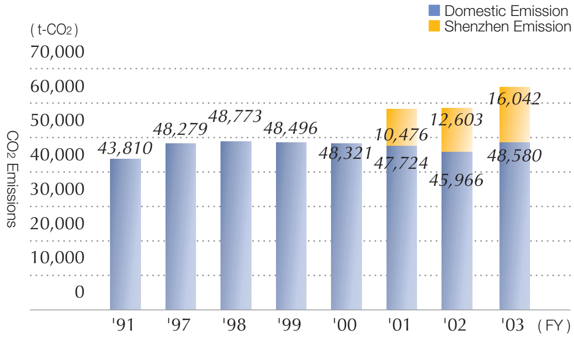
Energy and Resources Management

We are promoting energy saving measures to reduce Global Warming and CO_2 Emissions
Our expanded production increased energy consumption in FY2003.

Transition in Total Energy Use

In FY2003, the Olympus group clearly defined its target of a 6% reduction by FY2011 (for FY1991) based on the greenhouse effects gas reduction planned target adopted in the Kyoto Protocol of the Framework Convention on Climate Change. Since the majority of greenhouse gases the Olympus group emits is CO_2, reducing such emission will directly result from energy saving. Until now, we could see effects owing to measures by "grass-roots activity" in each facility. We consider overseas development of the production system to be a reason for such reduction. Reducing CO_2 Emissions is a global problem, and we must consider a reduction plan that include overseas production bases, rather than simply focusing on activities in Japan. It thus appears difficult to attain the target with conventional energy saving measures.

Domestic energy use in FY2003 was 48,580 ton CO_2, showing a 5.7% increase in the absolute value (not by points) for the previous year. The unit consumption to sales ratio, almost leveling off. This year, we began dealing with the amount of energy use from FY2001 to 2003 for the Shenzhen Plant in China, the largest overseas production base. Because of the increase in overseas production in FY2003, the amount of energy use, including the Shenzhen Plant, was 64,622 tons of CO_2, showing an increase of 10.3% over the previous year.



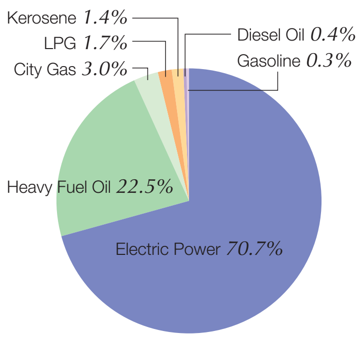
* We calculate the CO_2 emission factor for Shenzhen similarly to domestic cases using the factor for FY2000 prescribed in the Law concerning the Promotion of the Measures to Cope with Global Warming".

■ Transition in CO_2 Emissions

Items	Unit	FY1991	FY1999	FY2000	FY2001	FY2002	FY2003
CO_2 Emissions	t-CO_2	43,810	48,496	48,321	47,724	45,966	48,580
Amount of Energy	Terajoule	1,084	1,208	1,200	1,194	1,159	1,198
Net Sales	100 mil. yen	1,574	2,574	2,794	3,129	3,283	3,464
Unit Consumption to Sales	t-CO_2/ 100 mil. yen	27.8	18.8	17.3	15.3	14.0	14.0
Unit Consumption to Sales (100 in FY1997) %	%	–	79	72	64	59	59
Crude Oil Conversion Basis	kiloliters	28,069	31,280	31,054	30,910	30,000	31,012

* CO_2 emissions: CO_2 emissions for each year are calculated on the basis of factors specified in the FY2000 Regulations for the Law concerning Promotion of Measures to Cope with Global Warming..
* Conversion to Joules: For electrical power, factors specified in Regulations for the Law concerning Rational Use of Energy are used for each year but for other types of energy, factors specified in Overall Statistics about Energy is used.
* Conversion to crude oil: Conversion is conducted on the basis of factors specified in Regulations for the Law concerning Rational Use of Energy.

■ Energy Consumption and Energy Consumption per Unit of Net Sales



■ CO_2 Emissions by Type of Energy Source in FY2003

Example from Aizu Olympus

Aizu Olympus had a problem of solar heat through the plant building roof that placed a substantial load on the air conditioning system. To solve this problem, roof insulation was implemented over a roof area of 836 m² when constructing a new cleaning room. This reduced heat from outside entering the building.

The enhanced insulation and made an output reduction of 16kW in cooling requirement, bringing a reduction annually of 103,680 kWh.

Insulation is placed on the Roof of Cleaning Room

Example from Ina Plant

●Remodeled Air Conditioning System with High Efficiency Equipment

To replace conventional cold water package air conditioners and cooling towers, the Ina Plant introduced an absorption water chiller/warmer in high-efficiency thermoelectric equipment, cooling tower and air conditioning units, which is capable of leveling the power load and corresponding to seasonal variation. This replacement brought a 360,000 kWh reduction in annual electricity consumption. This facility can switch fuel from heavy oil to natural gas and a cogeneration system can be integrated if the infrastructure includes natural gas consumption

Cooling Water Pump with Higher Efficiency

Absorption Refrigerator

●An inverter-controlled compressor has been introduced

To perform tracking control in real time of air conditioning demand, an inverter-controlled device has been installed. This could exclude the loss of unloader, thus enabling an energy reduction of 460,000 kWh.

Inverter-controlled Compressor

●Introduction of Power Monitor

We introduced an electricity monitor that works on the internal LAN, enabling electricity consumption to be controlled in individual workplaces, saving energy.

Power Monitor

The Ina Plant was awarded the Director-General of Agency of Natural Resources and Energy prize.

This year, the Ina Plant won this prize — thanks to personnel cooperation in energy saving. We will continue to address energy saving, aiming for higher standards.

Sadayuki Ono (left) and Satoshi Mizutani admiring the prize
General Affairs group

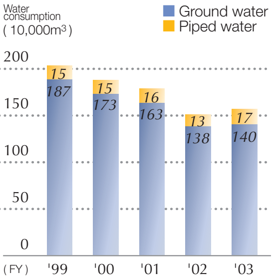
Example from Hinode Plant

The Hinode Plant used to compress air using three air compressors. Depending on the pressure situation, one compressor was in standby operation, consuming power running with no load. This was replaced by two smaller compressors capable of on/off operation. This eliminated unnecessary standby electricity, reducing electricity consumption 3,036 kWh a year.

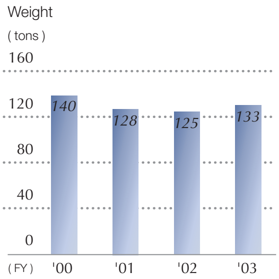
Small Compressors at Hinode Plant

Resource-Saving Activities

Total Water Consumption was 1,570,000 m^3 in FY2003, showing an increase of 4% over the previous year. Copy paper used was 133 tons, a 6% increase over the previous year.



■ Transition in Water Consumption



■ Transition of Total Consumption in Copy Paper

Waste Management and Recycling

In FY2003, we worked for the first year to implement the 02 Basic Environmental Plan, prioritizing Zero Emissions.
The amount of intermediate treatment of waste by contract showed a decrease of 683 tons from the previous year and the Recycled Resource Ratio was 76% in FY2003.

We are determined to achieve Zero Emissions

Focusing on facilities at which production is high, the number of personnel is high, and much of waste is discarded, we reviewed separating unrecyclable waste and recyclable waste whose infrastructure was already in place.

We identified how each branch was to attain a landfill ratio of 1% or less, which is the criterion for zero emissions, and intensively promoted reduction of waste volume and resource recycling. Some facilities achieved this landfill ratio in a month in the latter half of FY2003.

In FY2004, we will set up methods and rules for examination, aiming at zero emissions in major facilities.

Idea of Waste Origination to Final Disposition

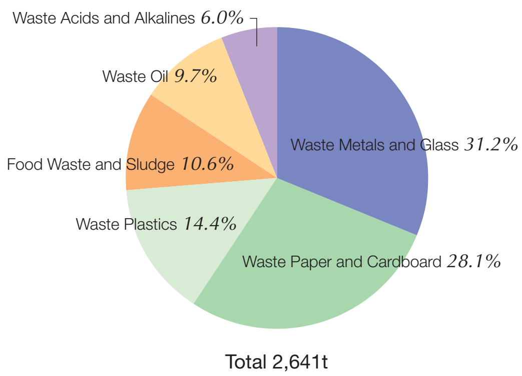
Olympus prioritizes reduction of the amount of final disposal, and its criterion for zero emissions is to reduce the volume of landfill after intermediate processing within 1% or less of total amount of emissions" ("Volume of landfills, C1" in the diagram below).

Olympus encourages volume reduction treatment such as Drying and Resource Recycling and Waste Liquid Regeneration in-house to reduce waste (amount of emissions produced) more intensively.

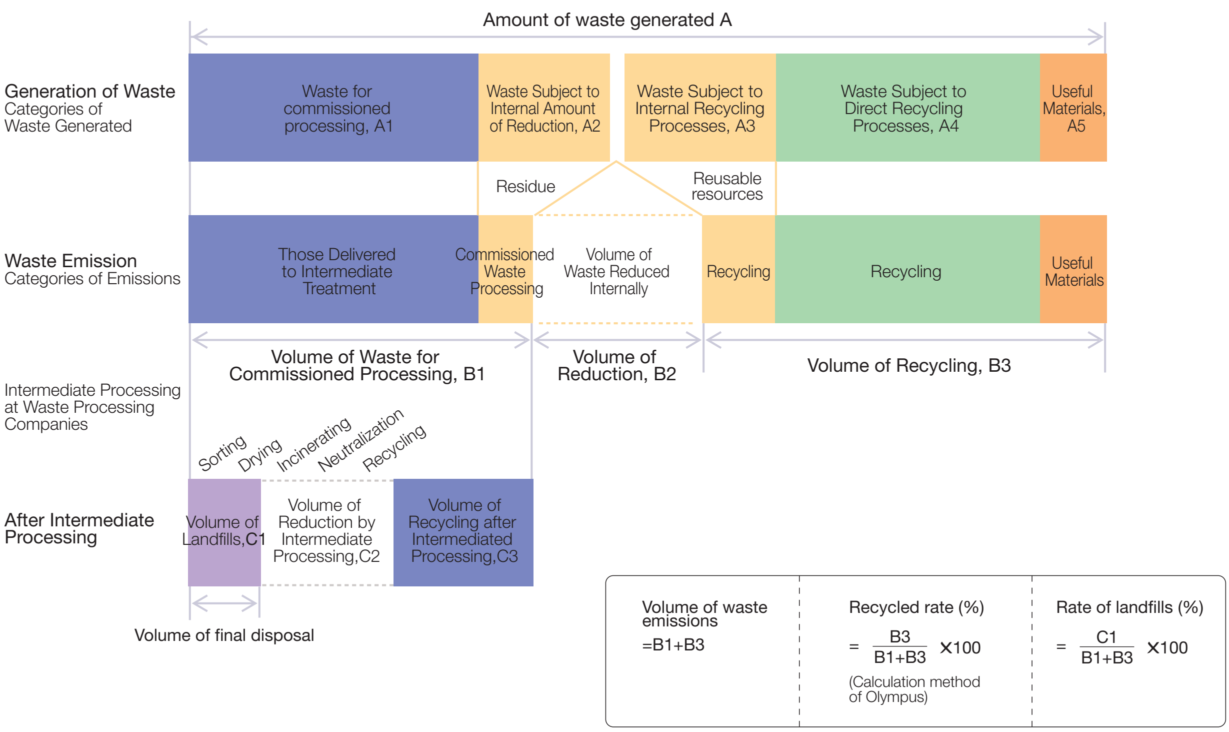
Amount and Rate of Recycling in FY2003

Olympus counts the amount of resources recycled as the amount of those reused as resources for recycling by facilities or by outsourcing contractors out of total emission materials at each facility. This includes materials sold out as valuable resources.

The amount of resources recycled in FY2003 was 2,641 tons, up 721 tons (38%) from the previous year. This included 268 tons of materials sold out as valuable resources, and the Recycled Resource Ratio was 76%, improving 20% over the previous year.



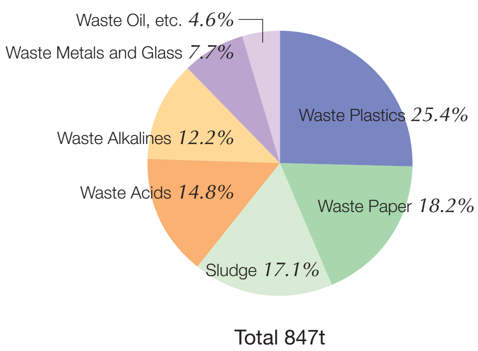
■ Breakdown of Amount of Recycled Materials



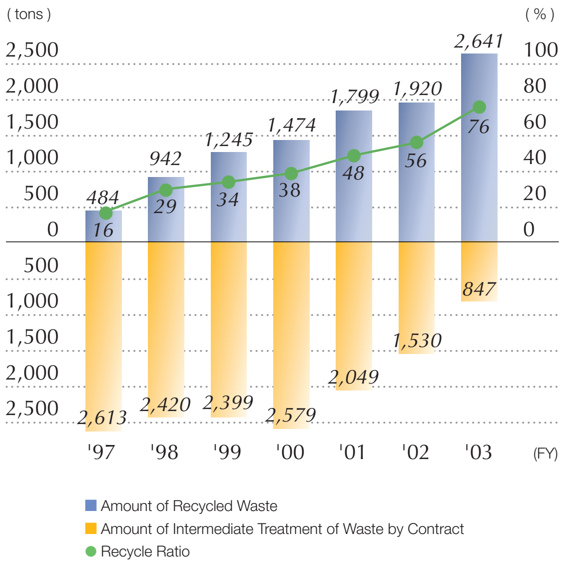
■ Category Grouping of Wasted at Each Phase from Generation to Final Disposal

Transition in Commissioned Waste Processing

We focused on reuse or internal circulation, mainly of lens sludge, waste plastics, and waste acids and alkalis, which are emission materials characteristic to the company to further reduce commissioned waste processing. The total volume in Domestic Development and Production Facilities in FY2003 was 847 tons, a reduction of 683 tons (45%) over the previous year and 1,766 tons (68%) over the reference year (FY1997).



■ Breakdown of Commissioned Waste Processing



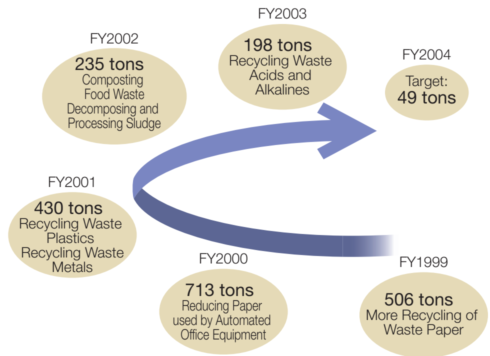
■ Transition in Amount of Recycling Materials and Commissioned Waste Processing

Hachioji Recycling Center

A year has passed since the recycling center started operation at the Technology Research Institute (Hachioji) on March 12, 2002.

The former waste collection depot has been totally renovated into a temporary storage space with wide frontage having total floor area of 263 m^2, including the second floor, to allow easy storage of large waste. Garbage-processing compost (high fermentation) equipment started operation in June 2001, and now operates 24 hours a day to process food waste from catering for about 3,000 personnel at the center.

Hachioji Recycling Center



■ Technology Research Institute's Concept of Reducing the Volume of Waste for Commissioned Processing

Thorough Separate Collection at Tatsuno Plant

The Tatsuno Plant separated waste into 52 types until October 2002. In December, however, it reviewed this and increased separation categories to 82 for a higher recycled resource ratio promoting resource recycling.

Since the Tatsuno Plant includes temporary staff dispatched from overseas, Examples of actual waste and photographs of the waste are placed on each separation container so that people can identify the suitable container at a glance.

Separate Collection at Tatsuno Plant

Chemicals Management

A variety of chemicals in manufacturing processes and in products, and some are hazardous to the environment and health. Olympus is focusing on accident prevention and reducing emissions into the environment.

Chemical Usage Standards

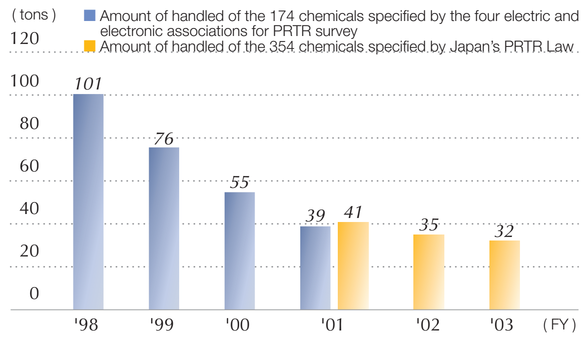
In FY2003, Olympus set up a new classifying system consisting of Prohibited, Restricted (reduced as much as possible), and Controlled (careful managed use) based on the degree of harmful effects for use as a component in products and use in manufacture processes.

PRTR Surveys

The Olympus group has been recording emitted and transferred chemicals since 1997 based on the guideline of four electric machinery and electronic organizations. Based on the pollution Release and Transfer Register (PRTR) Law, we surveyed 354 items of Class 1 substances subject to the law in FY2003. Chemicals handled in quantities more than 10 kg a year were picked up at each branch, and substances that were handled in quantities of 100 kg or more in total for all branches were summarized. Substances subject to the PRTR Law amounted to 31.77 tons in FY2003, a reduction of 3.76 tons over the previous year.

Category	Chemicals Contained in Products	Chemicals used in Manufacturing Processes
Prohibited Chemicals	Cadmium, Organotin Compounds, PBB, PBDE, PCB, Polychlorinated Naphthalene, Asbestos, Azo Compounds, Ozone Layer Depleting Substances	CFCs, Halon, Carbon Tetrachloride, HCFC, HBFCs, Methyl bromide, Dichloromethane, Tetrachloroethylene, 1,1,1-Trichloroethane, Trichloroethylene, cis-1,2-Dichloroethylene, Benzene, Asbestos, Aldrin, Endrin, Chlordane, Dieldrin, Hexachlorobenzene, Polychlorinated Naphthalene (only those with number of chlorines being 3 or higher), DDT, PCB, Bis (tri-n-butylchlorostannane) =Oxide, Amosite, Crocidolite, Bis (chloromethyl) ether, 4-Amino Biphenyl, 4-Nitro Biphenyl, Benzidine, β-Naphthylamine
Use-restricted Chemicals	Hexavalent chromium, lead, mercury, polyvinyl chloride, cyan compounds	
Use-controlled Chemicals	Antimony, Arsenic, Beryllium, Bismuth, Chromium, Cobalt, Nickel, Selenium, Tellurium, Thallium, Chlorinated Paraffin, Other Bromine-based Fire Retardant, Phthalic Acid Ester, Radioactive Substances	354 Chemicals specified in Article 1 of Japan's PRTR law (excluding chemicals listed above)

■ Chemical Substance usage Standards



■ Transition in handled PRTR Substances

Unit: tons

Code by the law	Chemicals	Amount Handled	Volume Released			Volume Consumed	Volume Recorded	Volume Removed	Volume Recycled	Volume of Landfill
			Air	Water Area	Soil					
30	Epoxy resin of bisphenol A-type (liquid)	0.29	0.01			0.20		0.07		
40	Ethyl Benzene	0.14	0.11					0.03		
42	Ethylene Oxide	3.64	0.78	0.06			2.81			
43	Ethylene Glycol	0.68	0.32	0.01				0.35		
63	Xylene	4.24	2.71					1.53		
69	Hexavalent Chromium Compounds	0.48				0.03	0.02	0.43		
101	Acetic acid 2-Ethoxyethyl	0.31	0.02			0.10		0.19		
145	Dichloromethane *1	0.36	0.23					0.13		
207	Copper water-soluble salt	0.13		0.04		0.05		0.05		
211	Trichloroethylene *1	0.47	0.47							
224	1,3,5-Trimethyl Benzene	0.16	0.16							
227	Toluene	11.64	9.54							
230	Lead and its compounds	5.56				2.91		1.74	0.91	
231	Nickel	0.36		0.03		0.23		0.09		
232	Nickel compound	1.69	0.01	0.26		0.67		0.76		
283	Fluorine and its compounds	0.45						0.45		
304	Boron and its compounds	0.27		0.04		0.02		0.21		
307	Poly (oxy-ethylene) = Alkyl Ether *2	0.63		0.06				0.57		
309	Poly (exy ethylene) = Nonyl Phenyl Ether	0.27		0.01			0.19	0.08		
Total		31.77	14.36	0.52	0.00	4.21	3.01	8.77	0.91	0.00

*1 Dichloromethane, trichloroethylene, nickel compounds (including nickel sulfate) are subject to survey of noxious substances.
*2 Limited to those with number of carbons in alkyl base radical is 12 to 15 and their mixture.

Totals may not correspond to the actual sum due to rounding off.

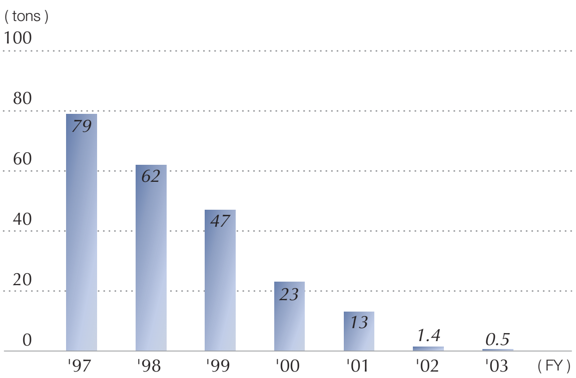
■ PRTR Survey Results

Reducing Organic Solvents

Olympus uses dichloromethane and trichloroethylene as chlorine-based organic solvent. Trichloroethylene was used as a lens overcoat dilution solvent at the Ina Plant. Although we did not have any other solvent whose performance is comparable to the solubility and drying ability of trichloroethylene, we were considering switching to some other solvent that affected the environment less. We selected butyl acetate-based solvent that dissolves pitch, which is the base agent of the overcoat, to replace trichloroethylene, but its low flash point involved the risk of explosion and fire. To solve this problem, we took the following measures:

- Changed the exhaust fan of the agent-applying booth to explosion-proof specifications, and
- Continuously checked for blocking of filters in booths,

thus totally eliminating trichloroethylene in manufacture processes in March 2002.



■Use of Trichloroethylene

Eliminating Ethylene Glycol

Olympus has focused on finding substitutions for and eliminating ethylene glycol, used on the automatic lens processing line. It was difficult, however, to find a perfect alternative that "operators can use safely"; when we used a promising substitute actually in the field, unexpected problems resulted although the experiment had resulted in good performance. We solved this problem by using "Gracool" to eliminate 530 kg ethylene glycol in a year.

Powder Painting Decreased Solvent Use

Olympus mainly uses organic solvent for general painting. The portion remaining as coating of products is about 15% and other portions are waste plastics (40%) and xylene (45%), which is a volatile organic chemical substance, are emitted into the atmosphere. Painting of organic solvent involved the following problems:

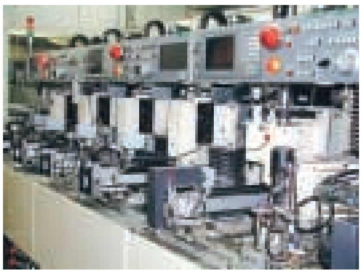
1. Waste plastics:
Annually about 5 tons of waste plastics are produced. Sludge must be treated as part of facility maintenance.

2. Organic solvent emitted into air
A variety of organic solvents was in paints and thinners used in the process, and most solvents were emitted into the atmosphere.

3. Drain treatment
A massive volume of water was used in the solvent painting facility (water booth), which required processing in external treatment facilities.

To solve these problems, Olympus, in cooperation with a paint manufacturer, developed a unique powder paint especially for microscope components. This powder painting technology features luxurious appearance specifications (grain leather pattern) and synthesis of resin that permits low temperature baking. We thus complete painting with zero emissions of paint waste or organic solvent into the air and reduced annual use of xylene by 1.7 tons.


Powder Painting Room at Ina Plant


Automatic Lens Processing Line