

Kawasaki



Environmental Report 2001

**With 100 years of experience, Kawasaki
has developed frontier technology
in the fields of land, sea and air.
Building on these achievements,
we will contribute towards the realization
of a sustainable society in the 21st century.**

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Overview

Reporting Scope

This report covers information on environmental aspects of offices, technical institutes, branch companies, and works of Kawasaki in Japan but does not cover the offices and companies outside of Japan.

Reporting Period

This is a report on environmental protection activities from April 1, 2000 to March 31, 2001, which we refer to as fiscal 2000. As the report is published in October, some information from April to September 2001 is also included. We will continue reporting our environmental activities annually.

Editorial Policy

Environmental Report 2001 was summarized in reference to the Environmental Reporting Guidelines issued by the Environment Agency of Japan (Currently the Ministry of the Environment). In the guidelines, there are 18 necessary headings of environmental reporting, under the four(4) main categories. They are: 1.Basic Headings, 2.Summary of Policies, Targets, and Achievements of Environmental Conservation, 3.State of Environmental Management, and 4.State of Activities for Reduction of Environmental Burden. Each heading consists of "Significant Components", "Significant Components for Specific Sectors", and "Further Recommended Components".

Special attention was given to provide accurate information under the headings and to strengthen understandability by using graphs and illustrations. Furthermore, to meet the interests of the vast range of stakeholders and to increase objectivity, the report was edited with the support of Cre-en Co., Ltd.

We hope this report will deepen the understanding of our environmental protection activities.

Outline of This Year's Report

The main contents of this report are as follows: summary of environmental protection activities on pages 5 to 6, organization, activities and results of environmental protection on pages 7 to 14, and contribution to the global environment through products and technologies on pages 15 to 20. As a social aspect, we have included information disclosure on page 21 and corporate citizenship and our history of environmental activities on page 22.

Environmental Reporting Guidelines (FY 2000 Version)

As the social responsibility of companies to present information about environmental issues has increased in the recent years, the importance of environmental communication using such tools as this report is growing stronger. In order for companies to provide a report comprehensible to a wide variety of stakeholders, the need for guidelines to demonstrate the principles and the necessary components of appropriate reporting has aroused. In June 1997, the former Environment Agency of Japan issued the Environmental Reporting Publication Guideline. In February 2001, the Ministry of Japan revised the guideline and issued the fiscal year 2000 version, which conforms to the current conditions of Japan by taking international guidelines into account.

Corporate Profile

Name : Kawasaki Heavy Industries, Ltd.
 Incorporated : October 15, 1896 (Founded: April, 1878)
 Capital : 81.4 billion yen
 Location of Head Offices : Kobe Head Office
 1-3, Higashikawasaki-cho
 1-chome Chuo-ku, Kobe 650-8680, Japan
 Tokyo Head Office
 4-1, Hamamatsu-cho
 2-chome Minato-ku, Tokyo 105-6116, Japan
 Representative : Masamoto Tazaki, President
 Kawasaki Network : Domestic Offices 28 (including 15 Works)
 Overseas Offices 9
 Overseas Main Affiliated Companies 21
 (Kawasaki Ownership: over 50%) (As of March 31, 2001)

Major Business Fields



Domestic Manufacturing Plants and Main Products

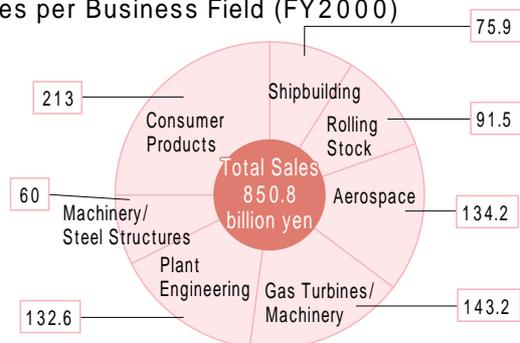
| Plant | Main Products | Location |
|-------------------------------|--|--------------------------------|
| Noda Works | Steel Structures | Noda, Chiba |
| Sodegaura Works ^{*1} | Steel Structures | Sodegaura, Chiba |
| Yachiyo Works | Crushing Plants, Grinding Plants, Cast Steel Products | Yachiyo, Chiba |
| Chiba Works ^{*2} | Plants, Boilers | Chiba |
| Gifu Works | Aircrafts, Space Development Equipment | Kagamigahara, Gifu |
| Nagoya Works 1 | Aircrafts | Yatomi-cho, Ama-gun, Aichi |
| Nagoya Works 2 | Aircrafts | Tobishima-mura, Ama-gun, Aichi |
| Kobe Works | Shipbuilding, Marine Engineering, Prime Movers | Kobe, Hyogo |
| Hyogo Works | Rolling Stock | Kobe, Hyogo |
| Nishi-Kobe Works | Hydraulic Machinery, Marine Engineering | Kobe, Hyogo |
| Akashi Works | Motorcycles, Industrial Robots, Jet Engines, Gas Turbines | Akashi, Hyogo |
| Seishin Works | Jet Engines | Kobe, Hyogo |
| Banshu Works | Civil Engineering and Construction Machinery, Port Facilities | Inami-cho, Kako-gun, Hyogo |
| Harima Works | Steel Structures, Civil Engineering and Construction Machinery | Harima, Hyogo |
| Sakaide Works | Shipbuilding, Marine Engineering | Sakaide, Kagawa |

*1: Sodegaura Works was closed in March 2001.
 *2: Chiba Works was closed in February 2001.

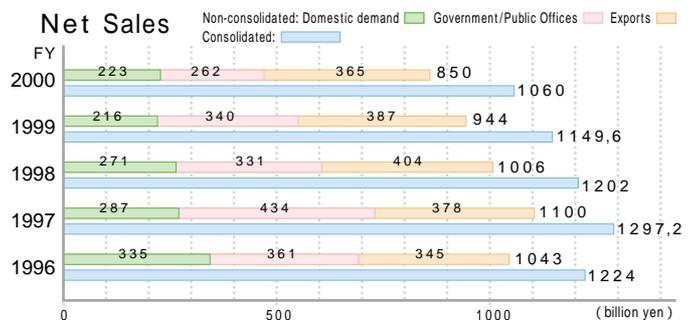
Management Policy

Kawasaki has adopted the objective of *Quality followed by Quantity*, to take its place among globally competitive enterprises in the 21st century, continue to develop, and enhance the trust of all its stakeholders. Briefly, this means we are giving quality priority over quantity, and will work aggressively to sell our high-value-added products and differentiated services to a wider range of customers; quality will drive quantity. In parallel with this, we are drawing on management resources to create a more sophisticated business structure and have adopted the goals of establishing strong earnings power and returning to a sustainable growth path. With these fundamental objectives in mind, we prepared our medium-term business plan in November 2000 and will be implementing it through the year ending March 2005. We will work to increase the awareness of every member of the management and staff of the Kawasaki Group regarding the changing environment and will motivate them to bring about Kawasaki's further evolution and development.

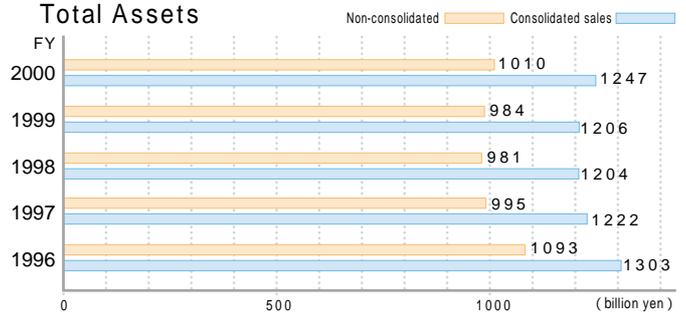
Sales per Business Field (FY2000)



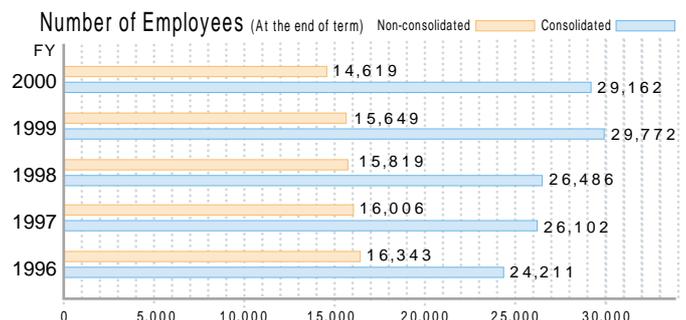
Net Sales



Total Assets



Number of Employees (At the end of term)



A Shift in Focus: From *Heavy* to *Flexible* Industries



Masamoto Tazaki
President

A handwritten signature in black ink that reads "Mr. Tazaki".

Masamoto Tazaki was born in 1935 in Manchuria. After graduating with an engineering degree from Kyushu University in 1958, he began working as an engineer at Kawasaki Heavy Industries Ltd. In June 2000, Tazaki became the president of Kawasaki.

Putting Quality First in All Our Operations

After the Second World War, Japan experienced unprecedented growth, with concomitant expansions in production, income and consumption levels. But the achievements brought with them a host of environmental problems, including waste management and disposal, and recently, a surge in nationwide crime. As a result, the social benefits enjoyed by most of the Japanese people have not been commensurate with the material richness that has been created over the years. The years of skyrocketing growth have taken their toll: as Japanese industry focused on meeting prodigious demand, emphasis on quality and environmental sustainability got lost in the shuffle. Kawasaki has a responsibility to address these issues in all of our far-flung operations, and we embrace the goal of achieving sustainability even as we pursue growth, productivity, quality and social well-being. If we describe an enterprise in terms of an area with "quantity" and "quality" as its horizontal and vertical axis, we have previously been increasing this area by expanding the "quantity" axis. However, to maintain the area and aim for sustainable prosperity, we must extend its "quality" axis instead.

From the moment I was appointed president of Kawasaki, I have emphasized this balance in the way we formulate and implement our business strategies. As part of this effort, we have adopted *Quality followed by Quantity* as the company's motto. We have shifted our focus from primarily accepting orders to meet highly specific customer needs to proposing solutions applicable to a broader range of customers with the aim of increasing added value. We have restructured the company by creating six in-house companies to increase the autonomy and allow speedier management of operations. Thus, we are flexibly transforming our business to implement the strategy of delivering *Quality followed by Quantity*.

Finding Spiritual, As Well As Material, Fulfillment

To achieve sustainable society, it is essential that we re-define the fundamental principles that guide our very lives. There is an ancient temple in Kyoto, Ryoanji, which houses a famed rock garden. In that garden is a stone water basin into which the Zen proverb *Learn to be contented* has been carved. I believe this is the true definition of fulfillment-learning to be content with what we have and to live in harmony with nature.

To attain this elusive state of fulfillment, it is crucial that we foster environmentally compatible values and lifestyles in our children. We must also teach them that nature can be as cruel as it is bountiful. I spent 10 years of my career in the United States. There, fathers teach children how to survive in nature and deal with the dangers through experiences in camps. It is my belief that the knowledge and the strength to survive, and to achieve greater spiritual contentment, depend to a large extent on education. This is especially true for today's younger generation in Japan.



Tazaki's personal golf ball markers are inscribed with the Japanese characters for the Zen proverb *Learn to be contented*. The written characters are read "ware-tada-taru-wo-shiru" sharing "□" at the center, which belongs to all characters.

Creating Technology for a Sustainable Society

During the Edo Period, from 1603 to 1868, the Japanese people lived in perfect harmony with nature. There had been no war, no abuse of natural resources and such traditional arts as flower arranging, tea ceremony and Noh drama flourished. Fine houses were constructed of wood and paper, built to last for as long as 20 years, when saplings had grown large enough to be harvested for new construction. Rivers flowed down unhindered from the mountains through the fields, watering the crops en route to the seas. For over 200 years, Japan achieved that difficult balance between prosperity and ecological sustainability.

We cannot return to the Edo Period, of course, but there are measures we can take to stem the damage that has been done in the name of progress. Our growing consumption of energy over the years has led to a depletion of most of our precious fossil fuels and subsequently, to the emergence of an ecological imbalance. This is a dangerous imbalance and must be rectified. We can begin by altering our lifestyles to accommodate continued development without compromising environmental sustainability. We can also reduce our consumption of nonrenewable energy resources, such as fossil fuels, and begin making a smooth transition to renewable forms of energy, such as wind and wave power.

Kawasaki's role in this important transition is to continue devoting substantial resources to producing technologies that utilize solar, wind and hydro-generated power, as well as to creating environmentally friendly products and environmental protection systems.

Japan faces particular challenges due to the scarcity of the natural resources that must support a large population, and the frequency of natural disasters as a result of earthquakes and typhoons. But we have already overcome so many difficult tests, and we are confident that we can show the world the solutions to environmental problems that currently confront us.

Think Globally, Act Locally

With the start of a new century, we strongly feel the need to reinforce our efforts to become an environmentally friendly enterprise. This initiative is not only important in our business activities itself but in increasing the brand value of Kawasaki. My motto, *Think globally, act locally* show the commitment to work step by step on surrounding issues, while keeping a broader view. This applies to our business strategy as well as environmental management programs. Kawasaki is currently implementing the third three-year phase of our Environmental Protection Activities Plan (EPAP), spanning the period from fiscal 2000 to fiscal 2002. The plan's ultimate goal is to transform Kawasaki into a model environmentally friendly enterprise.

Only through our management's continued pledge to proactively address environmental challenges can we assure that Kawasaki achieves this goal. Only through the application of our own expertise and ingenuity can Kawasaki "Heavy" Industries become a "flexible" enterprise and ensure that our industrial activities are consistent with environmental sustainability.

For all these reasons, the environmental report you now hold is a vital communications tool, enabling us to apprise you of the progress we are making toward sustainable society and to encourage your feedback. Your views are valuable to our future.



Environmental Charter

Kawasaki drew up the Environmental Charter in August 1999 to define our basic corporate approach to environmental protection and to guide members in all our business activities aiming for the realization of an environmentally friendly business enterprise.

Environmental Philosophy

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 to commit ourselves to contribute to the sustainable development of society through our environmentally friendly 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 volunteered 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 impacts.
- 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 impacts.
- 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.

Outline of Environmental Protection Activities in fiscal 2000

The 3rd stage of Environmental Protection Activities Plan

Kawasaki is implementing its environmental protection activities under the 3rd three-year stage of the Environmental Protection Activities Plan (EPAP) established by our Chief Environmental Officer. The main objective of EPAP from fiscal 2000 to fiscal 2002 is "Aiming for the realization of a sustainable society, Kawasaki will work towards environmentally friendly management". This is to be achieved under the seven themes illustrated in the following table.

In fiscal 2000, the establishment of the environmental management system (EMS) based on ISO 14001 has come close to completion along with the development of the basis for environmentally conscious products. As for the correspondence to the Kyoto Protocol to prevent global warming and achieving zero emission at the production sites, we are continuously improving our activities through midterm and long-term targets. The actual results of this term and the details of our next term targets are also shown in the table.

Action policy: "Aiming for the realization of a sustainable society, Kawasaki will work towards environmentally friendly management"

| Theme | Environmental protection activities | Results of activities in the current term (During FY2000) | Page | Challenges | Main measures for the next term (Starting FY2001) | Midterm and Long-term Targets |
|--|---|--|-------------------|--|---|---|
| Environmental management | Company-wide environmental protection activities Target •Implementation of EMS* •Promotion of ISO 14001 certification | •Acquired ISO 14001 certification in 6 divisions. •Trained 321 internal auditing personnel. | P 8 P 8 | •Complete acquisition of ISO 14001 certification in all divisions by the end of fiscal 2001. •Promote efficient business management through intensification of EMS. | •Set company-wide numerical targets in energy conservation, waste disposal, recycling, and CO ₂ emissions. | |
| | Stringent pollution measures Target •Compliance with environmental regulations •Compliance to the PRTR Law | •Decrease the number of administrative non-compliance. •Implementation of PRTR compliance measures. | P 6 P12 | •Reinforce management and reports of PRTR Law specified substances. (Scheduled for report in June 2002) | •Proper operation for PRTR Law. | |
| The reduction of environmental impact in production activities | Energy conservation Target •Promotion of numerical target management •Reduction of electricity, heat, and water consumption as well as CO ₂ emissions •Development of Green House Gas Reduction Plan | •Implementation of energy conservation activities. | P10 | •Set up numerical targets and annual reduction volume of CO ₂ . | •Develop Green House Gas Reduction Plan. | •Correspond to the Kyoto Protocol to prevent global warming. |
| | Promotion of resource preservation and recycling Target •Promotion of numerical target management •Promoting zero emissions at the production sites | •Improvement in waste reduction rate. •Improvement in the recycling rate. •Promoting zero emission activities at the Harima Works. | P13 P13 P14 | •Promote zero emission activity in the entire company. | •Achieve zero emissions at the Harima Works by the end of September 2001. | •Complete zero emission in all factories by the end of fiscal 2004. |
| | Research and development of environmentally conscious products and technologies | •Research and development of environmentally conscious technology and commercialization of products. | P16 | •Promote research and development, which contributes to the realization of a sustainable society. | •Conduct environmentally friendly business in compliance with laws on a Recycling-oriented Society. | |
| Creating environment-conscious products | Introduction of LCA (*3) method | •Studying and enhancing employees' understanding of LCA. •Studying Product assessment. •Developing the basis for the production of environmentally conscious products. | P17 P17 | •Study for introduction of LCA. •Effective use of product assessment. | •Spread LCA and Production Assessment throughout the company. | |
| | Introduction of green procurement | •Promotion of green procurement. | P17 P17 | •Examine and promote green procurement. | •Examine the "Green procurement materials for products and its production process." | |
| Activity evaluation | Introduction of environmental performance evaluation | •Implementation and prevalence of Environmental Performance Evaluation Guidelines. | | •Improve evaluation techniques. | •Enforce and spread of the Environmental Performance Guidelines issued by the Ministry of the Environment. | |
| Information disclosure | Improvement of environmental reports | •Publication of the Environmental Report (FY1999 version) •Promotion of internal communication. | P 21 P 21 | •Apply Environmental Reporting Guidelines. (FY2000 version) | •Apply the Environmental Reporting Guidelines issued by the Ministry of the Environment. | |
| Environmental accounting | Introduction of environmental accounting | •Conducting pilot programs of environmental accounting system issued by the Ministry of the Environment. | P 6 | •Formulate Company-wide Environmental Accounting Manual. | •Examination of company-wide Environmental Accounting Manual. | |
| The degree of environmental management | Improvement of subcommittees activities | •Inauguration of the zero emission working group, green procurement subcommittee, and environmental accounting subcommittee. | | •Correspondence to all issues through activities of subcommittee. | | |
| | Improvement in the degree of environmental management | •Ranked 83rd by Nikkei Publications for eco-friendly management. | P 22 | •Promote continual improvement. | | |

*1 EMS: Environmental Management System *2PRTR: Pollutant Release and Transfer Register *3LCA: Life Cycle Assessment

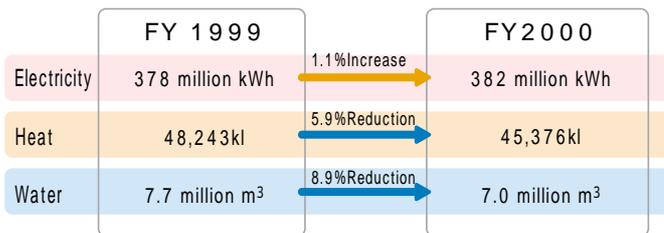
Actual Results in fiscal 2000

Reduction of Environmental Impact

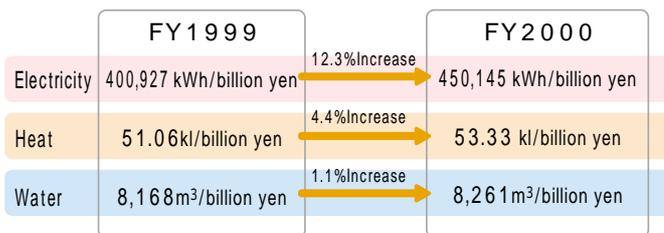
In order to reduce environmental impacts such as energy consumption, CO₂ emissions, and waste disposal, we have set numerical targets and energy management indicator* to promote our reduction activities.

Energy Conservation

Energy Use

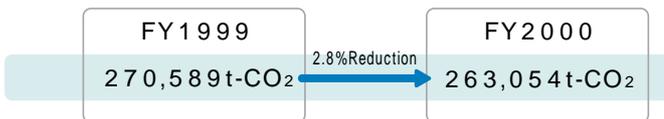


Energy Management Indicator



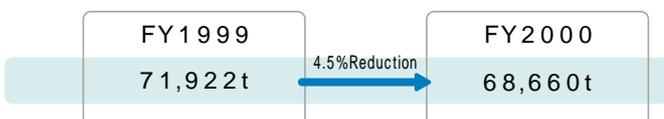
*Energy Management Indicator = Amount of energy used/ Net sales

CO₂ Emission

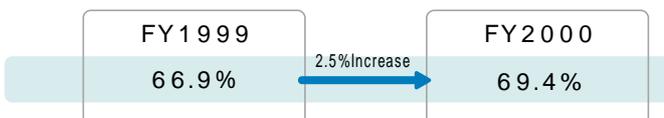


Waste

Amount of Emission



Recycling Rate



Compliance with the Law

As a result of fiscal 2000, we had no administrative penalty, provision, or residents' complaint. Unfortunately, we had one case of administrative warning, for removing a waste treatment facility, which was closed down due to the earthquake damage, without applying for permission in advance. We immediately held a committee to reinforce compliance and intercommunication organization.

Violations, Accidents, and Complaints

| | 1996 | 1997 | 1998 | 1999 | 2000 |
|--------------------------|------|------|------|------|------|
| Administrative Penalty | 0 | 0 | 0 | 0 | 0 |
| Administrative Provision | 2 | 2 | 1 | 4 | 0 |
| Administrative Warning | 1 | 0 | 0 | 0 | 1 |
| Residents Complaint | 7 | 1 | 3 | 2 | 0 |

Administrative Penalty: To receive judicial penalty.

Administrative Provision: To receive directions via documents.

Administrative Warning: To receive directions orally.

Environmental Accounting

As a method to evaluate environmental performance, we calculate our environmental facility investments and environmental protection costs. The environmental facility investment refers to the investments to environmental protection facilities such as facilities for preventing air contamination, water contamination, noise and vibration, as well as internal waste treatment facilities, and energy conservation facilities. On the other hand, the environmental protection cost refers to costs necessary for the maintenance of environmental protection facilities, the treatment of general and industrial waste, and the R&D of environment-conscious products and technologies. In fiscal 2000, the environmental facility investment was 751 million yen and the total environmental expenses amounted to 7.6 billion yen.

To prepare for the full application of the Environmental Accounting Guidebook provided by the Ministry of the Environment, we have formed an Environmental Accounting Subcommittee. The guidebook is currently in experimental use in the Harima and Akashi Works and consideration is being given to introduce it to the entire company from fiscal 2002.

Environmental Accounting (unit: million yen)

| | 1990 ~ 1996 | 1997 | 1998 | 1999 | 2000 | | |
|---------------------------------------|---------------------------|-------|-------|-------|-------|-------|-------|
| A: Environmental Facility Investments | 840 | 340 | 450 | 790 | 562 | 751 | |
| B: Environmental Protection Costs | Wastewater Treatment Cost | 556 | 609 | 633 | 625 | 591 | 579 |
| | Waste Disposal Cost | 613 | 1,060 | 1,112 | 1,043 | 988 | 928 |
| | Analysis Cost | 77 | 79 | 92 | 74 | 93 | 194 |
| | Sub-Total | 1,246 | 1,748 | 1,837 | 1,742 | 1,672 | 1,701 |
| R&D Expenditure | | 3,400 | 4,100 | 6,000 | 6,100 | 5,900 | |
| Total | 1,246 | 5,148 | 5,937 | 7,742 | 7,772 | 7,601 | |
| C: Net Sales (billion yen) | 891 | 1,043 | 1,100 | 1,006 | 944 | 850 | |
| B/C (%) | | 0.49 | 0.54 | 0.77 | 0.82 | 0.89 | |

Note: The environmental protection cost includes the costs of employment, facility depreciation, consumable supplies, electricity, and contracts. Until fiscal 1997, the R&D cost was calculated based on depreciation. However, since fiscal 1998, it is calculated based on accruals.

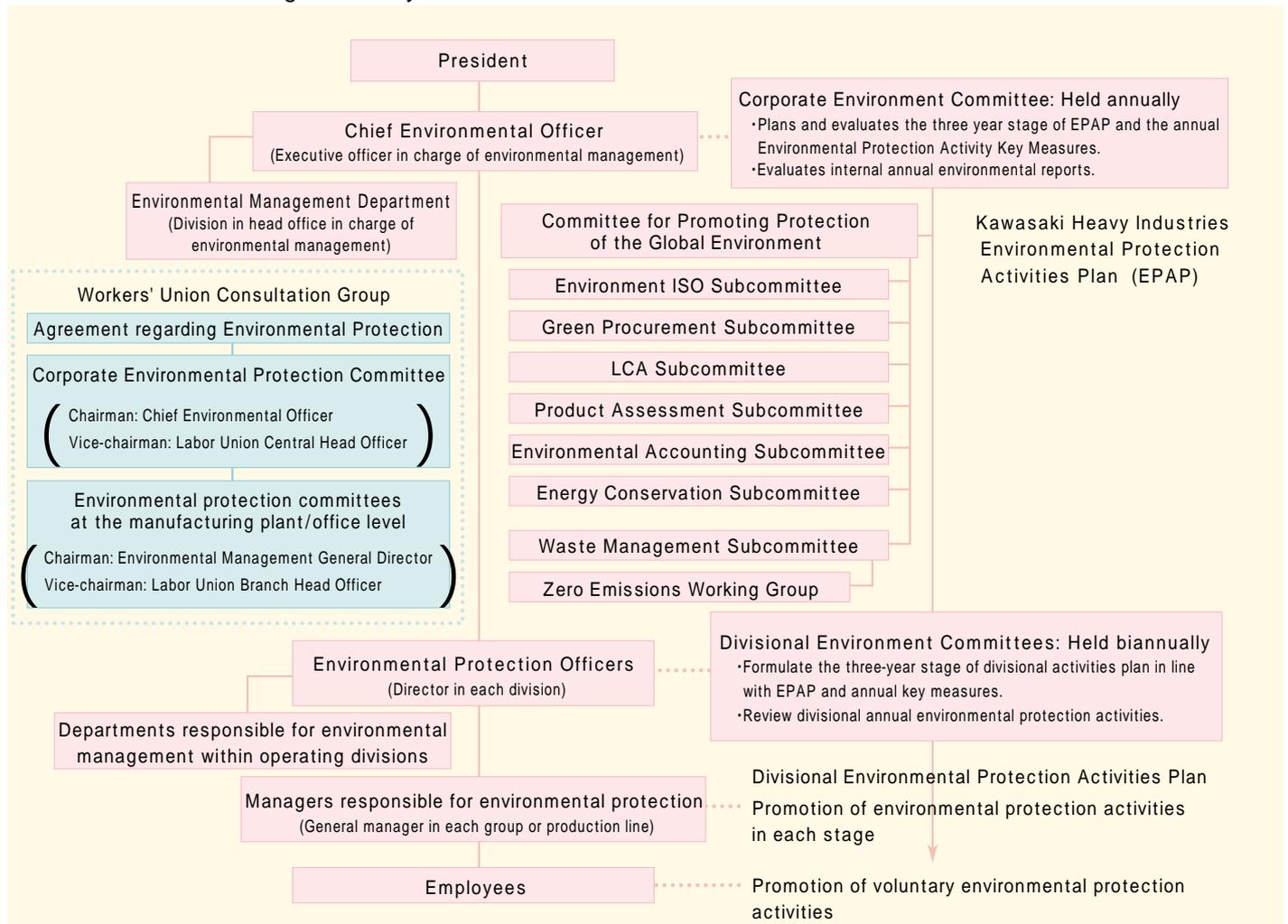
Environmental Management System

Organization for Environmental Management

The Chief Environmental Officer is in charge of Kawasaki's overall environmental protection activities. Under his leadership, the Corporate Environment Committee is assembled each year to plan and evaluate the three-year EPAP and the annual Environmental Protection Activity Key Measures.

In each division, Environmental Protection Officers formulate divisional three-year activities plan and its annual key measures. Divisional Environment Committees are gathered twice a year to follow-up on their activities.

Environmental Management System

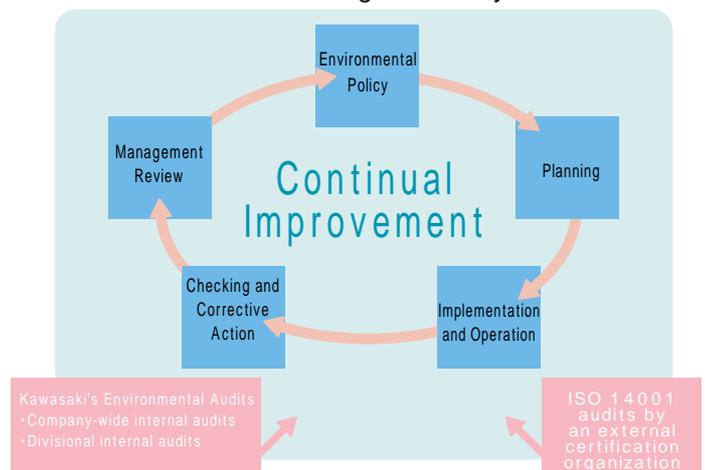


Operation of Environmental Management System

As a system for conducting environmentally friendly business management, we have realized an Environmental Management System (EMS) based upon ISO 14001 standards. The EMS is now implemented in each division and will be in continual improvement to advance its effectiveness.

Furthermore, to enhance our environmental activities, we will continue our efforts in acquiring ISO 14001 certification and improving environmental audits.

Environmental Management System



Environmental Audit

In order to improve environmental management continuously, we have established our own environmental auditing system. This three-tier auditing system comprises a company-wide internal audit conducted by the environmental management department, a divisional internal audit, and audits by the external ISO 14001 certification organization. This increases auditing objectivity, allowing us to make adequate evaluations.

Activities for ISO14001 Certification

In fiscal 2000, six of our business divisions; Construction Machinery Division, Industrial Plant Engineering Division, Ship Division (Sakaide Works), Crushing Plant Division, Machinery Division and the Power Plant Division, have acquired ISO 14001 certification. This makes the certification of 11 business divisions throughout the company. In addition, all of our manufacturing sites are expected to acquire certification by the end of fiscal 2001.

| Division | Certified Date |
|---|------------------------|
| Precision Machinery Division | February 1998 |
| Environmental Control Plant Division | March 1999 |
| Steel Structure and Industrial Equipment Division | November 1999 |
| Consumer Products & Machinery Group | February 2000 |
| Gas Turbine Division (Jet Engine Department) | March 2000 |
| Construction Machinery Division | May 2000 |
| Industrial Plant Engineering Division | July 2000 |
| Ship Division (Sakaide Works) | August 2000 |
| Crushing Plant Division | September 2000 |
| Machinery Division | December 2000 |
| Power Plant Division | February 2001 |
| Rolling Stock Division | Expected during FY2001 |
| Aerospace Division | Expected during FY2001 |
| Total | 11 |

Company-wide Internal Audit

The environmental management department carries out audits at the operational sites with an emphasis on environmental performance. The results of these audits are then summarized in the annual environmental report, which is reported to the Corporate Environment Committee for review and further improvement.

| | |
|-------------------|---|
| Scope | The total of 23 sites in Kawasaki including business offices, manufacturing plants and business divisions |
| Term | From February 20, 2001 to March 28, 2001 |
| Auditing Category | <ol style="list-style-type: none"> 1. Confirmation of operating condition of the divisional activities plan and the annual key measures in fiscal 2000. 2. Confirmation of environmental performance results. 3. Vision for the divisional activities plan and the annual key measures for fiscal 2001. 4. Field inspection 5. Report of audit results to addressed divisions. 6. Confirmation of improvement and countermeasures by documentation. |

Divisional Internal Audit

Under the operation of EMS, each division conducts its independent internal audits. The Environmental Auditing Team in each business division carries out audits neutrally, and promotes continuous improvements by summarizing audit reports and implementing corrective actions. Moreover, additional audits are conducted in areas where standards were not conformed.

Auditing Category

1. Condition of compliance with legal and voluntary regulations.
2. The relevancy of performance compared to the EMS standards.
3. Confirmation of progress and results of environmental management program.
4. Confirmation of corrective and preventive measures operation.

Training of Internal Auditors

Kawasaki conducts training programs to enhance the understanding of ISO 14001 standards and the concept of EMS among personnel who are involved in the establishment of EMS. The training programs range from current global environmental issues to related laws, and auditing techniques. After actual exercises and exams, the personnel are appointed as internal auditors by the head office. There have been 796 auditors appointed from fiscal 1996 to fiscal 2000.



Training Programs

| | |
|----------|---|
| Lectures | <ol style="list-style-type: none"> 1. Trends of global environmental problems and ISO14000s. 2. Description of ISO14001 standards. 3. Trends of the Japan Accreditation Board for Conformity Assessment. 4. Laws and regulations related to environmental protection. 5. Expansion from ISO 9000s to ISO14000s |
| Exercise | Environmental Auditing Techniques • Auditing techniques • Methods for creating ECAR* and ECM*. |
| Test | • Case study (Identifying non-conformance) • Board work (Review of the case study) • Creation of ECAR • Review of ECAR |

*ECAR: Environmental Corrective Action Request
ECM: Environmental Communication Memo

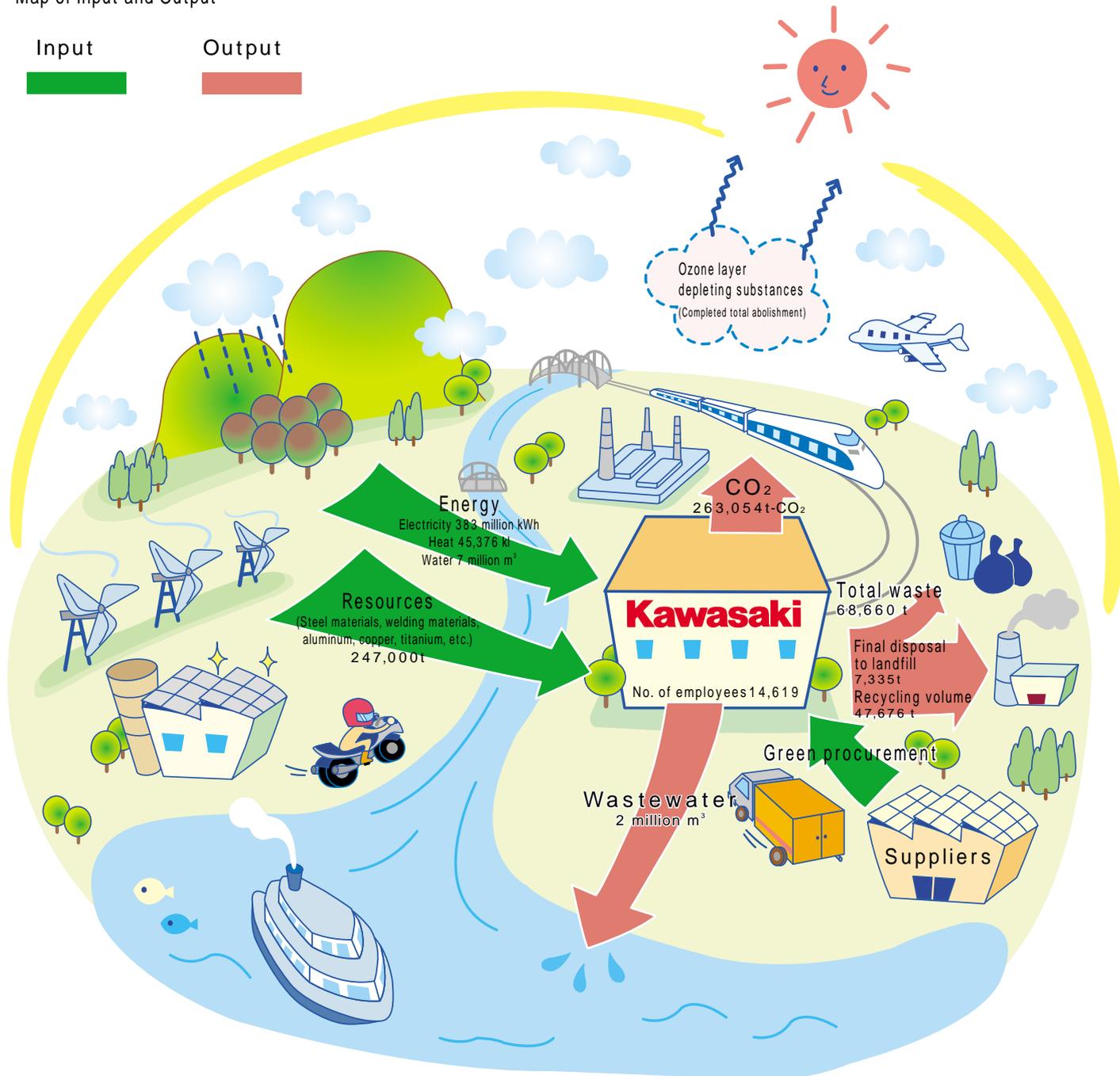
Environmental Performance (Improvements in Business Activities)

Current Environmental Impacts

We, humans live by utilizing various resources on the earth. Moreover, while conducting business activity, resources are purchased, and energy, water, and chemical substances are used during the production process. Not to mention waste is generated by them.

In order to understand our business activity in relation to society and the environment, we measure the amount of input and output of energy and resources every year. This information is put together in an annual environmental report to evaluate our performance appropriately. Corrective measures are then taken to reduce environmental impact.

Map of Input and Output



Energy and Resources

Energy Conservation Activities

By using the energy management indicator(*1) for business divisions, we keep track of electricity, heat and water consumption. This system allows us to make appropriate activities in each division to reduce energy use. Also, by utilizing the environmental management program (EMP), improvements in energy conservation operations, energy conservation PR, and the production system structure are conducted among production plants. Furthermore, we will continue our improvements by increasing the level of management.

Electricity

Electricity use was strictly conserved by the installation of thermostats, the revising of compressor operation methods, and the adoption of energy-saving parts and equipments. Moreover, we have promoted awareness in the company by addressing the turning off of lights during recess or vacation, conserving air conditioning, conducting patrols and restricting work on holidays. In addition, maintenance of facilities such as broken air pipes were checked and repaired. However, the energy use of the entire company has increased by 1.1% compared to the previous year. The company-wide energy management indicator(*2) has also increased by 12.3% due to increase of in-house production.

Heat

In order to reduce heat derived energy consumption, we have improved energy efficiency through the introduction of energy saving equipment and improving production methods. Specifically, we have promoted cogeneration and shortened the time of heat treatment. Other attempts for saving heat includes the implementation of individual air conditioning units, a restriction of heaters during the day time, maintenance of internal steam lines, and the restriction of in-plant vehicles. As a result, Kawasaki's heat energy use has decreased by 5.9% compared to last year, but the energy management indicator has increased by 4.4%.

Water

The reduction of unnecessary water loss is an aspect in water conservation that needs to be worked on. For instance, in the production lines, water loss has been reduced by the introduction of water-saving valves and controlling the amount of water flow. In other areas, Kawasaki promoted a check and repair system for water leakage, patrol activities, and water-saving awareness activities. Although the amount of water consumption has decreased by 2.8%, the company-wide energy management indicator has increased by 1.1%, compared to the previous year.

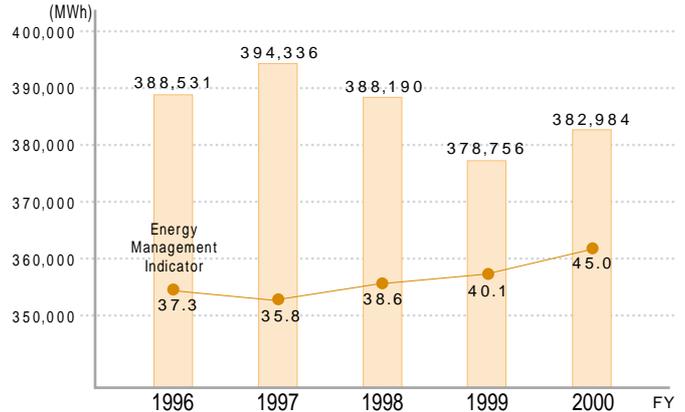
*1 Energy Management Indicator = Energy used / (Number of manufacturing plants, Quantity of production, or Net sales in accordance to divisional characteristics)

*2 Company-wide Energy Management Indicator = Energy used / Net sales

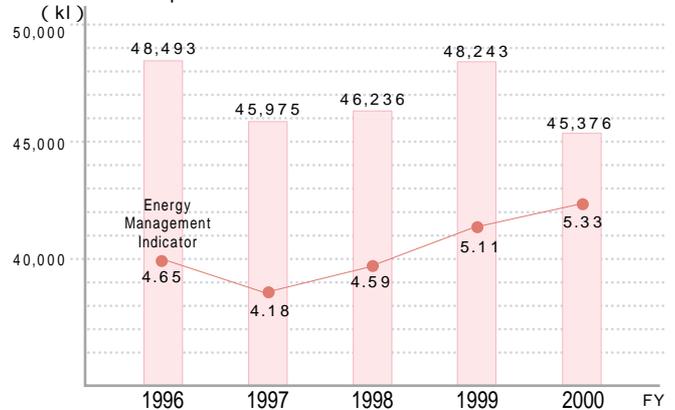
Resource Input

The resources used in our production and processing activities are monitored as the total amount of steel material, welding material, aluminum, copper, and titanium, which are our main consuming materials.

Electricity Consumption

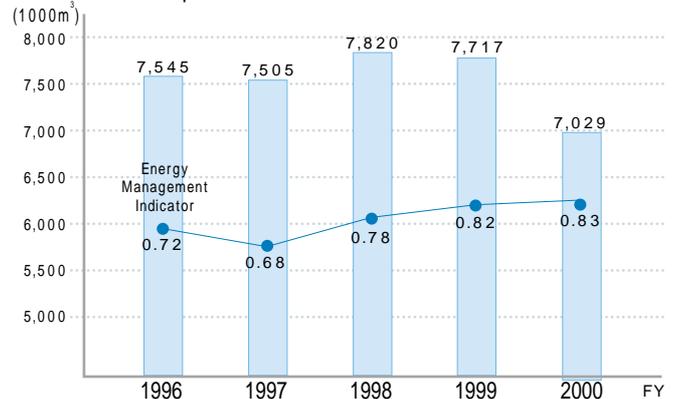


Heat Consumption

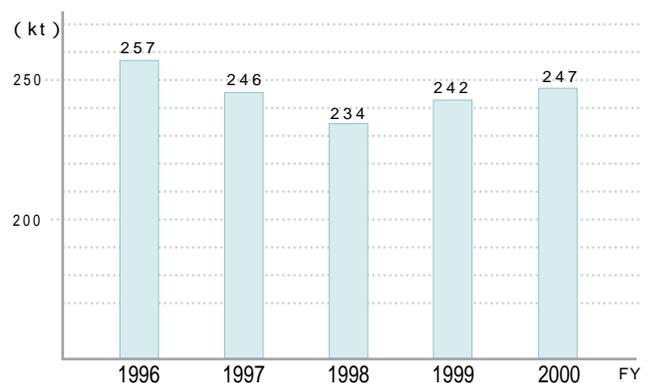


*Based on the Law Concerning the Rational Use of Energy, heat consumption is converted to the amount of crude oil used.

Water Consumption



Resource Input: Metal



Environmental Impact to Air and Water

Carbon dioxide (CO₂) has been identified as the main cause of global warming. To minimise Carbon dioxide emissions, we are working towards the establishment of the Green House Gas Reduction Plan by the end of fiscal 2001, which is based upon the contents of the Kyoto Protocol. Regarding ozone depleting substances, we have completely abolished their use in 1996.

Kawasaki promotes the reduction of the three major air pollution factors, namely sulfur oxides (SO_x), nitrogen oxides (NO_x) and dust. In combination of Kawasaki's compliance with the Air Pollution Control Law, we also implement emission management to reduce annual emissions.

*Kyoto Protocol: A treaty signed in the third Conference of the Parties (COP3) held in Kyoto in December 1997. Six greenhouse gases were targeted for a 5% reduction or more between 2008 and 2012 compared to the 1990 levels. The reduction rate assigned for Japan is 6%.

Global Warming Prevention Activities

Carbon Dioxide (CO₂)

We have changed the fuel used for boilers from coal oil to city gas. This change, along with the abolishment of incinerators has led to a 2.8% decrease in CO₂ emissions compared to the previous year.

Ozone Layer Protection Activities

Ozone Layer Depleting Substances

In 1988, the former Environment Agency issued a law to protect the ozone layer and we have been working ever since towards the reduction of ozone depleting substances. In the past, we used to use 1,1,1-trichloroethane as a degreasing agent for cleaning machine parts. From 1993 to 1995 we had gradually switched to alkali agents and invested 1.59 billion yen to install suitable facilities. Thus from 1996, the use of ozone depleting substances was abolished completely.

Air Pollution Prevention Activities

Sulfur Oxides (SO_x)

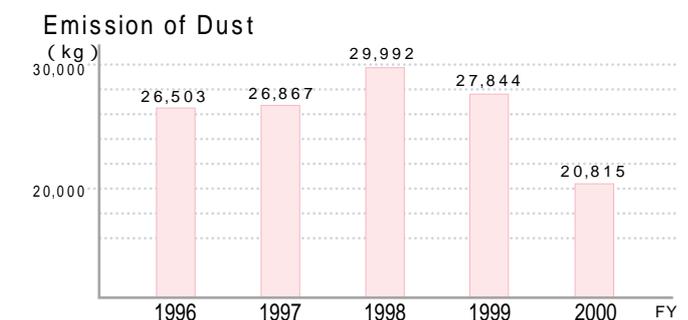
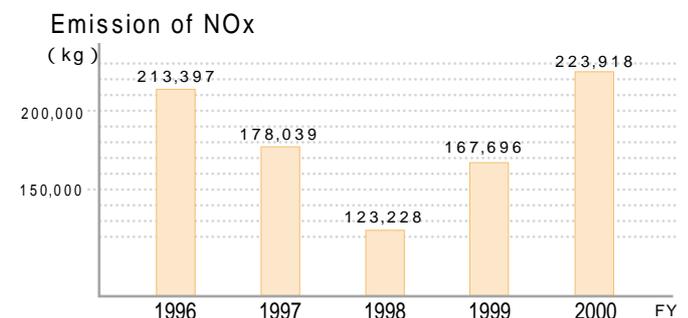
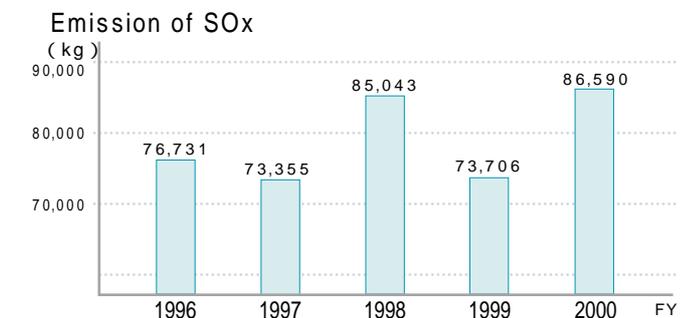
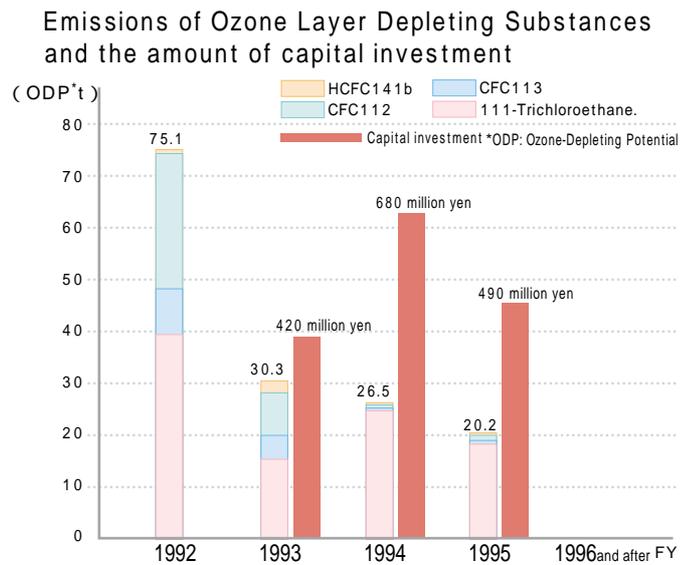
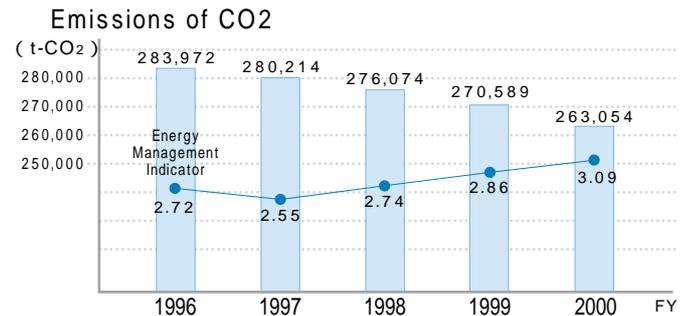
Although we were able to comply with the emission volume of the law, the amount of sulfur oxide emissions (kg/year) has increased compared to the previous year. This increase in emissions was caused by some of our factories, which used fuel with a high content of sulfur oxides. From now on, however, we will gradually change over to a higher quality fuel, which contains less sulfur oxides.

Nitrogen Oxide (NO_x)

As in the SO_x case, we are in compliance with the relevant regulations but the amount of NO_x emissions (kg/year) increased over that of the previous year. The increase was due to our testing operations of diesel engines at the production plants. We are now rationalising the testing time to reduce the amount of emissions.

Dust

Kawasaki accomplished compliance with the law along with the reduction of dust emissions (kg/year). The accomplishment was made possible by our efforts to decrease waste, which resulted in reduction of waste incinerating time and incinerators. We are working towards the complete abolishment of incinerators so that further dust emission reductions can be expected.



Water pollution Prevention Activities

There are three types of wastewater. The first is plating wastewater, which is discharged from plating facilities, containing toxic substances such as cadmium, cyanogens as well as hexavalent chromium. The second is effluent that comes from the cleaning process at manufacturing plants, which contains oil and SS. The third and final type is general drainage from toilets and cafeteria. The wastewater is treated properly by the water treatment facilities to meet the standards of the law.

Chemical Substances

Activities for PRTR

The Pollutant Release and Transfer Register (PRTR) Law was passed in April 2001. This law is aimed at keeping track of emissions and transfers of potential pollutants from business organizations. Kawasaki started collecting data on the 178 specified substances in 1997. During fiscal 2000, we initiated the pilot program of the Ministry of the Environment to report the total amount of chemical substances that were handled throughout the company. We are enhancing our data collecting system for the submission of divisional reports that is scheduled to commence in June 2002.

*PRTR Law: The PRTR Law was enacted in 1999, making it mandatory for companies to collect data regarding the release and transfer of chemical substances from their facilities and report these findings to the national governmental agency through the regional agencies. The reported data is disclosed to the public.

Total of Chemical Substances Handled in Fiscal 2000 (kg)

| Substances | Registration No. | Total |
|--|------------------|---------|
| Xylene | 63 | 588,828 |
| Chromium and its trivalent compounds | 68 | 581,341 |
| Toluene, | 227 | 464,306 |
| Manganese and its compounds | 311 | 416,141 |
| Dichloromethane | 145 | 113,394 |
| Water-soluble zinc compounds | 1 | 46,200 |
| Nickel compounds | 232 | 30,000 |
| Barium and its compounds | 243 | 23,900 |
| Hexavalent chromium compounds | 69 | 18,500 |
| Nickel | 231 | 16,255 |
| Water-soluble copper salt (excluding complex salt) | 207 | 14,100 |
| Phenol | 266 | 12,848 |
| Benzene | 299 | 12,000 |
| Ethyl benzene | 40 | 8,900 |
| Cobalt and its compounds | 100 | 6,563 |
| Styrene | 177 | 6,500 |
| Molybdenum and its compounds | 346 | 5,139 |
| Inorganic cyanide compounds | 108 | 2,700 |
| Bis Phenol A | 30 | 2,394 |
| 2-ethoxyethyl acetate | 101 | 2,347 |
| Lead and its compounds | 230 | 2,300 |
| Hydrogen Fluoride and its water-soluble salts | 283 | 2,000 |

Management of Dioxins and PCBs

Stop Incineration Treatment

The Law concerning Special Measures against Dioxins was passed in January 2000. To comply with these regulations, six of our production plants have stopped incineration of waste and transfer the waste to regional governments and recycling contractors. We are working towards banning incinerators from all production plants by November 2002.

*Law Concerning Special Measures against Dioxins: The law regulates daily intake, environmental quality standards and landfill of dioxins generated from waste incinerators

Voluntary Management of PCBs

The Law for the treatment of PCBs (polychlorinated biphenyl) was passed in July 2001. Kawasaki has been submitting reports of PCB keeping status to the Electric Insulator Treatment Association, keeping within the administrative standards. Kawasaki plans to decide how to treat the PCBs that we are holding, with the focus on the trends of PCB treatment facilities.

*Law for the treatment of PCBs: Under the Law for the treatment of PCBs, organizations are required to report to the prefecture government, the amount of PCBs that are kept and treated every year.

Ground Water

The use of tri-chloroethylene, an organic chlorine compound, is limited due to its toxicity and carcinogenic properties. At one of our manufacturing plants in Kakamigahara, Gifu, the substance was detected in the ground water at 0.057mg/l, which is twice the level of environmental regulation standards and was immediately reported to the authorities.

In this manufacturing site, the use of tri-chloroethylene in the cleaning process of components was eliminated 25 years ago. Moreover, ground water has only been used for industrial purposes. Further inspections in surrounding wells produced results that were well below the level of regulation standards.

From now on, we will conduct stringent management by continuous monitoring and improvement efforts under administrative instructions.

Other Pollutions

During fiscal 2000, there were no residents who complained about noise, vibrations, or odor. We are committed to maintaining these qualities for the surrounding society.

Waste

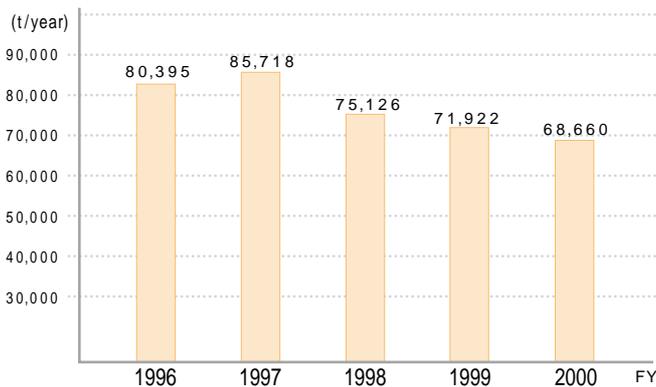
Waste Reduction and Recycling

Reduced Disposal Volume by 4.5%

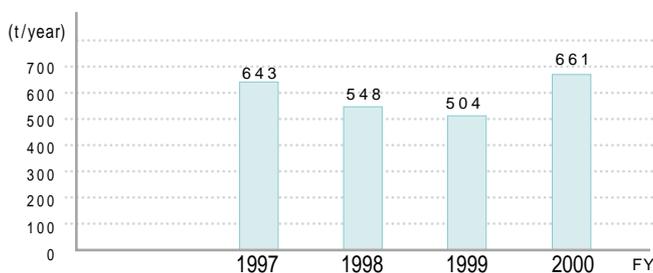
Kawasaki manages waste under 18 categories, which varies from rubber, paper, wood, ash, oil, metal and so forth. In fiscal 2000, each business divisions actively promoted the 3Rs (Reduce, Reuse, Recycle) as part of their environmental management program. Furthermore, monitoring the volume of waste generated and recycled was promoted in order to work towards the reduction target of 3.3% compared to previous year. The total volume of waste generated last year was 68,660tons, 47,676 tons of which were recycled, achieving the reduction rate of 4.5%.

From now on, we will not only reduce the generation of wastes that are large in volume and low in recycling rate, but also promote recycling. Specially controlled industrial wastes such as oil, acid, alkali, infection waste, asbestos, and dust are treated in accordance with the standards as put forth by the law.

Total Waste Volume



Specially Controlled Industrial Waste



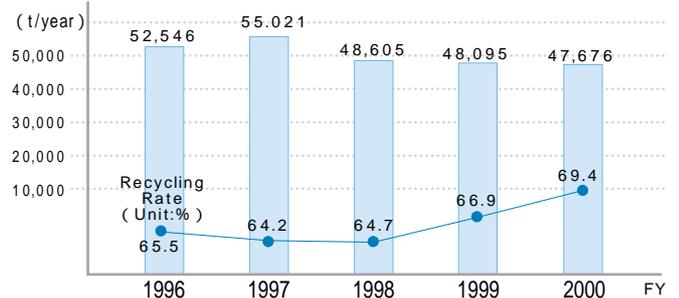
* Volume of Specially Controlled Industrial Waste is a breakdown of Total Waste Volume

Improved Recycling Rate by 2.5%

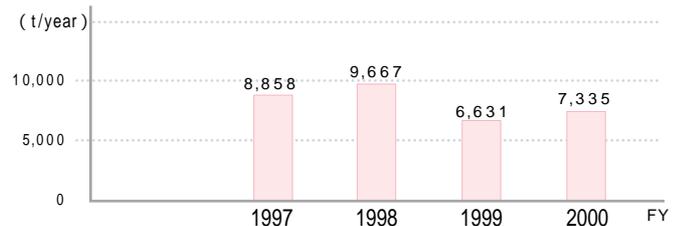
The total volume of waste recycled in fiscal 2000 was 47,676tons. The recycling rate increased to 69.4%, which is an improvement of 2.5% over the previous year. The recycling rates of paper, wood, and plastic in particular, have improved. Presently, Kawasaki is taking positive actions towards further enhancement.

*Recycling Rate (%) = (Recycling Volume / Total Waste Volume) x100

Recycling Volume



Waste Treated to Landfill



[Recycling Activities]

The numbers in () show the recycling rate in 1999

| Type of Waste | Activities | Output Volume (t) | Recycling Volume (t) | Recycling Rate (%) |
|----------------|---|-------------------|----------------------|--------------------|
| Metallic waste | •The largest output and recycling amount at each division. | 38,542 | 38,514 | 99.9 (99.8) |
| Rubber | •Reuse as fuel for cement | 11 | 10 | 88.5 (17.4) |
| Slag | •Recycle by installation of crushers •Reuse as sand for making cast | 7,221 | 4,497 | 62.3 (75.8) |
| Wood | •Recycle as wooden packaging material | 3,007 | 1,833 | 61.0 (58.2) |
| Paper | •Separate and collect by recycling boxes •Separate and correct of cardboard and paper used after copying and designing. •Recycle by Pulp-Mold Equipment •Thermal recycling | 3,155 | 1,112 | 35.2 (22.4) |
| Plastic | •Recycling of welding wire reel •Thermal recycling | 3,090 | 726 | 23.5 (5.6) |
| Glass | •Recycle at glass manufacturers •Recycle at municipal facilities | 106 | 21 | 19.9 (22.7) |
| Oil | •Reuse as fuel | 7,951 | 901 | 11.3 (3.8) |
| Alkalis | •Reuse at manufactures | 381 | 8 | 2.1 (0) |
| Sludge | •Recycle as cement fuel. •Reuse by composting | 3,258 | 47 | 1.5 (0) |
| Acids | •Collect silver from X-ray film fixers | 741 | 7 | 0.9 (0.5) |
| Others | | 1,197 | | |
| Total | | 68,660 | 47,676 | 69.4 (66.9) |

Zero Emission Activities

Goal of Achieving Zero Emissions

In order to bring about a sustainable society, maintaining the emission of waste as close to zero as possible is becoming a social movement. Kawasaki organized the Zero Emission Working Group in fiscal 2000 to attain the target of "zero landfills".

To accomplish this target, and to identify problems and advance our technology, we are currently studying the waste generation, recycling methods, and related technologies of the Harima Works in Hyogo as a model plant. Harima Works manufactures steel and other industrial equipment. We achieved Zero Emissions in this plant by the end of September 2001, and consequently in all our production plants by fiscal 2004.

Waste Treatment Structure in Kawasaki

The Environmental Management Department was organized in 1972, and since then, our policy has been that "Industrial waste should be treated properly by our business organization". In the Kansai district, where we have most of our production plants, we have been running Industrial Waste Disposal Center and Iwaoka Landfill Site as an organization for waste treatment. The waste generated in other districts is turned over to municipal facilities.

Stop of Industrial Waste Disposal Center

Kawasaki established the Waste Disposal Center in Kobe City in 1979 for the purpose of incineration treatment of specified burnable wastes generated from the Kansai district plants such as sludge, disposed paint, and plastics. In recent years, the volume of waste treated in the center has decreased sharply due to the Zero Emission activities and partial consignment to recycling companies. Thus far we have, since June 2001 stopped our own incineration treatment, as its role has finished.

Operation of the Iwaoka Landfill Site

The Iwaoka Landfill Site was inaugurated in 1973 for landfill treatment of unburnable wastes such as ash, sludge, slag, soil, sand, dust, and glass waste generated from the Kansai district production plants. Since Kawasaki is promoting Zero Emission activities throughout the company for complete accomplishment by 2004, the future operation is now under consideration.

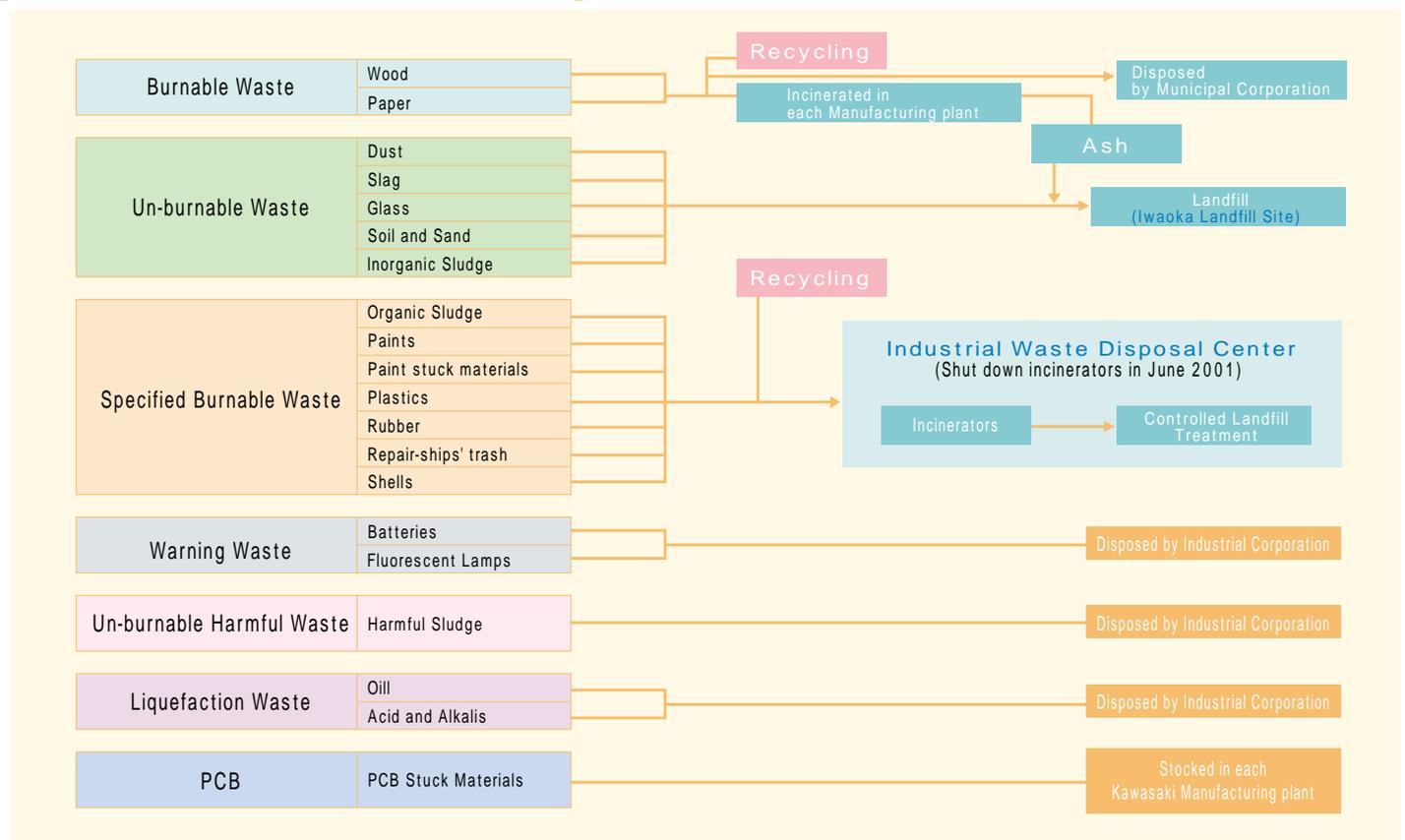


Industrial Waste Disposal Center



Iwaoka Landfill Site

[Basic Structure for Waste Treatment]



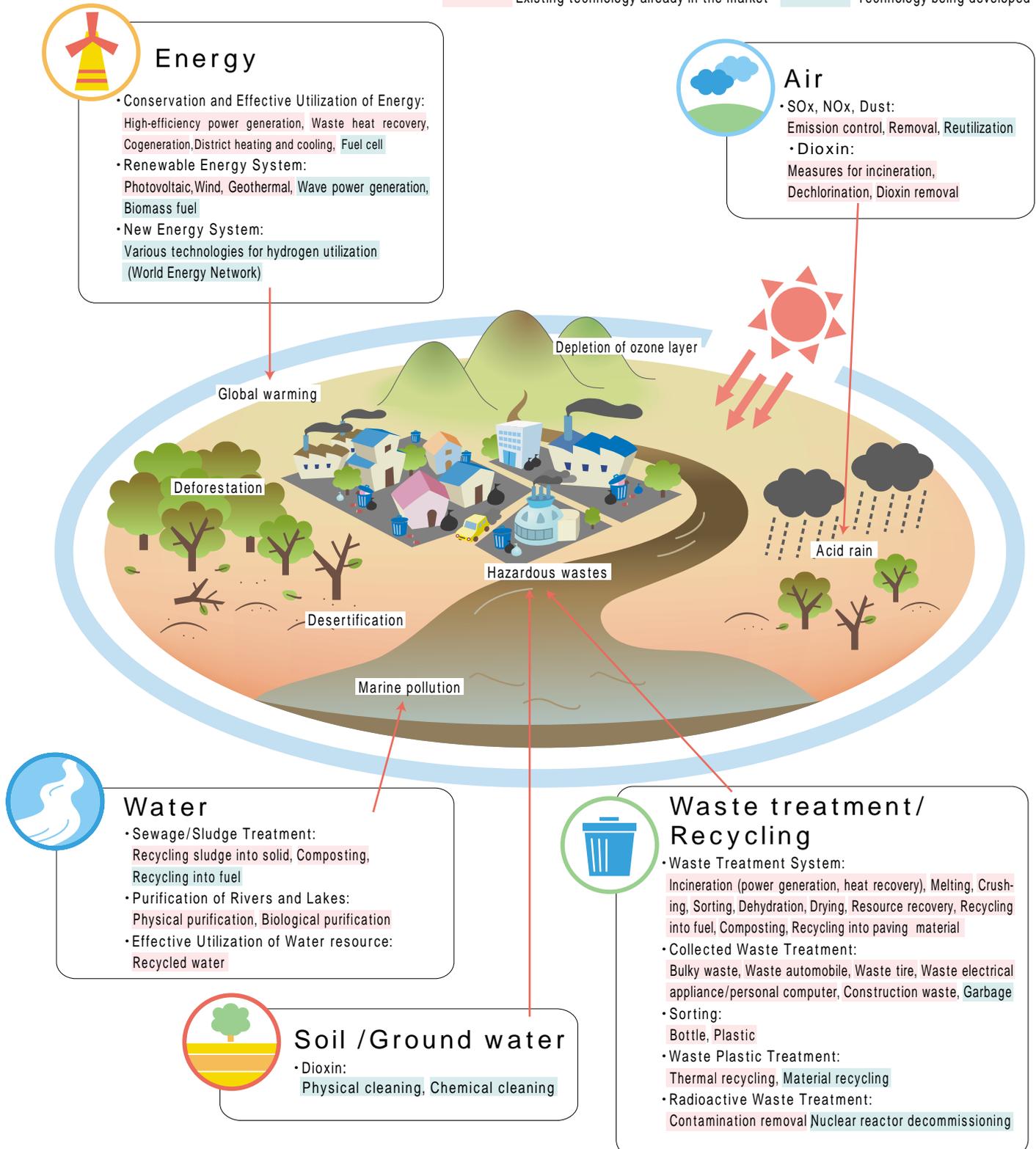
Contributing to Environmental Protection Through Products and Technologies

At present, the earth faces many environmental problems: global warming, depletion of ozone layer, acid rain, marine pollution, deforestation, desertification, hazardous wastes and so forth.

Kawasaki develops wide range of products and technologies that help to mitigate these environmental problems. The illustration shows the aspects of the environmental problems with our eco-products and technologies under the following headings/categories, which are colored according to the conditions of development.

Areas of Contribution

Existing technology already in the market Technology being developed



Products and Technologies to Protect the Environment

| Technology Fields | Products | Research & Development |
|---|--|---|
|  Energy | Conservation and Effective Utilization of Energy • Combined cycle power plant • Gas turbine cogeneration system P 18 • Waste heat recovery boiler • Cement waste heat power generation system P 18 • Top-pressure recovery plant for blast furnace • High efficiency Low-NOx coal fired boiler • Ice storage cooling system • District heating and cooling system • Optimization and diagnosis of industrial energy system | • High performance coal gasified generation technology • High performance gas turbine • Ceramic gas turbine • High-efficiency combustion technology (Various combustion system/Engine) • Low temperature waste heat recovery technology • Fuel cell power system • Super Eco-ship P 18 |
| | Renewable Energy System • Photovoltaic generation system P 18 • Wind power generation system P 18 • Geothermal generation system | • Black liquor gasification technology • Wave activated generation technology |
| | New Energy System | • Liquid-H ₂ carrier ship (World Energy Network) |
| | SOx/NOx Reduction, Dust Collection • De-SOx/De-NOx plant and dust collector for flue gas • Low-NOx gas turbine generation system • Low-NOx combustion system for heavy oil fired boiler • De-NOx system for road tunnel • Ventilation filter for road tunnel • Electrostatic precipitator for road tunnel P 19 | • Low-NOx combustion technology (Gas turbine, Boiler, Diesel, Jet engine) • De-NOx catalyst for lower temperature flue gas • De-NOx technology for marine diesel engine |
|  Air Pollution Control | Air Pollution Control • Photocatalytic coating business (For environmental protection) | • Clean-up technology for diesel engine exhaust |
|  Water Pollution Control | Sewage/Sludge Treatment • Sewage/Sludge treatment system • Reverse-osmosis membrane water treatment system (Recycled water etc.) • Sludge recycling system(Into activated carbonized material) P 19 • On vehicle sludge drying system | • Dehydration technology for sludge • Membrane water treatment technology |
| | Water Pollution Control | • Purifying technology for closed water basin |
|  Soil Pollution Control | Dioxin Cleaning | • Cleaning technology for dioxin polluted soil |
|  Waste Treatment/ Recycling | Waste Incineration • Heat recovery waste incineration system P 19 (Stoker-type, Fluidized bed-type, Gasifying-melting type) • High performance waste power generation system(Super waste power generation etc.) • Waste-burning power generation system(RDF, Soda recovery boiler etc.) • Waste Incineration system for pollution control • Flue gas treatment system(Dioxin, HCl, SOx, NOx) | • Advanced stoker type incinerator • Advanced dioxin reduction technology P 20 |
| | Crushing, Sorting • Bulky waste crushing and recycling system • Waste automobile/electrical appliance crushing and recycling system • Construction waste crushing and recycling system • Waste tire freeze-crushing system • Waste bottle/ plastic sorting system | |
| | Recycling, Pollution Control • Incineration and fly ash treatment system (Melting, Volume reduction, Pollution control, Recycling) • Refuse derived fuel (RDF) production system(Domestic/Industrial waste) • Refuse paper and plastic fuel (RPF) production system P 20 • Treatment system for slag from incineration ash P 20 • Food waste treatment system(Compost, Feed etc.) • Livestock waste treatment system • Coal fired boiler & ash recycling system(Paving material etc.) • Ultrasonic air filter cleaning system(Reusing air filter) | • Stabilization technology of incineration ash • RDF production technology using sludge • Fluff fuel/Industrial waste incineration technology • Garbage treatment technology (Biological treatment) • Organic waste methane fermentation technology • Waste plastic gasification technology • Waste polyvinyl chloride treatment technology • Sludge recycling technology • Dredged mud recycling technology • Pulverized coal fired boiler & ash recycling technology • Various material recycling technology • Waste wood recycling technology |
| | Radioactive Waste Treatment • Radioactive waste treatment system | • Nuclear reactor decommissioning technology |
| | Protection of the Natural Environment • Beach cleaner | |
| Others | Environment-conscious Products • The road surface heat environment control system using natural geothermal energy ... P 20 | |

Organization and Policy

Organization

Research and Development Group

Technology Group
 Planning & Control Department
 Akashi Technical Institute
 Gifu Technical Institute
 Kanto Technical Institute
 Production Technology Development Center
 Electronic &
 Control Technology Development Center

Products Group

Ship Division
 Rolling Stock & Construction Machinery Group
 Aerospace Group
 Gas Turbine & Machinery Group
 Plant Engineering Group
 Machinery & Steel Structure Group
 Consumer Products & Machinery Group

Policy

Research and development Group

Kawasaki realizes the social needs of the environmental protection technologies in local and global scale, and Kawasaki promotes the research and development (R/D) with clarifying the basic policy and the important fields in the present and future .

Kawasaki promotes its R/D for energy conservation, waste treatment and recycling system in recognition that the global warming protection and the creation of a recycling-oriented society are the most pressing issues, Kawasaki promotes its R/D of new technologies and products that contribute to the objective of achieving sustainable society.

Kawasaki participates in the environmental R/D projects as a member of teams organized by national projects, universities, countries and other public institutes contributing to solve environmental issues per its advanced technologies.

Products Group

Kawasaki contributes to the environmental protection supplying its technologies and products which reduce and minimize environmental impact.

Kawasaki promotes the system of manufacturing environment-conscious products in accordance with ISO 14001 standards.

Approach to Reduce Environmental Impact

Design for Environment

To build a sustainable society, manufacturers must reduce the environmental impact throughout the product's life cycle. In this respect, Kawasaki aims to build a system to improve product design and process by using Life Cycle Assessment (LCA) alongside with Product Assessment.

Using LCA to Reduce Environmental Impact

The LCA Subcommittee held explanatory meetings for all our production groups to promote company-wide understanding of the LCA analysis and LCA software. As one of the goals set in EPAP, product groups are preparing for the implementation of LCA in their production flows. Kawasaki will continue with its activities of promoting the use of LCA in all its product groups.

*LCA: Life Cycle Assessment is a method for evaluating objectively and quantitatively the impact of a product on the environment through its entire life cycle.

Using Product Assessment to evaluate potential impacts

We have conducted Product Assessment under the ISO 14001 environmental management system in acquiring certification. The table below shows our progress of assessment in the last three years. The Product Assessment Subcommittee has reviewed our Product Assessment Standards carried out in each product group and put together the results for Product Assessment Standards Manual.

*Product Assessment: A method for evaluating the environmental impact of a product prior to the designing process to include measures in the product specification.

| Product Assessment standards | 1998 | 1999 | 2000 |
|---------------------------------------|--|------|------|
| Number of Groups Prepared (total: 14) | 1 | 7 | 10 |
| Number of Products Applied | 10 | 47 | 69 |
| Example of Improvements | Resource conservation(Reduction of product weight) Higher energy efficiency and quality Purification of emitted gas Noise reduction Higher recycling rate | | |

Green Procurement

In Kawasaki, "Green Procurement Standards" were established by the Procurement Department at the head office in November 1999, setting the basic policies of Kawasaki's green procurement .

In fiscal 2000, the Green Procurement Subcommittee was formed to carry out the actual activities of green procurement.

Basic Principles

- 1.To consider environmental impacts throughout the entire life cycle of a product, that is from the selection of raw materials to final treatment.
- 2.To choose a supplier whose products have the lowest environmental impacts, given that the quality, price, and the date of delivery are same for all suppliers.
3. To collect information from suppliers about environmentally friendly materials.

Action Plan

step1

Increase the awareness of employees by supplying them with office equipment and stationery that meet the green procurement standards.

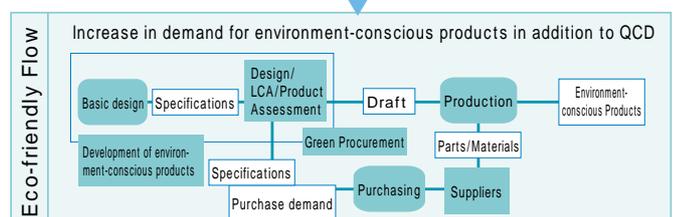
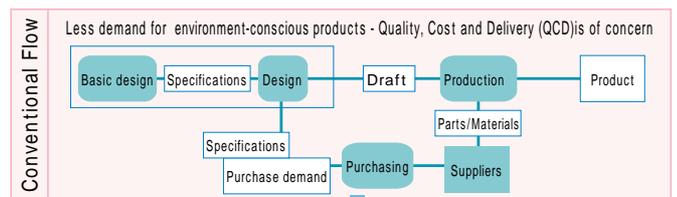
step2

Improve the quality of products by implementing green procurement standards in product design and production process.

Actual Activities

1. Preparation for green procurement (purchasing guidelines)
2. Organizing the data book of environmentally friendly materials and products
3. Promoting awareness among employees
4. Building partnership with suppliers
5. Evaluation of green procurement activities

Step1 was completed at the end of fiscal 2000 and we are now in the phase of step2. For Kawasaki to provide green products to the world, the selection of materials is an important factor in the designing process. We will work at the promotion of green procurement in conjunction with activities of LCA and Product Assessment Subcommittees.



Products and Technologies for a Sustainable Society

For the realization of a sustainable society, Kawasaki develops products and technologies in the areas of environmental issues such as energy, natural environment, waste treatment and so on. Here, we present some of our latest products, researches and technologies.

Energy

The consumption of fossil fuels and global warming is becoming a serious global crisis. Kawasaki will strive towards the utilization of renewable energy and building systems to increase energy efficiency.

Gas Turbine Cogeneration System

Achieving high energy efficiency and NOx reduction rate



Joint collaboration between Tokyo Gas, Osaka Gas, Toho Gas and Kawasaki has resulted into the development of a 650kW class Gas Turbine Cogeneration System. This is the first system in the world to use the Recuperated Cycle in this output range. The Recuperated Cycle system utilizes heat from exhaust gas with a heat exchanger and pre-heat compressed air. Compared to conventional systems, the Recuperated Cycle system has reduced fuel consumption and increased thermal efficiency by 25%. Moreover, when the Dry-Low-NOx Emission Combustor is installed on the Recuperated Cycle System, it reduces the emissions of NOx significantly. This lightweight gas turbine with less vibration, less noise and less maintenance cost is expected to be used in many facilities such as hospitals and factories.



Gas turbine cogeneration system

Cement Waste Heat Power Generation System (Vietnam)

Supporting environmental improvement in developing countries



Taking into account global environmental problems, developing countries with their rapid industrial growth need our support in tackling environmental problems. In Vietnam for example, where the cement industry is one of the largest in the country, the consumption of energy is becoming a serious problem. Kawasaki presented a solution by installing Cement Waste Heat Power Generation System that utilizes exhaust heat in the cement plants. We have been engaged in field surveys and designs in Vietnam since fiscal 1998 and have achieved good results.



Waste heat power generation system in cement incineration plant

Photovoltaic and wind power generation systems Utilization of renewable energy



CO₂ emissions are considered among the main causes of global warming. Renewable energy generated from photovoltaic and wind power will be in demand in the 21st century. Kawasaki constructed a system, which combines photovoltaic generation with gas turbine cogeneration. It was Japan's first attempt ever. This pyramid shaped object, which can be seen on the roof of the World Trade Center in Tokyo, has now become a new landmark of the area.

During fiscal 2000, we constructed our wind power generation system in Wakkanai City, Hokkaido, which is the 13th in the country. We will continue with our efforts to provide renewable energy.



Photovoltaic power generation system



Wind power generation system

Super Eco-ship

A new engine for the next generation ship
reduce environmental impact



The Ministry of Land, Infrastructure and Transport started the full-scale development of the next generation ship, "Super Eco-ship" in fiscal 2001, equipping a new style engine with less environmental impact. This new engine is a highly efficient gas turbine with less pollution. Five companies including Kawasaki participated in the technical research and development. Compared to the present diesel engines, this engine reduces the emissions of NOx to 1/10, SOx to 2/5, and noise level to 1/100. The engine also takes less space, increasing the cargo space by 20%. Moreover, it has other features such as new electric propulsion system and mitigation of the maintenance system. The ministry plans to build an actual ship by fiscal 2005.



Super Eco-ship image

Protection of the Natural Environment

Kawasaki has made an effort in developing technical systems which prevent and mitigate pollution of the natural environment, such as the air, water and soil.

Electrostatic Precipitator for Road Tunnel

Purifying emitted gas in tunnels



Automobile emissions, which contain Suspended Particulate Matter (SPM), have been a serious problem for human health in the city. Kawasaki has developed an Electrostatic Precipitator to remove SPM from the automobile emissions in tunnels. The installation of this system, not only improves the air quality and visibility inside the tunnel, but also prevents the pollution of air in the surrounding area.



Electrostatic precipitator installed in a road tunnel

Sludge Recycling System

Recycling sewage sludge into activated carbonized materials



Sludge discharged from sewage plants holds many problems such as deficiency of landfill sites, disposal costs, and inactive demand for recycled products. To solve these problems, attention is now paid to the technology that carbonizes sewage sludge and utilizes them as a fertilizer and a snow-melting agent. Kawasaki has developed an activated carbonized material production system from sewage sludge. This system can produce activated carbonized material at a moderate cost by activating carbonized sludge at a high temperature under steam-rich environment. The material can be used as a dioxin absorption agent, a deodorant and a desiccant in substitution for activated carbon.



Sludge recycling system

Waste

In realizing a recycling-oriented society, treatment and recycling of waste is a great challenge that must be faced. Kawasaki actively develops waste incinerating systems and recycling systems as a way of meeting this challenge.

Heat Recovery Waste Incineration System

Changing waste into a valuable resource

With the recognition that "Waste is a valuable resource", we make use of a waste incineration system as a power plant. Under this policy, we have developed a wide range of waste incinerators.

Stoker-type Incineration System



The stoker-type incinerator consisting of three stages of stokers performs stable combustion of waste, while simultaneously mixing and transferring it slowly onto stokers. It has specially designed structure including stokers to give a good gas flow and a good



Stoker-type incineration system

combustion state. An up-to-date waste incinerator plant is usually installed with a discharge gas clean-up system including an activated carbon absorption tower, an ash-melting furnace, a fly ash de-chlorination equipment and a power generator. This enables the environmental preservation and advanced material and heat recovery.

Internal Circulation Fluidized Bed-type Incineration System



Internal circulation fluidized bed-type incineration system

This type of incinerator is suited for combusting solidified RDF and generate power efficiently, utilizing its combustion heat. Its combustion and heat recovery zones are designed to prevent super heater piping from chlorine attack so that steam at high temperature and pressure is obtained. As a result high power generation efficiency is achieved.

Fluidized Bed-type Gasifying-melting System



This is a kind of incineration system that gasifies and carbonizes waste in a fluidized bed-type furnace and then melts it in a cyclone type melting furnace. The ash is discharged in form of slag. Since waste is treated at a lower temperature of 500-600 in a fluidized bed furnace, metals such as iron, aluminum and others can be extracted without oxidation. In



Fluidized bed-type gasifying-melting system

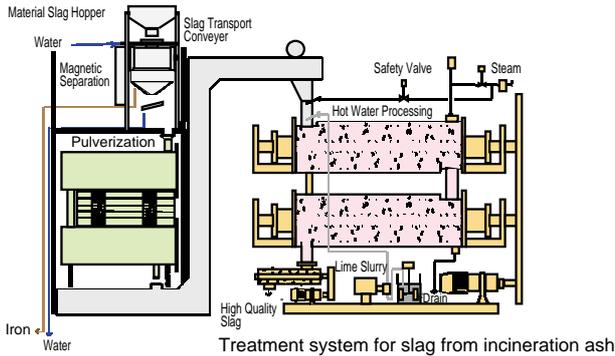
this way, effective resource recovery can be performed. High temperature melting at a cyclone furnace enables to control dioxin formation.

Treatment System for Slag from Incineration Ash

Reforming waste derived aggregates to be substituted for river sand



By various types of melting furnace, incineration ash is vitrified and recovered in a form of water-cooled slag through which reduction in volume and detoxification are made, and then becomes ready for recycling. Kawasaki has developed a treatment system for slag from incineration ash that can enhance the usefulness of slag. In this system, as recovered slag is subjected to the processes of magnetic matter removal, pulverization and hot-water treatment, the characteristics of slag become closer to those of river sand. Since reformed slag has appropriate particle size distribution, hydrophilicity, and sufficient safety, it can be utilized as fine aggregates for asphalt mixtures and concrete.



Advanced Dioxin Reduction Technology

Solving the formation mechanism of dioxins



Dioxins have been pointed out as carcinogens and endocrine disrupting chemicals threatening the health of human and other organisms. With the growing need for action to reduce these substances, Kawasaki is conducting its own research to develop technologies, which reduce and control dioxins, along with solving the formation mechanism. The findings from research works are applied to waste incineration systems enabling to develop more reliable systems.



A system for dioxin formation mechanism research

TOPICS

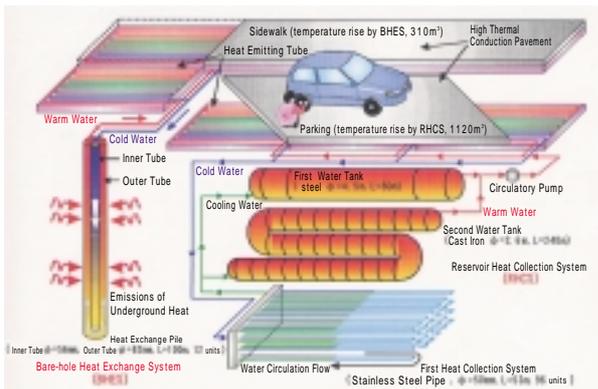
The Road Surface Heat Environment Control System Using Natural Geothermal Energy



Environmental Award from Japan Society of Civil Engineers

In May 2001, the road surface heat environment control system was granted the environmental award by the Japan Society of Civil Engineers, which recognizes revolutionary projects contributing to the protection of the environment.

Road heating is necessary for safe driving and securing barrier-free areas by melting snow in winter. However, large energy consumption and CO₂ emissions are becoming environmental concerns. The newly developed system can utilize natural geothermal energy, making the road warmer during winter and cooler during summer. The first installation in Japan was in Hachikita service area along route 9 in Hyogo prefecture. Here, the system covers 1430m², which is one of the largest areas in the world. After installation, it allows to walk and drive easily during winter and also prevents heat reflection during summer. It can be applied to other fields and is expected to be in use in variety of areas.



Road surface temperature control system at Hachikita service area. (Snow melting operation)

Refuse Paper and Plastic Fuel (RPF) Production System



Received "2000 Nikkei Superior Products and Services Awards"

Nihon Keizai Shinbun Inc., a major economic daily newspaper in Japan, recognizes innovative products and services each year. Kawasaki's Refuse Paper and Plastic Fuel (RPF) Production System won the "2000 Nikkei Superior Products and Services Awards" in February 2001.

RPF is a high calorie solid fuel, converted from paper and plastic refuse. It has calorific value of 6,000 to 10,000 kcal per kg, high enough to generate as much power as coal. This system can shred soft wastes such as films and sheets and does not require heating or waste water treatment, so that RPF can be produced with less environmental impact. Thus it is recognized as a system that contributes to a recycling-oriented society.



Refuse paper and plastic fuel (RPF) production system

Active Information Disclosure

Kawasaki provides information on how it contributes to a sustainable society and its actual environmental protection activities through various media, such as the Environmental Report and the Internet to inform all stakeholders who are concerned. We also welcome comments and questions from our stakeholders for further communication.

Environmental Report

We publish the annual Environmental Report, presenting our visions and activities of environmental protection so that various people of different parties can have a better understanding of Kawasaki. This 2001 edition, which marks our third publication, had 7,000 copies in Japanese and 2,000 copies in English distributed to our stakeholders.



Internet

In order to open our corporate visions, business activities, and environmental protection activities to more people, we have established an environmental web site within our corporate site in March 2000. From this site, you can view our environmental related information such as the organization for environmental management, green procurement, environmentally conscious products, and the annual Environmental Report. In addition, we have prepared a system to quickly respond to your comments and questions by e-mail.

Homepage address <http://www.khi.co.jp/earth/english/index.html>
 E-mail address webecocenter@khi.co.jp

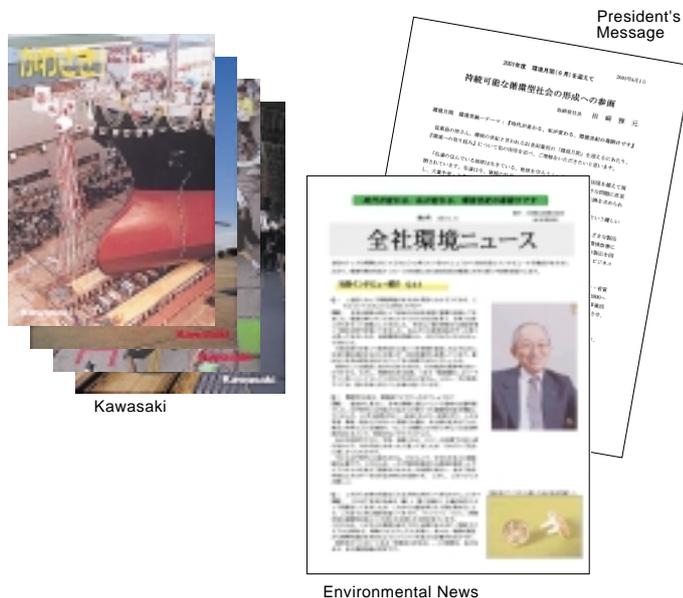


Education and Awareness

The knowledge and awareness of each employee is important in promoting environmentally friendly business and environmental protection activities effectively. Kawasaki enhances awareness of employees by addressing information and exchanging opinions through the intranet, electric bulletin board, and company newsletters. The Campaign for the Environmental Household Budget Ledger, and shows for environmental videos are also held for further education.

Newsletters

Kawasaki releases internal newsletters as another medium for strengthening awareness. The newsletter, "President's Message", is published during the Environmental Awareness Month every year. The quarterly "Kawasaki" and bi-annual "Environmental News" are also distributed to deliver our latest environmental topics.



Environmental Household Budget Ledger

The Environmental Household Budget Ledger calculates the volume of electricity, city gas and gasoline used in the household and the corresponding amount of CO₂ emissions. In addition, it helps users to monitor energy conservation and recycling levels. Kawasaki has introduced this tool to its employees and their families in June 2001 to promote environmentally friendly lifestyles.

Employee Training

At Kawasaki, we have created the Annual Training Plan, aimed at all employees, to provide them with various training programs, such as general education, management training, professional education and environmental education and training. We also encourage employees to acquire special knowledge and licenses to become an environmental specialist.

| Number of Qualified Pollution Control Manager | | Number of Qualified Energy Manager | |
|---|-----|------------------------------------|----|
| Air | 100 | Heat | 22 |
| Water | 98 | Electricity | 24 |
| Noise | 44 | Total | 46 |
| Vibration | 29 | | |
| Others (Dust, Senior Manager) | 23 | | |
| Total | 294 | | |

Corporate Citizenship

It is Kawasaki's belief that not only is it important to promote environmental protection activities in our business, but also to be involved with society. Our activities expand from local actions such as clean-up activities and idling stop campaigns for cars, to participation in governmental activities.

Community clean-up campaign by each business division
 Participation in events held by the fire station, the police station and the traffic safety association
 Implementation of campaigns to stop the idling of car engines.
 Participation in activities to prevent global warming.
 Cooperation in Japan International Cooperation Agency's (JICA) training program.

Cooperation in JICA's Training Program

When considering the world's economy, the developing countries are closely related to ours. But the economic growth and environmental protection in developing countries are not in good condition. In order to improve this situation, we are supporting a program of JICA to accept trainees from the International Center for the Environmental Management of Enclosed Coastal Seas (EMECS), to contribute to personnel training and technical-aid of developing countries. Specifically, we conduct training programs for the Management of Enclosed Coastal Sea Control at Akashi Works. We will continue our cooperation and support to JICA's global contribution activities as part of our social actions.



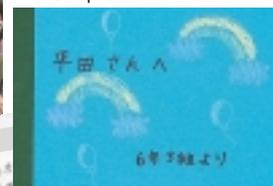
Community Involvement

Participation in Local Global Warming Prevention Activities

At the request of the Governor of Hyogo prefecture, members of Kawasaki are promoting global warming prevention activities in the district. Their roles are to offer environmental education to the citizens by providing booklets and lectures. The pictures below were taken in the global warming and energy lecture conducted at an elementary school by Satoshi Hirata, from Akashi Technical Institute. In the lecture, he presented the correct knowledge of CO₂ emissions and global warming, as well as on the present and future energy situation of Japan. The lecture was a big success and received compositions from students with comments such as, "I realized the importance of recycling and energy conservation". At Kawasaki, each one of us will contribute to local communities through environmental protection activities.



Compositions from students



History of Environmental Activities

| FY | Kawasaki's Activities | Environmental Issues and Trends (Japan/ World) |
|------|---|---|
| 1967 | | Enactment of Basic Law for Environmental Pollution Control |
| 1970 | Establishment of Pollution Control Agreement (Until 1979) | Convention of the 64th "Pollution Diet" |
| 1971 | | Establishment of the Environment Agency |
| 1972 | Organization of Environmental Management Department | Convention of the United Nations Conference on the Human Environment |
| 1973 | Establishment of Iwaoka Landfill Site | |
| 1974 | Establishment of Agreement with Workers' Union regarding Environmental Protection | |
| 1979 | Establishment of Industrial Waste Disposal Center | |
| 1987 | | Adoption of the Montreal Protocol |
| 1988 | | Establishment of the Protection Law of the Ozone Layer |
| 1991 | | |
| 1992 | | Convention of the Earth Summit |
| 1993 | Announced the bylaw, "Environmental Management Rule" | Enactment of Environmental Basic Law |
| 1994 | Held the 1st Corporate Environmental Protection Committee Created the Environmental Voluntary Plan Formulated the 1st Stage of Environmental Protection Activities Plan | |
| 1995 | Eliminated the use of specified chlorofluorocarbon gas | |
| 1996 | | International ISO 14001 established |
| 1997 | Formulated the 2nd Stage of Environmental Protection Activities Plan | Third Conference of the Parties(COP3) held |
| 1998 | | Establishment of Law Concerning the Promotion of the Measures to Cope with Global Warming |
| 1999 | Restructured the Environmental Management Department Held the 1st Corporate Environment Committee Establishment of the Environmental Charter Publication of the first environmental report | Enactment of PRTR Law Enactment of the Law concerning Special measures Against Dioxin |
| 2000 | Formulated the 3rd Stage of the Environmental Protection Activities Plan Announced the bylaw, "Environmental Management Regulation" Implementation of company-wide internal audit | Enactment of the Basic Law for Establishing the Recycle-based Society Sixth Conference of the Parties(COP6) held |
| 2001 | Shut down Industrial Waste Disposal Center | Second convention of COP6 |

The Nikkei Eco Management Ranking

In the "4th Eco Management Research" presented by Nihon Keizai Shinbun newspaper in December 2000, Kawasaki was ranked 83rd among the total of 791 companies in the manufacturing industry. We will continue our efforts to improve our environmental protection activities, aiming for advancement in the future.



Reference: "Eco management indicator" on Nihon Keizai Shinbun Newspaper (December 5, 2000 edition).

*Based on the results of the questionnaires, rankings were determined by the total scores of the following 11 evaluation categories: waste reduction, waste management, recycling, CO₂ measures, chemical substance management, pollution control, product measures, organization and policy, management system, environmental report and accounting, environmental education and corporate citizenship.

Bridge to the Future

For the past 100 years, Kawasaki's technological innovations have contributed to the development of society by providing frontier technology. Kawasaki always looks to the future with cutting edge technology particularly for land, air, and sea based industries. In the 21st century, Kawasaki envisages to extend its technological development and knowledge for the harmonious coexistence of man and nature.

Major Domestic offices

Kobe Head Office
Tokyo Head Office
Noda Works
Yachiyo Works
Sodegaura Works
Chiba Works

Gifu Works
Nagoya Works 1
Nagoya Works 2

Kobe Works
Hyogo Works
Nishi-Kobe Works
Seishin Works
Akashi Works
Banshu Works
Harima Works

Sakaide Works
Industrial Waste Disposal
Center & Iwaoka Landfill

Contacts:

KAWASAKI HEAVY INDUSTRIES, LTD.

Environmental Management Dept., Kobe Head Office
Kobe Crystal Tower, 1-3, Higashikawasaki-cho 1-chome,
Chuo-ku, Kobe 650-8680, Japan

Phone: 81-78-371-9542 Fax: 81-78-360-8700

Kawasaki Web Site

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



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