



Environmental Report

2004

Message from the President

In Pursuit of Sustainable Growth

— Coexistence with Communities, Symbiosis with Our Earth —



A handwritten signature in black ink that reads "Masamoto Tazaki". The signature is fluid and cursive.

Masamoto Tazaki
President and CEO

Seeking Sustainable Development through "Quality Followed by Quantity Management"

—Not Producing Unnecessary Things—

During the high economic growth period of the past, during which industry consumed a vast quantity of resources, industries strived to improve the material convenience and comfort in our daily lives. This type of economy, however, has led to excessive impacts on the global environment beyond the Earth's ability to purify and regenerate itself, and has caused a multitude of environmental problems.

Society now expects industry to take an active role in addressing the environmental problems, and an enterprise that fails to fully commit itself to realizing symbiosis with the global environment may not survive. In this so-called "Environment Century," satisfying people's material needs, while utilizing greatly reduced amounts of resource and energy has become the new mission for manufacturers. I can see that technologies that promote a sustainable society will become the focus of attention, replacing technologies based on high-energy consumption.

The shortsighted approach of simply lowering costs through mass production in order to create new demand has resulted in an oversupply of merchandise. We should not produce wastes and other things that society judges to be "unnecessary." Products manufactured by consuming precious resources and energy must satisfy the real needs of customers.

Since the day I became president of Kawasaki, I have been promoting a shift to the policy of **"Quality Followed by Quantity Management."** Valuing quality over quantity basically means making effort to satisfy customers through high-value-added products and services, but I believe this policy

should be extended to environmental management as the principle of **"Not Producing Unnecessary Things."** Following this management policy, Kawasaki has been pursuing its various business activities and steadily fulfilling its requirements. By further promoting this policy, we will contribute to the development of the sustainability of society and enhance our value to that society.

Technological Innovation that Enriches the Spirit

—Proactive Attitudes Overcome High Hurdles—

When applying the **"Quality Followed by Quantity"** policy to manufacturing, the consumption of resources and energy must be minimized while the satisfaction provided by products must be maximized. These requirements pose a difficult-to-solve equation, but there should be a key to its solution. That key is to incorporate "environment parameters" in the products being manufactured, and to create valuable products and services at reasonable costs by best harmonizing with the benefit provided by nature. The processes of realizing this key also gives birth to "technological innovation" that contributes to competitiveness.

Japan, a country with few natural resources and a high population density, has a tradition of living in harmony with nature and optimizing our consumption of those limited resources. I believe that Japanese today continue to carry this tradition in their genes.

I believe that we can create a new competitive edge that differs from that fostered during the resource consumption-oriented economic growth period, and gain a vision of our future growth by fully utilizing the wisdom that has been nurtured by Japanese tradition.

For example, new technologies that will change people's lives include techniques for optimally and more efficiently utilizing electricity and heat generated from petroleum, coal and the other fossil fuels that we inherited from the ancient Earth, and new power generation methods using biomass, wind power, and virtually inexhaustible solar energy. These are the fields to which Kawasaki's total technological infrastructure can contribute.

In addition, the use of hydrogen will be one of the most important keys to solving the environmental problems. Although there are many issues to be resolved in the use of hydrogen as one main energy source, I would like all of Kawasaki's employees to see this as the perfect opportunity to tackle this worthy theme, believing that these challenges are our chance to achieve even greater competitiveness. We can make it a reality with Kawasaki technology.

We have already entered an era where the growth of an enterprise rests heavily on its attitude toward environmental issues. Creating products and technologies that reduce energy consumption is already a Kawasaki strong point, and we want to contribute to the creation of a sustainable society by promoting technologies in the environmental field, offering products that directly contribute to environmental protection, and providing products with environmentally conscious product life cycles.

What We Must Do to Maintain Trust in the "Kawasaki" Brand

—"Think Globally, Act Locally" to Start a Consistent Effort from the Ground up—

In addition to creating high-value-added products while aiming to achieve "harmony with the global environment" through ceaseless technological innovation, it is also very important to help customers understand the value and application of the products we produce.

Recently, attention has focused on the concept of "life cycle costs," in which the sum of initial costs and running costs for a product are assessed. This represents a move by industry to pursue longer product service life and reduced energy usage during total service life—the result of reflecting on the unsustainable resource consumption-oriented culture that had dominated previously. This approach to manufacturing benefits customers by reducing operating costs, CO₂ emissions and other environmental impacts. We need to gather supporting data and make proactive proposals based on the **total energy management principle** so that our customers will understand these benefits. I want to maintain our customer's strong trust in the "Kawasaki brand" by actively improving the performance, quality and service of our products as well as by presenting powerful support of their merits.

One of my mottos is "**Think Globally, Act Locally.**" This expression means our view should be broad, but we must start by acting on issues close to us. This concept applies to our environmental protection activities as well. As a corporation, Kawasaki will faithfully endeavor to achieve the goal of "harmony with the global environment" through its business activities. At the same time, I would like to ask you to start with little things in your daily lives by adopting a lifestyle that reduces the environmental impact of your businesses and local communities and in your homes as well. There is no instant method to achieve a sustainable society. It is important to start out with something we can make effort with every day.

Enterprises exist and survive thanks to society. Considering the great impact of business activities on society, it is quite appropriate that every enterprise sincerely commits to environmental protection efforts. Furthermore, in recent years society has been keeping a careful eye on how well enterprises fulfill their social responsibilities in their various business activities. This is an era when acts that go against the interests of society can jeopardize the reason for existence of an enterprise. We must be prepared, formulating countermeasures against all sorts of foreseeable risks, including environmental issues. One of the most important issues to consider, in that sense, is our compliance with existing laws and regulations. We must realize that an enterprise is also a member of society, and we will make strong efforts to make sure our business activities are highly transparent.

I believe that our dedication to making products that society needs, and the positive activities in harmony with society of both the enterprise and its employees will certainly result in the lasting growth and progress of Kawasaki.

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Coexistence with Communities

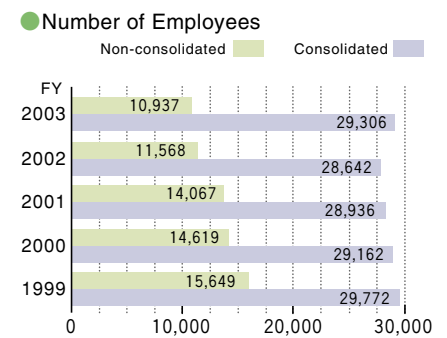
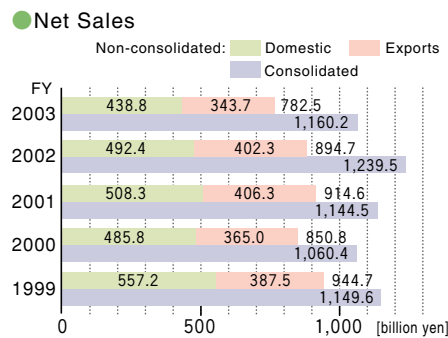
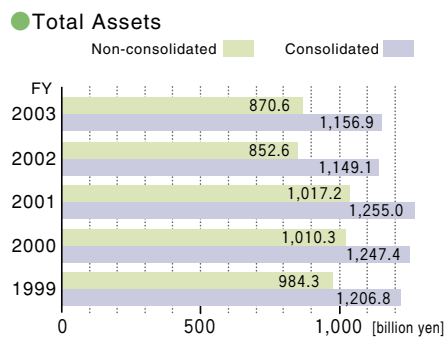
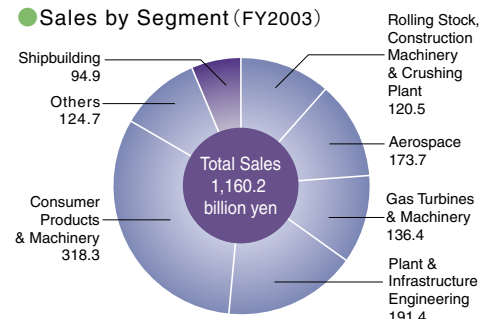
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Corporate Profile

- ◎ **Name:** Kawasaki Heavy Industries, Ltd.
- ◎ **Incorporated:** October 15, 1896 (Founded: April, 1878)
- ◎ **Capital:** 81.4 billion yen
- ◎ **Kobe Head Office:** 1-3, Higashikawasaki-cho 1-chome, Chuo-ku, Kobe, Hyogo 650-8680, Japan
- ◎ **Tokyo Head Office:** 4-1, Hamamatsu-cho 2-chome, Minato-ku, Tokyo 105-6116, Japan
- ◎ **Representative:** Masamoto Tazaki, President and CEO
- ◎ **Kawasaki Network:** Domestic: 24 (including 12 Works) Overseas: 7
- Subsidiaries and affiliates: 135** (As of March 31, 2004)



Internal Companies and Affiliates

Business Fields, Major Products and Domestic Works

Rolling Stock, Construction Machinery & Crushing Plant Company

[Major Products]

Rolling Stock, Construction Machinery, Crushers, Pulverizers, Cast Steel Products



As Japan's largest manufacturer of rolling stock, Kawasaki has produced a succession of vehicles that have left their mark on railway history, including the world famous Shinkansen trains, subway cars and monorails. Recently, we have also been delivering our products to overseas customers. We were awarded a contract to make Shinkansen trains for Taiwan's high-speed railway system, and in January 2004 we held the rollout ceremony for the first Shinkansen train for Taiwan at our Hyogo Works. We are not only promoting research and development of high-speed trains, including maglev linear motor cars, but are also working on developing environmentally conscious trains that make less noise and vibration.

In addition, we are bringing to market many other unique products that contribute to society. For example, our construction machinery includes wheel loaders and crushers that produce aggregate for constructing roads and buildings, and our resource recycling equipment includes equipment that converts plastic waste into solid fuel.

[Works] **Hyogo Works, Banshu Works, Yachiyo Works**

Aerospace Company

[Major Products]

Aircraft, Space Development Equipment



Our aircraft business has a wide scope, and includes joint development work with Boeing. We produce training aircraft, maritime patrol planes and transport planes and helicopters for the Japan Defense Agency. A transport helicopter we prepared for the Japan Defense Agency is one of the largest models in the world. We are working to develop this model, the BK117 with a German partner for civilian use as well. In Japan, we manufacture the greatest overall variety of aircraft models.

In the space development sector, we have been put in charge of construction of the launch facility for the H-2A rocket, which is entirely Japanese made. We also develop and fabricate fairings for satellite bearing rockets. Work on the Japanese equivalent of the Space Shuttle, construction of the laboratory module for the International Space Station, and astronaut training are also projects that have our commitment.

[Works] **Gifu Works, Nagoya Works 1, Nagoya Works 2**

Gas Turbines & Machinery Company

[Major Products]

General-purpose Gas Turbines, Jet Engines, Prime Movers, Equipment



We develop and manufacture jet engines for fixed wing aircraft and helicopters. We often cooperate with domestic and international partners, and the scope of our activities continues to expand. For example, we are taking part in national projects to develop supersonic transport and spacecraft.

We also independently developed and marketed gas turbine-driven emergency power generation equipment. Our share of the compact and medium-sized emergency power generation equipment market is now the largest in Japan.

Our machinery business began as a maker of ship engines, but has firmly established its position among manufacturers of land-based power generation equipment as well by producing, for example, power generation steam turbines and compressors.

[Works] **Akashi Works, Seishin Works, Kobe Works**

Editorial Policy

- With this Report, we intend to inform you about the current status of progress relative to our 2010 Environmental Vision: What Kawasaki Should Be in the Year 2010, as well as the 4th Environmental Management Activities Plan (EPAP) (FY2003-FY2005) that was developed in accordance with the 2010 Environmental Vision. Environmental Report 2004 describes our planned and actual environmental protection activities for FY2003, and our self-evaluation of the achievements of these activities.
- Kawasaki is a manufacturer that produces a variety of heavy industrial equipment that is utilized for the infrastructure of modern society. This Report provides information about how our products contribute to society in terms of environmental protection by summarizing specific data about improvements in product performance (energy savings, air quality improvements, reduction of hazardous materials use, recycling, etc.) as well as the development of environmental protection-related technologies.
- To make it easier to understand, items capable of quantification are presented together with numerical targets, wherever possible.
- For disclosure of environmental data, this Report provides data for every domestic production base in addition to data for every internal company.
- Regarding "Coexistence with Communities," this Report summarizes Kawasaki's contributions to communities not only for environmental aspects, but also for our efforts related to employment and labor safety and health.

We hope that this Report helps you understand our commitment to environmental management for realization of a sustainable society as well as our environmental protection activities.

To develop this Report, we have referred to the Environmental Reporting Guidelines (Fiscal Year 2000 Version) issued by the Ministry of the Environment, Government of Japan.

●Reporting Scope

This Report covers information on environmental aspects of Kawasaki head offices, technical institutes, branch offices, and works in Japan, and major affiliates Kawasaki Shipbuilding Corporation and Kawasaki Precision Machinery Corporation (KPM), but does not cover overseas offices.

●Reporting Period

The information contained herein is reported for the period of April 1, 2003 to March 31, 2004, which is our FY2003.

●Schedule for Future Issues

This report will be issued annually.

Promise to the Earth



地球が微笑む物づくり

[Environmental symbol]

This symbol identifies environmentally conscious products and manufacturing processes that Kawasaki has focused its knowledge on in order to alleviate environmental impacts, and reflects our dedication to solving global environmental problems.

Plant & Infrastructure Engineering Company

[Major Products]

Industrial Plants, Environmental Protection Facilities, Steel Structures



We manufacture plants and equipment that contribute greatly to society around the world. Our products include electricity-generating plants, refuse incinerators, recycling centers, and other facilities that contribute to environmental protection, as well as cement, chemical and other industrial plants.

We also fabricate structural members for extremely long bridges, such as the Akashi Straits Bridge, and high-rising buildings, including the Tokyo Metropolitan Government Buildings. Our steel structures also support multi-purpose dome stadiums, airport buildings and other infrastructure that is indispensable to society.

In addition, we contribute to the creation of comfortable living environments by promoting the use of clean energy sources, including LNG, wind power and biomass.

[Works] **Kobe Works, Harima Works**

Consumer Products & Machinery Company

[Major Products]

Motorcycles, ATVs, Jet Ski Watercraft, Industrial Robots



The Kawasaki brand is famous around the globe. Our motorcycle products are extremely popular among riders everywhere because of their unique characteristics and performance. Marine-sports enthusiasts throughout the world also love our Jet Ski® personal watercraft.

In 1970, we developed the first industrial robot in Japan, and since then, we have continued to lead the robot industry with our advanced technology and highly reliable products.

Our business motto is "simple and friendly" and, with this in mind, we manufacture high speed, high performance, compact state-of-the-art industrial robots, and offer engineering support for complete production systems that are designed with robots as key hardware.

[Works] **Akashi Works**

Kawasaki Shipbuilding Corporation

[Major Products]

Marine Vessels, Offshore Structures



Kawasaki Shipbuilding Corporation makes full use of the extensive experience it has accumulated through a "century of making ships" to engage in shipbuilding and ship repair.

As a pioneer in the field, we have superb engineering know-how and advanced technologies. Throughout our history, the company has produced many "first" ships in Japan, including the first submarine and the first LNG carrier. Our engineering ability remains at the top level in the world.

We build virtually every type of ship at our two shipyards in Japan and one shipyard abroad, including LNG carriers, LPG carriers, container ships, oil tankers, oceanographic vessels and Japan Coast Guard patrol vessels. We believe that our ships, and our efforts to develop technologies that make them more efficient and reduce environmental impacts contribute to the lives of people around the world.

[Works] **Kobe Works, Sakaide Works**

Environmental Management

To realize our intentions to contribute to a sustainable society, we have an "Environmental Charter." Furthermore, we are promoting environmental management activities to fulfill our 2010 Environmental Vision: What Kawasaki Should Be in the Year 2010.

Environmental Charter

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 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 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.

Action Plan for Our 2010 Environmental Vision

In 2003, we established "What Kawasaki Should Be in the Year 2010" as the 2010 Environmental Vision of the Kawasaki Heavy Industries Group. This vision defines how the Kawasaki Group should be in the year 2010, and consists of five aspects—environmental philosophy, environmental management, environmentally conscious products, environmentally conscious production, and environmental communication.

products, environmentally conscious production, and environmental communication. In practice, we have been working to realize this vision through a series of three-year Environmental Management Activities Plans, the first of which began in FY1994.

Item	What Kawasaki Should Be in the Year 2010 (2010 Environmental Vision)	4th Environmental Management Activities Plan (FY2003-FY2005)
Environmental Philosophy	<ul style="list-style-type: none"> · Actions by all Kawasaki Group employees are taken with concern for the environment, not only at work, but also in their local communities and homes, in accord with our Environmental Philosophy, which declares our commitments to the realization of a sustainable society. 	<p>Provision of comprehensive education and training programs for promoting environmental consciousness</p> <ul style="list-style-type: none"> · The Environmental Handbook is scheduled to be issued in FY2004. · Promotion through IT of the environmental consciousness of all employees · Continued education activities about environmental issues for employees
Environmental Management	<ul style="list-style-type: none"> · Implementation of an Environmental Management System (EMS) and action are taken based on this EMS by all Kawasaki Group employees. · Incorporation of environmental considerations into the business management of each internal company enhances their environmental management levels. · An environmental management information system is created. 	<p>Environmental management to increase social trust</p> <ul style="list-style-type: none"> · Support for promotion and creation of EMS for consolidated subsidiaries · Establishment of techniques for analyzing environmental management activities · Provision of management-related environmental information to Kawasaki management · Utilization of IT for acquiring and managing environmental data
Environmentally Conscious Products	<ul style="list-style-type: none"> · Design for Environment (DfE) is used for all products to enhance their environmental efficiency. · Products are offered that help protect the environment, thus contributing to the environment, society and businesses. 	<p>Contribution to the sustainable development of society through technologies and products that help protect the environment</p> <ul style="list-style-type: none"> · Application of Design for Environment (DfE) (product assessment, LCA, etc.) for major products · Promotion of green procurement systems in order to expand the scope of goods purchased through green procurement · Enhancement of supply of products that promote environmental protection and reduce environmental impact
Environmentally Conscious Production	<ul style="list-style-type: none"> · Administrative penalties and administrative provisions are avoided, and voluntary control standards based on the needs of society are established to improve our environmental management level. · Every production activity is free of irrationality and waste to enhance the efficient utilization of resources and energies. · Total greenhouse gas emissions amount in FY2010 is reduced by 6% relative to the FY1990 level. · Total waste production in FY2010 is reduced by 10% relative to the FY2000 level. · Maintenance of zero emissions (recycling rate 100%) is realized in all works. · The use of harmful chemical substances is reduced. 	<p>Strict compliance with environmental laws, regulations and agreements</p> <ul style="list-style-type: none"> · No administrative penalty, administrative provision, resident complaint, etc. · Setup of voluntary control standards that addresses social needs <p>Promotion of environmental impact alleviation in production activities</p> <ul style="list-style-type: none"> · Examination of programs for measuring and reducing the amounts of resources and energy input in production processes · Reduction in total emissions of greenhouse gases to FY1990 level (reduction of 9,500 t of CO₂) · Reduction in total waste production by 5% relative to the FY2000 level (reduction of 3,500 t) · Realization of zero emissions in all works by the end of FY2004 · Implementation of hazardous chemical substances reduction program
Environmental Communication	<ul style="list-style-type: none"> · Kawasaki Environmental Reports that comply with the needs of society are published. · Communication with stakeholders is promoted. · The entire corporation and all employees are committed to environmental improvement in local communities. 	<p>Improvement of social trust in Kawasaki for sustainable development</p> <ul style="list-style-type: none"> · Information disclosure of environmental data · Promotion of communications with stakeholders · Positive cooperation in environmental activities of national and local governments

Development into 3-year Environmental Management Activities Plan



Message from the Chief Environmental Officer



Shuji Mihara

Chief Environmental Officer
Executive Officer

Aspiring to Be a Sustainable Enterprise with Social Trust

I am not going too far when I say that in the 21st century - the "Environment Century" - environmental and energy-related problems, such as global warming, will have top priority among the issues that we must deal with assertively.

Not only the government of every country but every enterprise and individual is challenged to think, from a variety of perspectives, about what they need to do to attain symbiosis with the global environment.

Enterprises, in particular, must conduct business activities based on energy and resource conservation in order to realize an affluent, well-balanced and sustainable society.

We see this as an opportune time for Kawasaki to develop new technologies and offer products to protect the environment while, at the same time, reducing the environmental impacts during the production process, so that we can improve our corporate image and become a trustworthy and sustainable enterprise.

Regarding the 4th Environmental Management Activities Plan, which commenced in FY2003, three additional divisions achieved zero emissions (no disposal of waste as landfill); so now a total of 8 divisions out of 12 achieved this objective.

In FY2003, we standardized the method for managing greenhouse gas emissions, and assigned to each of our divisions a goal of further decreasing emissions. In addition, as a step toward establishing an Environmental Management System (EMS) for our consolidated affiliates, we established the Kobe Environmental Management System (KEMS) in collaboration with the City of Kobe and other organizations. KEMS stresses

the substantial points so that comparatively smaller organizations can implement it more easily and more effectively than ISO 14001.

The 4th Environmental Management Activities Plan is now steadily making progress. In FY2004, we will continue to expand the following activities with the goal of being a trustworthy and sustainable enterprise:

- Expansion of the application of Environmental Management System (EMS) throughout Kawasaki Heavy Industries Group's consolidated affiliates
- Incorporation of an integrated management system for environmental data that will enable effective environmental impact assessment by management
- Promotion of waste reduction and recycling activities: Realization of "Zero emissions" at all the domestic works and offices
- Establishing a draft plan for reducing usage of hazardous chemical substances
- Strengthening of our environmental risk management system in view of environmental regulation trends

I believe that, in pursuing these activities, the most important thing is "for every employee of the Kawasaki Heavy Industries Group to always act with the environment in mind not only at the company but in their communities and at home."

Only when all our employees have a strong environmental consciousness, society will recognize us as "an enterprise that contributes to the protection of the global environment" and purchase our products because they are made by Kawasaki everybody trusts, elevating our corporate image in society.

We should all reconsider the environmental impact of what we do at the company and at home, starting with things we can do beginning with the most familiar issues.

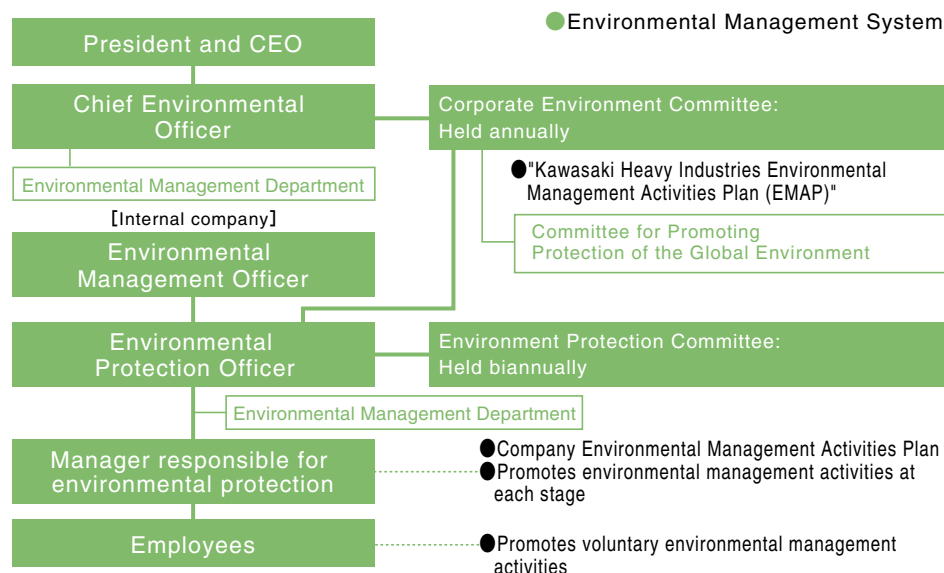
A company, whose employees voluntarily and proactively address various social problems including environmental issues, will enjoy favorable recognition from society and be capable of sustainable growth.

Much like with safety issues, if any of us fail to be conscious of environmental issues, something disastrous is bound to happen.

Let us all ask ourselves what we can or must do regarding waste reduction, the economical and moderate use of water, electricity and air conditioning, as well as compliance with environmental regulations, whether we are at the company, in our communities or at home.

Organization for Environmental Management

The organization for environmental management for all of Kawasaki is illustrated schematically to the right. Internal company systems are applied to environmental management activities so that environmental protection programs suitable to the products manufactured by each internal company are promoted. An Environmental Management Officer, an Environmental Protection Officer and a manager responsible for environmental protection are assigned to every internal company, every affiliate and the technical institutes.



Environmental Management

Key Measures and Evaluations for FY2003

4th Environmental Management Activities Plan—FY2003 Plan and Achievements, and Key Measures for FY2004

FY2003 marked the first year of the 4th Environmental Management Activities Plan, which is a three-year plan. In this year, to fulfill our 2010 Environmental Vision, "What Kawasaki Should Be in the Year 2010," measures were developed and executed along five themes. The achievements in this year are summarized below.

Other than the increase in greenhouse gas emissions due to increase in production (despite environmentally conscious production), the targets that were not achieved are responded to as key measures for FY2004.

*Evaluation criteria:◎...Target was fully achieved. ○...Target was almost fully achieved. △...Target was not achieved despite positive efforts.

Item	FY2003 Plan	Evaluation Result	FY2003 Achievements	FY2004 Key Measures
Environmental Philosophy Provision of comprehensive education and training programs for promoting environmental consciousness	<ul style="list-style-type: none"> ①Preparation of draft of "Environmental Handbook" ②Execution of environmental education utilizing Information Technology ③Continued reporting of environment-related topics, and enhancement of topic details 	<ul style="list-style-type: none"> △ △ ○ 	<ul style="list-style-type: none"> ①Employee environmental consciousness questionnaire (see page 9) ②Examination of environmental education system ③Environmental News, in-house magazine "Kawasaki" (see page 9) 	<ul style="list-style-type: none"> ·Publication of "Environmental Handbook" ·Trial execution of environmental education by e-learning ·Continued reporting
Environmental Management Environmental management to increase social trust	<ul style="list-style-type: none"> ①Development of program for creating EMS for affiliates ②Study of environmental management indexes ③Regular publication of Environmental Management Information ④Feasibility study for online environmental data acquisition 	<ul style="list-style-type: none"> △ △ ○ ○ 	<ul style="list-style-type: none"> ①Participation in start-up of Kobe version of EMS certification system ②Study of management indexes (proposal) ③Publication of environmental management information: twice/year ④Execution of demonstration of management system 	<ul style="list-style-type: none"> ·Support for affiliates in introducing EMS ·Determination of environmental management indexes and trial for evaluation ·Continued publication of Environmental Management Information ·Introduction of management system
Environmentally Conscious Products Contribution to the sustainable development of society through technologies and products that help protect the environment	<ul style="list-style-type: none"> ①Application of Design for Environment (DfE) to major products ②Study for formulation of green procurement rules ③Expansion of scope of environmentally conscious products being supplied 	<ul style="list-style-type: none"> ○ ○ ○ 	<ul style="list-style-type: none"> ①"Product assessment" (see page 11) "Life Cycle Assessment" (see page 11) ②"Creation of Management System for Substances with Environmental Impacts" for communication with customers of consumers products and machinery via the Internet (started in March 2004) (see page 11) ③Supply examples (see pages 12 through 18) 	<ul style="list-style-type: none"> ·Expand scope of application of DfE ·Formulation of green procurement rules for subcontractors
Environmentally Conscious Production Strict compliance with environmental laws, regulations and agreements	<ul style="list-style-type: none"> ①No administrative penalty, administrative provision, resident complaint, etc. ②Study of voluntary control standards 	<ul style="list-style-type: none"> △ ○ 	<ul style="list-style-type: none"> ①One complaint from residents (see page 9) ②Establishment of voluntary water quality control standards 	<ul style="list-style-type: none"> ·No administrative penalty/provision, resident complaint, etc. ·Establishment of voluntary air quality control standards
Environmentally Conscious Production Promotion of environmental impact alleviation in production activities	<ul style="list-style-type: none"> ①Energy and material flow evaluation and planning for major processes ②Total emissions of greenhouse gases from all of Kawasaki: 1% or greater decrease relative to the FY2002 level ③Waste production from all of Kawasaki: 2% or more decrease relative to the FY2000 level ④Achievement of zero emissions at Kobe Works Machinery Division and Akashi Works ⑤Hazardous chemical substances: development of chemical substance decrease plan, including study for alternative substances ·PCB-containing equipment: development of plan for total ban 	<ul style="list-style-type: none"> ○ △ ◎ ◎ ○ 	<ul style="list-style-type: none"> ①Start of management by energy flow (Gas Turbines & Machinery Company) ②Increase of 6.2% relative to FY2002 level (see page 19) ③Decrease of 3.3% relative to FY2000 level (see page 20) ④Fulfillment at Kobe Works, Akashi Works, Seishin Works, Tokyo Head Office and Tokyo Design Office (see page 20) ⑤Each division considered and executed decrease in use of the following substances: <ul style="list-style-type: none"> ·Dichloromethane, fluorine, lead, hexavalent chromium, etc. ·Tar epoxy coating ·Each division developed a plan for total ban of PCBs. 	<ul style="list-style-type: none"> ·Trial execution of energy flow technique ·Total CO₂ emissions from all of Kawasaki: decrease of 2.6% or more relative to FY2003 level (total 265,800 t-CO₂) ·Total waste production from all of Kawasaki: decrease of 3.5% or more relative to FY2000 level (total 66,300 t) ·Zero emissions at all works: fulfillment in FY2004 ·Hazardous chemical substances: promotion of decreased use ·PCB-containing equipment: promotion of total ban
Environmental Communication Improvement of social trust in Kawasaki for sustainable development	<ul style="list-style-type: none"> ①Continued publication of environmental report, inclusion of data by site and major affiliates ②Establishment of system for risk communication with stakeholders ③Promotion of environmental volunteer activities in local communities 	<ul style="list-style-type: none"> ◎ ○ ○ 	<ul style="list-style-type: none"> ①Disclosure of information about environmental data for all of Kawasaki (see pages 23 - 26) ②Execution of risk communication training according to PRTR (see page 9) ③Actual activities (see page 21). 	<ul style="list-style-type: none"> ·Additional information disclosure to improve social trust from society ·Continued enhancement of system for risk communication with stakeholders ·Continued activities for contribution to communities



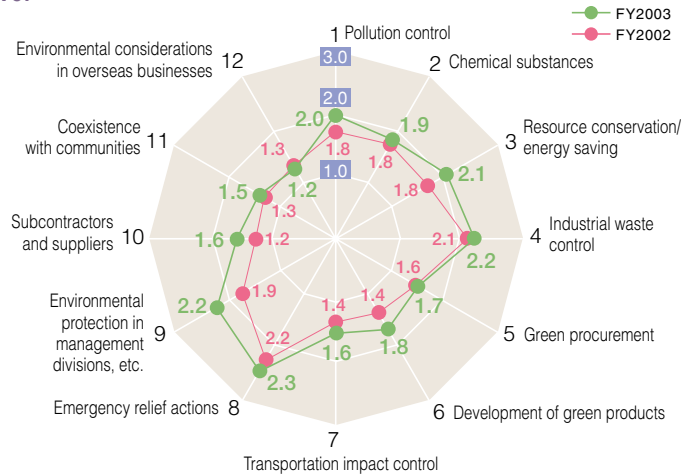
Voluntary Evaluation of Kawasaki's Environmental Level

In order to evaluate the FY2003 environmental protection activities, the results of the self-evaluations of all of the divisions were used to calculate corporate-wide averages. The results are shown in the radar chart to the right. Improvements were made in the following indexes, which were judged as areas where "more efforts are needed" in last year's evaluation.

- Development of green products (6)
- Transportation impact control (7)
- Subcontractors and suppliers (10)
- Coexistence with communities (11)

However, compared with other indexes, the above indexes still need further improvement. In particular, the "Environmental considerations in overseas businesses" index needs much more effort.

Our self-evaluation for environmental protection activities began in FY1999 according to the evaluation guidelines stipulated in the industry. All of our divisions had acquired ISO 14001 certification by FY2002. Since then, our self-evaluation of environmental protection activities has been based on our own "Kawasaki's Environmental Activities Evaluation Guide" that focuses on actual environment-related activities.



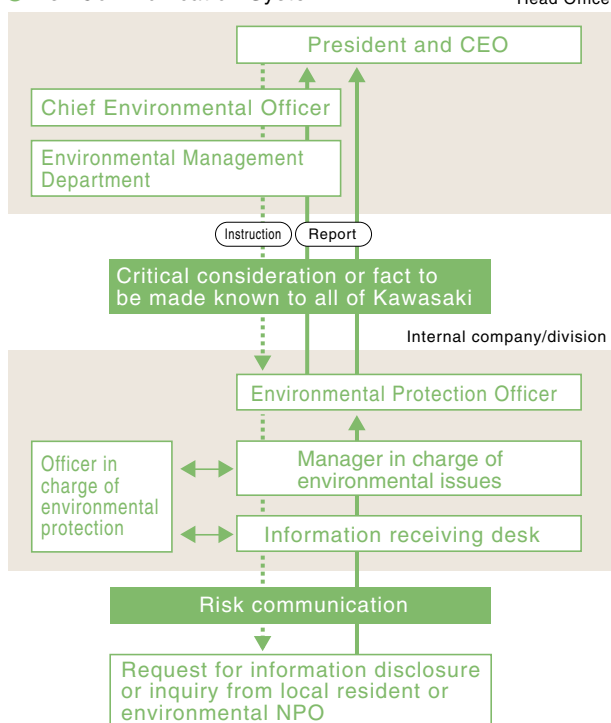
Environmental Management System (EMS)

Risk Management

While environment-related laws and regulations are being enhanced or newly enacted, each internal company is fully involved in risk management so that established EMS functions satisfactorily and environment-related trouble is avoided.

The risk communication system for information disclosure is illustrated schematically below. A request or inquiry from local residents or environmental NPOs is received by the environmental management section of each internal company or division involved, which then determines and provides an appropriate response. A critical consideration or fact that should be known by all of Kawasaki is reported to Head Office and at that time, instructions are sought as necessary.

Risk Communication System



ISO 14001 Certification

All our works in Japan have already acquired ISO 14001 certification, and established EMS.

The year and month of certification and the reviewing & registering organization for each internal company and affiliate are summarized below.

Company	Division	Date acquired	Registration
Rolling Stock, Construction Machinery & Crushing Plant Company	Rolling Stock Division	2002.2	LRQA
	Construction Machinery Division	2000.5	JICQA
	Crushing Plant Business Division	2000.9	NK
Aerospace Company	Aerospace Company	2002.2	BSK
Gas Turbines & Machinery Company	Gas Turbine Division	2000.3	LRQA
	Machinery Division	2000.12	NK
Plant & Infrastructure Engineering Company	Power Plant & Industrial Plant Engineering Division	2001.2	NK
	Environmental Control Plant Division	1999.3	NK
	Steel Structure & Industrial Equipment Division	1999.11	JICQA
Consumer Products & Machinery Company	Consumer Products & Machinery Company	2000.2	DNV
Affiliates	Kawasaki Shipbuilding Corporation		
	Kobe Works	2002.8	NK
	Sakaide Works	2000.8	DNV
	Kawasaki Precision Machinery Ltd.	1998.2	DNV

Registering organization: LRQA: Lloyd's & Register Quality Assurance
 JICQA: JIC Quality Assurance
 NK: Nippon Kaiji Kyokai (ClassNK)
 BSK: Japan Defence Association
 DNV: Det Norske Veritas

Environmental Management

Environmental Audit

- Three types of complimentary environmental audits are performed.
- (1) Environmental Management Hearing held by Environmental Management Department with all the internal companies and divisions.
 - (2) Internal Environmental Audits performed by each internal company and division within the scope of their EMS.
 - (3) ISO 14001 EMS audit conducted by an outside reviewing and registering organization.

Compliance with Laws and Regulations, and Pollution Prevention

In FY2003, there was one complaint from local residents about an obnoxious odor released from Shiga Combustion Laboratory (the Plant & Infrastructure Engineering Company). A measure to prevent recurrence of this problem has already been implemented. No problems were subject to administrative warning or more serious government action.

Environmental Education

Other than the environmental education programs held at each internal company and division, Kawasaki holds internal environmental audit training courses at regular intervals. The internal environmental auditors trained and qualified in FY2003, including those at affiliates, amounted to 137 persons. The number of people legally qualified for environmental protection is summarized in the tables to the right.

Risk Communication Training

We are committed to responding quickly to information disclosure requests as well as to the establishment of good communications with local residents and other stakeholders.

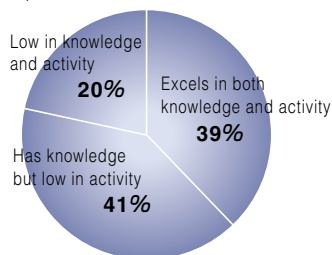
In FY2003, as part of an effort to build an in-house system for information disclosure as stipulated in the PRTR law, we held a training session for personnel in charge of environmental affairs from our internal companies and divisions to deepen their understanding of information disclosure.

Execution of Kawasaki Employee Environmental Questionnaire

We investigated the awareness of and actions for environmental protection of all Kawasaki employees. As a result, we learned that their environmental consciousness is high and that they often undertake environmental protection activities at their job sites. Nevertheless, their understanding of company-wide activities remains low and they do not often participate in environment-related events.

Considering these results, we intend to promote further environmental education activities.

Environmental consciousness levels of employees in daily life



Promotion of Environmental Awareness

To promote the environmental awareness of our employees, we publish Environmental News four times a year. The quarterly in-house magazine "Kawasaki" also has an environmental feature called Eco-mind.

Improve the quality of EMS of the entire Kawasaki Group



Violations, Accidents and Complaints in the Past 5 Years

FY	1999	2000	2001	2002	2003
Judicial or administrative penalty	0	0	0	0	0
Administrative provision	4	0	0	0	0
Administrative warning	0	1	1	3	0
Resident complaints	2	0	4	2	1

Judicial or administrative penalty: Punishment by judicial or administrative authorities
 Administrative provision: Instructions imparted in writing (e.g. improvement order, etc.)
 Administrative warning: Verbal warning

Number of Qualified Pollution Control Managers

Air	72
Water	76
Noise	33
Vibration	24
Others (Dust, Senior Managers)	17
Total	222

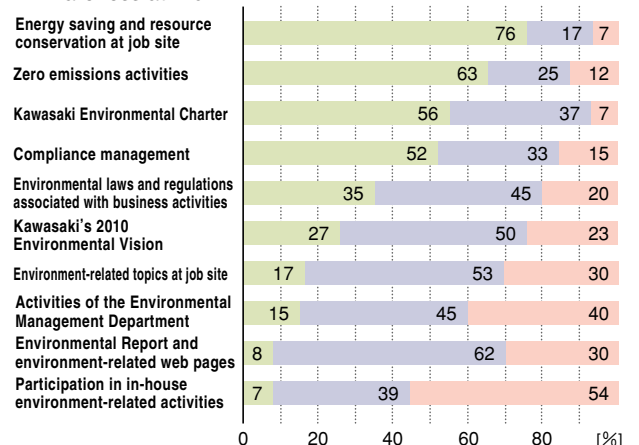
Number of Qualified Energy Managers

Heat	20
Electricity	20
Total	40



Training session

Environmental Awareness at Work



Environmental News



Environmental topics page in in-house magazine "Kawasaki"



Environmental Accounting

In accordance with the "Environmental Accounting Guidebook" issued by the Japanese Ministry of the Environment, we have attempted to provide an easy-to-understand presentation of our environmental accounting calculations for FY2003, focusing on the formulation of indexes for use by internal management. Based on the calculation results, we evaluated the environmental investments and costs for

maintaining environment-related equipment, economic effects, and the amounts of substances decreased. We analyzed and assessed the contributions of various investments and costs to actual decreases in substance amounts in order to develop more cost-efficient and effective environmental protection measures.

- Coverage: Domestic works and offices of Kawasaki Heavy Industries, LTD., Kawasaki Shipbuilding Corporation and Kawasaki Precision Machinery Ltd. (KPM)
- Period: April 1, 2003 to March 31, 2004

Calculation Results for FY2003 Environmental Accounting

Unit: million yen

Category	Sub-category	Item Details	Environmental investments	Environmental costs	Economic effect	Amount of substance decreased () indicates an increase.	
Business area cost	Global warming prevention (energy saving, decrease in greenhouse gas emissions, ozone layer protection, etc.)		42.3	1,159.4	Reduction of energy costs by saving 932.8	Total greenhouse gas emissions 272,883 t-CO ₂ Targeted emissions reduction 2,600 t-CO ₂ Actual emissions reduction (15,922) t-CO ₂	
	Efficient use of resources (raw materials, water, etc.)		2.7	143.7	Reduction of materials costs by resource conservation 130.6	Total material input 466,435 t Reduction in material input 19,939 t Total water consumption 7,156,000 m ³ Reduction in water consumption (163,000) m ³	
	Resource recycling activities	●Resource recycling activities	18.3	428.7	Income from recycling 746.9	Total waste emissions 66,395 t Targeted emissions reduction 1,400 t Reduction in emissions 565 t	
		●Waste disposal cost	26.3	685.7	Reduction of waste disposal costs 22.2	Amount of waste recycled 62,209 t Recycling rate 94 %	
	Risk control (pollution control, compliance management)		399.0	966.2	—	Total SOx emissions 18.1 t Reduction in emissions 4.5 t Total NOx emissions 98.3 t Reduction in emissions 62.2 t Total COD emissions 16.6 t Reduction in emissions 0.2 t	
	Subtotal		488.6 *1	3,383.7	1,832.5	—	
	[Comparison with previous FY]		[59%]	[124%]	[305%]	—	
	Upstream/downstream costs	Assessment, improvement for environmentally conscious products and green procurement		266.6	2,745.7	0.1	—
		Recovery, recycling, reuse and adequate disposal of products		0.0	0.1	0.0	—
		Reduction of environmental impacts from containers and packing materials		0.0	0.0	44.2	—
Subtotal		266.6	2,745.8	44.3	—		
Management activity cost	Management activities	●Environmental education	0.0	82.1	—	—	
		●Environmental Management Systems	0.0	347.2	—	—	
		●Environmental impact monitoring	0.0	63.5	—	—	
	Subtotal		0.0	492.8	—	—	
R&D activity cost	Research & development (alleviation of environmental impacts of products and during manufacture)		28.4	2,894.2 *2	—	—	
Social activity cost	Social activities	●Improvement of environment, contribution to communities	1.7	44.1	—	—	
		●Information disclosure	0.0	24.8	—	—	
	Subtotal		1.7	68.9	—	—	
Environmental damage cost	Countermeasures against ground water pollution		6.2	39.8	—	—	
Total		791.5 *3	9,625.2	1,876.8	—		
[Comparison with previous FY]		[65%]	[103%]	[297%]	—		

Item	Sum
Total plant and equipment investments for the entire company in the applicable period*4	28,344.8
Total R&D costs for the entire company in the applicable period*5	13,856.9
Percentage of environmental investment (Sum of environmental investments*3/Total plant and equipment investments for entire company*4)	3%
Percentage of R&D costs (Total environmental R&D costs*2/Total R&D costs for entire company*5)	21%
Percentage of environmental investments within business area (Sum of environmental investments in business area*1/Sum of environmental investments*3)	62%

Environmentally Conscious Products

With our 2010 Environmental Vision goals of "application of Design for Environment to products" and "provision of products that contribute to environmental protection," we intend to contribute to the formation of a sustainable society by offering products and technologies that help protect the environment.

Product Assessment

Gas Turbines & Machinery Company developed the KC Coupling

In FY2003, we made application of Design for Environment a Key policy, and carried out product assessment actively.

The Gas Turbines & Machinery Company executed product assessment for the high elasticity rubber coupling that is used for the power transmission shaft of marine and land engines. As a result, the Kawasaki compression type elastic coupling (KC coupling) was newly developed by using the experience gained from the Kawasaki shearing type elastic coupling (KE coupling). The KC coupling improves the

ranges of acceptable vibration torque and eccentricity. Furthermore, the outside diameter of the KC coupling is 10% to 20% smaller than that of the KE coupling and the weight of the KC coupling is 15% to 40% lighter than that of the KE coupling, so the KC coupling saves resources as an environmentally conscious product.



Newly developed KC coupling (Kawasaki compression type elastic coupling)

Implementation of Product Assessments in Past Years

FY	1999	2000	2001	2002	2003
Divisions with regulation/ Total divisions	7/14	10/14	11/14	10/13*	10/12*
Cases of product assessment	47	69	138	123	98

*The total has decreased from the previous year due to the integration of two divisions.

Life Cycle Assessment (LCA)

Rolling Stock, Construction Machinery & Crushing Plant Company has begun application of the LCA technique

Each division of Kawasaki has been attempting to introduce life cycle assessment (LCA) technique in order to assess environmental impacts.

In particular, the Rolling Stock, Construction Machinery & Crushing Plant Company has begun an effort aimed at establishing the LCA technique for rolling stock in order to apply LCA to development and production. In the first step, in order to collect basic data, the company has mainly analyzed the interrelation between environmental impacts and aspects at the stages from the preparation of raw materials to movement. As a result, it has become possible to assess the change in environmental impacts by varying the raw materials and other environmental aspects for a definite period. The company is going to

implement assessment of the interrelation between product performance and environmental impacts throughout the entire life cycle, including final disposal, so that the company can develop rolling stock products that are more environmentally conscious.

Railways are often considered to be a means of transportation that have less impact for the environment. By applying the LCA technique, we can offer even more environmentally conscious products, thus contributing to the improvement of the global environment.

Green Procurement

Following our "Basic Policy of Green Procurement," we have been expanding the scope of green procurement throughout Kawasaki.

In FY2003, we introduced the e-Procurement System, with which we began to monitor amounts purchased by green procurement as well as to expand the green procurement percentage. At the same time, in order to encourage each internal company to be responsible for increasing green procurement, we have been involved in establishing environmentally conscious requirements to be applied to green procurement guidelines for supplies as well as for specifications of products.

Consumer Products & Machinery Company has begun green procurement

The Consumer Products & Machinery Company has established "Green Procurement Guidelines" in which the company requires suppliers to comply with a total ban of substances prohibited by laws and regulations. Additionally, for lead, hexavalent chromium, mercury and cadmium, the company integrates its internet-based procurement system with the material data system developed by the four motorcycle manufacturers in Japan so that it can determine the contents of these substances in every motorcycle component, manufacture products with reduced environmental impact, and design recycling-ready products.

Basic Policy of Green Procurement

Implemented in 1999

- ① Environmental impact must be considered across the entire lifecycle of all products from resource mining to waste.
- ② In the selection of a supplier, if multiple suppliers are equal in terms of quality, price and delivery, a supplier who is most seriously committed in environmental conservation is given priority over other suppliers.
- ③ Environmental product information must be obtained from suppliers.



Internet-based procurement system—K-Lab Net (Kawasaki Collaboration Network)



Examples of Products that Contribute to Environmental Impact Reduction

Advanced Cogeneration System

● CO₂ emissions reduction of about 10,000 tons per year

Gas turbine cogeneration systems are ideally suited for saving energy and decreasing CO₂ emissions when used at locations where there are demands for both electricity and heat. Since we constructed our first unit in 1974, we have been developing gas turbines with our proprietary technology, and now we are considered to be one of the leaders in this field worldwide.

Our Gifu Works has installed a 6,000 kW class cogeneration system. This system supplies one quarter of the power consumed by the plant and approximately half of the amount of steam that was generated by a heavy oil-burning boiler. This system is designed to have a variable heat-electricity ratio, making it capable of flexible operation. During the winter season, when demand for steam is high, all the steam generated from the system is supplied to the plant, but during the summer season, when demand for electricity is high, a portion of the generated steam is injected into the gas turbine to convert the thermal energy into electricity. Thus, this system will help attain optimal energy saving, alleviating environmental impacts.

Introduction of this system will decrease the energy consumption of the plant by 7% and CO₂ emissions by 14%, which corresponds to a decrease of 9,800 tons of CO₂ per year.

We will further develop our gas turbine cogeneration system technology so that we can offer more environmentally conscious products that satisfy the needs of our customers.

● Gas turbine cogeneration system that has been installed at the Gifu Works



- Fuel: natural gas
- Generation output: 6,480 kW
- Steam generation: 12.6 t/h
- Run time: approx. 5,650 hrs/year

Improved Bow Form Greatly Improves Fuel Economy of LPG Carriers

● Reduces CO₂ emissions by about 30,000 tons/ship over 20 years.

Kawasaki Shipbuilding Corporation contributes to the improvement of the global environment through energy saving achieved by incorporating its unique bow form design **SEA-Arrow** (Sharp Entrance Angle bow as an Arrow) into medium-speed vessels such as LPG carriers. Unlike common bulbous bow forms, this bow form does not have a projecting bulb. This reduces the wave making resistance by half and helps decrease the needed main engine horsepower by 6 to 10%.

The decrease in required horsepower with the 80,000 m³ ship that was the first ship incorporating **SEA-Arrow**, which was delivered in June 2003, is approximately 6%, equivalent to a reduction of about 3 tons per day of C heavy oil burned by the main engine. Considering an average ship service life is about 20 years, the expected conservation of C heavy oil amounts to approximately 10,000 tons, which corresponds to a reduction of 30,000 tons of CO₂ emissions.

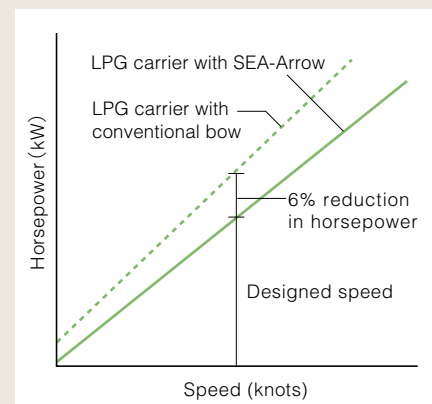
Currently, **SEA-Arrow** LPG carriers already delivered or ordered include one 80,000 m³ type and seven 59,200 m³ types. The expected reduction in CO₂ emissions over 20 years from each ship is approximately 30,000 tons, making the reduction for all eight ships as

much as 240,000 tons.

Furthermore, we will adopt **SEA-Arrow** in medium- and large-sized LPG carriers built from now on. In addition, Kawasaki Shipbuilding Corporation will continue to develop new technologies and build products with less environmental impacts.

In 2003, **SEA-Arrow** technology won The Japan Machinery Federation Presidential Prize (The Energy Conservation Division), one award in The Commendation System for Superior Energy-Conserving Machinery that is supported by the Ministry of Economy, Trade and Industry of Japan.

● Comparison of power curves



First ship with **SEA-Arrow**



Conventional bow form



SEA-Arrow bow form

Environmentally Conscious Products

Environmentally Conscious Products

When developing and designing new products, we always attempt to reduce their environmental impacts by examining them from an environmental perspective. We handle a diverse spectrum of products and the nature of the environmental impacts of these products varies

greatly. For every product, however, we intend to find and execute possible improvements for protecting the environment, beginning with the easiest to achieve.

- ★...Technical Institute, Head Office
- ...Rolling Stock, Construction Machinery & Crushing Plant Company
- ...Aerospace Company
- ...Gas Turbines & Machinery Company
- ...Plant & Infrastructure Engineering Company
- ...Consumer Products & Machinery Company
- ...Kawasaki Shipbuilding Corporation
- ...Kawasaki Precision Machinery Ltd.

Energy Consumption Efficiency and Greenhouse Gas Emissions



● Blended winglets

Winglets are smaller wings on the wingtips of aircraft. Blended winglets incorporate unique curved surfaces that improve aerodynamic characteristics to increase fuel consumption efficiency and reduce noise. They are made of a carbon fiber composite material that we have independently developed.



● Electronically controlled marine diesel engine

The engine has achieved lower fuel/lube oil consumption as well as cleaner emission by means of full-electronic control of fuel injection and valve timing, and has realized the operation in much lower revolution than current mechanically controlled engines, resulting in better maneuverability of ship. This engine has already been contracted for car carriers and super-large container ships.

Energy Consumption Efficiency

【Example】

- Wheel loaders: A tire-slip preventing system has been adopted to improve fuel efficiency
- Supersonic Transport (SST) engines: Reduced fuel consumption, reduced noise and cleaner exhaust have been realized
- Incorporated fluidized bed for cement kilns has reduced energy consumption below that of rotary kilns
- Fuel efficiency improvement for motorcycles has been evaluated as a percentage through the product assessment
- A novel bow form "Sharp Entrance Angle bow as an Arrow"

(SEA-Arrow) was introduced that, by reducing wave-making resistance, improves the propulsion performance of vessels

- An energy-saving arrangement "Rudder Bulb System with Fins" (RBS-F) is added to the rudder that, by reducing the energy loss, improves the propulsion performance of vessels
- Improved hull form design realizes an efficient LNG carrier able to carry 10,000 m³ (about 7%) more LNG with almost the same fuel consumption as conventional LNG carriers

Greenhouse Gas Emissions

【Example】

- Wheel loaders: Reduced use of air conditioner refrigerant (CFC)
- Wheel loaders and road rollers: Instruction manuals and labels specify that recovery of air conditioner refrigerant (CFC) is mandatory

Waste Disposal and Recycling



● Introduction of returnable packing materials for Jet Ski engines

The packing of Jet Ski engines for overseas export has been converted from wood and cardboard to a returnable steel pallet.

Containers and Packaging

【Example】

- The wooden crates for tugboat propellers were replaced with steel racks to eliminate the use of wood materials
- The packing for hydraulic equipment components for overseas export has been converted to a returnable cage type

Product Service life

【Example】

- A truss type doweled composite slab has realized a highly durable slab for road bridges
- Model change intervals for motorcycles have been evaluated through the product assessment

Ratio of Use for Reusable and Recyclable Parts

【Example】

- Shield machines: Reuse system for internal components has been implemented
- Recoverability rate of motorcycles has been evaluated through the product assessment (Recoverability rate of 90% or more)

Product Disassembly Time

【Example】

- Wheel loaders and road rollers: Reduction in use of FRP components having built-in metal parts
- Reduced number of parts used in motorcycles

Recovery of Used Products, Containers & Packaging

【Example】

Material type is indicated by a symbol on resin components (● wheel loaders, road rollers ● back-up gas turbine generators ● motorcycles ■ hydraulic equipment) ● Back-up gas turbine generator: Standardization of resin materials is in progress



Hazardous Substances and Pollutants



● Reduced use of lead in motorcycles

We have been reducing the use of four substances with environmental impacts (lead, mercury, hexavalent chromium, cadmium). The Ninja ZX-10R and Z-750 marketed in FY2003 employ lead-free wheel balancers.



● Cleaner exhaust gas from wheel loaders and road rollers

Our wheel loaders and road rollers have powerful, cleaner engines. The NOx and particulate matters in exhaust gas have been greatly decreased. 14 out of the 15 models of wheel loaders that needed to comply with exhaust gas regulations, as well as all 13 models of road rollers, have cleared the latest emission regulations defined by the Ministry of Land, Infrastructure and Transport.



● Oil-free hydraulic water gate actuation system

We have developed an oil-free hydraulic actuation system that does not cause environmental pollution even if the hydraulic fluid leaks out. It was first introduced in the gate opening and closing system of the Hirado sluiceway gate.

【Example】

● Aircraft: Adoption of a low-polluting coating that does not contain lead ● Development of the Super Marine Gas Turbine (for the Super Eco-Ship): Dramatic decrease of pollutants in exhaust gas has been demonstrated ● Used atmospheric corrosion resisting steel members for bridge girders, thereby eliminating the need for painting or repainting ● Development of polyurethane foam material for heat insulation of the cargo tanks of LNG and LPG carriers

that uses alternative fluorocarbons (HCFCs) as foaming agents and does not deplete the ozone layer ● Ships: In order to decrease use of chlorinated coating, chlorine-free coating has superseded chlorinated rubber-based coating ● Ships: In order to decrease use of thinner, a solvent-free coating has been used on fresh water tanks ● Study of possible improvements for hydraulic pumps in order to use bio-degradable hydraulic fluid

Product Weight



● Back-up gas turbine generator made more compact

The suction system, which occupies more than 30% of the generator volume, has been reduced to approximately one half the previous size. More compact auxiliary equipment has also been introduced, so now all 19 models are available in a more compact size. Each product is also approximately 27% lighter compared with the model it supersedes.

【Example】

● A fluidized-bed system has been incorporated into a cement kiln. Compared with the previous rotary kiln system, the weight of this new configuration is much lighter ● Adoption of the hovering stage has enabled designs for unique multi-purpose domes (with baseball fields, soccer fields, etc.) to help promote resource conservation ● Weight decrease percentage of each motorcycle product is evaluated through the product assessment ● Industrial robots: Decreased robot product weight relative to its load-bearing capacity

Vibrations and Noise

● A World-class Low Noise Train

EMU (Electric Multiple Unit) for Hong Kong KCRC jointly developed by The Kinki Sharyo Co., Ltd. and Kawasaki, applying Kawasaki-developed "Statistical Energy Analysis Method", is one of the quietest commuter train in the World.



In addition to the noise simulation using an analytical model, sound reduction index test and mechanical excitation test was conducted using a mock-up in the reverberation chamber to work out a noise reduction plan. On the actual train, further sound source and sound propagation route investigation was also conducted. As a result, drastical noise level reduction was achieved compared to a conventional train, 10 dBA in the interior from 80 dBA to 70 dBA and 3 dBA at the exterior from 76 dBA to 73 dBA.

【Example】

● Helicopters: Rotor blade geometry and rotor wingtip form have been optimized to decrease helicopter noise in flight ● Back-up gas turbine generator: New package features an equipment noise level of 55 dB ● A noise reduction hangar for testing aero-engines significantly reduces the noise occurring from engine testing on the ground ● Subway system: Proposal of effective noise dampening arrangements through application of noise evaluation technology ● Estimated and reduced noise of steel viaduct for railway ● A soundproofing device is installed at the top of sound insulating walls to dampen road traffic noise effectively ● Development of an electro-hydraulic hybrid system (inverter motor-driven pump unit) featuring reduced noise and power consumption

Environmentally Conscious Products

Environmental Protection Products

Kawasaki is dedicated to continuing to make a wide range of products that help protect the environment by realizing efficient energy utilization, pollution prevention, waste disposal and recycling. In FY2003, we remained committed to environmental protection by

keeping pace with the current legal and regulatory trends in environmental protection and better understanding social needs by providing a diverse variety of new and proven products.

- ★...Technical Institute, Head Office
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- ...Plant & Infrastructure Engineering Company
- ...Kawasaki Precision Machinery Ltd.
- ...Aerospace Company
- ...Consumer Products & Machinery Company

Energy



● Combined cycle power plant (CCPP)

CCPP systems burn fuel to produce the gas that drives electricity-generating gas turbines and to recover waste heat for generating steam to drive steam turbines. Boasting higher efficiency, CCPP systems are common in the field of thermal power generation. This example installed in Brazil is a natural gas burning CCPP.

Conservation and Effective Utilization of Energy

【Product】

- Gas turbine cogeneration system
- Waste heat recovery boiler
- Cement plant waste heat power generation system
- Top-pressure recovery plant for blast furnace
- Ice storage cooling system
- District heating and cooling system
- Optimization and diagnosis of industrial energy system

【Research & Development】

- Ceramic gas turbine
- Fuel cell power system
- ★ Advanced battery



● Wind Turbine Generation System

The total output of our 32 already installed wind turbine generation systems amounts to 39,200 kW. In February 2004, Kawasaki delivered an offshore wind turbine generation system, the first example of its type in Japan, to Setana-cho, Hokkaido. In this example, two 600 kW power generator units were installed at a location situated 700 m from the coast.

Renewable Energy System

【Product】

- Photovoltaic system
- Geothermal generation system

【Research & Development】

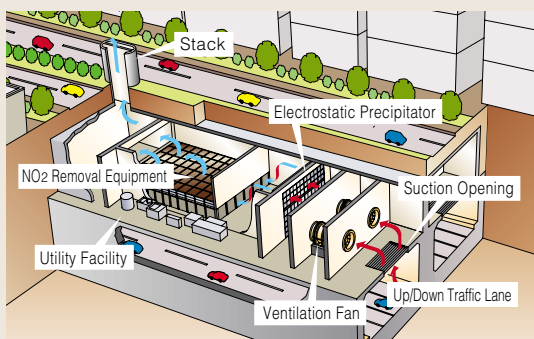
- ★ Black liquor gasification technology
- ★ Woody biomass power generation technology

New Energy System

【Research & Development】

- ★ Liquid-H₂ transport and storage technology

Air Pollution Control



● NO₂ removal system for road tunnel

This system uses an adsorbent to remove NO₂ and suspended particulate matter (SPM) from the gas released from stack. At present, a demonstration test prior to commercialization has been completed.



● Low NO_x heavy oil burning boiler (KACC)

This boiler consists of a high-temperature deoxidization combustion zone and a low-temperature oxidization combustion zone, and greatly decreases NO_x and dust in the exhaust gas. It can be used to burn low-grade heavy oil and certain powder fuels.

SO_x/NO_x Reduction, Dust Collection

【Product】

- De-SO_x/De-NO_x plant and dust collector for flue gas
- Low-NO_x gas turbine generation system
- Low NO_x coal burning boiler
- Ventilation filter for road tunnel
- Electrostatic precipitator for road tunnel

【Research & Development】

- De-NO_x technology for lower temperature flue gas
- ★ Motorcycle exhaust gas purifying catalyst

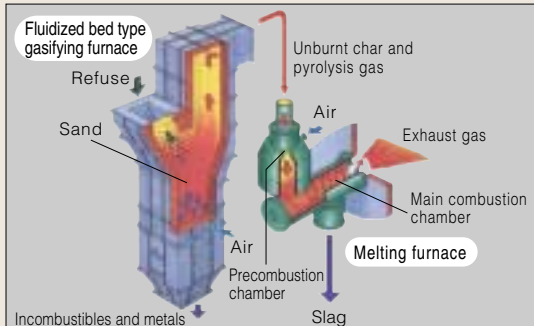
Air Pollution Control

【Product】

- ★ Photocatalytic coating business (For environmental protection)



Waste Treatment and Recycling



● Fluidized bed type gasifying-melting furnace

This system, which gasifies refuse in a fluidized bed type gasifying furnace and then melts ash in the melting furnace, has the advantage of melting ash by using the energy of the refuse itself and is intended to reduce the impact on the environment and operate economically. An actual plant built in Shiga Prefecture on Nov. 2002 achieved continuous operation for more than 3 months and was delivered to a customer in Apr. 2004.



● Refuse melting slag utilization system

With a magnetic separator, steel and iron are removed from the molten slag, and the grain size of the molten slag is adjusted with a crusher. Then, the slag is subjected to hot water treatment to convert the slag into a material resembling natural river sand. The so-treated slag will be used in various applications including aggregate for civil engineering and construction works.

Waste Incineration

[Product]

● High-performance refuse incineration system (Stoker-type furnace, Internal circulation fluidized bed-type furnace) ● Refuse gasifying-melting system (Shaft-type gasifying-melting furnace) ● High-efficiency refuse power generation system (Power generation from refuse combined with gas turbine, etc.) ● Waste-to-energy system (RDF power generation, Kraft recovery boiler, etc.) ● Flue gas treatment system for dioxin removal ● Dioxin thermal decomposition system for fly ash

[Research & Development]

● Monitoring technology for dioxin surrogates

Crushing and Sorting

[Product]

● Bulky waste crushing and recycling system
● Waste automobile/electrical appliance crushing and recycling system
● Construction waste crushing and recycling system
● Waste glass bottle/plastic sorting system

Recycling, Pollution Control

[Product]

● Incineration ash treatment system (Melting, Recycling) ● Refuse derived fuel (RDF) production system (Domestic waste, Industrial waste) ● Refuse paper and plastic fuel (RPF) production system ● Waste plastic rinsing and drying system (pretreatment before recycling)
● Food waste treatment system (Methane fermentation, Compost, Feed, etc.) ● Livestock waste treatment system (Methane fermentation, Compost, etc.) ● Coal fired boiler's ash recycling system (Road base material, etc.) ● Ultrasonic air filter cleaning system (Reusing air filter)

[Research & Development]

● Refuse incineration ash utilization technology ● Organic wastes treatment technology (Gasification, etc.) ★ Refuse gasification power generation technology ★ Removing technology of unburned carbon in coal ash ● PCB decomposition technology

Radioactive Waste Treatment

[Product]

● Radioactive waste treatment system

[Research & Development]

● Nuclear reactor decommissioning technology

Water and Soil Pollution Control



Sewage/Sludge Treatment

[Product]

● Sewage/Sludge treatment system ● Membrane type water treatment system (purification of leachates, etc.) ● Sewage sludge processing system (Transformation of sludge into fuel, fertilizer, etc.) ● On vehicle sludge drying system ● Turbid water filter

Water Pollution Control

[Research & Development]

● Purifying technology for closed water basin

Decontamination of Contaminated Soil

[Research & Development]

● Cleaning technology for dioxin polluted soil

● System for converting sludge into activated charcoal

Conventionally, sewage sludge has been incinerated and disposed of by landfill. We have developed a unique technology that converts sludge into activated charcoal that is recycled. The system produces activated charcoal rather than simply carbonating sludge, and is the first example of such a facility in Japan. A demonstration plant is being operated at wastewater treatment facilities in Fuji City, Shizuoka Prefecture and Nanao City, Ishikawa Prefecture and is attracting visitors from many municipalities around Japan.

Observation, Monitoring and Natural Environment Protection



Observation and Monitoring

● Offshore Monitoring Platform of Global Warming

To understand current climate change and to predict further change in the future caused by global warming, long-term and simultaneous observations of the biogeochemical cycle between the atmosphere and the ocean are needed. We are working to develop a cutting-edge offshore monitoring system and deploy a prototype

on the waters off the Northern Pacific Coast of Japan at the intersection of two ocean currents.

Natural Environment Protection

[Product] ● Beach Cleaner

Feature Report—Environmental Business Woody Biomass Power Generation Technology

Woody biomass, including wood waste from lumber mills and thinned wood, is environmentally conscious energy resource that is recyclable and considered to generate no CO₂. Woody biomass power generation can be categorized into large-scale centralized and small-scale distributed types. Since collection and transportation costs for woody biomass are relatively high, a power generation system optimized for use at the small-scale sources of the biomass is needed. We are committed to research, development and commercialization of a power generation system that is compact but features higher power generation efficiency through gasification of woody biomass.

Features of small-scale distributed woody biomass power generation

- ① Can help decrease CO₂ emissions by superseding conventional power generation processes.
- ② Can cope with very small-scale woody biomass sources that were not previously utilized for power generation.
- ③ Power generation efficiency can be as high as 20% and the waste heat can also be utilized.

Product Introduction: Pressurized Fluidized Bed Gasifier—Gas Turbine Power Generation System (suitable for application where 5 to 20 tons of woody biomass are available per day)

Tar can also be utilized as an energy source

Woody biomass is unique in that its gasification temperature is low compared to solid fuels such as coal. This enables woody biomass to be converted into fuels capable of generating high temperatures, including hydrogen and carbon monoxide, at relatively low reaction temperatures.

In order to realize a highly efficient power generation system by fully utilizing the advantages of woody biomass, it is necessary to achieve gasification at a lower temperature. However, gasification at a lower temperature can promote the occurrence of tar, which poses problems of adhesion and blocking.

To cope with this problem, a conventional system must either incorporate a tar removal system or execute gasification at a higher temperature to inhibit the occurrence of tar.

Our system utilizes wood waste as a fuel and generates gas with a pressurized fluidized bed gasifier. The gasification occurs at a relatively low temperature of approximately 650°C. The generated gas, which

contains combustible gas and tar, is directed to the gas turbine combustor while maintaining the temperature and pressure in order to avoid tar troubles that could occur from solidification and liquefaction by cooling.

Our system is advantageous in that the tar removing system is eliminated and all the generated gas is utilized as a fuel for the gas turbine.

While the gas turbine is driving the generator, the waste heat is used to preheat the gasifying air introduced into the fluidized bed gasifier. Gasification at a lower temperature and reuse of waste heat help achieve a power generation efficiency of 20%. This energy conversion efficiency is much higher than 10% that is achieved by conventional boiler and steam turbine systems.

In FY2003, we constructed a test plant with a generation output rated at 24 kW. During FY2004, we are going to verify the performance of the whole system, and in FY2005, will start a demonstration test at an actual lumber mill.

Test plant during tests of gasification reaction characteristics



A system that can be operated with just three buttons

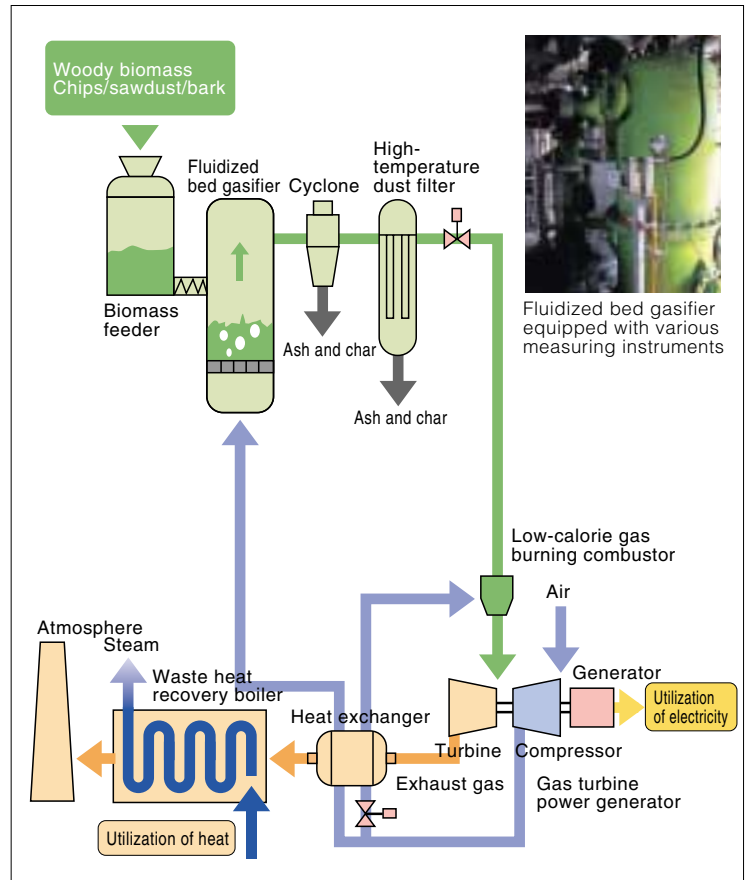
A gasification reaction test using a fluidized bed is currently in progress for the development of this system. During FY2004, we will begin a commercialization test. I think the highlight of the development work—when we offer the system at a lower price and complete an easy-to-operate system—will come soon. Because I myself was previously involved in the development of large-scale cement plants, I believe I must switch from a "large plant mind-set" to a "home appliance mind-set." Since our system will be used at lumber mills or the like, we have to complete a "system that can be operated with just three buttons."

Biomass technology is now attracting attention. About 50 years ago, Japanese were using firewood and charcoal for fuel, but these were replaced by coal and petroleum. Ironically, we are going to return to wood as a fuel. I hope that this trend becomes firmly established, and that society comes to use energies and resources that fit within natural cycles.



Tatsuya Watanabe
Senior Manager, Advanced Project Progressing Group
Plant & Infrastructure Engineering Company

System flow (demonstration plant)



Tar: A highly flammable macromolecular hydrocarbon that is likely to occur when wood is burned. When cooled, its components with high boiling points solidify and liquefy, resulting in high viscosity that can cause problems due to adhesion and blocking.

Product Introduction: Fixed Bed Gasifier—Gas Engine Power Generation System

(suitable for application with 1 to 5 tons of woody biomass per day)

Development of a gasifier that produces less tar

This system utilizes fuels, including wood residues, thinned wood and cut branches, with its fixed bed gasifier performing gasification. The main reason why gasification technique with woody biomass has not yet been commercialized is the problems caused by the tar in the gas generated from woody biomass. For this system, we have demonstrated, in partnership with a foreign venture company, a unique gasification technique that generates less tar. Thus, we have successfully designed with a much more compact tar removal system and reduced the initial and running costs.

The whole process is carried out at a pressure lower than atmospheric pressure. This decreases the possibility of gas leakage, attaining a higher degree of safety.

The calorific value of the gas generated from the gasifier is as low as 1/10 that of natural gas. To cope with this limitation, we have also developed a unique gas engine in partnership with a foreign company.

Currently, our system is undergoing a demonstration test with a test plant that has a power generation efficiency of 20% and a generation output of 80 kW, which is equivalent to the power requirements for about 30 households. A commercial version of our system will be released during FY2005.

Our system is suited for small-scale distributed power generation plants rated at 50 to 200 kW, and the waste heat from a gas engine in this system can also be utilized for various purposes, including steam generation, hot water supply and air conditioning.

Fast commercialization will contribute to the reduction of greenhouse gases

As the First Commitment Period (2008-2012) of the Kyoto Protocol will begin soon, effective greenhouse gas reduction efforts must start now. As can be expected from the establishment of "Biomass Nippon," a comprehensive strategy, in 2002, demands for bioenergy will expand significantly during the next several years. In order to shorten development lead-time and enable faster commercialization, with our foreign partners, we have been committed to R&D efforts for gasification and power generation technology, and started a commercialization program in FY2004.

In addition to working for Kawasaki, I am a Hyogo Prefecture global warming prevention activities advisor and an Environmental Counselor of the Japanese Ministry of the Environment. Citizens, local governments and businesses must each play their roles in decreasing greenhouse gas emissions. Still, fulfillment of the objectives of the Kyoto Protocol appears to be difficult in the current circumstances. As a researcher working at our company, I have been addressing how to decrease emissions of greenhouse gases by developing new products and new technologies. I believe it important to commercialize this product as soon as possible in order to help contribute to the reduction of emissions of greenhouse gases.

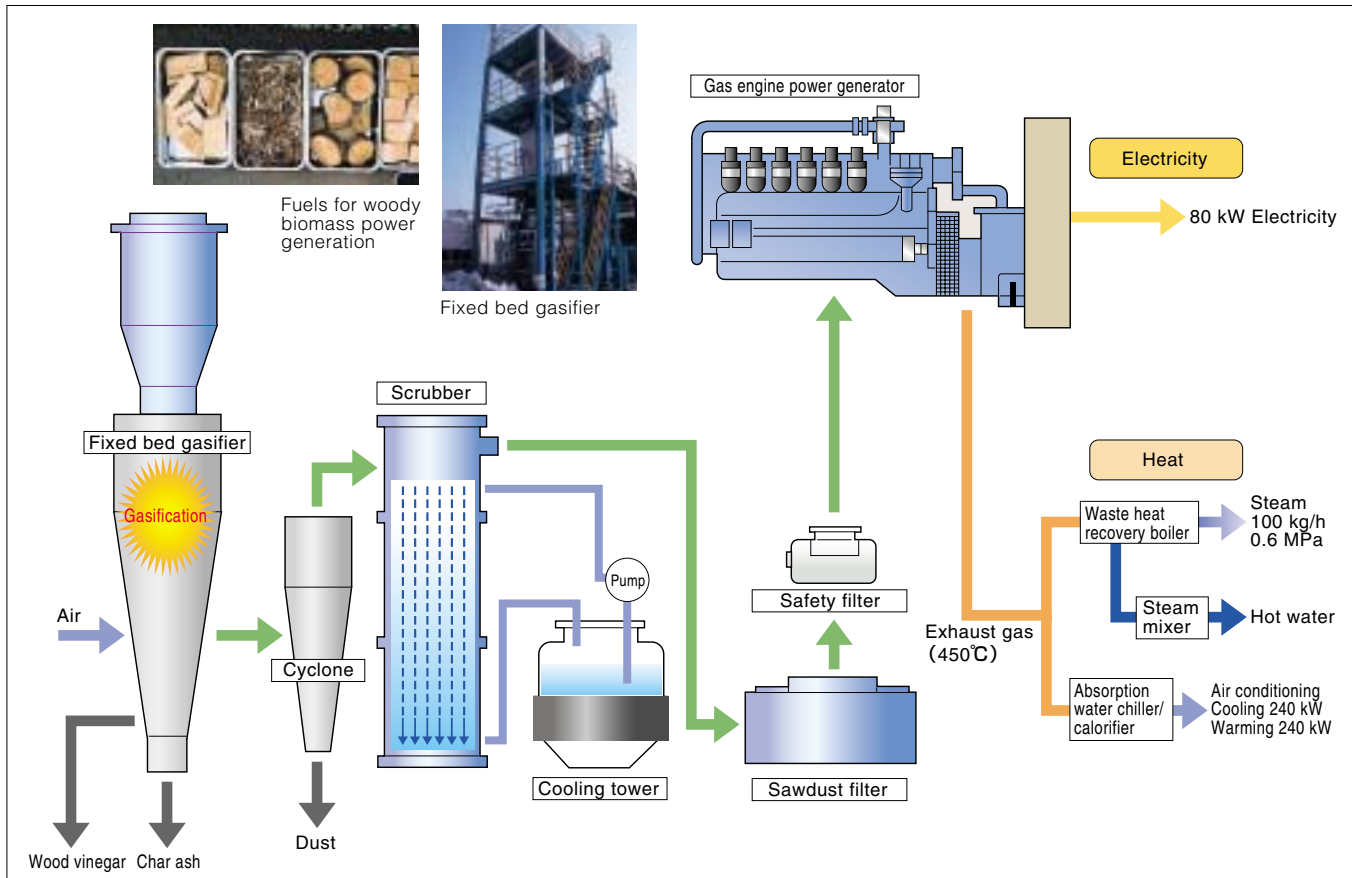


Satoshi Hirata
Manager, Bioenergy Group
Business Development
Department

Test plant in demonstration trials



System flow



Environmentally Conscious Production

In FY2003, 7 out of 12 works achieved "zero emissions" — a recycling and reuse rate of 100%.

We are also making diligent efforts to achieve targets for energy saving and reduction of greenhouse gases and hazardous chemical substances.

Energy Saving

All Kawasaki internal companies have already acquired ISO 14001 certification and are committed to energy saving activities according to our Environmental Management System program.

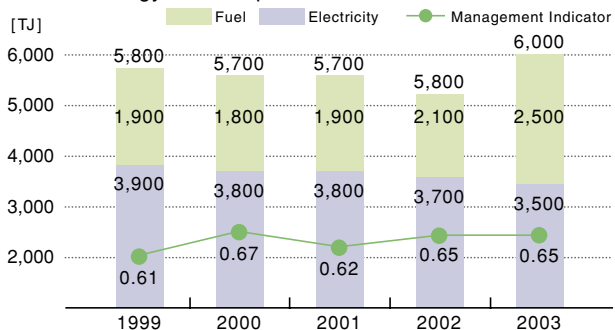
Our major efforts to conserve energy include optimal adjustment of the air pressures of compressors, which consume large amounts of electricity, turning unnecessary lighting off, setting air-conditioning to appropriate temperatures, and replacing old inefficient equipment and facilities with energy saving substitutes as soon as possible.

Despite various energy saving measures, however, our consumption of electricity and fuels in FY2003 was 200 TJ(terajoule), or 2.2% higher compared to FY2002 level, due to the increase in production in FY2003. In addition, water consumption in FY2003 was 2.3% higher than in FY2002.

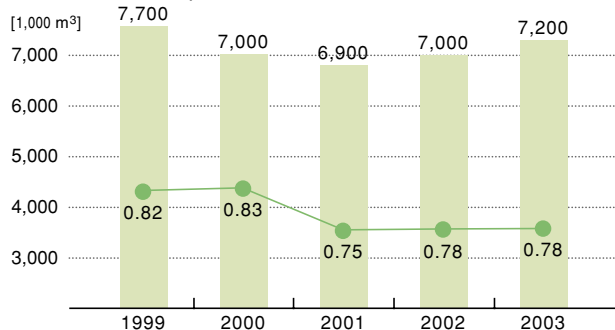
Currently, our Gifu Works is proceeding with introduction of a cogeneration system that can achieve dramatic energy savings. We expect that this system will eventually exhibit its effectiveness in our on-going energy saving efforts.

Incidentally, for management of our energy saving efforts, we use total quantity of heat, joules, as the measurement unit, which represents the sum of electricity and fuel.

Total Energy Consumption



Water Consumption



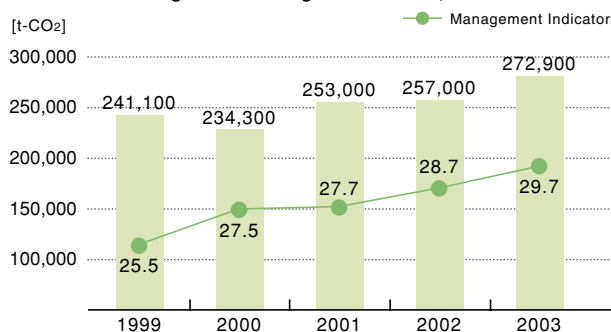
*Management Indicator: Total energy consumption, water consumption, and CO₂ emissions each divided by sales volume (including Kawasaki Shipbuilding Corporation and KPM).

Prevention of Global Warming

Due to increased production and other causes, our emission of greenhouse gases in terms of CO₂ equivalents in FY2003 was 6.2%, about 15,900 tons, more than in FY2002.

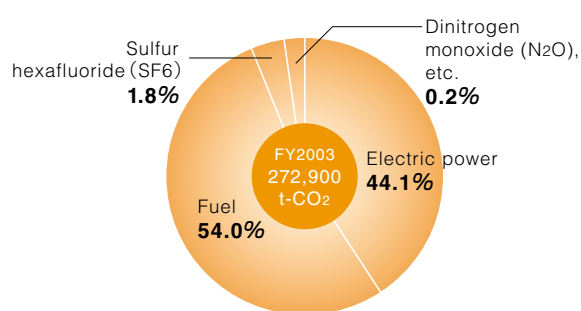
Note that Kawasaki developed our calculation procedures in July 2003 by referring to the guidelines for calculating enterprise greenhouse gas emissions issued by the Ministry of the Environment of Japan.

Emissions of greenhouse gases (CO₂ equivalent)



- Beginning with FY2001, calculation of sulfur hexafluoride (SF₆) has been included.
- Beginning with FY2002, waste disposal subcontracted to outside agents has been excluded.
- The electricity conversion factors employed are those specified by the power utility companies.
- Each fuel conversion factor is as specified in the Ministry of Environment guidelines.

Breakdown of Greenhouse Gas Emissions



Steps toward Reducing Greenhouse Gas Emissions

1st step (2002 - 2004)

[Promotion of Cost-Effective Emission Reduction]

- Energy saving and data analysis
- Review of reduction effects and cost effectiveness resulting from investments in plants and equipment
- Research of international trading

2nd step (2005 - 2007)

[Review of Possible Reductions, Costs, Effects, and Barriers]

- Determination of final reduction allotment
- Planning of credit trading system
- Determination of in-house standard for emission credit purchase cost

3rd step (2008 - 2012)

[Realization of 6% Reduction in Greenhouse Gases Relative to 1990 Level]

- Construction of in-house emission credit trading system



Waste Reduction

Promotion of the 3 R's (Reduce, Reuse, Recycle)

Since we produce a wide variety of products, the number of types of wastes is quite large. For this reason, all of Kawasaki is actively involved in implementing the 3 R's. For example, we control our wastes by classifying them into 20 types.

In FY2003, we emitted 66,400 tons of waste, a decrease of 600 tons relative to FY2002 level. The amount recycled in FY2003 reached 62,200 tons, which corresponds to a percentage of 94%, an improvement of 9% over the corresponding FY2002 level.

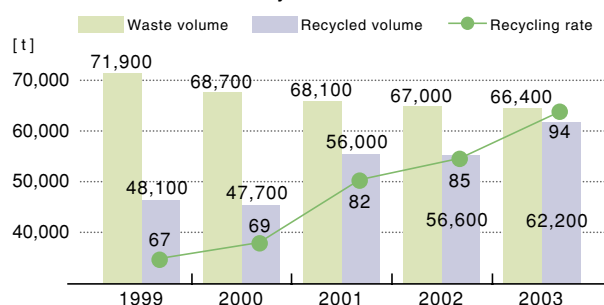
Three Works Achieved Zero Emissions in 2003

In FY2003, our Kobe, Akashi and Seishin Works achieved zero emissions of waste disposal as landfill. We have been working to fulfill zero emissions at all our works during this fiscal year (FY2004). The Kawasaki works that have already fulfilled zero emissions are now

Status of Fulfillment of Zero Emissions by Works

Works	Weight of wastes (tons/year)		Recycling rate (%)		Percentage recycled (%)		Fulfillment date
	① Total weight	② Weight excluding valuable materials	Before	After	① Material recycling	② Thermal recycling	
Harima Works	① 3,792 ② 464	① 3,268 ② 517	91.6	100	①95 ② 5	①97 ② 3	September 2001
Banshu Works	① 4,787 ② 1,292	① 4,941 ② 522	93.4	99.4	①95 ② 5	①96 ② 4	December 2001
Nishi-Kobe Works (KPM)	① 2,418 ② 1,027	① 2,804 ② 1,151	97.7	99.9	①73 ②27	①87 ②13	March 2002
Hyogo Works	① 4,375 ② 1,975	① 4,042 ② 1,865	89.2	100	①85 ②15	①91 ② 9	November 2002
Akashi Works (including Seishin Works)	① 16,705 ② 11,046	① 17,139 ② 11,961	75.0	99.3	①90 ②10	①92 ② 8	December 2003
Kobe Works (Machinery Division)	① 3,142 ② 1,155	① 2,838 ② 1,126	92.0	99.9	①83 ②17	①85 ②15	December 2003

Waste Volume and Recycled Volume



making efforts to decrease the total waste weight and improve the material recycling percentage. Measures for this purpose include thorough sorting of wastes and other exit controls. Entrance controls that inhibit the causes of wastes include material conserving design and improved production processes.

Chemical Substance Reduction

Compliance with Pollutant Release and Transfer Register (PRTR) Law

Beginning with FY2003, Type 1 designated chemical substances handled in amounts exceeding 1,000 kg must be calculated. As a result,

values for a total of 26 substances (as compared with 18 substances in FY2002) are included in Environmental Report 2004. The amounts of emitted toluene and xylene contained in paints are particularly high, so decreasing emissions of these poses another challenge.

Total of Chemical Substances Handled in FY2003

Gov't No.	Substance	Release into air	Release into public water area	Release into ground	Release subtotal	Transfer to public sewerage	Transfer as waste
[Type 1 Designated Chemical Substances]: 1,000 kg or more handled annually							
1	Water-soluble zinc compounds	0	58	0	58	0	636
30	Bisphenol A	0	0	0	0	0	4,576
40	Ethyl benzene	156,303	0	0	156,303	0	5,062
43	Ethylene glycol	0	0	0	0	0	342
63	Xylene	611,693	0	0	611,693	0	52,786
67	Cresol	0	193	0	193	0	1,094
68	Chromium and its trivalent compounds	49	20	0	69	0	33,955
100	Cobalt and its compounds	1	0	0	1	0	369
101	2-ethoxyethyl acetate	0	0	0	0	0	767
108	Inorganic cyan compounds	0	3	0	3	0	220
145	Dichloromethane (Also known methylene chloride)	75,724	16	0	75,740	0	5,169
177	Styrene	5,865	0	0	5,865	0	2,168
207	Water-soluble copper salts (other than complex salts)	0	12	0	12	0	229
224	1,3,5-trimethyl benzene	2,005	0	0	2,005	0	63
227	Toluene	243,729	0	0	243,729	0	50,242
230	Lead and its compounds	0	3	0	3	0	994
231	Nickel	3	0	0	3	0	1,162
266	Phenol	0	3	0	3	0	5,649
283	Hydrogen fluoride and its water-soluble salts	290	1,335	0	1,625	0	9,384
309	Poly(oxyethylene) = nonylphenyl ether	0	0	0	0	0	2,440
311	Manganese and its compounds	175	0	0	175	0	60,096
346	Molybdenum and its compounds	1	0	0	1	0	191
[Special Type 1 Designated Chemical Substances]: 500 kg or more handled annually							
69	Hexavalent chromium compounds	0	22	0	22	0	3,615
179	Dioxins (mg-TEQ)	0	1	0	1	0	0
232	Nickel compounds	0	1,327	0	1,327	0	4,468
299	Benzene	6	0	0	6	0	0

Coexistence with Communities

Firmly adhering to the belief that "an enterprise must be a member of communities," we encourage every Kawasaki worker not only to abide by communities' rules but to also maintain a firm commitment to information disclosure and to making positive contributions to communities.

Contributions to Communities

International Humanitarian Aid Using Our High Technology

More than 100,000,000 anti-personnel mines have been placed in about 90 countries around the world, including Iran and Afghanistan, claiming more than 20,000 casualties including noncombatant citizens. Manual removal of these existing mines is estimated to take more than 1,000 years, which poses a great problem for humanity. We have developed the world's first mine detection vehicle and anti-personnel mine clearance vehicle that increase the efficiency of mine removal by several hundred times.

These vehicles underwent a demonstration test at a proving ground in northern Japan with witnesses from the Japanese and foreign governments last year.

The real test of these vehicles will commence in the middle of August 2004 in the actual minefields of Afghanistan.



Mine detection vehicle —MINE DOG



Mine clearance vehicle —MINE BULL

Kawasaki Donates Portable Generators to Quake-hit Southeast Iran

To help the victims of the earthquake that hit the southeastern part of Iran in December 2003, Kawasaki donated 80 portable power generation units to Iran's Red Crescent through the Iranian Embassy in Japan.

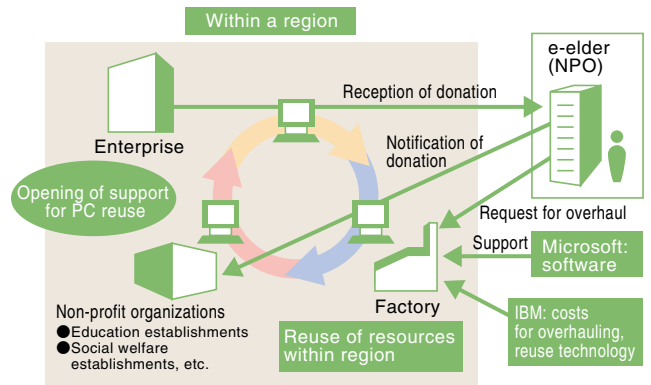
These portable generators with general-purpose gasoline engines can be installed individually wherever needed and used as power sources for lighting, water pumps, machinery and many other applications. We made this donation in the belief that the generators would enhance the lives of the victims and support reconstruction.



Donation of Used Personal Computers

Our Gas Turbines & Machinery Company is a member of the "Reused PC Donation Program" sponsored by IBM Japan, Microsoft Japan and "e-elder", a non-profit organization. Through the program, we give used personal computers to schools and other public institutions, donating 55 computers in FY2002 and 30 computers in FY2003.

Reuse Flow of Used Personal Computers



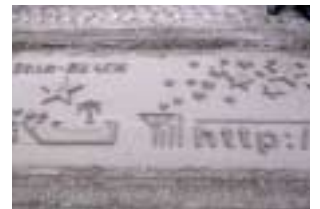
Clean-up Activities

During the May 2003 holiday season, we offered our Kawasaki Beach Cleaner, a machine that can recover and sort out wastes, for a beach cleanup event held at Odaiba Beach Park in central Tokyo.

At this event, the Kawasaki Beach Cleaner not only cleaned up the beach but also towed our Beach Stamp roller that stamped beach cleanup messages and company logos, and appealed to visitors to join in the beach cleanup.



Our Beach Cleaner cleans the beach of Odaiba



Our Beach Stamp roller stamps messages on the beach

Information Disclosure and Environmental Communications

In addition to this Environmental Report, we disclose information about our environmental management and environmental protection activities through various media, including in-house publications and our web site.

We took part in an experiential class for environmental communications held in Osaka and introduced our environmental protection activities to other participants.



Experiential class for environmental communications



Compliance Management

Establishment of Compliance Reporting and Consultation Program

Kawasaki recognizes that "antisocial conduct can endanger the very existence of a corporation" and is vigorously pursuing compliance management. Kawasaki's corporate policy has always been that "no employee shall ever be involved in any unlawful activities."

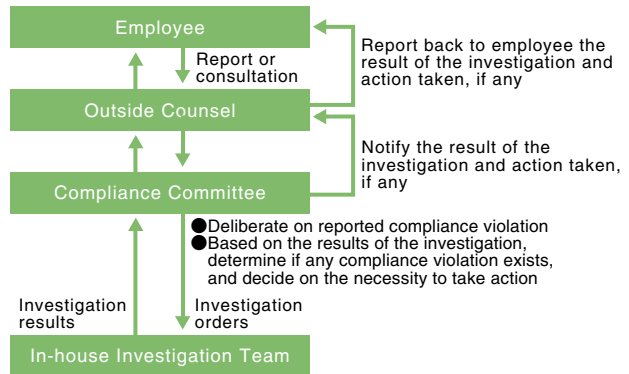
In line with this policy, in June 2003, we established the Compliance Reporting and Consultation Program. This program enables employees who become aware of any potential compliance violation within the company to report such violation to outside counsel. The outside counsel then forwards this information to Kawasaki's in-house Compliance Committee, which, if deemed necessary, will form an in-house investigation team to investigate the reported issues. If the Compliance Committee determines that there was a compliance violation, then it will take appropriate action to deal with it.



The "Compliance Guidebook," which outlines the new system and introduces examples of violations, has been developed and distributed to all employees.

In this day and age, it is critical that employees of every level within the company have a strong ethical standard. To achieve this goal, we at Kawasaki have always been striving to form an open and frank working environment where employees can speak out and openly discuss matters related to work which trouble them with their superiors. To further this effort, we have established this Compliance Reporting and Consultation Program.

Flowchart for Reporting and Consultation



Relations with Employees

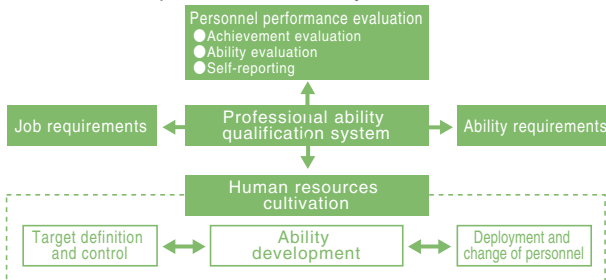
Personnel Affairs System

Our personnel management system seeks to provide our employees with a working environment that helps them have fulfilling and successful work and personal lives. With this goal in mind, we have adopted a professional ability qualification system as the core for our personnel affairs system. This system is the basis for motivating employees at work and helps guide human resources cultivation.

With this professional ability qualification system at the core, the framework for our personnel affairs system consists of closely interlinked systems for human resources cultivation, performance evaluation and personnel handling.

For example, performance targets provide evaluation criteria for our personnel evaluation system. This target encourages human resources cultivation by making it easier for employees to clarify their roles and

Overview of personnel affairs system



Industrial Safety and Hygiene

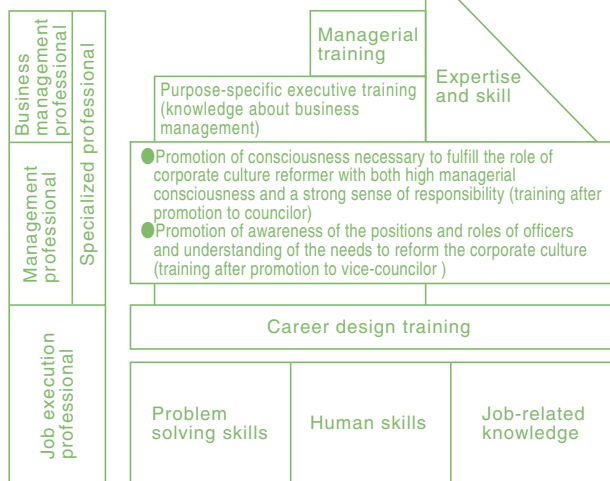
In order to ensure the safety and health of our full-time and part-time employees and provide a comfortable work environment, we are committed to safety and hygiene promotion activities based on our philosophy of "respect for people," which includes respect not just for human life but also for the humanity of each individual.



responsibilities and measure their progress toward these goals.

We believe that the ideal situation is when the company is able to help every employee maintain motivation for their work by keeping a balance between the abilities of the employees and the abilities needed for their jobs.

Career design concept



Putting safety and health first



In-house education news



Environmental Data

In our work to reduce environmental impacts, we are promoting energy saving, the prevention of global warming, waste reduction, and chemical substance reduction. The table below summarizes the energy and resource inputs and outputs associated with our FY2003 business activities by internal companies and major affiliates. Information about the environmental impacts and products of our major production works is given on pages 25 and 26.

Internal Companies/Affiliates

*1. Performance items in the table below were taken from "State of Activities for Reduction of Environmental Impact" contained in the Environmental Reporting Guidelines of the Ministry of the Environment. Environmental data is given in the horizontal direction for internal companies as well as for a single group consisting of the head offices, branch offices and technical institutes.

*2. The discharge concentration of regulated substances and the generation of noise, vibrations and odors are listed as "Compliant" or "No Compliant".

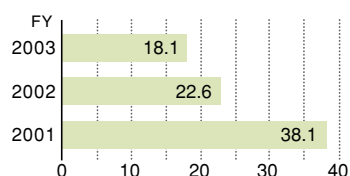
*3. "-" shows that data was unavailable. "0" means the measured data was zero.

*4. "Not applicable" means there were no regulated facilities that caused environmental impact of this type.

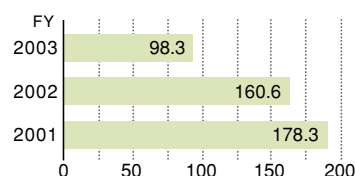
*5. Data in [] is the percentage of increase/decrease from performance data of the previous year. Provided only where last year's data was available.

Performance Items*1		Units	Rolling Stock, Construction Machinery & Crushing Plant Company	Aerospace Company	Gas Turbines & Machinery Company		
Environmental Impacts from Material/Energy Input	Total material input: Metals (steel, aluminum, copper, etc.)	ton	49,101	8,776	17,701		
	Recycled material amount	ton	4,070	0	0		
	Total energy consumption	Electricity	TJ	469	791	467	
		Fuel	TJ	145	448	491	
		Total	TJ	614	1,239	958	
	Renewable energy consumption	TJ	0	0	0		
	Water consumption	m ³	517,447	3,758,834	629,863		
	Recycled water amount	m ³	128,794	155,798	0		
	Recycled resource and recycled parts input	ton	0	0	0		
	Amount of hazardous material handled	kg	1,362,095	128,869	22,499		
Upstream Environmental Impacts	Green purchasing	1 mil yen	41	430	20		
Environmental Impacts from Output of Refuse	Emissions to Air	Greenhouse gas emissions	t—CO ₂	28,126	71,985	41,579	
		Ozone depleting substance emissions	ODP ton	0	4	0	
		SOx emissions	kg	4,505	9,227	3,993	
		NOx emissions	kg	5,748	15,522	50,279	
		Soot and dust emissions	kg	460	872	764	
		VOCs emission	kg	191,900	147,343	16,101	
		PRTR regulated substance emissions	kg	192,129	65,944	17,033	
		Concentration of restraint substances when emitted	SOx	PPM	Compliant*2	Compliant*2	Compliant*2
			NOx	PPM	Compliant*2	Compliant*2	Compliant*2
			Dust	g/m ³ N	Compliant*2	Compliant*2	Compliant*2
	Dioxins		ng/m ³ N	Not applicable*4	Not applicable*4	Not applicable*4	
		Benzene	mg/m ³ N	Not applicable*4	Not applicable*4	Not applicable*4	
	Noise and vibration	dB	Compliant*2	Compliant*2	Compliant*2		
	Odor	m ³ /min	Compliant*2	Compliant*2	Compliant*2		
	Emissions to "Water and Soil"	Total amount of drainage	m ³	260,258	2,240,000	129,492	
PRTR regulated substance discharge		kg	0.0	162	0		
COD discharge		kg	512	9,000	31		
Nitrogen discharge		kg	1,271	15,200	29		
Phosphorus discharge		kg	52	444	1		
	Density of emissions of substances under drainage control	mg/L	Compliant*2	Compliant*2	Compliant*2		
Emissions of Wastes	Total amount of wastes	ton	13,116	3,509	4,192		
	Reused resources	ton	5,457	1,894	0		
	Recycled resources	ton	7,153	793	3,685		
	Resources subject to thermal energy recovery	ton	387	431	276		
	Amount of wastes incinerated	ton	23	139	184		
	Final disposal wastes	ton	61	194	47		
	Specially controlled industrial waste	kg	95,111	140,750	105		
	PRTR substance transfer	kg	90,810	52,175	2,805		
Downstream Environmental Impacts	Environmental impact caused by product characteristics Production and sale of environmental impact reducing products		P11—18 ———— *3	P11—18 ———— *3	P11—18 ———— *3		
Environmental Impacts from Transportation	CO ₂ emission during transport	t—CO ₂	852	291	126		
	NOx emission during transport	kg	5,282	1,455	555		
	Number of eco-vehicle introduced	unit	0	2	5		

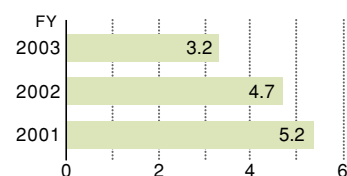
● SOx emission trend (t)



● NOx emission trend (t)



● Dust emission trend (t)



Plant & Infrastructure Engineering Company	Consumer Products & Machinery Company	Head Offices, Branch Offices & Technical Institutes	Kawasaki Shipbuilding Corporation	Kawasaki Precision Machinery Ltd. (KPM)	Total	Comparison with Previous Year
26,984	166,280	98	170,854	26,641	466,435	
0	736	0	2,120	0	6,926	
122	704	87	560	287	3,487	[−6.7%]
23	784	57	350	185	2,482	[+18.1%]
144	1,488	144	910	472	5,969	[+2.2%]
0	0	0	0	0	0	
71,722	1,036,900	76,488	834,354	230,074	7,155,682	[+2.3%]
30,013	30,320	0	0	11,780	356,705	[+21.3%]
10	0	0	0	0	10	
40,954	638,349	0	764,548	37,223	2,994,536	
399	259	9	9	19	1,185	
4,738	59,882	5,416	44,005	17,151	272,883	[+6.2%]
0	0	0	0	0	4	
0	278	—*3	97	13	18,113	[−19.8%]
159	18,090	—*3	365	8,178	98,342	[−38.8%]
0	797	—*3	119	175	3,187	[−32.1%]
38,038	113,795	—*3	611,863	27,606	1,146,647	
38,038	143,233	0	611,863	27,606	1,095,846	
Compliant*2	Compliant*2	Not applicable*4	Compliant*2	Compliant*2	Compliant*2	
Compliant*2	Compliant*2	Not applicable*4	Compliant*2	Compliant*2	Compliant*2	
Compliant*2	Compliant*2	Not applicable*4	Compliant*2	Compliant*2	Compliant*2	
Not applicable*4	Compliant*2	Not applicable*4	Not applicable*4	Not applicable*4	Compliant*2	
Not applicable*4	Not applicable*4	Not applicable*4	Not applicable*4	Not applicable*4	Not applicable*4	
Compliant*2	Compliant*2	Not applicable*4	Compliant*2	Compliant*2	Compliant*2	
Compliant*2	Compliant*2	Not applicable*4	Compliant*2	Compliant*2	Compliant*2	
13,734	620,671	0	0	44,446	3,308,601	[+5.4%]
0	2,829	—*3	0	0	2,991	[−9.2%]
41	5,627	0	1,034	337	16,582	[−1.2%]
199	13,392	—*3	—*3	369	30,459	
30	532	—*3	—*3	38	1,096	
Compliant*2	Compliant*2	Compliant*2	Compliant*2	Compliant*2	Compliant*2	
3,689	16,075	222	22,164	3,430	66,395	[−0.8%]
2,951	5,209	73	13,197	449	29,229	
409	9,393	15	5,645	2,781	29,874	[+9.8%]
328	1,184	75	225	200	3,106	
0	30	0	1,725	0	2,102	[−140.8%]
0	259	58	1,372	0	1,991	[−51.3%]
4	712,698	0	80,447	8,070	1,037,185	[+6.2%]
2,916	41,407	0	46,917	8,645	245,675	
P11—18	P11—18	P11—18	P11—18	P11—18	P11—18	
—*3	—*3	—*3	—*3	—*3	—*3	
298	21	43	3,195	72	4,897	
1,899	141	151	21,558	323	31,362	
4	43	0	0	0	54	

Environmental Data

Production Base

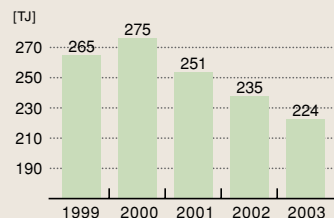
Yachiyo Works



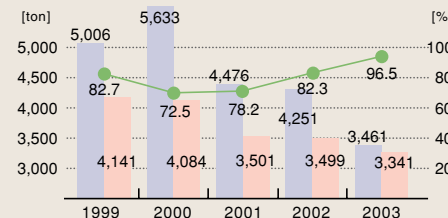
RPF (fuel derived from solidified waste paper and plastic) production facilities

● Major products: RPF production facilities, crushers, pulverizers, cast steel products, cast iron products
● Address: 1780, Kamikoya, Yachiyo, Chiba 276-0022 Japan

Energy consumption



Amount of waste discharged, amount recycled, recycling rate



Amount released into the atmosphere (kg)

SOx	4,474
NOx	5,350
Dust	448

Amount released into public water (kg)

COD	134
Nitrogen	378
Phosphorus	43

Gifu Works

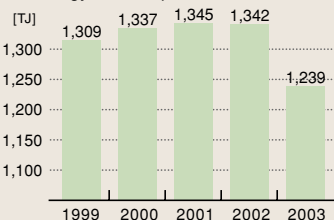
(including Nagoya Works 1 and Nagoya Works 2)



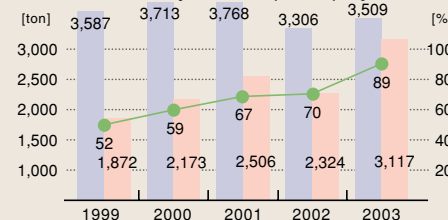
BK117 C-2 helicopter

● Major products: Aircraft (including helicopters), spacecraft, aviation-related facilities and equipment
● Address: 1, Kawasaki-cho, Kakamigahara, Gifu 504-8710 Japan

Energy consumption



Amount of waste discharged, amount recycled, recycling rate



Amount released into the atmosphere (kg)

SOx	9,227
NOx	15,522
Dust	872

Amount released into public water (kg)

COD	9,000
Nitrogen	15,200
Phosphorus	444

Kobe Works

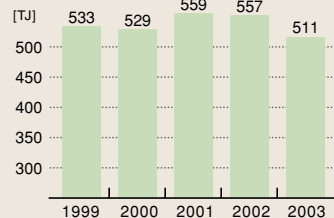
(including Kawasaki Shipbuilding Corporation)



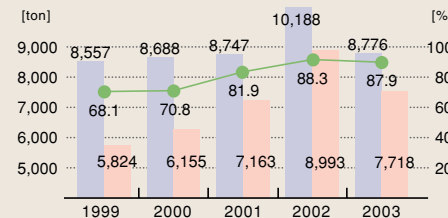
Two-cycle marine diesel engine

● Major products: Marine vessels, offshore structures, submarines, land & marine turbines and diesel engines
● Address: 3-1-1, Higashikawasaki-cho, Chuo-ku, Kobe, Hyogo 650-8670 Japan

Energy consumption



Amount of waste discharged, amount recycled, recycling rate



Amount released into the atmosphere (kg)

SOx	3,970
NOx	50,215
Dust	769

Amount released into public water (kg)

COD	34
Nitrogen	30
Phosphorus	0

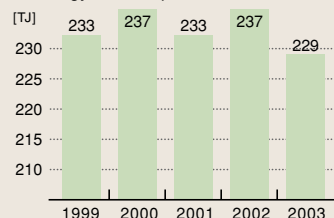
Hyogo Works



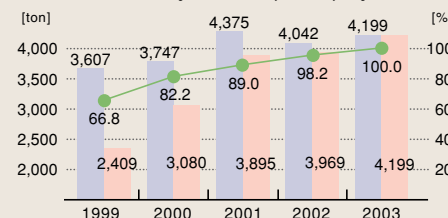
Magnetically levitated linear motor-driven high-speed train (for JR)

● Major products: Rolling stock, automated guideway transport, platform doors
● Address: 2-1-18, Wadayamadori, Hyogo-ku, Kobe, Hyogo 652-0884 Japan

Energy consumption



Amount of waste discharged, amount recycled, recycling rate



Amount released into the atmosphere (kg)

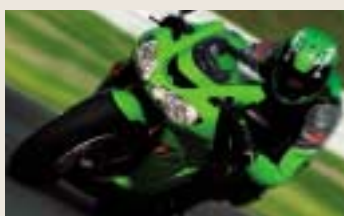
SOx	10
NOx	431
Dust	9

Amount released into public water (kg)

COD	23
Nitrogen	21
Phosphorus	1

Akashi Works

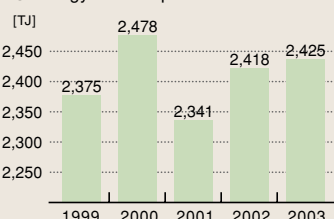
(including Seishin Works)



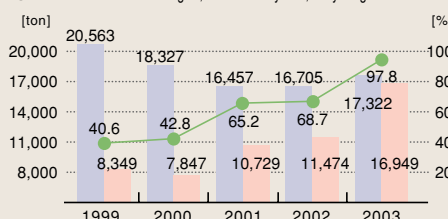
Ninja ZX-10R

● Major products: Motorcycles, robots, jet engines, and general-purpose gas turbines
● Address: 1-1, Kawasaki-cho, Akashi, Hyogo 673-8666 Japan

Energy consumption



Amount of waste discharged, amount recycled, recycling rate



Amount released into the atmosphere (kg)

SOx	278
NOx	18,090
Dust	797

Amount released into public water (kg)

COD	5,627
Nitrogen	13,392
Phosphorus	532

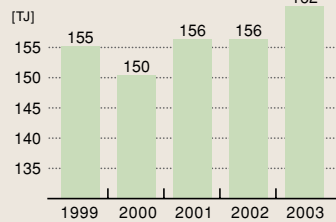
Banshu Works

- Major products: Construction machinery, cargo handling machinery
- Address: 2680, Oka, Inami-cho, Kako, Hyogo 675-1113 Japan

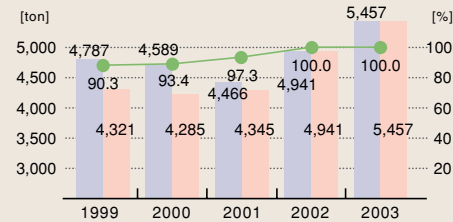


Wheel loader

● Energy consumption



● Amount of waste discharged, amount recycled, recycling rate



● Amount released into the atmosphere (kg)

SOx	NA
NOx	NA
Dust	NA

● Amount released into public water (kg)

COD	443
Nitrogen	350
Phosphorus	16

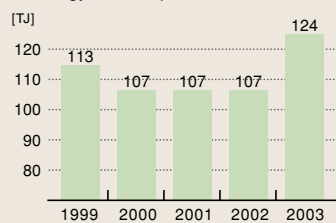
Harima Works

- Major products: Plants, environmental protection facilities, boilers, construction machinery, steel structures
- Address: 8, Nijijima, Harima, Kako, Hyogo 675-0155 Japan

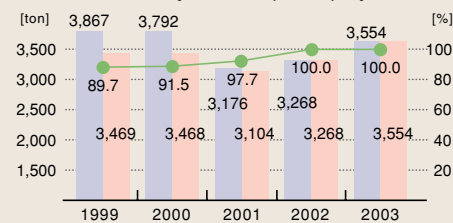


Detachable slurry triple station shield machine

● Energy consumption



● Amount of waste discharged, amount recycled, recycling rate



● Amount released into the atmosphere (kg)

SOx	NA
NOx	159
Dust	NA

● Amount released into public water (kg)

COD	41
Nitrogen	199
Phosphorus	30

Nishi-Kobe Works

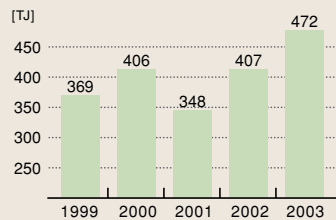
(Kawasaki Precision Machinery Ltd.)

- Major products: Industrial hydraulic devices, marine machinery, and precision equipment/devices
- Address: 234, Matsumoto, Hasetani-cho, Nishi-ku, Kobe, Hyogo 651-2239 Japan

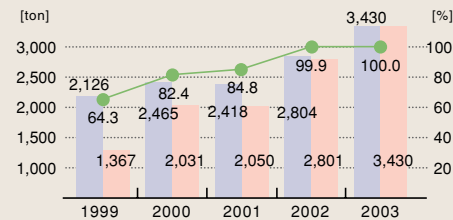


Hydraulic equipment

● Energy consumption



● Amount of waste discharged, amount recycled, recycling rate



● Amount released into the atmosphere (kg)

SOx	13
NOx	8,178
Dust	175

● Amount released into public water (kg)

COD	337
Nitrogen	369
Phosphorus	38

Sakaide Works

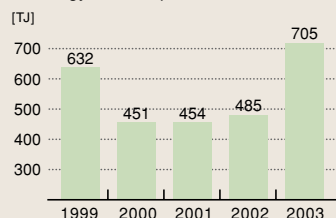
(Kawasaki Shipbuilding Corporation)

- Major products: Marine vessels, marine equipment (LNG/LPG carriers, container ships, oil drilling rigs, etc.)
- Address: 1, Kawasaki-cho, Sakaide, Kagawa 762-8507 Japan

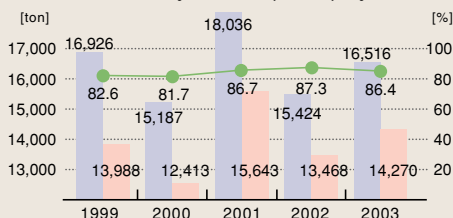


LNG carrier

● Energy consumption



● Amount of waste discharged, amount recycled, recycling rate



● Amount released into the atmosphere (kg)

SOx	97
NOx	365
Dust	119

● Amount released into public water (kg)

COD	1,034
Nitrogen	—
Phosphorus	—

Editor's Note

Thank you for taking the time to read the Kawasaki Environmental Report 2004.

Through this Report, we hope you could duly understand our contributions to communities through our business activities and products, pursuit of which is the most important mission for us as a heavy industry manufacturing business, as well as the environmental protection activities that we have continued steadily at our production bases over many years.

What is your impression? We always welcome feedback from readers. In addition to improving environmental protection activities themselves, we will make further efforts to provide an environmental report that is more appealing and easier-to-read in the future.

Promise to the Earth

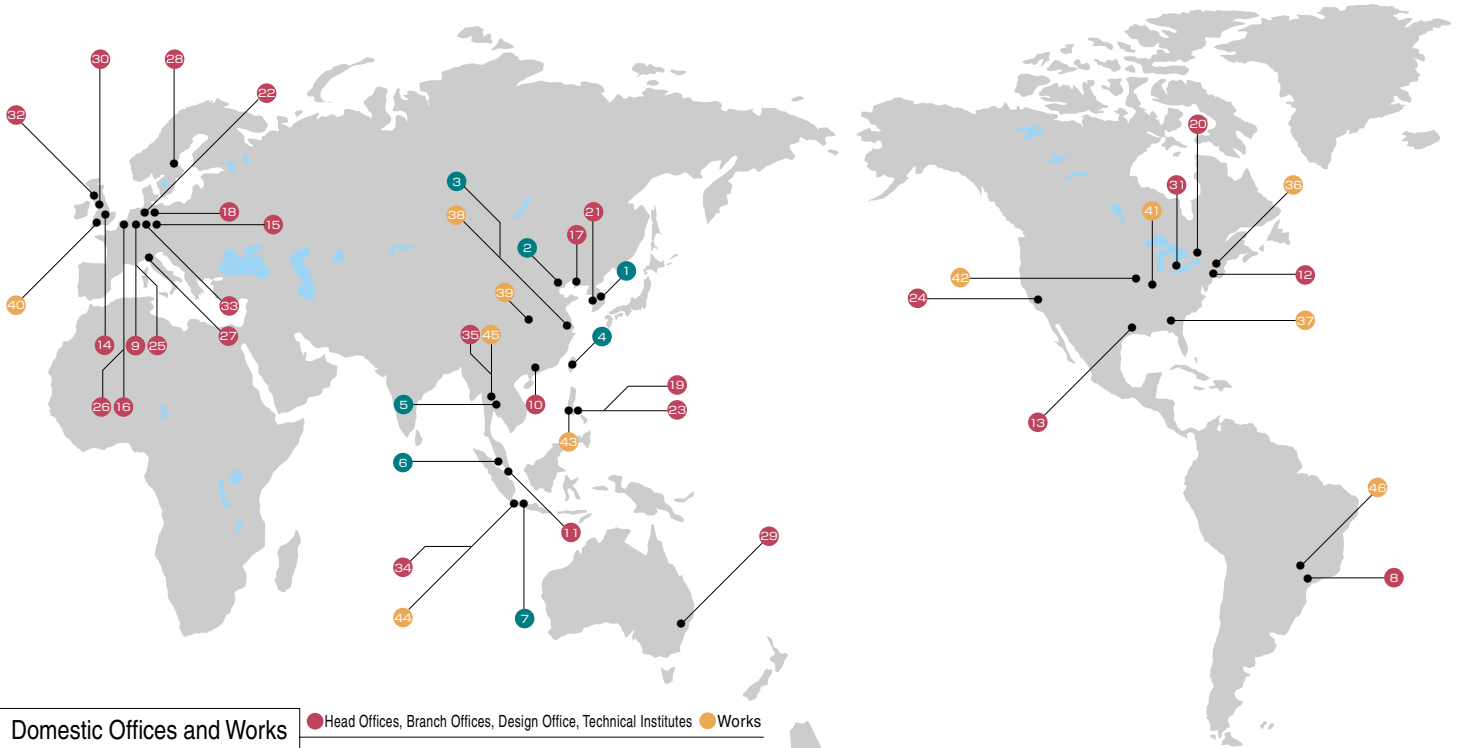


地球が微笑む物づくり

Global Network

● Overseas office ● Overseas affiliate (sales) ● Overseas affiliate (production)

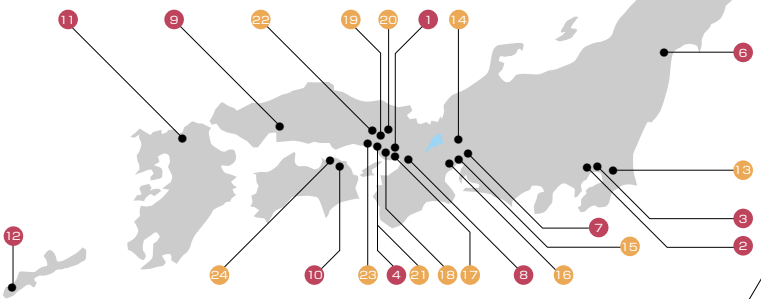
- | | | |
|--|---|--|
| 1 Seoul Office | 17 KHI (Dalian) Computer Technology Co., Ltd. | 33 Kawasaki Robotics G.m.b.H. |
| 2 Beijing Office | 18 Kawasaki Gas Turbine Europe G.m.b.H. | 34 P.T. Kawasaki Motor Indonesia |
| 3 Shanghai Office | 19 KHI Design & Technical Service Inc. | 35 Kawasaki Motors Enterprise (Thailand) Co., Ltd. |
| 4 Taipei Office | 20 Canadian Kawasaki Motors Inc. | 36 Kawasaki Rail Car, Inc. |
| 5 Bangkok Office | 21 Kawasaki Machine Systems Korea, Ltd. | 37 Kawasaki Construction Machinery Corp. of America |
| 6 Kuala Lumpur Office | 22 Kawasaki Motors Germany Branch | 38 Nantong Cosco KHI Ship Engineering Co., Ltd. |
| 7 Jakarta Office | 23 Kawasaki Motors (Phils.) Corporation | 39 Wuhan Kawasaki Marine Machinery Co., Ltd. |
| 8 Kawasaki do Brasil Industria e Comércio Ltda. | 24 Kawasaki Motors Corp., U.S.A. | 40 Kawasaki Precision Machinery (UK) Ltd. |
| 9 Kawasaki Heavy Industries (Europe) B.V. | 25 Kawasaki Motors Europe N.V. | 41 Kawasaki Motors Manufacturing Corp., U.S.A. (Maryville Plant) |
| 10 Kawasaki Heavy Industries (H.K.) Ltd. | 26 Kawasaki Motors France Branch | 42 Kawasaki Motors Manufacturing Corp., U.S.A. (Lincoln Plant) |
| 11 Kawasaki Heavy Industries (Singapore) Pte. Ltd. | 27 Kawasaki Motors Italy Branch | 43 Kawasaki Motors (Phils.) Corporation |
| 12 Kawasaki Heavy Industries (U.S.A.), Inc. | 28 Kawasaki Motors Sweden Branch | 44 P.T. Kawasaki Motor Indonesia |
| 13 Kawasaki Heavy Industries (U.S.A.), Inc. (Houston Branch) | 29 Kawasaki Motors Pty. Ltd. | 45 Kawasaki Motors Enterprise (Thailand) Co., Ltd. |
| 14 Kawasaki Heavy Industries (UK) Ltd. | 30 Kawasaki Motors U.K. Branch | 46 Kawasaki Aeronautica do Brasil Industria Ltda. |
| 15 Kawasaki Heavy Industries G.m.b.H. | 31 Kawasaki Robotics (U.S.A.), Inc. | |
| 16 KHI Europe Finance B.V. | 32 Kawasaki Robotics (UK) Ltd. | |



Domestic Offices and Works

● Head Offices, Branch Offices, Design Office, Technical Institutes ● Works

- | | | |
|------------------------------|---------------------|------------------|
| 1 Kobe Head Office | 11 Fukuoka Office | 21 Akashi Works |
| 2 Tokyo Head Office | 12 Okinawa Office | 22 Banshu Works |
| 3 Tokyo Design Office | 13 Yachiyo Works | 23 Harima Works |
| 4 Akashi Technical Institute | 14 Gifu Works | 24 Sakaide Works |
| 5 Sapporo Office | 15 Nagoya Works 1 | |
| 6 Sendai Office | 16 Nagoya Works 2 | |
| 7 Nagoya Office | 17 Kobe Works | |
| 8 Osaka Office | 18 Hyogo Works | |
| 9 Hiroshima Office | 19 Nishi-Kobe Works | |
| 10 Shikoku Office | 20 Seishin Works | |



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