

Environmental Report

Turning an eye toward the earth's future is our mission as an organization connected to a wide-range of industries.

This year's environmental report is divided into individual activity content.

We have endeavored to compile a report that is easy to read and follow so that more people will understand the activities JTEKT are undertaking.

Amidst society's rising awareness of global environmental conservation, JTEKT are implementing countermeasures from multiple aspects.

As a provider of products to a wide-range of industries, we believe the development of environmentally friendly products is a mission of particular importance.



Summary of FY2009 activities

→ P50

Carry out energy conservation inspections companywide and make improvements to reduce energy waste and loss.



→ P51

By improving long-distance transport, CO₂ emissions have been reduced by 300t per annum, and we have been certified as a green logistics partnership business.



→ P52

Developed a high speed rotating ball bearing for hybrid transmissions with suppressed distortion during high speed rotation.

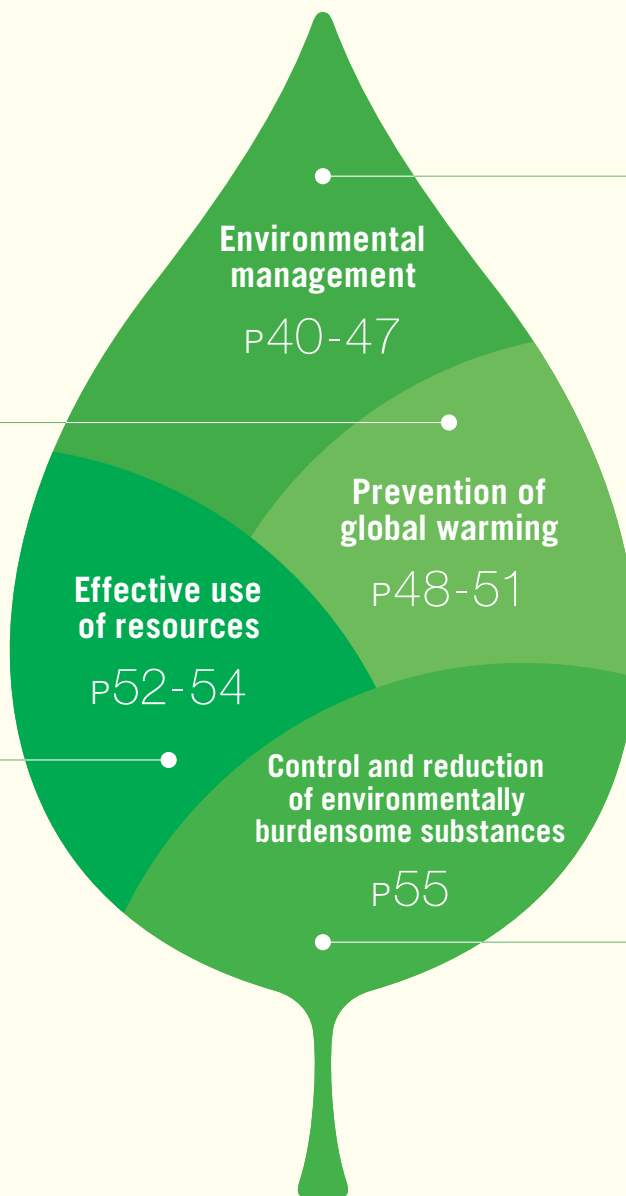


→ P54

Recycled landfill waste and achieved zero waste.

→ P54

Promoted the shift to simple and returnable packaging with the aim of reducing wood and paper packing materials.



→ P41

Held a JTEKT Group environmental meeting in Japan, in which all group companies participated.



→ P41

Implemented on-site confirmation and education at a Chinese manufacturing affiliate with the aim to minimize environmental risk.



→ P45

Began conducting on-site checks at valuable resource processors to confirm that valuable resources were being used appropriately and effectively.

→ P55

Promoted the reinvestigation and appraisal of the amount of chemical substances handled, in response to the revised PRTR regulation.

→ P55

As well as properly storing PCB devices in accordance with legislation, will complete the processing of high concentration PCB devices by 2016.

Environmental management

Basic concept

○ Aiming to create a sustainable society

JTEKT, with the aim of becoming an environmentally friendly manufacturer, considers the implementation of activities for the sake of environmental conservation as being an important corporate responsibility. Environmental conservation activities are pursued in all business fields on a group-wide basis and we will continue to contribute to the creation of a sustainable society.

Promotion structure

○ Centered around the Global Environmental Conservation Committee

JTEKT have established a Global Environmental Conservation Committee chaired by the company president to act as a deliberative organ for environment management.

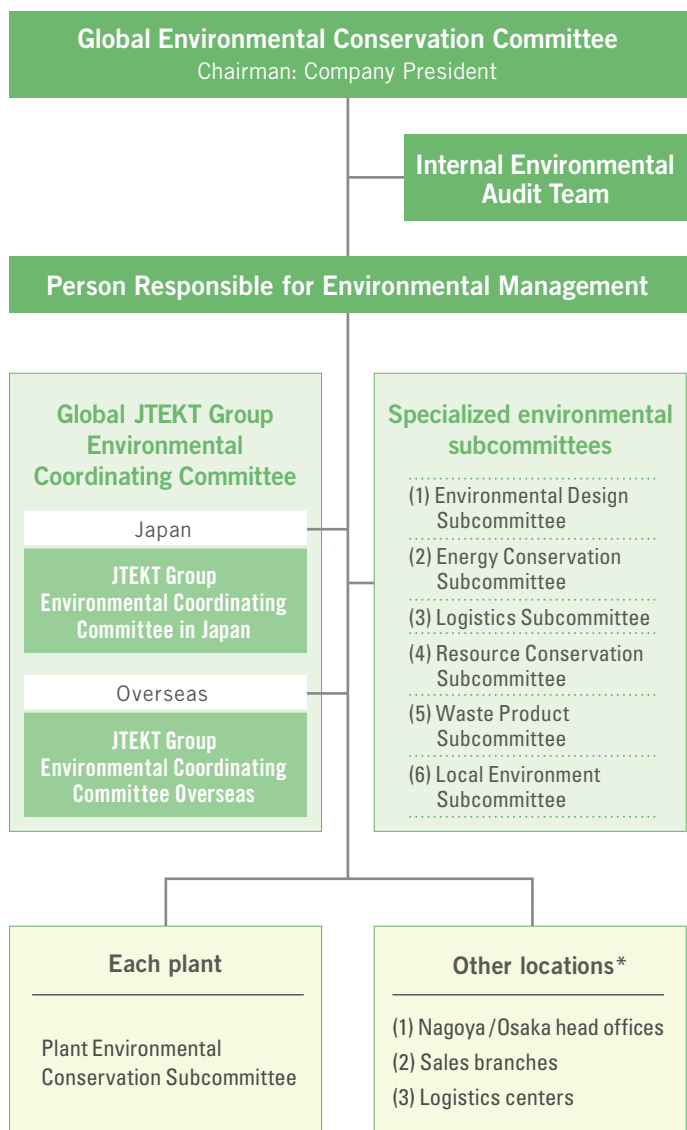
Furthermore, in order to deal with societal issues deeply intertwined with our business activities, six specialized environmental subcommittees have been established within the committee, and perform the tasks of forming company policy, monitoring activity progress, studying problems and determining countermeasures. ▶ Figure-01

Environmental Policy

JTEKT, based on a deep awareness of the importance of global environmental conservation, will proactively pursue environmental conservation in all business activities in the fields of bearings, driveline components, steering systems, and machine tools & mechatronics at all plants, head offices and sales offices with the active participation of all employees.

1. Continuously improve our environmental management system to harmonize our business activities with the environment and promote the cooperation of all suppliers of raw materials, etc.
2. Comply with all requirements of environmental laws, regulations, treaties, agreements, etc., related to our business activities and strive to prevent environmental pollution. Also, contribute to society by accurately grasping technical needs related to global environmental conservation and developing products to meet such needs.
3. Raise the environmental awareness of all employees and pursue the following as important environmental management objectives in relation to all our business activities, products and services:
 - (1) Develop and design environmentally friendly products
 - (2) Reduce CO₂ emissions through effective energy utilization
 - (3) Reduce waste
 - (4) Thoroughly control chemical substances and reduce environmentally burdensome substances
 - (5) Reduce primary materials and secondary materials
 - (6) Reduce CO₂ emissions in logistics
 - (7) Maintain and improve community environments
4. Maintain an environmental conservation promotion structure, clarify the purposes and targets of environment conservation activities, conduct periodic reviews, and pursue environmental conservation activities with the participation of all employees.
5. Maintain an awareness of the community surrounding each business site, maintain good communication with concerned government agencies and local residents, and publicly disclose information on our environmental management activities as necessary.

▶ Figure-01 The centralized control system for global environmental conservation



* Outside the scope of ISO14001 certification

Environmental management

Global environmental management

○ Promotion of global environmental management

To promote group-wide efforts which span the globe, we established a Global JTEKT Group Environmental Coordinating Committee to carry out environmental conservation activities in cooperation with affiliated companies in Japan and overseas. In FY2009, JTEKT Group Environmental Coordinating Committee meetings were held with manufacturing affiliates in Japan and activities to reduce CO₂ emissions and waste were promoted.

Moreover, in order to prevent environmental accidents, as well as distributing examples of incidents at other companies, we promoted response to environmental laws and regulations. The overseas group made on-site confirmations of the environmental management status of two Chinese manufacturing affiliates and an environmental workshop was held targeting the personal in charge of the environment.

01 | JTEKT Group Environmental Coordinating Committee in Japan

In June, 2009, 18 group companies participated in a Group Environmental Coordinating Committee meeting held in Japan, making decisions on how to achieve targets and responding to/discussing environmental laws and regulations. In December of 2009, a Coordinating Committee meeting was held at a group company, activity progress status was confirmed and, at the same time, the environmental facilities of the company hosting the meeting were inspected, in an effort to achieve mutual improvement.



JTEKT Group Environmental Coordinating Committee in Japan

02 | Overseas manufacturing affiliates on-site confirmation and education

With the aim of minimizing environmental risks such as environmental accidents and law violations, JTEKT conducted an on-site confirmation of two Chinese manufacturing affiliates (KLF, JAFS) in FY2009. The control status of environmental facilities, legal compliance of environmental measurement data, implementation of emergency response training and so forth was verified. We will continue to perform on-site confirmations of manufacturing affiliates and pursue activities to prevent environmental accidents.



On-site confirmation of waste storage area (China/KLF)



Environmental workshop (China/KLF)

03 | Group companies environmental management system certification acquisition status

As well as promoting environmental management, we are creating an effective system conforming to ISO14001. In FY2009, another two business sites in China acquired ISO14001 certification. Consequently, 43 out of the 51 corporations subject to the JTEKT Group Environmental Coordinating Committee (14 companies within Japan, 29 overseas) have acquired ISO14001 certification and completed their environmental systems.

ISO14001 certification in FY2009

Overseas group companies	Date of certification
JATJ (China)	August 2009
JDI (China)	February 2010

Environmental management

Environmental impact of business activities

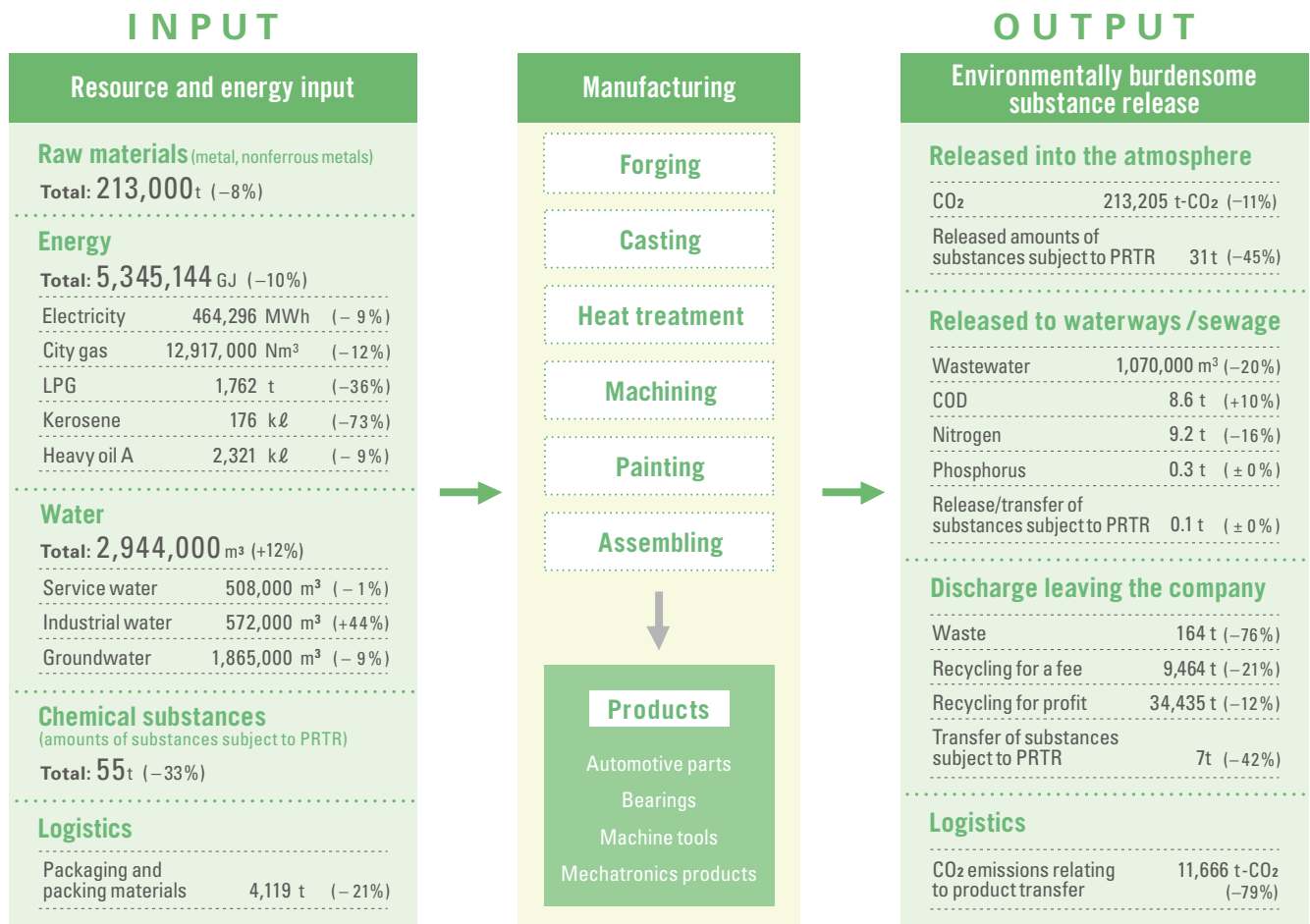
Reduction of environmental load in all business activity stages

JTEKT strives to quantitatively grasp resource and energy amounts used (input) and amounts discharged into the environment (output) and reduce environmental load in all business activity stages.

Resource and energy input versus environmentally burdensome substance output

The table below shows resource and energy input versus environmentally burdensome substance output for FY2009. In order to minimize the impact of business activities on global warming, JTEKT strives to reduce energy usage in all production processes such as forging, casting, heat treatment and machining and to switch to more efficient energy sources such as electricity and city gas. In FY2009, 97% of JTEKT's total energy consumption was electricity and city gas by thermal conversion, 2% higher than FY2008. ▶ Figure-01

Figure-01 Resource and energy input versus environmentally burdensome substance output



* Values in parenthesis are comparisons with the previous year

* Notes on the [Resource and energy input versus environmentally burdensome substance output]

CO₂ conversion coefficients to calculate CO₂ emissions volume

Electricity	0.3817 kg-CO ₂ /kWh
Heavy oil A	2.7000 kg-CO ₂ /ℓ
Kerosene	2.5308 kg-CO ₂ /ℓ
Propane gas	3.0094 kg-CO ₂ /kg
City gas	2.3576 kg-CO ₂ /Nm ³

The CO₂ conversion coefficients in the table to the left are used both in Japan and overseas. Regarding the conversions in this report, so that the results of our improvements could be evaluated, we fixed electrical conversion coefficients, and we converted cogeneration CO₂ reduction results using a thermal energy average and used this result to indicate emissions volume.

Heavy oil A: Among the three classes (A, B, C) of heavy oil, heavy oil A is the closest to kerosene and is used as fuel for boilers or heating.

GJ: Giga-joule (heat quantity unit), G=10⁹

PRTR regulation: "PRTR" is an abbreviation for Pollutant Release and Transfer Register, which is a system announced by the government for reporting the amount of chemical substances released or transferred.

COD: Chemical Oxygen Demand (water quality index)

Charged recycling: Pay a processing fee to recycle.

Environmental management

Targets and results

○ JTEKT Environmental Action Plan

To contribute to the creation of a recycling-based society, JTEKT has issued an Environmental Action Plan stipulating our activities policy and targets to be achieved by FY2010. Based on this plan, JTEKT, along with our affiliated companies, is carrying out environmental conservation activities. In FY2009, all nine FY2010 targets were achieved.

Consequently we have set even higher targets for these nine items and are striving to achieve them.

Amidst decreasing production volumes, CO₂ emissions and discharge per sales unit amounts (*) are worse than the previous year and we are improving this through the enhancement of productivity.

***Per sales unit amounts** JTEKT use per sales unit amounts calculated by dividing CO₂ emission and discharge amounts by sales volume as our CO₂ emission reduction index.

[1] Enhance environmental conservation activities through further efforts to reduce environmental load

Target and results percentages in parentheses are in comparison with the base year.

Action items	Details	FY2009 targets	Results	Evaluation	Challenges	Related pages
Promote measures to prevent global warming	● CO ₂ emissions: 5% reduction from FY2003 by the end of FY2010 [241,373 t-CO ₂]	243,100 t-CO ₂ (-4.3%)	213,205 t-CO ₂ (-16%)	○	156,200 t-CO ₂	49
	● CO ₂ emissions per sales unit (*): 7% reduction from FY1990 by the end of FY2010 [55.4 t/100 million yen]	55.6 t/100 million yen (-6.7%)	44.0 t/100 million yen (-26%)	○	35.9 t/100 million yen	
	● CO ₂ emissions per sales unit (global): 8% reduction from FY2003 by the end of FY2010 [54.1 t/100 million yen]	54.7 t/100 million yen (-6.9%)	496 t/100 million yen (-16%)	○	43.7 t/100 million yen	
Strengthen control of environmentally burdensome substances and reduce usage	● Substances subject to PRTR: 60% reduction from FY1998 by the end of FY2010 [77 t]	86 t (-55%)	38 t (-80%)	○	52 t	55
Reduce waste and promote resource conversation	● Zero landfill waste: 99% reduction from FY1995 by the end of FY2010 [154 t]	155 t (-99%)	0 t (-100%)	○	0 t	54
	● Incineration waste: 1/6 th or less of the FY1990 level by the end of FY2010 (-84%) [3,170 t]	3,840 t (-80%)	164 t (-99%)	○	415 t	
	● Wastes per sales unit: 5% reduction from FY2003 by the end of FY2010 [11.5 t/100 million yen]	11.6 t/100 million yen (-4.3%)	9.1 t/100 million yen (-25%)	○	8.7 t/100 million yen	
Promote logistics streamlining	● CO ₂ emissions in logistics: FY1990 level or lower by the end of FY2010 [15,865 t-CO ₂]	15,865 t-CO ₂	11,666 t-CO ₂	○	15,600 t-CO ₂	50
	● CO ₂ emissions per sales unit in logistics: 10% reduction from FY1990 by the end of FY2010 [3.26 t/100 million yen]	3.28 t/100 million yen (-9.5%)	2.40 t/100 million yen (-34%)	○	2.40 t/100 million yen	51

[2] Develop and design environmentally friendly products

Action items	Details	Results	Evaluation	Related pages
Promote efforts in the development and design stages	● Reduce environmental load	• Development of an H-EPS responding to idle stop	○	48
		• Development of a long life highly anticorrosive bearing for rolling machine roll necks		49
		• Development of a long life electrical corrosion resistant bearing for fan motors		52
Strengthen cooperation with business partners	● Further promote green purchasing ● Formulate environmentally friendly purchasing guidelines to share with business partners	Expansion of Green Purchasing Guidelines	○	28

* H-EPS is a registered trademark of JTEKT Corporation

[3] Strengthen environmental management system responding to consolidated management

Action items	Details	Results	Evaluation	Related pages
Develop structures and enhance activities	● Share basic policy and conduct guidelines	Continuing activities with group companies in Japan and overseas	○	40,41 44

[4] Actively participate in social activities as a corporate citizen

Action items	Details	Results	Evaluation	Related pages
Promote social contribution activities	● Participate in environmental conservation activities	Implemented clean-up activities around the plant	○	35,36
Maintain close communications with local communities	● Cooperate with and support local community groups	Ongoing discussions with local residents regarding environmental issues	○	35
Promote public relations activities and information disclosure	● Provide more environmental information via our website ● Enhance and continue issuance of our environmental reports ● Promote volunteer activities in local communities	Issued CSR report 2009	○	35

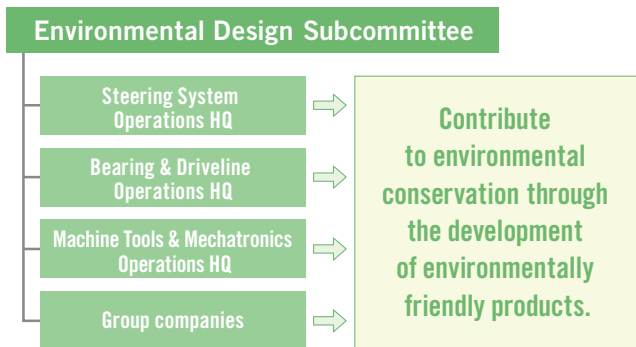
Environmental management

Develop and design environmentally friendly products

○ Promotion by the Environmental Design Subcommittee

At JTEKT, under the direction of the Global Environmental Conservation Committee, which oversees company environmental conservation activities, the Environmental Design Subcommittee, including members from group companies, works to promote the development of environmentally friendly products. Building products which are compact, lightweight, low in environmental load, etc., through engineering innovation in the development and design stages, environment conservation through our products is being expanded on a world scale.

Environmental design promotion framework



○ Assessment method

JTEKT has established an original environmental efficiency basic equation to serve as an index in quantitatively assessing environmental load reduction benefit. The larger the value, the greater the environmental load reduction benefit is. Each year JTEKT sets higher environmental efficiency

▶ Figure-01

Environmental efficiency basic equation and environmental efficiency value calculation

Environmental efficiency is a value calculated based on the degree of lightness, compactness, energy-savings, etc. The environmental efficiency value is calculated by dividing the environmental efficiency of the assessed product by that of the standard product.

$$\text{Environmental efficiency} = \frac{\text{Product performance}}{\text{Product environmental load}} = \frac{1}{\sqrt{W^2 + T^2 + E^2}}$$

W:Mass T:Loss E:Energy

$$\text{Environmental efficiency value} = \frac{\text{Environmental efficiency of assessed product}}{\text{Environmental efficiency of standard product}}$$

targets and works to reach them while monitoring progress.

▶ Figure-01

○ Machine Tools & Mechatronics Operations HQ Close cooperation with group companies

The Machine Tools & Mechatronics Operations HQ works in close cooperation with group companies to develop and design environmental products. Because machine tools are an industrial product used for a relatively long time, we use an independent index called the “JTEKT Eco-Scale” (*1) which matches individual product characteristics, making it easy to understand how environmental activities are progressing.



JTEKT Eco-Scale mark (example)

*1 JTEKT Eco-Scale JTEKT have set 12 items including power capacity, standby mode power consumption, footprint, machine mass and so on, and created an internal standard assessment point system using indexes (the smaller the value in the top of the displayed mark is, the better). The amount reduced from the 2002 product assessment point is expressed as the environmental load reduction ratio (% value at the bottom of the displayed mark).

Production and logistics considering the environment

○ 4 subcommittees promoting activities

At JTEKT, under the direction of the Global Environmental Conservation Committee, the Energy Conservation, Resource Conservation, Waste Product and Logistics Subcommittees take the lead in promoting environmental conservation activities in the production and logistics stages. With the belief that achieving efficient, non-wasteful production and logistics will reduce environmental load and lead to the creation of a sustainable society, we strive to enhance productivity and improving the logistic system.

▶ Figure-02

Calculation of environmental load reduction effect

As the environmental load reduction effect, it is possible to seek environmental load reduction ration more than the environmental efficiency value. For example, if the environmental efficiency value were 1.25, that product’s environmental load reduction benefit would be 20%.

$$\text{Environmental load reduction ratio} = \left(1 - \frac{1}{\text{Environmental efficiency value}} \right) \times 100$$

A reduced environmental load is sought as the reverse of the environmental efficiency value.

Environmental management

▶ Figure-02 Environmental Conservation Activities Framework



Reducing environmental risk

○ Deploying preventive activities

JTEKT, led by the Local Environment Subcommittee, are involved in preventive measures and risk reduction assuming environmental risk such as environmental accidents, legal violations, etc.

In order to prevent environmental accidents such as wastewater, exhaust gas, oils and chemical leakages, etc., that exceed our internal standard, we carry out daily inspections and monitor conditions based on our self-imposed standards. Moreover, while pinpointing cases which could have led to accidents and violations and devising countermeasures for them, we collect examples of other companies' accidents and circulate this information internally. We also carry out emergency response training annually to be prepared for the off-chance an accident occurs.

○ Legal compliance with environmental laws and regulations

In FY2009, JTEKT did not receive any fines or penalties and was not the subject of any lawsuits related to environmental matters.

○ Environmental complaints and accidents

JTEKT has established internal standards (*2) regarding amounts of plant wastewater discharge and substances released into the atmosphere that are stricter than regulatory amounts and strives to prevent environmental accidents and complaints. JTEKT had no accidents and received no complaints regarding environmental matters in FY2009.

*2 Internal standards JTEKT has set its internal standards at 80% of the regulatory requirements.

○ Environmental patrols by the plant manager

As part of our "Environment Month" every June, with the objective of preventing environmental abnormalities, plant managers conduct a patrol of environmental facilities at each respective plant. In FY2009, checks were made to ensure that daily management was being carried out properly on wastewater processing facilities, cleaning tanks, centralized oil supply equipment, etc., on which wastewater abnormalities may occur.



Environmental patrol (Tokushima plant)

○ Emergency response training

In order to be prepared for the worst, as well as preparing emergency procedures for individual equipment, we carry out regular emergency response training to keep damage to a minimum. After this training, procedures are revised where necessary.



Environmental emergency response training (Okazaki plant)

○ On-site confirmations of industrial waste processing and collection/transportation companies

JTEKT conduct annual on-site checks of all waste processing and collection/transportation companies to ensure that the consigned waste is being appropriately processed.

○ On-site checks of valuable resource processors

In order to confirm that valuable resources such as cutting chips, etc., discharged from plants are being utilized effectively and appropriately like industrial waste, JTEKT began conducting on-site checks of valuable resource processors from FY2009. We plan to complete on-site checks of all valuable resource processors by the end of FY2010.



On-site check of valuable resource processors (February, 2010)

Environmental management

Environmental audits

○ Action for continuous improvement

Once a year, JTEKT both conducts an internal audit and receives an external audit to ensure that its management system is continuously being improved. Audit results are reported to JTEKT's top management through the Global Environmental Conservation Committee.

01 | Internal audits

Every year, an internal environmental audit is conducted to make sure the environmental management system is being properly managed. Prior to conducting the audit, the internal environmental auditor is made aware of items which require particular attention and the latest information regarding environmental management, improving the quality of the auditor.

02 | External audits (ISO14001)

JTEKT received a regular audit in April, 2010. The result of which was zero nonconforming items and three proposals to improve environmental management even further. We were evaluated as running an efficient environmental management system and continuously maintaining and improving through the participation of all employees.



External audit at Kariya plant (April, 2010)

Environmental education

○ Providing education based on needs

At JTEKT, based on the needs of the individual employee, various types of education such as environmental awareness education and internal environmental auditor education is carried out to raise environmental consciousness and skills.

01 | Environmental awareness education

JTEKT carries out environmental awareness education for employees as part of our "Environment Month" every June. The slogan for the FY2009 awareness education was "Let's

each think of activities we can do to conserve energy and prevent environmental problems!"



Environmental awareness education (attended by 495 employees)

02 | Internal auditor education

JTEKT carries out education on internal auditing skills for our own employees and affiliated companies once a year. In FY2009, 34 people attended this course and were newly registered as internal environmental auditors.

03 | Environmental education by rank

Every year, within the overall company education curriculum, environmental education concerning ISO14001, JTEKT's environmental management system, and environmental action is held for newly enrolled students at JTEKT's Technical Training Center, newly hired employees, newly appointed managers and staff in professional-track careers (general/technical).

→ Related article on [page 30](#)

Number of employees obtaining main environmental qualifications (FY2009)

Pollution control manager	Air	26
	Water	35
	Noise	47
	Vibration	2
Energy manager		29
Energy management staff		7
Internal environmental auditor		283
Specially controlled industrial waste manager		33
Hazardous material handler (first-class)		3
Hazardous material handler (second-class)		363
Hazardous material handler (third-class)		54
Chief electrical technician (first-class)		1
Chief electrical technician (second-class)		13
Chief electrical technician (third-class)		22

Environmental management

Environmental accounting

○ Cost and results appraisal

JTEKT utilizes environmental accounting in order to quantitatively ascertain the costs and benefits of environmental conservation activities and to effectively and efficiently promote continuous improvements. At the same time, we utilize environmental accounting as information to stakeholders so that our environmental conservation activities can be better understood. Our calculations observe the guidelines stipulated by the Ministry of Environment. ▶ Figure-01

○ Environmental accounting results for FY2009

The total environmental conservation cost for FY2009 was 4.03 billion yen, comprising of 1.08 billion yen in investments and 2.95 billion yen in expenditures. This marked a decrease of 0.78 billion yen, or 16.3%, from the previous fiscal year. Most of the investment was for the global warming countermeasures of fuel conversion to a metamorphic furnace and renewal to a cooling tower style of air drying. The economic benefit of environmental conservation measures was 1.37 billion yen, with a reduction in business income from recycling due to lower production, resulting in a decrease of 0.64 billion yen, or 32%, from the previous year.

▶ Figure-01 Environmental conservation costs and economic benefit of environmental conservation measures

Environmental conservation costs

(Millions of yen)

Type	Details	Investment	Cost
① Business on-site costs			
① Pollution prevention costs	<ul style="list-style-type: none"> ● Maintenance of drainage ● Maintenance and repair of wastewater treatment facilities ● Maintenance and repair of dust collectors, etc. 	74	208
② Environmental conservation costs	<ul style="list-style-type: none"> ● Measures for energy conservation 	206	58
③ Resource recycling costs	<ul style="list-style-type: none"> ● Investment and management related to waste reduction, etc. ● Waste disposal and recycling 	7	320
② Upstream and downstream costs	<ul style="list-style-type: none"> ● Green purchasing ● Amount paid to industrial organizations 	—	460
③ Management activity costs	<ul style="list-style-type: none"> ● Training activities ● Maintenance of ISO 14001 certification ● Environmental monitoring, measurements, etc. 	—	151
④ R & D costs	<ul style="list-style-type: none"> ● R&D for eco-friendly products 	792	1,706
⑤ Social activities costs	<ul style="list-style-type: none"> ● Disclosure of environmental information ● Tree-planting, etc. 	—	39
⑥ Environmental damage costs	<ul style="list-style-type: none"> ● Local tax on pollutant amounts (Tokyo and Tokushima) ● Soil and groundwater restoration 	—	4
Total		1,079	2,946
Gross amount			4,025

Economic benefit of environmental conservation measures

(Millions of yen)

	Details of benefits	Economic benefit
Income	Business income from recycling waste generated by main business activities, used products, etc.	611
Expenditure reduction	Energy-cost reduction from promoting energy conservation	468
	Reduction of waste treatment costs resulting from resource conservation and recycling	289
Total		1,368

Items such as contribution to products' added-value, environmental risk avoidance, and corporate image improvement are not included in the calculation. The scope is limited to items regarding which economic benefit can be quantitatively calculated. Depreciation costs are not included. Expenditures with multiple outlay purposes are calculated pro-rata.

Covered range:
JTEKT (nonconsolidated) (head offices, branch offices, logistics centers, R&D departments, and all plants)
Period covered:
FY2009 (April 2009 to March 2010)

Prevention of global warming

Basic concept

○ Reducing CO₂ emissions across all processes

At JTEKT, to reduce the emission of CO₂ which is the main greenhouse effect gas, we are involved in energy conservation, etc., and aim to contribute to the prevention of global warming which is the environmental problem of top priority. This activity is promoted throughout all group companies both with Japan and overseas and covers all processes from the design phase to production and logistics.

Product-related countermeasures

○ Environmentally-friendly designs improving fuel efficiency

From an environmental design perspective, activities such as reducing steering system size and torque loss were pursued, resulting in the reduction of mass, torque loss and energy consumption of more steering systems than in FY2008.

This contributed to improved environmental efficiency and fuel efficiency compared with conventional products.

○ Reduction of product transport mileage (*1)

Promotion of local purchasing and production with the goal of reducing CO₂ emissions created during product transport.






*1 Product transport mileage The concept of reducing CO₂ emissions by reducing the resources and energy consumed by product transport. The figure obtained by multiplying product transport quantities by transport distance is assessed.

FY2009 development achievements 01

Various steering systems

From EPS (electric power steering), which contributes significantly to the environment, to conventional hydraulic power steering, we seek high performance in response to the vehicle's application and purpose at the same time as improving environmental efficiency. ▶ Figure-01

▶ Figure-01 FY2009 development achievements

	System	Development points	Results		Environmental efficiency value
			Mass	Energy consumption	
Electric power steering	C-EPS (Column assist type) 	● Reducer efficiency improvement (torque loss reduction)	29% reduction	83% reduction	1.66
	P-EPS (Pinion assist type) 	● Reducer efficiency improvement (torque loss reduction)	25% reduction	83% reduction	
	R-EPS (Rack assist type) 	● Motor efficiency improvement (torque loss reduction)	30% reduction	83% reduction	
Electric-hydraulic power steering	H-EPS 	● Control characteristics improvement (Idle stop/torque loss reduction)	27% reduction	83% reduction	1.83
			42% reduction	83% reduction	
			19% reduction	67% reduction	
Hydraulic power steering	HPS 	● Housing design optimization (lightweight) ● Normal sliding intermediate shaft (torque loss reduction)	14% reduction	17% reduction	1.19
			18% reduction		

*E-VGR, C-EPS, P-EPS, R-EPS and H-EPS are registered trademarks of JTEKT Corporation.

Steering types and applicable vehicles

	Applicable vehicles					Installed location
	Passenger cars				Heavy vehicles	
	Mini	Small	Medium	Large		
EPS (electric power steering)						
● C-EPS (column assist type)	○	○	○			Passenger compartment
● P-EPS (pinion assist type)		○	○			Engine room
● R-EPS (rack assist type)			○	○		Engine room
H-EPS (electric-hydraulic power steering)		○	○	○		Engine room
HPS (hydraulic power steering)	○	○	○	○	○	Engine room

Prevention of global warming

○ Reducing energy consumption with high efficiency

By integrating the processes that were conventionally carried out on multiple machines into one, JTEKT are advancing making high efficiency machining possible and developing products which reduce energy consumption amounts.

FY2009 development achievements 02

TG4 grinding center

A grinder equipped with two types of wheels and continuously machines multiple processes. With this machine we have achieved reduced running costs, a compact design and smaller footprint.



CO ₂ emissions	35% reduction
Eco-Scale	31% reduction

FY2009 development achievements 03

Combination machining center – FH1250SW

The large dia. deep drilling and boring of large parts is now possible.



CO ₂ emissions	38% reduction
Eco-Scale	34% reduction

TOPICS

TG4 grinding center receives “the Ten New Products Award”

The TG4 grinding center, a highly accurate, highly efficient CNC combination grinder with the smallest footprint in its class, received the 2009 Nikkan Kogyo Shimbun Top 10 New Products Award. As well as being a machine with a high speed and high accuracy wheelhead swiveling unit, by integrating processes, initial investment costs and running costs (i.e. energy consumption) have been reduced, resulting in the TG4 as being evaluated as an economical machine.



Award ceremony (January, 27th, 2010)

Reducing CO₂ emissions in production

○ Aiming high as a company on the whole

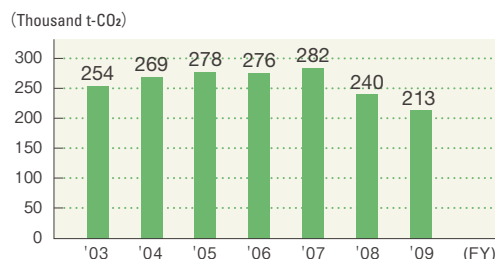
JTEKT promotes energy conservation and reduction of CO₂ emissions at production sites by working to raise the energy efficiency of current equipment, switching to more efficient devices, etc. In FY2009, we reached the FY2010 environmental action plan target for CO₂ emissions and set a “challenge” target of 146,200t-CO₂, however were unable to reach it. In the future we will promote the reduction of CO₂ emissions on a per sales unit basis as well as narrow down items necessary to meet targets and strengthen activities companywide.

Main activities

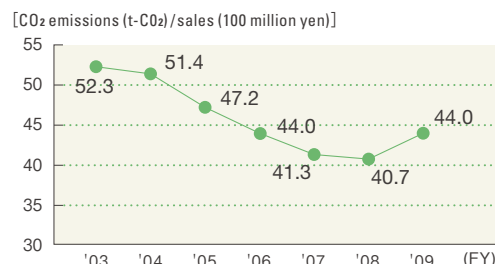
- Improve heat treatment processes
- Improve production machinery and ancillary equipment
- Pursue energy savings by combining low-load lines
- Reduce CO₂ through energy conversion
- Vitalize energy-saving activities at all workplaces
- Energy-saving patrols by company offices

Transition of total and per sales unit CO₂ emissions in production

Total CO₂ emissions



Per sales unit CO₂ emissions



Prevention of global warming

Status of main activities

01 | Improvement of productivity and introduction of high efficiency equipment

At JTEKT, we consider improving productivity in the machining and assembly processes which use 33% of overall energy, and improving efficiency of heat treatment, forging and casting processes which use up 28%, effective steps in promoting energy conservation. We strive to enhance productivity and introduce high efficiency equipment. In FY2009, production equipment was integrated, CO₂ emissions were reduced by 12,000t through production enhancement countermeasures and a further 6,400t of CO₂ was reduced by implementing countermeasures for heat treatment equipment and enhancing the efficiency of the forging and casting processes.

02 | Energy conservation inspections

In order to eliminate wasteful usage of energy, we conducted an energy conservation inspection companywide. Stopping energy supply in non-operational times and to non-operation, pointing out matters for improvement on-site, digging up improvement items and making countermeasures, we worked to reduce waste and loss through the visualization of per sales unit transition



Energy conservation briefing session

and circulated improvement methods companywide, confirming the current status of activities.

Reduction of global CO₂ emissions

Aiming to minimize the contribution of our global production operations to global warming, JTEKT is working to reduce CO₂ emissions not only within JTEKT but also at its group companies in Japan and overseas. JTEKT set a target of reducing CO₂ per sales unit emissions by 8% by FY2010 in comparison with FY2003 levels at all group production sites in Japan and overseas and as a result, the FY2009 per sales unit CO₂ was 16% less than FY2003. However, amidst decreasing production volumes, the situation is worse than last year, and we will continue enhancing production efficiency and promoting reduction activities from into the future.

Figure-01

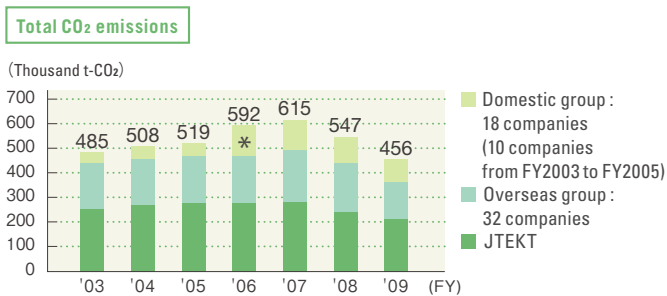
Reducing CO₂ emissions in logistics

Reaching total emission and per sales unit targets

FY2009 saw drastic fluctuations in demand however, we were able to achieve targets for both total and per sales unit CO₂ emissions in logistics. Because we have already achieved the FY2010 target of reducing emissions to the FY1990 level, we have set a new “challenge” target of reducing a further 10%.

Figure-02

Figure-01 CO₂ emissions (global and per sales unit)



Per sales unit CO₂ emissions

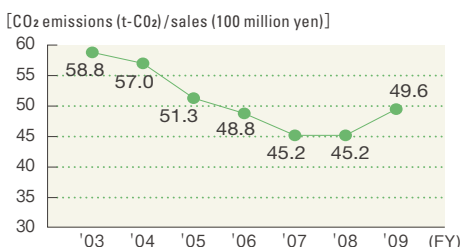
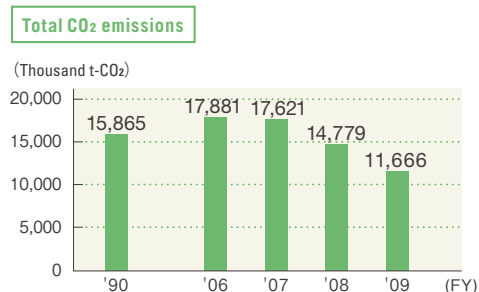
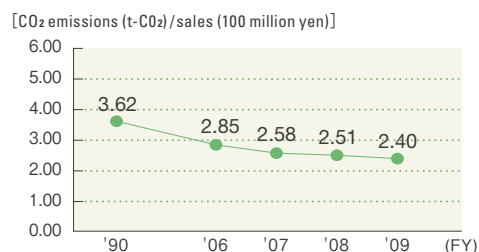


Figure-02 Transition of total and per sales unit CO₂ emissions in logistics



Per sales unit CO₂ emissions



Prevention of global warming

Main activities

- Expand long-distance transport improvements to other routes (Improving packing style through on-site assembly and switching to rail transportation)
- Switch to trailer-type trucks

Status of main individual activities

Expand long-distance transport improvements to other routes

By switching from truck to rail as a means of transporting cargo, CO₂ emissions can be suppressed by approximately 1/8th. At JTEKT, as part of a modal shift to plant-friendly transportation means we have worked to change long-distance transport to Iwate in Kyushu to rail.


In FY2009, we expanded improvements regarding transportation to Kyushu. We changed the logistics route between Nara and Kyushu, Toyohashi and Kyushu and enhanced

storage capacity through improving packaging style, reducing CO₂ emissions by 300t per annum. ▶ Figure-03

TOPICS

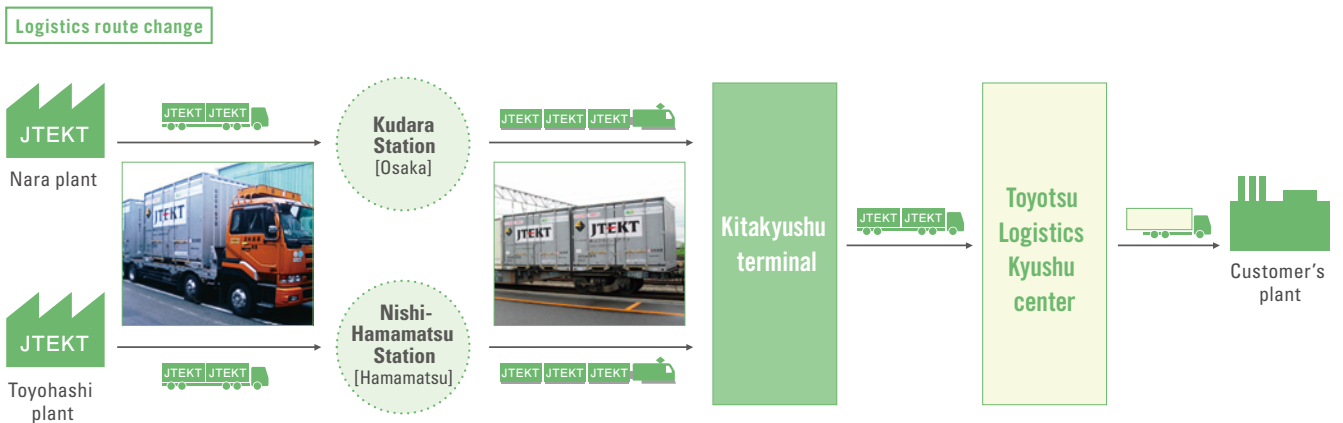
Certified as a green logistics partnership business

In FY2009, JTEKT were certified by the Ministry of Land, Infrastructure and Transport as a green logistics partnership business. This involves the cargo owner and logistics company clearly forecasting high energy results such as CO₂ emission reductions, etc and passing a rigorous audit by the MLIT, therefore in FY2009, only 12 companies nationwide, including JTEKT, were certified.











みんなで地球にやさしい物流を
グリーン物流パートナーシップ

▶ Figure-03



Enhancing storage capacity through improving packaging style

<div style="border: 1px solid #4CAF50; border-radius: 10px; padding: 2px; display: inline-block;">Before improvement</div>   <p>Polyvinyl case storage capacity - 1</p>	<div style="background-color: #4CAF50; color: white; padding: 5px; transform: rotate(90deg);">Packaging style change</div>	<div style="border: 1px solid #4CAF50; border-radius: 10px; padding: 2px; display: inline-block;">After improvement</div>   <p>Steel pallets storage capacity - 18</p>	<div style="background-color: #4CAF50; color: white; padding: 5px; transform: rotate(90deg);">Enhanced storage capacity</div> <p style="font-size: 1.5em; color: #4CAF50;">2.4 fold</p>	<div style="border: 1px solid #4CAF50; border-radius: 10px; padding: 2px; display: inline-block;">Before improvement</div>   <p>Storage capacity - 20</p>	<div style="border: 1px solid #4CAF50; border-radius: 10px; padding: 2px; display: inline-block;">After improvement</div>   <p>Storage capacity - 48</p>
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Effective use of resources

Basic concept

○ Responsibility as a manufacturer

At JTEKT, we consider the effective use of resources as one of the responsibilities of an environmentally friendly manufacturer. We are involved in activities throughout the entire life-cycle of our products. Such activities include developing products with high durability and long life, reducing material usage through downsizing and lightening equipment, and reducing waste and recycling.

Product-related countermeasures

○ Promoting long service life

Through the development of new technology and materials, we strive to improve durability performance and extend the life of each of our bearing products.

FY2009 development achievements 01

Development of a long life highly anti-corrosive bearing for rolling machine roll necks

We are developing long life, highly durable bearings for steel equipment and JHS (JTEKT hyper strong) bearings into a series. The improvement of rolling contact fatigue and anti-corrosiveness is essential for rolling machine roller neck bearings and, through the adoption of newly developed bearing material and special heat treatment, life has been significantly extended.

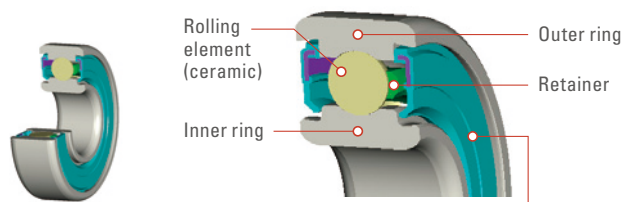
Life	4 fold (premium specifications)
Environmental efficiency value	1.21



Developed product appearance

over 100,000 hours at an ambient temperature of 60 degrees Celsius.

Life	Approx. 3 fold
Reduction in weight	7% lighter
Environmental efficiency value	1.23



Developed product appearance

Ultra light contact heat resistant seal

TOPICS

Development of a high speed rotating ball bearing for hybrid transmissions

In order to make the hybrid transmission motor smaller, high speed rotation is necessary to compensate the drop in output. Distortion of conventional retainers was largely due to centrifugal force at high speed rotation and there was a risk of this leading to sticking due to heavy contact with the ball. Consequently, we have elastic fit together two pairs low-cost resin retainers from both sides of the ball, suppressing distortion caused by centrifugal force and achieving high speed rotation.



Ball bearing appearance
(Left: With retainers assembled)

FY2009 development achievements 02

Long life, electrical corrosion preventive bearings for fan motors

By 24 hour operation of a fan motor which serves both as a chiller and ventilator, grease deterioration and electrical corrosion progresses, and bearings reaching audio life are increasing.

Furthermore, damage to bearings does not only shorten fan motor life, but could damage the product itself. As a solution, we have developed a long life, electrical corrosion preventive bearing and achieved a fan motor life of

Saving resources in production

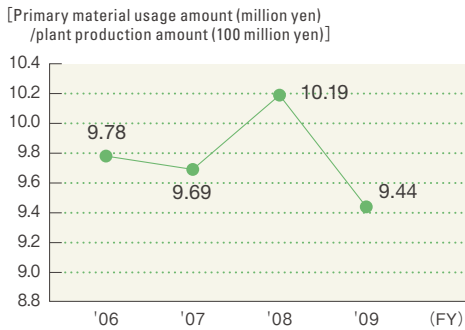
○ Reduction of primary material usage amounts

We have reduced material usage by changing product designs, changing manufacturing methods, and reducing stock removal. Also, while making efforts to reduce waste material, we also strive to reuse waste material, by using surplus material removed during die cutting in smaller products.

▶ Figure-01

Effective use of resources

▶ Figure-01 Primary materials usage per sales unit



Reducing waste created when forging hub unit bearing outer rings

As the flange is shaped abnormally, burr generating hot forging is the main processing method used. However, the material wasted as burrs after die cutting was an issue. We have improved the process and developed a type of hot forging that doesn't generate burrs, improving material yield.

▶ Figure-02

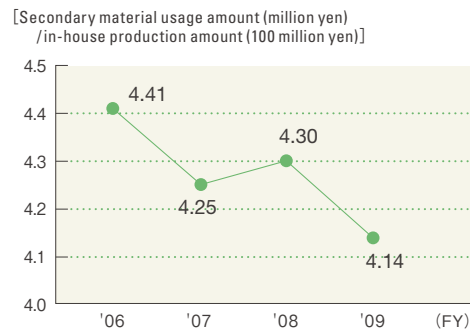


○ Reduction of secondary material usage amounts

We succeeded in reducing usage by revising the material, shape, hardness and other specs of secondary material such as grinding wheels, cutting tools and dies and further increasing their durability. Also, we strove to

promote recycling by reusing oil, grinding wheels, cutting tools and jigs.

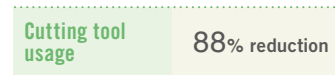
Secondary materials usage per sales unit



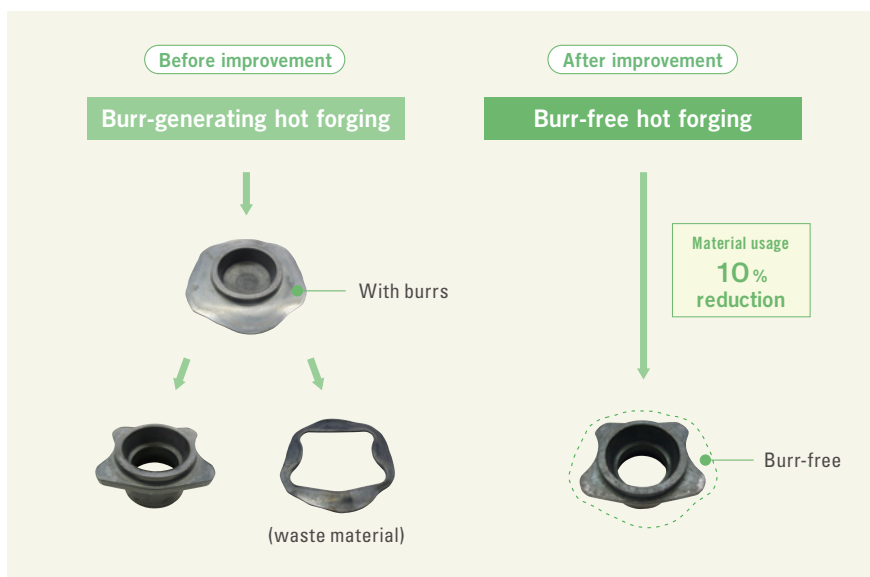
Reduction of cutting tool usage by raising re-polishing frequency

Side cutters are used for the machining of center bearing caulk grooves. With the conventional cutting tool, the outer diameter face was re-polished to secure groove shape. This caused the O.D to grow smaller, and it was only possible to re-polish with the same cutting tool twice. However, by improving cutting tool shape and only re-polishing the rake face, it is now possible to re-polish up to 15 times with the same tool. As a result of cutting tool life being extended, these improvements resulted in reducing usage.

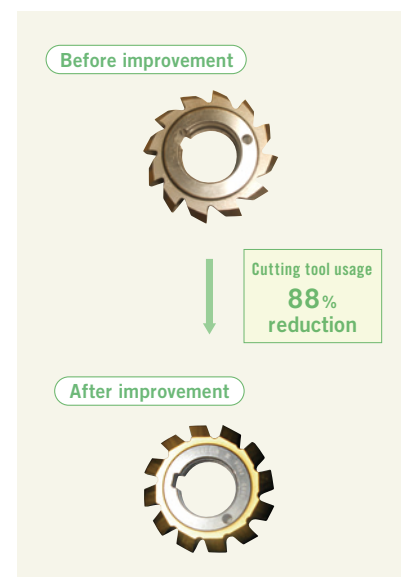
▶ Figure-03



▶ Figure-02



▶ Figure-03



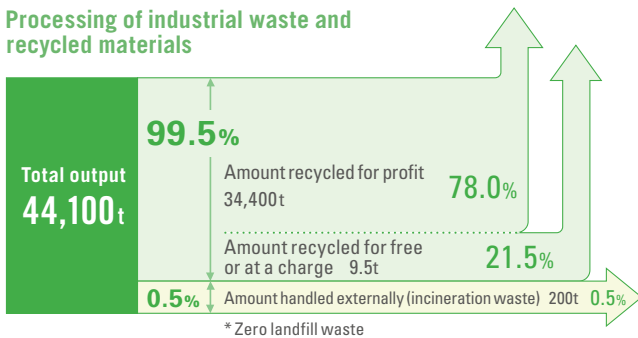
Effective use of resources

Waste reduction

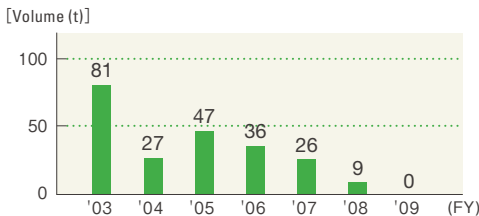
○ Achieved zero landfill waste

In order to utilize resources effectively and in view of limited landfill space, JTEKT has worked to reduce targets for waste, including waste disposed of for free and at a charge. In FY2009, we succeeded in converting all landfill waste to recycled waste. A large amount of incineration waste was also converted to recycling, and significantly reduced the amount created by improving internal processing methods. We will continue efforts to reduce overall waste leaving our plants, including activities to sell certain waste for profit.

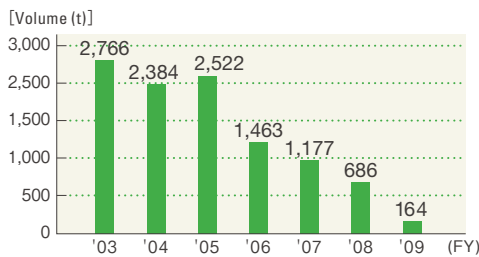
Processing of industrial waste and recycled materials



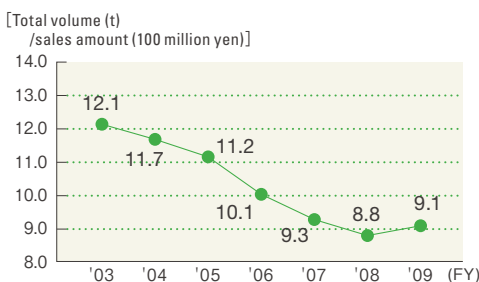
Yearly transition of landfill waste output



Yearly transition of incineration waste



Yearly transition of waste per sales unit



Status of main individual activities

Reduce waste fluid discharge

In FY2009, we used the drop in production as an opportunity to make improvements, and promoted making countermeasures at the source of waste generation in order to restrain it by reviewing management methods.

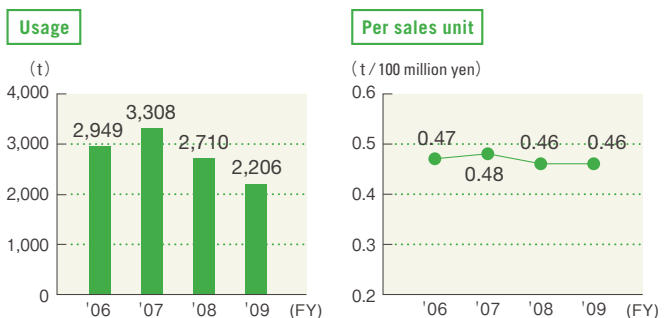
For example, coolant and washing agent used in production processes causes deterioration, necessitating periodical replacement. In line with the drop in production, by switching from periodical replacement to quantitative replacement which suits the number of workpieces machined, waste fluid discharge has been reduced by 150t per annum.

Reduction of packaging material

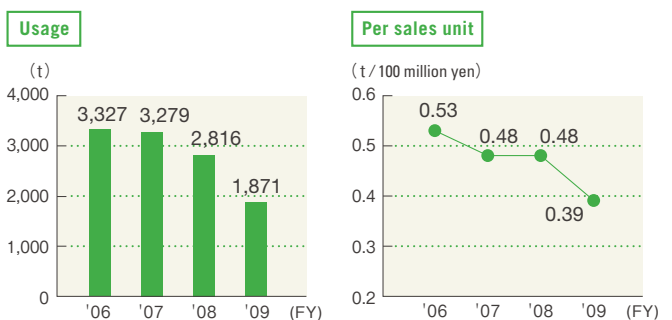
○ Reducing packaging and packing material

At JTEKT, in order to effectively utilize resources, we have established targets for both wood and paper packaging material and promote simple and returnable packaging. By changing from cardboard to plastic polyvinyl cases we have created returnable packaging.

Transition of wood packaging usage and per sales unit



Transition of paper packaging usage and per sales unit



Control and reduction of environmentally burdensome substances

Basic concept

○ For the reduction of environmentally burdensome substances

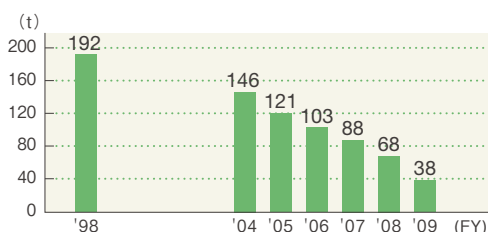
At JTEKT, as well as observing laws and regulations regarding the control of chemical substances that impact upon the environment, we have established an independent standard to make control even more thorough. We appraise the current conditions regarding handling, secure safety, and then work to reduce the output of environmentally burdensome substances in order to reduce the impact on the environment as much as possible.

Control and reduction of chemical substances

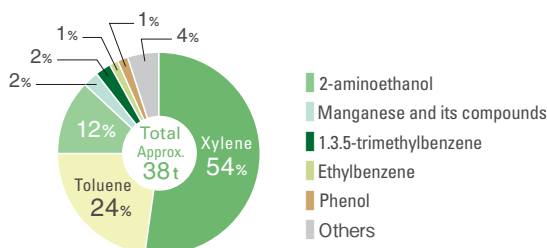
○ Reduction of substances subject to PRTR

JTEKT has established a Chemical Substance Control Standard regarding the control of chemical substances incorporated in our products, and in order to reduce the impact of chemical substances on health and the environment, we are continuing efforts to reduce the output and transfer of substances subject to PRTR (*1).

Yearly transition output and transfer breakdown of substances subject to PRTR



Discharge and transfer breakdown of substances subject to PRTR for FY2009



*1 PRTR regulation Pollutant Release and Transfer Register is a system to collect and disseminate information on environmental releases and transfer of toxic chemicals from industrial and other facilities.

○ Response to the revised PRTR regulation

The PRTR regulation was revised in November of 2008, and after specified substances were deleted and added, substances subject to this regulation increased from 435 to

562. The revised regulation will go into effect from 2011, and JTEKT are cooperating with business partners to reinvestigate the chemical substances included in the paint, coolant, etc., used internally. Furthermore, we have re-registered MSDSs (*2) in the control system for secondary materials used in production and are continuing efforts to appraise the amount of chemical substances handled, and respond to the regulation.

*2 MSDS MSDS stands for "Material Safety Data Sheet". These contain information related to the nature of chemical substances and handling methods.

○ Soil and groundwater measures (continued report)

Regarding the groundwater contamination previously caused by the Kariya and Okazaki plants by the trichloroethylene used as a cleaning agent, etc., from 1998 a pumping and aeration system (*3) has been implemented at these plants as a sewage leakage prevention and purification measure. Furthermore, in FY2004, the Okazaki Plant adopted a microbial purification system (*4) that utilizes microbes stimulated by nutrients. As a result, the soil and groundwater quality of these plants had satisfied the regulatory standards in all designated places as of the end of 2009. Measurement results are reported to the local government agency and to local residents at community discussions.

→ Related article on page 35

Trichloroethylene measurement values

Plants	Maximum measurement value in groundwater	
	FY2008	FY2009
Kariya	0.472mg/ℓ	0.933mg/ℓ
Okazaki	0.040mg/ℓ	Less than 0.001mg/ℓ

* Environmental standard: 0.03mg/ℓ

* For plants other than the above, no trichloroethylene was detected in measurements taken in wells around the plant borders.

*3 Pumping and aeration system Groundwater is pumped up and sprayed and air is blown on it from below to aerate and separate organic solvents, which are made to adhere to activated carbon for removal.

*4 Microbial purification system This is a method of restoring contaminated environments by utilizing microbial function. The purification capability of microbes living in the environment is raised by injection of nutrients, etc.

○ Proper storage and control of PCM devices

The handling and reporting of devices with insulating oil containing the widely used PCB (polychlorinated biphenyl) is obligatory under the PCB Waste Special Measures Act. At JTEKT, as well as properly handling such waste and reporting to governmental agencies in accordance with this Act, we detoxified 31 high pressure condensers, which contain highly concentrated amounts of PCB, at PCB processing facilities run by the Japan Environmental Safety Corporation by FY2009. We plan to process the 215 units we currently have in storage by 2016.