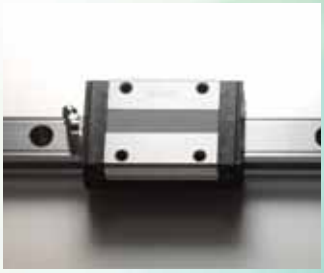
Harmony with the environment

In an era when "environmentally conscious" attitudes are a well-established aspect of daily life for ordinary consumers, businesses—especially manufacturers—have to do more to help protect the global environment. THK practices environmental management, which means incorporating environmental consciousness into every aspect of corporate management, and therefore conducts its business activities with respect for the global environment. Evidence of this can be seen in THK's comprehensive efforts to conserve energy and recycle raw materials and other resources.



Topics in 2009

• ISO 14001 certification

THK has launched a campaign to ensure that all its production sites, both in Japan and overseas, obtain ISO 14001 certification. As part of this initiative, THK LIAONING became certified in fiscal 2009. The process of obtaining certification has made THK LIAONING's employees increasingly aware of the need for environmental conservation.

• Green purchasing briefings

THK held briefing sessions on green purchasing practices in five locations in Japan, eliciting the participation of around 350 partner businesses. These briefings were occasioned by major revisions to the THK Group's Green Purchasing Guidelines, as a result of amendments to the Law Concerning the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc., and the coming into force of REACH, the European Union regulation concerning the registration, evaluation, authorization, and restriction of chemicals.

Promoting environmental management

Q What is the basic philosophy underlying THK's environmental activities and environmental management efforts?

A **The THK Group's philosophy is set forth in its basic environmental policy. THK sets targets and identifies specific areas where efforts are needed on the basis of this policy.**

Basic environment policy

Since the development of the LM Guide, the THK Group has contributed to both society and the economy through its pioneering role as a manufacturer of linear motion systems and machine components. THK believes that it is a company's social responsibility to leave the global environment in good condition for the next generation, which is why THK is undertaking the following initiatives to continually decrease environmental burdens and maintain and improve the natural environment.

THK Group's basic policy regarding the environment

1. Conservation of the environment is considered a major management concern, and we are striving to accurately grasp the impact on the environment produced by the Group's business activities, products, and services. Every division participates by setting relevant environmental goals.
2. In addition to following environmental laws, we set self-imposed standards for Group companies and regularly review them to improve the efficiency and effectiveness of our environmental management.
3. We will continually promote the development of products that help reduce environmental burdens.
4. We will continually promote conservation and recycling of resources, with particular attention to reducing and recycling waste from our manufacturing divisions.
5. To promote greater unity in our environmental activities, we will provide guidance and support to our affiliates and business partners, and strive to work in cooperation and harmony with local communities.
6. This basic policy regarding the environment shall be disseminated to all divisions in the Group through education, training, and activities designed to improve awareness. We will disclose information concerning the environment to parties within and outside the Group in a timely manner.

■ Environmental activities and targets

Area	Objectives and goals	Main activities
Energy conservation and preventing global warming	Cut greenhouse gas emissions	① Energy diagnostics ② Energy conservation ③ Use of clean energy
Material conservation and zero emissions	Reduce environmental impact: achieve zero emissions	① Input controls (materials, parts and by-products) to reduce usage and boost per-unit yields ② Controls on emissions and final waste disposal ③ Material reuse and recycling
Harmful substance controls	Eliminate and control harmful substances in THK Group production and distribution activities	① Substitution of PRTR-designated substances ② Investigation and substitution of chemical substances covered by the REACH regulations ③ Green procurement and purchasing
Environment-friendly products and services	Develop products and supply services using LCA (Life Cycle Assessment) methods	① Caged Ball Product series development ② Extension of service life and maintenance-free periods

Environmental management system

Q What mechanisms does THK have in place to deal with environmental issues?

A **THK has introduced mechanisms to facilitate the acquisition of ISO 14001 certification—the international standard for environmental management systems—and is pursuing this objective through concerted efforts by all its business divisions.**

Environmental management system

THK is actively working to acquire ISO 14001 certification for all its production sites in Japan and overseas. In fiscal 2009 THK LIAONING, located in China's Liaoning Province, became certified. Through their successful efforts to obtain certification, the employees of THK LIAONING have become more aware of the importance of environmental preservation. In accordance with China's laws and with environmental conditions there, THK Liaoning has enacted rules requiring the thorough sorting of waste materials and other useful measures.

Environmental activities are carried out by all THK Group companies. The Risk Management Division's Environmental Management Department, located at THK Headquarters, coordinates activities carried out by THK's administrative, production, and distribution divisions.

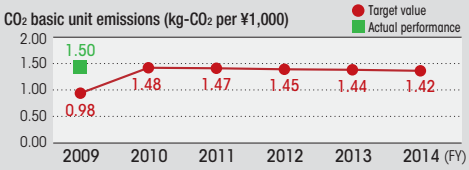
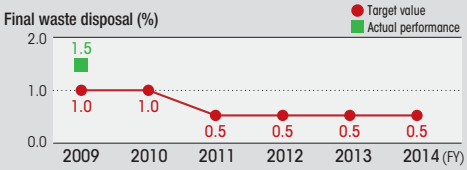
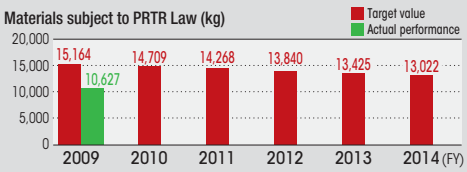
In fiscal 2009 THK met its targets for harmful substance controls by reducing its use of PRTR-designated substances, but failed to meet its targets for energy conservation, preventing global warming, material conservation, and zero emissions (see pages 34 and 35). For this reason the company has revised its medium-term environmental plan, which covers the next five years, and established a new set of numerical environmental targets.

ISO 14001 certified business locations

Location	Date of certification	Certifying body
YAMAGATA Plant	Sept. 10, 1999	JQA
KOFU Plant	Dec. 28, 2000	JQA
YAMAGUCHI Plant	Feb. 2, 2001	JQA
TRNA* (America)	Jun. 13, 2001	SQA
THK RHYTHM, Headquarters/GOKYU Plant	Dec. 20, 2001	JIA
MIE Plant	Sept. 6, 2002	JQA
THK RHYTHM KYUSHU	Dec. 20, 2002	JIA
TMA (America)	Jul. 14, 2003	QMI
TME (Europe)	Feb. 3, 2004	AFAQ
GIFU Plant	Dec. 24, 2004	JQA
THK NIIGATA	Oct. 21, 2005	JQA
THK RHYTHM INASA Plant	Dec. 20, 2006	JIA
THK WUXI (China)	Jan. 7, 2008	CQC
DALIAN THK (China)	Dec. 18, 2008	TÜV
THK LIAONING (China)	Jan. 12, 2010	TÜV

* TRNA : THK RHYTHM NORTH AMERICA CO., LTD.

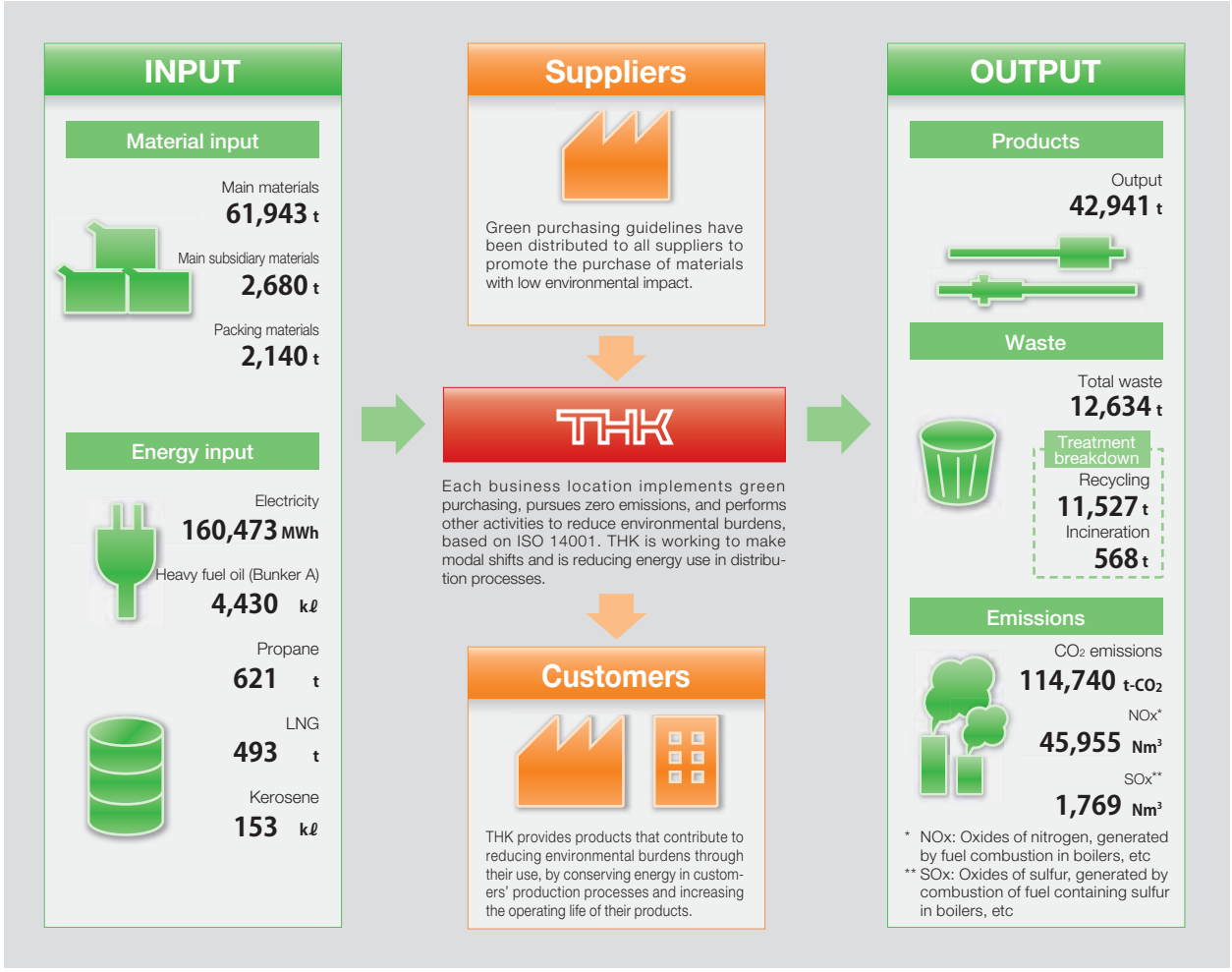
THK's environmental targets

No.	Field	Fiscal 2010 targets	Midterm targets(by fiscal 2014)
1	Energy conservation and preventing global warmning	Reduce CO_2 basic unit emissions to 1.48 kg-CO_2 per ¥1,000 (1% reduction relative to the 2009 level) Fiscal 2009 target was 0.98; 1.50 actual (target not met) Major efforts in fiscal 2010 ① Reduction in absolute power consumption (full-scale conservation of electricity) ② Controlled energy usage (powering machines, air-conditioning, and lighting) ③ Increased equipment efficiency	Reduce CO_2 basic unit emissions by 5% Standard value: 1.50 kg-CO_2 per ¥1,000 (relative to fiscal 2009) 
2	Material conservation and zero emissions	Reduce emissions rate to less than 1% Fiscal2009 target was 1%; 1.5% actual (target not met) Major efforts in fiscal 2010 ① Better waste separation to facillitate recycling ② Monitoring of external recycling ③ Use of extended-life machining oil	Achieve and maintain zero emissions (less than 0.5% of final waste disposal) Standard value: 1.5% (relative to fiscal 2009) 
3	Harmful substance controls	Reduced the use of PRTR-designated substances to 14,709 kg or less Fiscal 2009 target was 15,164 kg; 10,627kg actual (target met) Major efforts in fiscal 2010 ① Green procurement ② Updating and controlled usage of forklifts ③ Use of alternative solvents in production processes	Reduce use of materials subject to PRTR Law (3% per year) Standard value:15,164 kg (Fiscal 2009 target) 

Environmental impact: The big picture

Q What is the status of THK's management of environmental burdens?

A **Every year THK collects detailed numerical data on its energy consumption and emissions of environmental pollutants and is working hard to reduce both.**



Cost of environmental protection

(¥ million/year)

Category	Investment	Expenditures	Main measures
1) Business areas			
Pollution control	9.4	40.9	Maintenance of air and water quality monitoring equipment, oil-water separator tanks, etc.
Environmental protection	261.4	29.9	Introduction of energy-saving incidental equipment, related construction work
Resource recycling	6.5	103.7	Disposal and recycling of industrial waste
2) Upstream/downstream costs	0.1	2.5	Green purchasing
3) Control activities	2.3	107.3	Acquisition of ISO certification, awareness of environmental laws
4) R&D (including Development Dept.)	30.9	313.1	
5) Social activities	0.0	20.0	
6) Environmental cleanup	0.0	0.0	
Total	**310.6**	**617.4**	

Notes: 1) Figures on overall environmental burdens and other environmental accounting data represent an aggregate based on data from the following production facilities: THK's five Plants in Japan, in YAMAGATA, KOFU, GIFU, MIE, and YAMAGUCHI: other THK Group Plants in Japan; THK NIIGATA, three THK INTECHS Plants, Nippon Slide, THK RHYTHM CO.,LTD., and THK RHYTHM KYUSHU CO.,LTD.: and five overseas THK Plants; TMA (America), TME (France), DALIAN THK (China), THK WUXI (China), THK LIAONING (China)
2) Figures on NOx and SOx emissions are for THK's five Plants in Japan only.

Energy conservation and preventing global warming

Q What efforts has THK made to reduce CO_2 emissions?

A **THK is switching to energy-saving production equipment, air-conditioning systems, and lighting, and is improving operational efficiency to reduce its energy consumption.**

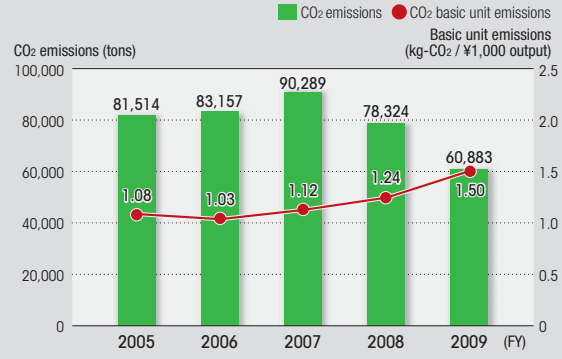
CO_2 emissions in fiscal 2009

THK sets targets for reducing CO_2 emissions, using basic units (CO_2 emissions divided by production value). In fiscal 2009 the target basic unit was set at 0.98 but the actual result was 1.50, reflecting a sharp decline in production caused by the economic downturn. In absolute terms, CO_2 emissions declined by 17,440 tons, for a 22% reduction compared to the previous year; 78,324 tons of CO_2 were emitted in fiscal 2008, while 60,883 tons were emitted in fiscal 2009.

In an effort to improve on the above results and in order to comply with the revised Law Concerning the Rational Use of Energy (which entails a shift from reporting based on results for individual business locations to reporting based on companywide results and also requires a minimum 1% annual reduction in energy usage), from fiscal 2010 on THK is basing its fiscal 2014 target on the fiscal 2009 results, to help ensure annual reductions of at least 1%.

Energy-saving initiatives carried out by THK in fiscal 2009 included conversion to energy-saving lighting and air-conditioning systems and more efficient use of coolers, air compressors, and other incidental equipment. In addition, a number of new efforts were initiated in fiscal 2010 to help THK achieve its targets: (1) a switch to the use of low-loss transformers, (2) the introduction of LED lighting, (3) the introduction of inverter-controlled production equipment, (4) the recovery of heat from boilers, (5) the reduction of air-blower operating times, and (6) the intensification of production lines.

■ **Reducing CO_2 emissions**



Reducing energy consumption by air compressors

THK's YAMAGUCHI Plant is conserving energy by reducing the amount of electricity consumed by air compressors. The plant has introduced a system that automatically starts and stops various air compressors depending on the demand for air inside the plant.

In the past, an engineer in charge of air compressors would check the demand for compressed air inside the plant and turn individual air compressors on and off accordingly. Thanks to a program that automatically controls the number of air compressors in operation in response to variations in air pressure, the new system efficiently delivers a stable supply of air. As a result, the amount of electric power consumed by air compressors has been reduced by 25%, which has contributed significantly to the plant's efforts to conserve energy.

An air compressor at the YAMAGUCHI Plant

At THK NIIGATA, the operation of the plant's multiple air compressors used to be centrally regulated using an inverter controller. In the interest of conserving electric power, the respective power consumption figures resulting from centralized control and decentralized control were monitored for a period of six months. This revealed that power consumption is more easily reduced through the use of decentralized control.

Based on these findings, the plant's approach to operating air compressors was altered from centralized control to decentralized control, which has resulted in energy savings of approximately 500 kilowatt hours per day.

Power consumption at THK NIIGATA was monitored overa a six-month period.

Energy-saving light fixtures

At THK's MIE Plant, 16 conventional mercury-vapor lamps have been replaced with lamps equipped with reflector shades, resulting in energy savings of approximately 40 kilowatt hours per day. This has also improved conditions in the workplace by increasing illumination by a factor of 1.7, from 210 to 350 lux.

In addition, conventional recessed lights used in the office building showroom have been replaced with LED lights. The LED lights consume a mere one-eighth the electricity that the old lights consumed, resulting in energy savings of approximately 1.95 kilowatt hours per day.

The MIE Plant showroom

Material conservation and zero emissions

Q What efforts has THK made to reduce waste?

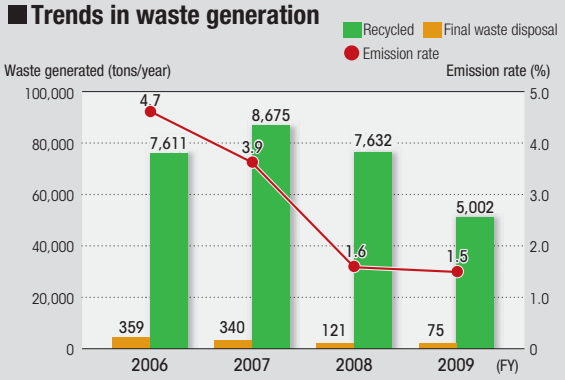
A **THK sets clear targets for reducing waste by carefully monitoring its emission rates and has intensified its efforts to recycle various types of waste materials.**

Material conservation and zero emissions

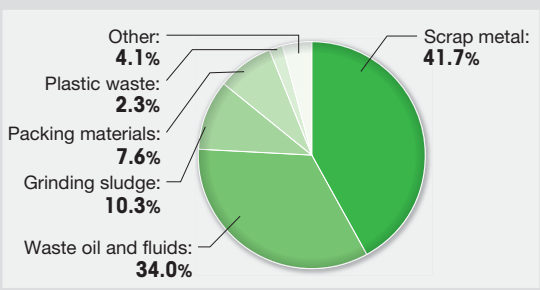
THK sets its waste-reduction targets based on its emission rate—the volume of waste designated for final disposal, expressed as a percentage of the total volume of waste generated. The waste-reduction target for fiscal 2009 was set at less than 1%, but THK failed to meet the target; the actual figure was 1.5%. This occurred because the contractor hired by THK to recycle its grinding sludge did not recover enough sludge to permit complete recycling, due to a decline in THK's output. As a result, some of the sludge was incinerated, and the remains were buried in landfills. This issue has now been rectified, and grinding sludge is being thoroughly recycled.

The total amount of waste generated in fiscal 2009 was 5,002 tons, which was 2,630 tons, or approximately 34%, less than in fiscal 2008. Some 75 tons of waste was designated for final disposal (in landfills or by incineration), which was 46 tons, or 38%, less than in fiscal 2008. These results reflect both the decline in THK's output and measures taken to reduce waste generation at the source, as well as more thorough recycling of grinding sludge, scrap metal, grindstones, plastic waste, and waste oil and fluid. THK will strive to meet its waste-reduction target for fiscal 2010 through efforts such as disassembling and separating the components of composite materials (materials made from two or more constituent materials), recycling solvents, and using extended-life cutting fluid.

■Trends in waste generation



■Waste



Recovery and recycling of rare metals

At THK NIIGATA, some of the waste fluid generated in the manufacture of Ball Splines used to be consigned to landfills. In fiscal 2009, however, the plant adopted new methods of storing and accumulating waste fluid, enabling it to stockpile enough waste fluid to make recycling feasible. As a result, the plant has established a recycling system that permits the recovery of materials from which rare metals can be extracted. About 40 kilograms of such materials are expected to be recovered every year. After the materials are recovered, the waste fluid is separated into ammonia and water by a recycling company, and the ammonia is subsequently incinerated.

Approaches to waste reduction

At THK Manufacturing of America (TMA), which is located in the state of Ohio, ongoing efforts are being made to generate less waste and recycle more materials. TMA used to simply throw away used cleaning rags but has now joined forces with a recycling company to launder and reuse them. As a rule, cleaning rags are washed and reused at least three times. In this way the volume of waste attributable to discarded cleaning rags has been reduced by 25,200 kilograms per year.

TMA has also enlisted the cooperation of customers who regularly purchase LM Guides in an effort to reduce the number of cardboard packing boxes used, by switching to larger boxes that can hold more products. This has resulted in a 4,200-kilogram annual reduction in the amount of waste attributable to packing boxes. Customers have reacted favorably to this development, since they end up with fewer boxes to discard and spend less time unpacking the products they order.

Used cleaning rags are collected in bins.

Cleaning rags, washed and ready to be reused

Harmful substance controls

Q What measures has THK introduced to reduce the use of harmful substances?

A **THK is both reducing its use of PRTR-designated substances and increasing its procurement of raw materials that contain no harmful substances.**

Reduced use of PRTR-designated substances

As part of its framework for controlling harmful substances—substances that could adversely affect human health and damage ecosystems—THK is working to reduce its Production Division's use of chemical substances that are subject to the Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc., also known as the PRTR Law,* and has set an annual target of reducing such use by 3% in comparison to the previous year. THK met this target for the third year in a row in fiscal 2009; the total amount of harmful substances used during the year was 10,627 kilograms.

The target was achieved thanks to a number of factors, including a decline in operation of forklifts powered by gasoline or light diesel oil, resulting from a lower production volume; an ongoing shift from gasoline- and light-diesel-oil-powered forklifts to forklifts powered by batteries or liquid propane; and an ongoing shift to the use of grinding fluid and detergents that do not contain PRTR-designated substances.

As a result of revisions to the applicable laws, the number of PRTR-designated substances has increased. Although this may pose greater challenges, THK will continue to ensure that legally prescribed controls are thoroughly implemented, closely monitor and accurately report PRTR data, and keep working to reduce its use and emissions of PRTR-designated substances.

*PRTR: Pollutant Release and Transfer Register. The PRTR Law was enacted to facilitate better control over and reporting of emissions of designated chemical substances.

Substances subject to the PRTR Law (kg)

Type	Amount handled	Amount emitted into the atmosphere
Xylene	2,991	40
Toluene	3,849	120
Ethyl benzene	567	21
Benzene	195	44

Nontoxic grinding fluid

In the past, THK's MIE Plant used grinding fluid containing Class I Specified Chemical Substances, as designated under the Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. Working in cooperation with a grinding fluid manufacturer, the plant has been switching to the use of fluid that contains no such substances. Over the course of one year of testing on grinding machines equipped with separate fluid tanks, the nontoxic fluid's performance compared favorably with that of conventional fluid, so the plant has been shifting to the use of nontoxic fluid. Because this initiative began midway through fiscal 2009, the transition was only 40% complete by the end of the year, but it is expected to be completed in fiscal 2010. Thus, the MIE Plant is scheduled to completely abolish the use of grinding fluid containing Class I Specified Chemical Substances.

Green purchasing briefings

In fiscal 2009, in response to the revision of the PRTR Law and the coming into effect of the REACH regulation* in the European Union, sweeping revisions were made to the THK Group's green purchasing guidelines, which specify standards for the purchasing of chemical substances. To explain the new guidelines, the company held green purchasing briefings in five locations in Japan, which were attended by representatives from some 350 partner businesses.

THK's green purchasing practices form the basis of its environmental preservation efforts and compliance with respect to the environment. The objectives of THK's green purchasing efforts are (1) to ensure consideration for the environmental impact of products, components, and materials procured, at each stage in the process extending from manufacture and distribution through use and eventual disposal; and (2) to ensure closer attention to the environmental impact of items procured, through active efforts to protect the overall environment. These objectives can only be achieved through cooperation with THK's partner businesses.

At the briefings, THK representatives explained the revised green purchasing guidelines and the REACH regulation and other regulations. They also asked that partner businesses lend their cooperation to THK's green purchasing efforts by using new techniques to ascertain the presence of various chemical substances and switch to materials that do not contain harmful substances.

The briefings included question-and-answer sessions to provide partner businesses with an opportunity to ask questions and express their views. THK will incorporate these views into its green purchasing activities and intends to further improve its communications with partner businesses and establish a mutually beneficial environmental quality system.

A green purchasing briefing at THK headquarters

*REACH regulation: A European Union regulation, effective as of June 1, 2007, imposing a comprehensive system for the control of chemical substances. The acronym REACH is derived from the phrase "Registration, Evaluation, Authorisation and Restriction of Chemicals."

Green distribution

Q What measures does THK have in place to reduce CO_2 emissions in its distribution activities?

A **THK employees responsible for promoting green distribution hold regular meetings and are working to reduce CO_2 emissions through measures such as improving load ratios, integrating transport routes, and effecting a modal shift from automotive to rail transport.**

Green distribution

THK's Distribution Division, operating through Distribution Centers located all over Japan, is engaged in green distribution activities aimed at reducing environmental burdens throughout the entire distribution process. THK is pursuing a variety of initiatives, such as promoting a modal shift and integrating truck routes, based on two key principles of green distribution: reducing CO_2 emissions and improving transport efficiency.

To promote green distribution, Green Distribution Committee members selected from THK Distribution Centers in Japan meet regularly to discuss green distribution activities, formulate plans, and review the status of ongoing efforts.

Activities in fiscal 2009 included a review of regular chartered shipping routes and efforts to improve load ratios and integrate truck transport routes. These efforts have enabled the CHUBU Distribution Center to operate one fewer regular truck route per day in Aichi Prefecture. At the KOFU Plant's Distribution Center, shipments previously transported to the Kanto region by fixed-route trucks are now carried on regular chartered trucks, which has increased load ratios by about 10%.

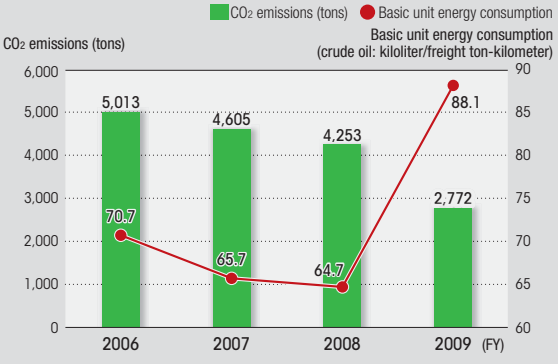
A Green Distribution Committee meeting

Transport-related CO_2 emissions

In fiscal 2009 CO_2 emissions resulting from the transport of products and components declined to 2,772 tons, which is 1,481 tons, or approximately 35%, less than in fiscal 2008. Basic unit energy consumption (energy consumption divided by ton-kilometers of freight) increased approximately 36%, however, from 64.7 in fiscal 2008 to 88.1 in fiscal 2009.

These results reflect a major decrease in shipping volume, on the one hand, as well as an overall decline in load ratios for transport trucks and less progress than expected in pursuing a modal shift on various transport routes. THK expects to reduce its basic unit energy consumption in fiscal 2010 by integrating chartered truck operations, improving load ratios, and implementing a modal shift in transport operations among THK Group companies.

■ Trends in transport-related CO_2 emissions and specific energy consumption for THK alone



Converting forklifts

THK is in the process of replacing forklifts that run on gasoline or light diesel oil with battery- or propane-driven forklifts, to reduce the environmental impact and the noise transmitted to nearby residential areas. Of the 55 forklifts now in use at THK Distribution Centers, only five, or about 10%, are gasoline-powered. In light of the resulting improvements in working conditions—less noise and dust—THK is planning to convert more forklifts in the future.

A battery-powered forklift

Reusing pallets

THK's YAMAGUCHI Distribution Center is now recovering and reusing skid pallets used for shipping products to overseas plants and distributors. These pallets have been used for some time to facilitate the efficient loading of shipping containers. In cooperation with overseas distributors and THK Group production sites, the Distribution Center has established procedures and routes for recovering the pallets and is now reusing them, having won approval from THK customers for this effort to reduce the eventual environmental burden. Since the introduction of the new system, about 400 pallets have been returned and reused every year.

A reusable skid pallet