

# **Environmental and Social Report 2009**

KAWASAKI HEAVY INDUSTRIES, LTD.

# We contribute to the development of society and the improvement of the global environment through a wide range of business activities

# **Corporate Profile**

| Company Name:                                  | Kawasaki Heavy Industries, Ltd.  |
|--|--|
| Incorporated:                                  | October 15, 1896<br>(Founded in April 1878)  |
| Capital:                                       | 104 billion yen  |
| Kobe Head<br>Office:                           | 1-3, Higashikawasaki-cho<br>1-chome, Chuo-ku, Kobe, Hyogo,<br>650-8680 Japan                         |
| Tokyo Head<br>Office:                          | 4-1, Hamamatsu-cho 2-chome,<br>Minato-ku, Tokyo, 105-6116 Japan                                      |
| Representative:                                | Satoshi Hasegawa, President  |
| Kawasaki Group<br>Network:<br>(See back cover) | 20 Domestic (10 works)<br>4 Overseas<br>123 Affiliated Companies<br>(97 Subsidiaries, 26 Affiliates) |
|  | (As of March 31, 2009)   |

# Operating Income

(billions of yen)

1,241.5

876.2

447.9

4<mark>28.3</mark>

2004



1,501.0

889.9

521.7

368.2

2007

1,338.5

771.4

455.9

315.5

2008

Consolidated

Nonconsolidated

(Exports) Nonconsolidated

(Domestic)

(FY)

1.438.6

919.6

533.0

386.6

2006

1,322.4

845.8

456.9

388.9

2005

# Total Assets



### Number of Employees (End of FY)



# **Editorial Notes**

Reporting Scope: This report covers the environmental and social activities of the entire Kawasaki Group; however, the environmental responsibility section is focused on Kawasaki Heavy Industries, Ltd., and the following three main subsidiaries; Kawasaki Shipbuilding Corporation, Kawasaki Precision Machinery Ltd., and Kawasaki Plant Systems, Ltd. Reporting Period: The period for reporting covers FY2008 (April 1, 2008, to March 31, 2009) Some information from FY2009 is also included. **Next Scheduled** This report will be published annually. **Publication:** CSR Division (CSR Department and Divisions **Responsible for** Environmental Affairs Department) (see the back cover for contact **Publication:** 

This report is prepared with reference to the Environmental Reporting Guidelines issued by the Ministry of the Environment and the GRI Sustainability Reporting Guidelines.

information)

## **Overview of Business**







Rolling Stock



Shipbuilding



Energy Plants & Facilities

Leisure Products

Industrial Equipment

Environment & Recycling

### Sales by Segment (FY2008, consolidated) (billions of yen)



### Main Businesses of Our Internal Companies and Three Main Subsidiaries\*

| Rolling Stock Company                              | Train cars, Integrated transit systems,<br>Battery-driven low-floor light rail vehicle   |  |  |  |
|--|--|--|--|--|
| Aerospace Company                                  | Aircraft (Fixed-wing aircraft and Helicopters),<br>Space systems and peripheral equipment  |  |  |  |
| Gas Turbine & Machinery Company                    | Aircraft jet engines, Gas turbine engines for  |  |  |  |
| Gas Turbine Div.<br>Machinery Div.                 | aircraft and ships, Gas turbine generators,<br>Steam turbines for ground and maritime<br>applications, Aerodynamic machinery           |  |  |  |
| Consumer Products & Machinery<br>Company           | Motorcycles, ATVs (all-terrain vehicles),<br>JET SKI <sup>®</sup> Watercraft   |  |  |  |
| Industrial Facilities and Tunneling Equipment Div. | LNG and LPG tanks, Firefighting training systems, Shield machines  |  |  |  |
| Robot Div.   | Industrial robots  |  |  |  |
| Kawasaki Shipbuilding Corporation                  | LNG carriers, LPG carriers,<br>Other mercantile and government vessels   |  |  |  |
| Kawasaki Precision Machinery Ltd.                  | Hydraulic equipment for construction machines, Hydraulic equipment and systems for industrial machines                                 |  |  |  |
| Kawasaki Plant Systems, Ltd.                       | Industrial plants, Industrial machines,<br>Boilers, Municipal refuse incineration plants,<br>Sewage treatment plants, Recycling plants |  |  |  |
|  |  |  |  |  |

\* Three main subsidiaries: Kawasaki Shipbuilding Corporation, Kawasaki Precision Machinery Ltd. and Kawasaki Plant Systems, Ltd.

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# Realizing continuous growth as an enterprise to contribute to the abundant lifestyles of people around the world and the future of the global environment



Since 1878, when the Kawasaki Group began as a shipbuilding business, we have built our business foundations in the fields of rolling stock and aircraft as well as in land, sea and air transportation systems and transportation equipment. During these 130 years, we have also been expanding our business in the areas of industrial infrastructure, energy and the environment, and recreational vehicles including motorcycles. Without a doubt, we have reached this present by realizing "continuous growth."

In addition to constant innovation, the indispensable elements that are required for a corporation to grow continuously include having soundness of the management and making contributions to society. Having established a CSR Department and an Environmental Affairs Department within our CSR Division, our Group is pursuing these elements of "soundness of the management" and "contributions to society" as a unified whole. Through this report, we hope to communicate about the types of activities that we are undertaking with specific examples so that our readers will gain a broad understanding of our efforts.

President Satoshi Hasegawa

### Kawasaki Group Mission Statement

We established the Kawasaki Group Mission Statement in 2007 as a compass for the entire Group. This statement incorporates the social mission that our Group is necessary to fulfill in the 21st century, the sense of values that we should share in order to increase our brand value, principles for management activities and guidelines for the daily conduct of each individual member of our Group.

The Kawasaki Group Mission Statement is comprised of the following four parts, which are envisioned as layers that start with the Group Mission at the core.

### **Group Mission**

#### Kawasaki, working as one for the good of the planet

- We are the Kawasaki Group, a global technology leader with diverse integrated strengths.
- We create new value for a better environment and a brighter future for generations to come.

### The Kawasaki Group Core Values

 Value Creation:
 We are globally driven to create new value – both for our customers and for the benefit of society as a whole.

 Originality:
 We thrive on originality, innovation and leadership.

 Excellence:
 What we produce is of exceptionally high quality and functionality, as we constantly strive to be at the global cutting edge.



# Realizing Contributions to Society with Manufacturing as the Foundation

We have undertaken business with the advancement of society and the nation through "manufacturing" as our basis since the time of our establishment. We have greatly expanded our business fields, but that fundamental philosophy has not changed in any area of our business.

We have summarized this fundamental philosophy that we have inherited as the basic approach to management for the Group in the Kawasaki Group Mission Statement (hereafter, the "Mission Statement"). The contents of our Mission Statement are explained in detail at the bottom of these pages. The first of the Kawasaki Group Management Principles is set as follows. "Trust: As an integrated technology leader, the Kawasaki Group is committed to providing high-performance products and services of superior safety and quality. By doing so, we will win the trust of our customers and the community." This demonstrates that we truly place our philosophy of contributing to society through manufacturing at the forefront of our approach.

In manufacturing, the provision of high-quality products that satisfy customers is an obvious goal, but in recent years, it also goes without saying that consideration of the global environment has become an indispensable goal. We believe that one of the major social responsibilities of manufacturing businesses such as our Group is contributing to the prevention of global warming by providing products that not only do not use or emit harmful substances, but that also greatly save energy.

Fortunately, our Group possesses outstanding technologies for clean energy, energy saving and other products related to the environment, and we are providing numerous products and services that utilize them. We have explained many of these products in detail in the past, but we introduce some in this report as well, and we sincerely hope that you will read about them.



### The Kawasaki Group Management Principles

- 1. Trust: As an integrated technology leader, the Kawasaki Group is committed to providing high-performance products and services of superior safety and quality. By doing so, we will win the trust of our customers and the community.
- 2. Harmonious coexistence: The importance of corporate social responsibility (CSR) permeates all aspects of our business. This stance reflects the Kawasaki Group's corporate ideal of harmonious coexistence with the environment, society as a whole, local communities and individuals.
- 3. People: The Kawasaki Group's corporate culture is built on integrity, vitality, organizational strength and mutual respect for people through all levels of the Group. We nurture a global team for a global era.
- Strategy: The Kawasaki Group pursues continuous enhancement of profitability and corporate value based on three guiding principles

   selectively focusing resources on strategic businesses; emphasizing quality over quantity; and employing prudent risk management.

### The Kawasaki Group Code of Conduct

- 1. Always look at the bigger picture. Think and act from a long-term, global perspective.
- 2. Meet difficult challenges head-on. Aim high and never be afraid to try something new.
- 3. Be driven by your aspirations and goals. Work toward success by always dedicating yourself to your tasks.
- Earn the trust of the community through high ethical standards and the example you set for others.

5. Keep striving for self-improvement. Act on your own initiative as a confident professional.

6. Be a part of Team Kawasaki. Share your pride and sense of fulfillment in a job well done.



For more details see Kawasaki Heavy Industries "Kawasaki Group Mission Statement" at http://www.khi.co.jp/ overview/mission\_e.html

### Contributing to the Abundant Lifestyles of People Around the World

At the core of our Mission Statement is the Group Mission (our role in society), which we have stated as, "Kawasaki, working as one for the good of the planet."

"Abundant lifestyles" include material wealth, but what we want to emphasize by "abundant lifestyles" here is also the meaning of "abundance in the spiritual sense." We must seriously think about what our Group can do to promote "spiritual abundance" and take actions accordingly.

The second of the Kawasaki Group Management Principles also includes "spiritual abundance" in its meaning, and is as follows. "Harmonious coexistence: The importance of corporate social responsibility (CSR) permeates all aspects of our business. This stance reflects our Group's corporate ideal of harmonious coexistence with the environment, society as a whole, local communities and individuals."

Specific examples of related activities are presented in this report starting on page 20. In addition to the cooperation and participation of our business locations in local events, the invitation of ordinary citizens to naming and launching ceremonies for newly-built ships and other established activities, other examples include our contributions to local society through Kawasaki Good Times World, our corporate museum, and financial donations at times of disaster. Moreover, recently, we have also been participating in "corporate forest restoration" projects. In this report, we discuss in detail these efforts to preserve forest resources. In 2007, we began efforts in the town of Niyodogawa-cho in Kochi Prefecture. We have also started a five-year forest restoration effort in the town of Taka-cho in Hyogo Prefecture.

We will continue undertaking specific efforts such as these that contribute to "spiritual abundance."

# Contributing to the Future of the Global Environment

The main theme of the environmental activities of our Group is efforts to reduce greenhouse gas emissions. If we imagine that the amount of primary energy used per person in developing countries reached, without any technological advancements, the same level as that currently used in developed countries, we fear that the impact of increased burdens on the global environment would be immeasurable. As a corporation, we must think about efforts to improve the environment in consideration of how it will be in the future for our children and grandchildren.

In addition to actively working to enhance our independent reduction efforts for greenhouse gas emissions, we are also participating in Japan's Experimental Introduction of an Integrated Domestic Market for Emissions Trading, and we are seeking to achieve our targets for reducing the amounts of greenhouse gases that we emit. For example, we have implemented specific measures, including the installation of photovoltaic systems in new factories that are larger than a certain size.

With continued business growth, reducing amounts of emissions is not easy, but through the application of the technologies of our Group, we are also able to utilize international emissions trading. We will continue to implement various measures to reduce emissions.



### Medium-Term Business Plan "Global K"

The Global K is a business plan, covering primarily the years 2006 to 2010, compiles strategies to realize a vision for the entire Group and each business field 10 years from now. It specifies business strategies for growth and prosperity of the Group in the first half of the decade.

Web For more details see Kawasaki Heavy Industries Medium-Term Business Plan "Global K" at http://www.khi.co.jp/annual/japanese/pdf/presentation\_0610e.pdf

### Corporate Vision

Kawasaki Heavy Industries, Ltd. aims to become a leading global enterprise working as one for the good of the planet through its core businesses, which encompass land, sea and air transportation systems as well as energy and environmental engineering sectors.





# **Assuring Sound Management**

In order for our Group to achieve its contributions to society, the assurance of sound management is a major prerequisite.

For this purpose, increasing the transparency of management by establishing and strengthening systems for internal control and compliance is necessary. Efforts for this are explained in detail starting on page 12. First of all, however, we are working to establish internal regulations related to corporate ethics, conduct various types of education, create compliance committees in each organization and make other efforts to comprehensively spread awareness throughout the Group about the details of various laws and regulations that require our compliance. In addition to the CSR Department within the CSR Division, which is an organization under the direct control of the president, we are also establishing sections responsible for CSR in each business division and undertaking other systematic efforts to make compliance understanding and implementation permeate the Group. Moreover, we are striving to cultivate a corporate culture that always prioritizes information disclosure and transparency.

Risk management is also important in order to assure "sound management," and we have implemented systems to check and follow-up on important projects, as well as creating risk countermeasures that are suitable to the characteristics of each business area. At present, we are once again conducting risk evaluation that covers the entire Group. Along with this, we are verifying whether or not effective check systems and countermeasures have been prepared for risks that require responses.

Our duty as a corporation is to be useful to our numerous stakeholders, including our customers and business clients, local communities, shareholders, investors and employees. Even as the global economy struggles through confusion, with our Mission Statement as a compass, we are continuing to "invest in growth" and intend to keep managing with broad awareness of our social responsibility as a group that is "working as one for the good of the planet." We hope that you will continue to support our efforts.



Satoshi Hasegawa President Kawasaki Heavy Industries, Ltd.



### Basic Objectives and Policies

#### (1) Basic objectives

With "quality followed by quantity," "selectivity and concentration" and "creation of new value" as our foundations for management, we will become a highly profitable, globally recognized enterprise.

### (2) Basic policies

- (1) Concentrate management resources on key businesses areas where high earnings can be expected and growth businesses that are keys to future earnings.
- (2) Develop our businesses globally and seek to become a leading global enterprise in core business fields.
- (3) Provide products and services that have high functionality and are high quality throughout their entire lifecycles in order to build a solid income foundation that is not influenced by changes in the economy.

### Key measures

- (1) Strengthen technological abilities (2) Cultivate ways of thinking and behavior patterns that are market-oriented
- (3) Accelerate global expansion (4) Create and foster new products and new businesses
- (5) Strengthen Group management abilities (6) Promote CSR

Feature Report

# "A Stakeholder Meeting to Discuss the Kawasaki Report - Environmental and Social Responsibility"

# For the purpose of receiving a wide variety of feedback about the CSR activities of the Kawasaki Group

We invited professors and students from Kobe University to participate in a stakeholder meeting to discuss our report. Since the university and many of our business bases are located around Kobe, this allowed us to hear frank opinions and questions from nearby stakeholders. We want to use their feedback to not only improve future reports, but also to further advance our CSR activities.

### Theme The Kawasaki Report - Environmental and Social Responsibility as a Whole

### Opinions from Kobe University scholars 1

A student questioned whether, "The report might contain a lot of uncommon foreign vocabulary that ordinary Japanese readers cannot understand easily, such as 'compliance' and 'corporate governance.' " The student further noted, "I also heard from a friend that it would be easier to understand if ordinary Japanese was used instead." A professor also noted, "Depending on their fields of study, even university students do not have many opportunities to learn about ideas such as 'compliance' and 'corporate governance.' Even after graduation, many people live their lives without having much involvement with corporate activities. I think it is necessary to think about people like these too, and investigate how to transmit information."

Another student said, "The first pages have the 'Corporate Profile' and the 'Overview of Business,' and the net sales and operating income appear. This creates the incongruous sense that this report is a brochure for investors." A professor further added, "This is because the connection with the environmental report is difficult to understand."

#### In response to these opinions

Regarding the use of vocabulary, we believe that this depends on whom we expect the stakeholders that will read this report to be. Given the circumstances of our business, it is unavoidable that the core of our readership will be members of society who are active in business fields. Preparing a report that every person could understand would be very difficult, but we did create it with the desire to make it understandable to university students and people with equivalent or greater levels of knowledge.

Furthermore, the Corporate Profile and the Overview of Business are important elements of this report. The amount of environmental impacts caused by a corporation's business activities and its business scale are important indicators for evaluating that corporation.

# Management Approaches

#### Opinions from Kobe University scholars 2

One student said, "I think that it is good that the stance of Kawasaki Group is made clear in the 'Mission Statement,' but the relationship between 'Material well-being,' 'Psychological well-being' and the 'Earth' in the diagram is very difficult to understand." A professor commented, "There are terms such as 'Psychological well-being' and 'Creating new value,' but what do these mean in terms of how contributions are being made to society now?"

In addition, a student asked, "In the medium-term business plan there is the expression 'to become a highly profitable, globally recognized enterprise' and quantitative targets in the business plan are noted, but isn't the purpose of this report different?" A professor suggested, "University students are in the process of learning about corporate management and economic value, so I think that this opinion is natural. It is possible that people who live lives that are distant from corporations would have the same kinds of opinions."

### In response to these opinions

The fundamental concept of our Mission Statement is "Kawasaki, working as one for the good of the planet." This statement aims to promote not only "material well-being" but also "psychological well-being." When every one of our employees acts with this idea always in mind, our products and business operations are transformed to align with the intentions of our Mission Statement. We believe that this, therefore, links to contributions to society.

Regarding the discussion of the medium-term business plan, the economic sustainability of the corporation is a prerequisite to allowing us to make contributions to the environment and society. We believe that economic activities themselves are extremely important because they generate products that are necessary for society as well as create employment opportunities.

#### Participants from Kobe University

| laoto Hashimoto  | Associate Professor <sup>1</sup>                                     |
|------------------|--|
| lasayuki Itoh    | Professor <sup>1</sup>   |
| akuya Iwasa      | Associate Professor <sup>1</sup>                                     |
| tsushi Fujiki    | Third year of Doctoral Course <sup>2</sup>                           |
| lirotaka Kondoh  | First year of Doctoral Course <sup>3</sup>                           |
| akeshi Matsuoka  | First year of Master's Course <sup>3</sup>                           |
| uki Matsuoka     | First year of Master's Course <sup>3</sup>                           |
| azutoshi Akiyama | Third year of Department of Human Environmental Science <sup>1</sup> |
| laruka Yoshinuma | Second year of Department of Human Environmental Science             |
|                  |  |

<sup>1</sup> Faculty of Human Development <sup>2</sup> Graduate School of Humanities <sup>3</sup> Graduate School of Human Development and Environment

### Employees attending from Kawasaki Heavy Industries

Sadao Fujii Atsuko Kakihara Kanji Tetsu Senior Manager, Environmental Affairs Dept., CSR Div. Manager, CSR Planning Sect., CSR Dept., CSR Div. Senior Staff Officer, Environmental Affairs Dept., CSR Div.

# 3 CSR Activities

#### Activities for society

### Opinions from Kobe University scholars 3

Students also made the following suggestions. "From the perspective of confirming the practical effects of compliance, I want to know how many cases of consultation using the Compliance Report and Consultation System there were, and how many among them were resolved." "I understand CSR to include efforts to contribute to society through the resolution of poverty and other social problems. I want you to become more involved in efforts that contribute to society such as the Collaborative Forest Restoration Project."

.....

#### In response to these opinions

Just starting the Compliance Report and Consultation System did not assure that it would function well. For example, there might have been people who were concerned that if they used the system, they would destroy the mutual trust that they have with other employees. By undertaking a variety of forms of public relations to promote the system, however, we have greatly enhanced awareness throughout the group about the arrangements that have been made to "keep the names of people who report or seek consultation completely confidential," and the number of consultations has been increasing. Last year there were 17 consultations, and we were able to reach a solution that was desirable for both the company and the person seeking the consultation in every case.

Moreover, since we have business bases in many places in Japan and abroad, we are undertaking efforts to harmoniously coexist with each location by incorporating their local characteristics. In the future, we want to put more emphasis on these types of efforts in our reports.



Taketoshi Hara Hiroshi Tsuji Senior Staff Officer, Environmental Affairs Dept., CSR Div. Senior Staff Officer, Environmental Affairs Dept., CSR Div.

### Activities for the environment

### Opinions from Kobe University scholars 4

Students suggested the following. "Looking at the graph of energy saving activities, they do not seem very successful. Are your efforts to reduce environmental impacts not making progress, or are there results that cannot be seen in a graph?" "I am concerned about the item that states 'administrative measures and warnings occurred.' Are corporate policies not reaching the worksite level?"

### In response to these opinions

Due to increases in our business scale, our total amount of energy consumption has also increased, but by basic unit\*, which is another index, it has decreased. For CO<sub>2</sub>, we also use a basic unit, which is easy to understand, as an index for manufacturing workplaces, and we are seeking to reduce the total amounts by doing whatever is possible. Moreover, we are now advancing investigations for an action plan for the medium and long term to 2020 as our next step.

Regarding the administrative measures, the concentration of nitrogen oxides (NOx) in the exhaust gas emissions from one of our power generation facilities exceeded the standard legal values in February of this year, so we were reprimanded by the government. Each plant has established a system to check and manage, but its measures to prevent human errors, including those caused by habit were insufficient. Currently, we have started an Environmental Investigation Team to check compliance from a third-party standpoint, and we are making thorough efforts for measures to prevent recurrence.

\* Amount of energy consumption per unit of net sales

# "Meeting of stakeholders who work for our company" (held February 10, 2009) to exchange opinions about the Kawasaki Report 2008 - Environmental and Social Responsibility

Twelve employees from various divisions, including those related to the environment, technology and office work, participated in this meeting sponsored by the Environmental Affairs Department and CSR Department. They exchanged opinions about the contents of the report, including items about environmental and CSR activities.



Feature Report

# Efforts to Contribute to Society by Our Business Bases in Japan and Abroad

Striving to form a more abundant future with the coexistence of people, society and the environment

Each Kawasaki Group business base in Japan and abroad is conducting independent efforts to contribute to society and undertaking efforts for symbiosis with society. In various ways, they are realizing the Kawasaki Group Management Principles in our Mission Statement of "Harmonious coexistence: The importance of corporate social responsibility (CSR) permeates all aspects of our business. This stance reflects the Kawasaki Group's corporate ideal of harmonious coexistence with the environment, society as a whole, local communities and individuals." (Please see "Coexisting with Communities and People" on page 20 also.)

The businesses of the Kawasaki Group are in fields of the enhancement of social infrastructure related to transportation equipment as well as the environment and energy. This means that our businesses themselves contribute to society. In addition, our business places and production bases in Japan and abroad are making contributions to their local communities according to their resources and environments and promoting the realization of "well-being."

We expect that the efforts to make social contributions will enhance employee morale and pride in their companies

and will increase their sense of corporate citizenship, and that this will lead the Kawasaki Group to act in accordance with its "social responsibilities," generating a cycle that

raises corporate quality.

in U.S.A.

#### Kawasaki Good Times Foundation

# Establishment of a Fund for Contributions to Society in the United States of America

The Kawasaki Group has established business bases for motorcycles, rolling stock, robots and construction machinery. Both independently and working in cooperation with each other, these bases are conducting efforts that are rooted in American society.

One of these is the Kawasaki Good Times Foundation (KGTF), which was established in 1993.

Several bases contributed funds to establish this foundation, and some of the profit is also added to the foundation every year. This foundation is managed and operated by KHI (USA), which is the headquarters organization for Kawasaki Heavy Industries in the USA. The operating funds are donated to the Metropolitan Museum of Art and other arts and cultural facilities, various philanthropic projects and activities that support education, medical treatment and science.

The culture of making contributions to society is well-established in the USA, and volunteerism, monetary contributions, the donation of goods, and various other types of approaches are applied naturally and on a broad basis. We respect this culture and are learning this spirit of coexistence with society.



# in Japan

### Efforts by Kawasaki Precision Machinery to cultivate rice using green manure

### The Origins and Roots of Manufacturing Are Agriculture

Kawasaki Precision Machinery Ltd. (Nishi-ku, Kobe), which boasts of its production facilities and having the largest scale in the industry, is a company that produces hydraulic equipment for diverse types of machinery and plants. From the perspective that "the origin of manufacturing is agriculture," we seek to educate newly hired employees at this company about the fact that manufacturing is not limited to automated production processes. For this purpose, we have borrowed a paddy field adjacent to our manufacturing plant and we are undertaking rice cultivation in collaboration with the University of Hyogo and with the cooperation of local agricultural groups.

We have adopted a "green manure rice cultivation" method for this agriculture project. First, we plant flowers in the field, and then we plow these back into the soil of the field as fertilizer. Unlike agricultural methods that use chemical fertilizers to promote growth, this approach allows employees to experience the cultivation of rice through various processes. Furthermore, by receiving guidance from nearby farmers and employees who are also part-time farmers, we also have an opportunity to exert ourselves alongside our neighbors from the local community. In addition, we can enjoy picking the flowers, which is a stage when family members can also participate.

In addition to distributing the harvested rice to participants, we also plan to provide it to the cafeteria in the plant so that it can be shared by all employees.



Group of flowers that will become fertilizer



Rice planting with newly hired employees also participating

#### KCM efforts to purify a reservoir

### Providing Something Good for the Corporation to the Local Community

The Banshu Plain of Hyogo Prefecture is one of the few areas in Japan that has numerous reservoir ponds. At KCM Corporation, which is located in this Banshu Plain, we manufacture wheel loaders and other construction machinery. We are also cultivating "effective microorganisms" (EM) that we use to purify the ponds that are on corporate property.

In the area where the plant is located, there is a shrine where people, including those who have connections to KCM, go to pray for safety every New Year. A pond that parishioners jump into for purification during one of this shrine's festivals had begun to give off a slimy odor, so KCM provided effective microorganisms in response to requests from the community.

The EM culture fluid that KCM contributed was mixed with the mud in the

Shrine ceremony

Certificate of

pond, and nearby elementary school students and neighborhood organizations formed "EM balls." As a result of spreading the EM around the edge of the pond, parishioners who entered afterwards said, "This year there was no slimy smell at all," and expressed their gratitude for the benefit from the EM.

# **Social Responsibility**

# We Contribute to the Creation of Abundant Lifestyles

The Group Mission of the Kawasaki Group is to continue to be "Kawasaki, working as one for the good of the planet" through our products and technologies. In order to fulfill this mission, we will keep providing society with products and services that offer advanced functionality, high quality and safety.

Moreover, as stated in the basic objectives of our medium-term business plan (Global K), we seek to "Reinforce CSR organization to enhance corporate quality."

In the Kawasaki Group, we are working in-house to promote the raising of awareness about CSR so that all our employees always work with an attitude of sincerity. This leads to increasing the quality of our companies by realizing a level of work quality that is highly evaluated not only by customers but also by members of society at large.

Furthermore, we are making extensive management and education efforts related to compliance with laws and regulations, environmental preservation, safety and human rights in order to fulfill these fundamental duties that we have as a corporation even more thoroughly.

In addition, as a good corporate citizen, we want to contribute to the harmonious coexistence of the earth, society, communities and people. We also want to increase the realization of well-being by advancing efforts to contribute to society and promote coexistence with local communities in our own ways that utilize our strengths as the Kawasaki Group.

Corporate citizenship

Contributions to well-being (harmonious coexistence of the earth, society, communities and people)

Corporate mission

# Kawasaki,

working as one for the good of the planet

### **Fundamental duties**

Legal compliance, environmental protection, safety assurance, human rights promotion

# In Keeping with the Public Trust

Plan

Kawasaki aims to be a corporation that continues to have the trust of society by developing and reinforcing its corporate structure to promote corporate governance, internal control and compliance.

# **Reinforcement of Corporate Governance**

### **Policies of Corporate Governance**

Led by our directors and auditors, we are building corporate governance systems that are suitable for our Group and seeking to implement them thoroughly. As a unified Group, our fundamental approach to corporate governance is to conduct management that is highly transparent to stockholders, customers, employees, local communities and other stakeholders. Furthermore, while building harmonious relationships with stakeholders, we seek to improve enterprise value by maintaining efficient and sound operation.

### **Structure of Corporate Governance**

In our structure of corporate governance, the directors are in charge of formulating management strategies and supervising the conducting of operations, and auditors, including two outside auditors who have no stake in Kawasaki, conduct auditing, thereby retaining objectivity and neutrality of management monitoring.

We also introduced the internal company system, in which each company autonomously carries out business operations in their own field under the management of each company president assigned by the Board of Directors.

For business operations, executive officers appointed by the Board of Directors are responsible for the conduct of business operations under the executive officer system in order to quickly respond to changes in the operating environment.

### **Promotion of Group Management**

Basic goals and policies for conduct of operations are determined by the Board of Directors.

Receiving these directions, the Group Executive Officer Committee, which includes all executive officers, presidents and planning & control division managers of three main subsidiaries, seeks to thoroughly realize these basic goals and policies.

Important business subjects are intensively discussed by the Management Committee, composed of representative directors, and predetermined items are put to review by the Board of Directors. The Management Committee, which also serves as the advisory organ for the President, is responsible for discussing essential management tasks and reviewing management policies and strategies. When necessary, the Committee invites executive officers of subsidiaries to ensure thorough review of the problems. Incentive salary system is introduced for the directors. On the other hand, the directors are appointed on one-year basis to clarify management responsibility.

# Reinforcement and Improvement of the Auditing Function

The auditors, including two outside ones, attend the Board of Directors and the Management Committee meetings, check important documents, have periodic meetings with the representative directors, and investigate the operational and financial status through auditing divisions of the Company and subsidiaries.

The Auditing Department, which is responsible for internal auditing, endeavors to improve the capability of compliance, as the department regularly monitors to make sure the business operations in all the fields of the Group's business activities are conducted in compliance with the applicable laws and regulations as well as internal rules. In addition, this department undertakes evaluations related to internal controls over financial reporting and strives to increase the performance of internal controls.

The auditors and the Auditing Department share information on auditing through a monthly meeting to reinforce each auditing function.

Moreover, along with receiving audits of financial reports by external auditors, we receive internal control auditing and conduct suitable reporting.



# **Corporate Governance and Compliance**

# Promotion of Internal Control and Compliance

# Fundamental Approach to Internal Control Systems

We are working to review our internal control systems continuously in order to build an even stronger corporate structure by improving the efficiency of our business activities, our compliance with laws and regulations and our risk management.

Furthermore, we have established the Fundamental Philosophy of the Kawasaki Heavy Industries Corporate Ethics Rules as our basic ideas regarding ethical issues, and we are striving to expand understanding of it among all directors and employees in order to enable them to fulfill our social responsibilities as a corporation.

# Efforts to Promote Internal Control and Compliance

Kawasaki Group Internal Control and Compliance System

# The Fundamental Philosophy of the Kawasaki Heavy Industries Corporate Ethics Rules

- 1. Follow the Code of Ethics as a Corporate Member We should carry out business activities with truth and proper conduct.
- 2. Respect Each Other's Personality and Human Rights and Practice No Discrimination

We should respect everyone's personality and human rights and refrain from segregation and discrimination, sexual harassment, and bullying in order to create and maintain a comfortable work place.

#### 3. Promote Environmental Conservation

We should cherish the limited resources of mother nature and actively and voluntarily conduct ourselves with an eye to environmental conservation in order to reduce our impact thereupon, including saving resources and energy, minimizing waste, recycling resources, and preventing environmental pollution.

4. Comply with Laws, Regulations and Social Rules We should realize the importance of legal, social and ethical compliance, and aggressively promote such compliance.

# 5. Ensure Appropriate Accounting Procedures and Reliability of Financial Reporting

We should carry out recording and accounting of corporate activities correctly and precisely according to the best practice specified by laws, regulations and standards.



\* Three main subsidiaries: Kawasaki Shipbuilding Corporation, Kawasaki Precision Machinery Ltd. and Kawasaki Plant Systems, Ltd.

#### **CSR** Committee:

Since this is our highest decision-making agency, our president is the chairperson of this committee.

#### Compliance Committee:

Compliance committees are established in each of our internal companies, our three main subsidiaries and other affiliates in order to realize thorough legal compliance, and these committees are undertaking compliance promotion efforts.

#### Export-related Law Compliance Examination Committee:

In order to prevent their use for arms, this committee makes the final determinations about compliance with laws and regulations related to exports of goods and technologies.

## We Have Established a Compliance Report and Consultation System

When employees suspect that there might be a compliance violation in their section, ordinarily, they should first report to and consult with their superiors and the related sections. However, if they suspect that their superiors or that many people in the section might be involved, they might feel that they are isolated, under pressure from those around them or otherwise in a difficult position that makes them wary or afraid to use in-house reporting or consultation. For such situations, we established our Compliance Report and Consultation System.

In this system, an external lawyer consults directly with the people who come to him and listens to their reports. Moreover, with the name of the person who came for consultation kept secret, the situation is reported to the Compliance Report and Consultation System Subcommittee. The Compliance Report and Consultation System Subcommittee, which also has the external lawyer as a member, investigates the situation to determine whether or not there is a violation and decides future measures in response. The external lawyer conveys this directly to the person who came for the consultation.

In order to allow our employees to use this system effectively, we make them aware of how to use it and post the results of its use through numerous means, including articles in the Compliance Guidebook that we distribute, in-house intranet notice boards and in-house magazines.

In FY2008, there were 17 cases of reporting and consultation.

### In 2009, We Conducted a Compliance Consciousness Survey

We conducted our first compliance consciousness survey in February 2009 in order to examine the results of the various policies that we had implemented thus far and to use this to guide our future compliance promotion efforts.

This survey was given to 15,052 directors and employees of Kawasaki Heavy Industries, Ltd. and our three main subsidiaries. The surveys were anonymous, and we received responses from 14,504 recipients (96.4% response rate).

As a result of this survey, we have determined that we must put even more energy into raising awareness and providing education for compliance than we have in the past. For this purpose, we are considering how to further enhance the contents of our educational efforts. Compliance Consciousness Survey (selected extracts)

Do you have pride in the fact that you work in the Kawasaki Group?



Do you think that your workplace is a "workplace with good communication" where people can say things that need to be said?



At your workplace, have you talked about compliance, and have you received information related to compliance from a superior (or a colleague)?



If you do not understand laws and regulations or company rules related to work, do you immediately try to confirm or inquire about them yourself?



# Social Responsibility Serving Our Customers

# Contributing to Firefighting Training at Fire Academies Through the Creation of Realistic Fire Environments

According to the 2008 Firefighting White Paper, about 55,000 fires occurred in 2007 in Japan. The national firefighting structure includes 1,706 fire departments and 3,218 branch stations throughout the country with a total of about 158,000 fire department staff members. The firefighters, who are the ones on the frontline in firefighting efforts, must receive education and training established by fire academies. In this education and training, the most important aspect is training that involves fighting actual fires.

Kawasaki Heavy Industries contributes to the training of fire department staff members and improving their skills by providing our Advanced Fire-fighting Training (AFT) System®, which is a very sophisticated firefighting training system that simulates extremely realistic fire environments.



View of a training tower

# **Repeated Simulation of Realistic Fire** Situations Using Burning Gas

At present, fire academies have been established in all 47 prefectures and 8 ordinance-designated cities, as well as in the Fire and Disaster Management Agency of the Ministry of Internal Affairs and Communications, for a total of 56 schools throughout Japan. Every day, numerous trainees undergo rigorous training at fire academies.

Most of the time, firefighting training with real fires, which is considered to be the most important part of the education and training provided by fire academies, is conducted in the yards and other outdoor areas of these schools by burning scrap wood, heavy oil and other materials. This approach does not allow control over the force of the flames, so there are problems related to safety and the environment.

Since a single training session, including cleaning up afterwards, requires a significant amount of time and expense, providing repeat training for a large number of trainees in a short amount of time is not possible. A large amount of space is also necessary, and we can expect that nearby residents might complain about smoke and soot from the fires.

In contrast to this, our AFT System® can create realistic fire situations using gas as fuel (either city gas or propane) in mockups built indoors that include kitchens and bedrooms. Since the flames, heat and smoke can all be controlled at will by computer, the creation of fire situations for a variety of scenarios can be realized safely and in very short amounts of time. Moreover, firefighting skills can be improved even more through repeated training because the scenarios can easily be prepared as many times as desired.

Through the use of a variety of sensors, including gas concentration detection devices and manual emergency stop buttons, the training environment is always kept safe and training can be provided with peace of mind. In addition, since the training occurs indoors, there is almost no impact on the environment. Furthermore, since the fuel used is inexpensive gas and the mockup can be used repeatedly for many years, these systems are also economical.



Mock smoke generation equipment



Burner control equipment

# With Flames Reaching the Ceiling and Mock Smoke Billowing Out, a Scene Is Created That Is Just Like a Real Fire

As an example, take the case of a fire that has started in a kitchen. In this mockup, a sink, a corner cabinet, a gas range and other kitchen features are simulated and the fire is started through operation of the site control panel. Once the fire starts, the force of the flames steadily increases until the fire finally reaches the ceiling and the room becomes hot all at once. Since the flames created by the gas fuel do not generate smoke, mock smoke is also generated artificially. With the addition of the smoke to the flames further enhancing the sense of realism, the experience is just like an actual fire.

Since a number of different scenarios can be set for this type of fire scene, training under a variety of conditions that are suitable to the firefighting skills of the trainees is possible.

The AFT System<sup>®</sup> has been constructed to allow the simulation of not only residential fires, but also many other types of fire situations, including fires in buildings, tunnels, aircraft, ships, rolling stock and industrial plants.

At the time of this report, our AFT System<sup>®</sup> has been installed and are being utilized in seven fire academies and other facilities in Japan.



Full-size mockup of a kitchen



Kitchen during fire generation



### This is an effective system that allows repeated training that includes "firsthand experiences with flames and smoke."

Our school installed the first AFT System<sup>®</sup> in Japan in 1995. Since then, we have been utilizing this system, which generates real fire in five places including a kitchen, a bedroom and a basement, for firefighting training. The first necessary element in firefighting training for firefighters is that the trainees have "firsthand experiences with flames and smoke." Since this system can easily simulate a fire, and its flames and smoke can be controlled at will, we can conduct trainings whenever we want. Moreover, we can also generate just smoke, making this perfect for training firefighters to respond to smoky fires, which have been frequent in recent years.



Tokyo Fire Department Fire Academy Instructor, Recruit Training Group, Training Unit Fire Department Assistant Commander Hiroshi Yokoo



Educational Materials Management Group Manager Mitsuo Kondo

Since we use propane gas, which produces flames that are redder compared to those generated by city gas, as a fuel at our school, it truly feels like a real fire. The first time trainees experience it, the realism is so great that they hesitate for a moment, making this training very effective.

Because about 1,000 people receive training at our school every year, roughly 13,000 trainees have experienced this system since we installed it. We will continue to make use of this system and keep working to cultivate fire department staff members that have the advanced skills that are needed by society.

# Creating a Flexible Working Environment

Kawasaki strives to create a workplace in which each and every one of its employees can work positively while they show off their individuality, and we have introduced a variety of systems for this, and strive to enrich their content.

# Supporting a Balanced Working Life

We are supporting the realization of balanced working lives as a way to create workplaces where people are able to work positively. Among these efforts, we will introduce our Consecutive Vacation Days for Refreshment program and the expansion of our System for Fostering the Next Generation in this section.

### Consecutive Vacation Days for Refreshment

We began our Consecutive Vacation Days for Refreshment program in April 2008. In this program, at the beginning of the fiscal year employees are required to set consecutive vacation days for later in the year. When those days come, they must take a vacation from work in this system. Moreover, until FY2007, one day was provided as an anniversary holiday, but we have now expanded this to a two-day vacation.

The purpose of the Consecutive Vacation Days for Refreshment system is to promote the use of annual paid vacation days. By taking planned breaks, we hope to help employees become refreshed both mentally and physically and to create a balance between work and private life. Moreover, promoting the use of annual paid vacation days is also a goal of the company from the perspective of supporting the fostering of the next generation, which is discussed next. Litilization rate of the

The actual utilization record of our Consecutive Vacation Days for Refreshment program in FY2008 is shown in this table. We can see that many employees are using this system.

| Consecutive Vacat  | ion Days |
|--------------------|----------|
| for Refreshment pr | ogram    |
|                    | FY2008   |

| Office and technical workers | 87.6% |
|------------------------------|-------|
| Production workers           | 86.4% |
| Average                      | 86.9% |

### System for Fostering the Next Generation

We are providing various forms of support so that all employees are able to continue their jobs when they raise children. We want our employees to be able to continue working positively while balancing it with child-rearing.

In particular, we have received high evaluations from many outside sources, including a Director Award from the Hyogo Prefectural Labor Bureau, for our pioneering efforts with our childcare leave system and other systems that support child-rearing.

In addition to these systems, we implemented new enhancements for systems such as the following in FY2009.

# Enhanced support for childcare through the use of accumulated vacation days for leave

- · Leave can be used in increments of one day for the purpose of childcare. (Previously, the minimum leave for this purpose had been one week.)
- This system can be used until the fiscal year that the child graduates from elementary school. (Previously, it had been until entering elementary school.)

Accumulated vacation days for leave is a system that allows the accumulation of up to a certain number of days from annual paid vacation days for leave that are unused at the end of the fiscal year. The reasons allowed for the use of accumulated vacation days for leave are limited, but use restrictions have been relaxed for childcare in FY2009, making this system even easier to use.

We expect that this change will provide even more support for fostering the next generation than before.

### Voi<u>ce</u> User Voice

# I enjoyed a trip to Okinawa using Consecutive Vacation Days for Refreshment.

By adding Consecutive Vacation Days for Refreshment to a Saturday and Sunday, I made a four-day weekend and took a trip to Okinawa with my spouse.

We rented a car near Naha Airport and took a scenic drive to Motobu. Encountering a giant whale shark and a manta ray at the Churaumi Aquarium, discovering small colorful tropical fish while snorkeling at Minna Island... just seeing these creatures, I forgot about the passage of time. In Okinawa, the ocean is the best.

It was a refreshing trip.



# Creating Safer and Healthier Workplace



Kawasaki has proclaimed that protecting the safety and health of its employees comes first, and aims to promote the creation of a healthy workplace and foster various activities in safety management and health management to bring this about.

# **Safety Management Activities**

### 1. Continuous Utilization and Improvement of Occupational Safety and Health Management Systems

We are striving to prevent occupational accidents and create comfortable workplace environments by promoting measures for risk assessment in the workplace. Furthermore, we are planning to continuously improve safety and health management systems by improvements based on the results of system audits.

# 2. Continued Execution of KSKY Activities

Since 2002, the execution of KSKY activities is one of our most important policies for safety. The letters of KSKY stand for the first letters of Japanese words meaning "basic rule" for K, "pointing and calling" for S and "predicting danger" for KY. The purpose of these activities is to ensure thorough compliance with basic safety rules and safety checks, enhance sensitivity to danger and toxicity, encourage every employee to willingly participate in safety actions and create a workplace that is able to promote "mutual cautioning" among employees as a standard practice.

### 3. Promoting Education That Simulates Experiences of Danger

Through the use of simulated experiences of danger that engage the senses of sight, hearing and touch, we make employees understand the dangers in their workplaces. In addition, through education such as simulated experiences of danger that enhance sensitivity to danger, we are seeking to raise safety awareness and striving to prevent occupational accidents that are caused by unsafe behaviors.



Facilities for simulated experiences of danger based on 38 unsafe situations

# **Occupational Health Management Activities**

### 1. Providing a Variety of Health Classes

As one of our corporate-wide THP\* efforts, we are holding classes on health, including a class to improve the dietary practices of younger people, a class to improve high blood sugar and a class on dental hygiene, in order to promote health management.

These classes are held for new employees, as well as employees that shows signs of having lifestyle diseases based on the results of regular health diagnoses. \* THP: Total Health Promotion

# 2. Implementation of Stress Checks

During regular health diagnoses, we check the stress level of employees in their daily lives, and industrial physicians interview employees with high stress levels and provide them with individual guidance. Furthermore, this is the second year that we have implemented efforts to improve stress in the workplace using work stress diagnoses, and we have been undertaking efforts related to reforming stressful environments. In addition to these efforts, we began conducting education through E-learning about line-care, self-care and other topics last year.

### 3. Implementation of Fatigue Accumulation Self-diagnosis Checks

We require people who work long hours to conduct Fatigue Accumulation Self-diagnosis Checks. Industrial physicians interview employees with high levels of accumulated fatigue and provide them with individual guidance.



"Health seminar" given by a nutritionist

# Communication with Shareholders and Investors

Besides returning profits to shareholders that are appropriate for our performance, we are proactively making efforts to disclose information to shareholders and investors through briefings and our website.

# **Meeting of Shareholders**

The highest corporate decision-making body for Kawasaki is the Meeting of Shareholders. We believe that this meeting is an important opportunity for communication between our shareholders and the Kawasaki board members.

In order to enable our shareholders to thoroughly consider the important issues that they will decide on at the Meeting of Shareholders, we send out invitation letters at a date that is earlier than what is required by law. Furthermore, for shareholders who are not able to attend the meeting, we have made it possible for them to exercise their voting rights using the Internet and mobile phones.

We explain annual progress and results of our business using images at the site of the Meeting of Shareholders, and we strive to explain the business conditions of the company in a manner that is easy for our shareholders to understand. (You can also see the images used at the Meeting of Shareholders on our website.)

The 186th Ordinary Meeting of Shareholders regarding the fiscal year ended March 2009, was held on June 25, 2009 in the city of Kobe. Approximately 700 shareholders attended and enthusiastically exchanged opinions.



Scene from the 186th Ordinary Meeting of Shareholders

# **Distribution of Dividends**

Our basic dividend policy is to pay stable cash dividends that are appropriate to our performance while giving careful attention to increasing retained earnings to strengthen and expand the KHI Group's management base in preparation for our future growth.

For FY2008 (fiscal year ended March 2009), we paid an annual cash dividend of three yen per share.

# Change of Net Income (Consolidated Basis) and Annual Dividends per Share

|            | FY2004 | FY2005 | FY2006 | FY2007 | FY2008 |
|------------|--------|--------|--------|--------|--------|
| Net income | ¥7.92  | ¥11.20 | ¥18.94 | ¥21.08 | ¥7.02  |
| Dividend   | ¥2.50  | ¥3.00  | ¥5.00  | ¥5.00  | ¥3.00  |

# **IR Efforts (Information Disclosure)**

We endeavor to disclose information on our business performance in a fair and prompt manner through constructive approaches to investor relations (IR) around the world.

For institutional investors and analysts, we hold interim and end-of-year financial performance briefings and one-on-one meetings. Corporate representatives visit institutional investors outside Japan to explain recent business performance and other critical information.

In addition, our website has a section entitled "Investor Relations" with pages for shareholders and investors. These pages include information on our business outlook, our recent business performance, our management policies, our historical financial results by business segment, every type of accounting document and presentation materials distributed at interim and end-of-year financial performance briefings.

Moreover, at the end of June and in the beginning of December, we send our shareholders a "BUSINESS REPORT" to report our business situation.





For more details see Kawasaki Heavy Industries "Financial Highlights" at http://www.khi.co.jp/annual/ english/highlight/index.html

# Toward Coexisting with Society and People



As a member of society, we seek to contribute to the growth and well-being of local communities.

We are determined to fulfill our social responsibility as a corporate citizen by promoting coexistence with local communities.

#### Efforts at Our Aerospace Company Sharing Our Products and Our Values

Our Gifu Works, which is a manufacturing plant for aircraft, is in Kakamigahara, Gifu Prefecture. This city is known as "an aircraft industry and aviation testing town," and it is home to the Kakamigahara Aerospace Science Museum, which was established "because the city wants to convey to future generations the story of the challenges that Japan's aerospace

engineers have taken on and the products of their endeavors." The Kawasaki Heavy Industries Aerospace Company has donated a prototype of the BK117, which was the first helicopter produced in Japan, as well as a variety of development parts to this museum.

In addition to displaying a variety of aircraft, the Kakamigahara Aerospace Science Museum offers hands-on events as well as classes on manufacturing for families, especially those with children who are in elementary and junior high schools. Employees and retired employees of our Aerospace Company also support the museum by volunteering. By assisting with conducting and leading events, they are spreading understanding about the aerospace industry and the pleasure of manufacturing.



BK117 helicopter parked at our Gifu Works

#### **Efforts at Our Harima Works** Sharing the Resources of the Plant Location

Our Harima Works, which is located in the central southern part of Hyogo Prefecture, is on an artificial island called "Harima Niijima." With the slogan, "From underground to outer space," we manufacture tunnel boring machines, tanks for liquefied natural gas and other large-scale products, railroad rolling stock bogies, propulsion engines for ships, and rocket parts at this seaside industrial complex.

In order to engage in the manufacture of large-scale products, our Harima Works occupies a spacious 450,000 m<sup>2</sup> property and has a long wharf for sea transport. The Harima Road Race, a running event, is held annually in the town of

Harima where the plant is located. The running course through Harima Niijima with its views of the Akashi-Kaikyo Bridge is popular and every year numerous participants join the race.

We provide access to a road through the Harima Works for this race, and about 3 km of the 10 km course passes through our property. In addition, we participate as event committee members, and we provide Kawasaki goods and other prizes to participants in the family division. Furthermore, among our other efforts to promote coexistence with the community, we also contribute to a fund for the installation of outdoor lights in the community, as well as support and participate in the Harima town summer festival.



Athletes running in front of our Harima Works

#### Inviting Members of the Community to Ship Launching Efforts at Kawasaki Shipbuilding Ceremonies

At the Kobe Shipyard of Kawasaki Shipbuilding Corporation, we build many ships of a variety of types every year. We invite numerous citizens to the naming and launching ceremonies for these ships. Guests include kindergartners as well as

elementary and junior high school students from the neighborhood, business partners and the families of Kawasaki employees, and sometimes up to 3,000 people observe these events.

There are many fans who come repeatedly to these ship launching ceremonies, which are especially impressive conclusions to the shipbuilding process. Furthermore, there are also many people who bring along small children. The ceremonies that unfold before the eyes of these small observers must remain deeply in their hearts.

The employees of the shipyard are proud of their products and their craftsmanship, and sharing this wonder with the numerous ordinary people witnessing gives them an added sense of joy.



Ordinary citizens have been invited to this launching ceremony

#### Supporting and Participating in a Efforts by Kawasaki Plant Systems "Collaborative Forest Restoration" Project

Kawasaki Plant Systems, Ltd., together with Kawasaki Heavy Industries, Ltd., has supported a "collaborative forest restoration" project that is being promoted by Kochi Prefecture and the town of Niyodogawa-cho.

In this project, which is one part of an environmental conservation project advanced by Kochi Prefecture, for a three-year period starting from 2007, corporations, communities and local governments are cooperating in efforts to restore forests that have not been cared for due to the decline of the forestry industry.

Moreover, the forest that is the focus of the collaborative project in which Kawasaki Plant Systems is involved is one part of a forest owned by the town of Niyodogawa-cho. We have named this forest the Kawasaki-Niyodogawa Manabi-no-Mori (forest for learning). In the town of Niyodogawa-cho, people are using the wood from forest thinning and timber scraps from forested region (including Kawasaki-Nivodogawa Manabi-no-Mori) as fuel. In addition to generating

electricity and providing heat, they are advancing an experimental project sponsored by the New Energy and Industrial Technology Development Organization (NEDO) to produce pellets as an alternative fuel for use instead of heavy oil. We are also participating in this experimental project by supplying the Woody Biomass Fluidized-Bed Gasification Power Generation System that Kawasaki Plant Systems has developed.

During this project, we sent newly hired employees to this "collaborative forest" to experience the actual work of forest thinning. 13 newly hired employees participated in 2007, 10 in 2008 and 29 in 2009. Through interaction with the local people, they have also gained valuable experiences that could not be had within the company.



New employees participating in forest restoration

### Efforts at Our Corporate Museum

### Deepening Communication with the Community at Kawasaki Good Times World

In May 2006, we opened Kawasaki Good Times World, our corporate museum. The goal of this museum is to allow as many people as possible to experience the "wonders of technology" and the "importance of craftsmanship." We also established this facility in order to deepen communication with members of the community. Starting with our history that is over 100 years long and accurately showing changes through the eras, we introduce our representative products for the land, sea and air that have contributed to the development of society with our leading-edge technology. Moreover, the museum also holds various events and other programs as a part of our efforts to communicate with the local community.



Kawasaki products that have contributed to the development of society on display at Kawasaki Good Times World

### Sightseeing Flights Through the Skies of Kobe by Helicopter

In July 2009, we held a Helicopter Festa. About 700 museum visitors, including people who had made reservations in advance, enjoyed a five-minute trip above the port of Kobe during free flights to experience Kawasaki BK117 helicopters. In addition to using video and panels to introduce the helicopters in a variety of situations where they are used effectively, we also exhibited helicopter blades and instruments. Furthermore, we also held a special program of making flying paper propellers.

### Running a Mini SL That Makes a Big Impression

In July 2009, we also held a Mini Railroad Festa in Kobe Meriken Park. Model trains, including familiar commuter trains and steam trains that run on real coal, were run through Meriken Park, and about 2,000 museum visitors had rides. They enjoyed the realism of the steam train because coal was fed into the boiler and a steam whistle was sounded as it was running.



The Helicopter Festa held in front of Kawasaki Good Times World



A Mini SL running through Kobe Meriken Park

### Participation in a "Corporate Forest Restoration" Project

### What Is a "Corporate Forest Restoration" Project?

As a corporation that declares contribution to the global environment in our Group Mission, we seek to advance coexistence with local communities and contribute to the prevention of global warming. In December 2008, Kawasaki participated in a corporate forest restoration project promoted by Hyogo Prefecture.

Corporate forest restoration projects are one aspect of efforts to promote forest restoration that the citizenry of Hyogo Prefecture is participating in as a whole. This is an effort that corporations, communities and local governments are pursuing cooperatively. For the next five years, we will plant trees, clear undergrowth, thin forest, and conduct environmental education for employees at a forest of approximately 140,000 m<sup>2</sup> located in Taka-cho, Hyogo Prefecture. We have named this forest the Kawasaki Heavy Industries Saidani Nagomi-no-Mori. Through these efforts, we will also contribute to reducing CO<sub>2</sub> emissions.

### The Start of Forest Restoration Efforts in Kawasaki Heavy Industries Saidani Nagomi-no-Mori



Agreement signing ceremony: from the right, Mayor Toda of Taka-cho, Governor Ido of Hyogo Prefecture, Kawasaki Vice President Matsuzaki (at the time of the photograph)

(The amount of reduction is equivalent to the CO<sub>2</sub> absorbed by 8,000 trees in a plantation forest\*.) \* Calculated using materials presented by the Forestry Agency

### **First Forest Restoration Efforts**

We conducted our first forest restoration efforts on April 12, 2009. As they perspired with their labor, employees and their family members, numbering about 80 people in total, had the opportunity to "experience" forest restoration efforts including tree planting and trimming.

After listening to a lecture on the topic of "the status of efforts to conserve the forest in Taka-cho," families who had brought children, about 20 people, planted mountain maples. Meanwhile, the other 60 or so participants trimmed Japanese andromeda and other evergreens in an effort to create a forest with more sunlight.

Our employees will continue to work to restore the forest, undertaking forest restoration efforts in our "Nagomi-no-Mori" at a pace of about two times per year.



Planting a mountain maple by the side of a stream



Participants in our first forest restoration efforts

# We Also Conducted Forest Restoration Training Activities for Our New Employees

On April 24, following our first forest restoration efforts, the new employees assigned to our Corporate Technology Division this year participated in forest restoration training activities in the Saidani Nagomi-no-Mori.

They listened to a lecture on efforts to conserve the forest and were made aware of the current situation and issues, then they experienced forest restoration activities by undertaking forest thinning work.



Forest restoration training activities by new employees

# Promotion of Environmental Management

While seeking harmony with the global environment, the Kawasaki Group is advancing its environmental management for the purpose of forming a future society that is even more abundant and beautiful.

### **Furthering "Environmental** Management" under the Medium-Term **Business Plan "Global K"**

In 2003, Kawasaki established the 2010 Environmental Vision: "What Kawasaki Should Be in the Year 2010" as guidelines for seeking the improvement of environmental management. In pursuit of this vision, we undertake environmental activities under our Environmental Management Activities Plan, which is set with specific details every three years.

In our 6th Environmental Management Activities Plan, which began in FY2008, we describe the promotion of environmental management that increases the

confidence of society in the entire Kawasaki Group. Moreover, in order to further promote environmental management based on our medium-term business plan "Global K" with the goal of achieving our vision of "What Kawasaki Should Be in the Year 2010," we have incorporated policies related to the reduction of greenhouse gas emissions and the minimization of environmental risks into our business plan, and we have built a system that allows follow-up with effective efforts.

FY2010, which is the target year of our 2010 Environmental Vision, is drawing very close. In FY2009, in addition to keeping this system on a stable track, we want to begin preparing a new 2020 Environmental Vision (What Kawasaki Should Be in the Year 2020).

### The 2010 Environmental Vision: "What Kawasaki Should Be in the Year 2010" (excerpts)

| Environmental<br>Philosophy             | Contribute to the realization of a sustainable society  |
|---|---|
| Environmental<br>Management             | Create an Environmental Management System (EMS)   |
| Environmentally<br>Conscious Products   | Offer products that protect the environment   |
| Environmentally<br>Conscious Production | <ul> <li>Reduce the average amount of CO<sub>2</sub> emissions for FY2008–2012 by 6% relative to the FY1990 level</li> <li>Reduce the amount of waste production by FY2010 by 10% relative to the FY2000 level</li> <li>Achieve zero waste emissions at all plants</li> </ul> |
| Environmental<br>Communication          | Conduct in-house environmental education and contribute to improving community environments   |

### **Environmental Charter Environmental Philosophy**

(Established in 1999)

As a company in key industries related to land, sea and air, Kawasaki is deploying its business activities globally in pursuit of reducing environmental impact and creating a sustainable society. This makes us commit ourselves to contribute to the sustainable development of society through our environmentally conscious business activities, technologies and products that preserve the global environment.

### **Conduct Guidelines**

- 1. Recognizing that global environmental protection is a common and serious issue for humankind, Kawasaki will positively volunteer to engage itself in harmonizing with the environment globally. We shall regard this as one of the most important strategies when we deploy our business activities.
- 2. During its production stages, Kawasaki will endeavor to conserve resources, to save energy, to recycle resources and to reduce industrial waste and will promote the reduction of environmental impact.
- 3. In the new product planning (i.e. research and development) and designing stages, Kawasaki will render careful attention throughout the procurement, production, distribution, utilization and material disposal stages in order to minimize the environmental impact.
- 4. In seeking solutions to global environmental issues, Kawasaki will do its best to develop and provide new technologies and new products that contribute to environmental protection, energy saving and resource conservation.
- 5. Notwithstanding its compliance with environmentally related institutional laws, regulations and agreements and voluntary action plans of each industry concerned, Kawasaki will voluntarily institute its own environmental control standards as an appropriate and necessary action in order to strive to improve environmental control levels
- 6. Through environmental training and public awareness activities, Kawasaki will strive to enlighten all its employees on global environmental issues and will support individual views, lifestyles and will encourage their participation in the social activities and services
- 7. Kawasaki will implement an environmental management system to promote environmental preservation and conservation, and hold regular conferences to review management systems and maintain continual improvement.

### Toward the Realization of the Social Mission of Our Corporation

Two years have passed since the beginning of the First Commitment Period (2008–2012) of the Kyoto Protocol, and opportunities are increasing at an international level for reducing greenhouse gas emissions to prevent global warming. Moreover, in September this year, the Japanese government set a medium-term reduction goal of "a 2020 target to reduce emissions by 25% compared to 1990," which is more ambitious than the reduction plan of the Kyoto Protocol.

We recognize that the reduction of greenhouse gas emissions is an important management issue for our Group. Our fundamental stance as a corporation is to create products with outstanding energy efficiency that customers can safely use for a long time with peace of mind. Our fundamental stance itself, which is the practice of realizing contribution to society based on manufacturing, ultimately results in efforts to prevent global warming and conserve resources.

Last year, we independently set "reducing our average amount of  $CO_2$  emissions per net sales basic unit for FY2008–2012 by 10% compared to FY2007" as a new target for the entire Group, and we are strengthening our efforts to reduce greenhouse gas emissions in our production processes. At the same time, we are also participating in the emissions trading system that is being conducted on an experimental basis by Japan, and we consider this system one of our measures that can be implemented in order to realize new reduction targets.



Seiji Yamashita Chief Environmental Officer General Manager of CSR Div. Executive Officer

In February this year, we discovered the fact that the nitrogen oxide in gas emitted from the in-house power generation systems at one of our plants exceeded the standard levels of environmental laws and regulations as well as local agreements. We reported this immediately to the government and took countermeasures to prevent recurrence. In addition, for the purpose of reducing environmental risks at all our Group plants, we have conducted thorough on-site investigations into the status of their compliance with environmental laws and regulations.

In order to implement the social mission of our Group, which is to be "Kawasaki, working as one for the good of the planet," we will continue to make efforts with environmental management as an important theme, and contribute to the resolution of global environmental problems through the business of our corporation.



### **Environmental Management System**

\*Three main subsidiaries: Kawasaki Shipbuilding Corporation, Kawasaki Precision Machinery Ltd. and Kawasaki Plant Systems, Ltd.

# Efforts for the Reduction of Greenhouse Gas Emissions

In addition to reducing greenhouse gas emissions by providing products and technologies that contribute to the realization of a low-carbon society\*, the Kawasaki Group is strengthening its independent efforts to reduce the greenhouse gas emissions that result from our production activities.

### **Global Warming Countermeasures**

### 1. Revision of Target Setting

Our Group is comprised of very different types of business units, including built-to-order manufacturing and mass production businesses. For this, the greenhouse gases emitted by our production activities tend to fluctuate widely due to the changing volume of orders and the varying pace of operations. In consideration of these types of conditions, we believe that in our efforts to reduce greenhouse gas emissions setting targets based on basic units is appropriate in order to improve CO<sub>2</sub>/energy efficiency, and we have revised our reduction target accordingly.

#### CO<sub>2</sub> Reduction Target

Reduce the CO<sub>2</sub> emissions basic unit with net sales as the denominator by an average of 10% for FY2008-2012 compared to FY2007.

### 2. Strengthening Our CO<sub>2</sub> Reduction Efforts

#### (1) Companywide CO<sub>2</sub> emissions reduction projects

We have achieved a certain level of results in the reduction of greenhouse gas emissions from our production activities through conversion to energy-saving equipment. In order to realize further reductions, the establishment of analytical methods and the strengthening of our systems to execute companywide reduction efforts were necessary. For this purpose, we began reinspecting the energy consumption of plants companywide from the previous fiscal year, and started a companywide CO2 emissions reduction project to investigate CO2 emissions reduction factors.



We are decreasing CO<sub>2</sub> emissions throughout the entire lifecycles of products

The Kawasaki Group undertakes production activities in a wide variety of business areas, ranging from shipbuilding businesses that conduct built-to-order manufacturing to businesses that manufacture mass-produced goods. Thus, comparison of the energy saving efforts that are undertaken in our various business activities using the same standards is difficult, so we have introduced detailed basic unit management methods that are suitable for each form of business. As we visualize the causes of basic unit fluctuation and clarify points for possible improvements, we will also continue to investigate measures to reduce CO2 emissions that can be implemented in the same manner even when business forms differ, and we will realize optimal measures for the Group as a whole.

### (2) Promoting the introduction of photovoltaic systems

We are positively considering and advancing investments in equipment that contributes to reducing greenhouse gas emissions from a companywide perspective. As a rule, we are installing photovoltaic power generation equipment when constructing new plants.



Photovoltaic systems at the Kawasaki Precision Machinery main plant (core parts plant)

#### (3) Rebuilding our energy management system

With the revision of the Law Regarding the Rationalization of Energy Use, we have rebuilt our in-house energy management system, and have arranged a system for the smooth implementation of companywide CO<sub>2</sub> emissions reduction projects. Along with our efforts to follow up the effectiveness of investment in energy saving equipment that is incorporated in our business plan starting in the previous fiscal year, our Group as a whole is making efforts to reduce greenhouse gas emissions.

\* Low-carbon society: this is an ideal society that has greenhouse gas emissions no greater than the amount that can be absorbed by nature.

# Material Balance of Business Activities and **Environmental Accounting**

lan

In the manufacture of various products, we are making efforts to reduce the amounts of the raw materials, energy and water that we use, as well as reduce the emissions of substances that are harmful to the environment.

# Summary of Environmental Impact in FY2008



# **Environmental Accounting Calculations for FY2008**

These data were compiled in accordance to the Environmental Accounting Guideline released by the Ministry of the Environment. Coverage: Kawasaki Heavy Industries, Ltd., and our three main subsidiaries.\* Period: April 1, 2008 to March 31, 2009 Millions of Yen

|   | Item                      |                               | Environmental<br>Investments | Environmental<br>Costs | Economic<br>Effects                         |   | Item  | Total      |                              |  |                             |                      |
|---|---------------------------|-------------------------------|------------------------------|------------------------|---|---|---|------------|------------------------------|--|-----------------------------|----------------------|
|   | Olahal                    |                               | Clobal warming provention    |                        |   |   | 000   | 2.245      | Reduction of<br>energy costs |  | Total investments in FY2008 | 57,588 <sup>*3</sup> |
|   | Giobai wai                | ming prevention               | 860                          | 2,215                  | 231   |   | Total B&D costs in EV2008   | 36 739*4   |                              |  |                             |                      |
|   | Efficient us              | e of resources                | 44                           | 170                    | Reduction of<br>materials costs             |   | 101411140 00313111112000  | 50,755     |                              |  |                             |                      |
|   |                           |                               |                              | 170                    | 50  |   |   |            |                              |  |                             |                      |
| Business<br>area costs                  | Resource                  | Resource recycling activities | 11                           | 882                    | Income<br>from recycling                    |   | Item  | Proportion |                              |  |                             |                      |
|   | activities                | Waste disposal costs          | 11                           | 192                    | Reduction of waste<br>disposal costs<br>118 | - | (Environmental investments <sup>*2</sup> /<br>Total investments <sup>*3</sup> ) | 4%         |                              |  |                             |                      |
|   | Environme                 | ntal risk control             | 698                          | 1,034                  | _   |   | Percentage of R&D costs   |            |                              |  |                             |                      |
|   | Subtotal                  |                               | 1,625                        | 4,501                  | 2,195                                       |   | (Environmental R&D costs*1/   | 14%        |                              |  |                             |                      |
|   | Compariso                 | ns w/ previous FY             | 183%                         | 106%                   | 81%   |   | Total R&D costs <sup>*4</sup> )   |            |                              |  |                             |                      |
| Upstream/d                              | lownstream o              | costs                         | 397                          | 3,783                  | 0   |   |   |            |                              |  |                             |                      |
| Manageme                                | Management activity costs |                               | 6                            | 473                    |   |   |   |            |                              |  |                             |                      |
| R&D costs                               |                           | 151                           | 5,174 * <sup>1</sup>         |                        | Ī   |   |   |            |                              |  |                             |                      |
| Social activity costs                   |                           | 41                            | 186                          |                        |   |   |   |            |                              |  |                             |                      |
| Environmental damage compensation costs |                           | 47                            | 73                           |                        |   |   |   |            |                              |  |                             |                      |
| Total                                   |                           | 2,266 <sup>*2</sup>           | 14,191                       | 2,195                  |   |   |   |            |                              |  |                             |                      |
| Con                                     | nparisons w/              | previous FY                   | 137%                         | 108%                   | 81%   |   |   |            |                              |  |                             |                      |

Environmental Responsibility

\* Three main subsidiaries: Kawasaki Shipbuilding Corporation, Kawasaki Precision Machinery Ltd. and Kawasaki Plant Systems, Ltd.

# Achievements and Appraisal of Environmental Management Activities

We have been making efforts based on our 2010 Environmental Vision, which was established in 2003 with the aim of realizing "What Kawasaki Should Be in the Year 2010." Currently, we are in the process of executing a three-year basic plan for 2008–2010. Timed along with the preparation of a new medium-term business plan for the Kawasaki Group as a whole, we have also begun creating a new 2020 Environmental Vision that, inheriting the spirit of the present 2010 Environmental Vision, defines "What Kawasaki Should Be in the Year 2020." We will determine policies during FY2009, and we are in the process of work that we will explain in next year's environmental report.



# Main achievements of FY2008

- (1) We made arrangements for the purpose of reducing CO<sub>2</sub> emissions (participation in a Japanese emissions trading system).
- (2) We almost completed the target of companywide development of environmental management systems, and we raised our management to a level that is able to implement continuous reform.
- (3) We undertook a variety of efforts for the realization of contribution to society through our products and technologies.

| Environmental<br>Management                | <ol> <li>Implemented energy saving diagnoses and set basic unit per net sales</li> <li>Reduced latent risks through our environment-related equipment plan</li> </ol>           |
|--|---|
| Environmentally<br>Conscious Products      | 1) Evaluated the reduction of environmental impacts at the stage of product use   |
| Environmentally<br>Conscious<br>Production | <ol> <li>Created waste emissions basic unit per net sales</li> <li>Prepared a plan for the reduction of VOCs and heavy metals (hexavalent chromium and lead)</li> </ol>         |
| Environmental<br>Communication             | <ol> <li>Executed E-learning for Kawasaki and three main subsidiaries</li> <li>Held a stakeholder meeting about our Report - Environmental and Social Responsibility</li> </ol> |

# **Priority Initiatives for FY2009**

Prepare a new 2020 Environmental Vision (FY2010-2020) and set new environmental targets for FY2012

| Environmental<br>Management                | <ol> <li>Strengthen independent CO<sub>2</sub> emissions reduction efforts</li> <li>Make efforts for thorough compliance with environmental laws and regulations</li> </ol>              |
|--|--|
| Environmentally<br>Conscious Products      | 1) Investigate methods to evaluate environmental impacts during the lifecycles of our main products  |
| Environmentally<br>Conscious<br>Production | <ol> <li>Reduce waste emissions using basic unit per net sales</li> <li>Reduce VOCs by 20%, reduce hexavalent chromium and lead by 45%, and reduce<br/>dichloromethane by 35%</li> </ol> |
| Environmental<br>Communication             | <ol> <li>Expand environmental E-learning to our subsidiaries</li> <li>Participate in Hyogo Prefecture's "corporate forest restoration project" efforts</li> </ol>                        |

# Three-year plan (FY2008-2010)

#### Environmental Management Promotion of environmental management to increase the social trust of the Kawasaki Group

### 1. Follow-up incorporated in the business plan of the Kawasaki Group

- 1) Make efforts to reduce greenhouse gas emissions
- 2) Reduce latent risks through environment-related equipment plan

### 2. Environmental risk management

- 1) Conduct environmental conservation activities and risk management based on EMS
- 2) Undertake risk management through review of risks in production and environmental equipment
- 3) Establish environmental risk management systems
- 4) Thoroughly comply with environmental laws, regulations, agreements, etc.

#### Environmentally Conscious Products Contribute to the sustainable development of society through technologies and products conducive to environmental impact alleviation

- 1) Evaluate reduction of environmental impacts (CO2, SOx, NOx, etc.) in product lifecycles
- 2) Expand provision of green products Determine design and procurement guidelines to improve green procurement level in product composition

#### Environmentally Conscious Production Efforts to reduce environmental impacts with production activities that consider the production efficiency

- 1) Make efforts to reduce waste
- 2) Reduce quantity of hazardous chemicals handled toward FY2010 target

### Environmental Communication Efforts to improve mutual trust with stakeholders

- 1) Conduct internal environmental education and awareness-raising efforts
- 2) Disclose information to stakeholders
- 3) Actively cooperate in community environmental activities

# **Environmental Management Activities**

We are striving to build an environmental management system (EMS) for the entire Kawasaki Group. In order to prevent environmental trouble from occurring, we are also making efforts to implement environmental risk management and employee education on the environment.

# **Further Development of EMS**

All the production bases of Kawasaki Heavy Industries and our three main subsidiaries<sup>\*</sup> in Japan have acquired ISO14001 certification. Now, we are promoting the development of EMS at our subsidiaries in Japan and abroad.

Among our subsidiaries in Japan, for example, Alna Yusoki-Yohin Co., Ltd. received ISO 14001 certification, and 41 of 49 of these companies had completed the establishment of an environmental management system by FY2008.

Of the 12 overseas companies where we are seeking to develop EMS, one more company, KMM Maryville, completed EMS development in FY2007. For the remaining six companies that do not yet have an EMS, based on local laws and regulations, we will clarify objectives according to business conditions and scale and set timeframes and otherwise implement incremental efforts for EMS development.

\* Three main subsidiaries: Kawasaki Shipbuilding Corporation, Kawasaki Precision Machinery Ltd. and Kawasaki Plant Systems, Ltd.

# **EMS Establishment Lists**

Kawasaki Heavy Industries/Three main subsidiaries

|                           | Internal Company                                   |  | Date<br>acquired | Registration |
|---------------------------|--|--|------------------|--------------|
| S                         | Rolling Stock Company                              |  | 2002             | LRQA         |
| ki<br>strie               | Aerospace Company                                  |  | 2002             | BSK          |
| asa                       | Gas Turbine &                                      | Gas Turbine Division                     | 2000             | LRQA         |
| y lr                      | Company  | Machinery Division                       | 2000             | NK           |
| leav <sub>k</sub>         | Consumer Products & I                              | Machinery Company (including Robot Div.) | 2000             | DNV          |
| ±                         | Industrial Facilities and Tunneling Equipment Div. |  | 1999             | JICQA        |
| es li                     | Kawasaki<br>Shiphuilding                           | Kobe Works                               | 2002             | DNV          |
| liari                     | Corporation  | Sakaide Works                            | 2000             | DNV          |
| iree<br>bsic              | Kawasaki Precision Machinery Ltd.                  |  | 1998             | DNV          |
| E 🗟 Kawasaki Plant System |  | ystems, Ltd.                             | 2001             | NK           |

LRQA: Lloyd's Register Quality Assurance, JICQA: JIC Quality Assurance, NK: Nippon Kaiji Kyokai (ClassNK), BSK: Bouei Choutatsu Kiban Seibi Kyoukai (Defense Procurement Framework Establishment Association of Japan), DNV: Det Norske Veritas

### Subsidiaries in Japan

| Oversight organization | Company                       | Establishment<br>level | Date of<br>establishment |
|------------------------|-------------------------------|------------------------|--------------------------|
|                        | Kawaju Tokyo Service Corp.    | 3                      | 2009                     |
|                        | Kawasaki Trading Co., Ltd.    | 1                      | 2004                     |
|                        | Kawaju Service Co., Ltd.      | 1                      | 2000                     |
| Head                   | Kawaju Techno Service Corp.   | 3                      | 2005                     |
| office                 | Kawasaki Life Corporation     | 2                      | 2006                     |
|                        | Kawasaki Hydromechanics Corp. | 1                      | 2007                     |
|                        | K Career Partners Corp.       | 2                      | 2007                     |
|                        | Benic Solution Corp.          | 2                      | 2006                     |

| organization          | Company                                     | Establishment<br>level | Date of establishment |
|-----------------------|---|------------------------|-----------------------|
| Head                  | Kawasaki Machine Systems, Ltd.              | 1                      | 2000                  |
| office                | KCM Corporation                             | 1                      | 2000                  |
|                       | Alna Yusoki-Yohin Co., Ltd.                 | 1                      | 2008                  |
|                       | EarthTechnica M&S Co., Ltd.                 | 1                      | 2000                  |
|                       | Kawasaki Rolling Stock Component Co., Ltd.  | 1                      | 2002                  |
|                       | Kawasaki Rolling Stock Technology Co., Ltd. | 1                      | 2002                  |
| Rolling<br>Stock      | Kansai Engineering Co., Ltd.                | 3                      | 2002                  |
| otoott                | Kawajyu Hyogo Service Co., Ltd.             | 3                      | 2002                  |
|                       | EarthTechnica Co., Ltd.                     | 1                      | 2000                  |
|                       | Nichijo Manufacturing Co., Ltd.             | 3                      | 2005                  |
|                       | Nisseki Service Consultant Co., Ltd.        | 2                      | 2005                  |
| Industrial Facilities | Kawajyu Steel Work & Engineering Co., Ltd.  | 3                      | 2006                  |
| Equipment             | Kawaju Facilitech Co., Ltd.                 | 2                      | 2007                  |
|                       | Kawaju Gifu Engineering Co., Ltd.           | 1                      | 2002                  |
| Aerospace             | Kawaju Gifu Service Co., Ltd.               | 1                      | 2002                  |
| Aerospace             | KGM (Kawaju Gifu Manufacturing) Co., Ltd.   | 1                      | 2002                  |
|                       | NIPPI Corporation                           | 1                      | 2006                  |
| Gao Turbino           | Kawaju Akashi Engineering Co., Ltd.         | 1                      | 2000                  |
| Gas Turbine           | Kawasaki Thermal Engineering Co., Ltd.      | 1                      | 2002                  |
| Machinary             | Kawasaki Prime Mover Engineering Co., Ltd.  | 1                      | 2002                  |
| Machinery             | Kawasaki Naval Engine Service, Ltd.         | 1                      | 2002                  |
|                       | K-GES Co., Ltd.                             | 1                      | 2006                  |
| Consumer              | Kawasaki Oita Manufacturing Co., Ltd.       | 3                      | 2008                  |
| Machinery             | Kawasaki Motors Corporation Japan           | 1                      | 2008                  |
|                       | Union Precision Die Co., Ltd.               | 1                      | 2006                  |
|                       | Akashi Ship Model Basin Co., Ltd.           | 3                      | 2008                  |
|                       | Kawasaki Techno Wave Co., Ltd.              | 1                      | 2000                  |
| Kawasaki              | Kawaju Kobe Support Co., Ltd.               | 2                      | 2005                  |
| Corporation           | Kawaju Marine Engineering Co., Ltd.         | 1                      | 2008                  |
|                       | KHI JPS Co., Ltd.                           | 3                      | 2008                  |
|                       | Kawasaki Shipbuilding Inspection Co., Ltd.  | 2                      | 2008                  |
| Kawasaki              | KEE Environmental Construction, Co. Ltd.    | 1                      | 2003                  |
| Systems               | KEE Environmental Service, Ltd.             | 1                      | 2002                  |

For our subsidiaries in Japan, we are promoting the establishment of EMS using three levels that we have set based on real conditions, in consideration of their characteristics including business contents, production activity scales and product features.

Level 1 Acquire ISO 14001 Level 2 Acquire simplified EMS certification

### Subsidiaries Overseas

certification or its equivalent

| Oversight organization                  | Company  | Date<br>acquired | Registration |
|---|--|------------------|--------------|
| Consumer<br>Products &                  | Kawasaki Motors Manufacturing Corp.<br>Lincoln Plant (U.S.A.)          | 2003             | DNV          |
| Machinery                               | ry Kawasaki Motors Manufacturing Corp. 200<br>Maryville Plant (U.S.A.) |                  | DNV          |
| Robot                                   | Kawasaki Robotics, Inc.<br>(U.S.A.)                                    | 2006             | DNV          |
| Kawasaki<br>Shipbuilding<br>Corporation | Nantong Cosco KHI Ship<br>Engineering Co., Ltd. (China)                | 2003             | DNV          |
|   | Kawasaki Precision<br>Machinery (UK) Ltd. (U.K.)                       | 2001             | LRQA         |
| KPM                                     | Flutek, Ltd. (South Korea)   | 2005             | KMA          |
|   | Kawasaki Precision Machinery<br>(Suzhou) Ltd. (China)                  | 2007             | BSI          |

DNV: Det Norske Veritas, LRQA: Lloyd's Register Quality Assurance, KMA: KMA R&A Inc., BSI: British Standards Institution

Level 3 Self-declaration of EMS establishment

# **Compliance with Laws & Regulations**

Violations and Accidents during the Past 5 Years

| FY                                | 2004 | 2005 | 2006 | 2007 | 2008 |
|-----------------------------------|------|------|------|------|------|
| Judicial/Administrative Penalties | 0    | 1    | 0    | 0    | 0    |
| Administrative Measures           | 0    | 1    | 0    | 0    | 1    |
| Administrative Warnings           | 0    | 0    | 6    | 4    | 3    |

Judicial/Administrative Penalties: Punishment by judicial or administrative authorities

Administrative Measures: Receiving instructions for improvements, etc. in written form

Administrative Warnings: Receiving verbal directives concerning business practices

#### Administrative Measures

 Nitrogen oxide emissions from gas turbine power generation systems exceeded laws and regulations as well as environmental conservation agreements (Akashi Works)

### Administrative Warnings

N-hexane extract substances exceeded wastewater standards (Hyogo Works: 2 instances)

Amount of wastewater and phosphorus concentration exceeded reported values (Akashi Works)

### **Risk Management**

# Responding to the administrative measures for exceeding nitrogen oxide emission standards

Our Akashi Works received a written remonstrance from Hyogo Prefecture for exceeding the nitrogen oxide emission standards of the Air Pollution Control Law and environmental conservation agreements.

We exceeded standards even as we were seeking to further advance our efforts for pollution prevention. In order to assure that it never occurs again, we established an investigation committee that included outside experts and other third-party members. This committee examined the causes and deliberated countermeasures to prevent recurrence. In addition, we established a companywide committee to investigate the status of compliance with environmental laws and regulations. They conducted on-site inspections of every company plant and promoted recurrence prevention countermeasures simultaneously throughout the company.

We will continue to strive to make our compliance with laws and regulations even more certain by implementing these countermeasures to prevent recurrence of such an incident.

### **Education**

#### **E-learning**

In recognition of the global scale of environmental problems, we are clarifying the purposes of the efforts that we make for the environment during the conduct of our company business, along with contents about undertaking business activities and the manufacture of products that are better for the environment and other organizational efforts. In addition, we are also placing emphasis on contents that make employees understand the importance of conducting themselves with consideration for the environment during their individual work activities. We had every employee possible, from the chairman, the president and other managers to temporary workers, participate in this computer-based education program. During FY2008, we provided this education to about 12,000 employees of Kawasaki Heavy Industries and our three main subsidiaries, achieving a participation rate of 96%.

### Raising awareness about the environment

We are conducting publicity activities with the goal of raising the environmental awareness of every individual employee. We are conducting these awareness-raising activities continuously to promote conduct that is considerate of the environment not only in the workplace, but also in local communities and households.







"Message from the President" about environmental management

n the Environmental News out (released 4 times a year)

"Eco Mind" in our Group magazine Kawasaki (released 5 times a year)

#### **Cultivation of Qualified Managers**

In order to enhance our environmental management efforts, we are also focusing on the cultivation of individuals who have legal qualifications required by laws and regulations related to the environment.

| Number of Qualified<br>Pollution Control Managers |     |  |
|---|-----|--|
| Air   | 75  |  |
| Water   | 81  |  |
| Noise, Vibration                                  | 53  |  |
| Others  | 24  |  |
| Total   | 233 |  |

 Number of Newly Registered ISO 14001 Auditors (including subsidiaries)



### Number of Qualified Energy Manager

61



# **Contributing to the Environment Through Our Products**

# Consideration for the Environment in Our Products



We believe that one of the pillars of our Mission Statement is to contribute to the environment through our products. By making efforts in design and procurement and implement thorough compliance with laws and regulations, we will continue to promote consideration for the environment in our products in the entire Kawasaki Group.

### Main Efforts of the Kawasaki Group

### **Efforts in Design and Procurement**

#### **Product Assessment**

For newly developed and designed products, as well as for particularly important products, we implement product assessment for resources conservation, energy saving, and recycling with the goal of reducing the environmental impacts of products during their lifecycles.

Main product assessment items

- 1. Product weight reduction
- 2. Product energy saving
- 3. Longer product life
- 4. Product safety and environmental conservation effectiveness
- 5. Measures for product disposal and recycling
- 6. Environmental impacts when problems or other extraordinary circumstances occur
- 7. Provision of information for use and maintenance
- 8. Compliance with regulations

### **Green Procurement**

We are promoting "green procurement" in order to reduce environmental impacts during product lifecycles even at the procurement stage.

The Consumer Products & Machinery Company applies green procurement guidelines to business partners in Japan and abroad, and we request them to identify and manage environmental substances of concern that are contained in procured parts and materials. We also ask these partners to establish their own environmental management systems. For environmental substances of concern, in 2008, we achieved the elimination and reduction targets voluntarily set by the Japan Automobile Manufacturers Association, Inc. (JAMA) for lead, mercury, hexavalent chromium and cadmium. These targets conform to the EU ELV Directive<sup>1</sup>. Moreover, in order to comply with the REACH Regulation<sup>2</sup> and other overseas laws and regulations, we began collecting data on environmental substances of concern designated by GADSL<sup>3</sup>, including substances from our overseas production bases.

<sup>1</sup> ELV Directive: End of Life Vehicles Directive

 $^2\,\text{REACH}$  Regulation: Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals

### **Responding to the ELV Directive, the RoHS Directive**<sup>4</sup> and the **REACH Regulation**

Since 2000, the ELV Directive, the RoHS Directive and the REACH Regulation have strengthened laws and regulations related to chemical substances in the EU. The RoHS Directive covers electrical and electronic equipment, so some of the products made by our Robot Division and Kawasaki Precision Machinery Ltd. have met the directive. The ELV Directive covers automobiles, but excludes motorcycles. The Consumer Products & Machinery Company, however, is participating in the voluntary efforts of JAMA, and Kawasaki Precision Machinery Ltd. is also applying the directive to some of its products.

The REACH Regulation came into force in June 2007, and it applies to all chemical substances manufactured in or imported into the EU. Businesses that manufacture or import chemical substances in quantities of one ton or more are required to register and report those substances. In addition, there are regulations related to evaluation, authorisation, restriction and communication of information, so it is necessary to have a system to determine information about the chemical substances included in our products throughout our entire supply chain.

The Consumer Products & Machinery Company has created the KMDS II<sup>5</sup> system to collect data about environmental substances of concern that we handle.

### Response to REACH in the Consumer Products & Machinery Company



<sup>4</sup> RoHS Directive: Directive on Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment

<sup>5</sup> KMDS II: Kawasaki Material Data System II

<sup>&</sup>lt;sup>3</sup>GADSL: Global Automotive Declarable Substance List

### Efforts for Consumer Products, including Motorcycles and JET SKI® Watercraft

### **Cleaning Exhaust Gas**

In FY2008, continuing from the previous year, we sought to make the exhaust gas of the motorcycles that we sell in Japan cleaner. We began the sales of our ZRX1200 DAEG, which is a large motorcycle model. This model complies with the Japanese motorcycle emission regulations that became much stricter in FY2007. By adopting computerized fuel injection systems, we have made precise control possible throughout the entire rotational range and realized extremely smooth engine characteristics in the rotational range of ordinary use, while obtaining maximum performance at medium and high speeds. In addition to purified exhaust gas this motorcycle has also cleared noise regulations.

Moreover, through the installation of fuel injection systems and other new technologies, we are able to clean exhaust gas, and we are even able to sell motorcycles in Europe that have cleared the motorcycle emission regulations, which became much stricter there in 2006 (EURO-III).



ZRX1200 DAEG

# **Promotion of 3R**

We have been steadily operating an autonomous motorcycle recycling system in cooperation with three other motorcycle manufacturers and 12 importers in Japan. This effort has had no structural trouble related to receiving motorcycles for disposal.

Using this system, which began in October 2004, we have achieved a recycling rate of 87.8% in its 5th fiscal year (April 1, 2008 – March 31, 2009).

Furthermore, for our new models of motorcycles, we are endeavoring to consider Design for Environment, including reducing materials and recycling, from the development phase. We conduct preliminary evaluations of our efforts related to reducing, recycling and reusing

(3R) at the beginning of each of the design, prototyping and mass production stages. In particular, through the use of materials that are easy to recycle, we are seeking to increase recyclability. Calculating the potential recycling rate based on the "Guidelines for the definition of the potential recycling rates of new vehicles and its calculation method (1998 JAMA)," we have achieved a rate of over 90% for every model, with the majority of models scoring over 95%.

### Elimination and Reduction of Environmental Substances of Concern

For new motorcycles sold in Japan, we have already been achieving the voluntary reduction targets established by JAMA since FY2007. In addition, we have also achieved the voluntary reduction targets for older motorcycle models that we have continued selling.

### Japan Automobile Manufacturers Association "Reduction targets for environmental substances of concern" for new vehicles

|   | Substance | Reduction target   |  |
|---|-----------|--|--|
| Lead <sup>1</sup> Use 60 g or less in and after January 2006<br>(for 210 kg weight vehicle)           Mercury         Use prohibited in and after October 2004<br>(Exception for the use of minute quantities<br>that are necessary for traffic safety <sup>2</sup> )           Hexavalent<br>chromium         Use prohibited in and after January 2008 |           | Use 60 g or less in and after January 2006<br>(for 210 kg weight vehicle)  |  |
|   |           | Use prohibited in and after October 2004<br>(Exception for the use of minute quantities in parts<br>that are necessary for traffic safety <sup>2</sup> ) |  |
|   |           | Use prohibited in and after January 2008   |  |
|   | Cadmium   | Use prohibited in and after January 2007   |  |

<sup>1</sup> Used batteries are already recycled and excluded from the target values <sup>2</sup> Combination lamps, discharge headlamps, etc.

For general purpose engines, JET SKI<sup>®</sup> Watercraft, there are no Japanese regulations like the JAMA voluntary reduction targets, but we are making elimination and reduction efforts that follow those applied for motorcycles, and we had achieved voluntary reduction targets for lead, mercury and cadmium by FY2007. Hexavalent chromium had been contained in a very small amount of parts, but through the use of substitutes we completed its elimination in FY2008.

# Contributing to the Environment **Through Our Products**

# **Environmentally Conscious Products**

We believe that reducing the environmental impacts of products that support the foundations of society and industry, including transportationrelated products, industrial plant and equipment, is one of our missions for society. We will continue our efforts to improve environmental performance in the future, through products.

### **Transportation-Related Products**

In the aircraft industry, we are working with leading corporations in Europe and America in the joint development and manufacturing of fuselages and jet engines, and our technologies are receiving high praise worldwide.

In the rolling stock field, we manufacture a wide range of products, including shinkansen bullet trains, express trains, commuter trains, subway trains, freight trains and locomotives. In response to the demand for increased energy efficiency during operation, we are striving to reduce the weight of train cars and decrease their air resistance as well as improve motor efficiency through technological cooperation with customers and the application of our own technologies. Moreover, we are also advancing new technologies, including our next-generation light rail vehicle SWIMO and our Battery Power System (BPS) for Railways.

In our shipbuilding business, starting with LNG carriers and LPG carriers, we are developing and building a variety of products, including container ships, bulk carriers and crude oil tankers. We are also propulsion manufacturing systems. including diesel engines and steam turbine plants for LNG carriers. In response to the demand for increased fuel efficiency, we are working to develop technologies for optimizing hull forms and increasing the efficiency of propulsion systems.

### Preparing for the Mass Production of the Trent 1000, the Most Advanced **Passenger Aircraft Engine**



We have participated in the development of the Rolls-Royce plc (UK) Trent

1000 from the basic design stage. We are responsible for the design, manufacturing and assembly of the intermediate pressure compressor (IPC) module, which is one of the most important parts for the engine. It has been decided to use this engine for the Boeing 787 Dreamliner, which is being made lighter using the most innovative composite materials. We are also participating in the development and manufacture of fuselages for this aircraft. Through the use of the high fuel efficiency Trent 1000 and lighter-weight fuselages, the Dreamliner will be able to improve fuel efficiency by 20% compared to the previous model.



Trent 1000 transparent illustration



Energy Saving

Resourc

conservation (overhead lines

### Putting Our Next-Generation Light Rail Vehicle SWIMO and Battery Power System (BPS) for Railways into Use

We have developed the battery-driven low-floor light rail vehicle SWIMO, which uses the large-scale nickel-metal hydride battery GIGACELL that we also developed in-house. During braking, the driving motor is used as a power generator, and the electricity that is generated (regenerated electricity) is stored in the GIGACELL. With energy saving greatly increased, we are able to realize operation using the power stored in the GIGACELL in areas without overhead lines to run distances of more than 10 km. We have also developed a BPS for Railways that utilizes the GIGACELL, which features great capacity and ability to charge and discharge rapidly to improve energy efficiency.



SWIMO



**BPS** for Railways

### Delivery of the LNG BARKA 155,000 m<sup>3</sup> **LNG Carrier**



We delivered the LNG BARKA, which is our first 155,000 m<sup>3</sup> LNG carrier.

While maintaining the hull dimensions of a 147,000 m<sup>3</sup> carrier, which is a size that is able to enter the major LNG terminals around the world, this carrier has a capacity that is 8.000 m<sup>3</sup> greater. We have greatly reduced the amount of fuel consumption per unit of cargo. For the LNG tanks, we have adopted the "advanced insulation panels (Kawasaki Panel System)," which suppresses the LNG evaporation rate to about 0.15% per day.

### **Increased Fuel Efficiency with Electronically Controlled Diesel Engines**

With our electronically controlled diesel engine, we have achieved the practical use of a system that is the first in the world to realize operation with one turbocharger disengaged. This system is designed to increase thermal efficiency and improve fuel efficiency by cutting off one turbocharger during partial load operation of an engine. By using this system, we can reduce CO<sub>2</sub> emissions.



155,000 m<sup>3</sup> LNG carrier Kawasaki Shipbuilding Corporation

### High fuel efficiency



Electronically controlled diesel engine

# **Industrial Plant and** Equipment

We are developing and manufacturing a variety of products that support the foundations of industry, including, large-scale plants for cement, chemicals and nonferrous metals, steam turbines, aerodynamic machinery and other prime movers, as well as industrial robots. hydraulic equipment, and even shield machines and other civil engineering machinerv.

For plants, in addition to increasing the performance of rotary kilns, we are developing various other technologies, including fluidized-bed cement kilns that can realize greatly improved energy saving.

We are also working to reduce environmental impacts from prime including movers. increasing the efficiency of all types of steam turbines and aerodynamic machinery, by using our advanced fluid dynamics technologies and mechanical device technologies.

In the field of industrial robots, we are responding to a variety of needs, including for assembly, handling, welding, painting and sealing, and we are providing automation systems that contribute to increasing efficiency as well as energy saving.

We are developing various hydraulic equipment products for industrial machinery, particularly emphasizing construction machinery. In order to respond to market demands for energy saving and low noise, along with improving our hydraulic equipment, we are also working on developing technologies for entire systems.

Compared to methods that excavate from the surface, the excavation of tunnels using shield machines is a very efficient way to work, and it also has few impacts on the environment. We are seeking to further reduce environmental impacts by reusing internal parts of shield machines and enabling excavation of any cross-section shape.

### Kawasaki MAG-Turbo, an Aeration Blower That Increases Energy Saving in **Sewage Treatment Plants**

In sewage treatment plants, aeration blowers are the greatest consumers of energy. We developed the high-efficiency Kawasaki MAG-Turbo in order to resolve this problem. By allowing high-speed revolution while maintaining

mechanical noncontact using magnetic bearings, we have created a blower that is high-efficiency, is good for energy saving and produces very little noise and vibration. With the Kawasaki MAG-Turbo, we have also realized a compact package that incorporates the control system. Its outstanding features have been evaluated highly, and we had received orders for 38 units by the end of FY2008.



**Energy Saving** 

Low noise and

Kawasaki MAG-Turbo

Energy Saving

Resource conservation

(equipment reductio

### New Spot Joining Technology—Friction Spot Joining (FSJ) Robots

Instead of resistance spot welding or rivet joining, the FSJ robots that we have developed conduct a completely new type of spot joining on light metal alloys, including aluminum alloys and magnesium alloys. While a joining tool is rotated, the tool is forced into the overlapping metal plates, and the frictional heat softens and mixes metals to join them together. Compared to resistance spot welding, the amount of electricity consumed is less than 1/20, making high-capacity power reception systems unnecessary and thus reducing equipment costs.



FSJ robots



Joining overview

### **Development of Energy-Saving Inverter** Systems for Industrial Machines

We have developed the KESV Series of energy-saving inverter systems for

hydraulic pumps. By detecting the pressure holding status of the hydraulic system and automatically controlling the rotation speed of the hydraulic pump, the power consumed while holding pressure is greatly reduced. In one example of an actual application, we achieved a reduction of up to 50% in power consumption while holding pressure. We have prepared a series for Energy-saving inverter 1.5 - 22 kW electric motors, and many have also been employed in facilities for machining our products.

### Reducing Impacts on the Surface and Underground Environments — Our Shield Machine That Uses the **APORO-Cutter Method**

Kawasaki and Kajima Corporation have jointly APORO-Cutter (all potential rotary cutter) shield machine that can excavate cross-sections of any shape. This machine allows the tunnel cross-section to be as small as necessary, decreasing the amount of excavated soil and realizing reduced impacts on the surface and underground environments.



Energy Saving



system

Kawasaki Precision Machinery Ltd.



#### developed a new



machine

# **Contributing to the Environment Through Our Products**

# **Environmental Solution Products**

We are developing environmental solution products that are useful for directly improving and conserving the environment, and providing these products to society. We will seek to contribute to the sustainable development of society by improving their performance and developing new technologies.

### **Energy-Related Products**

We have numerous high-performance products, including gas turbines, steam turbines and various types of boilers, and we are providing a range of energy systems that incorporate these products to locations around the world.

We have a long record of achievements with high-efficiency power generation systems, including combined cycle power plants (CCPP), which are plants that combine gas turbine power generation with steam turbine power generation using the heat from the gas turbine, and gas turbine cogeneration systems that use the heat from gas turbine power generation to make steam and hot water. Moreover, we have developed Green Gas Engine power generation systems, which have the world's highest power generation efficiency, in 2006. With these products, we have a lineup that can meet the demands for heat and electricity use ratios of various users.

In addition, among technologies that use renewable energy, we have woody biomass power generation systems that use wood chips and thinned wood as fuel, photovoltaic systems, small-scale hydraulic power generation systems and bioethanol production technologies.

Furthermore, we are also actively striving to advance technologies that efficiently use waste heat recovered from various plants, including those that make cement, chemicals, iron and nonferrous metals

### Completed Production of 100th M7 **Gas Turbine**

Since delivering our first M7 gas turbine, which is especially for cogeneration, in 1994, we have completed production of more than 100 of these units in total. This is a first for this class of gas turbine in Japan. We have added the 7,000 kW M7A-03 to our lineup. This model has the highest level of

efficiency in the world. In FY2008, we received our first order for a power generation system that includes the M7A-03D from Germany. By replacing an existing coal-burning boiler power generation system with this product, CO2 emissions can be expected to be reduced by about 30% (30,000 tons per year).



Use of high-efficiency

NOx reduction

Interior of M7 gas turbine

Use of high-efficiency energy

NOx reduction

### **Completion of Verification Test of Green Gas Engine Power Generation Systems**

At our test plant for Green Gas Engine power generation systems, we completed one year of verification test (4,000 cumulative hours). The KG-18, which is the largest model in the series (18 cylinders, 7,800 kW), achieved the world's highest power generation efficiency at 48.5% and a low NOx level of 160 ppm (O<sub>2</sub>=0% conversion). As a result, denitration equipment has become unnecessary in most regions in Japan. Utilization in cogeneration systems is also possible, and the overall heat efficiency in this case exceeds 85%.



Green Gas Engine power generation system

Renewable energy

Use of previously

Low noise and low vibration

### **Development of Compact Small-Scale Hydraulic Power Generation Systems**

We have developed compact, small-scale hydraulic power generation systems

(ring waterwheels) and succeeded in realizing a product lineup. Small-scale hydraulic power generation enables the utilization of previously unused hydraulic power energy for small-scale power generation. Through the incorporation of water-lubricated bearings, we have achieved an oil-free, low-noise and low-vibration design. Our lineup includes units ranging in capacity from 20 kW to 500 kW.



Power generation system (40 kW) installed in a pipe Kawasaki Plant Systems, Ltd.

### **Bioethanol Production Technology** That Uses Rice Straw

The Ministry of Agriculture, Forestry and Fisheries has started a "project for the establishment of technologies for the effective use of soft cellulose," and we were selected to be a project leader along with the Akita Agriculture Public Corporation. We are seeking to establish bioethanol production technologies that use rice straw and rice husks. In the rice straw saccharification process, we plan to use a "hot water-type" bioethanol production technology. This new technology, which we jointly developed with NEDO, does not use sulfuric acid.







Pilot plant during joint development with NEDO (at Okinawa Kvuvo Seito) Kawasaki Plant Systems, Ltd.

We have various types of technologies related to waste heat recovery boilers. the which are core of these energy-efficient technologies, and we are realizing high reliability in their application. Waste Heat Recovery Power Generation in cement plant that uses this waste heat recovery boiler is very effective in reducing CO2 emissions and is receiving great attention in China and Southeast Asia.

### Waste Treatment and Recycling-Related Products

We began developing waste treatment technologies early on, and we have various types of refuse treatment technologies, including incineration systems and gasification and melting systems, for urban refuse. In addition to delivering these types of systems all over Japan, we are also providing various types of industrial waste incineration systems (for power generation).

We are developing and supplying recycling systems, including refuse-derived fuel (RDF) production systems, bulky waste crushing and recycling systems, and PET bottle recycling systems. Moreover, we were the first in Japan to realize an activated carbonization system for sewage. In these ways, we are striving to recycle wastes and reduce final waste disposal amounts.

# Environmental Pollution Prevention-Related Products

To improve the atmosphere, we make flue gas De-SOx systems to treat the combustion exhaust gas from boilers, and we have delivered a great number of these systems in Japan and abroad since the 1970s.

For the improvement of water quality, we are developing and providing new systems that contribute to increasing the performance of sewage and sludge treatment systems.

### Contributing to the Reduction of CO<sub>2</sub> Effective use of waste heat Emissions with Waste Heat Recovery Power Generation (WHRPG) in Cement Plant

WHRPG in cement plant recovers heat from exhaust gas in a cement plant by waste heat recovery boilers and generates electric power using

steam turbines. This electric power can cover about 30% of the electricity consumed by the entire cement plant, and we have gained a reputation for high reliability even in the difficult conditions of a cement plant waste heat recovery boiler. Since delivering our first WHRPG in cement plant in 1980, we have a record of delivering over 100 units (including some under construction) in Japan and abroad. Through this, we are contributing to the reduction of  $CO_2$  emissions.



WHRPG in cement plant

Kawasaki Plant Systems, Ltd.

Use of high-efficiency energy

### Delivery of a Cutting-Edge Refuse Treatment System

We have delivered a cutting-edge refuse treatment system to the Clean Association of TOKYO 23. The concepts of this system are to increase the efficiency of waste power generation and to pursue technologies for the effective use of residuals. The system is comprised of a fluidized-bed gasification and melting furnace and a plasma ash melting furnace that we have developed in-house. The system has cleared dioxin emission standards, exhaust gas regulations, wastewater regulations, ash leaching regulations and other strict standards.



Refuse treatment system (Clean Association of TOKYO 23)

Kawasaki Plant Systems, Ltd.

Waste recycling

### Delivery of the First Activated Carbonization System for Sewage in Japan

We have delivered the first activated carbonization system for sewage in Japan to the Tainai City Nakajo Cleanup Center in Niigata Prefecture. This system dries, carbonizes and reactivates sewage sludge, and produces activated carbon products that can be used as substitutes for commercially-available activated carbon. By enabling the effective use of sludge without incinerating it, this system contributes to both the recycling of waste and energy saving.



Main unit of the carbonization furnace Kawasaki Plant Systems, Ltd.

Improving the atmosphere

# Flue Gas De-SOx Systems Utilized in Japan and Abroad

Flue Gas De-SOx systems remove sulfur oxides from the exhaust gas emitted by power generation boilers and various types of industrial boilers for the purpose of preventing air pollution. We have accumulated over 30 years of research and improvements to complete the development of technologies that offer high performance, outstanding energy saving and reliability.



(Saudi Arabia) Kawasaki Plant Systems, Ltd.

# Reducing Environmental Impact in Production Activities

Due to changes in the forms of our business, the results of our efforts for energy saving, global warming prevention, waste reduction and chemical substances reduction have become difficult to evaluate. From this year, we will analyze the effects of our activities using a basic unit per net sales as a typical index in order to promote effective measures based on these results.

## **Energy Saving Activities**

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In order to reduce the amounts of greenhouse gas emissions, we are implementing energy-saving measures that contribute to reducing electricity and fuel consumption according to the characteristics of each plant.

We were able to control the total energy consumption in FY2008.

Moreover, we were able to reduce our water consumption compared to the last fiscal year by implementing thorough measures to conserve water and prevent water leaks from pipes and by recirculating and reusing water in industrial processes.



### Total Energy Consumption



<sup>1</sup> Basic unit: Divided the total energy consumption, water consumption, greenhouse gas emissions, and amount of produced waste by net sales, respectively.

<sup>2</sup> TJ: terajoules (10<sup>12</sup> J)

# Activities to Prevent Global Warming

We were able to keep the total greenhouse gas emissions at about the same level as in the last fiscal year. However, the basic unit per net sales, which is an evaluation measure that takes growth in business scale into account, worsened. In order to achieve our targets, an even greater reduction is necessary.





companies. (Electricity conversion factor for FY2007 were used to compute those of FY2008.)





In addition to continuing to reduce the total greenhouse gas emissions, we will analyze the effect of our activities using a basic unit per net sales for evaluating improvements and continue to investigate effective measures.

### **Waste Reduction Activities**

Among our efforts for waste reduction, we are promoting the reuse and recycling of waste oil. We are also continuing to advance our "zero emissions" efforts in which we seek to recycle 100% of the waste emitted from our plants without simple incineration or disposal as landfill. In addition to efforts that suit the characteristics of each plant, we are also undertaking the "zero emissions" efforts as shared measures at every plant.

#### Examples of 3R Activities

- Suppressed generation of metal scraps, waste oil, wood scraps and other waste
- Expansion of reuse by, for example, using reusable containers instead of pallets and wooden boxes
- Purchase of recycled goods, increase of their use rate and related efforts

As a result of these efforts, our recycling rate in FY2008 reached 96%, which was the same as in FY2007.

Due to the decrease in production volume because of the changing economic conditions and the conclusion of various temporary factors from the previous fiscal year, which included the construction of new company buildings and the renewal of plant facilities as part of business reorganization, the total amount of waste that we produced declined greatly, resulting in a reduction of about 12% from the record of the previous fiscal year to about 66,400 tons.

Moreover, our basic unit per net sales was 6.3 points, which is about the same as last year. Since this basic unit is also an important index for evaluating improvements, we will continue to analyze the results of our efforts and investigate effective measures.



# **Efforts for Reducing Chemical Substances**

As part of our shared efforts for reducing chemical substances, we are working to realize reduction targets set at every site for major VOC, dichloromethane and heavy metals. We are basically on track in moving toward our reduction targets for dichloromethane and cadmium.

We are following up efforts that we believe are necessary to further strengthen reduction measures for major VOC, hexavalent chromium and lead.

### Amounts of Chemicals Subject to Reduction Handled and Emitted

|                          | Substance                    | FY2008 | Increase<br>or decrease<br>from FY2007 |
|--------------------------|------------------------------|--------|--|
| Major<br>VOC             | Toluene (t/year)             | 328    | +7.9%                                  |
|                          | Xylene (t/year)              | 760    | -6.4%                                  |
|                          | Ethylbenzene (t/year)        | 301    | +5.2%                                  |
| Dichloromethane (t/year) |                              | 50     | -18%                                   |
| Heavy<br>metals          | Lead (t/year)                | 3.6    | -43%                                   |
|                          | Hexavalent chromium (t/year) | 20     | +5.3%                                  |
|                          | Cadmium (t/year)             | 0.12   | -7.7%                                  |

 Amount of major VOC and dichloromethane is the amount emitted. while that of heavy metals the amount handled.

### **Major VOC**

Reducing major VOC in the paint manufacturing process is important. Due to current conditions, including paint specifications by users for some transportation systems, changes in coating standards because of international regulations, reduction has been difficult. In FY2008, we installed coating robots and adopted electrostatic coating. Our amounts of emissions were almost the same as the previous fiscal year, but we will continue to make systematic efforts to reduce them, including the adoption of powder paints and water-based paints.

### **Hexavalent Chromium**

Hexavalent chromium is used in numerous special surface treatment processes. We are striving to introduce technologies that do not use hexavalent chromium, but more time is necessary. The amount that we handled increased from the previous fiscal year, but we are continuing to make systematic efforts for chromium-free paints and other possible measures.

#### Lead

Lead is included in many paints, so we are working to reduce it by, in particular, switching to lead-free paints. The amount that we handled decreased from the previous fiscal year, and we will continue to make efforts toward the goal of further reducing its use in the future.

### Started Mass Production Operation at the New Painting Shop of Our **Consumer Products & Machinery** Company

### Reduction in the Amounts of VOC **Emissions**

We have installed 12 of the latest coating robots, which are of our manufacture, at the new plant of our Consumer Products & Machinery Company. In addition to automating painting work, we are increasing the transfer efficiency through the adoption of electrostatic coating and striving to reduce the amounts of VOC emissions. Moreover, in order to reduce deficiencies caused by dust adhering to the surfaces being coated, which has been a most important issue for painting plants until now, we are utilizing equipment that incorporates various countermeasures.



Painting robots





# KAWASAKI HEAVY INDUSTRIES, LTD.

### Environmental Affairs Department, CSR Division

http://www.khi.co.jp/earth/english/index.html

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