Sumitomo Heavy Industries Group **Environmental** Sustainability Report 2011

### Sumitomo Heavy Industries, Ltd.

Environmental Management Division

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The Sumitomo Heavy Industries Group aims to be a corporation that contributes to implementing sustainable development of society by taking action to protect the global environment and to reduce the environmental burden through "first-class products" and "first-class services" as well as its production activities.

Our Group's efforts to protect the global environment are also consistent with the "Sumitomo Business Spirit."

Meanwhile, the times are undergoing great changes. We find ourselves in a severe economic environment, but our Group will continue to push hard for action to protect the global environment.

Our Group is rolling out activities to prevent global warming across all Group departments. For these activities, we evaluate not only numerical values, but also processes at all departments. In our view, these activities are the very image of management, and the processes and results of the activities are one of the indicators for evaluating management strength at our Group.

The second medium-term environmental plan (FY2008 - FY2010) has ended and as of this fiscal year, we have launched the third medium-term environmental plan (FY2011 - FY2013).

In the third medium-term environmental plan, environmental activities are more closely integrated with management and, overseas companies included, our priority policies are

- to promote activities to prevent global warming;
- to promote environmental risk management;

We aim to be a corporation that contributes to delivering sustainable development of society by integrating environmental activities with management.

> President and CEO Yoshinobu Nakamura

- to contribute to the eco society through products and
- to promote contribution activities in local communities.

In particular, by providing "first-class products" that take the environment into account in a range of international fields, we will promote contributions to eco society.

In order to provide environmentally friendly "first-class products" and "first-class services" while we strive to reduce the environmental burden at production, we will have to overcome many issues that block the way.

In order to gain the strength to knock down barriers and overcome problems, the kind of innovation where we go all out as a Group is essential and we are pushing hard for policies of innovation.

In addition, the target values given in the third medium-term environmental plan are minimum values and every company in the SHI Group is taking on the challenges of higher target values.

In order to gain the understanding and trust of all our stakeholders, the Sumitomo Heavy Industries Group will continue to fulfill its social responsibilities to protect the global environment.

We appreciate your opinions and advice, which we will draw on for future initiatives.



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#### Editorial Policy

The Sumitomo Heavy Industries Group issued its first Environmental Report in 2001. In 2005, we expanded the scope of the report to include social aspects and changed its name to Environmental Sustainability Report. Every year, we widen the scope of social contribution activities and environmental activities, which form the social responsibilities of the Group. In addition to promoting environmental management including activities to prevent global warming, the 2011 Report also introduces our engagement with biodiversity as a form of social contribution. We have also expanded the scope of data on the environmental burden overseas. To convey to a wide audience our engagement with environmental and social activities, we have sought to make the report accessible by using plain and concise language and by making frequent use of graphs, illustrations and photographs. Further, when issuing this Report, we consulted the Environmental Reporting Guidelines (2007) and the Environmental Accounting Guidelines (2005) from the Ministry of the Environment.

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#### Scope of the report Sumitomo Heavy Industries, Ltd. and its group companies

Period covered by this report April 1, 2010 – March 31, 2011

Previous issue: September 2010 Current issue: August 2011 Next issue: August 2012

#### Disclaimer

This report contains not only facts relating to the past and present of Sumitomo Heavy Industries Group but also plans, forecasts, and projections based on management plans and management policy at the date of publication. These plans, forecasts and projections are assumptions and judgments based on available information at the time of writing, and results or matters pertaining to future business activities could differ materially from the descriptions due to changing conditions.

## **The Sumitomo Heavy Industries Group** contributes to building an affluent society with "manufacturing" technology

Since its foundation as a repair shop for the Besshi Copper Mine in 1888, the Sumitomo Heavy Industries Group has moved in step with social and industrial development. With a manufacturing technology nurtured by a tradition spanning more than 100 years, we make use of proven technologies that "actuate and control" devices from the world of nanotechnology to gigantic structures to realize original ideas and dreams.

#### **Business Description**

Machinery Components	We handle speed reducers, which are devices for lowering the number of motor revolutions and raising torque. Taking part in a broad range of markets, speed reducers are used in conveyance lines at factories, in robotic joints and in the drive systems of a range of machines.	Main Products Power transmission equipment Inverters
Precision Machinery	We handle the injection molding machines for making plastic products, devices for manufacturing liquid crystal and semiconductors, and devices for diagnosing and curing cancer. Among injection molding machines, products that require precision machining are one of our particular specialties.	Main Products Plastic injection molding machines, cyclotrons for medical use, ion accelerators, plasma coating systems, laser processing systems, cryogenic equipment, precision positioning equipment, transfer molding press machines, precision forgings, defense equipment
Construction Machinery	An extremely fuel-efficient product, our hydraulic excavator was the first construction machinery to win the Energy Conservation Grand Prize. Featuring outstanding maneuverability, the Good Design Award is another stellar achievement for the excavator.	Main Products Hydraulic excavators Mobile cranes Road machinery
Industrial Machinery	We handle products referred to as heavy machinery. They include forging presses for producing components for automobile engines, large cranes for shipyards and ports, steam turbines for private power generation at factories, automated warehouse systems etc.	Main Products Forging presses Material handling systems Logistics & handling systems Turbines Pumps
Ships	We specialize in midsized tankers with a capacity in the 100,000 ton class. By narrowing down the types of ships, we have raised development efficiency and we take pride in a low fuel consumption that is in the top class for the industry.	Main Products Ships
Environmental Facilities & Plants	We also handle boilers that are 100% biomass fuel compatible, and energysaving effluent treatment facilities. Our products also include exhaust gas processing facilities that do not use water, and facilities for recovering metals from waste.	Main Products Power generation systems, industrial wastewater treatment systems, water and sewage treatment systems, landfill leachate treatment systems, air pollution control plants, process equipment for chemical plants, reactor vessels, mixing reactors, steel structures, food processing machinery



Company name	Sumitomo Heavy Industries, Ltd.
Founded	November 20, 1888
Incorporated	November 1, 1934
Head Office	1-1 Osaki 2-chome, Shinagawa-ku, Tokyo







Net sales ratio by region (FY2010)

10%

548

billion yen

1%

Net sales ratio by segment (FY2010)



Other	Construction Machinery
Environmental Facilities	Machinery Components
& Plants	Precision Machinery
Ships	
Industrial Machinery	



3



Capital	30,871,650,000 yen
Number of employees	Consolidated: 17,025
Net sales	Consolidated: 548,015 million yen



#### Changes in net income













Capable of pinpointing and picking off cancer cells, outstanding in terms of its gentle therapy effect on







Responds to wide-ranging customer needs with a sophisticated quality assurance system. At oil refineries, the coke drums are capable of processing heavy oil in the most efficient manner

Plays a part in a range of

compact machinery to the

world's largest machines.

Oil Refineries 3

forging scenarios fror

Semiconductor Factories 5 Ion implantation system

> Delivering high productivity with high precision and high quality Compatible with 65 nm ultrafine LSI. Implants ion n wafers



performance at the

international top leve

Contributes to processing SOx, NOx and dioxins in exhaust das. Treats exhaust gas without using water.

#### Advanced technologies with confidence and results that respond to the needs of the times.

We are proud to have delivered about 6,500 turbines to approxi nately 80 countries worldwide

#### Dry-type desulphurization-denitrification system

### Container transfer crane Harbors 10



#### environmental issues caused by heavy fuel consumption, black smoke and other exhaust gases. By adopting a hybrid system, we have kept maximum engine output to about 1/3, reduced fuel consumption by approximately 60%, and reduced exhaust das

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Close Up

Close Up

#### The SAT-Chel® wastewater treatment system received the Chairman's Prize from the Japan Society of **Industrial Machinery Manufacturers**

#### - Sumitomo Heavy Industries Environment Co., Ltd. -

In July 2010, the SAT-Chel® was awarded the Chairman's Prize from the Japan Society of Industrial Machinery Manufacturers in appreciation of its performance.

Installed in the pre-treatment stage of an anaerobic wastewater system, SAT-Chel® solubilizes insoluble matter (SS) and recovers methane gas. The system is acclaimed for its excellent environmental performance including cutting CO<sub>2</sub> emissions through waste reduction, effective utilization of energy and reduced power consumption.

#### Reducing excess sludge

With conventional methods, insoluble matter flushed into wastewater is turned into concentrated sludge and separated out during pre-processing, then mixed with the waste sludge that is generated during post-processing and desiccated before discharge, but the separation treatment during pre-processing requires both high costs and energy. With SAT-Chel®, chemical processing and physical manipulation are applied to insoluble matter to reduce the amount of concentrated sludge generated by more than 40%. In fact, there have been reports of 45% reductions at facilities where the system has been introduced.



#### Energy conservation

Hardly any electric power is required for the facility, which runs on a single compact centrifugal pump. A separate heat source for steam is required, but it is possible to recover methane gas to generate heat by means of methane fermentation of the solubilized liquid. Since the equipment recovers more energy than it uses for heating, it is possible to make effective use of energy.

#### SAT-Chel<sup>®</sup> facility for solubilizing insoluble matter

#### Special Features

- A simple flow for solubilizing early sediment sludge waste sludge (activated sludge)
- Solubilization ratio of 40-65%
- Solubilization in a single tank
- Excess caustic soda is utilized effectively for methane fermentation

#### Solubilization principles/treatment flow

Hydrolysis, heating of SS by adding caustic soda Accelerate SS denaturation, dissolution by means of (heat energy) Caustic soda Steam



# Close Up

#### Biomass boiler awarded the Director-General's Prize from the Industrial Science and Technology Policy and Environment Bureau of Japan's Ministry of Economy, Trade and Industry - Energy & Environment Group -

In July 2010, the circulating fluidized bed (CFB) boiler for private power generation was awarded the Director-General's Prize from the Industrial Science and Technology Policy and Environment Bureau of Japan's Ministry of Economy, Trade and Industry in appreciation of its performance.

Depending on the method of combustion, there are several categories of boilers for private power generation, but the CFB boiler is notable for its compatibility with a range of solid fuels. It facilitates effective use of low-grade coal, woody biomass such as building scraps or thinned wood, waste tires or other new energy fuels. The boilers are expected to be an effective means for users to reduce CO<sub>2</sub> emission as they handle biomass fuels, which are fuels that do not emit CO<sub>2</sub>. For example, overseas there are many resources, such as residue from palm trees, which are discarded as is without utilization. In step with increased demand for energy, the facility will be able to contribute to environmental protection around the globe by making effective use of these resources.

# Close Up 3

### Low-emission construction machinery certification for the hybrid hydraulic excavator

- Sumitomo (S.H.I.) Construction Machinery Co., Ltd. -

In April 2011, the SH200HB-5 LM model of hybrid hydraulic excavator from Sumitomo (S.H.I.) Construction Machinery was certified as lowemission construction machinery by the Ministry of Land, Infrastructure and Transport.

The LM specification refers to a lifting magnet, which is used when handling metal scrap. Power generated by deceleration in swing-and-dump maneuvers is used to drive the motor and to support engine output, thereby improving fuel efficiency.

In January 2009, this excavator was launched as the world's first hybrid model with a magnet specification. Compared to conventional models, the new model that went on sale in 2008 achieved a 25% improvement in fuel consumption, but compared to that new model, this model has improved fuel consumption by another 20%.





#### Boiler diagram





# **Sumitomo Heavy Industries Group Third Medium-Term Environmental Plan**

To fulfill its responsibilities as a global corporation, the Sumitomo Heavy Industries Group has drafted a set of environmental policies based on fundamental environmental philosophies, and is working toward their implementation. Since FY2005, we have developed "activities to prevent global warming" in stages to help combat global warming, which represents a severe threat to the environment.

We have formulated the third medium-term environmental plan targeting the period from FY2011 to FY2013. Based on this plan, the SHI Group aims to be a corporation that contributes to the protection of the global environment and reduction of the environmental burden through products and production activities. We will continue to coexist with local communities, fulfilling our social responsibilities to protect the global environment as a member of the community, and contributing to the sustainable development of society.

#### Basic Policies of the Third Medium-Term Environmental Plan

The Sumitomo Heavy Industries Group aims to be a Global Excellent Company that contributes to implementing the sustainable development of society by holding fast to the "Sumitomo Business Spirit" and keeping its sights set on the 2020 low-carbon society as a long-term vision.

In the third medium-term environmental plan, we are keeping the medium-term management plan in mind while reflecting on the second medium-term environmental plan and recognizing anew the environmental issues expected from 2011 onward as we work to protect the global environment.

# >FY2011-2013

Third Medium-Term **Environmental Plan** 

Zero emissions factories Expanding environmentally friendly "first-class products"

Prevent global warming

#### >FY2008-2010

Second Medium-Term **Environmental Plan** 

Activities to reduce CO<sub>2</sub> emissions (Improve energy productivity) Extend to overseas Group companies Managing harmful substances, biodiversity

#### Sumitomo Heavy Industries Group: **Environmental Management Activities**

#### >FY1995-

Established Sumitomo Heavy Industries Environmental Policy (1997) Established Sumitomo Heavy Industries Group Environmental Policy (1999) (Pollution prevention activities ISO14001 acquisition and support)

> **Sumitomo** Heavy Industries Group

#### >FY2005-2007

First Medium-Term **Environmental Plan** Start of activities to prevent global warming (Reducing use of electricity, reducing use of paper, green logistics)

# Prevent air pollution

Environmenta consideration Reduce power consumption

#### We will continue to contribute to the implementation of the low-carbon society by providing products that are in line with the times. Biomass

Renewable energies

Prevent water pollution

Zero emission

Effective utilization of energy

>FY2000-2004

Environmental Management Activities Pollution prevention activities, ISO14001 acquisition and support Waste reduction and recycling

Environmental risk management

Sumitomo Heavy Industries Group **Environmental Policy** 

Third Medium-Term **Environmental Plan** 

Policy for the fiscal year

Environmental management system



Community contribution



Reduce CO<sub>2</sub>

Energy conservation

Hybrid

Reduce waste

# **Environmental Management System**

At Sumitomo Heavy Industries Group, we have been promoting environmental management with awareness that business corporations have social responsibilities for protecting the global environment, for preserving the local environment, and for engaging in economic activities that are oriented toward recycling.

#### Sumitomo Heavy Industries Group Environmental Philosophy

The Sumitomo Heavy Industries Group contributes to implementing sustainable development of society by holding fast to the "Sumitomo Business Spirit."

The Sumitomo Heavy Industries Group is taking action across the Group to protect the global environment.

#### **Environmental Policy**

In order to implement the sustainable development of society, we must respond to global environment issues and reduce the burden on the environment posed by various aspects of corporate activity. To do so, the Group is promoting autonomous and proactive initiatives to protect the environment.

In 1992, we established the Environmental Committee to promote environmental protection and compliance in local communities. In September 1997, we established the Sumitomo Heavy Industries Environmental Policy in order to drive home the message of environmental management.

In addition, in order to clarify the basic policy of activities across the Group, we established the Sumitomo Heavy Industries Group Environmental Policy in November 1999, expanding environmental management across the Group as a whole including overseas facilities.

Sumitomo Heavy Industries Group Environmental Policy

- Consideration of the impact on the environment around the facilities
- Prevention of environmental pollution
- Waste reduction
- Saving energy / Saving resources / Promoting recycling



#### **Environmental Management**

We have established an Environmental Management Division in the General Affairs Group, which draws up the medium-term environmental plan (the current third medium-term environmental plan runs from FY2011 to FY2013), environmental goals on an annual basis, and develops environmental management across the Group including personnel training.

The medium-term environmental plan and the annual environmental goals are rolled out across the Group after approval by the President and CEO.

#### **Environmental Management Audit**

#### Japan

Once a year, the Environmental Management Division conducts an audit of each works and Group company. The audit covers environmental management as a whole and its principal emphasis is on activities to prevent global warming. In order to improve performance and to implement continued improvements, the emphasis is placed on validating and verifying the systems. We also undertake extraordinary audits as the need arises.

The audit results are evaluated on a five-point scale based on independent evaluation standards for each department, the aim being to raise the levels.

#### Overseas

The Environmental Management Division undertakes documentation checks and on-site internal audits of each overseas corporation with the principal objective being activities to prevent global warming and environmental risk reduction.

In FY2010, we conducted audits at four factories in China and two factories in the United States.

We created a new environmental manager post in Shanghai, China, and we are implementing inspection and support for environmental activities across China as a whole.



/orks and divi ompanies witl	sions that have received ISO14001 certification hin the scope of certification	Group companies in Japan that hat independently received the ISO140	ve 101 certification		
Works / Divisions	orks / Group Companies within the Date of isions Scope of Certification Certification		Group Company	Date of Certification	
Sumiju Plant Engineering Co., Ltd.     Sumiju Business Ltd.		August 1998	Sumitomo NACCO Materials Handling Co., Ltd.	March 2000	
	Sumiju Tokki Service Co., Ltd.	, laguer 1000	Shin Nippon Machinery. Co., Ltd.	February 2002	
	Sumitomo (S.H.L.) Construction Machinery Co		Izumi Food Machinery Co., Ltd.	June 2002	
	Ltd.		SEN Corporation	October 2002	
01.11	Kenki Engineering Chiba Co., Ltd.	4 11 4 0 0 0	Sumiju Environmental Engineering Inc.	October 2002	
Chiba Works	Hitachi Sumitomo Heavy Industries Construction Crane Co., Ltd.     Sumitomo (S H L) Construction Machinery Sales	April 1999	Sumitomo Heavy Industries Environment Co., Ltd.	November 2002	
	Co., Ltd.		Lightwell Co., Ltd.	February 2005	
	Sumitomo Heavy Industries Marine & Engineering		Nihon Spindle Mfg. Co., Ltd.	March 2006	
Yokosuka	Co., Ltd. Sumiju Precision Forging Co., Ltd.	E 1 1000	Japan Electron Beam Irradiation Service Co., Ltd.	January 2007	
Works	<ul> <li>Sumiju Yokosuka Kogyo Co., Ltd.</li> <li>Environmental Engineering Center of Sumitomo</li> </ul>	February 1999	Sumitomo Heavy Industries PTC Sales Company	September 2007	
	Heavy Industries Environment Co., Ltd.		SFK Co., Ltd.	August 2008	
Hitachi Sumitomo Heavy Industries Construction			Seisa Gear, Ltd.	August 2009	
Nagoya Works	Crane Co., Ltd.	January 1999	Sumitomo Heavy Industries Modern, Ltd.	December 2009	
Sumiju Tomida Machinery Co., Ltd.     Sumiju Technos Co., Ltd.			Group companies outside Japan th	nat have	
Okayama	<ul> <li>Sumitomo Heavy Industries Finetech, Ltd.</li> </ul>	March 2000	Independently received the ISO140	01 certification	
Works			Overseas Group Company	Date of Certification	
Ehime Works	<ul> <li>Sumitorio Heavy industries feditio-rolt Co., Etc.</li> <li>Sumitorio Heavy Industries Engineering &amp; Services Co., Ltd.</li> </ul>	November 1000	Sumitomo (SHI) Demag Plastics Machinery GmbH (Wiehe factory)	April 1998	
Factory)	<ul> <li>Sumitomo Heavy Industries Himatex Co., Ltd.</li> <li>Sumiju Plant Engineering Co., Ltd.</li> </ul>	November 1999	Sumitomo (SHI) Cyclo Drive Germany GmbH	March 2006	
	<ul> <li>Sumiju Techno Craft Co., Ltd.</li> </ul>		Sumitomo (SHI) Cryogenics of Europe, Ltd.	June 2008	
Sumitomo Heavy Industries Process Equipment			Ningbo Sumiju Machinery, Ltd.	September 2008	
(Saijo Factory)	Co., Ltd • SHI Examination & Inspection, Ltd.	February 1999	SHI Manufacturing & Services (Philippines) Inc.	January 2011	
Energy &			Sumitomo (SHI) Cyclo Drive China Ltd.	May 2011	
Environment Group	Sumiju Environmental Technology Co., Ltd.	October 2002	Sumitomo (SHI) Demag Plastics Machinery GmbH (Schwaig factory)	July 2011	

### ISO14001 Certification

#### Japan

Twenty-one of the main departments (works, divisions, Group companies) have acquired ISO14001. In Japan, all principal manufacturing divisions have completed the ISO certification.

#### Overseas

At present, six companies and seven factories have obtained the certification. Link-Belt Construction Equipment Company, which manufactures construction equipment in the United States, Sumitomo Heavy Industries (Tangshan) Ltd., which manufactures speed reducers in China, and Sumitomo (S.H.I.) Construction Machinery (Tangshan) Co., Ltd., which manufactures construction machinery in China, are planning to acquire the certification in FY2011.

# **Environmental Objectives** (Medium-Term Plan) and Results

The Sumitomo Heavy Industries Group has drafted the second medium-term plan that specifies the targets to be achieved by the end of FY2010 and has been continuing with its efforts to reduce the burden on the environment.

#### Entire View of the Burden on the Environment (Sumitomo Heavy Industries Group)



#### **Environmental Accounting for FY2010**

As a yardstick for measuring the investment, expenditure and effect of environmental protection, we have conducted environmental accounting in accordance

with the Environmental Accounting Guidelines, 2005, issued by the Ministry of the Environment.

Cost of Environmental Protection (Accounting Base: Sumitomo Heavy Industries Group) Unit: million year						
	Category	Details of the main activities and the effects	Investment amount	Costs	Economic effect	Main content
(1) Co Ar	osts within Business eas (Sites)	Handling or processing water, air, noise, vibration, chemical substances, and waste materials; reducing energy and resource consumption; and recycling materials	372	495	246	
uwc	(1)-1 Costs for Preventing Pollution	Renovation of wastewater treatment facilities; implementing measures to collect dust, for handling substances containing volatile organic compounds (VOC), and for removing asbestos; inspections for detecting extremely small PCB content; operation control of water treatment facilities; measuring and analyzing water quality, exhaust gas, noise and vibration; and ensuring compliance with the values stipulated in regulations.	151	230	18	Reducing cost of wastewater treatment
Breakd	(1)-2 Costs for Global Environment Protection	Power monitoring, equipment to conserve energy, updated lighting, energy conservation investment, temperature control	216	41	227	Cost reduction with introduction of energy conservation, natural energy
	(1)-3 Resource Recycling Costs	Recycling waste products, including wood, plastic, used paper, oil waste and raw garbage; creating waste yards; regenerating thinner; collection, transportation, processing, and disposal of waste; and implementing steps to reduce the volumes of waste	5	224	1	Reducing landfill by separating rubbish, cost reduction by cutting back on waste
(2) Up Do	ostream and ownstream Costs	Cost of cutting paper to use reverse side	0.0	0.4		
(3) M Co	anagement Activity osts	Administering and maintaining ISO14001 standards; providing training (general, specialized, screening panel, for internal auditing); monitoring the implementation of action plans; receiving regular screening; expansion and maintenance of green areas; confirmation of PRTR; and measurement of VOC	13	139		
(4) Research and Development Costs		Researching and developing energy-saving products and renewable energy; developing technologies to counter corresion in metting chlorine furnaces; developing combustion technologies for high alkaline fuel for CFB boliers; researching improved fuel consumption for ships; Developing high-efficiency motors; energy conservation; developing commercial versions of compact (resource-saving) equipment (water treatment); developing forklifts; emission control responses; other environmental responses; developing energy-saving products	787	654		
(5) Cost of dealing with environmental damage Levies on air pollution loads; share of compensation for contamination and green belts charged to regional corporations		Levies on air pollution loads; share of compensation for contamination and green belts charged to regional corporations	0	1		
		Total	1,172	1,289	246	

Unit: million yen

Item	Description	Amount
Total amount of investment made in the period	Renovations of wastewater treatment facilities; Maintaining sewage systems; Installing oil-water separating tank; Upgrading transformers (high-performance); Lighting INV and scaling back on lighting; Investing in energy conservation measures; Upgrading air conditioning; Upgrading lighting; Upgrading compressors	1,172
Total cost assumed in the period	Recycling, collecting, transporting, processing and disposing of waste; Inspections to detect extremely small amounts of PCBs; Operational control of waste water treatment facilities; Measuring water quality, exhaust gas, noise and vibration; Administering and maintaining ISO14001; Providing training; Monitoring implementation of action plans; Fixed term; Updated inspections	1,289
Total cost of research and development in the period	Researching and developing energy-saving products and renewable energy; developing technologies to counter corrosion in melting chlorine furnaces; developing combustion technologies for high alkaline fuel for CFB boliers; researching improved fuel consumption for ships; Developing high-efficiency motors; energy conservation; developing commercial versions of compact (resource-saving) equipment (water treatment); developing forklifts; emission control responses; other environmental responses; developing energy-saving products	1,441
Cost of disposal of valuables etc. in the period	Effective utilization of remainder materials such as metal scraps etc.	255
	Total cost of environmental protection activities during the period	2,461

#### Activities in FY2010 - General Overview

In order to contribute to the prevention of global warming, we have set a target to reduce overall CO<sub>2</sub> emissions by 16% compared to FY2004 levels, but in FY2010 we achieved a 24% reduction. The table below outlines the achievement.

Production in COp- emasure a work and best work of the second by P2010 (25% exclusion norm P1000 level by P2010 (25% exclusion norm P2000 level by P2010 (2	Index	Item	Second Medium-Term Plan (2008 – 2010)	Achievements in FY2010	Evaluation	Third Medium-Term Plan (2011 – 2013)	Plans for FY2011
Promotion (a) Cabba Werning Promotion Construction Producting Promotion Construction Promotion Construction Promotion Construction Promotion Construction Promotion Construction Promotion Construction Promotion Construction Promotion Construction Promotion Construction Promotion Construction Promotion Construction Promotion Construction Construction Promotion Construction Construction Construction Construction Construction Construction Construction Construction Construction Construction Construction Constructi		<ol> <li>Reduction in CO2 emissions at works and offices</li> </ol>	Reduction by 16% from the FY2004 level by FY2010 (25% reduction over FY1990 levels)	Reduction by 24% from the FY2004 level	0	Reduction by 19% from FY2004 levels by FY2013 (28% reduction over FY1990 levels)	Reduce CO <sub>2</sub> emissions by 17% from FY2004 level (26% reduction over FY1990 levels) (Target exceeds medium- term plan)
Permitting         © Relating scores for process imponentent         We raised for a score by process imponentent         Process for process imponentent         Process for process imponentent         Relation to y 42% from the Process for Pr2008 level         Process for process imponentent         Relation to y 42% from the Pr2005 level         Process for process imponentent         Relation to y 42% from the Pr2005 level         Process for process imponentent         Relation to y 42% from the Pr2005 level         Process for process imponentent         Relation to y 42% from the Pr2005 level         Process for process imponentent         Relation to y 42% from the Pr2005 level         Process for process imponentent         Relation to y 42% from the Pr2005 level         Process for process imponentent         Relation to y 42% from the Pr2005 level         Process for process imponentent         Relation to y 42% from the Pr2005 level         Precess for process imponentent         Relation to y 42% from the Pr2005 level         Precess for process imponentent         Relation to y 42% from the Pr2005 level         Precess for process imponentent         Relation to y 42% from the Pr2005 level         Precess for process imponentent         Relation to y 42% from the Pr2005 level         Precess for process imponentent         Relation to y 42% from the Pr2005 level         Precess for process imponentent         Relation to y 42% from the Pr2005 level         Precess for process for process imponentent         Relation to y 42% from the Pr2005 level         Precess for process f	Prevention of Global	Improved energy productivity Energy productivity = Net sales/CO <sub>2</sub> emissions (CO <sub>2</sub> reduction due to productivity improvements at factories)	Improvement by 4% compared to FY2008	Reduction of 10.4% for the Group		By FY2013, a 7% improvement in the energy productivity indicator compared to FY2008	Improvement by 5% compared to FY2008
Promotion of previous logiest phases that 30 or provide logiest phase	warming	③ Raising scores for process improvement	We raised the score for process improvement activities by three points compared to FY2008 levels	Improved score by three points for the Group	O	Achieve the in-house benchmark of a four point score for process improvement activities across all departments	Raise the score by 0.4 points
Promotion of gene highest of a provide of a provide of the pr		④ Reduction in paper usage	Reduction by 40% from FY2005 level by FY2010	Reduction by 49% from the FY2005 level	0	Reduction by 45% from FY2005 level by FY2013	Reduction by 42% from the FY2005 level
Permotion of Promotion of Recurcion and Recycling         • Reduction in volume of waste generated and disposed of         • Amound generated in P2020 is less than 30,420 tons (Down 10% from P2020 it less)         • Amound generated in P2020 is less in 30,420 tons (Down 10% from P2020 is less)         • Amound generated in P2020 is less in 30,420 tons (Down 10% from P2020 is less)         • I3% enduction in amount generated compared to P20207 levels investige           • Requestion on Revelope entissions         • Achieve zaro emissions factories         • Achieve zaro emissions factories         • Achieve zaro emissions factories         • Achieve zaro emissions factories           • Reduction in water usage         • Reduction by 20% from P2000 is level by P2010 it han, am for zaro emissions factories         • Reduction by 25% from the P2005 level         • Reduction by 25% from the P2005 level         • Reduction by 25% or more from the P2005 level         • Reduction by 25% or more from the P2005 level         • Reduction by 25% or more from the P2005 level         • Reduction by 25% or more from the P2005 level         • Reduction by 25% or more from the P2005 level         • Reduction by 25% or more from the P2005 level         • Reduction by 25% or more from the P2005 level         • Reduction by 25% or more from the P2005 level         • Reduction by 25% or more from the P2005 level         • Reduction by 25% or more from the P2005 level         • Reduction by 25% or more from the P2005 level         • Reduction by 25% or more from the P2005 level         • Reduction by 25% or more from the P2005 level         • Reduction by 25% or more from the P2005 level         • Reduction by 25% or mor		⑤ Promotion of green logistics Reduction in CO <sub>2</sub> emissions in transportation	Target for FY2010: Reduction by 11% per basic unit of transportation compared with the figure for FY2006 as the benchmark.	Reduction by 14% from the FY2006 level	O	By FY2013, 14% reduction per basic unit of transportation against FY2006 benchmark	12% reduction per basic unit of transportation against FY2006 benchmark
Conservation and Regring and Regring <ul> <li>Achievement of zero emissions</li> <li>Achievement of zero emissions</li> </ul> Athin recycling rate of 99.5% rectories              Achieve zero emissions factories              Achieve zero emissions	Promotion of Resource	<ol> <li>Reduction in volume of waste generated and disposed of</li> </ol>	<ul> <li>Amount generated in FY2010: less than 30,420 tons (Down 10% from FY2007 level)</li> <li>Amount of disposal: less than 300 tons (below 1% of target value for volume generated) Then, aim for zero emissions factories</li> </ul>	Amount generated: 28,020 tons (Down by 17% from FY2007 levels)     Amount of disposal: 143 tons (0.5% of volume generated)	0	13% reduction in amount generated compared to FY2007 levels	11% reduction in amount generated compared to FY2007 levels
Image: Promotion of Promotion of equipment that uses PCB (Law Concentrations of PCB Buildion of use Pr22005 level         Reduction by 25% from the Pr22005 level         Reduction by 25% or more from the Pr22005 level         Reduction by 25% or more from the Pr22005 level         Reduction by 25% or more from the Pr22005 level         Reduction by 25% or more from the Pr22005 level         Reduction by 25% or more from the Pr22005 level         Reduction by 25% or more from the Pr22005 level         Reduction by 25% or more from the Pr22005 level         Reduction by 25% or more from the Pr22005 level         Reduction by 25% or more from the Pr22005 level         Reduction by 25% or more from the Pr22005 level         Reduction by 25% or more from the Pr22005 level         Reduction by 25% or more from the Pr22005 level         Reduction by 25% or more from the Pr22005 level         Reduction by 25% or more from the Pr22005 level         Reduction by 25% or more from the Pr22005 level         Reduction by 25% or more from the Pr22005 level         Reduction by 25% or more from the Pr22005 level         Reduction by 25% or more from the Pr22005 level         Reduction by 25% or more from the Pr2205 level         Continue complete abolition of diabioned from the Pr2205 level         Continue complete abolition of or use of the terastrone statistic complete abolition continues of the Pr2205 level         Continue complete abolition of use of the terastrone statistic complete abolition continues of the Pr2205 level         Continue complete abolition of use of the terastrone statistic complete abolition continues of the Pr2205 level         Continue complete abolition of use of the terastrone statistic com the Pr2205 level         Complete abolition of use tera	and Recycling	<ul> <li>Achievement of zero emissions</li> </ul>	Attain recycling rate of 99% or more by FY2010. Then, aim for zero emissions factories	Recycling rate of 99.5%	0	Achieve zero emissions factories	Achieve zero emissions factories
Promotion of gragenetinon fail         • Complete abolition of the hamful chemical substances dichoromethane, tetrachlored tyles and trichoromethane, tetrachlored tyles of contamination Countermeasures Law, Montreal Protocol)         • Complete abolition of the hamful chemical substances dichoromethane, tetrachlored tyles of contamination Countermeasures Law, Montreal Protocol)         • Complete abolition of the hamful chemical substances trichoromethane, tetrachlored tyles of contamination Countermeasures Law, Montreal Protocol)         • Complete abolition of the substances HCFC-141b, HCFC-225 by 05% for more form the Protocol         • Complete abolition of use         • Complete abolition of use         • Complete abolition of use           Promotion of Prevention of Environmental Pollution         • Emission control of substances designated as COC (Air Pollution Control Law)         • Complete abolition of tetra tables det ty 23% from the Pr2006 level         • Complete substances designated as COC (Air Pollution Control Law)         • Complete abolition of use         • Complete abolition of use         • Reduced by 33% from the Pr2006 level         • Reduced by 33% from the Pr2006 level         • Complete abolition of use           • Total prohibition of use 0 Total prohibition of use for equipment with high concentrations of PCB Waste)         • Total prohibition of use         • Control of supported by atters top of equipment with a low concentration of PCB         • Total prohibition of use         • Complete abolition of previormental societies and concentrations of PCB         • Complete abolition of use         • Complete abolition of previormental societies and complete abolition of oreasures for gen procurement substances         <		③ Reduction in water usage	Reduction by 20% from FY2005 level by FY2010	Reduction by 25% from the FY2005 level	O	Reduction by 25% or more from the FY2005 level	<ul> <li>Reduction by 22% or more from the FY2005 level</li> <li>Toward non-attainment in zero divisions</li> </ul>
Promotion of Prevention of Environmental Pollution <sup>®</sup> Emission control of substances designated as VOC (Air Pollution Control Law)       Controlled emission of painting solvents, mainly toluene, xylene, and ethylpenzen. Reduced by 23% from the FY2006 level       Reduced by 33% from the FY2006 level       Reduced by 33% from the FY2006 level         Pollution <sup>®</sup> Total abolition of equipment that uses PCB (Law Concerning Special Measures Against PCB Waste)          Total prohibition of use <sup>®</sup> Complete early registration of equipment with high concentration of PCB <sup>®</sup> Complete early registration of equipment with high concentrations of PCB @ Investigation of low concentrations of Law users) <sup>®</sup> Complete early registration of equipment with high concentrations of equipment with high concentration of PCBs <sup>®</sup> Total prohibition of use          Expansion of Line-up of Environmentally Friendly Products          Promotion of measures for gree procurement (purchase of raw materials and components)          Respond to customers' requests by guaranteeing that shipped products do not contain prohibited substances.          Continue in accordance with the Green Procurement Guidelines          Review Green Procurement Guidelines; Develop regulations for prohibited substances		<ol> <li>Emission control of organochlorine chemicals (Soil Contamination Countermeasures Law, Montreal Protocol)</li> </ol>	Complete abolition of the harmful chemical substances dichloromethane, tetrachloroethylene and trichloroethylene under the Soil Contamination Countermeasures Law by FY2010     Reduction in ozone depleting substances HCFC-141b, HCFC-225 by 50% or more from the FY2006 level by FY2010	Compared with FY2005 • Dichloromethane reduced by 98%, trichloroethylene reduced by 92%, tetrachloroethylene complete abolition continues • HCFC-141b completely abolished, HCFC-225 complete abolition continues	0	Continue complete abolition of use	Complete abolition of dichloromethane, trichloroethylene, complete abolition of tetrachloroethylene continues Continue complete abolition of ozone depleting substances, HCFC-141b, HCFC-225
Image: State of the substances	Promotion of Prevention of Environmental Pollution	<ul> <li>Emission control of substances designated as VOC (Air Pollution Control Law)</li> </ul>	Controlled emission of painting solvents, mainly toluene, xylene, and ethylbenzen. Reduction by at least 30% from the FY2006 level to be achieved by FY2010	Reduced by 23% from the FY2006 level	0	Reduced by 33% from the FY2006 level	Reduced by 31% from the FY2006 level
Expansion of Line-up of Environmentally Friendly         Promotion of measures for green procurement (purchase of raw materials and components)         Respond to customers' requests by guaranteeing that shipped products do not contain prohibited substances.         Continue in accordance with the Green Procurement Guidelines; Develop regulations for prohibited substances         Review Green Procurement Guidelines; Develop regulations for prohibited substances		③ Total abolition of equipment that uses PCB (Law Concerning Special Measures Against PCB Waste)	Total prohibition of use (1) Early registration of equipment with high concentrations of PCB (2) Investigation of low concentrations	<ol> <li>Complete early registration of equipment with high concentration of PCB</li> <li>Investigation continuing for equipment with a low concentration of PCBs</li> </ol>	0	Total prohibition of use	<ol> <li>Complete early registration with the Japan Environmental Safety Corporation of equipment with high concentration of PCB. Dispose of appropriately after receipt of disposal notice</li> <li>For low concentrations, replace and store in accordance with plans</li> </ol>
1) Zero environmental Zero environmental accidents (legal violations) Ligad violations)	Expansion of Line-up of Environmentally Friendly Products	Promotion of measures for green procurement (purchase of raw materials and components)	Respond to customers' requests by guaranteeing that shipped products do not contain prohibited substances. Have the suppliers guarantee that the products they deliver do not contain prohibited substances.	Continue in accordance with the Green Procurement Guidelines	0	Review Green Procurement Guidelines; Develop regulations for prohibited substances	Review Green Procurement Guidelines; Develop regulations for prohibited substances
		<ol> <li>Zero environmental accidents (legal violations)</li> </ol>	Zero environmental accidents (legal violations)	Five environmental accidents (legal violations)		Zero environmental accidents (legal violations)	Zero environmental accidents (legal violations)
Image: Plan and push for obtainment by Group ISO14001 certifications         Plan and push for obtainment by Group companies         Obtained by two overseas companies         Expand certification at overseas factories to 10 companies         To be obtained by three overseas companies		② Increase in the number of ISO14001 certifications	Plan and push for obtainment by Group companies including overseas	Obtained by two overseas companies	0	Expand certification at overseas factories to 10 companies	To be obtained by three overseas Group companies
Environmental Management           Image: Sexpansion of the scope of the Consolidated Environmental Management         Conduct audits and research into the risk associated with the principal overseas manufacturing bases to avoid risks and to promote measures for environmental activities.         Image: Conduct audits and research into the risk associated with the principal overseas manufacturing bases to avoid risks and to promote measures for environmental activities.         Image: Conduct audits and research into the risk associated with the principal overseas manufacturing bases to avoid risks and to promote measures for environmental activities.         Image: Conduct audits and research into the risk associated with the principal overseas manufacturing bases to avoid risks and to promote measures for environmental activities.         Image: Conduct audits and research into the risk associated with the principal overseas manufacturing bases (Conduct environmental audits of overseas factories (United States, China)         Image: Conduct audits and research into the risk associated with the principal overseas manufacturing bases         Image: Conduct audits and research into the risk associated with the principal overseas manufacturing bases         Image: Conduct audits audits of overseas factories (United States, China)         Image: Conduct audits audits and research into the risk associated with the principal overseas manufacturing bases         Image: Conduct audits audits of overseas factories (United States, China)         Image: Conduct audits audits audits audits of overseas factories         Image: Conduct aud	Environmental Management	③ Expansion of the scope of the Consolidated Environmental Management	Conduct audits and research into the risk associated with the principal overseas manufacturing bases to avoid risks and to promote measures for environmental activities.	<ul> <li>Continue environmental reviews at principal overseas manufacturing bases (collect environmental data, risk management)</li> <li>Conduct environmental audits of overseas factories (United States, China)</li> </ul>	0	Expand to principal overseas manufacturing bases	<ul> <li>Local guidance by head office, periodic environmental audits</li> <li>Post full-time staff to Shanghai, create a network</li> <li>Raise the level of education for environmental managers at Chinese factories</li> </ul>
Contribute to biodiversity     Carry out systematic tree-planting and growing programs in all areas     Carry out systematic tree-planting and growing programs in all areas     Carry out systematic tree-planting and growing programs at factory premises     Expand tree-planting and growing programs at factory premises     Carry out systematic tree-planting and growing programs at factory premises		Contribute to biodiversity	Carry out systematic tree-planting and growing programs in all areas	Carry out systematic tree-planting and growing programs in all areas	0	Expand tree-planting and growing programs at factory premises	Expand tree-planting and growing programs at factory premises

We are pushing ahead with the third medium-term environmental plan (FY2011-FY2013) based on reflection of the second medium-term environmental plan.

# **Global Warming Prevention Activities**

In its business activities, including procurement, manufacturing and logistics, Sumitomo Heavy Industries Group has been taking measures to reduce  $CO_2$  emissions by positioning it as the most important issue.

#### Promoting Environmental Management

In the Sumitomo Heavy Industries Group, activities to prevent global warming are positioned as a part of environmental management with discussions conducted at evaluations by the President on visits to the manufacturing floor. The results from each business division are fed back for monthly processing at the Environmental Management Division. The results are also announced at the quarterly meetings of the Executive Board. Each division in the Group promotes activities to prevent global warming and is engaged in activities to improve a range of processes in order to further enhance the efficient use of energy and to "visualize" activities and initiatives through "the participation of all employees."

#### **Reducing CO<sub>2</sub> Emissions**

The Sumitomo Heavy Industries Group started to take action in FY2005 with the First Medium-Term Environmental Plan to reduce  $CO_2$  emissions by 10% from FY2004 levels by FY2007. As of FY2008, we launched the Second Medium-Term Environmental Plan aiming to further reduce  $CO_2$  emissions by 16% from the FY2004 level by FY2010. Compared to the benchmark year of FY1990 for the Kyoto Protocol, the target is to achieve a 25% reduction.

In FY2010 we were able to control emissions to far exceed the target with a 24% reduction over FY2004 levels and a 32% reduction over FY1990 levels.

#### **Energy Productivity**

While being mindful of the business characteristics of the SHI Group, we have developed monthly management and operations at each Business Unit since FY2009 using the new energy productivity (net sales/CO<sub>2</sub> emissions) indicator, which is a consolidated indicator.

As for the FY2010 target value for energy productivity, we set a numerical value of a 4% improvement over FY2008, which is at the top level in comparison with other companies. We have set a target of a 7% improvement over FY2008 levels as the target value for the medium term in FY2013. In terms of FY2009 energy productivity for the whole SHI Group, we achieved the target with an improvement of 3% against the target of a 2% improvement over the FY2008 standard, but FY2010 finished down with a shortfall of 10%. The reason is that net sales were brisk in FY2008, but in FY2010 there was a decrease in net sales due to the impact of the collapse of Lehman Brothers and some departments were unable to achieve the appropriate reductions in  $CO_2$  emissions.

- In the future, we will redouble our efforts to
- Concentrate operating hours
- Ø Minimize standby power
- 8 Minimize working areas
- 4 Make effective use of facilities.

#### **Promoting Green Logistics**

In transportation, we have been making efforts to reduce  $CO_2$  emissions by eliminating waste and by improving efficiency. With FY2006 as the benchmark year, we aimed to achieve an 11% reduction in the basic unit of transportation (t- $CO_2$ /t) in FY2010. Through measures such as a switch to modal shift, efficient transportation

planning and by making improvements to loading ratios, we exceeded the target with a 14% reduction in FY2010. We will be pushing activities toward the goal of a 12% reduction in FY2011 compared to FY2006 levels.



Loading a railway container

#### Activities to Reduce Paper Usage

Reducing paper use is part of activities to save resources and at the same time, it is linked to activities to prevent global warming such as reducing  $CO_2$  emissions in the papermaking process. In FY2013, the Sumitomo Heavy Industries Group aims for a 45% reduction compared to FY2005 levels.

In FY2010 we exceeded the target of a 40% reduction over FY2005 levels with a reduction of 49%.





#### Environmentally Friendly "First-Class Products"

The Sumitomo Heavy Industries Group has created systematic and voluntary standards across the Group such as carrying out Lifecycle Assessments\*, improving recycling rates at the time of disposal, reducing the volume of packaging, curtailing harmful substances contained in products, and developing products that consume less energy, weigh less, are more compact and last longer. We have launched initiatives for continuous improvements and evaluation based on these standards.

As a result, we targeted three products in FY2010: the biomass boiler (Energy & Environment Group), the hydraulic excavator (Sumitomo (S.H.I.) Construction Machinery Co., Ltd.) and the bag filter (Nihon Spindle Mfg. Co., Ltd.)

In the future, the main focus of our initiatives will be the expansion of environmentally friendly "first-class products."

\* Lifecycle Assessment: A method of objective and quantitative evaluation of environmental impact throughout the lifecycle (all stages from extracting the resources to manufacturing, use, disposal and transportation) of products and services



# Activities Directed Toward Creating a Society Based on Recycling

In order to build a recycling-oriented society, we at the Sumitomo Heavy Industries Group are controlling the discharge of waste generated by our business activities, reusing and making efficient use of resources as well as working on initiatives to reduce the environmental burden posed by our business activities.

# Measures for reducing the environmental burden

Establishing a society based on recycling is essential for ensuring the sustainable development of society. We manage our waste by classification into the three categories shown below. We aim to reduce the volume of waste generated through our business activities and put more emphasis on improving the recycling of waste. We also take action to reduce the burden on the environment by setting specific goals.

Waste for Disposal	Discarded as landfill or incinerated as unusable waste
Valuable Resources	Recycled for reuse. Metal scraps account for the main part.
<ul> <li>Waste for Recycling</li> </ul>	Discarded as waste, but recycled and later reused

#### Initiatives to reduce waste

#### Nagoya Works

In the past, the grinding sludge generated by processing machines was disposed of in landfills. In FY2010, we selected a new waste product processor to facilitate

recycling of the material as both an auxiliary fuel and material for steel products by solidification treatment and mixed compression with waste plastics. By stopping the use of landfill, we were able to achieve zero emissions.



#### Results of our initiatives in FY2010

Control of waste generated and reduction in the volume of waste discarded

In FY2013, we aim to reduce the volume of waste discarded by 13% compared to FY2007 levels. In FY2010, we worked to control the volume of waste including metal scraps, to eliminate wastefulness and to streamline production activities. Additionally, there was also a decline in production volume and we achieved the target for FY2010, keeping the volume of waste at 28,020 tons, which is a reduction of 17% compared to FY2007 levels. The target for waste disposal is less than 1% of the volume of waste. In FY2010, we achieved the target with a disposal volume of 143 tons, or 0.5%.

The outlook is for the volume of waste to grow due to increased production output in FY2011, but we are making efforts toward further reductions with a view to achieving the target.

#### Shin Nippon Machinery Co., Ltd.

As of FY2010, we selected a new waste processor and started to recycle the whetstone powder from grinders and the spent sand slag from sandblasting as material for roadbeds.

#### Ehime Works (Niihama Factory)

At Sumitomo Heavy Industries Himatex Co., Ltd. on the premises of the Niihama Factory, the shot dust generated when manufacturing chains is recycled as iron material. We are also promoting recycling by rigorously separating bricks and fibers when upgrading the furnace.

#### Achieving zero emissions

The definition of a zero emissions factory at Sumitomo Heavy Industries Group is a factory where the volume of waste for landfill is less than 0.5% of the volume of waste.

The zero emissions rate (landfill rate) was below 0.4% for the SHI Group as a whole in FY2010. However, on a per-factory basis, there are still factories that have not achieved the zero emissions status.

In FY2010, nine factories achieved zero emission status. In FY2011, we will take action to achieve zero emissions at all factories with initiatives to reduce the volume of landfill in addition to improving recycling rates.

#### **Overseas Environmental Initiatives**

#### Link-Belt Construction Equipment Company

For a period of 6 years, we have expanded the Lexington factory in order to build production structures for new product lineups. In this period, all departments have collaborated on initiatives to improve the environmental aspects as a part of CSR.

We have cut energy usage and increased both recycling and reuse to achieve a reduction of the environmental burden. Here, we would like to introduce several examples.

- We have reduced power consumption by 70% by replacing sodium-vapor lights in the ceilings with fluorescent lights and sensors to detect human presence.
- We have recovered exhaust heat from paint drying facilities and compressors at the factory to use for



#### **Reducing water consumption**

Reducing water consumption is linked to protecting resources and reducing discharge into public water systems. The Sumitomo Heavy Industries Group has set a target of reducing water consumption in FY2013 by 25% compared to FY2005 levels. In FY2010, we continued to identify water leaks and eliminate waste through the visual installation of water pipes (aboveground installation). As a result, we achieved the goal three years ahead of time with a 25% reduction from FY2005 levels. We aim for further reductions in FY2011.

heating the manufacturing area during the winter.

- By upgrading the natural gas combustion boilers, we improved efficiency by 10%.
- By reusing 64% of waste paint solvent, we achieved savings of USD13,000 in FY2010.
- By recycling factory waste, we reduced landfill expenditure by USD22,000 in FY2010.

At present, we are working toward the targets to reduce carbon dioxide emissions and to reduce paper, which is a new target. We also aim for a September registration to introduce the ISO14001.





# **Activities for Managing Chemical Substances**

We manage chemical substances with the aim of implementing prevention of environmental pollution.

# Complete abolition of organochlorine chemicals

Complete abolition of substances subject to the Soil Contamination Countermeasures Law

We have set a goal of completely eliminating by FY2011 the use of dichloromethane, tetrachloroethylene and trichloroethylene, which are organochemical substances subject to the Soil Contamination Countermeasures Law.

In FY2010, the total reduction for these three substances was 97% compared to the level in FY2005. By substance, the achievement breaks down as follows: dichloromethane was reduced by 98% from FY2005 level, surpassing the 54% reduction from FY2005 level in FY2009. With the introduction of substitutes, trichloroethylene has been reduced by 92% compared to FY2005 levels. Total abolition is slated for FY2011. Use of tetrachloroethylene was completely abolished as of FY2009.

# Management of PCB (polychlorinated biphenyl) and total abolition of equipment containing PCB

We have completed early registration of all equipment with high concentrations of PCB with the processing company, Japan Environmental Safety Corporation, and we have undertaken a systematic course of detoxification based on the Law Concerning Special Measures Against PCB Waste. In FY2010, we also investigated and upgraded equipment with low concentrations of PCBs. We are looking into processing of equipment that is in storage. By FY2010, we also undertook a major upgrade of lighting equipment with stabilizers and transformers containing PCBs. Total abolition of ozone depleting substances

We have worked toward the goal of total abolition of the ozone depleting substances HCFC-141b and HCFC-225 by FY2010.

We completely abolished the use of HCFC-225 as of FY2008 while HCFC-141b was completely abolished in FY2010 with the adoption of substitutes.

# Emission control of VOC (volatile organic compounds)

Toluene, xylene and ethylbenzene in paint solvents account for over 90% of the VOC we use. Our goal is to reduce emissions of these chemicals by at least 33% by FY2013 compared with the level in FY2006.

We have made progress with the reductions thanks to the introduction of solvent collection and removal equipment at our large-scale paint facilities, which are subject to legal controls. As a result, we saw reductions of approximately 23% in FY2010 compared to the level in FY2006. Measures to control VOC emissions in FY2011 continue on from FY2010 with the operation of solvent collection and removal equipment, expansion of powder paint, and the adoption of low-solvent paints to control emissions.



Storing transformers containing minute amount of PCB (Okayama Works)



# Emissions and transfer of PRTR substances

More than 90% of PRTR substances are paint solvents (toluene, xylene, ethylbenzene). In FY2010, we reduced these substances by 29% of the level in FY2006. We will continue to expand the use of low-solvent paint while ensuring that we maintain the quality of our products. We will also install and expand solvent collection and removal equipment to reduce the emission and transfer of PRTR substances.

Emissions and transfer volume of Class I Designated Chemical Substances under the PRTR Law in FY2010 (Substances subject to reporting)

(kg/year

	, 1 0,	(0),
Substance number	Substance designation	Emissions + transferred amount
53	Ethylbenzene	212,041
80	Xylene	476,425
87	Chrome and trivalent chrome compound	353
296	1, 2, 4-trimethylbenzene	1,356
297	1, 3, 5-trimethylbenzene	6,067
300	Toluene	189,687
349	Phenol	1,413
374	Hydrogen fluoride and its water- soluble salts	17,629
384	1-bromopropane	8,174
405	Boron and its compounds	2,317
412	Manganese and its compounds	16,008
448	Methylenebis (4, 1-phenylene) = diisocyanate	7

\*Emissions + transferred amount is the total amount for Sumitomo Heavy Industries and all Group companies

#### **Contributing to Protection of the Global Environment through Products**

**Compliant with Standard** Specifications in the RoHS Directive

With a capacity in the 2.5W - 15kW range, these compact

conveyors, food processing machines, packaging machines

and assistive products etc. Compliant with the EU directive

on Restrictions of Hazardous Substances (RoHS Directive),

Small Size Gear Motors

(Hyponic Gear Motor, Altax®NEO, Prest®NEO, Astero®)

the products are safe and environmentally friendly.

motors for speed reducers are used in the drive parts of

Power Transmission and Controls Group



#### Helps Reduce Waste

Sumitomo Heavy Industries Modern, Ltd.

This system re-pelletizes the mill ends generated in plastic film production and other processes to recycle them into raw materials, reducing waste by reusing mill ends and defective products

**Helps Reduce Waste** 

Mechatronics Division

This device encapsulates

semiconductor IC chips using

of molding and curtails the

volume of waste generated.

resin. It reduces burr at the time



Pelletizing Recycling System

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Semiconductor

#### Contributing to QOL (Quality of Life)

#### Quantum Equipment Division

This is one of a range of radiation therapy devices. Compared to regular x-rays, it is capable of pinpointing and picking off cancerous cells for outstanding therapeutic value that is gentle on the body of the patient. We have developed a device that is more compact than the conventional ones.



Proton cancer therapy equipment

Circulating fluidized bed boiler



Sumitomo Heavy Industries HIMATEX Co., Ltd.

A mill roll used in iron-making. The use of different materials for the outer shell layer and inner core ensures wear resistance and economic

Energy and Environment Group

for power generation and

as tires.

contributing to reduced CO<sub>2</sub>

emissions, the facility can also

be adapted to waste fuel such

In addition to using biomass fuel

efficiency at Centrifugally Cast High-Speed Roll the same time.

Reducing CO<sub>2</sub> by Using Biomass



Sumitomo Heavy Industries Finetech, Ltd.

Purifies grinding lubricant and cutting fluid, extending the lifecycle of the fluid. In addition to minimizing top-ups and cutting down on liquid content in recovered waste, the frequency of changing filters is reduced due to the high-efficiency magnetic separator.



**Rendering Industrial Waste** Harmless and Recycling Resources

#### Energy and Environment Group

reduction of the environmental burden.



Sumitomo W+F Botary Kilns



#### Power Transmission and Controls Group

We have done a thorough review of energy loss in the motor to achieve an average reduction of 10%. Clearing the IE2 international standard for efficiency, the motor contributes to energy conservation.



Speed reducer with high-efficiency motor

#### **Reduced Power Consumption**

#### Plastics Machinery Division

In this machine that produces plastic products by pouring molten plastic into a mold and shaping it, the electric drive system replacing the hydraulic drive realizes substantial reductions in power consumption.



Fully Electric Controlled Plastic Injection Molding Machine

#### Improving Efficiency of **Power Generation**

Sumiju Forging Co., Ltd.

Our advanced, integrated blade manufacturing technology is applied to these blades, which require more complexity and more exacting precision to improve power generation efficiency.



Blades for gas turbines





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# Magnetic separator



#### Reduce CO<sub>2</sub> by Generating **Renewable Energy**

Shin Nippon Machinery Co., Ltd.

Used to generate renewable energy (power generation fueled by renewable energy) with the aim of reducing CO2



Steam turbine for private power generation

#### Contributing to Biomass **Power Generation**

Seisa Gear, Ltd.

An important component for biomass power facilities. Rotating at high speeds, the dynamic force of the large-scale turbines is transmitted to the power generator securely and without waste



Gearbox for power generating equipment

#### **Reducing Power Consumption**

#### Precision Equipment Group

Ultrahigh vacuum pump used in semiconductor production processes and other applications that reduces power consumption by separately optimizing and operating multiple cryopumps and the minimum number of compressors.



Semiconductor device with lower voltage and lower power consumption vatio

#### SEN Corporation

Used in the semiconductor manufacturing process and elsewhere, the system implants ion in silicon wafers. Tracking the rapid evolution in semiconductor technology, the system implements lower voltage and lower power consumption.



Ion implantation system

#### **Contributing to Protection of the Global Environment through Products**

Separation

Superior Diffusion Performance **Enables Energy Conservation** 



This equipment diffuses ultrafine air bubbles into factory effluent and sewage to provide efficient purification of wastewater. There are an energy-conserving effect of a superior diffusion performance and a cost reduction effect due to simple maintenance.



Micrus<sup>®</sup> Superfine-bubble membrane tube

40% or More Reduction in the Sludge Output Dires® Sludge Reduction System

Sumiju Environmental Engineering Inc.

A system that controls excess sludge discharged from effluent treatment facilities through the use of microorganisms. This system significantly reduces initial costs and running costs compared to conventional mechanical systems or systems that use chemicals.



Nihon Spindle Mfg. Co., Ltd.

An air-conditioning control system that is able to keep the temperature within ±1°C and the humidity within ±5% of the set values. With a superior control system, this system reduces power consumption by 60% compared to conventional systems



Air-conditioning control system, Kurieko II

**Extending Adaptable Applications** for Streamlining Izumi Food Machinery Co., Ltd. Heat exchanger for use in food production. Contributing to streamlined production, this product group is adaptable to a range of liquid shapes from low to high flow properties. NT-type plate heat exchange



**Compact Facility with High-Speed** 

Sumitomo Heavy Industries Environment Co., Ltd.



**Conserving Energy on Ships** Sumitomo Heavy Industries Marine & Engineering Co., Ltd. Achieves energy conservation performance at international top levels by combining the optimum ship design with energy-saving additions and high-efficiency propellers of our own Oil tanker development

Column-in-Column<sup>®</sup> (CIC) distillation column (Dividing-wall distillation column (DWC) from Sumitomo)

#### Contributes to Processing SOx, NOx and Dioxin in Exhaust Gas Energy & Environment Group The exhaust gas processing facility uses a moving bed of activated charcoal to process SOx, NOx, dioxin, dust and mercury. Since it is possible to use one device for desulphurization, denitrification and to remove dioxins, energy consumption can be reduced over conventional facilities 20% Reduction in Power Consumption Nihon Spindle Mfg. Co., Ltd. A facility for removing dust from soot and smoke emitted by steelworks. Improves the flow of air and reduces power consumption by 20% compared to conventional facilities Contributes to High Energy-**Conservation Effect and Zero** Emissions Sumiju Plant Engineering Co., Ltd. We have developed a compact unit for the high-performance falling film plate evaporator. As well as implementing a high energy-saving effect, the unit collects water and valuable resources from waste water and contributes to zero emissions. Reducing CO<sub>2</sub> and Cost of Running with Hybrid **Construction Machinery** Sumitomo (S.H.I.) Construction Machinery Co., Ltd. The magnet specification machine is primarily used for





Drv-type desulphurizationdenitrification system



Pulse dust collector



Mini-evaporato

scrap work. Energy generated when decelerating for swiveling action powers the machine, drives the motor and supports engine output. Aimed at improving fuel consumption.



SH200HB-5 LM specification

#### **Reducing Power Consumption** by Building Compact Devices



The device produces the pharmacological agent (labeled compound) for PET (Positron Emission Tomography) examinations, one type of cancer diagnosis. Being about half the size of conventional units, it helps reduce the power consumption and the generation of waste at hospitals

# Ultra-Compact Cyclotron (HM-7) for PET Diagnosis

#### Low-Noise. **Cuts Maintenance Costs**

Sumitomo Heavy Industries Techno-Fort Co., Ltd.

This clutch and brake unit for activating and stopping the rotary shaft reduces noise levels by 10% compared to air-powered and dry units. The airless operation also reduces running costs



Wet clutch and brake for forging presses

#### 60% Reduction of Fuel **Consumption with Hybrid Power Supply**

Sumitomo Heavy Industries Engineering & Services Co., Ltd.

Mounted on container cranes, energy generated when decelerating and lowering containers is stored and used to support hoisting operations.



Sybrid System™



# **Environmental Impact Data**

Environmental impact data for SHI works (including Group companies within the works), Group companies in Japan (away from SHI works) as well as the main overseas Group companies

#### Environmental impact data for each works



#### **Okayama Works**



#### Ehime Works (Saijo Factory)

Established in 1973 ISO14001 (obtained in February 1999) Site Area: 535,000m<sup>2</sup> Building Area: 58,341m<sup>2</sup> Main Products: Steel Structures, Pressure Vessels, Stirring and Mixing Equipment, Coke Oven Machines Amount Disposed of CO<sub>2</sub> Emissions (million yen/ Waste Energy productivity t-CO2) (t/year) (t-CO<sub>2</sub>) Amount Discharged 8,000 4.000 r Zero emissions rate 100ר 6,000 3,000 4,000 2.000 1.000 2.000 2004 ) 2008 2009 2010 F 2007 2008 2009 **2010** (FY) 2001



#### Nagoya Works





#### Environmental impact data for Group companies in Japan (away from the works)



4.000

2,000



#### Environmental impact data for main overseas Group companies





4.000

2.000

2007 2008 2009 2010 FY



2004) 2008 2009 2010 FM



2007 2008 2009 2010 (F)



100

2001 2007 2008 2009 2010 F

# **Social Contribution Activities**

Each division and company in the Sumitomo Heavy Industries Group aims to establish itself in the local community.

Each employee takes the initiative in planning and implementing activities for contributing to the community.

#### Social Contribution Activities

#### **Biodiversity Measures**

The Sumitomo Heavy Industries Group works hard to plant and grow trees to contribute to biodiversity conservation.

At the Tanashi Works, we are protecting the Musashino forest, which occupies about 30% of the 43,000m<sup>2</sup> site area. There are more than 4,500 trees of more than 40 different species and Nishi-Tokyo City has designated 164 of these trees protected trees. Past habitat surveys have confirmed the presence of numerous organisms and the area is considered an important natural asset for scientific research.

The Tanashi Works have named a part of the area the "Forest of Inspiration" and opened it to the general public. We have installed benches and wheelchair accessible walking trails, creating a place where local residents can come to relax. In the fall, leaves on the ground are collected for composting as part of the agricultural courses sponsored by community centers in Nishi-Tokyo City, and nurserv school children collect acorns. Chestnuts collected within the grounds are provided to the locally organized Jomon no Mori Autumn Festival as an ingredient for baking cookies.

Acorns collected from the trees in the forest at the Tanashi Works are distributed to other Works and Group companies for planting as a part of tree-planting campaigns. We aim for ecological factories and to make efficient use of the space within the Works to increase the forested area. We are also engaged in activities to expand green curtains.

We are promoting a range of initiatives to create leafy factory premises by increasing the forested area at every Works. At the Yokosuka Works, there is a campaign to plant a tree for every ship that is built and delivered.





of Inspiration" (Tanashi Works)



Acorn seedlings (Saijo Factory)



(Saijo Factory)



Trees planted to commemorate the delivery of a newly built ship (Yokosuka Works)

A curtain of bitter melon vines (Sumitomo NACCO Materials Handling Co., Ltd.)



Planting seedlings in beds at the front gate (Niihama Factory)





A curtain of bitter

(Seisa Gear, Ltd.)

melon vines

Green curtain at the main office building (Niihama Factory)

#### **Traffic Safety Initiatives**

As a member of the local traffic safety association, the Sumitomo Heavy Industries Group participates in traffic safety campaigns. We also organize lectures on traffic safety in all areas to raise awareness of traffic safety among company employees. We also request the cooperation of forwarding companies entering and leaving the factory.

The Nagoya Works and Sumitomo NACCO Materials Handling Co., Ltd. proactively cooperate with local traffic safety campaigns by periodically undertaking traffic monitoring duties.

At the Yokosuka Works, we sponsor lessons in improving motorcycle driving skills in cooperation with the local police station.



(Nagoya Works) (Sumitomo NACCO Materials Handling Co., Ltd.)

A lesson in driving a motorcycle (Yokosuka Works)

#### **Disaster Prevention Drills**

As a member of the local community, the Sumitomo Heavy Industries Group is involved in action to prepare for a natural disaster.

The Niihama Factory, the Niihama fire department and Sumitomo Chemical Co., Ltd. jointly organize a large-scale fire and disaster prevention drill. Each workplace also conducts monthly fire drills using fire extinguishers, indoor and outdoor fire hydrants in an effort to raise awareness and improve the skills of on-site fire-fighting teams.



Fire and disaster prevention drill (Niihama Factory)

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#### **Rescue Drills**

The Sumitomo Heavy Industries Group conducts rescue drills under the guidance of the fire department.

The Yokosuka Works offered a course in advanced life-saving skills at the large meeting room in the main building. Lasting six and a half hours, the course focused on CPR. AED and other practical skills in addition to lectures as well as hypothetical situations (involving infants and small children, for example).

We will continue with the classes to be able to contribute to the local community in a disaster or other emergency situation.

In addition, the Nagoya Works, the Okayama Works and Sumitomo NACCO Materials Handling are registered with the fire department as companies loaning out AED equipment.



Course in advanced life-saving skills (Yokosuka Works)

**Blood Donation Drives** 

The Sumitomo Heavy Industries Group has continued to collaborate with blood donation drives for many years and for the employees, this has become a fixture as the most familiar contribution activity.

In FY2010, a total of 1,271 individuals donated blood. In the future, the Group will continue its blood donation activities in order to save precious lives.



Giving blood (Yokosuka Works)

## **Social Contribution Activities**

#### Communication with the Local Community

#### Summer Evening Festival

We organize a summer evening festival at the Tanashi Works to mix with people from the local community.

At the Tanashi Works summer evening festival, we introduced the environmental household account book and conducted a survey where we asked those who participated in the event to tell us about the eco activities they do at home, the aim being to increase awareness of energy conservation. Those who completed the questionnaire were presented with 1kg of potatoes produced at a local farm operated by the University of Tokyo. We also introduced environmental initiatives undertaken at the Tanashi Works.



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Information about the summer evening festival

#### Workplace Experience

Every year, the Sumitomo Heavy Industries Group accepts factory visits and workplace experience as a way of supporting young people in the local community. For students, experiencing the manufacturing workplace, something they cannot do at home or at school, is a particularly valuable experience. It is also an opportunity for high school and university students to familiarize themselves with the Company. In FY2010, we accepted 85 schools and 610 persons for workplace experience and visits. We will continue to accept visits while paying careful attention to safety.

# Participating in Cleanup Activities in the Local Community

The Sumitomo Heavy Industries Group regularly conducts cleanup activities in the surrounding area and we work hard to keep the environment beautiful.

We also participate in cleanup activities organized by local authorities and volunteer groups.

This year, in addition to participating in cleanup activities in the vicinity of the works, the Saijo Factory and SEN Corporation also participated in the "Refresh Setouchi" cleanup activities at Takasu Beach in Saijo City in Ehime Prefecture. Takasu Beach is the only remaining natural sand beach in Saijo City so protecting the environment there is in everyone's interest. Launched in 1993, the campaign has grown into the largest event among the volunteer campaigns in the city and this year, it also marked its 18th anniversary.

The Nagoya Works and Sumitomo NACCO Materials Handling also participate in the Adopt Program\* supervised by Obu City in Aichi Prefecture and undertake cleanup activities in the environs.

#### Adopt Program:

Adopt signifies affiliation. It is a volunteer campaign where residents themselves designate a public facility, such as a park or a footpath, and register it. To be able to enjoy using the facility, they collect trash, water trees and weed as if they were looking after their own child.



Cleanup activity at Takasu Beach (Saijo Factory and SEN Corporation)



Cleanup activity

(Niihama Factory)



Cleanup activity (Nagoya Works)

#### Efforts at Overseas Group Companies

#### **Tree-Planting**

(Tangshan) Co., Ltd.)

We also make efforts to plant and grow trees to contribute to the protection of biodiversity and to improve awareness of the environment among employees at overseas factories.

In Tangshan in China's Hebei Province, the cherry trees planted by Sumitomo Heavy Industries (Tangshan), Ltd. and Sumitomo (S.H.I) Construction Machinery (Tangshan) Co., Ltd., with many hopes of expanding together with us in the area, flowered this spring.

In the Philippines, SHI Manufacturing & Services (Philippines) Inc. plants trees every year jointly with other Japanese corporations in the same industrial park. With friendship as the goal, all participants completed the activities with enjoyment and laughter.



(Tree planting activity SHI Manufacturing & Services (Philippines) Inc.

#### Power Conservation in the Summer of 2011

At the SHI Group, we are expanding activities to prevent global warming across all departments. In particular, we are focused on power consumption, which accounts for approximately 80% of energy usage, and we have undertaken initiatives to reduce consumption since FY2005.

In the summer of 2011, we implemented even further power conservation measures across all departments in the SHI Group in order to comply with measures to deal with the supply and demand of electric power.

From July to September, the office departments at each Works in the Kanto area have changed their days off and stepped up activities to conserve energy in order to reduce peak power consumption.

At the head office and the office departments at branch companies, we are conducting summer time and Super Cool Biz campaigns.

#### Donations

In the Philippines, SHI Manufacturing & Services (Philippines) Inc. and other Japanese corporations in the same industrial park donate books to a local elementary school every year. In a unique activity, they also make chairs and desks from the wood for packing crates delivered to the factory to donate to local elementary schools. Both are the source of a great deal of joy with the adults smiling at the happy faces of the children.





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