

## Making a positive environmental contribution

In recent years the focus of environmental activities has shifted from cutting emissions of harmful chemical substances toward pursuing the development of a sustainable society by eliminating any detrimental effects to ecosystems, including humans. The THK Group recognized early on the importance of focusing on sustainable development as we try to preserve the global environment. We have established a basic environmental policy, and we aim to make our business activities compatible with environmental needs based on this policy. We have mainly focused our environmental preservation activities on four designated key areas (see chart). Environmental programs are underway in each of these areas across THK operations.

The relevant THK division leads the implementation of activities under each heading with cooperation from related divisions. Promotion of such activities extends across operating sites and organizational lines. At each operating site, one designated department has responsibility for all environmental activities undertaken at the site. Site-based environmental activities operate autonomously based on ISO14001-certified management systems.

THK's environmental regulatory compliance system is structured so that all THK Group companies are made aware of any new legislation or ordinances relating to the environment or energy, and of any new market requirements pertaining to THK products. This ensures that our response is not limited to a specific factory or operating site, but can also be prompt and coordinated at the group level. At the same time, we strive to be a company that cares about the environment by fostering stronger links with customers and suppliers and by seeking the cooperation of local communities.

Function-based programs
R&D Division
Material Procurement Division
Design Division
Manufacturing Technology Division
Energy Management Division
Distribution Division (distribution centers)
Sales & Marketing Division
Management Division (QA for harmful substances)

Site-based programs
All THK production sites
THK Group companies
Administrative sections

### THK Group environmental activities

Area	Objectives and goals	Main activities
Energy conservation	<ul style="list-style-type: none"> <li>Cut greenhouse gas emissions</li> <li>Achieve 15% reduction in CO<sub>2</sub> emissions per unit of output relative to FY2005 levels by FY2010</li> </ul>	<ul style="list-style-type: none"> <li>(1) Energy diagnostics</li> <li>(2) Energy conservation</li> <li>(3) Use of clean energy</li> </ul>
Material conservation, zero emissions	<ul style="list-style-type: none"> <li>Reduce environmental impact; achieve zero emissions</li> </ul>	<ul style="list-style-type: none"> <li>(1) Input controls (materials, parts and by-products) to reduce usage and boost per-unit yields</li> <li>(2) Controls on emissions and final waste disposal</li> <li>(3) Material re-use/recycling</li> </ul>
Harmful substance controls	<ul style="list-style-type: none"> <li>Eliminate and control harmful substances in THK Group production/distribution activities</li> </ul>	<ul style="list-style-type: none"> <li>(1) Substitution of PRTR-designated substances</li> <li>(2) Green procurement and purchasing</li> </ul>
Environment-friendly products and services	<ul style="list-style-type: none"> <li>Develop products and supply services using LCA (Life Cycle Assessment) methods</li> </ul>	<ul style="list-style-type: none"> <li>(1) Cage-embedded product series development</li> <li>(2) Extension of service life and maintenance-free periods</li> </ul>

### Environmental activities and targets

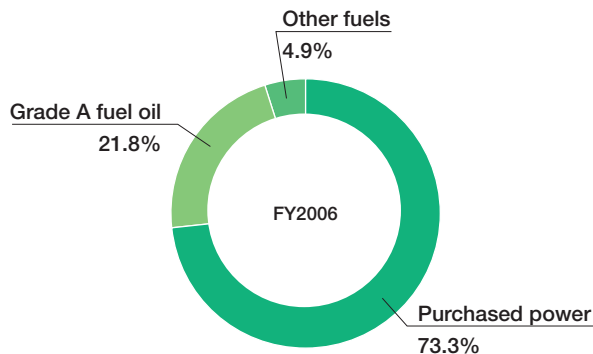


Employees take part in a site beautification program (Gifu Plant)

### Energy management and CO<sub>2</sub> emissions reduction

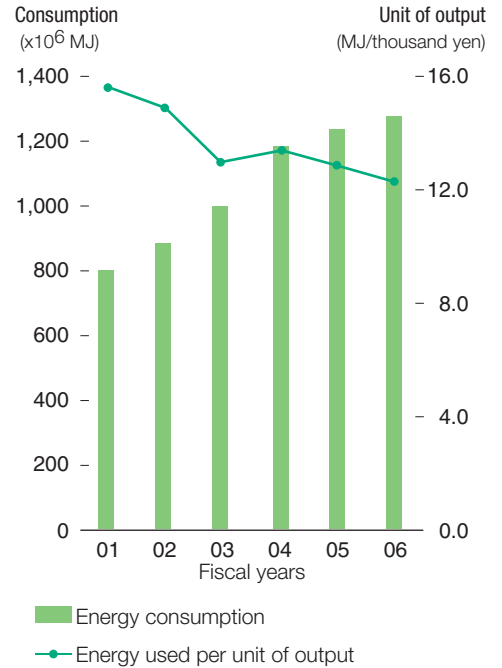
THK Group operations consume considerable amounts of energy in manufacturing processes such as grinding and heat treatment and in air conditioning, lighting or compressed air systems. In terms of the energy sources, we buy power from electric utilities for about two-thirds of our needs and use Grade A fuel oil for a further 20%. We also make use of propane gas and other fossil fuels, as well as liquefied natural gas (LNG).

As part of efforts in Japan to meet commitments under the Kyoto Protocol, the THK Group has voluntarily established a carbon dioxide emissions reduction target covering the entire organization, including all administrative sections. Our goal is to reduce CO<sub>2</sub> emissions per unit of production output by fiscal 2010 to a level 15% below our actual emissions in fiscal 2005 on that basis. Besides making consumption more efficient through energy-saving measures, we are also working to improve the composition of energy inputs to emit less carbon dioxide. In fiscal 2006, we reduced total CO<sub>2</sub> emissions by 0.6% while raising production output by 9.1% over the previous year. Emissions per unit of output thus fell by 8.8%. Continuing the pattern seen

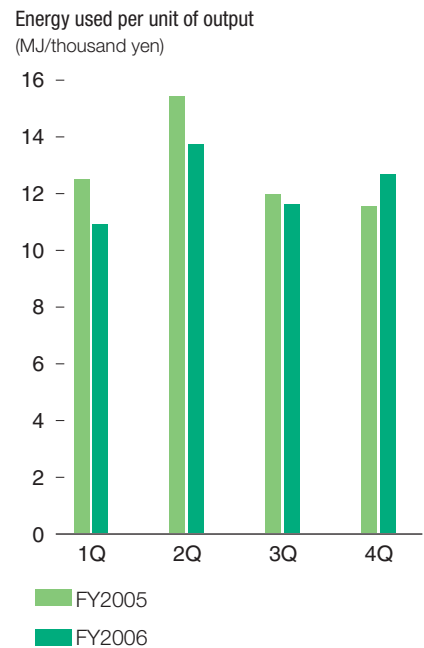


Breakdown of THK Group energy used

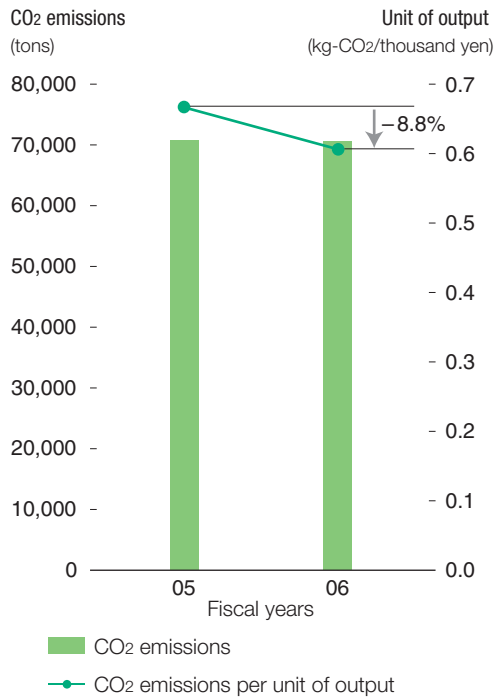
in fiscal 2005, both of our plants at Yamaguchi and Yamagata made less use of onsite cogeneration systems during the year. These moves reduced the calorific ratio of Grade A fuel oil by 8.4%, which in turn cut overall group CO<sub>2</sub> emissions by 1.9%.



### Energy consumption by fiscal year (THK production sites)



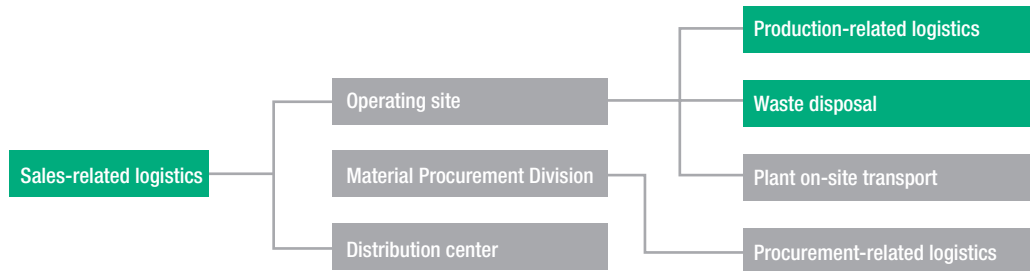
Energy consumption per unit of production output, by quarter (THK Group, FY2005–FY2006)



THK Group CO<sub>2</sub> emissions

Projects to expand and install new equipment at the Yamagata Plant, the Chubu Distribution Center and other facilities contributed to increased energy consumption during the second half of fiscal 2006. In each case we ensured that designs for buildings and facilities incorporated the latest energy conservation technology. The Yamagata plant now employs a hybrid heating system with multiple types of heat-generators to optimize power consumption depending on the system load. At the Chubu Distribution Center, we are now operating gas-fired heat pumps with high energy-efficiency as measured in terms of the COP (coefficient of performance). These pumps run on LNG, a relatively clean fuel that is shared with the nearby Gifu Plant to power the air-conditioning systems on both sites.

Our Manufacturing Division is not just installing new facilities or remodeling them. We are also taking appropriate measures to maintain facilities and to upgrade or replace obsolete equipment, based on energy audits conducted at existing facilities. Other efforts to fix small problems, such as sealing air leaks or



Scope of freight transport covered by law (areas shaded green)



Gas-fired heat pumps that run on LNG (Chubu Distribution Center)

switching off lights during breaks, are also proving highly effective in helping to maintain and improve energy efficiency.

In April 2006, a new law came into force in Japan relating to energy-saving measures within the transport sector. In response to this, we began assessing the total quantities transported within operations and calculating related CO<sub>2</sub> emissions. This analysis considered the content of all freight loads transported as part of sales- and production-related logistics as well as waste disposal. On a non-consolidated basis, THK's freight transport volume exceeded 30 million ton-kilometers in fiscal 2006. In line with the new law, THK has received approval as a designated freight consignor from the Bureau of Economy, Trade

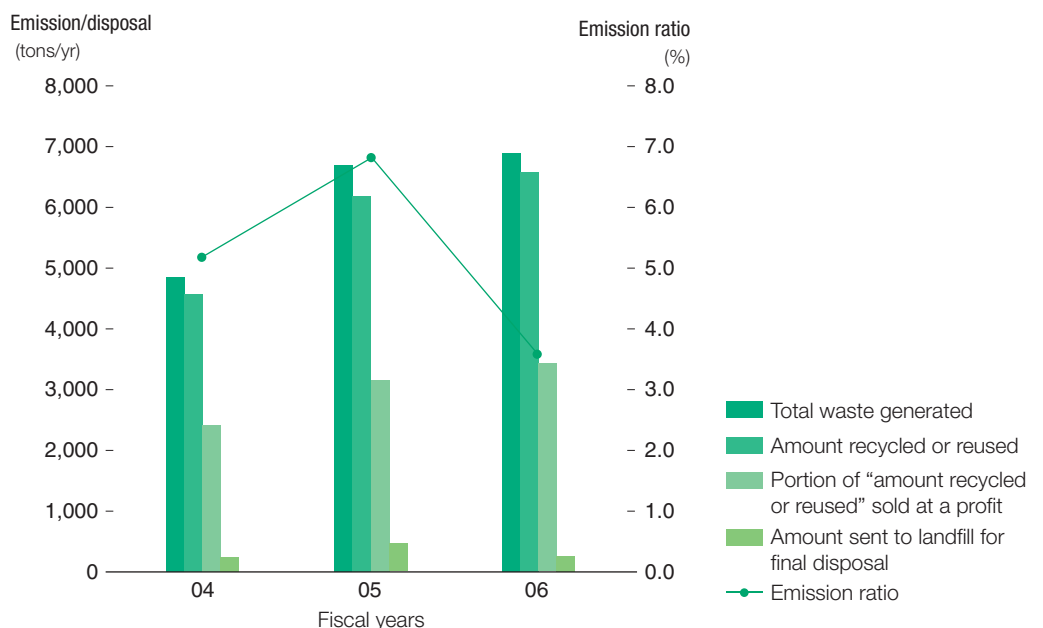
and Industry with the relevant jurisdiction. Besides promoting modal shifts in distribution from road haulage to rail and improving transport methods through measures such as using low-emission vehicles, our policy is also to target CO<sub>2</sub> emissions reductions by trying to boost transport efficiency itself.

### Material conservation, waste reduction and recycling

THK is working to conserve resources by trying to raise production yields per unit of input, both for raw materials that go directly into production processes ("direct materials") and other materials used as part of the overall process ("indirect materials"). While more than 99% of the materials used in THK products are made out of steel or other metals, this still leaves scope for raising production yields on processes such as cutting LM guide rails or fabricating shafts or nuts for ball screws. The major indirect materials used during the production process are grinding wheels and coolants. With the former, we are making greater use of cubic boron nitride (CBN) grinding wheels to extend service life while at the same time making efforts to reduce the amount of wheel dressing involved. To reduce coolant usage, we are addressing various issues to enable the use of dry processes or technology for spraying coolant in mist form.

<b>Type I production site (energy management)</b> (Annual usage > 3,000kl crude-oil equivalents)
Kofu plant
Yamaguchi plant
Yamagata plant
Gifu plant
<b>Type II production site (energy management)</b> (Annual usage > 1,500kl crude-oil equivalents)
Mie plant

### Designated plants under revised energy conservation law



Waste emissions and recycling at THK Group production sites

We are also conducting “zero emission” activities to reduce the amounts of waste sent to landfill for disposal. This involves actively trying to reuse, or else convert into saleable materials, all general waste as well as any unavoidable onsite emissions of material wastes, either prior to or during the production process. Waste products generated in each section are separated and collected before being fed into a subsequent waste disposal or recycling step. Any wastes that require transport are temporarily stored onsite. Our projected waste emission rate for fiscal 2006 was 3.6% (see chart). We aim to reduce this rate toward zero by restricting emissions of general waste and by trying to convert waste items into valuable commodities for resale. For example, some THK plants are recovering iron from grinding sludge.

Japan has passed a law that mandates recycling of containers and packaging as part of efforts to promote a recycling-oriented society. As a designated enterprise under this law, the THK Group measures and records the amounts of any containers and packaging used in operations that are made from paper or plastic.



Waste sorting and collection (Yamagata Plant offices)

**Management of harmful substances**

Based on the provisions of Japan’s Pollutant Release and Transfer Register (PRTR) Law, THK’s Manufacturing Division has adopted special measures to manage certain chemical substances specified in the legislation (see chart). During fiscal 2006, efforts were made to introduce substitute chemicals in place of PRTR-designated substances in 13 types of

material. Going forward, while monitoring amounts of PRTR-designated substances released into the environment or sent for disposal in waste, we plan to employ measures to handle such substances appropriately and to reduce usage.

The THK Group Green Procurement Guidelines specify harmful substances that are regulated either according to the purchasing standards of certain customers or by laws and regulations, including the EU RoHS (Restriction of Hazardous Substances) directive and the Chemical Substances Control Law. We are working to eliminate or reduce the use of harmful substances in all parts and materials, both at the R&D stage and in procurement. For example, the specifications for the new TD-type servo amplifiers that were designed for the GLM 10/20 series of linear motor actuators are fully compliant with our guidelines for parts. We are also trying to eliminate or restrict the use of harmful substances in existing materials. Specific examples of harmful substances targeted by such measures include lead (contained in the additives used in some plastics), hexavalent chromium (present in surface coating films) and cadmium (contained in zinc alloys).

To promote green procurement, we have researched for database compilation purposes all potentially harmful substances that are contained in THK Group products and related components. Development of new products, or the adoption of a new material, requires either registration of the substance in the database or revision of data. This database allows us to respond quickly to any inquiries from customers about harmful substances.

The Chinese version of the EU RoHS directive came into force in March 2007. We have been sending our customers the necessary information relating to our products. The use of product safety data sheets (SDS) within supply chains has also become an important issue since the new EU directive REACH (Registration, Evaluation, Authorization and Restriction of Chemicals) came into force in June 2007. We are preparing to revise and upgrade the contents of existing material safety data sheets (MSDS).

Including affiliates, six production sites within the THK Group have developed environmental management systems (EMS) that have been certified to the ISO14001 standard. Based on the EMS, each site sets autonomous policies and undertakes activities to meet its own environmental preservation targets. To provide customer assurances relating to green

	Fiscal years	
	2005	2006
Number of targeted substances	71	58
Amount handled (kg)	19,697	18,859

(aggregate figures for THK Group)

procurement, we are reinforcing environmental quality control systems that manage all chemical constituents based on a fully integrated ISO9001 methodology. In particular, we are seeking to establish comprehensive controls within our supply chain by seeking the full cooperation of upstream suppliers and other business partners, including subcontractors.



Emergency training drill (Kofu Plant: mopping up an oil spillage using an absorbent mat)

### Development of eco-friendly products

THK products offer a fundamentally eco-friendly solution since they operate on the principle of reducing friction inherent in mechanical motion through a rolling action. This helps to reduce energy consumption. Another positive aspect from an environmental perspective is that the steel we use as the main material for our products is recyclable.

Our use of cage-embedded technology based on innovative new concepts and the development of related products has also been effective in improving operational conditions for many types of equipment. This technology has contributed to extended service life, reduced noise, longer maintenance-free periods and reduced incidence of dust pollution. In turn, these benefits translate into reduced usage of materials such as lubricating oil over the lifetime of equipment. Moreover, we remain focused on trying to raise the overall environmental performance of our products further through the development of lubricators ("QZ") and optional dust-prevention fittings ("LaCS").

## 1. Altered surface coating

### Surface coating with Cr (VI)

- (e.g.) Black chromate (Cr (VI))
- Glossy chromate
- Colored chromate



### Use of substitute process and materials

- (e.g.) Trivalent chromate film
- Stainless steel (no surface coating needed)
- Ferrous-ferric oxide coating



## 2. Materials altered

### Alterations to materials with lead/cadmium

- (e.g.) Copper alloy
- PVC
- Grease



### New materials

- (e.g.) Lead/cadmium-free copper alloy
- Lead-free PVC
- Lead-free grease

## Examples of toxic substance removal/reduction