# Plant and Office Initiatives for the Environment

The Tokyo Electron Group is implementing aggressive measures to reduce waste, save resources and prevent global warming. This section highlights environmental activities at our manufacturing plants and offices.

Total Environmental Impact		lr	nput				Output	
	l		Y 2008	Comparison with FY 2007	7		( FY 2008	Comparison with FY 2007
ight indicate the material flow at the Tokvo		Electricity 270.1	5 MkWh	(+2.4%)	TEL	Total product ship	ment 27,329 t	(+0.2%)
anufacturing plants and offices.		Gas 1,	478 km³	(+21.8%)		CO2 1	13,169 t-CO2	(+2.2%)
ironmental impact mainly stems from the process		Fuel	2,613 kl	(-0.3%)	Group	NOx	12.1 t	(+1.6%)
cts. This is because we evaluate our products		Water 1,	180 km <sup>3</sup>	(+1.8%)	(Domestic and overseas	Wastewater	1,170 km <sup>3</sup>	(+1.8%)
a range of gases and chemicals to simulate the		Chemical product (Regulated under the PE	ts 12.4 t	(-37.4%)	plants and offices)	Waste	12,312 t	(-20.5%)
or manufacturing process.		as Type I chemical prod Paper (copy paper)	337 t	(-10.7%)		Recycled amo Amount of wa and disposed	ount <b>11,945</b> t aste simply incine of in landfills	(-20.7%) rated
							366 t	(-11.6%)

## Details of

The figures on the r Electron Group's ma

The Group's env of evaluating produc using electricity and actual semiconducto

## **Preventing Global Warming**

#### **Reducing Energy Consumption**

Our Group is committed to reducing energy use in compliance with the Energy Saving Act. Our plants and offices are actively reducing their energy consumption by setting specific targets calling for energy efficient use of lighting and OA machines, and appropriate temperature control of air conditioners. We will intensify our efforts to meet our commitment on environmental activities.

#### **CO<sub>2</sub> Emissions from Energy Consumption**

In fiscal year 2008, we achieved the target of reducing CO<sub>2</sub> emissions from energy use per unit sales<sup>1</sup> by 1% from the previous year, although our total emissions of CO<sub>2</sub> from energy consumption increased due to production growth. We will continue to improve on our energy-saving measures.

We also began to calculate our emissions at overseas sites by applying energy coefficients used in the Survey Report on Estimated CO2 Emission Factors of the Power Sector of Major Countries (June 2006) by the Japan Electrical Manufacturers' Association (JEMA).

CO<sub>2</sub> Emissions from Energy Consumption CO<sub>2</sub> emissions (in Japan) CO<sub>2</sub> emissions (overseas) (t-CO2) - Energy use per unit of sales in comparison with the previous fiscal year Energy use per unit sales<sup>2</sup> 7.335 104 4 105.83 52.456 94,009 95 486 02.97 65 817 95,487 50 / 88 104.110 04.24 84 76 03 '04 '05 '06 **'98** 'qq 00 '01 '02 '07 '08 (EY) 1 Comparison with the previous fiscal year (Plants in Japan and overseas) = per-unit energy use in FY 2008/ per-unit energy use in FY 2007

2 Energy use per unit sales=Energy use/ Sales



#### **Reducing the Use of Greenhouse Gases other** than CO<sub>2</sub>

We use perfluorocarbons (PFCs) and sulfur hexfluoride (SF6), which are greenhouse gases, in dry etching, cleaning and other processes during process development and process evaluation.

In fiscal year 2008, we used 10,610 tons of greenhouse gases (as CO<sub>2</sub> equivalent), which is substantially smaller than the fiscal year 2007 level (21,006 tons). This was mainly due to a considerable decrease in the volume of SF<sub>6</sub> used for product development and evaluation at the Yamanashi Plant.



## **Resource Conservation**

#### **Our Approach to Resource Conservation**

We are working to minimize our use of resources. Specifically, we are reducing the use and purchase of copy paper and stationery and implementing green procurement practices giving preference to environmentally-conscious products.

We have replaced printer toner cartridges with cartridges made from recycled materials and cooperate with the manufacturers in the recovery of end-of-life cartridges. At some offices, we have established an intranet-based system, under which stationery no longer needed can be used by other departments.

#### Efforts to Reduce the Use of Paper

We are making a group-wide effort to reduce paper consumption. Our employees are encouraged to practice duplex copying, copy at a reduced size and digitize information and internal circulars. As a result, the Group's total use of copy paper in fiscal year 2008 fell by



TOPICS

#### **Donating PCs to Industrial High Schools**

The Tokyo Electron Group is a partner in the Aizu Craftsmanship Training Project. This project aims to train the future talent who will support semiconductor and other manufacturing sectors in the Aizu area of Fukushima Prefecture. We donated 10 PCs to each of the project's member high schools, Aizu Industrial High School and Kitakata Industrial High School. Students from the two schools became the first high school participants of SEMICON Japan\* in 2007 with tools they developed themselves. The donated computers were used by our field engineers. We presented the donation certificate at a ceremony held at Aizu Industrial High School on January 25, 2008, which was attended by more than 100 students, teachers and related parties.

about 10%, or about 9.7 million sheets, from the previous year. In addition to reducing paper consumption, we are working to conserve natural resources through efforts such as using recycled paper and introducing bamboo-mixed paper cups.

We will continue to reduce the use of copy paper and minimize paper-based records and accounting slips in order to achieve further reductions in our total paper consumption.

#### Efforts to Reduce the Use of Water

At our manufacturing plants, various measures are underway to reduce the use of water. For example, the plants have installed a water re-circulating system to reuse cooling water. They have also installed automatic faucets in restrooms and other facilities. These touch-free automatic faucets prevent water waste by automatically shutting off the supply when the user's hands are removed from the sensor range.



Water Consumption



Presenting the donation certificate at the ceremony

\*SEMICON Janan: World-class exposition of semiconductor and electronics equipment and materials

# Plant and Office Initiatives for the Environment

## Waste Reduction and Recycling

#### Our Approach to Waste Reduction and Recycling

The Tokyo Electron Group strives to reduce and recycle waste. We work according to a firm policy to minimize waste first and foremost, but if waste is generated it should be recycled to the greatest extent possible, and unrecyclable waste should be disposed of in a proper manner.

In recent years, landfill costs have surged due to site shortages. This means that waste reduction also leads to cost reduction. We separate recyclable waste from non-recyclables, use new manufacturing processes which do not involve waste generation, manage the qualifications of contract waste disposal companies and periodically review final waste disposal practices.

#### Waste Generation and Recycling Rate

In fiscal year 1999, the Tokyo Electron Group set a target of increasing the entire Group's average recycling rate to 95% by fiscal year 2006. As a result of efforts to attain this target, we



# **TOPICS** Collection and Donation of Pop Can Tabs

Our offices and plants are conducting a variety of programs to promote effective use of waste. For example, our Sagami Plant participated in a pop can tab collection program in November 2007 run by a local association of corporate executives and donated 6.5 kg of collected tabs. With the resulting funds, the association donated wheelchairs to social welfare facilities.



Document to prove the receipt of pop can tabs

achieved a recycling rate of 97.0% in fiscal year 2008 and 97.3% in fiscal year 2007. We are also focusing on reducing overall waste generated, as well as handling liquid waste by installing liquid waste treatment facilities.

#### **Breakdown of Waste Generated**

Liquid waste from chemicals used in the product development and evaluation processes accounts for the largest percentage of waste generated by the Group. At present, most liquid waste is recycled. Thanks to the aforementioned treatment of liquid waste by in-house facilities, we were able to achieve a reduction of 20% in the total

waste (including waste recycled) in fiscal year 2008, 58% of which is liquid waste, down from 71% in fiscal year 2007.



#### **Zero Emissions**

We define plants where less than 2% of waste generated by the plant is incinerated or put into landfills as "zero emission plants" and encourage all plants to achieve zero emissions. In fiscal year 2008, all our manufacturing plants strived to attain this goal, and achieved zero emissions. Our next step is to achieve zero emissions at our office facilities.

#### **Recycling Rate of Waste**

Plants	Recycling rate		
Tohoku Plant	98.3%		
Miyagi (Matsushima) Plant	99.7%		
Sagami Plant	99.5%		
Yamanashi Plant (Hosaka district)	99.9%		
Yamanashi Plant (Fujii district)	99.8%		
Kansai Technology Center	100%		
Saga Plant	99.9%		
Koshi Plant	100%		
Ozu Plant	100%		

Note: Rate of recycling of industrial waste (including industrial waste subject to special control)

# HIGHLIGHTS

(Plants in Japan)

# **Management of Chemical Substances**

# Our Approach to the Management of Chemical Substances

The Tokyo Electron Group uses chemical substances mainly in developing and manufacturing products. When developing products, we sometimes adopt new chemical substances that have not been used before, or use chemical substances in a way that is different from their traditional usage. In these cases, we look closely at the development facilities and methods, assess the environmental and operational risks associated with the use of the substances, and implement necessary measures before using the substances. We are also replacing dangerous and harmful chemicals used in the manufacturing process with safer substances.

#### **Compliance with the PRTR\* Act**

According to the provisions of the Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof (PRTR Act), we rigorously control the specific chemical substances regulated under the act and identify the use and emissions of these substances on a continuous basis. Among the substances regulated under the PRTR Act, we use large amounts of hydrogen fluoride, mainly for cleaning test wafers. The hydrogen fluoride waste is disposed of by an external company or it is disposed of in an approved manner within our premises. Ethylene glycol, used as a refrigerant for cooling water, is another heavily used regulated substance. TEL recycles almost all ethylene glycol we use. We will continue to properly manage all risks associated with the use of chemical substances.

\* PRTR: Pollutant Release and Transfer Register. Under the PRTR system, the use of chemical substances that may be hazardous to human health and the ecosystem, their release into the environment, and transfer (contained in waste) outside of the business premises are identified, tabulated and disclosed.

# TOPICS

# Prevention of Chemical Pollution

At our Kansai Technology Center in Amagasaki City, Hyogo, we properly manage various types of chemicals used to develop and evaluate products. At the same time, we also ensure that appropriate steps are taken to prevent air and water pollution. The Center has periodically reported its wastewater data to Amagasaki City for the past five years (the city ordinance required more than nine such reports). Wastewater released from the Center has consistently met the applicable municipal standard. In February 2007, we were recognized by the City as an office with excellent wastewater management. We will continue to manage and control chemical substances, including proper monitoring of wastewater discharge.

Handling of Substances Regulated as Class I **Designated Chemical Substances under the PRTR Act** (kg) Other Xvlene 4.578 Hvdrogen fluoride and its water soluble salts ,221 Ethylene glycol 4.118 4.558 2.108 1 439 577 3,553 5 021 3.690 9,844 4.811 9 1 4 4 6.353 4 000 3 962 2,800 '07 '03 '04 '05 '06 '08 (FY)

Note: Data for fiscal year 2003 was calculated in metric tons

#### Material Balance of Chemical Substances Regulated under the PRTR Act



#### PCB Storage

Based on the Law Concerning Special Measures against PCB Waste, we report on the storage and disposal of waste containing polychlorinated biphenyl (PCB) to the governor of the prefecture on an annual basis. The Tokyo Electron Group presently stores two waste transformers and four waste capacitors that contain PCB in a strict and secure manner.

