Expert Subcommittee, Global Warming Countermeasures Expert Subcommittee, and Occupational Safety & Health Expert Subcommittee) to two (Environment Expert Subcommittee and Occupational Safety & Health Expert Subcommittee). The important functions of the Global Warming Countermeasures Expert Subcommittee of planning and implementing workshops and other events have been transferred to the Environment Expert Subcommittee. It is also planned to fully transfer functions related to the Environment & Safety Committee. The Environment & Safety Committee (ESC) has been transformed into the Environment & Safety Committee (ESC).

The Environmental Report 2015 is the 17th volume since the inaugural first volume that was published in 1999. We hope that the Environmental Report helps our stakeholders gain a better understanding of our activities.

Teruyuki Tosaka, Ph.D.
Chairman, Environment & Safety Committee, JPMA

Message from the Chairman, the Environment & Safety Committee

I believe the collapse of the World Trade Center Building on September 11, 2001, caused by an unprecedented act of terrorism, is still fresh in our memories. This earth-shaking event took a heavy toll of human lives, and has resulted in many “secondary victims.” The collapse of a building constructed in 1973, which contained massive amounts of harmful substances such as asbestos, dioxin, mercury, and lead built into the large numbers of personal computers, caused significant environmental destruction in the southern part of Manhattan. Victims not only include the evacuees from the building at the time and the firefighters involved in the restoration work, who were exposed to dust containing lethal and other harmful substances, but also business persons who returned to their offices within less than a week after the disaster. Some criticize New York City’s risk management at the time. Another worrying incidence occurred on August 12, 2015 in Tianjin City, China – there was a massive explosion at a warehouse storing hazardous chemical substances. Many were killed and injured, including firefighters who were at the scene, and the concentration of cyanides suddenly rose in nearby rivers, the sea, and wastewater.

While incidences and accidents on such a large scale may not occur very often around us, we are not immune to the risk of environmental destruction or death due to harmful substances. Some of our member companies may actually be conducting risk assessment, not only of their own premises, but also of other risks such as hazardous substances generated at neighboring facilities. While it would be difficult to prevent environmental destruction due to acts of terrorism such as those mentioned above, I believe it is possible to take measures to minimize damage when such incidences occur (for example, to keep track of hazardous substances and to take action when emissions or leakage occur).

Marking the 20th year since the establishment of the Environment Committee, the former body, the Environment & Safety Committee has reviewed its organizational structure in FY 2015. We have fully transferred responsibilities related to follow-up surveys concerning Keidanren’s Commitment to a Low-Carbon Society to the Federation of Pharmaceutical Manufacturers’ Associations of JAPAN (FPMAJ), which serves as the point of contact for the industry. In this way, we have reduced the number of expert subcommittees from the former three (Environment Expert Subcommittee, Global Warming Countermeasures Expert Subcommittee, and Occupational Safety & Health Expert Subcommittee) to two (Environment Expert Subcommittee and Occupational Safety & Health Expert Subcommittee). The important functions of the Global Warming Countermeasures Expert Subcommittee of planning and implementing workshops and other events have been transferred to the Environment Expert Subcommittee. It is also planned to fully transfer functions related to the follow-up survey concerning the Keidanren Voluntary Action Plan on the Environment (Section on the Establishment of a Sound Material-Cycle Society) to the FPMAJ in 2016.

Businesses affect biodiversity, and also benefit from it in various ways. As such, they must be mindful of conservation and sustainable use of biodiversity throughout their operations in general. The impact on biodiversity comes in various forms, including emissions into the atmosphere (greenhouse gases, volatile organic compounds, etc.), effluent, waste, noise and vibration, and land use, which actually include many areas covered by our environmental protection activities. To promote biodiversity conservation by the pharmaceutical industry further, we believe it would be useful to continue sharing cases of activities implemented by member companies and in other industries, and to also study the relationship between the Aichi Biodiversity Targets (20 specific targets) that were agreed upon in 2010, and business activities.

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In light of the above-mentioned circumstances, the overriding objective of JPMA for FY 2015 is to assure that the pharmaceutical industry takes a leading role in the Japanese economy through the development of new drugs. It will also make efforts to gain greater public understanding of the pharmaceutical industry and to promote global expansion. Toward this end, JPMA is working on the following key areas:

1. Making a contribution to improve the quality of healthcare/economic progress through promoting innovation;
2. Ensuring compliance and improved transparency of corporate activities; and
3. Making efforts to promote international cooperation and improve global health.

JPMA has also been working on industry-wide voluntary measures against environmental issues in the world today, such as global warming, waste, and harmful chemical substances, which are increasingly becoming serious and complex. Concerning global warming countermeasures in particular, JPMA is promoting greenhouse gas emissions reduction by member companies through participation in Keidanren’s Commitment to a Low-Carbon Society. Also in terms of resource conservation and waste management, JPMA participates in the Keidanren Voluntary Action Plan on the Environment (Sound Material-Cycle Society) and promotes the 3R (Reduce, Reuse and Recycle) activities of member companies.

JPMA will, through an organization-wide effort, continue to promote environmental protection activities to create a low carbon, sound material-cycle society, and contribute to progress in creating a “sustainable society” in which the environmental burden is reduced and where the natural environment and business activities are harmonized.

JPMA will continue to contribute to the “health and welfare of people worldwide” and “Japan’s economic growth,” and will actively promote environment and safety-related actions. We will facilitate dialogue with our stakeholders, especially our patients, so that we can meet the expectations society has of our industry.

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The safety and health of residents in the coming days are matters of concern. While incidences and accidents on such a large scale may not occur very often around us, we are not immune to the risk of environmental destruction or death due to harmful substances. Some of our member companies may actually be conducting risk assessment, not only of their own premises, but also of other risks such as hazardous substances generated at neighboring facilities. While it would be difficult to prevent environmental destruction due to acts of terrorism such as those mentioned above, I believe it is possible to take measures to minimize damage when such incidences occur (for example, to keep track of hazardous substances and to take action when emissions or leakage occur).

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Japan Pharmaceutical Manufacturers Association
The Environmental Report is compiled with the intention of widely informing society about the actions of the Environment & Safety Committee of the Japan Pharmaceutical Manufacturers Association (JPMA), in order to raise our profile in society and to be utilized as a tool of communication. It is also hoped that this publication will help respective member companies in their activities. Editing of the Environmental Report is in accordance with the Action Plan endorsed by the Environment & Safety Committee General Assembly. The Steering Committee is responsible for compiling the data, such as the status of actions by the Steering Committee and Expert Subcommittees, the status of progress towards the numerical targets, as well as the information provided by respective member companies or those parties that supported the activities of the Environment & Safety Committee.

**Scope of this Report**
JPMA has a membership of 72 companies (as of April 1, 2015). The membership list can be found on page 30. Please note that the performance data collected mainly from member companies in 2014, but some data include data from companies belonging to other associations under IFPMA (Federation of Pharmaceutical Manufacturers Associations of Japan).

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**Japan Pharmaceutical Manufacturers Association**

The Japan Pharmaceutical Manufacturers Association (JPMA) is a voluntary association comprising 72 research-oriented pharmaceutical companies (as of April, 2015). JPMA, celebrating its 45th anniversary in 2013, has been contributing to advancing global healthcare through the development of innovative ethical drugs, facilitating sound development of the pharmaceutical industry through proactively establishing policies and recommendations in response to globalization and enhancing public understanding of pharmaceuticals. As a member of the IFPMA (International Federation of Pharmaceutical Manufacturers & Associations), JPMA is engaged with various global issues in the pharmaceutical and healthcare sector, including countermeasures against emerging diseases across the globe and infectious diseases in developing countries, drug access problems, intellectual property rights and the threat of counterfeit drugs.

Working collaboratively with PRIMA (Pharmaceutical Research and Manufacturers of America) and EFPIA (European Federation of Pharmaceutical Industries and Associations), JPMA takes active roles at ICH (International Conference on Harmonization), which aims at international harmonization of pharmaceutical regulations.

Through mutual information sharing and close collaboration with each member organization, JPMA continues to act globally for the advancement of medical treatments for patients worldwide.

**Environment & Safety Committee**

The Environment & Safety Committee, established in 1996, sets targets for global environmental conservation and occupational safety and health, and supports member companies pursuing environmental, health and safety policies.

The Committee prepares an annual plan to clarify the targets with numerical values and to attract them through facilitating the exchange of information between member companies and hosting the workshop on technologies and seminars. Through these activities, we try to assist in attaining targets, and follow-up the situation of action plan annually. It is also recognized as an important role of the Committee to collaborate with various stakeholders in the effort to tackle the environment and occupational safety, and health issues, which are common tasks for the pharmaceutical industry. Thus, the Committee endeavors to strengthen communication with outside parties.

**Organization**

The Environment & Safety Committee consists of committee members and technical committee members who participate in the following: the “General Assembly,” “Planning Conference,” “Steering Committee” and “Expert Subcommittees.” The General Assembly is held annually in April to govern basic policies, establishing the action plan for each fiscal year and mid term range, and other businesses. The Planning Conference, consisting of a chairperson, deputy chairpersons, and a secretary, assigns and coordinates Expert Subcommittee tasks, handles government administration-related matters, and reports to and communicates with the Board of Directors. The Steering Committee consists of a chairperson and vice chairperson of each Expert Subcommittee, Planning Conference members, and member who is appointed by chairperson of the Committee, and is responsible for implementing the action plan and coordinating other matters of general business. Within each Expert Subcommittee, the technical committee members are assigned to working groups, each of which engages in a particular task described in the business/project plan, and these groups conduct investigations, plan and implementation of workshop on technologies, prepare investigation reports, and/or other relevant tasks.

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Planning/Progress

Environment & Safety Action Plan

The Environment & Safety Committee deliberates and votes to adopt the annual and midterm action plans in the General Assembly held in April, taking the status of progress in the previous year and current legal and societal trends into consideration.

In FY 2014, the committee continued from the previous fiscal year to identify Global Warming Countermeasures, Resource Conservation & Waste Management, Chemical Substance Management, and Occupational Safety and Health as focus project areas and implemented actions as planned. In addition, the Environment & Safety Committee has strived for gathering information from external organizations and experts including such challenges that were difficult for a single company to resolve and such issues that should be handled by the Committee itself. By compiling reports on those activities and information and making them accessible in periodical publications such as information bulletins, investigational reports, a technical case information dossier, etc., we help our member companies’ actions to protect the environment and promote occupational safety and health.

We set numerical targets on the following environmental challenges in FY 2014 and promoted actions. In addition, concerning occupational safety and health, we collected performance data from the member companies and investigated the status of their efforts concerning issues such as the status of occupational incidents, status of business vehicle accidents and actions. The outcomes were compiled in the report and published to facilitate sharing of information among the member companies.

Global Warming Countermeasures

Reduce CO2 emissions generated by the pharmaceutical industry by 23% from the FY 2005 level by FY 2020

JPMA first took part in the Keidanren Voluntary Action Plan (Global Warming Countermeasures) in FY 1997, formulating its own Voluntary Action Plan for global warming countermeasures with a target posted for FY 2012. Despite our continuing industry-wide concerted efforts to reduce CO2 emissions, we were unable to attain the target due to the less favorable electricity conversion factor in the aftermath of the Great East Japan Earthquake and the nuclear plant accident. Since FY 2013, JPMA has worked towards attainment of the target for the new action plan, Action Plan for a Low-Carbon Society, strengthening the partnership with the follow-up working group, established under FPMAJ Environment Committee, and striving to make steady progress on the FPMAJ Action Plan for a Low-Carbon Society.

Resource Conservation & Waste Management

Reducing the final disposal volume of industrial wastes in FY 2015 by about 65% from FY 2000

Since FY 1997, JPMA has taken part in the Keidanren Voluntary Action Plan on the Environment (SOUND Material-Cycle Society), by setting its own numerical targets and striving to reduce wastes. So far JPMA has made steady progress in reducing the respective indicators: the amount of final disposal, the final disposal rate (quantity of waste disposed in the end against total quantity of waste initially generated, indicated as a percentage), and the amount of waste generated in the first place and has attained the respective targets. For the voluntary action plan for the fourth period, started in FY 2011, FPMAJ, collaborated to set a common numerical target, and they have engaged in continuing proactive actions to reduce the level of final disposal output.

Chemical Substance Management

Since FY 1997, JPMA has made voluntary efforts to reduce the atmospheric release of harmful atmospheric pollutants such as dichloromethane, 1,2-dichloroethane, and chloroform, towards attaining our voluntary numerical reduction targets. We revised the numerical targets in FY 2001 (the second period plan) and FY 2005 (the third period plan) following attainment of the previously set target. In FY2007, the final year of the third term of the action plan, based on analyses of the data for the year, it was deemed that these actions achieved the primary objective. Consequently, no new numerical targets shall be set, but existing efforts still continue.

Action Plans: State of Progress

In the Environment & Safety Committee, respective expert subcommittees develop and implement an annual action plan and midterm action plan that determine how actions are advanced for global warming countermeasures, resource conservation & waste management, chemical substance management, and occupational health and safety. The Planning Conference liaises with relevant expert subcommittees to act as the channel of communication with umbrella industrial organizations, the national government and the society. The following summarizes the state of progress of the Environment & Safety Committee activities in FY 2014.

Global Warming Countermeasures

The amount of CO2 emissions in FY 2014 was 1,830,000 tons, which was 24% (580,000 tons) less than the total emissions of 2,410,000 tons in the base year 2005 and 4% (70,000 tons) less than the previous year, achieving the FY 2020 target of 1,860,000 tons by 30,000 tons.

To tackle the increasing energy demand due to the expanding pharmaceutical market, the industry has made proactive efforts such as increasing production efficiency and introducing cutting-edge technologies and achieved reduction in CO2 emissions. In addition to ongoing efforts for switching energy sources, we will continue to strive towards attaining the target through sharing information on energy saving efforts by the member companies among industry organizations, introducing cutting-edge technologies and improving manufacturing processes.

Resource Conservation & Waste Management

JPMA has worked alongside FPMAJ in the Keidanren Voluntary Action Plan on Environment (SOUND Material-Cycle Society). Since FY 1997, JPMA has conducted a follow-up survey to monitor members’ efforts to reduce industrial waste generation and the quantity of final disposal from the companies participating in the Voluntary Action Plan through an annual survey. Since FY 2011, JPMA’s follow-up survey has included a survey on the level of industrial waste generation and details about methods of disposal, in addition to the reduction in the quantity of output to landfill sites (final disposal output). The final disposal output in FY 2014 was 4,000 tons, which was 1,000 tons more than the previous fiscal year and a reduction of 80% of the base year level (FY 2000), continuing attainment of the target. We intend to strive, not only for continuing attainment of the target but also for a higher level of reduction in the quantity of final disposal, through sharing technical information and motivational activities by the member companies.

Chemical Substances Management

The targets for the third period of the Voluntary Action Plan, whose aim is to reduce atmospheric releases of dichloromethane, 1,2-dichloroethane and chloroform, were attained in FY 2007. This achievement let JPMA conclude the original goal was sufficiently achieved. Following that achievement, instead of setting new numerical targets, JPMA has decided to continue with its efforts as well as follow-up monitoring. The total quantity released into the environment in FY 2014 of Class 1 Designated Chemical Substances stipulated by the Chemical Substance Release Monitoring and Management Promotion Act (commonly known as the PRTR Act) was 217 tons (88% less than the FY 2002 level), which is 125 tons less than the previous fiscal year. The combined quantity of the 101 volatile organic compounds (VOCs) released into the atmosphere was 1,762 tons, 490 tons less than the previous fiscal year. We will endeavor to have member companies share technical information and to promote ongoing voluntary reduction efforts at member companies.

The JPMA action plans for resource conservation and waste management, and chemical substance management have progressed smoothly. Our actions for prevention of global warming have made good progress since the start of the Action Plan for a Low-Carbon Society in FY 2013

JPMA member companies will continue to advance such industry-wide actions as actions for a low-carbon society and for a sound material-cycle society. Especially with regard to the actions for global warming countermeasures and resource conservation and waste management, JPMA will work as a part of the collaboration by other organizations under the umbrella of FPMAJ and make maximum efforts towards attainment of action plan targets. Meanwhile, concerning chemical substance management and occupational health and safety, we intend to continue with respective surveys to monitor the current state of respective member companies, as well as to strive for industry-wide improvement through sharing information on effective countermeasures.
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The growing impact of global warming, as observed in melting glaciers, extreme weather events, and in other forms, is worrying. If global warming continues at the current pace, it is expected to cause more frequent and severe heat waves, changes in ecosystems, spread of tropical diseases and other phenomena, which would pose a major threat to humanity. The Government of Japan has submitted to the United Nations its plan to reduce greenhouse gas emissions by 26% from the FY 2013 levels by 2030. To achieve this goal, the government, corporations, organizations and individuals are required to come together and consider what each can do, and then work on mitigation and adaptation measures. JPMA will work on global warming countermeasures, following the new Keidanren’s Commitment to a Low-Carbon Society which started in FY 2013, building on the knowledge and experience gained from working on the Keidanren Voluntary Action Plan for the Environment between 1997 and 2012. JPMA will also strive to fulfill its accountability to stakeholders.

Global Warming Countermeasures

<table>
<thead>
<tr>
<th>FY2014 Action Plan: Summary of Progress and Achievement</th>
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</thead>
<tbody>
<tr>
<td><strong>Topics</strong></td>
</tr>
<tr>
<td>Energy Saving &amp; Global Warming Countermeasures</td>
</tr>
<tr>
<td>● Reduce CO₂ emissions by the pharmaceutical industry by 23% from the FY 2005 level by FY 2020</td>
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<tr>
<td>Resource Conservation &amp; Waste Management</td>
</tr>
<tr>
<td>● Almost 65% reduction of final disposal amount of wastes in FY 2015 against that in FY 2000</td>
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<tr>
<td>Chemical Substance Management</td>
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<tr>
<td>Occupational Safety &amp; Health</td>
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<tr>
<td>Other Issues</td>
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</tr>
</tbody>
</table>


As an organization under the umbrella of FPMAJ, JPMA takes part in Keidanren’s Commitment to a Low-Carbon Society. Since FY 2013, we have been following up the levels of CO₂ emissions and the progress of actions by companies that participate in Keidanren’s Commitment to a Low-Carbon Society. Aside of JPMA, some other organizations representing specific types of operations also participate in this Commitment, namely Japan Generic Medicines Association (JGA), Japan Self-Medication Industry (JSMI), the Intravenous Solutions Society, Japan Kampo Medicines Manufacturers Association, Pharmaceutical Drug Processors Association, External Pharmaceutical Association, Japan Direct-Selling Pharmaceutical Manufacturers Association, and Japan Association of Vaccine Industries. The data used in this report are compiled from the responses received from member companies of these nine organizations (including consolidated companies by Japan). The FPMAJ Action Plan for a Low-Carbon Society has the following four objectives and targets:

1. Establishment of reduction targets for domestic business operation up to the year 2020
2. Strengthened cooperation with other interest groups
3. Contributions on the international level
4. Development of innovative technologies

The following shows the state of progress of each objective/target.

1. 1. Establishment of reduction targets for domestic business operation up to the year 2020

   - **Target**: Reduce CO₂ emissions by the pharmaceutical industry by 23% from the FY 2005 level by FY 2020

   - **Method of estimation, etc.**
     - **Scope of the Survey**: CO₂ emissions from energy use at plant or research laboratories in Japan
     - **Method of survey and estimation**: Estimation based on the table provided in Keidanren Follow-up Survey form, using the FPMAJ progress monitoring factor for grid electricity
     - **Coverage**: Number of companies whose data are collated: 88
     - **Sales**: Domestic sales made by the companies whose data are compiled: ¥9,503,300,000,000

   - **Achievement**
     - FY 2010 and before: The carbon emission factor after adjustment for “carbon emission factor accompanying electricity use at consumer end”, as indicated by Keidanren. FY 2011 and 2012: Adjusted data indicated by Keidanren in FY 2011, which converts the generation and sale of electricity to carbon. FY 2013: FY 2013 stated: The carbon emission factor target for FY 2020, published prior to the Great East Japan Earthquake by the Federation of Electric Power Companies of Japan: 0.809 t-CO₂/1000 kWh (3.0 t-CO₂/1000 MWh)
     - FY 2010 and before: 0.877 t-CO₂/1000 MWh (3.4 t-CO₂/1000 MWh)
     - FY 2011: 0.877 t-CO₂/1000 MWh (3.4 t-CO₂/1000 MWh)
     - FY 2012: 0.877 t-CO₂/1000 MWh (3.4 t-CO₂/1000 MWh)
     - FY 2013: 0.927 t-CO₂/1000 MWh (3.4 t-CO₂/1000 MWh)

   - **Comparison**
     - FY 2010 and before: The carbon emission factor after adjustment for “carbon emission factor accompanying electricity use at consumer end”, as indicated by Keidanren. FY 2011 and 2012: Adjusted data indicated by Keidanren in FY 2011, which converts the generation and sale of electricity to carbon. FY 2013: FY 2013 stated: The carbon emission factor target for FY 2020, published prior to the Great East Japan Earthquake by the Federation of Electric Power Companies of Japan: 0.809 t-CO₂/1000 kWh (3.0 t-CO₂/1000 MWh)
     - FY 2010 and before: 0.877 t-CO₂/1000 MWh (3.4 t-CO₂/1000 MWh)
     - FY 2011: 0.877 t-CO₂/1000 MWh (3.4 t-CO₂/1000 MWh)
     - FY 2012: 0.877 t-CO₂/1000 MWh (3.4 t-CO₂/1000 MWh)
     - FY 2013: 0.927 t-CO₂/1000 MWh (3.4 t-CO₂/1000 MWh)
Environmental Report

Planning/Progress

<table>
<thead>
<tr>
<th>FY2014 Action Plan: Summary of Progress and Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Topics</strong></td>
</tr>
<tr>
<td>Energy Saving &amp; Global Warming Countermeasures</td>
</tr>
<tr>
<td>● Reduce CO₂ emissions by the pharmaceutical industry by 23% from the FY 2005 level by FY 2020</td>
</tr>
<tr>
<td>● Host a workshop on energy saving and global warming countermeasures</td>
</tr>
<tr>
<td>● Compile information on global warming countermeasures and feed them back to the member companies</td>
</tr>
<tr>
<td>● Develop a post-Hydra CO₂ emissions reduction plan</td>
</tr>
<tr>
<td>● Promotion of effective use of business vehicles used by MIRs</td>
</tr>
<tr>
<td>Resource Conservation &amp; Waste Management</td>
</tr>
<tr>
<td>● Almost 65% reduction of final disposal amount of wastes in FY 2015 against that in FY 2000</td>
</tr>
<tr>
<td>Action plan</td>
</tr>
<tr>
<td>● Follow-up for the Keidanren Voluntary Action Plan (Sound Material–Cycle Society)</td>
</tr>
<tr>
<td>● Provide information to promote 3R activity for member companies</td>
</tr>
<tr>
<td>● Collaboration with third parties</td>
</tr>
<tr>
<td>Chemical Substance Management</td>
</tr>
<tr>
<td>● Conduct PRTR and VOC survey, and feed them back to the member companies</td>
</tr>
<tr>
<td>● Study technologies for reduction of atmospheric emissions of chemical substances and their feedback to the member companies</td>
</tr>
<tr>
<td>● Compile information on environmental risk assessment of pharmaceutical products</td>
</tr>
<tr>
<td>● Study on chemical process safety</td>
</tr>
<tr>
<td>● Study on handling highly active pharmaceutical substances</td>
</tr>
<tr>
<td>Occupational Safety &amp; Health</td>
</tr>
<tr>
<td>● Conduct survey on activities for occupational safety and health, and feed them back to the member companies</td>
</tr>
<tr>
<td>● Study actions for maintaining and improving employees’ health and feed them back to the member companies</td>
</tr>
<tr>
<td>● Host a workshop on occupational safety and health study and develop measures to prevent business</td>
</tr>
<tr>
<td>vehicle accidents , and feed them back to the member companies</td>
</tr>
<tr>
<td>Other issues</td>
</tr>
<tr>
<td>● Dispatch timely an appropriate information on environmental safety and health such as Environmental Report and Environment News</td>
</tr>
<tr>
<td>● Collaboration and communication with stakeholders as well as among the industry</td>
</tr>
<tr>
<td>● Host a workshop on disaster recovery technologies</td>
</tr>
<tr>
<td>● Host environmental &amp; safety lectures, and workshops</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Global Warming Countermeasures

The growing impact of global warming, as observed in melting glaciers, extreme weather events, and in other forms, is worrying. If global warming continues at the current pace, it is expected to cause more frequent and severe heat waves, changes in ecosystems, spread of tropical diseases and other phenomena, which would pose a major threat to human kind. The Government of Japan has submitted to the United Nations its plan to reduce greenhouse gas emissions by 26% from the FY 2013 levels by 2030. To achieve this goal, the government, corporations, organizations and individuals are required to come together and consider what each can do, and then work on mitigation and adaptation measures. JPMA will work on global warming countermeasures following the new Keidanren’s Commitment to a Low-Carbon Society which started in FY 2013, building on the knowledge and experience gained from working on the Keidanren Voluntary Action Plan for the Environment between 1997 and 2012. JPMA will also strive to fulfill its accountability to stakeholders.


As an organization under the umbrella of FPMAJ, JPMA takes part in Keidanren’s Commitment to a Low-Carbon Society. Since FY 2013, we have been following up on the levels of CO₂ emissions and the progress of actions by companies that participate in Keidanren’s Commitment to a Low-Carbon Society. Aside of JPMA, some other organizations representing specific types of operations also participate in this Commitment, namely Japan Generic Medicines Association (JGMA), Japan Self-Medication Industry (JSMI), the Intraavenous Solutions Society, Japan Kampo Medicines Manufacturers Association, Pharmaceutical Drug Processors Association, External Pharmaceutical Association, Japan Direct-Selling Pharmaceutical Manufacturers Association, and Japan Association of Vaccine Industries. The data used in this report are compiled from the responses received from member companies of these nine organizations (including consolidated companies under Japan). The FPMAJ Action Plan for a Low-Carbon Society has the following four objectives and targets:

1. Establishment of reduction targets for domestic business operation up to the year 2020
2. Strengthened cooperation with other interest groups
3. Contributions on the international level
4. Development of innovative technologies

The following shows the state of progress of each objective/target.

1. Establishment of reduction targets for domestic business operation up to the year 2020

<table>
<thead>
<tr>
<th>Target</th>
<th>Method of estimation, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce CO₂ emissions by the pharmaceutical industry by 23% from the FY 2005 level by FY 2020</td>
<td><strong>Method of estimation, etc.</strong></td>
</tr>
<tr>
<td>Scope of the Survey</td>
<td>CO₂ emissions from energy use at plant or research laboratories in Japan</td>
</tr>
<tr>
<td>Method of survey and estimation</td>
<td>Estimation based on the table provided in Keidanren Follow-up Survey form, using the FPMAJ progress monitoring factor* for grid electricity</td>
</tr>
<tr>
<td>Coverage</td>
<td>Number of companies</td>
</tr>
<tr>
<td></td>
<td>Domestic sales made by the companies whose data are compiled</td>
</tr>
<tr>
<td></td>
<td>Coverage: 27.8%</td>
</tr>
</tbody>
</table>

* FPMAJ progress monitoring factor:
FY 2010 and before: The carbon emission factor after adjustment for “carbon emission factor accompanying electricity use at consumer end”, as indicated by Keidanren
FY 2011 and 2012: Adjusted by Keidanren in FY 2011, which converts the generation end and direct carbon emission factor to the consumer and factor in this scenario if the Great East Japan Earthquake had not occurred. 0.887 x C1000 kWh (0.4 x CO₂/1000 kWh)
FY 2013 and estimated: The carbon emission factor target for FY 2020, published prior to the Great East Japan Earthquake by the Federation of Electric Power Companies of Japan: 0.880 x C1000 kWh (0.3 x CO₂/1000 kWh)
As seen in Table 1, the volume of production (sales) has been showing an increasing trend, and the figure of the FY 2014 was 1.26 times that of the FY 2005 level.

Table 1. Changes in CO2 emissions based on FPMAJ progress monitoring factor and sales volume

<table>
<thead>
<tr>
<th>FPMAJ progress monitoring factor (consumer end) (IC/CO2 2005 KWH)</th>
<th>CO2 emissions (10,000 t-CO2)</th>
<th>CO2 emissions ratio against FY 2005 level</th>
<th>Sales ¥ 100,000 (M)</th>
<th>Sales ratio against FY 2005 level</th>
<th>CO2 emissions sales base index</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 2005</td>
<td>1.152</td>
<td>241</td>
<td>1.00</td>
<td>73,917</td>
<td>1.00</td>
</tr>
<tr>
<td>FY 2006</td>
<td>1.118</td>
<td>233</td>
<td>0.97</td>
<td>74,373</td>
<td>1.01</td>
</tr>
<tr>
<td>FY 2007</td>
<td>1.236</td>
<td>241</td>
<td>1.00</td>
<td>76,747</td>
<td>1.04</td>
</tr>
<tr>
<td>FY 2008</td>
<td>1.017</td>
<td>229</td>
<td>0.87</td>
<td>77,957</td>
<td>1.05</td>
</tr>
<tr>
<td>FY 2009</td>
<td>0.857</td>
<td>192</td>
<td>0.80</td>
<td>81,531</td>
<td>1.10</td>
</tr>
<tr>
<td>FY 2010</td>
<td>0.955</td>
<td>192</td>
<td>0.80</td>
<td>83,970</td>
<td>1.14</td>
</tr>
<tr>
<td>FY 2011</td>
<td>0.927</td>
<td>189</td>
<td>0.78</td>
<td>88,144</td>
<td>1.19</td>
</tr>
<tr>
<td>FY 2012</td>
<td>0.827</td>
<td>195</td>
<td>0.81</td>
<td>90,396</td>
<td>1.22</td>
</tr>
<tr>
<td>FY 2013</td>
<td>0.800</td>
<td>190</td>
<td>0.79</td>
<td>94,061</td>
<td>1.27</td>
</tr>
<tr>
<td>FY 2014</td>
<td>0.800</td>
<td>183</td>
<td>0.76</td>
<td>92,771</td>
<td>1.26</td>
</tr>
<tr>
<td>FY 2015 Target</td>
<td>0.800</td>
<td>186</td>
<td>0.77</td>
<td>97,486</td>
<td>1.32</td>
</tr>
</tbody>
</table>

The CO2 emissions sales unit base index has been steadily declining annually due to the efforts made by companies to reduce emissions.

Examples of measures taken in FY 2014

A unique aspect concerning energy consumption in the pharmaceutical industry is the high ratio of energy used, from the R&D stage to the manufacturing and sales phases, to assure the quality of products. An especially notable point is the high ratio of base load energy required to meet the GMP and GRP requirements. Pharmaceutical manufacturers are switching their energy sources from fuel to electricity, and the ratio of electricity to the total energy used in FY 2014 was approximately 60%, indicating high dependence on electricity. This ratio shows an increasing trend even further, indicating that the industry is highly sensitive to the grid electricity carbon emission factor.

To encourage member companies to introduce highly efficient machinery and to switch to alternative energy sources with lower CO2 emissions, FPMA has facilitated sharing of member companies’ initiatives and technical information concerning energy-saving machinery and devices. The total amount invested in equipment and facilities related to energy saving in FY 2014 was ¥1,025 million. The main actions taken are summarized in Table 2. We plan to continue promoting the introduction of highly efficient machinery and devices, as well as switching of energy sources.

In addition, such measures to cut emissions from distribution as third party logistics (3PL), shared distribution and modal shift have been introduced.

Furthermore, FPMA runs a workshop on energy saving and global warming countermeasures technologies to facilitate the sharing of information on trends related to the policies of energy saving and global warming countermeasures and the information on advanced technologies between industry organizations.

It has been noted that the level of CO2 emissions from business vehicles is relatively high in the pharmaceutical industry. That is why the industry is actively introducing highly fuel-efficient cars such as hybrid and electric cars, which has seen a steady decrease in total CO2 emissions and per-unit CO2 emissions (CO2 emissions from one business vehicle).

Table 2. Status of CO2 emissions from business vehicles

<table>
<thead>
<tr>
<th>Year</th>
<th>Total number of business vehicles</th>
<th>Number of hybrid vehicle</th>
<th>Number of electric vehicle</th>
<th>Quantity of gasoline used</th>
<th>CO2 emissions per unit (100,000 t-CO2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>45,571</td>
<td>171</td>
<td>17</td>
<td>83,704</td>
<td>182.2</td>
</tr>
<tr>
<td>2006</td>
<td>49,310</td>
<td>187</td>
<td>10</td>
<td>84,493</td>
<td>186.0</td>
</tr>
<tr>
<td>2007</td>
<td>50,846</td>
<td>201</td>
<td>0</td>
<td>84,277</td>
<td>192.7</td>
</tr>
<tr>
<td>2008</td>
<td>52,911</td>
<td>216</td>
<td>0</td>
<td>83,516</td>
<td>196.4</td>
</tr>
<tr>
<td>2009</td>
<td>51,053</td>
<td>204</td>
<td>0</td>
<td>80,777</td>
<td>197.8</td>
</tr>
<tr>
<td>2010</td>
<td>51,353</td>
<td>209</td>
<td>0</td>
<td>77,396</td>
<td>201.2</td>
</tr>
<tr>
<td>2011</td>
<td>51,614</td>
<td>216</td>
<td>0</td>
<td>76,950</td>
<td>204.6</td>
</tr>
<tr>
<td>2012</td>
<td>52,406</td>
<td>216</td>
<td>0</td>
<td>77,179</td>
<td>207.0</td>
</tr>
<tr>
<td>2013</td>
<td>52,930</td>
<td>216</td>
<td>0</td>
<td>77,567</td>
<td>209.4</td>
</tr>
<tr>
<td>2014</td>
<td>53,406</td>
<td>216</td>
<td>0</td>
<td>78,027</td>
<td>211.8</td>
</tr>
</tbody>
</table>

In Table 2, Examples of measures taken in FY 2014 and their effect on CO2 reduction

<table>
<thead>
<tr>
<th>Measures taken</th>
<th>CO2 reduction (t-CO2)</th>
<th>CO2 reduction (t-CO2) per 100,000 t-CO2</th>
</tr>
</thead>
<tbody>
<tr>
<td>① Introduction of energy-saving procedures (e.g., cold water, hot water supply, etc.)</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>② Change in internal air and flue gas temperature, ventilation, operating time, etc.</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>③ Review of operation and/or control procedures for facilities and machinery (boiler, compressor, etc.)</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>④ Change in reference values and set values of energy sources (temperature, ventilation frequency, cleanliness, etc.)</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>⑤ Change of plant to switching or using resources with lower CO2 emissions</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>⑥ Change in reference values and set values of energy sources (temperature, ventilation frequency, cleanliness, etc.)</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>⑦ Review of operation and/or control procedures for facilities and machinery (boiler, compressor, etc.)</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>⑧ Change in reference values and set values of energy sources (temperature, ventilation frequency, cleanliness, etc.)</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>⑨ Introduction of energy monitoring system</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>⑩ Introduction of highly efficient heat pumps</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>⑪ Introduction of highly efficient heat pumps</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>⑫ Introduction of highly efficient heat pumps</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>⑬ Introduction of highly efficient heat pumps</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>⑭ Introduction of highly efficient heat pumps</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>⑮ Introduction of highly efficient heat pumps</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>⑯ Introduction of highly efficient heat pumps</td>
<td>5</td>
<td>10</td>
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<tr>
<td>⑰ Introduction of highly efficient heat pumps</td>
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<td>10</td>
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<tr>
<td>⑱ Introduction of highly efficient heat pumps</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>⑲ Introduction of highly efficient heat pumps</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>⑳ Introduction of highly efficient heat pumps</td>
<td>5</td>
<td>10</td>
</tr>
</tbody>
</table>

In Table 3, Status of CO2 emissions from business vehicles, it can be seen that the level of CO2 emissions from business vehicles is relatively high in the pharmaceutical industry. That is why the industry is actively introducing highly fuel-efficient cars such as hybrid and electric cars.
Global Warming Countermeasures

The impact of revision of the emission factor (260,000 t-CO\(_2\), which was 24% (580,000 t-CO\(_2\)) less than the FY 2005 emission level was 320,000 t-CO\(_2\), after removing the 300,000 t-CO\(_2\) reduction made by FY 2014 against the FY 2005, the estimated CO2 emissions for FY 2014 (BAU) would have been 2,840,000 t-CO\(_2\). This means that the reduction made by FY 2014 against BAU was 1,010,000 t-CO\(_2\). The actual level of reduction (by industry’s efforts) after removing the impact of revision of the emission factor was 750,000 t-CO\(_2\).

As seen in Table 1, the volume of production (sales) has been steadily declining annually due to the efforts made by companies to reduce emissions.

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales (¥100,000,000)</th>
<th>CO2 emissions (10,000 t-CO(_2))</th>
<th>Sales ratio against FY 2005 level</th>
<th>CO2 emissions sales index</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 2005</td>
<td>1,152</td>
<td>241</td>
<td>1.00</td>
<td>73,917</td>
</tr>
<tr>
<td>FY 2006</td>
<td>1,118</td>
<td>233</td>
<td>0.97</td>
<td>74,373</td>
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<tr>
<td>FY 2007</td>
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<td>76,747</td>
</tr>
<tr>
<td>FY 2008</td>
<td>1,017</td>
<td>209</td>
<td>0.87</td>
<td>77,067</td>
</tr>
<tr>
<td>FY 2009</td>
<td>0.957</td>
<td>192</td>
<td>0.80</td>
<td>81,521</td>
</tr>
<tr>
<td>FY 2010</td>
<td>0.955</td>
<td>192</td>
<td>0.80</td>
<td>83,970</td>
</tr>
<tr>
<td>FY 2011</td>
<td>0.927</td>
<td>189</td>
<td>0.78</td>
<td>88,144</td>
</tr>
<tr>
<td>FY 2012</td>
<td>0.927</td>
<td>185</td>
<td>0.81</td>
<td>90,018</td>
</tr>
<tr>
<td>FY 2013</td>
<td>0.900</td>
<td>189</td>
<td>0.79</td>
<td>94,061</td>
</tr>
<tr>
<td>FY 2014</td>
<td>0.900</td>
<td>183</td>
<td>0.76</td>
<td>92,771</td>
</tr>
<tr>
<td>FY 2020 Target</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Examples of measures taken in FY 2014

A unique aspect concerning energy consumption in the pharmaceutical industry is the high ratio of energy used, mainly due to the heavy use of diesel used for business vehicles. It has been noted that the level of CO\(_2\) emissions from business vehicles is relatively high in the pharmaceutical industry. That is why the industry is actively introducing highly fuel-efficient cars such as hybrid and electric cars.

2. Strengthened cooperation with other interest groups

While striving for more efficient means of transporting drugs, e.g. shared distribution, we will promote the introduction of highly fuel-efficient cars into business vehicle fleets and the use of public transport in urban areas. In addition, as well as to endeavor to share information on energy saving between the industry organizations, we will educate and motivate employees to improve their awareness of global warming and energy saving and encourage them to take actions at work as well as at home.

It has been noted that the level of CO\(_2\) emissions from business vehicles is relatively high in the pharmaceutical industry. That is why the industry is actively introducing highly fuel-efficient cars such as hybrid and electric cars, which has seen a steady decrease in total CO\(_2\) emissions and per-unit CO\(_2\) emissions (CO\(_2\) emissions from one business vehicle).

<table>
<thead>
<tr>
<th>Year</th>
<th>Total number of business vehicles</th>
<th>Quantity of gasoline used</th>
<th>CO2 emissions per unit (t-CO(_2)/unit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>63,017</td>
<td>83,704</td>
<td>16,978</td>
</tr>
<tr>
<td>2006</td>
<td>61,751</td>
<td>83,492</td>
<td>16,787</td>
</tr>
<tr>
<td>2007</td>
<td>60,130</td>
<td>83,277</td>
<td>16,596</td>
</tr>
<tr>
<td>2008</td>
<td>58,411</td>
<td>82,958</td>
<td>16,405</td>
</tr>
<tr>
<td>2009</td>
<td>56,692</td>
<td>82,639</td>
<td>16,213</td>
</tr>
<tr>
<td>2010</td>
<td>54,963</td>
<td>82,317</td>
<td>16,021</td>
</tr>
<tr>
<td>2011</td>
<td>53,234</td>
<td>81,995</td>
<td>15,829</td>
</tr>
<tr>
<td>2012</td>
<td>51,505</td>
<td>81,673</td>
<td>15,636</td>
</tr>
<tr>
<td>2013</td>
<td>49,776</td>
<td>81,351</td>
<td>15,443</td>
</tr>
<tr>
<td>2014</td>
<td>48,047</td>
<td>80,929</td>
<td>15,250</td>
</tr>
</tbody>
</table>

In addition, such measures to control emissions from distribution as third party logistics (3PL), shared distribution and modal shift have been introduced.

Furthermore, JFPA runs a workshop on energy saving and global warming countermeasures technologies to facilitate the sharing of information on trends related to the policies of energy saving and global warming countermeasures and the information on advanced technologies between industry organizations.

We believe taking actions with our products is an essential aspect of our efforts to prevent global warming in the pharmaceutical industry. One typical example of such actions is our relative to reduce fluorocarbon use in metered dose inhalers (MDIs). As fluorocarbons cause greater greenhouse effects than CO\(_2\), the reduction of their use is strongly desired.

Table 2. Status of CO2 emissions from business vehicles

Table 3. Changes in CO2 emissions based on FPMAJ progress monitoring factor and sales volume

Table 4. Changes in actual HFC release levels and CO2 equivalent
Global Warming Countermeasures

Although previously chlorofluorocarbon (CFC) was used in MDIs, its role in the destruction of the ozone layer became an issue, which led to the move to switch to an alternative hydroflurocarbon (HFC). After completing the switch from CFC to HFC in 2006, it was revealed HFC also has a strong greenhouse effect, which motivated us to work towards reduction by setting an HFC release reduction target of 150 tons, a 72% reduction from the estimated HFC release level of 540 tons in FY 2010. As a result of our efforts to develop powder-based inhalers and improving existing product technology, we have achieved a major reduction as seen in Table 4, far exceeding our own target. Although the quantity of inhalers dispatched will continue to increase as cases of asthma or chronic obstructive pulmonary disorder (COPD) are anticipated to increase, we will strive to reduce HFC use by promoting powder-based inhalers and improving existing products.

3. Contributions on the international level

It is anticipated we will see further globalization in the pharmaceutical market and more drugs manufactured overseas. We believe we can make contributions in lessening the burden on the environment and reduction of energy use overseas by exporting our cutting-edge drug manufacturing technologies.

Japan is ahead of the rest of world in the reduction of HFC use in MDIs. By exporting this technology overseas, we believe we can make a global-scale contribution to the reduction of greenhouse gases.

4. Development of innovative technologies

Aiming to lessen the burden on the environment and ensure safety over the long term and to take long-term actions to prevent global warming, we will strive to develop what can be called green chemistry technologies as a part of drug manufacturing technologies, which will minimize the use of organic solvents, as well as to make the drug manufacturing process more energy efficient.

There are companies that are taking such actions as shortening and optimizing the reactive process to reduce usage of raw materials, reagents, solvents and energy, and also downsizing the analytical process that uses organic solvents (liquid chromatography). Our challenge is to share and promote such efforts within the industry. Furthermore, looking towards the year 2050, we believe we need to develop the kind of manufacturing technologies that contribute to the reduction of the greenhouse gases in product life cycle including supply, manufacturing and use.

TOPICS

The 19th Workshop on Energy Saving and Global Warming Countermeasure Technologies

On Friday, October 2, 2015, the Environment & Safety Committee hosted the 19th Workshop on Energy Saving and Global Warming Countermeasure Technologies at Ohmachi 1st Square Conference (Ohmachi, Chiyoda-ku, Tokyo). The course had 77 participants.

This workshop has been held annually since FY 1997 with the aim of helping JPMA member companies make progress in their actions concerning energy saving and global warming countermeasures. Continuing from the previous year, the 19th workshop was held under the theme, “Pharmaceutical Industry’s Measures on Energy towards a Low-Carbon Society.” We invited speakers from the Ministry of Economy, Trade and Industry and the Ministry of the Environment, who made presentations titled, “Recent Trends of Energy Saving Policies” and “Towards Greenhouse Gas Reduction in 2020 and Beyond (COP21)”, respectively, providing information on the trends related to their respective policies. We also invited a speaker from Japan Research Institute, Limited, who made a presentation titled, “Effects of Liberalization of Electricity and Gas on Company’s Energy Saving, CO2 Emissions Reduction, and Cost Saving Activities,” and another from NEC Corporation, who spoke about, “Use of Data to Manage Energy and Facilities in Plants and Laboratories.”

In view of the International and domestic business environment that are both likely to become increasingly severe, the Environment & Safety Committee intends to continue supporting the activities of JPMA member companies and related companies towards creation of a Low-Carbon Society, by offering opportunities to share information on energy saving measures and global warming countermeasures taken by companies.

Resource Conservation & Waste Management

From before promulgation of the Basic Act on Establishing a Sound Material-Cycle Society in 2001, JPMA has developed its own voluntary action plan for the environment and set numerical targets to guide our actions (Figure 1). The JPMA also conducted studies on how wastes are generated and disposed. So far, we have made steady progress in reducing the amount of final disposal output, the final disposal rate (quantity of waste disposed in the end against total quantity of waste initially generated), indicated in percentage, and the amount of waste generated in the first place. Together with FPMAJ, we set a common new target for the amount of final disposal output in the plan for the fourth period, started in FY 2011. The results of our FY 2014 survey on the status of waste generation and disposal by respective companies in four organizations under the umbrella of FPMAJ, which: promote action towards attainment of the target, showed that our targets set in the JPMA Voluntary Action Plan for the Environment were again achieved for the second year running, following FY 2012, owing to our various motivational promotion activities for the reduction of final disposal output and efforts by our member companies. We believe it is essential to continue our efforts to reduce waste as much as possible and strive to build a sound material-cycle society for more efficient use of available resources. We will continue proactive waste management actions so that we will continue to attain future JPMA Voluntary Action plan targets.


JPMA, together with FPMAJ, takes part in Keidanren’s Voluntary Action Plan on the Environment (Section on the Establishment of a Sound Material-Cycle Society). Since FY 1997, JPMA has conducted annual follow-up surveys to monitor the status of actions taken by member companies that participate in the Voluntary Action Plan to reduce the amount of waste generation and waste for final disposal. Since FY 2011, JPMA has set numerical targets to reduce the final disposal volume, and has been continuing with follow-up surveys to monitor this volume as well as the amount of waste generation and the details concerning the methods of disposal.

The final disposal volume in FY 2014 was about 6,000 tons (Figure 1). Although it was an increase of 1,000 tons compared to the previous fiscal year, it was an 80.0% reduction from the FY 2000 (base year) level, confirming that we have been able to continue meeting the target.

However, according to a survey of member companies conducted this year concerning the estimated amount of final disposal in FY 2015, the situation is likely to worsen, as in the previous year, and will remain low at a reduction of 68% from the actual data stated in this report have been adjusted based on the coverage obtained by dividing the total sales volume of respondent companies by Japan’s total drug sales (Figure 1). The actual coverage in FY 2014 was 72.7%. Since the measured value of waste includes legal industrial waste as well as other goods such as valuables and goods given to others for free, we use the general term “waste” in this section.

Reducing the final disposal volume of industrial waste in FY 2015 by about 65% from FY 2000

As an organization under the umbrella of FPMAJ, JPMA takes part in Keidanren’s Voluntary Action Plan on the Environment (Section on the Establishment of a Sound Material-Cycle Society). It monitors the status of member companies’ activities and reports it to Keidanren.

Figure 1. Changes in the final disposal volume
Although previously chlorofluorocarbon (CFC) was used in MDIs, its role in the destruction of the ozone layer became an issue, which led to the move to switch to an alternative hydrofluorocarbon (HFC). After completing the switch from CFC to HFC in 2006, it was revealed HFC also has a strong greenhouse effect, which motivated us to work towards reduction by setting an HFC release reduction target of 150 tons, a 72% reduction from the estimated HFC release level of 540 tons in FY 2010. As a result of our efforts to develop powder-based inhalers and improving existing product technology, we have achieved a major reduction as seen in Table 4, far exceeding our own target. Although the quantity of inhalers dispatched will continue to increase as cases of asthma or chronic obstructive pulmonary disorder (COPD) are anticipated to increase, we will strive to reduce HFC use by promoting powder-based inhalers and improving existing products.

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There are companies that are taking such actions as shortening and optimizing the reactive process to reduce usage of raw materials, reagents, solvents and energy, and/or down-sizing the analytical process that uses organic solvents (liquid chromatography).

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We invited speakers from the Ministry of Economy, Trade and Industry and the Ministry of the Environment, who made presentations titled, “Recent Trends of Energy Saving Policies” and “Towards Greenhouse Gas Reduction in 2020 and Beyond (COP21),” respectively, providing information on the trends related to their respective policies. We also invited a speaker from Japan Research Institute, Limited, who made a presentation titled, “Effects of Liberalization of Electricity and Gas on Company’s Energy Saving, CO2 Emissions Reduction, and Cost Saving Activities,” and another from NEC Corporation, who spoke about, “Use of Data to Manage Energy and Facilities in Plants and Laboratories.”

In view of the international and domestic business environment that are both likely to become increasingly severe, the Environment & Safety Committee intends to continue supporting the activities of JPMA member companies and related companies towards creation of a Low-Carbon Society, by offering opportunities to share information on energy saving measures and global warming countermeasures taken by companies.

From before promulgation of the Basic Act on Establishing a Sound Material-Cycle Society in 2001, JPMA has developed its own voluntary action plan for the environment and set numerical targets to guide our actions. Not just on the use of waste, JPMA also conducted studies on how wastes are generated and disposed. So far, we have made steady progress in reducing the amount of final disposal output, the final disposal rate (quantity of waste disposed in the end against total quantity of waste initially generated, indicated in percentage), and the amount of waste generated in the first place. Together with FPMAJ, we set a common new target for the amount of final disposal output in the plan for the fourth period, started in FY 2011.

The results of our FY 2014 survey on the status of waste generation and disposal by respective companies in four organizations* under the umbrella of FPMAJ, which promote action towards attainment of the target, showed that our targets set in the FPMAJ Voluntary Action Plan for the Environment were again achieved for the second year running, following FY 2012, owing to our various motivational promotion activities for the reduction of final disposal output and efforts by our member companies. We believe it is essential to continue our efforts to reduce waste as much as possible and strive to build a sound material-cycle society for more efficient use of available resources.

We will continue positive waste management actions so that we will continue to attain future FPMAJ Voluntary Action Plan targets.

Since last year’s report, we have started to cover the activities that the four organizations under the umbrella of FPMAJ implemented towards creating a sound material-cycle society, in the interest of aligning the scope of the study with the reports made to Keidanren as follow-up of the Voluntary Action Plan on the Environment (Section on the Establishment of a Sound Material-Cycle Society). The report of this fiscal year has been made in the same way. Please note that the actual data stated in this report have been adjusted based on the coverage obtained by dividing the total sales volume of participating member companies by the total sales volume of respondent companies by Japan’s total drug sales.

As an organization under the umbrella of FPMAJ, JPMA takes part in Keidanren Voluntary Action Plan on the Environment (Section on the Establishment of a Sound Material-Cycle Society). It monitors the status of member companies’ activities and reports it to Keidanren.

Reducing the final disposal volume of industrial waste in FY 2015 by about 65% from FY 2000

JPMA, together with FPMAJ, takes part in Keidanren’s Voluntary Action Plan on the Environment (Section on the Establishment of a Sound Material-Cycle Society). State of Progress

JPMA’s Actions

The results of our FY 2014 survey show that the four organizations under the umbrella of FPMAJ, which promote action towards attainment of the target, showed that our targets set in the FPMAJ Voluntary Action Plan for the Environment were again achieved for the second year running, following FY 2012, owing to our various motivational promotion activities for the reduction of final disposal output and efforts by our member companies. We believe it is essential to continue our efforts to reduce waste as much as possible and strive to build a sound material-cycle society for more efficient use of available resources.

We will continue positive waste management actions so that we will continue to attain future FPMAJ Voluntary Action Plan targets.

The actual data stated in this report have been adjusted based on the coverage obtained by dividing the total sales volume of participating member companies by the total sales volume of respondent companies by Japan’s total drug sales. The actual coverage in FY 2014 was 72.7%. Since the measured value of waste includes legal industrial waste as well as other goods such as valuables and goods given to others for free, we use the general term “waste” in this section.

The final disposal volume in FY 2014 was about 6,000 tons (Figure 1). Although it was an increase of 1,000 tons compared to the previous fiscal year, it was an 80.0% reduction from the FY 2000 (base year) level, confirming that we have been able to continue meeting the target.

However, according to a survey of member companies conducted this year concerning the estimated amount of final disposal in FY 2015, the situation is likely to worsen, as in the previous year, and will remain low at a reduction of 86% from the level of the base year unless new reduction measures are implemented. The survey result confirms the need for member companies to continue their reduction measures, not just to meet the numerical target, but also to achieve a higher level of reduction of the final disposal volume.

Figure 1. Changes in the final disposal volume


<table>
<thead>
<tr>
<th>Year</th>
<th>Final disposal volume (1,000 ton)</th>
<th>Ratio (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>6,000</td>
<td>100.0%</td>
</tr>
<tr>
<td>2001</td>
<td>5,300</td>
<td>88.3%</td>
</tr>
<tr>
<td>2002</td>
<td>5,000</td>
<td>83.3%</td>
</tr>
<tr>
<td>2003</td>
<td>4,200</td>
<td>70.0%</td>
</tr>
<tr>
<td>2004</td>
<td>4,200</td>
<td>70.0%</td>
</tr>
<tr>
<td>2005</td>
<td>4,200</td>
<td>70.0%</td>
</tr>
<tr>
<td>2006</td>
<td>4,200</td>
<td>70.0%</td>
</tr>
<tr>
<td>2007</td>
<td>4,200</td>
<td>70.0%</td>
</tr>
<tr>
<td>2008</td>
<td>4,200</td>
<td>70.0%</td>
</tr>
<tr>
<td>2009</td>
<td>4,200</td>
<td>70.0%</td>
</tr>
<tr>
<td>2010</td>
<td>4,200</td>
<td>70.0%</td>
</tr>
<tr>
<td>2011</td>
<td>4,200</td>
<td>70.0%</td>
</tr>
<tr>
<td>2012</td>
<td>4,200</td>
<td>70.0%</td>
</tr>
<tr>
<td>2013</td>
<td>4,200</td>
<td>70.0%</td>
</tr>
<tr>
<td>2014</td>
<td>4,200</td>
<td>70.0%</td>
</tr>
<tr>
<td>2015</td>
<td>4,200</td>
<td>70.0%</td>
</tr>
</tbody>
</table>

* JPMA, Japan Generic Medicines Association; JAPMA, Japan Automatic Pharmaceutical Industry Association; Japan Kampo Medicines Manufacturers Association
This is because the volume of waste generation (the denominator) worsened by 0.2 points from FY 2013. Meanwhile, the ratio of final disposal of the volume of waste generation was 2.2%, decreased by 0.2 points from FY 2013. This increase was likely due to increased production in FY 2014. Waste plastics and sludge showed an increasing trend, and waste oil showed a decreasing trend. The amount of 117,000 tons was reduced through incineration and other processes, accounting for 42.7% of the total quantity of waste generated. As seen in this flow chart, the key to reducing the final disposal volume is, first of all, to sort the waste thoroughly to reduce the quantity of waste going directly to final disposal as much as possible, and to increase the amount for recycling. Measures concerning materials that require intermediate processing for detoxification, etc., for example, reduction of the waste volume and recycling of generated residues through the process as much as possible also contribute to reduce the final disposal volume. The 151,000 tons of waste that were eventually recycled have effectively been used as resources to some way.

### 2. Waste Generation Volume and Final Disposal Rate

The volume of waste generation increased by 21,000 tons from FY 2013 to 274,000 tons, which was 72.7% of the FY 2000 figure (Figure 3). This increase was likely due to increased production, while no major changes were observed in terms of the breakdown by type of waste. However, waste plastics and sludge showed an increasing trend, and waste oil showed a decreasing trend.

The ratio of final disposal of the volume of waste generation was 2.2%, worsened by 0.2 points from FY 2013 (Figure 4).

According to a survey of member companies concerning the estimated amount of waste generation in FY 2015, the volume would be 4,000 tons less than the current level if waste reduction measures had been adopted, while the final disposal ratio would likely have remained at about 2.3%. This is because the volume of waste generation (the denominator) is expected to decrease, while the ratio of materials that are difficult to recycle, etc. contained in the waste generation is expected to increase.

### 3. Flow of Waste Processing and Disposal

Figure 6 shows the flow of processing and disposal of waste, based on survey responses by member companies. The amount of waste eventually recycled was 151,000 tons, which accounted for 59.6% of the total quantity of waste generation. The amount of waste that ended up in final disposal was 6,000 tons, or 2.2% of the total quantity of waste generated. The amount of 117,000 tons was reduced through incineration and other processes, accounting for 42.7% of the total quantity of waste generated.

As seen in this flow chart, the key to reducing the final disposal volume is, first of all, to sort the waste thoroughly to reduce the quantity of waste going directly to final disposal as much as possible, and to increase the amount for recycling. Measures concerning materials that require intermediate processing for detoxification, etc., for example, reduction of the waste volume and recycling of generated residues through the process as much as possible also contribute to reduce the final disposal volume. The 151,000 tons of waste that were eventually recycled have effectively been used as resources to some way.
This is because the volume of waste generation (the denominator) would likely have remained at about 2.3%. According to a survey of member companies concerning the final disposal rate, the ratio of final disposal of the volume of waste generation was 2.2%, worsened by 0.2 points from FY 2013. Meanwhile, the ratio of final disposal to the volume of waste generation was 2.1 tons per hundred million yen. As seen in this figure chart, the key to reducing the final disposal volume is, first of all, to sort the waste thoroughly to reduce the quantity of waste going directly to final disposal as much as possible, and to increase the amount for recycling. Measures concerning materials that require intermediate processing for detoxification, etc., for example, reduction of the waste volume and recycling of generated residues through the process as much as possible also contribute to reduce the final disposal volume. The 151,000 tons of waste that were eventually recycled have effectively been used as resources in some way.

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Meanwhile, the ratio of final disposal of the volume of waste generation was 2.2%, worsened by 0.2 points from FY 2013 (Figure 4).

According to a survey of member companies concerning the estimated amount of waste generation in FY 2015, the volume would be 4,000 tons less than the current level if waste reduction measures had been adopted, while the final disposal ratio would likely have remained at about 2.3%. This is because the volume of waste generation (the denominator) is expected to decrease, while the ratio of materials that are difficult to recycle, etc., contained in the waste generation is expected to increase.

Figure 5 shows the changes in per-unit waste generation, obtained by dividing the total quantity of waste generated by the drug sales figure. In FY 2000, waste generation was 4.4 tons per hundred million yen, but the figure has been declining ever since, and reached 2.1 tons per hundred million yen in FY 2014. We believe this result has been achieved through the effective use of resources by member companies as part of their efforts to create a Sound Material-Cycle Society.

3. Flow of Waste Processing and Disposal

Figure 6 shows the flow of processing and disposal of waste, based on survey responses by member companies. The amount of waste eventually recycled was 151,000 tons, which accounted for 56.0% of the total quantity of waste generated. The amount of waste that ended up in final disposal was 6,000 tons, or 2.2% of the total quantity of waste generated. The amount of 117,000 tons was reduced through incineration and other processes, accounting for 42.7% of the total quantity of waste generated.
Various types of chemical substances are used in the pharmaceutical industry for research, development and manufacture of pharmaceuticals that contribute to people’s health. Some of those chemicals pose a potentially harmful impact on human health and the ecosystem if discharged into the environment. JPMA recognizes the importance of proper control of those chemical substances, and has been implementing voluntary actions to properly manage chemical substances.

We also promote research activities concerning process safety to control emissions of chemical substances in the environment and to prevent fire outbreaks, explosions and other dangers in the process of manufacturing pharmaceuticals.

JPMA began a survey on PRTR substances (Note 1) in FY 1997, and a survey on volatile organic compounds (VOCs) (Note 2) in FY 2007. JPMA reports data on chemical substances used by its member companies, including information on the amount handled and the amount emitted into the environment.

### 1. PRTR Survey

The total amount of the 462 substances specified in Class I Designated Chemical Substances under the PRTR Law (PRTR substances) handled by the 65 member companies (those who responded) on 209 business premises in FY 2014 were 8,413 tons (down by 34% from the previous fiscal year), excluding dioxin. The amount released into the atmosphere was 209 tons (down by 37% from the previous fiscal year), and the amount released into public waters was 8 tons (same as the previous fiscal year). None of the substances were released into the soil.

Emissions of PRTR substances into the environment have steadily been declining since FY 2002. The total amount of emissions into the environment in FY 2014 was 217 tons, which was 37% less than that in the previous fiscal year. This was an 88% reduction from the FY 2002 level (Figure 3). Atmospheric release accounts for 96% or more of total emissions into the environment for all fiscal years.

### 2. VOC Survey

The Air Pollution Control Act has a provision to control atmospheric releases of volatile organic compounds (VOCs). Although our member companies have few facilities that are subject to regulation under this law, JPMA has conducted an annual survey on their usage of VOCs. Our survey focuses on 101 substances, including the 100 main VOCs identified by the Ministry of the Environment, as well as n-propyl alcohol, a substance widely used in the pharmaceutical industry. Data on the quantity handled and the amount released into the atmosphere are compiled and analyzed.

Among the 65 member companies (those who responded), at the 209 business premises there were 41 substances that were used in quantities equal to or more than one ton in FY 2014. In total, 34,190 tons of VOCs were handled (down 34% from the previous fiscal year). The major substances used were, in descending order of quantity, methanol, acetonitrile, ethyl acetate, toluene, and n-hexane (Figure 4). Atmospheric release of those five substances totaled 198 tons, which accounted for 99% of the total atmospheric release of PRTR substances (209 tons).

### 3. Actions to Reduce Atmospheric Release of Chemical Substances

Owing to the voluntary efforts by the member companies to control atmospheric release of VOCs, the amount of 101 types of VOCs released into the atmosphere has declined since FY 2008. The total quantity released into the atmosphere in FY 2014 was about 22% less than the previous year. Compared with FY 2008 data, it is a 43% reduction.

### Table 1. Examples of measures to reduce atmospheric release of chemical substances

<table>
<thead>
<tr>
<th>Measures implemented</th>
<th>No. of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changes in production processes and/or method of analysis</td>
<td>11</td>
</tr>
<tr>
<td>Installation of solvent recovery units and/or filtering units</td>
<td>4</td>
</tr>
<tr>
<td>Installation of solvent recovery unit</td>
<td>3</td>
</tr>
<tr>
<td>Use of alternatives to organic solvents (switching to water-based products, etc.)</td>
<td>6</td>
</tr>
<tr>
<td>Installation of exhaust fume processing unit</td>
<td>4</td>
</tr>
<tr>
<td>Others</td>
<td>12</td>
</tr>
</tbody>
</table>
Various types of chemical substances are used in the pharmaceutical industry for research, development and manufacture of pharmaceuticals that contribute to people’s health. Some of these chemicals pose a potential harmful impact on human health and/or the ecosystem if discharged into the environment. JPMA recognizes the importance of proper control of those chemical substances, and has been implementing voluntary actions to properly manage chemical substances. We also promote research activities concerning process safety to control emissions of chemical substances in the environment and to prevent fire outbreaks, explosions and other dangers in the process of manufacturing pharmaceuticals.

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Annual usage amounts of major substances were, in descending order of quantity, 2,058 tons of toluene, 1,518 tons of dichloromethane, 1,369 tons of acetone, 777 tons of n,N-dimethylformamide, and 733 tons of n-hexane (Figure 1). The major substances released into the atmosphere were, in descending order of quantity, dichloromethane, toluene, n-hexane, acetonitrile and chloroform (Figure 2). Atmospheric release of those five substances totaled 198 tons, which accounted for 95% of the total atmospheric release of PRTR substances (209 tons).

Emissions of PRTR substances into the environment have steadily been declining since FY 2002. The total amount of emissions into the environment in FY 2014 was 217 tons, which was 37% less than that in the previous fiscal year. This was an 88% reduction from the FY 2002 level (Figure 3). Atmospheric release accounts for 96% or more of total emissions into the environment for all fiscal years.

JPMA began a survey on PRTR substances (Note 1) in FY 1997, and a survey on volatile organic compounds (VOCs, Note 2) in FY 2007. JPMA reports data on chemical substances used by its member companies, including information on the amount handled and the amount emitted into the environment.

2. VOC Survey

The Air Pollution Control Act has a provision to control atmospheric releases of volatile organic compounds (VOCs). Although our member companies have few facilities that are subject to regulation under this law, JPMA has conducted an annual survey on their usage of VOCs. Our survey focuses on 101 substances, including the 100 main VOCs identified by the Ministry of the Environment, as well as n-propyl alcohol, a substance widely used in the pharmaceutical industry. Data on the quantity handled and the amount released into the atmosphere are compiled and analyzed.

Among the 65 member companies (those who responded), at the 209 business premises there were 41 substances that were used in quantities equal to or more than one ton in FY 2014. In total, 34,180 tons of VOCs were handled (down 34% from the previous fiscal year). The major substances used were, in descending order of quantity, methanol, acetonitrile, ethyl acetate, toluene, and n-hexane, in descending order of quantity (Figure 4). The total amount of VOCs released into the atmosphere was 1,782 tons, which included methanol, isopropyl alcohol, ethyl acetate, dichloromethane, methanol, and acetonitrile, in descending order of quantity (Figure 5). Atmospheric release of these six substances totaled 1,676 tons, which accounted for approximately 94% of the total atmospheric release of VOCs.

3. Actions to Reduce Atmospheric Release of Chemical Substances

Owing to the voluntary efforts by the member companies to control atmospheric release of VOCs, the amount of 101 types of VOCs released into the atmosphere has declined since FY 2008. The total quantity released into the atmosphere in FY 2014 was about 22% less than the previous year. Compared with FY 2008 data, it is a 43% reduction (Figure 6).

Owing to the voluntary efforts by the member companies to control atmospheric release of VOCs, the amount of 101 types of VOCs released into the atmosphere has shown a steady decline from FY 2008. JPMA has been conducting a questionnaire survey on the management of the atmospheric release of chemical substances, to study the specific details of member companies’ initiatives and to share such information, and thereby to encourage member companies to strengthen their voluntary actions even further. In addition to physical measures, such as the installation of solvent recovery units and filtering units, other measures to reduce the use of chemical substances by using alternatives to organic solvents or through changes in production processes, have also been introduced. These measures have contributed to emissions reduction (Table 1).
Pharmaceutical companies are involved in people’s lives and health. It is a part of our missions to create and maintain a work place environment for our employees that is safe, healthy and comfortable to work in. In order to achieve this, JPMa has conducted studies on and promotional activities for occupational safety and health. Especially in recent years, we have been engaged in proactive actions to detect and handle risks that threaten occupational safety and health before an incident happens.

JPMa aims to create a safe environment, in which every employees, not those at all manufacturing or R&D facilities, can work in a physically and mentally health condition. JPMa has conducted studies in occupational safety and facility types. In addition, JPMa has held a seminar regarding mental health issues of employees and prevention of traffic accidents by business vehicles.

1. Status of Occupational Accidents and Categorization of their Type

The 64 out of 72 JPMa member companies responded to our questionnaire survey about the rate of occupational accidents reported in FY 2014 (excluding those occurred during commuting) and provided data covering some 146,604 employees. This survey again included the section for accidents that did not require a day off work as a result of the accidents in addition to questions about the accidents that required a day(s) off work. The FY 2013 survey also sought data about the types of accidents.

2. No Time Loss Occupational Accidents in FY 2014 (Figure 1)

Altogether, 599 cases of No Time Loss Occupational Accidents occurred in FY 2014. Over the past 3 years, numbers of accidents have maintained about six hundred. The FY 2012 and 566 cases in FY 2013.

The workplace type that reported the highest number of such accidents was sales offices with 288 cases (48%), followed by manufacturing plants with 144 cases (24%), R&D facilities with 73 cases (13%), head offices with 68 cases (11%) and others with 21 cases (4%). Sales offices have made up 50% or more in the No Time Loss Occupational Accidents category for 3 years in row, with 303 cases (51%) in FY 2012 and 268 cases (47%) in FY 2013.

To address this situation, the Environment & Safety Committee has established the Business Vehicle Accident Prevention Study Group for investigation and analysis of the current status and for facilitation of information sharing and educational and motivational actions concerning new accident prevention technologies and countermeasures at each company, continuously.

2. Time Lost Occupational Accidents in FY 2014 (Figure 2)

In FY 2014, the number of Time Lost Occupational Accidents was 102. There were 139 cases in FY 2012 and 99 cases in FY 2013. The workplace type that reported the highest number of accidents that required a day off work was sales offices with 49 cases (48%), followed by manufacturing plants with 33 cases (32%), head offices with 11 cases (11%), R&D facilities with 10 cases (9%) and others with 3 cases (3%). At sales offices and manufacturing plants accounted for 80% of the total number. The percentage of Time Lost Occupational Accidents to the total occupational accidents (Accidents that did not require a day off + Time Lost Occupational Accidents ) is approx. 15% for head offices and sales offices, approx. 19% for manufacturing plants, 7% for R&D facilities, and approx. 13% for others. Except for R&D facilities, the percentages were no large differences among the workplace types. Although task details and work environment vary, there is no difference in the likelihood of an occupational accident becoming a Time Lost Occupational Accident at any business facility. Therefore the same diligent exercising of safety cautions is required.

Figure 1. Accidents that did not require a day off work in FY 2014: Numbers and percentages of accident by workplace type

Figure 2. Accidents that required a day(s) off work in FY 2014: Numbers and percentages of accident by workplace type
Pharmaceutical companies are involved in people’s lives and health. It is a part of our missions to create and maintain a work place environment for our employees that is safe, healthy and comfortable to work in. In order to achieve this, JPMA has conducted studies on and promotional activities for occupational safety and health. Especially in recent years, we have been engaged in proactive actions to detect and handle risks that threaten occupational safety and health before an incident happens.

Summary of Process Safety Study Group Workshops Held between December 2014 and October 2015

<table>
<thead>
<tr>
<th>Date</th>
<th>Day 1 (Morning)</th>
<th>Day 2 (Morning)</th>
<th>Total</th>
</tr>
</thead>
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<tr>
<td>3rd June</td>
<td>Title: &quot;New trends of research for preventing process accident of a differential-type adiabatic calorimeters for thermal hazard evaluation, and risk assessment and risk reduction for preventing process accident.&quot;</td>
<td>Title: &quot;Sharing of cases (by a Study Group member company)&quot;</td>
<td>600 cases</td>
</tr>
<tr>
<td>5th June</td>
<td>Title: &quot;Lecture 'Safety Competency Assessment for Industrial Safety and the Application for Pharmaceutical Industry.'&quot;</td>
<td>Title: &quot;Lecture on Handling of Highly Active Pharmaceutical Substances (Revised)&quot;</td>
<td>566 cases</td>
</tr>
</tbody>
</table>

Activities of the Section on Handling of Highly Active Pharmaceutical Substances

After a six-month preparatory period, which started in February 2014, the Section concerning Pharmaceutical Substances Management has started its activities as a section committee of the Process Safety Study Group. It started with 14 members representing three companies, who were mainly in charge of manufacturing processes of active pharmaceutical ingredients, including those in charge of handling highly active pharmaceutical substances.

The questionnaire survey conducted during the preparatory period revealed that companies had common concerns related to the assessment of substances and operations, and on specific containment measures, while the volume of handled substances is increasing. Hence, the Section identified it as a venue to share information that is relevant to these concerns. The Company Safety Assurance Committee is the venue to share information that is relevant to these concerns.

The Pharmaceutical Expert Committee of the JPMA Quality & Technology Committee plans to initiate a new project in the next fiscal year, focusing on handling highly active pharmaceutical substances. We will continue our activities to provide the necessary information to those handling highly active pharmaceutical substances, as well as to those who subcontract such work to third parties.

JPMA's Actions

JPMA aims to create a safe environment, in which every employee, not only those at manufacturing or R&D facilities, can work in a physically and mentally healthy condition. JPMA has conducted studies on occupational safety and facility types. In addition, JPMA has held a seminar regarding mental health issues of employees and prevention of traffic accidents by business vehicles.

1. Status of Occupational Accidents and Categorization of their Type

The 64 out of 72 JPMA member companies responded to our questionnaire survey about the rate of occupational accidents reported in FY 2014 (excluding those occurred during commuting) and provided data covering some 146,604 employees. This survey again included the section for accidents that did not require a day off work as a result of the accidents in addition to questions about the accidents that required a day(s) off work. The 2013 survey also sought data about the types of accidents.

3. No Time Loss Occupational Accidents in FY 2014 (Figure 1)

Altogether, 599 cases of No Time Loss Occupational Accidents occurred in FY 2014. Over the past 3 years, numbers of accidents have maintained about six hundred: 600 cases in FY 2012 and 566 cases in FY 2013. The workplace type that reported the highest number of such accidents was sales offices with 288 cases (48%), followed by manufacturing plants with 144 cases (24%), R&D facilities with 78 cases (13%), head offices with 68 cases (11%) and others with 21 cases (4%). Sales offices have made up 50% or more in the No Time Loss Occupational Accidents category for 3 years in a row, with 303 cases (51%) in FY 2012 and 268 cases (47%) in FY 2013.

To address this situation, the Environment & Safety Committee has established the Business Vehicle Accident Prevention Study Group for investigation and analysis of the current status and for facilitation of information sharing and educational and motivational actions concerning new accident prevention technologies and countermeasures at each company, continuously.

Figure 1. Accidents that did not require a day off work in FY 2014: Numbers and percentages of accident by workplace type

Figure 2. Accidents that required a day(s) off work in FY 2014: Numbers and percentages of accident by workplace type
The total number of work days lost (Total Work Days Lost) following occupational accidents in FY 2014 was 1,336 days, which was better than the 1,914 days in FY 2012 together with the 1,271 days in FY 2013. Following the decrease in the number of cases of Time Lost Occupational Accidents, it was also noted that serious accidents (long-term Time Lost Occupational Accidents) also declined.

The type of workplace with the highest number of Total Work Days Lost was manufacturing plants losing 500 days (37%), followed by sales offices losing 414 days (31%) and head offices losing 277 days (21%) for R&D facilities. Manufacturing plants and sales offices accounted for 68% of the Total Work Days Lost, showing a similar trend noted in Time Lost Occupational Accidents (80% of all).

**FY2014 Time Lost Occupational Accidents Ratio (Figure 4)**

The Time Lost Occupational Accidents Ratio indicates the frequency of incidents that required at least 1 day off work. This rate for the whole of JPMA was 0.37 in FY 2014, which was lower than 0.49 in FY 2012 and 0.55 in FY 2013. According to the MHLW, the FY 2014 Occupational Accidents Statistics' data showed that the Time Lost Occupational Accidents Ratio was 1.06 for the entire manufacturing sector and 0.76 for the entire chemical industry. Our figures were lower than those figures. In terms of workplace-specific data, the highest figures were found for 3 types of workplaces: manufacturing plants at 0.58, sales offices at 0.42 and others at 0.44. It is thought that the workplaces categorized as ‘others’ tend to have a smaller number of employees; therefore the number for Time Lost Occupational Accidents Ratio for ‘others’ was lower than that for the other sectors.

**FY 2014 Occupational Accident Severity Score (Figure 5)**

The Occupational Accident Severity Score indicates the seriousness of an occupational accident suffered. The Occupational Accident Severity Score for JPMA in FY 2014 was 0.004, which was lower than 0.006 in FY 2012 and 0.004 in FY 2013. According to the MHLW, the FY 2014 Occupational Accidents Statistics' data, the Occupational Accident Severity Score for the entire manufacturing sector was 0.09 and 0.17 for the entire chemical industry. Our figures were considerably lower than those. The severity scores for the entire chemical industry were 0.76 and 1.06 for the entire manufacturing sector was 0.09 and 0.17 for the entire chemical industry. Our figures were considerably lower than those.

The FY 2014 study found a similar pattern for the most common types of Time Lost Occupational Accidents (102 cases in total) that occurred in FY 2014 concerning the number of days lost, age and years of experience of persons injured in accidents by major types of accidents (e.g., “motor accident”, “falling over” and “being caught between objects or in a machine”) and overall accident occurrence. The number of days off taken for Time Lost Occupational Accidents, as seen in Figure 7, was found to be up to 3 days in 44 cases (43%) and between 3 days in 25 cases (25%), together 68% of all cases needed fewer than 10 days off to recover. On the other hand, there were 12 cases (12%) of accidents that resulted in 30 or more days off work. Patterns identified for respective accident types include motor accidents, for which fewer than 10 days off were needed in 86% of the cases; however, for accidents caused by falling over, only 55% needed fewer than 10 days off work, while 27% needed 30 or more days off work.

From the data of the type of the person injured, as seen in Figure 8, there is a similar ratio in respective age groups: 24% were in their 25-29 years, 23% were in their 30-34 years, 37% were in their 40s and 22% were in their 50s.

When looking at age for different accident types, the younger generation in their 30s or 30s were more likely to suffer a motor accident, making up 83% of the total, while those in their 20s or 30s made up only 27% of accidents caused by falling over, in contrast to 46% for those in their 50s or older. More over, middle generation in their 40s were more likely suffer being caught between objects or in a machine.

The data on the years of work experience of the person injured are shown in Figure 9. The pattern identified is 23% for those with less than 3 years experience, 18% for those with more than 3 but less than 5 years, 22% for those with more than 5 but less than 10 years experience. Therefore, 63% of those injured in motor accidents had less than 10 years’ work experience. After the first 10 years, the number of cases declines into about 10% as the person gains mastery of their work until the 30 year of tacher work. But those with 30 or more years of experience again start to have more accidents. In terms of accident types, those with less than 10 years’ experience represent 78% of those injured in motor accidents but only 59% in accidents caused by falling over.

It is considered that we need to take actions tailored for the potential accident type in order to achieve zero occupational accidents.

![Figure 3. Number and percentage of Total Work Days Lost in FY 2014 (Lost Work Days)](image)

**Figure 6. Accidents that required a day(s) off work : Type of accidents in FY 2014**

- Manufacturing plants: 500 cases (33%)
- R&D facilities: 500 cases (33%)
- Head offices: 500 cases (33%)
- Sales offices: 500 cases (33%)
- Others: 500 cases (33%)

**Figure 7. Number of days off the work at the Accidents**

- Total (N=9)
- Traffic accidents: 9 cases (100%)
- Falling over: 3 cases (33%)
- Being caught between objects or in a machine: 6 cases (67%)

**Figure 8. Age of workers in Accidents that required a day(s) off work**

- 15-19 years: 9 cases (100%)
- 20-29 years: 9 cases (100%)
- 30 years or longer: 9 cases (100%)

**Figure 9. Years of experience of workers when Accidents occurred**

- Unknown: 9 cases (100%)
- 5-9 years: 9 cases (100%)
- 10 years or more: 9 cases (100%)

TheFY 2014 study found a similar pattern for the most common types of Time Lost Occupational Accidents to that in the previous year. The most common types were “motor accidents (on road)” (30 cases, 29% of all cases for Time Lost Occupational Accidents), followed by “falling over” (26 cases, 25%), and “being caught between objects or in a machine” (12 cases, 12%). However, the “recoll of movement or forced operation (lower back pain, etc.)” category seen more in FY 2012 (25 cases or 20%) had a greatly reduced figure of 8 cases making up 8% of the total in FY 2014 as in FY 2013.

This year has been an effect of the measures to prevent lower back pain implemented by respective companies, following the revision of the “Guidelines to prevent lower back pain in workplace” by MHLW, which came into force in June of 2013.
The FY 2014 Total Work Days Lost (Lost Work Days) (Figure 3) shows the total number of work days lost (Total Work Days Lost) following occupational accidents in FY 2014 was 1,396 days, which was better than the 1,914 days in FY 2012 together with the 1,721 days in FY 2013. Following the decrease in the number of cases of Time Lost Occupational Accidents, it was also noted that serious accidents (long-term Time Lost Occupational Accidents) also declined. The type of workplace with the highest number of Total Work Days Lost was manufacturing plants losing 500 days (35%), followed by 414 days (31%) lost for sales offices, 277 days (21%) lost for head offices and 95 days (7%) lost for R&D facilities. Manufacturing plants and sales offices accounted for 68% of the Total Work Days Lost, showing a similar trend noted in Time Lost Occupational Accidents (80% of all).

The FY 2014 Total Lost Occupational Accidents Ratio (Figure 4) shows the ratio of incidents that required at least 1 day off work. This rate for the whole of JPMA in FY 2014 was 0.37, which was lower than 0.49 in FY 2012 and 0.55 in FY 2013. According to the MHLW, the FY 2014 Occupational Accidents Statistics data showed that the Time Lost Occupational Accidents Ratio was 1.06 for the entire manufacturing sector and 0.76 for the entire chemical industry. Our figures were lower than those figures. In terms of workplace specific data, the highest figures were found for 3 types of workplaces: manufacturing plants at 0.58, sales offices at 0.42 and others at 0.44. It is thought that the workplaces categorized as "others" tend to have a smaller number of employees; therefore the number for Time Lost Occupational Accidents is relatively lower.

The FY 2014 Occupational Accident Severity Score (Figure 5) indicates the seriousness of an occupational accident suffered. The Occupational Accident Severity Score for JPMA in FY 2014 was 0.004, which was lower than 0.006 in FY 2012 and 0.004 in FY 2013. According to the MHLW FY 2014 Occupational Accidents Statistics data, the Occupational Accident Severity Score for the entire manufacturing sector was 0.09 and 0.17 for the entire chemical industry. Our figure was considerably lower than those, suggesting JPMA membership suffered less severe accidents than other businesses in the manufacturing sector. Per-workplace scores were 0.007 for manufacturing plants, the highest, then 0.002 for R&D facilities, 0.004 for head offices, 0.003 for sales offices, and 0.006 for others. Although we did not suffer as many severe accidents as other industry types, it is thought that our manufacturing plants are more prone to severe occupational accidents when compared with other workplaces, therefore caution is required.

The data by workplace type show that the 33 cases for Time Lost Occupational Accidents occurred at manufacturing plants were mainly either "being caught between objects or in a machine" (12 cases, 38%), "failing over" (7 cases, 21%), and "record of movement or forced operation (lower back pain, etc.)" (5 cases, 15%). The 6 cases that occurred at R&D facilities were 2 case each for "failing over 2012", "1 case for "contact with harmful object" and "hit by flying or falling object". In contrast, the majority that occurred at sales offices (49 cases) were "motor accident (on road)" (30 cases, 61%), followed by "failing over" (11 cases, 22%). The most common causes for Time Lost Occupational Accidents were "motor accident (on road)" and "failing over", a trend continued from the previous year, making up 55% of all accidents. We need to continue our actions to prevent these types of occupational accidents.

The FY 2014 study found a similar pattern for the most common types of Time Lost Occupational Accidents to that in the previous year. The 3 most common types were "motor accidents (on road)" (30 cases, 29% of all cases for Time Lost Occupational Accidents), followed by "failing over" (26 cases, 25%), and "being caught between objects or in a machine" (12 cases, 12%). However, the "record of movement or forced operation (lower back pain, etc.)" category seen more in FY 2012 (25 cases or 20%) had a greatly reduced figure of 8 cases making up 8% of the total in FY 2014 as in FY 2013. This 10 years had an effect of the measures to prevent lower back pain implemented by respective companies, following the revision of the "Guideline to prevent lower back pain in workplace" by MHLW, which came into force in June of 2012.
2. Traffic Accidents involving Business Vehicles and Accident Prevention

Business vehicles are essential for Medical Representatives (MRs) assigned to provide drug information for medical care. JPhMFA conducts annual surveys of its member companies on their management and business vehicle operation systems and accident status. The 10th survey received responses from 64 companies, of which we used the data of 57 companies (involving approximately 57,000 vehicles) for analyses, excluding seven companies for such reasons as inability to provide valid data.

The Business Vehicle Accident Prevention Study Group, now in its sixth year, has been active in implementing activities including the sharing of case studies on accident prevention measures by member companies, and organizing lectures by guest speakers.

Meanwhile, the rate of accidents causing injury or death declined for MR-owned vehicles as well as leased vehicles, and the rate for all vehicles was 2.0%, which is 0.3% lower than the previous year.

Concerning the number of liable accidents, 13 companies reported a “significant increase” or an “increase” from the previous fiscal year, while 20 companies said there was “no change” and 23 companies responded that there was a “decrease” or a “significant decrease.” Notably, 14 companies reported “no change” and 23 companies said there was “no change from the previous fiscal year,” while 20 companies said there was “no change” and 23 companies responded that there was “no change from the previous fiscal year” and showed a notable increase over the past three years. The rate of accidents causing injury or death was 5.6%, and this rate has decreased continuously for five consecutive years.

The liable accident rate (number of liable accidents divided by the total number of vehicles) of all vehicles was 21.0% in FY 2014. The liable accident rate with MR-owned vehicles declined for MR-owned vehicles as well as leased vehicles, and the rate for all vehicles was 2.0%, which is 0.3% lower than the previous year.

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Looking at the initiatives taken by the companies and their impact, we found that many companies are implementing the following measures: making penalties more stringent, for example, by setting periods of suspension from driving and requiring the submission of statements of regret, detailed reports of accidents, arranging face-to-face guidance by immediate supervisors and sending those who caused accidents to driving schools, and sharing information on accidents among the relevant divisions and conducting training of managers.

According to the survey, the rate of liable accidents by new graduate MRs in FY 2013 declined to 20.1%, which is 4.5% lower than the rate of FY 2012. The rate of liable accidents by new graduate MRs during the training period after they have joined the company and at their places of work, based on the results of their driving ability assessment and condition, these courses have been effective.

In FY 2013, the rate of liable accidents by new graduate MRs within 12 months of their first assignment was 86.6%, which was higher than the previous year and showed a notable increase over the past three years. The rate of accidents causing injury or death was 5.6%, and this rate has decreased continuously for five consecutive years.

Number of vehicles driven by new graduate MRs, number of liable accidents and number of accidents causing injury or death (FY 2013)

<table>
<thead>
<tr>
<th>Type of vehicle</th>
<th>Number of companies</th>
<th>Number of liable accidents</th>
<th>Rate</th>
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</thead>
<tbody>
<tr>
<td>All vehicles</td>
<td>5</td>
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<tr>
<td>Leased Vehicles</td>
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<td>MR-owned vehicles</td>
<td>20</td>
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<td>5%</td>
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Table 1. Trends in business vehicle accidents (comparison with the previous fiscal year)

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<thead>
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<th>Number of companies</th>
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<tr>
<td>All vehicles</td>
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<td>MR-owned vehicles</td>
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<td>1%</td>
<td>1%</td>
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<td>1%</td>
</tr>
</tbody>
</table>

Table 1. Trends in business vehicle accidents (comparison with the previous fiscal year)

3. Accident rate of new graduate MRs within 12 months of their first assignments

To analyze the percentage of persons causing multiple liable accidents, we looked at the percentage of persons who caused accidents by the number of accidents caused, as well as the percentage of accidents. We compared the data of all vehicles (57 companies) with the data of new graduate MRs (50 companies) in a follow-up study after a year over three years.

The percentage of persons who caused multiple accidents for all vehicles was 2.4%, and this figure remained more or less unchanged over three years. The figure for new graduate MRs turned to an increasing trend since the last fiscal year, and rose to 20.1% this fiscal year.

Number of persons involved in liable accidents (within 12 months of first assignment)

<table>
<thead>
<tr>
<th>Fiscal year</th>
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<th>Twice or more</th>
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<tr>
<td>FY 2011</td>
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<td>FY 2012</td>
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Table 4. Percentage of MRs involved in liable accidents (all vehicles)

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Table 4. Percentage of MRs involved in liable accidents (all vehicles)

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<th>FY 2013</th>
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<tr>
<td>Rate</td>
<td>5.6%</td>
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Table 4. Percentage of MRs involved in liable accidents (all vehicles)

3. State of persons causing multiple liable accidents

To analyze the percentage of persons causing multiple liable accidents, we looked at the percentage of persons who caused accidents by the number of accidents caused, as well as the percentage of accidents. We compared the data of all vehicles (57 companies) with the data of new graduate MRs (50 companies) in a follow-up study after a year over three years.

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Table 4. Percentage of MRs involved in liable accidents (all vehicles)

3. Efforts to reduce accidents

Concerning the number of liable accidents, 13 companies reported a “significant increase” or an “increase” from the previous fiscal year, while 20 companies said there was “no change” and 23 companies responded that there was a “decrease” or a “significant decrease.” Notably, 14 companies reported a “significant decrease,” indicating that the specific measures they had taken produced good results.

Looking at the initiatives taken by the companies and their impact, we found that many companies are implementing the following measures: making penalties more stringent, for example, by setting periods of suspension from driving and requiring the submission of statements of regret, detailed reports of accidents, arranging face-to-face guidance by immediate supervisors and sending those who caused accidents to driving schools, and sharing information on accidents among the relevant divisions and conducting training of managers.

According to the survey, the rate of liable accidents by new graduate MRs in FY 2013 declined to 20.1%, which is 4.5% lower than the rate of FY 2012. The rate of liable accidents by new graduate MRs during the training period after they have joined the company and at their places of work, based on the results of their driving ability assessment and condition, these courses have been effective.

In FY 2013, the rate of liable accidents by new graduate MRs within 12 months of their first assignment was 86.6%, which was higher than the previous year and showed a notable increase over the past three years. The rate of accidents causing injury or death was 5.6%, and this rate has decreased continuously for five consecutive years.

Number of vehicles driven by new graduate MRs, number of liable accidents and number of accidents causing injury or death (FY 2013)

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<tbody>
<tr>
<td>All vehicles</td>
<td>5</td>
<td>20</td>
<td>40%</td>
</tr>
<tr>
<td>Leased Vehicles</td>
<td>8</td>
<td>26</td>
<td>15%</td>
</tr>
<tr>
<td>MR-owned vehicles</td>
<td>20</td>
<td>10</td>
<td>5%</td>
</tr>
</tbody>
</table>

Table 1. Trends in business vehicle accidents (comparison with the previous fiscal year)
2. Traffic Accidents involving Business Vehicles and Accident Prevention

Business vehicles are essential for Medical Representatives (MRs) assigned to provide drug information for medical care. JPMJ conducts annual surveys of its member companies on their management and business vehicle operation systems and accident status. The 10th survey received responses from 64 companies, of which we used the data of 57 companies (involving approximately 57,000 vehicles) for analyses, excluding seven companies for such reasons as inability to provide valid data.

The Business Vehicle Accident Prevention Study Group, now in its sixth year, has been active in implementing activities including the sharing of case studies on accident prevention measures by member companies, and organizing lectures by guest speakers.

Meanwhile, the rate of accidents causing injury or death declined for MR-owned vehicles as well as leased vehicles, and the rate for all vehicles was 2.0%, which was 0.3% lower than the previous year.

3. Efforts to reduce accidents

Concerning the number of liable accidents, 13 companies reported a “significant increase” or an “increase” from the previous fiscal year, while 20 companies said there was “no change” and 23 companies responded that there was a “decrease” or a “significant decrease.” Notably, 14 companies reported a “significant decrease,” indicating that the specific measures they had taken produced good results.

Looking at the initiatives taken by the companies and their impact, we found that many companies are implementing the following measures: making penalties more stringent, for example, by setting periods of suspension from driving and requiring the submission of statements of regret, detailed reports or others, arranging face-to-face guidance by immediate supervisors and sending those who caused accidents to driving schools, and sharing information on accidents among the relevant divisions and conducting training of managers.

4. Accident rate of new graduate MRs within 12 months of their first assignments

In FY 2013, the rate of liable accidents by new graduate MRs (within 12 months of first assignment) was 8.6%, which was higher than the previous year and showed a notable increase over the past three years. The rate of accidents causing injury or death was 5.6%, and this rate has decreased continuously for the past few consecutive years.

Number of new graduate MRs (within 12 months of first assignment) involved in liable accidents (FY 2013)

<table>
<thead>
<tr>
<th>Company</th>
<th>Number of accidents</th>
<th>Rate of liable accidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 2014</td>
<td>16,844</td>
<td>5.6%</td>
</tr>
<tr>
<td>FY 2013</td>
<td>105</td>
<td>6.7%</td>
</tr>
<tr>
<td>FY 2012</td>
<td>105</td>
<td>6.8%</td>
</tr>
</tbody>
</table>

5. State of persons causing multiple liable accidents

To analyze the percentage of persons causing multiple liable accidents, we looked at the percentage of persons who caused accidents by the number of accidents caused, as well as the percentage of accidents. We compared the data of all vehicles (57 companies) with the data of new graduate MRs (50 companies in a follow-up study after a year) over three years.

Percentage of MRs involved in liable accidents (all vehicles)

<table>
<thead>
<tr>
<th>Fiscal year</th>
<th>Once</th>
<th>Twice or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 2014</td>
<td>14.8%</td>
<td>2.4%</td>
</tr>
<tr>
<td>FY 2013</td>
<td>14.5%</td>
<td>2.4%</td>
</tr>
<tr>
<td>FY 2012</td>
<td>14.8%</td>
<td>2.4%</td>
</tr>
</tbody>
</table>

6. Activities to reduce accidents targeting new graduate MRs

Various types of driving training courses are provided to new graduate MRs prior to joining the company, during the training period after they have joined, and at their places of work, based on the results of their driving ability assessment and condition. These courses have been effective.
Leased Vehicles: Whether or not to Permit Use for Non-Work Purposes

The questionnaire included a question asking companies whether or not they allowed the use of leased vehicles for non-work purposes. This year, 52 out of 57 companies that responded (43.9%) answered that they allowed the use of vehicles for non-work purposes under certain conditions. The figure was 15 out of 52 companies (28.8%) last year, and 14 out of 54 companies (25.5%) the year before last year, indicating an increase over the past three consecutive years.

From the perspective of occupational health and safety, this subject has implications with respect to workers’ accident compensation insurance. However, the subject has been included in the questionnaire to provide information to member companies who may consider this policy in the future, in view of work-life balance in this day and age and to support women’s active participation in society.

Table 6. Conditions for purpose of use

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Number of Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>No condition</td>
<td>12</td>
</tr>
<tr>
<td>Child care-related</td>
<td>8</td>
</tr>
<tr>
<td>Other purposes</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 7. Advance notification or application

<table>
<thead>
<tr>
<th>Application</th>
<th>Required</th>
<th>Not required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workdays</td>
<td>25</td>
<td>2</td>
</tr>
</tbody>
</table>

Actions of the FPMAJ Environment Committee

Concerning global warming countermeasures, and resource conservation and waste management, the FPMAJ Environment Committee has taken a strong stance in the Environmental Action Plan (EAP) from the outset, and has been monitoring the progress and reporting back to Keidanren every year. FPMAJ’s own action plan, aligned with Keidanren (FPMAJ Action Plan for a Low-Carbon Society), has started in FY 2013, through which we are continuing our energy-saving activities. Additional surveys and inspections are conducted every year by the Ministry of Health, Labour and Welfare (MHLW) and Keidanren, requiring proactive efforts to assure the completion of the action plan. Concerning the surveys to monitor the progress, the “Working Group on the Action Plan for a Low-Carbon Society” has been set up in the FPMAJ Environment Committee in FY 2014, and since then we have been working on tasks ranging from the development of questionnaires, the compilation and analyses of responses, to the preparation of the report. We have also moved forward on outsourcing the tasks of survey system development and data compilation, aiming to improve the accuracy of the survey and the efficiency of our work. Other issues than the above are also gaining greater importance, including issues unique to the pharmaceutical industry such as medical waste management measures and environmental challenges such as initiatives concerning biodiversity. We would like to fulfill our social responsibility proactively by responding to society’s demands related to those issues.

State of Progress of FY 2014 Business Plan

Global Warming Countermeasures

Nine organizations and 90 companies are taking part in the FPMAJ Action Plan for a Low-Carbon Society as of August 2015. A list of these organizations and companies is available on the FPMAJ website (http://www.fpma-j.or.jp/documents/20140874rlycp.pdf [in Japanese]).

We have conducted the second follow-up survey concerning the Action Plan for a Low-Carbon Society (of the actual FY 2014 data). When using the carbon emission factor as a target for FY 2020 published by the Federation of Electric Power Companies of Japan prior to the Great East Japan Earthquake (3.31 x 10⁵ kWh), we have achieved a reduction of 3.6% from the previous fiscal year, and a 24.0% reduction against FY 2005, the base fiscal year. This means that we are able to meet the FY2020 target of a 23% reduction. However, additional energy-saving and related measures are required, since the energy use is expected to increase in association with the future expansion of the pharmaceutical market. For details, please see the previous section on Global Warming Countermeasures (pages 8-11).

FPMAJ Target

To reduce CO₂ emissions generated by the pharmaceutical industry by 23% from the FY 2005 level by FY 2020.

Scope

- Organizations and companies: FPMAJ member organizations and companies (including affiliated companies)
- Divisions: Plants and Research laboratories
- Gas type: CO₂ emitted during energy use

Assumptions

- The carbon emissions factor for electricity in FY 2020 will be improved to 3.3 x 10⁵ CO₂ eq/10⁴ kWh (from 4.2 in FY 2005).
- The scale of the pharmaceutical market in FY 2020 will be 150% of the scale in FY 2005.
- The share of electricity in energy use will rise to 60% (from 46% in FY 2005).

When the Action Plan for a Low-Carbon Society was originally formulated in September 2010, it was assumed that the carbon emissions factor for electricity would be improved substantially towards FY 2020. Since this assumed improvement has been factored into the FPMAJ Action Plan for a Low-Carbon Society, we plan to revise the current numerical target if this assumption changes in the future.
Leased Vehicles: Whether or not to Permit Use for Non-Work Purposes

The questionnaire included a question asking companies whether or not they allowed the use of leased vehicles for non-work purposes. This year, 25 out of 57 companies that responded (43.9%) answered that they allowed the use of vehicles for non-work purposes under certain conditions. The figure was 15 out of 52 companies (28.8%) last year, and 14 out of 54 companies (25.9%) the year before last year, indicating an increase over the past three consecutive years. From the perspective of occupational health and safety, this subject has implications with respect to workers’ accident compensation insurance. However, the subject has been included in the questionnaire to provide information to member companies who may consider the policy in the future, in view of work-life balance in this day and age and to support women’s active participation in society.

< In cases of permission to use vehicles for non-work purposes >

(1) Conditions for the purpose of use

Out of the 25 companies that permitted the use of vehicles for non-work purposes, 12 companies had no conditions, 8 companies allowed use for child care purposes only, and 5 companies allowed use under other conditions, including “up to 100 km per month”, “for transporting of goods when moving or in relation with company club activities of the company, and other purposes.”

(2) Notification or application in advance

Out of 25 companies, 23 responded that notification or application in advance is required.

Below are the open-ended answers received from the companies concerning the conditions for use of vehicles for non-work purposes.

- The main conditions are the employee is the only person who may drive, and only in case of adequate insurance coverage.
  - (1) Concerning private use exceeding 100 km per month, the individual has to pay the company a use fee based on mileage.
  - (2) For private use, the actual mileage must be recorded regardless of the amount. Private use for the month must be approved by the employee’s superior.
  - Use of vehicles for the purpose of picking up and dropping off in relation to childcare, for example at a day-care center, is only allowed when approved by the company.
  - Individuals must pay the cost for private mileage.
  - The individual may not have caused any liable accidents in the previous 12 months.
  - The individual must have obtained accident insurance for the purpose of picking up or dropping off preschool children aged six or under or under their living with the individual and requiring nursery care.
  - New graduate employees are given permission from the second year onwards.
  - Submission of application for weekend/holiday use is mandatory.
  - The individual has to pay 10 yen per kilometer as the personal share.
  - Only the employees in concern is allowed to drive.
  - Medical professionals are not allowed to drive in the same car (except family members).
  - Private mileage is limited to 200 km one way at a time.
  - Maximum mileage per month is 1,000 km.
  - Approval of the superior is required before applying to the administration division at the Headquarters.
  - “Guidelines for Private Use” will be introduced in October 2015, and the system will be operated based on the new guidelines.
  - Those who wish to use vehicles for private use must apply once a year, and a pay user fee of 10,000 yen per month.
  - A blanket application must be submitted in advance for use of vehicles for non-work purposes. Since all costs including the insurance premium when vehicles are in use, gasoline bills, and repair costs are borne by the company, a fixed-amount fee will be collected every month.
  - Collection of a user fee for private use.
  - Those who have caused multiple accidents or traffic offenses will be suspended from driving.
  - Applicants must study the Guidelines for Private Use before submitting an application.
  - Only when a staff member living apart from her/his family due to his/her job is returning home, she/he will be allowed to use the vehicle, provided that she gives notification in advance.
  - Use for purposes such as transporting of goods when moving or in relation with company club activities.
  - Only applicable to those who have caused no or one liable accident within the previous 12 months.

Table 6. Conditions for purpose of use

<table>
<thead>
<tr>
<th></th>
<th>FY 2013</th>
<th>FY 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>No condition</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Child care-related</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
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<td>5</td>
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<tr>
<th></th>
<th>Required</th>
<th>Not required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Out of 25</td>
<td>23</td>
<td>2</td>
</tr>
</tbody>
</table>

Actions of the FPMAJ Environment Committee

Concerning global warming countermesures, and resource conservation and waste management, the FPMAJ Environment Committee has taken up the Keidanren (all companies acting in Japan)’s Action Plan right from the outset, and has been monitoring the progress and reporting back to Keidanren every year. FPMAJ’s own action plan, aligned with Keidanren’s (FPMAJ Action Plan for a Low-Carbon Society), has started in FY 2013, through which we are continuing our energy-saving activities. Additional surveys and inspections are conducted every year by the Ministry of Health, Labour and Welfare (MHLW) and Keidanren, requiring proactive efforts to assure the completion of the action plan. Concerning the surveys to monitor the progress, the “Working Group on the Action Plan for a Low-Carbon Society” has been set up in the FPMAJ Environment Committee in FY 2014, and since then we have been working on tasks ranging from the development of questionnaires, the compilation and analysis of responses, to the preparation of the report. We have also moved forward on outsourcing the tasks of survey system development and data compilation, aiming to improve the accuracy of the survey and the efficiency of our work. Other issues than the above are also gaining greater importance, including issues unique to the pharmaceutical industry such as medical waste management measures and environmental challenges such as initiatives concerning biodiversity. We would like to fulfill our social responsibility proactively by responding to society’s demands related to these issues.

State of Progress of FY 2014 Business Plan

3 Global Warming Countermesures

Nine organizations and 96 companies are taking part in the FPMAJ Action Plan for a Low-Carbon Society as of August 2015. A list of these organizations and companies is available on the FPMAJ website (http://www.fpma-j.or.jp/documents/2014-07/kenkyucyo.pdf [in Japanese]). We have conducted the second follow-up survey concerning the Action Plan for a Low-Carbon Society (of the actual survey in FY 2014 data). When using the carbon emission factor as a target for FY 2020 published by the Federation of Electric Power Companies of Japan prior to the Great East Japan Earthquake (0.331 CO2/kWh), we have achieved a reduction of 3.6% from the previous fiscal year, and a 24.0% reduction against FY 2005, the base fiscal year. This means that we are able to meet the FY2020 target of a 23% reduction.

However, additional energy-saving and related measures are required, since the energy use is expected to increase in association with the future expansion of the pharmaceutical market. For details, please see the previous section on Global Warming Countermesures (pages 8-11).

FPMAJ Target

To reduce CO2 emissions generated by the pharmaceutical industry by 23% from the FY 2005 level by FY 2020.

Scope

- Organizations and companies: FPMAJ member organizations and companies (including affiliated companies)
- Divisions: Plants and Research laboratories
- Gas type: CO2 emitted during energy use

Assumptions

- The carbon emissions factor for electricity in FY 2020 will be improved to 3.3 t-CO2/10,000 kWh (from 4.2 in FY 2005).
- The scale of the pharmaceutical market in FY 2020 will be 150% of the scale in FY 2005.
- The share of electricity in energy use will rise to 60% (from 46% in FY 2005).

When the Action Plan for a Low-Carbon Society was originally formulated in September 2010, it was assumed that the carbon emissions factor for electricity would be improved substantially towards FY 2020. Since this assumed improvement has been factored into the FPMAJ Action Plan for a Low-Carbon Society, we plan to revise the current numerical target if this assumption changes in the future.

Stakeholder Engagement

The Federation of Pharmaceutical Manufacturers’ Associations of Japan (FPMAJ) is comprised of 15 organizations with pharmaceutical manufacturing corporate membership, each representing a specific operational type (such as ethical drugs, non-prescription drugs, or other operational type) and 17 regional organizations based in their respective prefectures (such as Pharmaceutical Manufacturers’ Association of Tokyo and Osaka Pharmaceutical Manufacturers’ Association). The Environment Committee was established in 2007, having identified the main challenges as being those of global warming countermesures, whose regulatory and societal demands for action are becoming stronger every year, arching of reduction and proper disposal of wastes, among the many environmental challenges concerning the entire pharmaceutical manufacturing sector. Members of the FPMAJ Environmental Committee have been nominated by the four organizations (two to four members from each organization) with an environment-related committee, among 15 operation type specific organizations; the Japan Pharmaceutical Manufacturers Association; the Japan Generic Medicines Association, the Japan Self Medication Industry and the Japan Kampo Medicines Manufacturers’ Association. The committee works in partnership with MHLW and external industry organizations and councils such as Keidanren to tackle the actions to protect the environment.
Leader of the Working Group

To conclude this section, we would like to present the activities implemented by FPMAJ’s Working Group on the Action Plan for a Low-Carbon Society. Since FY 2011, FPMAJ has been working under the Keidanren’s Voluntary Action Plan since FY 1997, and has been making efforts in stakeholder engagement and investigations of various challenges to meet the numerical targets.

FY 2015 FPMAJ Environment Committee Business Plan (Priority Issues)

Global Warming Countermeasures
- Conduct a follow-up survey in accordance with the Action Plan for a Low-Carbon Society, and preparation and submission of the report
- Responding to MHLW’s follow-up on the Action Plan for a Low-Carbon Society
- Strengthening the follow-up system on the Action Plan for a Low-Carbon Society, including information-sharing and investigations of various challenges to meet the numerical targets

Resource Conservation and Waste Management
- Conducting a follow-up survey in accordance with the Voluntary Action Plan and preparation and submission of the report
- Information sharing and improvement of the follow-up system to meet the numerical targets
- Setting a target related to the Voluntary Action Plan on the Environment for FY 2016 and beyond
- Preparation for discussions on review of the Ad on Recycling of Containers and Packaging
- Compilation and dissemination of information concerning reduction and proper disposal of medical waste, and maintaining a good relationship with the concerned organizations

Gathering of information
- Gathering information on environmental challenges like biodiversity that have a major impact on business activities

Activities of FPMAJ’s Working Group on the Action Plan for a Low-Carbon Society

The JPMA Environment & Safety Committee facilitates member companies to share information about cutting-edge technologies and their experience in actions for the environment and occupational safety and health. To raise their awareness and help find solutions. Our seminars and talks include speakers from outside, in an effort to provide information on cutting-edge technologies and legal trends in Japan or overseas concerning protection of the environment and occupational health and safety. The expert subcommittees run technical courses and workshops regularly to offer the opportunities to share information such as technical information and legal trends in specific technical areas and information on cases of member companies’ actions in protecting environment and occupational health and safety efforts. The Committee makes reports of those actions available to the member companies via Environment News and Environment Report.

Publication of Study Reports

The Environment & Safety Committee General Assembly is held annually in April to discuss and determine an annual action plan concerning Environment Protection and Occupational Safety and Health related matters for the streamlined implementation of these actions. The respective Technical Subcommittees conduct questionnaire surveys, etc., to monitor progress in attaining the targets and to identify issues and tasks, and also prepare reports of the outcomes as a form of feedback to the member companies. The pharmaceutical industry also takes part in the Keidanren Action Plan for a Low-Carbon Society, and Voluntary Action Plan on Environment (Sound Material-Cycle Society) through follow-up studies on the state of progress and action by the members; compiling the data and information obtained into a report and periodically reporting this to Keidanren.

Publication of Environmental Reports

Since the inaugural issue published in FY 1999, the Environment & Safety Committee has published an annual Environment Report. The Environmental Report discloses information about the pharmaceutical industry’s actions for the environment and occupational health and safety as a means to fulfill our account ability to stakeholders. The report is also expected to be a tool for communication between the member companies and society.

Publication of “Environment News”

The Environment & Safety Committee issues “Environment News,” which includes summaries of Environment and/or Occupational Safety and Health related seminars and Workshops on Technologies for easy access by the member companies. This information is uploaded to PRIASENET, the internet shared between the Federation of Pharmaceutical Manufacturers’ Associations of Japan, the Osaka Pharmaceutical Association and the Tokyo Pharmaceutical Association, so that the information is widely distributed in the pharmaceutical industry. “Environment News” was issued four times in FY2014.

Study Group Activities

The Environment & Safety Committee has study groups to fulfill our account ability to stakeholders. The report is also expected to be a tool for communication between the member companies and society.

Environment and Safety Lecture and Workshop on Technologies

The Environment & Safety Committee facilitates member companies to share information and improve their activities by offering lectures that cover topics related to professional expertise and management issues concerning environmental protection and occupational safety and health, and through presentations on initiatives taken by the companies.

When we replace air-conditioning equipment, what portion of the capital investment cost would contribute to the reduction of CO2 emissions? Should we delete all historical data when we sell a plant? Should we use the Global Warming Potential of fluorocarbons listed in the IPCC Fourth Assessment Report? The above are some of the issues discussed by the Working Group on the Action Plan for a Low-Carbon Society under the FPMAJ Environment Committee. The Global Warming Countermeasures Expert Subcommittee established under the JPMA Environment & Safety Committee has been playing a central role in collecting and analyzing data concerning follow-up for the Voluntary Action Plan on the Environment, which has been ongoing since FY 1998. However, the questions include a wide range of issues on diverse subjects, from energy use, the number of business vehicles, to activities on public premises. There is also a need for increasingly sophisticated analyses to achieve accountability, for example, when responding to follow-up by the MHLW, which started in 2007. In view of these circumstances, the key functions involved in follow-up on the Action Plan for a Low-Carbon Society that started in FY 2013 have been transferred to the FPMAJ Environment Committee, which performs data compilation and analysis with the help of member companies of other organizations representing specific types of operations, and external specialists. While the system is still in an early stage, we are discussing such matters as those mentioned above by looking into specific cases, thus sharing and accumulating know-how. We hope that these discussions as well as the reports that come out of the discussions will contribute to achieving a low-carbon society.
Resource Conservation and Waste Management
With regard to actions for waste management, FPMAJ has participated in the Keidanren Voluntary Action Plan on the Environment (Section on the Establishment of a Sound Material-Cycle Society) since FY 1997, and has been making efforts in such areas as the reduction of the final industrial waste disposal volume. Since FY 2011, FPMAJ has been working under the fourth period of its voluntary action plan, which has set FY 2015 as the target fiscal year. In FY 2014, the fourth year under the action plan, the final industrial waste disposal volume was 5,990 tons, which was 80% less than that in the base fiscal year (FY 2000), indicating that we have been able to continue meeting the target (to reduce it by about 68%). For details, please see the earlier section titled, Resource Conservation and Waste Management (pages 12-14).

FY 2015 FPMAJ Environment Committee Business Plan (Priority Issues)

Global Warming Countermeasures
- Conduct a follow-up survey in accordance with the Action Plan for a Low-Carbon Society, and preparation and submission of the report
- Responding to MHLW’s follow-up on the Action Plan for a Low-Carbon Society
- Strengthening the follow-up system on the Action Plan for a Low-Carbon Society, including information-sharing and investigations of various challenges to meet the numerical targets

Resource Conservation and Waste Management
- Conducting the follow-up survey in accordance with the Voluntary Action Plan and preparation and submission of the report
- Information sharing and improvement of the follow-up system to meet the numerical targets
- Setting a target related to the Voluntary Action Plan on the Environment for FY 2016 and beyond
- Preparation for discussions on review of the Act on Recycling of Containers and Packaging
- Compilation and dissemination of information concerning reduction and proper disposal of medical waste, and maintaining a good relationship with the concerned organizations

Gathering of information
- Gathering information on environmental challenges like biodiversity that have a major impact on business activities

Activities of FPMAJ’s Working Group on the Action Plan for a Low-Carbon Society

“Should we use the Global Warming Potential of fluorocarbons listed in the IPCC Fourth Assessment Report?”

The above are some of the issues discussed by the Working Group on the Action Plan for a Low-Carbon Society under the FPMAJ Environment Committee. The Global Warming Countermeasures Expert Subcommittee established under the JPFMA Environment & Safety Committee has been playing a central role in collecting and analyzing data concerning follow-up for the Voluntary Action Plan on the Environment, which has been ongoing since FY 1998. However, the questions include a wide range of issues on diverse subjects, from energy use, the number of business vehicles, to activities on office premises. There is also a need for increasingly sophisticated analyses to achieve accountability, for example, when responding to follow-up by the MHLW, which started in 2007. In view of these circumstances, the key functions involved in follow-up on the Action Plan for a Low-Carbon Society that started in FY 2013 have been transferred to the FPMAJ Environment Committee, which performs data compilation and analysis with the help of member companies or other organizations representing specific types of operations, and external specialists. While the system is still in an early stage, we are discussing such matters as those mentioned above by looking into specific cases, thus sharing and accumulating know-how. We hope that these discussions as well as the reports that come out of the discussions will contribute to achieving a low-carbon society.
Environment and Safety Lectures and Workshop on Technologies (November 2014 – October 2015)

<table>
<thead>
<tr>
<th>Chemical substances management and risk communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minako Kano Nagano, Senior Manager of Technology and Evaluation</td>
</tr>
</tbody>
</table>

The global trend of chemical substances management and the current situation in Japan were presented, along with an overview of the structure of the chemical substances management framework in Japan and the challenges and opportunities for corporations. In particular, the importance of risk assessment was emphasized, and the factors to be considered in such assessments were highlighted.

<table>
<thead>
<tr>
<th>Global warming and decision making in society</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yuka Takei, Chief, Climate Risk Assessment Section of Infrastructure Safety Service, National Institute for Environmental Studies; Izumi Tanaka, Senior Commercial Officer, Royal Danish Embassy</td>
</tr>
</tbody>
</table>

The presentation focused on the current state of global warming and the actual measures being taken by companies to address this issue. In particular, the challenge of finding a global warming mitigation strategy that is acceptable to society as a whole was highlighted, and the need for cooperation between businesses and governments was emphasized.

<table>
<thead>
<tr>
<th>The ONLY three points necessary to get your staff involved in environmental activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yukihiro Kawasaki, Advisor Professor, Kanazawa University Graduate School of Human and Socio-Environmental Studies; Seita Emori, Manager Corporate Social Responsibility, CSR Producer Ltd.</td>
</tr>
</tbody>
</table>

The presentation included three key points: (1) an introduction to CSR activities; (2) an overview of environmental activities conducted by Kawasaki; and (3) the importance of involving staff in these activities. In particular, the need for staff engagement and the role of management in facilitating this engagement were emphasized.

<table>
<thead>
<tr>
<th>Situation of environment, and environmental education in Denmark</th>
</tr>
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<tbody>
<tr>
<td>Senta Yamasaki, Senior Communication Officer, Royal Danish Embassy</td>
</tr>
</tbody>
</table>

The presentation covered the history of environmental and safety initiatives in Denmark, with a focus on the environmental education programs. The presentation highlighted the importance of involving children in environmental activities and the role of government in supporting these initiatives.

<table>
<thead>
<tr>
<th>Environment and Safety Lecture (April 2015)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toshiro Kato, Assistant Professor, Kanazawa University Graduate School of Human and Socio-Environmental Studies</td>
</tr>
</tbody>
</table>

The presentation focused on the importance of environmental stewardship within the country and international cooperation between developed and developing nations. The presenter provided an overview of how CDP, a not-for-profit organization based in London, promotes corporate environmental and social sustainability. The presentation emphasized the importance of business leaders in driving change and the role of government in supporting these initiatives.

<table>
<thead>
<tr>
<th>New trends in occupational safety and health management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isao Kato, President, Environmental Health Co., Ltd.</td>
</tr>
</tbody>
</table>

The presentation focused on the new trends in occupational safety and health management, with a focus on enhancing the health and safety of workers. The presenter highlighted the importance of risk assessment activities and the role of management in promoting a safe and healthy working environment.

<table>
<thead>
<tr>
<th>Features of traffic accidents in recent years, and measures that should be taken by companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shigeo Nakagawa, Chief Consultant, Sumitomo Royal Resources Consulting Co., Ltd.</td>
</tr>
</tbody>
</table>

The presentation focused on the features of traffic accidents in recent years and the measures that should be taken by companies to prevent these accidents. The presenter highlighted the importance of risk assessment activities and the role of management in promoting a safe and healthy working environment.

<table>
<thead>
<tr>
<th>Environment and Safety Lecture and Workshop on Technologies (October 2015)</th>
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<tbody>
<tr>
<td>Akira Shimada, Section Chief, Climate Change, Ministry of Economy, Trade and For Natural Resources and Energy and Conservation Division, Agency Deputy Director, Energy Efficiency, NITE Akifumi Kitashima, Section Chief, Climate Change, Ministry of Economy, Trade and For Natural Resources and Energy and Conservation Division, Agency Deputy Director, Energy Efficiency, NITE</td>
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The presentation covered the history of environmental and safety initiatives in Denmark, with a focus on the environmental education programs. The presentation highlighted the importance of involving children in environmental activities and the role of government in supporting these initiatives.

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<tr>
<td>Izumi Tanaka, Senior Commercial Officer, Royal Danish Embassy</td>
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The presentation focused on the current state of global warming and the actual measures being taken by companies to address this issue. In particular, the challenge of finding a global warming mitigation strategy that is acceptable to society as a whole was highlighted, and the need for cooperation between businesses and governments was emphasized.

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<td>Yoshikatsu Okamoto, General Manager, Corporate Social Responsibility, Shiseido Co., Ltd.</td>
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<th>History of Environmental and Safety Initiative</th>
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1979: The Japan Pharmaceutical Manufacturers Association was founded. “Related Technology Liaison Group” was established to undertake technological reviews on pollution issues around factories (in principle, waste water issues)

1978: “Related Technology Liaison Group” was reorganized to the “Factory Waste Water Regulatory Measures Review Group”

1977: In collaboration with the concerned authorities and agencies, an “Environmental Action Review Group” was established for adopting the government administration’s intentions, communicating the industry’s ideas, exchanging information within the industry and the confirmation of a common direction for the environmental action among the members

1976: Environment Committee established. Five internal subcommittees were established (Planning Subcommittee, Chemical Substances Subcommittee, Environment Management Subcommittee, Resource Conservation and Waste Management Subcommittee, and, Energy Saving and Global Warming Countermeasures Subcommittees)

1996: Voluntary Action Plan for reduction of atmospheric emissions of harmful chemical substances (three substances) was formulated for the first period, ending in FY 2000

1997: Took a part in Keidanren Voluntary Action Plan (Global Warming Countermeasures)

2001: Reduced from the five subcommittees structure to four subcommittees structure (Chemical Substance Management Subcommittee, Environment Management Subcommittee, Resource Conservation and Waste Management Subcommittee, Energy Saving and General Warming Countermeasures Subcommittee), as well as establishment of the Planning Council

2002: Committee activities expanded to occupational safety and health. Renamed the “Environment & Safety Committee” “Study Groups” were organized as places for activities beyond the subcommittees.

2003: Voluntary Action Plan on Waste Reduction was formulated for the second period, ending in FY 2010

2005: Voluntary Action Plan for Reduction of Atmospheric Emissions of Harmful Chemical Substances (three substances) was formulated for the second period, ending in FY 2007

2006: Voluntary Action Plan on Wastes Reduction was formulated for the third period, ending in FY 2010

2008: Subcommittees reorganized from a four-subcommittee regime to a three-subcommittee regime (Environment Subcommittees, Occupational Safety / Health Subcommittees and Global Warming Countermeasures Subcommittees)

2010: Voluntary Action Plan on a series of actions for waste reduction was completed in its final year in FY 2010

2011: A fourth period voluntary action plan for waste reduction towards the final year of FY 2015 was settled on

2012: Fundamental Philosophy and Guidelines for Conduct Concerning Biodiversity was formulated to present the JNMA’s stance on biodiversity.

2013: First period Keidanren Voluntary Action Plan on Global Warming Countermeasures, lagged in FY 2012, was concluded.

2014: Second period Keidanren’s Voluntary Action Plan on Global/Warming Countermeasures, target in FY 2020, was settled.

2015: Third period Keidanren’s Voluntary Action Plan on Global Warming Countermeasures, target in FY 2030, was settled.

2016: Fifth period voluntary action plan for waste reduction towards the final year of FY 2020 was settled on.

Subcommittees reorganized from a three-subcommittee regime to a two-subcommittee regime (Environment Subcommittees and Occupational Safety & Health Subcommittees)
Effects of liberalization of energy saving, CO emissions reduction, and cost-saving activities by corporations

Recent trends of energy-saving policies

Presentation included an overview of the energy-saving scenarios mentioned above, and highlighted the continued efforts of companies to address energy-saving issues.

Polices and trends covering international trends in energy conservation, and issues related to the implementation of greenhouse gas reduction policies.

Use of data to manage energy and facilities in plants and research institutes

NEC's use of data to support energy-saving efforts in Japan, including analysis of energy-saving policies and cost-benefit analysis for energy-saving projects.

Training & Motivation

History of Environmental and Safety Initiative

1978 * "Related Technology Liaison Group" was reorganized to the "Factory Waste Water Regulatory Measures Review Group"

1979 * In collaboration with the concerned authorities and agencies, an "Environment Action Review Group" was established for adopting the government administration's intentions, communicating the industry's ideas, exchanging information within the industry and the confirmation of a common direction for the environmental action among the members.

1996 * Environment Committee established. Five internal subcommittees were established (Planning Subcommittee, Chemical Substances Subcommittee, Environment Management Subcommittee, Resource Conservation and Waste Management Subcommittee, and Environmental Management Subcommittee).

1997 * Took a part in Kasedani Voluntary Action Plan (Global Warming Countermeasures), and also initiated the "Environmental Action on Waste Reduction (Proposal)" was formulated.

2001 * Reducing the five subcommittees structure to four subcommittee structure (Chemical Substance Management Subcommittee, Environmental Management Subcommittee, Resource Conservation and Waste Management Subcommittee, and Energy Saving and Global Warming Countermeasures Subcommittees), as well as establishment of the Planning Council.

2005 * Voluntary Action Plan on Waste Reduction was formulated for the second period, ending in FY 2010.

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2012 * Fundamental Philosophy and Guideline for Conduct Concerning Biodiversity was formulated to present the JPMA's stance on biodiversity.

2015 * Fifth period voluntary action plan for waste reduction towards the final year of FY 2020 was settled on.

Workshop on Environmental Technologies (January 2015)

The ONLY three points necessary to get your staff involved in environmental activities

Yuko Kokubu

Basic Manager, Corporate Social Responsibility Section, Taisei Corporation

The presentation included the following topics: "environmental initiatives in Japan," "the reasons why employees would participate in environmental activities," and "the need for new environmental initiatives and guidelines." The presentation also emphasized the importance of involving employees in decision-making processes.

Situation of Situational and Environmental Education in Denmark

Suzu Yamaoka

Senior Communications Officer, Royal Danish Embassy

The following topics were covered: "environmental activities of some companies," "problems faced by officers in charge of environmental activities," and "whether a new framework for GHG emissions reduction from 2020 onwards in which all countries have to participate."
History of Environmental and Safety Initiative

Progress of Our Voluntary Action Plans

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<th>Area of Action</th>
<th>Year of Planning</th>
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<td></td>
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<td>Global Warming Countermeasures</td>
<td>FY1997 (First Period Plan)</td>
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<td>FY2013 (Second Period Plan)</td>
<td>Reduce CO2 emissions by 23% from FY2005 level by FY2020</td>
<td>FY2020</td>
</tr>
</tbody>
</table>

Members of Planning Conference and Steering Committee of Environment & Safety Committee

<table>
<thead>
<tr>
<th>Planning Conference</th>
<th>Chairperson</th>
<th>Asahiko Tsuji</th>
<th>CHUGAI PHARMACEUTICAL CO., LTD.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deputy Chairperson</td>
<td>Hideo Tsubota</td>
<td>TAKEDA PHARMACEUTICAL CO., LTD.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Souichirou Okada</td>
<td>SHIONOGI &amp; CO., LTD.</td>
</tr>
<tr>
<td>Steering Committee</td>
<td>Chairperson</td>
<td>Osamu Oldi</td>
<td>SUMITOMO DAINIPPON PHARMA CO., LTD.</td>
</tr>
<tr>
<td>Environmental</td>
<td></td>
<td>Massaki Oda</td>
<td>ASTELLAS PHARMA INC.</td>
</tr>
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<td></td>
<td>Deputy Chairperson</td>
<td>Makoto Kurokawa</td>
<td>TAIHO PHARMACEUTICAL CO., LTD.</td>
</tr>
<tr>
<td>Occupational Safety &amp; Health</td>
<td>Chairperson</td>
<td>Yosuke Tani</td>
<td>PFIZER JAPAN INC.</td>
</tr>
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<td></td>
<td>Deputy Chairperson</td>
<td>Teruo Yamano</td>
<td>TAKEDA PHARMACEUTICAL CO., LTD.</td>
</tr>
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<td></td>
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<td>Hisashi Oya</td>
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JPMA Member Companies (listed in alphabetical order): 72 Companies as of April 2015

- ABBOTT JAPAN CO., LTD.
- ACHILLEA K.K.
- AJINOMOTO PHARMACEUTICALS CO., INC.
- KOWA Company, Ltd.
- ALCON JAPAN LTD.
- KRACIE PHARMA, LTD.
- ASAHI KASEI PHARMA CORPORATION
- KYORIN PHARMACEUTICAL CO., LTD.
- ASKA PHARMACEUTICAL CO., LTD.
- KYOTO PHARMACEUTICAL INDUSTRIES, LTD.
- ASTELLAS PHARMA INC.
- KYOWA HAKKO KIRIN CO., LTD.
- AstroZeneca K.K.
- MARUHO CO., LTD.
- BAXTER LTD.
- MARUSHI PHARMACEUTICAL CO., LTD.
- BAYER YAKUHIN, LTD.
- Meiji Saita Pharma Co., Ltd.
- BOSTON-MYERS K.K.
- MERCK SERONO CO., LTD.
- Caligene K.K.
- MINOPHAGEN PHARMACEUTICAL CO., LTD.
- TWi CHEMOTHERAPEUTIC RESEARCH INSTITUTE
- CHUGAI PHARMACEUTICAL CO., LTD.
- MOCHIDA PHARMACEUTICAL CO., LTD.
- DANISH SANKYO CO., LTD.
- MSD K.K.
- EISAI CO., LTD.
- NICHIDAN PHARMACEUTICAL CO., LTD.
- EIJ LILLY JAPAN K.K.
- NIPPON BEHRINGER INELHEIM CO., LTD.
- FUJIMOTO PHARMACEUTICAL CORP.
- NIPPON CHEMPHAR CO., LTD.
- FUSO PHARMACEUTICAL INDUSTRIES, LTD.
- NIPPON KAYAKU CO., LTD.
- Genzyme Japan K.K.
- NIPPON SHINYAKU Co., Ltd.
- GlaxoSmithKline K.K.
- NIPPON ZOKI PHARMACEUTICAL CO., LTD.
- HISAMITSU PHARMACEUTICAL CO., INC.
- NOVARTIS PHARMA K.K.
- JANSEN PHARMACEUTICAL K.K.
- NOVO NORDISK PHARMA LTD.
- JAPAN TOBACCO INC.
- Otsuka Pharmaceutical Co., Ltd.
- AstraZeneca K.K.
- SUMITOMO DAINIPPON PHARMA CO., LTD.
- Celgene K.K.
- TAIHO PHARMACEUTICAL CO., LTD.
- CHUBU PHARMACEUTICAL CO., LTD.
- TERUMI PHARMACEUTICAL CO., LTD.
- DOCHI SANKYO CO., LTD.
- TEOJIN PHARMA Limited
- EISAI CO., LTD.
- NISSIN PHARMACEUTICAL CO., LTD.
- ELI LILLY JAPAN K.K.
- TOYAMA CHEMICAL CO., LTD.
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- TEOJIN PHARMA Limited
Japan Pharmaceutical Manufacturers Association Environmental Report 2015

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Planning Conference
Chairperson
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Deputy Chairperson
Ashiko Takasugi
TAKEDA PHARMACEUTICAL CO., LTD.
Sakura Kobayashi
DAICHI SANKYO CO., LTD.
Souchi Tanimoto
SHIONOGI & CO., LTD.

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TAIHOU PHARMACEUTICAL CO., LTD.

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EISAI CO., LTD.
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Yoshihiko Umezawa
PFIZER JAPAN INC.

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OTSUKA PHARMACEUTICAL CO., LTD.

Secretary
Tatsuro Konno
JPMA

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Pfizer JAPAN INC.

AJINOMOTO PHARMACEUTICALS CO., INC
Kowa Company, Ltd.
POLA PHARMA INC.

ALCON JAPAN LTD.
KRACIE PHARMA, LTD.
Sanofi K.K.

ASAIKASEI PHARMA CORPORATION
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SANTEN PHARMACEUTICAL CO., LTD.

ASKA PHARMACEUTICAL CO., LTD.
KYOTO PHARMACEUTICAL INDUSTRIES LTD.
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SEKAGAKU CORPORATION

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Calgene K.K.
MINOPHAGEN PHARMACEUTICAL CO., LTD.
TASHO PHARMACEUTICAL CO., LTD.

The CHemo Sero Therapeutic Research Institute
MITSUI TANABE PHARMACO CORPORATION
TAKEDA PHARMACEUTICAL CO., LTD.

CHUGAI PHARMACEUTICAL CO., LTD.
MOCHIDA PHARMACEUTICAL CO., LTD.
TEIJIN PHARMA Limited

DAICHI SANKYO CO., LTD.
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NIPPON BOSHEHINGER INGELHEIM CO., LTD.
TOA EYO LTD.

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Toray Industries, Inc.

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UCB JAPAN LTD.

HISAMITSU PHARMACEUTICAL CO., INC.
NOVARTIS PHARMA K.K.
WAKAMOTO PHARMACEUTICAL CO., LTD.

JANSSEN PHARMACEUTICAL K.K.
NOVO NORDISK PHARMA LTD.
YAKULT HONSHA CO., LTD.

JAPAN TOBACCO INC.
ONEI PHARMACEUTICAL CO., LTD.
ZERIA PHARMACEUTICAL CO., LTD.

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