Working to Dramatically Reduce Environmental Load

Clarification of Executive Responsibilities in Tire and MB Groups Respectively

The bulk of the resources and energy used and SOCs emitted by Yokohama Rubber are associated with production. Recognizing, therefore, the particular importance of minimizing the environmental impact of our production activities (i.e., practicing environmentally conscious production), Production Environmental Task Forces have been established in the Tire Group and the MB Group to provide a framework for executive responsibility in each of these groups. The lines of business and production methods of the two groups differ considerably. The Tire Group manufactures tires and related products using large quantities of thermal energy and water, while the MB Group manufactures a diversity of products spanning a range of fields, including adhesives, aircraft products, and golf products, necessitating that environmental measures be finely tuned according to the type of product concerned.

Primary Concerns are Improved Energy Efficiency in the Tire Group and Reduced Industrial Waste Emissions in the MB Group

In fiscal 2006, Yokohama Rubber managed to reduce emissions of greenhouse gases by 8.2%. Emissions of industrial waste, on the other hand, rose 0.8% from the previous year. In recognition of this, the Tire and MB Groups will be taking action following the principles outlined below in fiscal 2007.

Saving energy by eliminating wasteful use of resources

Akihisa Takayama
Managing Corporate Officer,
General Manager of Tire Production Div.

Production wastage to be cut to less than 1% in fiscal 2007

Toshio Izawa
Corporate Officer in charge of MB Production,
General Manager of Hoses and Coupling Div.

Akihisa Takayama (left) and Toshio Izawa

Tire Group

The Tire Group's activities are guided by the principle of "everyone working together to build an environmentally friendly, rewarding workplace of which to be proud." The key priority in fiscal 2006 was making radical improvements regarding energy sources, and this we achieved as a result of switching fuels at three of our main domestic tire plants and completing deployment of cogeneration systems. From this fiscal year, we will be pursuing drastic improvements in energy efficiency. By taking sweeping action to get rid of waste and inefficiency so as to eliminate movement, transport, and shutdown loss, shedding light on and improving energy efficiency mechanisms from logical and theoretical angles, and raising awareness of energy-saving activities in the workplace in order to maximize energy efficiency, we plan to achieve a 10% reduction in greenhouse gas emissions in fiscal 2008 compared with fiscal 1990. We will also be taking action to reduce emissions of industrial waste and achieve a 100% recycling rate to the next level, and at the same implementing measures to reduce the impact of noise, odor, and particulate matter emissions on the environments around plants.

MB Group

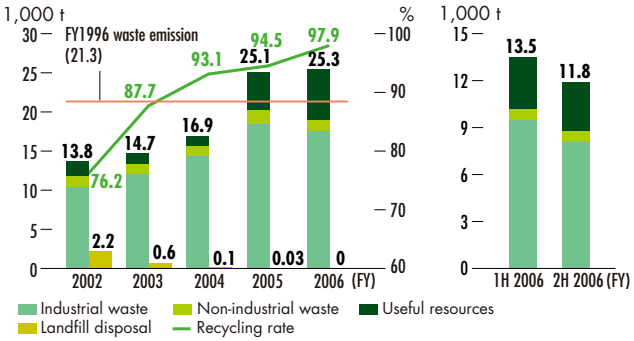
The MB Group is targeting a 13.1% reduction in emissions of industrial waste in fiscal 2007 compared with the previous year. Although in fiscal 2006 some individual divisions achieved cuts, a 10% rise in output rose in Hoses & Couplings and Industrial Products meant that the group was unfortunately unable to achieve its overall objective. Output is continuing to grow by around the same rate in fiscal 2007, too, but by stepping up action on the MB-Pi Initiative to innovate in production, we aim to lower production wastage (from spoilage and cutoffs, etc.) to no more than 1%. Technology and production divisions will collaborate on comprehensive action, such as full participation in 2S activities, reinforcement of fundamentals such as independent maintenance of facilities, practical research on resolving on-site problems with the materials available on the spot, and development of manufacturing techniques to drastically minimize production wastage. Effective use of resources to combat global warming is a key priority, and reducing product wastage has a key role to play in this.

Reduction of Industrial Waste

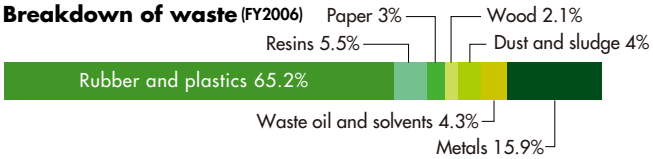
12.3% Reduction from Previous Six Months in Second Half of Fiscal 2006, and Drastic Reduction Planned in Fiscal 2007

Emissions of waste[1] in fiscal 2006 rose 0.8% from a year earlier to 25,338 tons. Compared with the 13,497 tons emitted in the first half of the year, however, emissions fell 12.3% to 11,841 tons in the second half, and in fiscal 2007, we plan to drastically reduce emissions of product wastage with the aim of cutting emissions by 20% compared with their level in fiscal 2006 in order to achieve the Phase I target of a 35% reduction by the end of fiscal 2008 compared with fiscal 1996. The recycling rate, meanwhile, was raised from 94.5% in the previous fiscal year to 97.9%. Our target in fiscal 2007 is 99%.

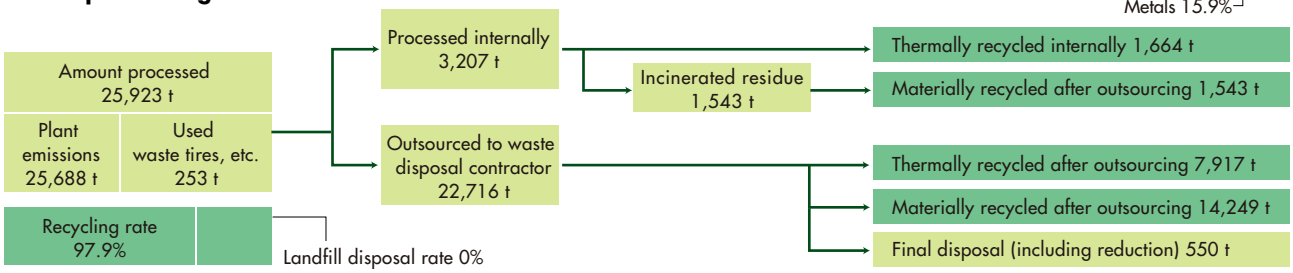
Waste emission, landfill disposal, and recycling rate



Breakdown of waste (FY2006)



Waste processing flow (FY2006)



Continuation of Zero Emissions

Since the end of March 2006, we have continued to emit zero waste[2] at eight of our production sites in Japan.

Toward Total Recycling of Industrial Waste

In line with the principle declared in GD100 of pursuing world-class environmental action at our operations, we aim to be recycling all our industrial waste[3] by the end of 2010. To this end, we are working to expand recycling by contracting chemical producers to recycle sulfur that is no longer required back into raw materials. The 2.1% of industrial waste that could not be recycled in fiscal 2006 consisted of waste solvents, which are hard to recycle, and small quantities of unsortable waste. Using our network of internal and external contacts, we are examining possible recyclers of solvents, while the idea of re-sorting small quantities of waste for recycling is also being pursued.

Auditing of All Industrial Waste Disposal Contractors

In order to prevent illegal dumping and also to confirm that waste is being properly processed by waste disposal contractors, audits are conducted in accordance with internal guidelines. In fiscal 2006, all contractors were audited (compared with 51% in fiscal 2005). In fiscal 2007, audits of contractors hired by more than one plant will be shared to improve efficiency. To further improve the level of control, internal guidelines on preliminary investigation of new contractors were also strengthened in fiscal 2006.

Proper Control of PCB Waste

By March 2006, early registration of 189 items of PCB waste from transformers and condensers was completed. These will be subject to proper management and storage in accordance with legislation and company regulations until processing commences.

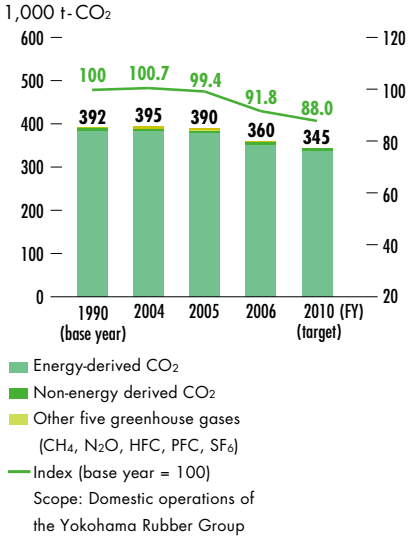
1. The definition of 'waste': Unwanted substances emitted during production activity, including industrial waste, non-industrial waste, and useful resources.
2. The definition of 'zero emissions': Zero emission of waste that is destined directly for landfill disposal.
3. The definition of 'total recycling': Zero emission of waste for final disposal (waste destined directly for landfill disposal and incinerated waste that is not effectively utilized).

Reduction of Greenhouse Gas Emissions

8.2% Reduction in Emissions, Exceeding the Target Set by the Kyoto Protocol

Greenhouse gas emissions by the Yokohama Rubber Group's domestic operations shrank 8.2% in fiscal 2006 compared with the base year, exceeding the target of a 6% reduction set for Japan under the Kyoto Protocol. A major contributor to this was the completion of a gas-powered cogeneration system (with a total efficiency of at least 85%) at the Shinshiro Plant in January 2007. As a result of these activities, the Mishima Plant became in May 2007 the first recipient in the tire industry of the Environmental Conservation Encouragement Award at the Japan Cogeneration Center Awards. The Hiratsuka East Plant in addition finished introducing substitutes for PFCs, which have a high CO_2 equivalent coefficient, in September 2006. Looking ahead, we intend to work on improving "e/t" specific energy consumption.

Combined greenhouse gas emissions and their indices (1990 =100)



Breakdown of greenhouse gases (FY2006)

Greenhouse gas type	Emission (1,000 t-CO_2)	Percentage of total
Energy-derived CO_2	351	97.4
Non-energy-derived CO_2	5	1.3
CH_4	0.02	0.0
N_2O	0.3	0.1
HFC	0	–
PFC	4	1.2
SF_6	0	–

Calculation methods

Data up to FY2005 were calculated in accordance with *Guidelines on Calculation of Greenhouse Gas Emissions from Business Establishments* (Ministry of the Environment). In FY2006, data were calculated by methods provided by the system for calculation, reporting, and publication of greenhouse gas emissions in accordance with the law on concerning the promotion of measures to cope with global warming.

Purchased power carbon dioxide emission factor (kg-CO_2/kWh): The coefficient for FY1990 (0.424) is from *Summary Findings of a Study of Calculation of Greenhouse Gas Emissions* (Ministry of the Environment, August 2002); the coefficients for FY2004 (0.421) and FY2005 (0.425) are averages for all power sources on the user side (*Environmental Action Plans in the Electricity Industry*, Federation of Electric Power Companies of Japan, September 2006); and the coefficient for FY2006 is from *Ministerial Ordinance on Calculation of Emissions of Greenhouse Gases in Association with the Business Activities of Specified Emitters* (Ministry of Economy, Trade and Industry/Ministry of the Environment Ordinance No. 3).

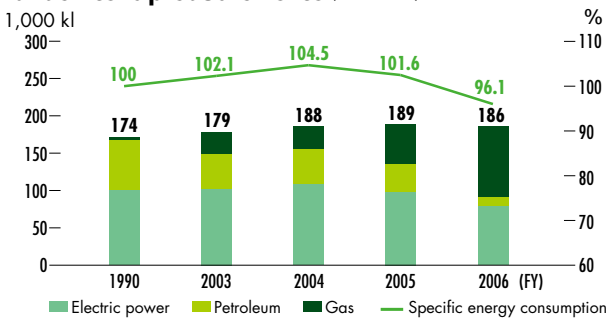
Base year: The base year is 1990 for all substances except HFCs, PFCs and SF_6, for which 1995 is adopted as the base year in accordance with the Kyoto Protocol.

Calculations of emissions by group companies include estimates, and greenhouse gas emissions in past years are corrected in accordance with revisions to the estimation methods. Note that the impact of these changes is minor.

Enhanced Energy Management to Reduce CO_2 Emissions

As energy-derived CO_2 accounted for 97.3% of total emissions at Yokohama Rubber's eight production sites in Japan in fiscal 2006, we are pursuing management of "CO_2/e" and "e/t" in accordance with a formula for energy management. Regarding "e/t" in particular, we are expanding visualization as a means of maintaining strict control of, for example, cumulative energy savings and increases in energy use due to the installation of equipment and facilities unrelated to production. Specific energy consumption in fiscal 2006 was improved by 5.5% from the previous year. MBO at non-production sites is also practiced.

Energy use and specific energy consumption at domestic production sites (1990 =100)



Energy management formula (CO_2 = [CO_2/e] x [e/t] x[t])

[CO_2/e]: CO_2 emission factor in energy supply. Improved by fuel conversion (gasification) and use of natural energy.

[e/t]: Specific energy consumption. Improved by energy-saving activities and increases in productivity.

[t]: Output. Warehouse-in rubber equivalent in the case of Yokohama Rubber.

Energy use is crude oil equivalent according to the Law Concerning the Rationalization of Energy Use.

Our Activities case number 03

General Manager Toshihiko Suzuki (left) and Deputy General Manager Kenji Teraoka in front of the cogeneration system at the Shinshiro Plant, which boasts a total efficiency of at least 85%

Installation of High-efficiency Cogeneration System

We are pursuing the deployment of high-efficiency cogeneration systems, which drastically reduce emissions of greenhouse gases, to curb the increase in the environmental load that accompanies increases in production capacity.

Focus on Drastic Cuts in Greenhouse Gas Emissions

The primary focus since the introduction of the first cogeneration system (CGS) at the Hiratsuka Factory in 1998 has been drastically reducing emissions of greenhouse gases. At the time, heavy oil was the main type of fuel used for CGS. Swimming against the stream, however, Yokohama Rubber chose to use more costly natural gas. 1998 was the year that we really began to pursue becoming a green company, as reflected by the launch of the DNA series, the industry's first eco-tire. There must not have been any compromise.

CGS Installed at Three Sites Since 2005

Detailed data on the Hiratsuka Factory system's operation and management have been compiled and analyzed since its installation, and high-efficiency systems that are among the most advanced in Japan have been introduced at our plants in Mishima, Mie, and Shinshiro since 2005, when the Kyoto Protocol came into effect. As a result, we have achieved an 8.2% reduction in emissions, exceeding the -6% target set for Japan by the Kyoto Protocol.

Raising Employee Awareness through Total Productive Maintenance Activities (TPM)

Even small air leaks can seriously hamper system efficiency. In order to maximize system performance, therefore, a strong awareness of the environment among those responsible for managing and operating equipment is essential. Adopting as our watchword "top-level systems are maintained by top-level awareness among employees," total productive maintenance (TPM) is practiced with the involvement of all employees, and steps are being taken to raise employee awareness.

Kenji Teraoka
Deputy General Manager of the Shinshiro Plant
(formerly General Manager of the Facilities Administration Dept.)

What are Cogeneration Systems?
Cogeneration systems (CGS) are energy-saving systems that use fuel to generate electricity, and simultaneously utilize the resulting waste heat for uses such as air conditioning or generating hot water and steam. Major reductions in energy use and CO_2 emissions have been achieved by effectively utilizing the waste heat recovered. The CGS installed by Yokohama Rubber achieves a high total efficiency of at least 85% by using waste heat for a steam absorption chiller and reheat boiler.

Initiatives to Reduce CO_2 Emissions from Logistics Operations

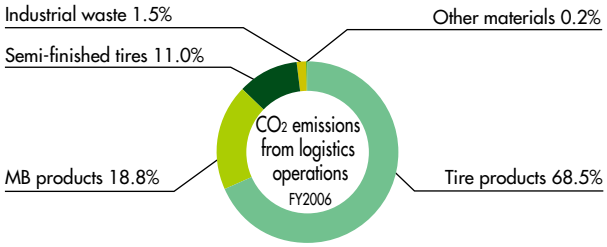
Annual Year-on-year 1% Reduction in CO_2 Emission Factor Targeted

In fiscal 2006, we began compiling data on energy use and CO_2 emissions in transportation, and found as a result that total transportation ton-kilometers came to 231,950,000 and CO_2 emissions to 28,000 tons.

Energy use and CO_2 emissions from logistics operations (FY2006)

Total transportation volume (10,000t-km)	23,195
Energy use (crude oil equivalent: kl)	11
CO_2 emissions (1,000t-CO_2)	28
Weight transported (1,000 t)	1,185
Specific energy consumption (l/t)	9.1
CO_2 emission factor (kg-CO_2/t)	23.8

Adopting as our target an annual 1% reduction in the CO_2 emission factor (kg-CO_2/ton = CO_2 emissions/weight transported) compared with the previous year, we are working to achieve improvements in logistics.



Deepening Cuts in CO_2 Emissions from Logistics Operations

In order to reduce CO_2 emissions from logistics operations, we are pursuing the following ongoing measures.

Promotion of Modal Shift

Marine Transport

53% of shipments by weight from the Mie, Mishima, and Shinshiro Plants to Hokkaido, Miyagi, and Fukuoka Prefectures were transported by ferry services in fiscal 2006.

Rail Transport

In fiscal 2007, the Onomichi Plant began using JR container services for shipments to Hokkaido.

Increased Use of Fuel-efficient and Low-emission Vehicles

Freight companies are urged to use fuel-efficient vehicles, and use of freight companies that employ such vehicles is being expanded.

Centralized Consolidated Shipment

Loading ratios are being increased and the number of truck loads reduced through centralized consolidated shipment of cargoes between the three hose and coupling plants.

Improvement of Loading Efficiency through Use of Higher Tonnage, Low-bed Trucks

In order to increase loading efficiency and reduce shipping frequency, freight companies are requested to use higher tonnage, low-bed trucks. The proportion of such vehicles used in the second half of fiscal 2006 was 33%, and we aim to achieve a further 3% improvement in fiscal 2007.

Elimination of Intra-plant Transport

At the Shinshiro Plant, supplies used to have to be transported from the secondary plant to the main plant due to the secondary plant's lack of warehousing space. By constructing a warehouse at the secondary plant, we plan to cut CO_2 emissions by 2.4 tons per month from January 2008.

Increased Direct Delivery ("disintermediation")

We are expanding direct delivery from our plants to retailers. In fiscal 2006, increases in direct deliveries were made at the Mie and Mishima Plants.

Reduction of Industrial Waste

We aim to cut the amount of industrial waste transported by 20% from the previous fiscal year.

Distribution of Green Procurement Guidelines to Enhance Coordination with Business Partners

In February 2007, in order to further cut CO_2 emissions by enhancing coordination with our business partners, we distributed Green Procurement Guidelines to 312 logistics providers with which we do business. These guidelines include specific requirements of our partners, including acquisition of ISO14001 certification, avoidance of empty mileage, and reduction of use of packing and packaging materials.

Main content

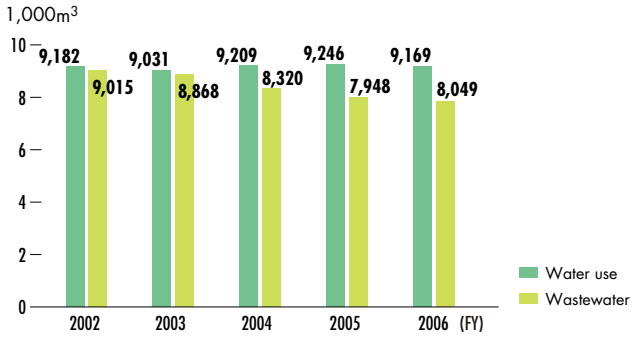
Cooperation requests made of our partners: acquisition of external ISO14001 certification, avoidance of empty mileage, reduction of use of packing and packaging materials, use of low-emission vehicles, etc.

Green Procurement Guidelines

Protection of Water, Air, and Soil Environments

Reduction of Water Use through Increased Recycling

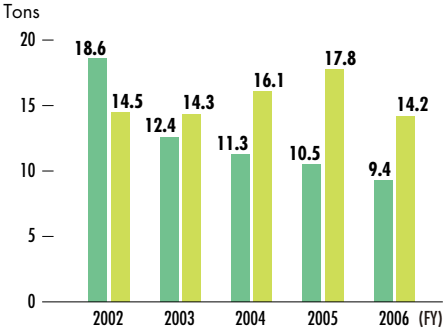
Water use kept down to the 9,100,000 m³ ton mark despite increased output



The data on wastewater includes estimates, as some establishments were not equipped with flowmeters during the period concerned.

Improvement in Both BOD and COD Loads

The following year-on-year improvements in the BOD and COD loads were achieved in fiscal 2006.

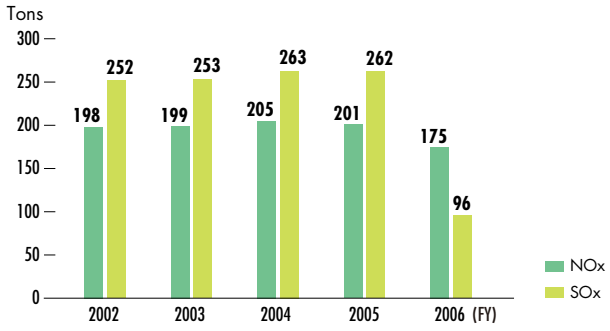


BOD: Biochemical oxygen demand
COD: Chemical oxygen demand
BOD is a measure of water pollution in rivers, and COD is a measure of water pollution in seas and lakes. The higher the value, the greater is the level of pollution.

Corrections are made to the BOD and COD loads in past years due to some establishments not having been equipped with wastewater flowmeters during these periods. The effect of these changes is minimal.

Significant Reduction in NOx and SOx Emissions

The substitution of natural gas for heavy oil and activities to save energy yielded a steep 12.9% reduction in NOx and 63.4% reduction in SOx emissions in fiscal 2006 compared with the previous year.



NOx: Nitrogen oxides SOx: Sulfur oxides

Measures against Dioxins

The concentration of dioxins is measured regularly once a year at the Mie Plant, which is equipped with a waste incinerator, and is within regulatory limits.

Dioxin measurements at Mie Plant (FY2006)

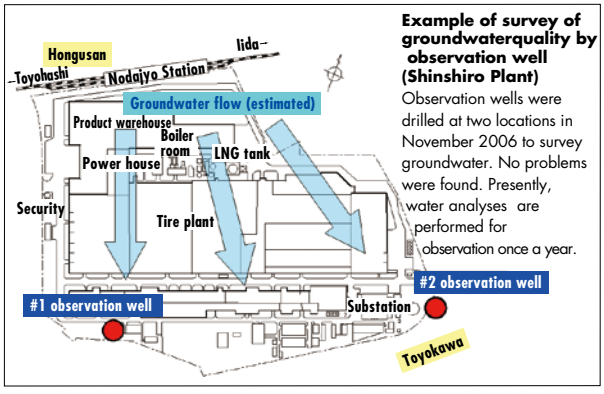
Category	regulatory value	measured value
Exhaust gas (ng-TEQ/m3N)	10	0.00047
Wastewater (pg-TEQ/L)	10	0.0021
Incinerated residue (ng-TEQ/g)	3	0.00000031
Fly ash (ng-TEQ/g)	3	0.19

Measures against Distinctive Smell of Rubber

As a result of employing less odorous materials and sealing facilities, the number of complaints about odors declined from nine in fiscal 2005 to three in fiscal 2006.

All Production Sites in Japan Clear Soil Pollution Law Requirements

In fiscal 2006, use of shallow observation wells was expanded to seven sites (at the Nagano Plant, where the water vein is deep underground, direct soil analysis is employed). It was confirmed as a result that all production sites in Japan are within the limits for hazardous substances laid down by the Soil Pollution Law. At the Hiratsuka Factory, where the concentration of chlorinated organic solvents in groundwater used to exceed limits, aerated cleaning is still employed.



Example of survey of groundwaterquality by observation well (Shinshiro Plant)
Observation wells were drilled at two locations in November 2006 to survey groundwater. No problems were found. Presently, water analyses are performed for observation once a year.