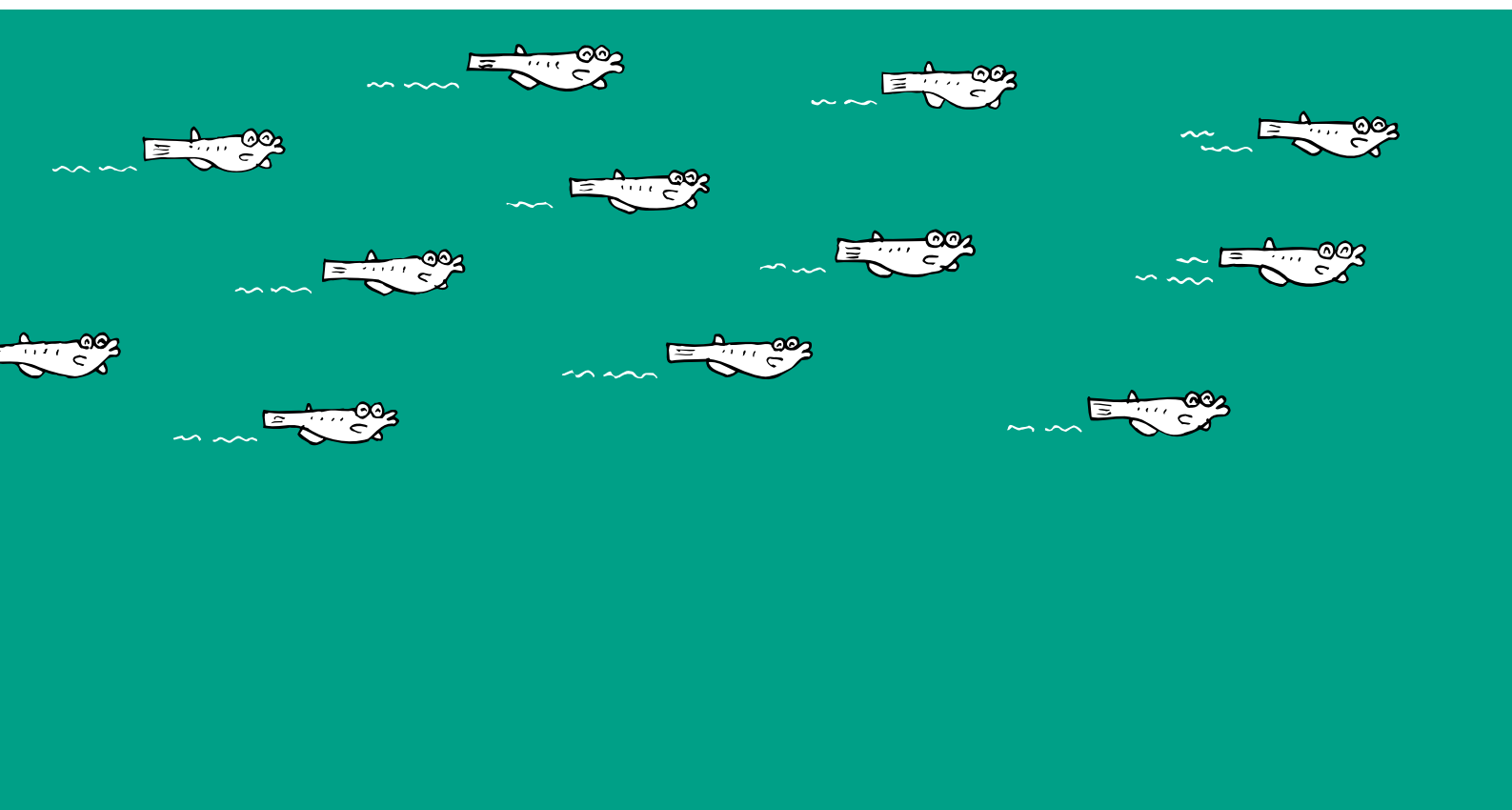


# ENVIRONMENTAL REPORT 2003



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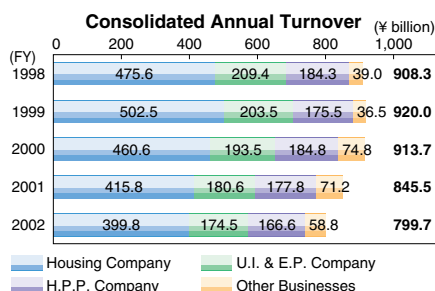
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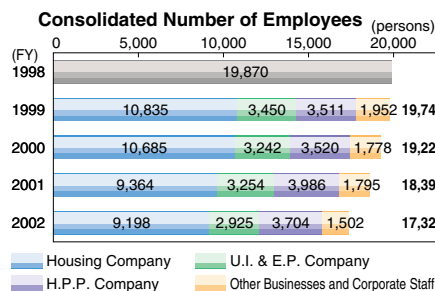
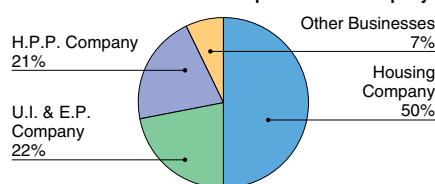
## Profile of the Company

(as of March 31, 2003)

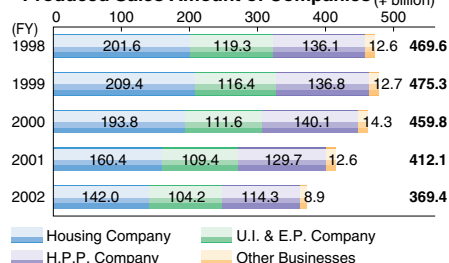
Established on	March 3, 1947
Capital	¥100.0 billion
Domestic Subsidiaries	180 companies
Overseas Subsidiaries	30 companies
Main Business Indices (FY2002 in consolidation)	
Consolidated Subsidiaries	142 companies
Annual Turnover	¥799.7 billion
Number of Employees	17,329



## Consolidated Turnover Ratio per Internal Company



## Produced Sales Amount of Companies



## Main Business Areas

(as of March 31, 2003)

### ● Housing Company

Sekisui Heim  
(steel-framed modular houses)  
Sekisui Two-U Home  
(wooden-structured modular houses)  
Land for residential use, Renovation,  
Interior/exterior decoration  
Nursing rooms for the elderly

### ● Urban Infrastructure & Environmental Products Company

UPVC pipes, Lined steel pipes  
Plastic valves, Plastic pits  
Pipe relining materials and engineering  
Garbage treatment systems,  
Synthetic wood  
Building materials (rain gutters,  
roofing tiles, balcony flooring)  
Bath units, Septic tanks,  
Electric hot water units

### ● High Performance Plastics Company

Interlayer film (for laminated glass for  
windows of vehicles and buildings)  
Adhesives, High performance resins  
Adhesive tapes  
(packaging and industrial use)  
Engineered fine parts,  
Foamed polyethylene  
Packaging and agricultural film  
Plastic containers, Marking film  
Plastic home products  
(for cleaning, bathroom, toilet,  
kitchen and storage goods)  
Vacuum blood collection tubes,  
Medical tapes, Diagnostics

### ● Other Businesses

Sound insulating floor boards, Heat  
retaining/sound insulating floor boards  
Fireproof tapes and sheet  
Semiconductor production equipment,  
Molds, Machines and equipment  
Welfare services, Agricultural and building  
material supplies

#### ● Unit

As the indices for our improvement activities, we are using Unit (environmental loads per scale of production) as the indices of our improvement activities.

$$\text{Unit} = \frac{\text{Environmental loads}}{\text{Scale of production}}$$

Each internal company uses its own scale of production in the management of the progress underway that matches the characteristics of its products as follows:

Housing Company: Quantity of production (number of house units)  
Urban Infrastructure & Environmental Products Company: Produced sales amount  
High Performance Plastics Company: Quantity of production (tonnage)

For the entire Sekisui Chemical Group, we use Produced sales amounts (on ex-godown bases) as a unified scale of production.

#### ● Data

Any slight inconformity between figures for breakdowns and for totals is due to the rounding of figures in summation.

## Editorial Policy of Environmental Report 2003

Sekisui Chemical Group operates in a wide range of markets, engaged in a variety of businesses including housing and building materials, civil engineering and industrial materials and consumer goods. Accordingly our customers vary from individual users to business organizations, government offices and public bodies.

Related environmental issues and areas for improvement also vary (P4). In order to clarify our environmental policies and activities exactly, this report is arranged in four sections i.e. for the entire Group and for each internal company. The major themes for each internal company are reported in concrete in their respective sections.

## Message from the President

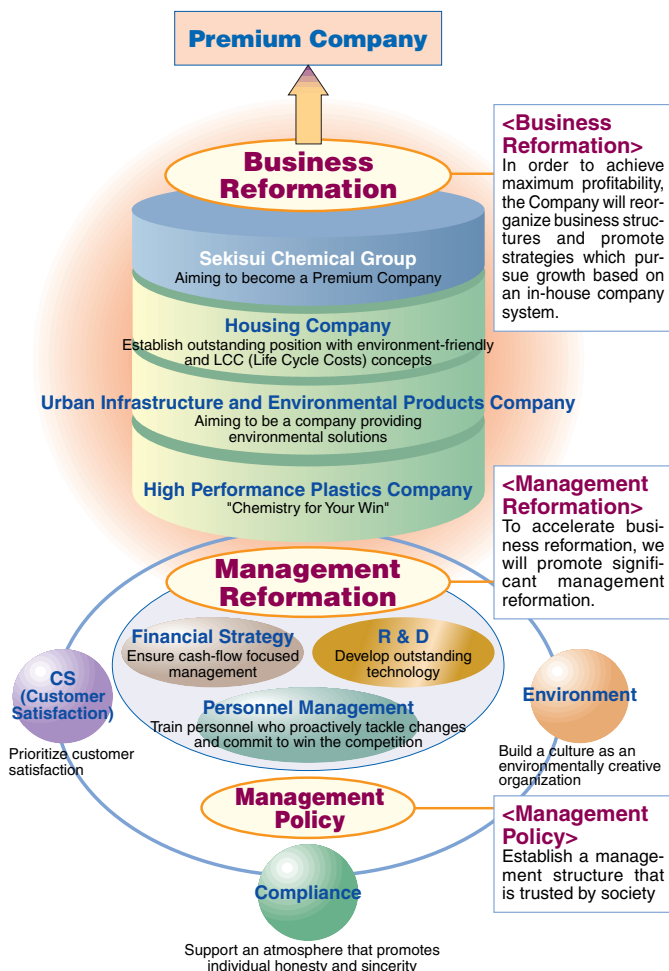
We are aiming at becoming an environmentally creative organization by implementing environmental corporate management.



*Naotake Okubo*

Naotake Okubo  
President

### ●Outline of our Mid-term Management Vision "GS21-Premium 600"



Over the last year I have found myself thinking about the environment more than ever. As Chairperson of the Keidanren Nature Conservation Fund, I visited the project sites of the desert greening in Daitong, China and the mangrove reforestation in Nakhon Si Thammarat, Thailand. At these sites I very keenly felt that it is easy to talk about environmental conservation but it is extremely difficult to accomplish such projects as these, and my understanding of environmental matters has deepened.

Our four-year Middle Term Environmental Plan, "STEP-21" is now completed. Many good results were produced, such as the achievement of zero emission and the acquisition of ISO14001 by our plants and house sales subsidiaries, the awarding of the Minister of Economy, Trade and Industry Prize in the "Grand Prize for Energy Conservation" to our Hot Water Unit with CO<sub>2</sub> Heat Pump "Eco-Cute" and the commendation of our Environmental Reports. Despite our failure to achieve our targets in the items related to reduction of environmental loads, such as carbon dioxide emission and ex-godown Unit of waste generation volume in production processes, I am fully convinced that the bases for our environmental activities have been firmly established.

The activities of Sekisui Chemical Group are closely related to human lifestyles through the production and supply of houses, urban infrastructures and plastic products, all of which are fundamental to the daily life of modern society. Therefore, concern for environmental issues is a key pillar of our company management. The coexistence of ecology and economy is requisite for business management and the growth of business must not be attempted without paying full consideration to environmental demands.

In "GS21-Premium 600", our newly established Mid-term Management Vision, our concern for the environment takes a central position in our business perception together with CS and total compliance with all regulations governing, and all laws related to, every aspect of our operations. We envisage our future identity as being that of a "premium company", aiming at becoming an environmentally creative organization whose existence is desired and supported by society, achieving eminence in technology and excellence in profitability. To develop into an environmentally creative organization we must conduct "environmental corporate management" which will require us to: ① create businesses inspired by our concern for the environment; ② have environmental consideration as a fundamental aspect of our corporate culture by formulating our management accordingly; ③ upgrade our business efficiency by minimizing environmental loads to result in the elimination of all wastefulness. We are pursuing these three subjects in accordance with "STEP-2005", our new Middle Term Environmental Plan which commenced on April 1, 2003. We fully disclose all information related to our environmental activities in order to keep in close communication with local communities, NGOs and society as a whole. By so doing, we believe that our Group is an organization in which you can trust.

It is our hope that this report will be a valuable means for our communication with you, and that it will give you a deep understanding of the environmental conservation activities of our Sekisui Chemical Group. We look forward to receiving your comments and advice.

## Environmental Corporate Management of Sekisui Chemical Group

We progressively promote **environmental corporate management** which seeks continual growth based on the environment as the key, and aim at being an **environmentally creative organization** that maintains a prominent position on environmental issues.

We, Sekisui Chemical Group, have been progressively promoting environmental conservation activities focusing on our plants, such as environmental consideration regarding all our products, resources circulation (3R's), prevention of increase in global warming and appropriate management of chemical substances. From now on, we are extending these activities to all our workplaces and to include all our employees, by which we aim at

becoming an **environmentally creative organization** that maintains a prominent position on environmental issues. In this way, we are enabling the coexistence of ecology and economy to seek continual growth based on environmental issues, with the conviction that our activities for aiming at becoming an environmentally creative organization constitute exactly the **environmental corporate management** of Sekisui Chemical Group.

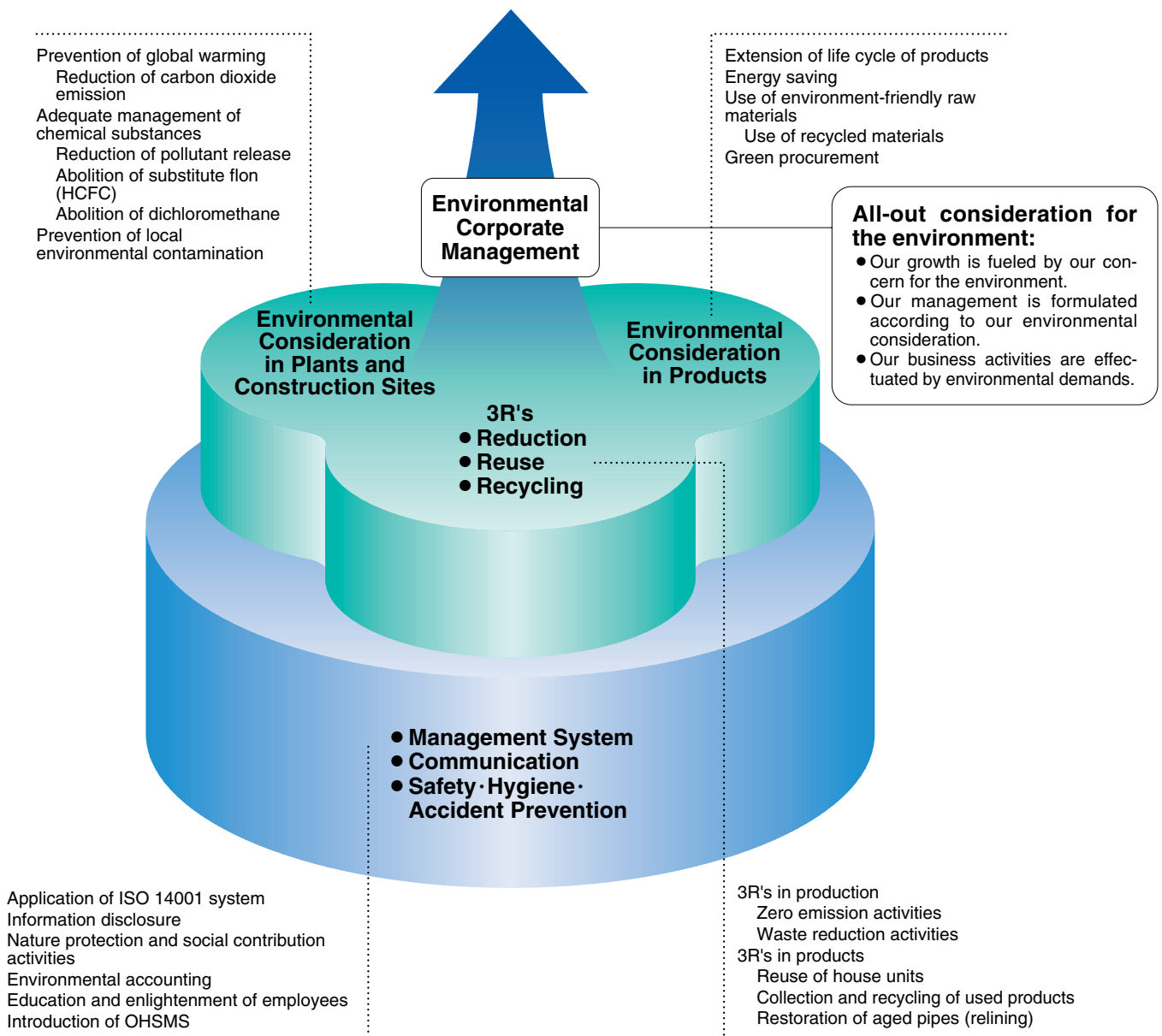
### Environmentally Creative Organization

Our concept of an environmentally creative organization is:

- One that maintains a corporate character and culture which enables continual growth and reform based on the environment as the key
- One that promotes the coexistence of ecology and economy realized through all-out environmental consideration

( Ecology: Consideration for the global environment and symbiosis with local environments )  
 ( Economy: Economical efficiency for our customers and ourselves )

- One that is continually relied upon by the whole of society to fully meet every expectation and demand.



## ■Revision of Corporate Policy on the Environment and Safety, and Activity Guidelines

In STEP-21, our Middle Term Environmental Plan that ended in fiscal 2002, we produced fruitful results in ISO 14001 acquisition and attainment of zero emission. However we could not reach our targets in energy saving or reduction of waste generation (PP4-5). In order to be recognized as an environmentally creative organization in society, we must improve these performances and continue to grow as an enterprise simultaneously. So, in our new STEP-2005, we have reviewed and revised our Corporate Policy on the Environment and Safety, and Activity Guidelines, in order to become an environmentally creative organization through implementing environmental corporate management in all

workplaces and by all people of Sekisui Chemical Group.

The major points of revision are as follows:

- ①With the development of our "philosophy on environment and safety", we have established the direction that Sekisui Chemical Group must take,
- ②As our basic policies we clearly aim at becoming an environmentally creative organization,
- ③In order for our environmental activities to be deeply rooted among all people of Sekisui Chemical Group, we have specified clearly in our Activity Guidelines the items to be implemented by our clerical staff and sales people.

### Corporate Policy on the Environment and Safety

#### [Philosophy]

**We, Sekisui Chemical Group, recognize that there can be no sustainable development without our total commitment to issues of environmental protection and safety. We are dedicated to the creation of a better environment by continually promoting environment and safety activities, enabling the structuring of a recycling-based society and global environmental protection through our businesses, products and contribution to society.**

#### [Basic Policies]

**It is our conviction that focus on the environment holds the key to our continued growth into the future, and therefore we are aiming to become an "environmentally creative organization", with a corporate culture based on our environmental concerns, in order to meet the expectations society has placed on us.**

1. We have utmost concern for the environment and safety of all our products and business activities from the stages of research and development through procurement, production, sales, use, and to disposal of products, and comply precisely with all requirements on the issue.
2. We promote effective utilization, reuse, and recycling of limited resources to reduce the environmental loads.
3. We enhance positively the environmental performance and safety in handling chemical substances and minimize chemical risks.
4. We not only comply with international and national laws and regulations, but also proactively set our own objectives and targets to promote continual improvements and also to enhance environmental concern through the education of all our staff.
5. We endeavor to secure accountability in cooperation and collaboration with local communities and society as a whole and with governmental and industrial organizations through close communication with them.

April 1, 2003



Naotake Okubo  
President

### Activity Guidelines

#### 1. Environmental Corporate Management

- ①We enhance and extend our environmental corporate management systems on a global scale.
- ②We implement our environmental corporate management and assess the effects continually.
- ③We create businesses for improvement of the environment which are supported by the market.

#### 2. Environmental Consideration for our Products

- ①We continue to develop technologies, always having concern for safety and environmental issues, and to supply products which meet environmental demands throughout their entire life cycles.
- ②We are dedicated to recycling and therefore make efforts to collect as many used products as possible.

#### 3. Reduction of Environmental Loads and Risks in Production

- ①We promote reduction, reuse, and recycling of wastes at our plants and house construction sites.
- ②We promote energy saving and reduction of greenhouse gas emission.
- ③We exercise appropriate management of chemical substances, and prevent chemical risks.

#### 4. Environmental Consideration in Distribution and Sales

We reduce environmental loads.

#### 5. Environmental Conservation in Offices

We enhance effective utilization of resources and promote energy saving.

#### 6. Contribution to the Environment and enhanced Communications with the Public

- ①We participate in global environmental conservation activities in cooperation and collaboration with local communities and NPOs/NGOs.
- ②We ensure that information we distribute is fully understandable, and we constantly pursue excellent communications with the public.

#### 7. Education and Enlightenment

We enhance the environmental awareness of all staff through our pertinent educational activities.

April 1, 2003



## Relations of Business Activities with Environmental Issues and Outstanding Subjects

Reduction of environmental loads that accompany our business activities and environmental consideration of our products are the major themes for the entire Sekisui Chemical Group. Each company is working on environmental matters specific to the characteristics of its businesses and products.

Sekisui Chemical Group supplies society with houses, that are fundamental to, and plastic products that are convenient for, daily living. In carrying out our operations, it is true that our use of energy and resources produces environmental loads.

Therefore, we consider that reduction of environmental loads in our business activities, and throughout the whole of socie-

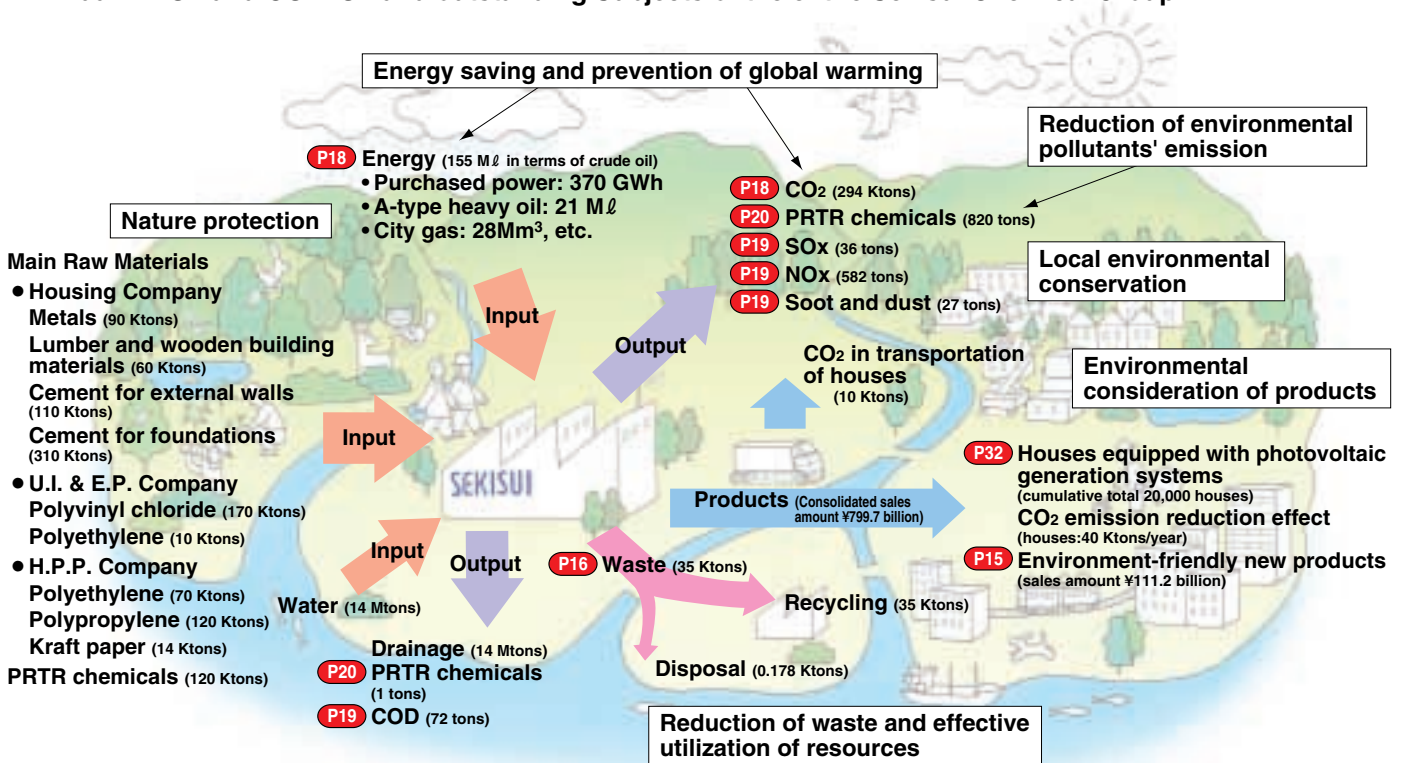
ty by the enhancement of environmental consideration for our products, are most important subjects in management.

As the business activities and type of products differ according to each company, the importance of the subjects to tackle will differ respectively.

### Business Characteristics, Main Environmental Subjects and Implementation Policy of each Company

	Business Characteristics and Main Environmental Subjects	Implementation Policy	Page No.
Housing Company	<ul style="list-style-type: none"> <li>• Products in use for long periods, CO<sub>2</sub> emission rate is high during use. →Reduction of CO<sub>2</sub> emission during usage.</li> <li>• Voluminous waste is generated during assembly and disassembly. →Systematization of resources recycling and longer life of houses</li> <li>• Products are used as space for daily living. →Improvement of indoor living environments</li> </ul>	<b>Leading Company in Environmental Issues</b> Contributes to society with our environment-friendly residential houses that can be lived in safely and comfortably for at least 60 years.	30
Urban Infrastructure and Environmental Products (U.I. & E.P.) Company	<ul style="list-style-type: none"> <li>• Products and systems closely related to living environments, such as physical infrastructure and water environments. →Development and supply of environment-friendly products and systems</li> </ul>	<b>Company providing Environment Solutions</b> Contributes to creation of environment-friendliness through environment-friendly products' manufacture and systems' structure by its cutting-edge technologies	40
High Performance Plastics (H.P.P.) Company	<ul style="list-style-type: none"> <li>• Intermediate materials for industrial use. →Support to the customers in their environmental consideration for the products they supply</li> <li>• Large environmental loads (CO<sub>2</sub>, waste, chemical substances) are generated in production processes. →Reduction of environmental loads during production in the plants</li> </ul>	<b>"Chemistry for Your Win"</b> Supplies the customers with intermediate materials and main functional parts/components that support their development of environment-friendly products	50

### Annual INPUT and OUTPUT and outstanding Subjects of the entire Sekisui Chemical Group



## Management Systems

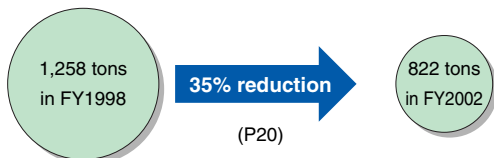
- **Revision of Corporate Policy on the Environment and Safety and Activity Guidelines (P3):**  
It is clearly specified that we aim at becoming an environmentally creative organization through implementing environmental corporate management in all workplaces and by all people of Sekisui Chemical Group.
- **Start of our Middle Term Environmental Plan "STEP-2005" (P8):**  
Targets are set for all workplaces and all people in order to enable implementation of environmental corporate management.
- **Acquisition of ISO 14001 certification by 80 workplaces in cumulative total (P10)**
- **Environmental Accounting:**  
Environmental conservation expenditure: **¥7.6 billion**  
Economical effects: **¥8.7 billion (P12)**

## Development of Environment-friendly Products and Technologies

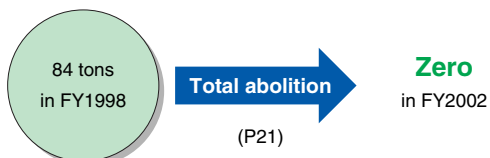
- **Environment-friendly new products (put on the market in FY1999 - FY2002):**  
Number of items put on the market: **183**  
Sales amount in FY2002: **¥111.2 billion**  
Sales rate to new products: **30% (P15)**
- **Housing Company (PP32-36):**  
Sales of houses in the conception of "**zero heating and lighting expenses**"  
Full-scale sales of houses of rebuilding system in which "**houses are reused**"
- **U.I. & E.P. Company (PP42-45):**  
**Recycled PVC pipes** specified in the Green Procurement Standards  
Development of **REW Technology** to turn waste lumber into structural material for houses
- **H.P.P. Company (PP56-59):**  
Start of united resources circulation with customers, by using new containers made of raw materials obtained by recycling used containers

## Appropriate Management of Chemical Substances

- **Emission and transfer into the environment:**  
(Chemical substances specified as Class 1 in PRTR Law)

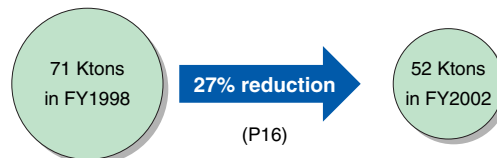


- **Volume of dichloromethane for washing use:**



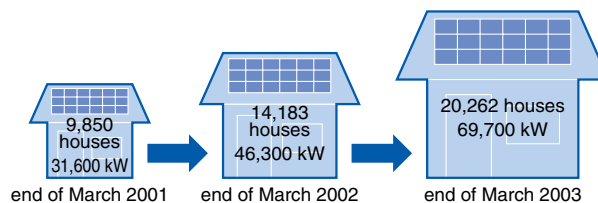
## Contribution to Resources Recycling-based Society

- **Zero emission (100% recycling of waste):**  
Achieved at **33 plants** according to the plan  
Achieved at **22 house sales subsidiaries (P37)**
- **Volume of waste generated (plants):**

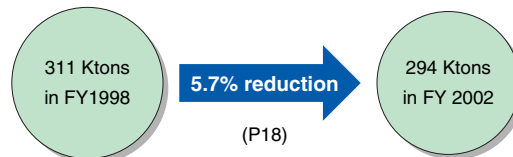


## Prevention of Global Warming

- **Houses equipped with Photovoltaic Generation Systems: exceeded 20,000 houses in cumulative total (P32)**



- **CO<sub>2</sub> Emission Reduction Effect during usage (houses):**  
**Approx. 40 Ktons**  
(Converted to an annual basis including effects of heat insulation) (PP18&33)
- **CO<sub>2</sub> Emission (plants):**



## Nature Protection and Social Contribution Activities

- **Continuation of support to environmental NGOs' nature protection activities (P24)**
- **Steady growth of Biotope in Kyushu Sekisui Industry Co., Ltd. (P48)**
- **Development of Biotope in Shiga-Ritto Plant (P48)**
- **Social contributions in educational and training areas:**
  - Start of Sekisui Chemical Co., Ltd. Research Fund for the Development of Technologies from Nature (P24)
  - Implementation of House Making Course for Children (P25)

## Achievements of Middle Term Environmental Plan, "STEP-21"

As the result of our environmental activities for the last 4 years, we have achieved our targets in 26 out of 35 items. The 9 remaining items include the reduction of carbon dioxide emission and of waste.

We, Sekisui Chemical Group companies, promoted the Middle Term Environmental Plan, "STEP-21" (Sekisui Total Environmental Plan for the 21st Century), for 4 years from 1999 to 2002 and made our best efforts to reduce the environmental loads derived from our business activities. The following table shows our targets and the status of achievements.

As the result of our environmental activities for the last 4 years, we have almost fully achieved our targets to construct such systems as EMS (Environmental Management Systems), the systems to develop environment-friendly products and technologies, and the recycling systems for used products.

Environmental Subjects <small>(Note 1)</small>	Implementation Items	Targets for Fiscal 2002 (STEP-21 Targets)		
<b>Management</b>	EMS structuring (Acquisition of ISO14001 certification)	Acquisition by 78 plants, R&D institutes and house sales subsidiaries, and by 6 overseas plants (cum. total)		
	Environmental accounting	Annual publication		
<b>Development of Environment-friendly Products and Technologies</b>	Development of environment-friendly new products	Minimum 150 product items (cum. total) to be put on the market		
	Development of environmental conservation and recycling technologies	Environment-friendly new products to be minimum 30% of the total sales of new products		
	Introduction of green procurement	Completion of 10 themes (cum. total)		
	Introduction of LCA (Life Cycle Assessment)	At least 70% green procurement		
<b>Contribution to a Resource Recycling-based Society</b>	Promotion of zero emission	Plants	Attainment of zero emission at 33 plants	
		New house construction sites (Waste from new house construction)	Attainment of zero emission at construction sites (house sales subsidiaries) throughout Japan	
		Waste reduction	Minimum 25% reduction of waste per ex-godown Unit at plants against fiscal 1998	
	Promotion of used products collection and recycling	System structuring	System structuring nation-wide and the model districts completed Targeted products: FRP bathtubs, rain gutters, roofing tiles, and "Hanayaka" PE film for agricultural use	FRP bathtubs Rain gutters Roofing tiles "Hanayaka"
			Elevation of recycling ratio	PVC pipe and fittings: minimum 80% of material recycling (fiscal 2005) LP pipe: minimum 30% of material recycling (fiscal 2002)
	System structuring for collection and recycling of waste from residential buildings	Completion of recycling system throughout Japan based on the "Construction Materials Recycling Law"		
	Promotion of package saving	Minimum 20% reduction of per variable cost Unit of the targeted products against fiscal 1998		
	<b>Prevention of Global Warming</b>	Reduction of CO <sub>2</sub> emission		Minimum 4% reduction of CO <sub>2</sub> emission per ex-godown Unit against fiscal 1998
		Promotion of energy saving	Plants	Minimum 4% reduction per ex-godown Unit against fiscal 1998
			Head Offices	Osaka: minimum 4% reduction against fiscal 1998 Tokyo: minimum 2% reduction against fiscal 2000
R&D institutes			Minimum 4% reduction of power consumption in offices against fiscal 1998	
Increased use of environment-friendly cars		Minimum 50% of the renewed or registered company cars leased from Sekisui Lease Co., Ltd.		
Promotion of green distribution		Completion of model systems structuring		
<b>Appropriate Management of Chemical Substances</b>	Reduction of pollutants release/transfer		Minimum 30% reduction per ex-godown Unit against 1998 of chemicals designated as Class 1 by Japanese PRTR Law	
	Total abolition of substitute flons (HCFCs)		Aiming at total abolition by the end of fiscal 2005	
	Total abolition of dichloromethane for washing use		Total abolition for washing use	
	Survey of soil contamination		Planned implementation of soil contamination survey of plant premises	
	Countermeasures against sick house syndrome		Achievement of lower toluene and xylene concentration than the guideline specification at the time of handover to customers	
<b>Nature Protection Activities</b>	Support of nature protection activities		Support in cooperation with Keidanren Nature Conservation Fund	
	Nature protection activities in local communities		Achievement of minimum 10 Activity Points at main plants Achievement of 100% employee participation at main plants	
	Biotope construction at our workplaces		Completion of the first biotope with the local community	
<b>Communications</b>	Education of activity leaders on Sekisui Chemical's Nature Study Course		Education of 250 activity leaders (cum. total)	
	Publication of Environmental Report		Annual publication, publication on our website, disclosure of information from workplaces	

Note 1: In our former reports, the items of "STEP-21" in this table were classified into three categories in accordance with three corporate environmental policies, but the order of those items in this report has been changed for clarification purposes.

Note 2: Evaluation standards ○-Target well achieved ○-Target mostly achieved ×-Target not achieved



Regarding performance, we could reduce the total environmental loads such as waste generation, carbon dioxide emission, environmental pollutants discharge and consumed quantity. We could not achieve, however, in the items where our targets were set in terms of ex-godown Unit reduction. This is due to the fact that the reduction of environmental

loads by the improvement activities carried out in our workplaces and by the amalgamation of our workplaces was smaller than the decrease of our production sales amount because of the downward movements in the market place.

Achievement Status (Results in Fiscal 2002)	Evaluation (Note 2)	Page	Achievement Status of Each Company (Results in Fiscal 2002) (Notes 3,4)		
			Housing Company	Urban Infrastructure & Environmental Products Company	High Performance Plastics Company
Acquisition by 82 workplaces (domestic 78, overseas 4, including 3 under Headquarters' control) / Fiscal 2002: Acquisition by 6 workplaces (No. of domestic workplaces since reduced by 2 due to integration)	○	10	48 workplaces (cum. total)	14 workplaces (cum. total)	15 workplaces (cum. total)
Continuation of annual publication since 2000	○	12	Publication of data by Company since 2001		
183 product items (cum. total) put on the market	◎	15	14 types (cum. total)	64 items (cum. total)	105 items (cum. total)
30.4% during fiscal 2002	○	15	30%	28%	41%
Completion of 21 themes	◎	15	13 themes	7 themes	1 theme
Achievement of 65% green procurement	○	14	—	—	—
Completion of evaluation on the model themes	○	15	Heim	REW	Protect Tape
Attainment at 33 plants (cum. total) (including 1 plant under Headquarters' control)	○	17	10 plants	10 plants	12 plants
Attainment of zero emission at 22 sales subsidiaries. Promotion on-going at 18 sales subsidiaries	×	17	22 sales subsidiaries	—	—
7.2% reduction per ex-godown Unit (27% reduction of waste generation)	×	16	▼7% per Unit (▼35% of volume)	▼31% per Unit (▼40% of volume)	▼17% per Unit (▼1.8% of volume)
Collection route structuring in Kinki and Kanto districts	○	17	—	Structuring in Kinki and Kanto districts	—
Test operation in Kanto and Tokai districts	○	17	—	Test operation in Kanto and Tokai districts	—
Preparation for system implementation in Okayama district	○	17	—	Preparation in Okayama district	—
Grasp of movements in the industry for our future planning	×	17	—	—	Grasp of movements in the industry
Completion of recycling stations throughout Japan, recycling ratio: 48%	○	17,46	—	Completion of recycling stations throughout Japan	—
Extension of recycling stations throughout Japan, recycling ratio: 32%	○	17,46	—	Extension of recycling stations throughout Japan	—
Formula for contracts and official reports on house renovation/demolition	○	37	Formula for contracts and official reports on house reform/demolition		
0.3% reduction per variable cost Unit	×	—	Parts and component packaging: 2.6% reduction	Product packaging: 2.8% increase	Product packaging: 5.7% reduction
20% increase per ex-godown Unit (5.7% reduction of emission volume)	×	18	△6.1% per Unit (▼25% of volume)	△12% per Unit (▼2.0% of volume)	△19% per Unit (▼0.1% of volume)
24% increase per ex-godown Unit (2.4% reduction of consumption)	×	18	△17% per Unit (▼17% of consumption)	△15% per Unit (△0.5% of consumption)	△22% per Unit (△17% of consumption)
Osaka: 14% reduction (against fiscal 1998) Tokyo: 24% reduction (against fiscal 2000)	◎	18	—	—	—
Total 2.0% reduction in 4 R&D institutes	×	18	Tsukuba Workplace: 21% reduction	Kyoto R&D Labs.: 0.2% reduction	Minase Res. Labs.: 23% increase
89% of the renewed or registered cars in fiscal 2001	◎	18	—	—	—
Promotion by Housing Company and High Performance Plastics Company	○	18	Rationalization of house unit distribution	—	Implementation of joint distribution of packaging tapes
17% reduction per ex-godown unit (35% reduction in total volume)	×	20	▼79% per Unit (▼85% of volume)	▼32% per Unit (▼41% of volume)	▼11% per Unit (▼25% in volume)
Completion of alternative substances determination	○	21	—	Completion of determination on alternative substance	Completion of determination on alternative substance
Completion of total abolition for washing use	○	21	—	Completion of total abolition for washing use	Completion of total abolition for washing use
Completion of survey at 3 workplaces	○	21	—	—	Completion of survey at 3 workplaces
Achievement of lower contamination than the guideline	○	38	Achievement of contamination below the guideline level		
Support of 5 projects in fiscal 2002 (41 in cumulative total)	○	24	—	—	—
Achievement of 10 Activity Points at all 30 object workplaces	○	25	—	—	—
83% employee participation	×	25	—	—	—
Construction of the biotope at Kyushu Sekisui Ind. Co., Ltd. and opening of mini-sanctuary for local community	○	24,48	—	—	—
Education of 257 leaders (310 leaders cum. total)	○	27	—	—	—
Annual publication since 1999, publication on our website, disclosure of PRTR data and measurement results on items regulated by laws	○	60	—	—	—

Note 3: In this table, ex-godown Units are used to show the increase or reduction of Units in compliance with the indices used by the whole Group.

Note 4: △-increase ▼-reduction

## New Middle Term Environmental Plan, "STEP-2005"

We have launched from fiscal 2003 our new Middle Term Environmental Plan, "STEP-2005" to end in fiscal 2005. We will carry out Environmental Corporate Management by steadily implementing the plan.

In order for environmental corporate management to be most effective, environmental consideration must be at the heart of our corporate culture. We must ensure that environmental consideration is prioritized in every corporate decision, and that a long term environmental vision is always maintained, and appropriate indices for the reduction of environmental loads are strictly adhered to.

In this new middle term environmental plan we:

- ① developed in concrete the implementation items from activity guidelines and we will promote our environmental corporate culture by letting every employee play an active role;
- ② will extend our environmental activities to our overseas subsidiaries. We will also establish a system to assess the business results of the entire Group from the environmental aspect, and have the environment hold a clear place in management;

③ have established our targets to be achieved by fiscal 2005 as our intermediate targets, with the aim of attaining our long term targets by the end of fiscal 2010 (see table top of P9), which were laid out in March 2002;

④ set our emission targets of carbon dioxide and chemical substances in terms of volume not Units, which is more realistic to lowering the environmental loads over all.

The promotion of our Middle Term Environmental Plan, "STEP-2005", and the achievement of its targets constitutes the implementation of our environmental corporate management. We all will promote our environmental activities to achieve the targets.

	Activity Guidelines	Implementation Items	
1. Environmental Corporate Management	① Extension of our environmental corporate management system to our international operations	1. Expansion of EMS structuring and its maintenance 2. Extension to overseas subsidiaries	
	② Implementation of environmental corporate management and continuous assessment of its effect	1. Establishment of assessment system for business results 2. Extension of environmental accounting within our Group	
2. Environmental Consideration for Products	① Development of technologies and supply of products which are in full compliance with safety and environmental requirements throughout their life cycles	1. Elevation of environment-friendly product sales ratio 2. Sale of environment-friendly products 3. Countermeasures against sick house syndrome 4. Implementation of green procurement system 5. Development of environmental conservation and recycling technologies 6. Introduction of LCA	
	② Collection and recycling of used products	Structuring and implementation of collection and recycling systems for used products	PVC pipe, LP House modules
3. Reduction of Environmental Loads and Risks in Production	① Promotion of reduction, reuse, and recycling (3R's) of waste from plants and house construction sites	1. Reduction of waste generation from production processes in plants 2. Increase of number of zero emission workplaces 3. Zero emission at new house construction sites 4. Promotion of recycling of waste from demolished houses	
	② Promotion of energy saving and reduction of greenhouse gas emission	1. Reduction of carbon dioxide emission from plants 2. Energy saving in plants 3. Energy saving in R&D institutes	
	③ Appropriate management of chemical substances and reduction of chemical risks	1. Reduction of release and transfer of chemical substances specified as Class 1 in the PRTR Law 2. Total abolition of substitute flons (HCFCs) 3. Total abolition of chlorine solvent for use in production processes 4. Measures for soil contamination by chemical substances	
4. Environmental Consideration in Distribution and Sales	① Reduction of environmental loads	1. Promotion of green distribution 2. Increase of use of environment-friendly cars	
5. Environmental Conservation in Offices	① Enhancement of resources and energy saving	1. Achievement of zero emission in offices 2. Energy saving in head offices	
6. Contribution to the Environment and enhanced Communications with the Public	① Participation in global environmental conservation activities with communities and NPOs/NGOs	1. Support for nature protection activities of NPOs/NGOs 2. Contribution to environmental protection activities of local communities	
	② Distribution of information in understandable manner and promotion of better communications	1. Introduction of environmental labels 2. Publication of site reports	
7. Education and Enlightenment	① Enhancement of environmental awareness	Education of employees on Sekisui Chemical's Nature Study Course	

## ■Sekisui Chemical Group's Environmental Targets for fiscal 2010

Carbon dioxide emission (Total volume)	13% reduction at the plants against fiscal 2000 (equivalent to 7% reduction against fiscal 1990 as the benchmark year)
Waste	50% reduction of waste generation per ex-godown Unit from production processes against fiscal 1998
	Zero emission at head offices, branches and R&D institutes
	100% recycling of wastes from demolition, construction and renovation



**Setsushi Nakamura**  
Managing Director  
in Charge of  
the Environmental Management  
of Sekisui Chemical Group

	Targets for fiscal 2005	Targets for fiscal 2003
	EMS restructuring by staff of Headquarters and internal companies, extension to plants	Formation of the master plan
	Grasp of actual environmental status and execution of implementation plan (12 plants)	Survey and grasp of actual environmental status
	Introduction as internal company assessment	Setting of indices for environmental corporate management assessment
	Extension to house sales companies	Implementation at model sales companies
	Minimum 25% against consolidated sales amount	Minimum 20%
	Minimum 30 product items (cum. total) during the 3 fiscal years	Minimum 30 product items (cum. total) during 3 years Minimum 25 product items
	Attainment below the guideline level designated by the Ministry of Health, Labour and Welfare at the time of handover to customers	Standardization of measuring methods and system structuring
	Minimum 80% green procurement ratio	Minimum 70%
	Completion of 15 development themes by the end of fiscal 2005	Systematic promotion
	Implementation of LCA for environment-friendly products	Establishment of assessment methodology
	Contribution to elevation of recycling ratio in collaboration with the relevant industrial associations	Contribution to elevation of recycling ratio in collaboration with the relevant industrial associations
	Application of the reuse system to apartment houses and to extensions on individual houses	Accumulation of successful results and know-how on individual houses
	Minimum 15% reduction of waste generation in Unit against fiscal 1998	Minimum 11% reduction
	Achievement of zero emission at 5 more workplaces	Start of zero emission activities at 5 workplaces
	Attainment of zero emission at all house sales subsidiaries (fiscal 2003)	Attainment of zero emission at all subsidiaries
	Minimum 90% recycling ratio of designated building materials	Grasp of actual recycling ratio of designated building materials
	Maximum 304 thousand tons of carbon dioxide emission from energy consumption	Maximum 315 thousand tons
	Minimum 5% reduction of heat converted energy Unit against fiscal 2000	Minimum 3% reduction
	Minimum 5% reduction of power consumption in offices against fiscal 2000	Minimum 3% reduction
	Maximum 760 tons of release and transfer	Maximum 900 tons
	Total abolition of HCFCs	Formation of a plan for total abolition
	Achievement of total abolition for use in production processes	Formation of a plan for total abolition and study on alternative materials
	Completion of soil contamination survey at object workplaces	Completion of survey at 3 workplaces
	Establishment of a system to grasp carbon dioxide emission volume	Grasp of current status at model workplaces and establishment of data collection system
	Minimum 50% of the company cars leased from Sekisui Lease Co., Ltd.	Minimum 40% of company cars
	Achievement of zero emission in Osaka and Tokyo head office buildings	Start of zero emission activities in head office buildings
	Minimum 5% reduction of power consumption against fiscal 2000	Minimum 3% reduction
	Continuous support for NPOs/NGOs' projects through Keidanren Nature Conservation Fund	Continuous support
	Minimum 10 Activity Points (cum. total)	Continuation of environmental protection activities with local communities
	Introduction in fiscal 2005	Decision on introduction and method
	Publication by workplaces and house sales subsidiaries with ISO 14001 certification	Publication by model workplaces
	Minimum 200 new participants (cum. total) on Nature Study Course during the 3 fiscal years Minimum 40 participants (cum. total) on follow-up courses	Minimum 60 participants on Nature Study Course Minimum 10 participants on follow-up courses

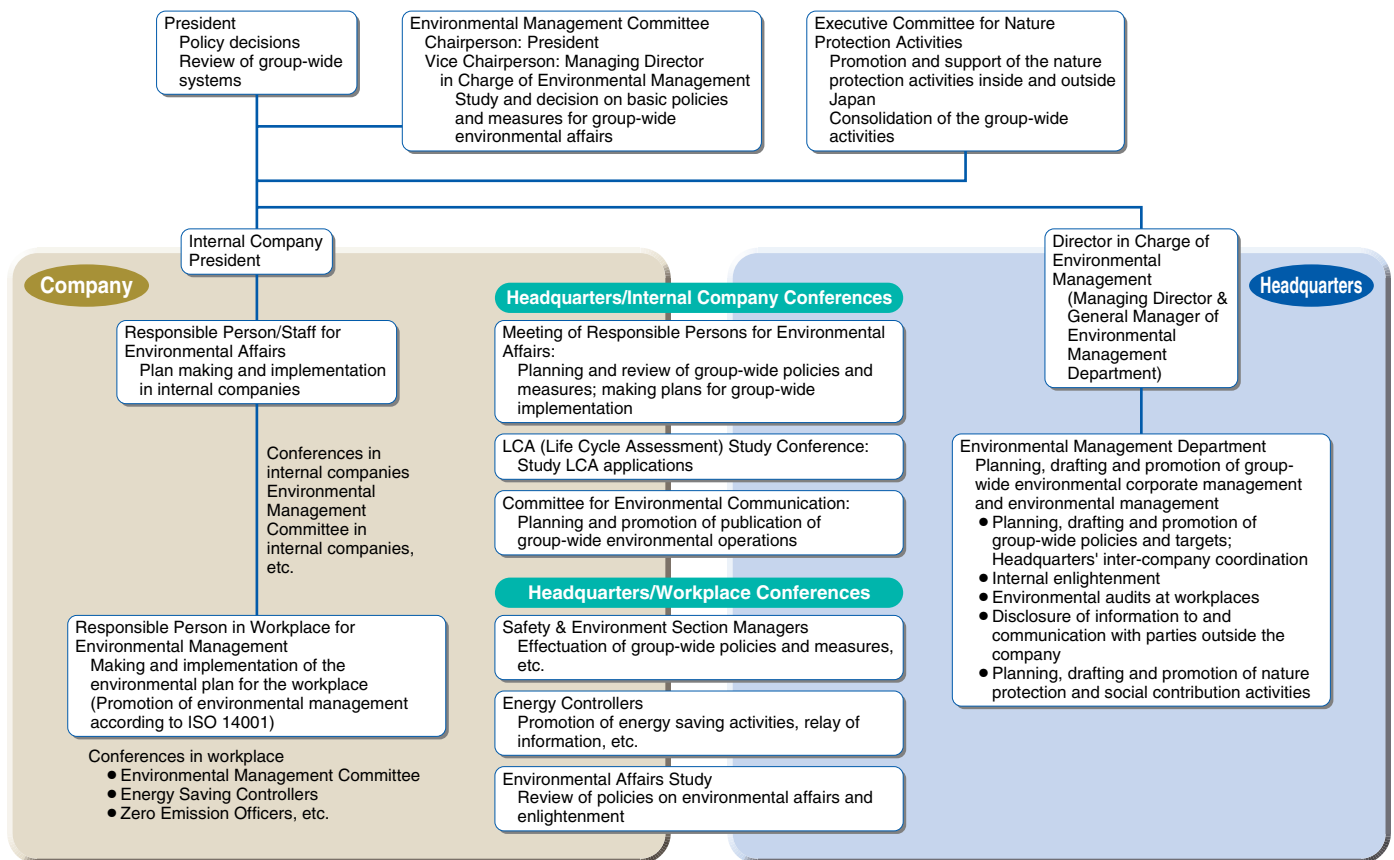
## Environmental Management

We have been promoting the ISO 14001 system structure in order to implement our autonomous improvement activities effectively. Eighty workplaces of our Group had acquired ISO 14001 by the end of fiscal 2002.

### ■Promotion System and Roles for Environmental Conservation

The group-wide basic policies and measures for environmental management (long term, middle term and annual plans, and basic policies on environmental issues) are studied and decided by the Environmental Management Committee, chaired by the President. The policies and measures thus decided are forwarded through respective internal companies to their workplaces for implementation and deployment. We also organize meetings for Headquarters and internal companies, as well as those for Headquarters and workplac-

es, to level up and speed up our activities by information exchange and horizontal deployment of activities. In order to progress the environmental corporate management of Sekisui Chemical Group (P2) more powerfully and expeditiously, the Environmental Management Department, consolidated with appropriate functions and roles, was newly established in April 2003, as the corporate office in charge of environmental planning and management.



### ■Structuring of Environmental Management Systems

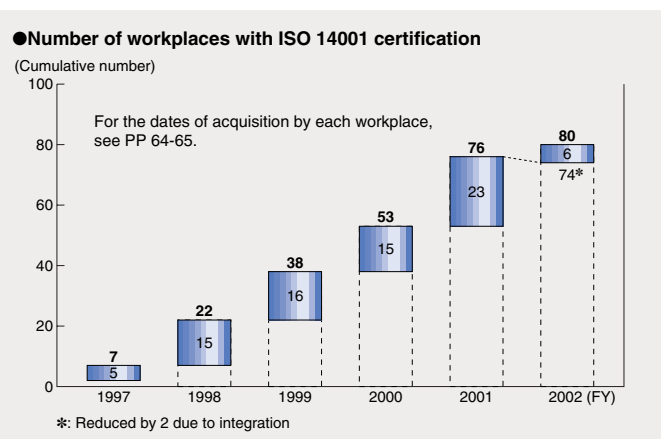
In order to effectively implement autonomous prevention of environmental pollution, continual improvement activities and full compliance with the laws, we are aggressive in introducing the ISO 14001 system as our environmental management system.

Our first workplaces for acquiring ISO 14001 were plants whose environmental impacts and loads were heavy on the surrounding areas. Then, we extended our acquisition to our house sales subsidiaries operating at house building sites, and to our R&D institutes in charge of promoting the environment-friendliness of our products.

The goals of our Middle Term Environmental Plan "STEP-21" were accomplished, with the acquisition of the ISO 14001 certification by 80 workplaces (76 domestic and 4 overseas) in cumulative total as of the end of fiscal 2002. However, a few workplaces prioritized acquisition of ISO 9000 and one operates according to its own EMS.

In implementing environmental corporate management, we intend to restructure the management systems in the admin-

istrative sections of Headquarters and internal companies to realize an environment-friendly corporate culture throughout our Group.





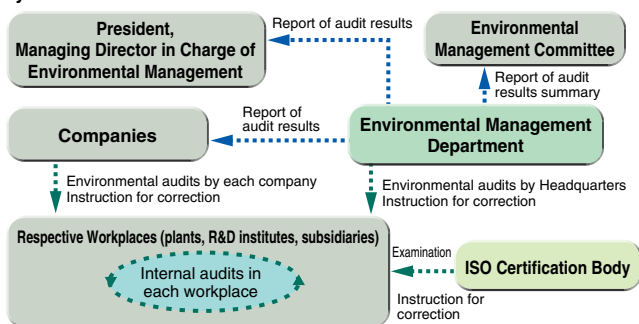
## System and Results of the Environmental Audits

As well as the internal audits by respective plants and R&D institutes and audits by the external auditing bodies in accordance with ISO 14001, these plants and institutes are also subjected to environmental audits by our Headquarters in order to enhance continuous improvement of their management systems and environmental performance.

Besides auditing the management systems, the environmental audits by the Headquarters focus on compliance with relevant environmental legislation and regulations, improvement of performance and future planning. The results of these audits are relayed to their top managements.

Also, the Headquarters point out any malfunctions in these plants and R&D institutes, and give advice and guidance for immediate correction.

### System of the environmental audits



Our audit results for fiscal 2002 are shown in the table below. Items for improvement have been corrected, except on such time-taking items as capital expenditures and audits conducted at the fiscal year end.

Further, we have established Environmental Management Evaluation Sheets that specify the level Sekisui Chemical Group should realize in its environmental management, and have started their use in the audits for fiscal 2003.

### Audit results in fiscal 2002 (as of March 31, 2003)

		Number of cases	Correction completed	Correction in progress
Environmental Audits by Headquarters <Note 1> (30 workplaces)	Pointed items	197	151	46
	Demanded items	146	86	60
	Proposed items	11 <Note 2>	4	6
	<b>Total</b>	<b>354</b>	<b>241</b>	<b>112</b>
Examination by External Parties	Renewal (11 workplaces)	Not in conformity (major)	0	0
		Not in conformity (minor)	10	7
		Matters to be observed	48 <Note 2>	28
		<b>Total</b>	<b>58</b>	<b>35</b>
	Surveillance (24 workplaces, 28 audits)	Not in conformity (major)	0	0
		Not in conformity (minor)	15	15
		Matters to be observed	122 <Note 2>	91
<b>Total</b>	<b>137</b>	<b>106</b>		
Internal Audits in Workplaces (36 workplaces, 39 audits)	Not in conformity (major)	0	0	
	Not in conformity (minor)	170	163	
	Matters to be observed	399 <Note 2>	380	
	<b>Total</b>	<b>569</b>	<b>543</b>	

Note 1: Classification of instructions in the Headquarters environmental audits:

Pointed items: Immediate improvement required

Demanded items: Improvement within 1 year required

Proposed items: Review of improvement recommended or advised

Note 2: The figures include the items that have been labeled as non-conforming, so are greater than the total number of items for correction completed and correction in progress.

## History of Our Environmental Activities

- Sep. 1972** Start of company-wide commitment to pollution control. Start of Environmental Management Dept.
- Apr. 1980** Start of company-wide commitment to energy saving.
- Jan. 1991** Implementation of Environmental Audit System. Start of Environmental Management Committee, and Environmental Management Section in the Safety & Environment Dept.
- Jul. 1991** Establishment of the Basic Policies on environmental issues.
- Oct. 1992** Start of the Environmental Technology Project for development of recycling and energy saving technologies.
- Apr. 1993** Introduction of Evaluation Systems of Products Assessment for Environmental Impacts.
- Oct. 1993** Implementation of Voluntary Environmental Plan.
- Apr. 1995** Start of Responsible Care Activities. Joined JRCC (The Japan Responsible Care Council.).
- Apr. 1996** Announcement of Top Management Policy for Environment and Safety. Start of ISO 14001 certification acquisition activities.
- Apr. 1998** Start of zero emission activities. Publication of the Leaflet on Environmental Affairs.
- Apr. 1999** Start of Middle Term Environmental Plan, "STEP-21".
- Jul. 1999** Revision of Corporate Policy on the Environment and Safety. Publication of Environmental Report 1999 (issued annually thenceforth).
- Mar. 2000** Achievement of zero emission at 6 plants.
- Jul. 2000** Announcement of Environmental Accounting for fiscal year 1999 (published annually thenceforth).
- Apr. 2001** Start of zero emission activities at the house construction sites.
- Sep. 2001** Achievement of zero emission in all of the house production plants.
- Nov. 2001** Commencement of green procurement.
- Mar. 2002** Achievement of zero emission in all of the plants of Sekisui Chemical Co., Ltd.
- Mar. 2003** Revision of Corporate Policy on the Environment and Safety, and Activity Guidelines. Revision of Middle Term Environmental Plan. Achievement of zero emission at the construction sites of 22 house sales subsidiaries. Completion of zero emission at 33 plants.
- Apr. 2003** Start of new Middle Term Environmental Plan, "STEP-2005". Start of Environmental Management Department.



**Responsible Care**

Responsible Care is the voluntary management of chemical substances through their life cycles, starting from development and continuing through manufacture, use and disposal by the manufacturers or distributors, to ensure safety and environmental conservation. Such management requires planning, annual activities, publication of results and continued efforts for improvement on the part of the participating firms. Sekisui Chemical Co., Ltd. has been a member of the Japan Responsible Care Council since its start in 1995, and has been continuing the responsible care activities progressively.

## Environmental Accounting

Our fiscal 2002 Environmental Expenditure was ¥7.6 billion (Table 1), and the Economical Effects ¥8.7 billion (Table 3). As the economical effects of environmental conservation, we evaluate the power saving effect from our houses equipped with our photovoltaic generation systems as being ¥1.4 billion in terms of economical merits for the customer.

### ■Our Environmental Accounting

Secisui Chemical Group is aiming at becoming an environmentally creative organization by having environmental activities as the key for management. So, for us environmental accounting is of utmost importance, in that it grasps the expenditure and effects related to environmental conservation activities, is the tool for the purpose of effective environmental corporate management, and for our stakeholders' understanding, by fulfilling our accountability regards precise disclosure of all relevant information. Our summation was conducted according to the Environmental Accounting Guideline issued in March 2002 by the Japanese Ministry of the Environment. As regards the economical effects and environmental performance indices, we have added our own concepts in view of our business characteristics and environmental conservation activities.

### ■Environmental Accounting for fiscal 2002

(1) The scope of summation of fiscal 2002 extends from that of fiscal 2001, by the addition of 5 companies (4 house sales subsidiaries and 1 subsidiary under Headquarters' control) but one workplace was excluded due to business restructuring.

- (2) We have applied eco-efficiency as the index for environmental corporate management.
- (3) We have estimated the power saving effect from the houses equipped with our photovoltaic generation systems as the economical effects (economical merits for the customer) of environmental conservation.

### ■Summation of Environmental Accounting

- (1) Summation Period: April 1, 2002 to March 31, 2003
- (2) Scope of Summation: Targeted workplaces (as listed on PP64-65) + 4 R&D institutes + Headquarters + internal company head offices + 1 subsidiary under Headquarters' control + 4 house sales subsidiaries
- (3) Principle of Summation:
  - Depreciation amounts are the same as those of financial accounting.
  - Investment amounts are based on approvals of budget during the fiscal period.
  - Expenditure and investment that contain other than environmental conservation activities are pro-rata distributed by 10% increments.

■Table 1: Environmental Conservation Expenditure

(Unit: ¥1 Mil.)

Items		Housing Co. (Note 1)		U.I. & E.P. Co.		H.P.P. Co.		Entire Company (Note 2)	
Category	Main projects	Expenditure	Investment	Expenditure	Investment	Expenditure	Investment	Expenditure	Investment
1) Within workplaces	Prevention of air pollution, water contamination, noise	370	54	150	35	361	46	1,068	166
	Prevention of global warming (energy saving)	18	3	9	21	80	9	115	33
	Waste reduction, recycling, disposal, treatment	1,010	22	433	26	475	186	1,986	276
2) Up/downstream	Reduction of environmental loads in containers and packaging. Payment difference by green purchase	1	0	45	0	42	0	123	0
3) Management activities	Environmental education, EMS maintenance, information disclosure, personnel	303	0	237	0	300	0	1,689	0
4) R&D	Research and development	98	23	643	129	344	202	1,385	458
5) Social activities	Contribution to society	14	0	18	0	22	0	85	0
6) Environmental damages	Restoration of nature	28	0	0	0	160	0	188	0
Total		1,842	102	1,535	211	1,784	443	6,639	933

Items		Housing Co. (Note 1)		U.I. & E.P. Co.		H.P.P. Co.		Entire Company (Note 2)	
		R&D cost	Investment	R&D cost	Investment	R&D cost	Investment	R&D cost	Investment
Total amount of R&D costs and investments in the fiscal period		5,290 (Note 3)	1,469	5,409 (Note 3)	4,735	7,670 (Note 3)	6,503	23,403 (Note 3)	13,338
Ratio of amount related to environmental conservation activities to the total (%)		1.8	7.0	11.9	4.5	4.5	6.8	5.9	7.0

(Note 1) 4 house sales subsidiaries are included. (Note 2) The 3 internal companies and Headquarters (Note 3) R&D cost is the total of that of all consolidated companies.

■Table 2: Environmental Conservation Effects [Physical Quantity]

Category of effect		Indices representing environmental conservation effects (comparison to FY 2001)						Environmental Indices				Evaluation	
		Classification	Housing Co.	U.I. & E.P. Co.	H.P.P. Co.	Entire Company (Note 2)	Page	Items		FY 2001	FY 2002		
Within workplaces	Input of resources	Power consumption (GWh)	-6	3	-11	-15	18	Ex-godown Units	Energy consumption (power + fuel) (Kℓ/¥1 Mil) (Note 4)		0.392	0.421	×
		Fuel consumption (Mℓ)	0	0	-3	-3	18		CO <sub>2</sub> generation (Tons/¥1 Mil) (Note 6)		0.769 (Note 7)	0.795	×
	Environmental loads/waste	CO <sub>2</sub> generation (Ktons) (Note 5)	-5	1	-17	-23	18		Pollutant emission (Tons/¥1 Mil)		0.0024	0.0022	○
		Pollutant emission (Tons) (Note 8)	-20	-34	-135	-189	20		Waste generated (Tons/¥1 Mil)		0.150	0.141	○
		Waste generated (Ktons) (Note 9)	-4	-3	-1	-8	16		Outside disposal (Tons/¥1 Mil)		0.015	0.001	◎
		Outside disposal (Ktons) (Note 10)	0	-5	0	-6	16		CO <sub>2</sub> emission reduction (cum. tons)		30,301	42,493	◎
Up/downstream	Goods and services	CO <sub>2</sub> emission reduction (Tons)	12,192	—	—	12,192	33						
Other environmental conservation effects	No. of workplaces with ISO 14001	New	5	0	0	6	10	No. of workplaces with ISO 14001 (cum. number)		76	80 (Note 11)	○	
		Renewed	0	4	5	11	—						
	No. of zero emission sites (Note 12)	22 (Note 13)	2	5	29	17	No. of zero emission sites (cum. number) (Note 12)		26	55	◎		

(Note 4) Coefficients are officially announced by the Japanese Ministry of Economy, Trade and Industry in crude oil conversion. (Note 5) Emission from production + emission from incineration (Note 6) Coefficients are officially announced by the Japanese Ministry of the Environment in CO<sub>2</sub> conversion. (Note 7) Coefficients of FY2002 are used for calculation. (Note 8) Chemical substances specified as Class 1 in PRTR Law (Note 9) Emission + volume of saleable materials + internal incineration (Note 10) Simple incineration + landfill (Note 11) Rescission of the certification by 2 workplaces is reflected. (Note 12) A workplace belonging to more than one company is calculated as one. (Note 13) The number of all new house construction sites of house sales subsidiaries that achieved zero emission

## ■Our Activities and Effects in fiscal 2002

- (Table 1) Our environmental conservation costs totaled ¥6.6 billion for expenditure (including ¥1.1 billion by 4 house sales subsidiaries) and ¥0.9 billion for investment (no investment by 4 house sales subsidiaries) respectively. Waste disposal charges increased greatly, because 4 house sales subsidiaries were included in the object of summation. The main investment items are related to waste recycling and energy saving, including photovoltaic generation facilities installed in the house manufacturing plants.
- (Table 2) Regarding the environmental conservation effects [physical quantity], we reduced the quantity of all classified items. However, the ex-godown Unit of energy consumption and CO<sub>2</sub> emission worsened due to the increase of products requiring more energy use and the decrease of houses requiring less energy use in the production processes. Thanks to photovoltaic generation systems and other energy saving systems, CO<sub>2</sub> reduction effects steadily increased, reaching 40,000 tons in cumulative total. We also promoted zero emission activities at the construction sites of our house sales subsidiaries.

- (Table 3) We calculate that the actual economical effects were ¥1.6 billion (including ¥4 million for 4 house sales subsidiaries) and the estimated effects ¥7.1 billion, both related to the environmental conservation measures. The major parts of the effects arose from our energy saving activities, and cost reduction was realized by our waste reduction activities including resources saving.
- (Table 4) As a new part of the economical effects related to the environmental conservation effects, we have evaluated the power saving effect by photovoltaic generation to be ¥1.4 billion as the economical merit for the customer. CO<sub>2</sub> reduction effect thanks to photovoltaic generation equals the CO<sub>2</sub> generated when 9 million liters of kerosene is burnt.

## ■Future Proceedings

- (1) With the consolidated basis, we will extend and enhance the summation range centering on our workplaces with heavy environmental loads.
- (2) We review evaluation indices for the continual improvement of our environmental corporate management.

■Table 3: Economical Effects Related to Environmental Conservation Measures [Monetary Unit] (Unit: ¥1 Mil.)

Category of effect		Housing Co.	U.I. & E.P. Co.	H.P.P. Co.	Entire Company (Note 2)	Sources
Income	Income from sales of valuable materials	2	11	37	51	Segregation and recycling of waste
Cost reduction	Cost reduction from package saving	1	9	3	14	
	Cost reduction from energy saving activities	38	22	352	413	
	Cost reduction from waste reduction	13	109	1,016	1,138	Including resources saving activities
Sub-total (actual effect)		54	151	1,408	1,616	
Contribution portion of environmental conservation activities (Note 15)		268	1,847	2,369	4,484	Added value of facilities (Note 14)
Contribution portion of R&D of environment-friendly new products (Note 15)		1,825	461	330	2,616	(Note 16)
Sub-total (estimated effect) (Note 15)		2,093	2,308	2,699	7,100	
Total		2,147	2,459	4,107	8,716	

(Note 14) Excluding environment-friendly new products (Note 15) Excluding 4 house sales subsidiaries (Note 16) Environment-friendly new products sales × ratio of environmental R&D expenditure to total R&D expenditure.

■Table 4: Economical Effects Related to Environmental Conservation Measures [Monetary Unit] (Unit: ¥1 Mil.)

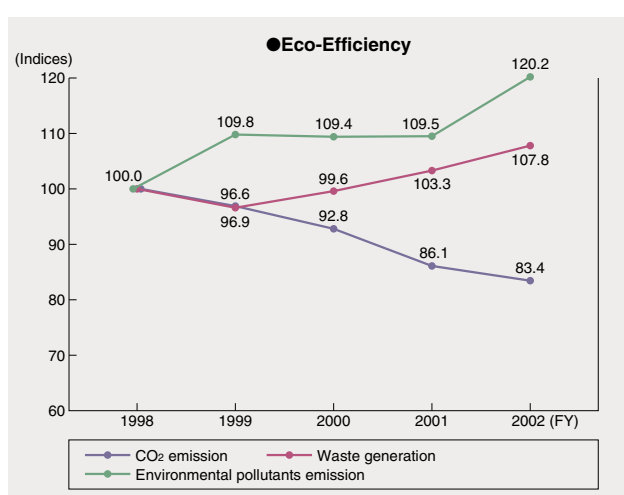
Category of Effect	Effect		Sources
	Annual power generation	Amount saved	
Power saving effect in houses equipped with photovoltaic generation systems	62,000MWh	1,426	Annual generated power in houses equipped with photovoltaic generation systems (= reduction of purchased power charges) is converted to monetary unit. The power unit price is based on the calculation standard for energy saving effect set by The Energy Conservation Center, Japan.
Total		1,426	

## ■Evaluation Indices of Environmental Corporate Management

As the indices to evaluate environmental loads associated with business activities, we have applied eco-efficiency as advocated by the WBCSD (Note 17). We use these indices as the evaluation indices of our environmental corporate management. We have adopted "produced sales amounts" for economic activities as the numerator, and "CO<sub>2</sub> emission", "waste generation" and "environmental pollutants emission" for environmental loads as the denominator. The graph (right) shows the indices with fiscal 1998 as 100. As a result, our eco-efficiency was improved in waste generation and environmental pollutants emission, while CO<sub>2</sub> emission continued to increase.

$$\text{Eco-Efficiency} = \frac{\text{Produced Sales Amount}}{\text{Individual Environmental Loads}}$$

(Note 17) WBCSD: The World Business Council for Sustainable Development



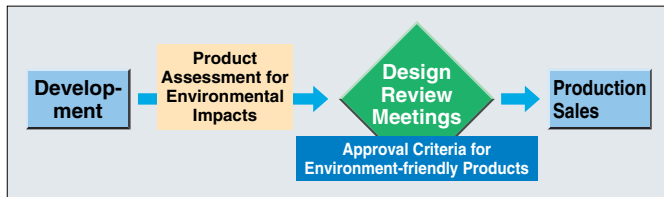
## Development of Environment-friendly Products and Technologies

As manufacturers, the development of technologies and products with minimal environmental loads is our most important mission. In fiscal 2002, we had 183 environment-friendly new products on the market in cumulative total, which equals 30.4% of the total sales amount of our new products.

### ■Scheme of Environmental Consideration for Products

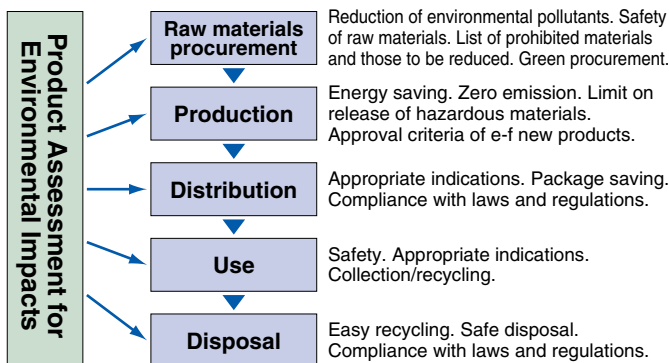
The environment-friendliness of our products is checked prior to marketing based on our Product Assessment for Environmental Impacts and in accordance with our Approval Criteria for Environment-friendly Products at Design Review (DR) Meetings held at each internal company.

#### ●Development scheme of environment-friendly (e-f) new products



#### ●Product assessment for environmental impacts

We have continued Product Assessment for Environmental Impacts since fiscal 1993. At each step of research and development, trial mass production and actual production, we assess the environmental impacts of our products throughout their entire life cycles, from raw material procurement to disposal, thereby reducing the environmental loads of our products.



### ■Green Procurement

#### ●Green procurement (Raw materials and equipment)

We have set up standards applicable to the entire Sekisui Chemical Group, based on which we assess the suppliers and purchased items with respect to raw materials, packaging materials and equipment.

In fiscal 2002, our actual result was 65.3% against the target of 70% of the procurement amount. We will enhance our activities by reviewing the object items. (Outline of Green Procurement Standards is given in our Environmental Report 2002. [http://www.sekisui.co.jp/eco/report2002\\_e/report2002\\_e.html](http://www.sekisui.co.jp/eco/report2002_e/report2002_e.html))

#### ●Green purchase (Office supplies and equipment)

We have set up standards applicable to the entire Sekisui Chemical Group. The summation results for fiscal 2002 are given in the following table.

	Purchased amount (¥ million approx.)
Copy paper	31
Other office supplies	96
OA equipment	118

### ■Approval Criteria for our Environment-friendly Products

Products Sekisui Chemical Group introduces to the market announced as "environment-friendly" have to meet one or more of our approval criteria as follows:

- 1) Purposed for environmental conservation
- 2) Approved by appropriate independent institutions
- 3) Environmental loads less than those of conventional or similar products.

In fiscal 2002, we reviewed and revised our approval criteria by adding or deleting several items and adjusting standard values. The revised criteria are adopted in fiscal 2003. Methods to clearly convey environmental information (e.g. environmental labeling) regarding our products are now under study.

#### ●Approval criteria for our environment-friendly products

Classification	Approval Criteria		Standard Value	
Products to achieve or support environmental conservation, and to reduce environmental loads or environmental problems	Products to save resources, to utilize recycled raw materials, to reduce environmental loads, to utilize natural energy, to dispose of waste, to promote recycling, to use previously unutilized water, or to promote composting		—	
Products approved or registered as environment-friendly by independent institutions	Products with the Eco Mark. Products commended for energy saving. Products approved or registered by relevant NGOs or consumer associations		—	
Products contributing to landscape conservation and a green environment	Products and methods to contribute to conservation or improvement of landscape or green scenery		—	
Products that meet a minimum of one item of the standard values in the right column, compared to the status-quo of our conventional products or other manufacturers' similar products, or products already publicly known to be of acceptable standards	Attention to production process	Reduction of environmental loads	Reduction of emission of environmental pollutants or chemical substances hazardous to ecological systems, as specified by relevant laws or by industrial associations' autonomous regulations	Reduction of emission to the environment by 50% or more
		Fundamental attention	Resources saving	Reduced amount of raw material use
	Use of recycled materials		Use of previously unutilized lumber such as from forest thinning	Use of 50% or more
			Use of recycled raw materials or components	Use of 40% or more
	Attention to installation and use	Reduction of environmental loads	3 other criteria	
			Reduced amount of energy use	Reduction by 20% or more
		Utilization of natural energy	7 other criteria	
	Attention to disposal	Easy treatment and disposal	Use of renewable energy	Incorporation in basic specifications
			Use of biodegradable raw materials	Use of 100% in the main functional part
		Easy recycling	4 other criteria	
		Reduced use of composites	Use of 50% or less	
		5 other criteria		



## ■Direction of our Environment-friendly Products Development in each Business Segment

Each of our internal companies is committed to developing and supplying environment-friendly products and services.

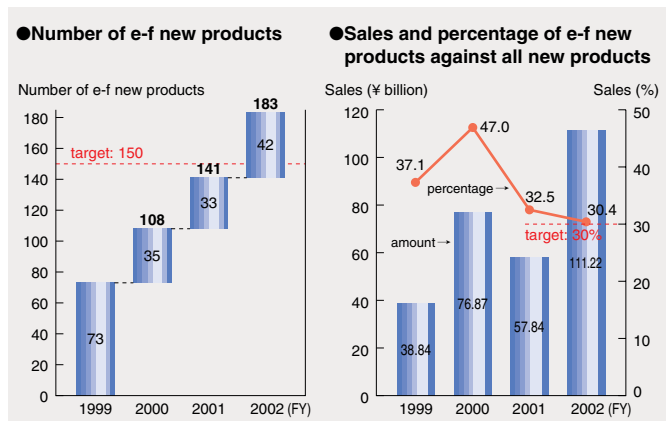
	Direction of Environmental Consideration in Products	PP
Housing Company	<ul style="list-style-type: none"> <li>Reduction of CO<sub>2</sub> emission from households</li> <li>Extension of lifespan and reuse</li> </ul>	32 - 36
Urban Infrastructure & Environmental Products Company	<ul style="list-style-type: none"> <li>Response to demand for next generation infrastructure</li> <li>Use of recycled materials</li> <li>Environmental purification and energy saving</li> </ul>	42 - 45
High Performance Plastics Company	<ul style="list-style-type: none"> <li>Products that can contribute to customers' environmental considerations</li> </ul>	56 - 59

## ■Results of our Efforts for Environment-friendly New Products

A target to introduce a total of more than 150 environment-friendly new products by our three internal companies to the market, equal to 30% or more of new product sales, was set for the four years of fiscal 1999 through fiscal 2002.

Our efforts resulted in 183 items, and 30.4% respectively in fiscal 2002, satisfactorily achieving our target both in the number of items and in the sales ratio.

We continue our efforts aggressively to make all our products environment-friendly, and plan to achieve 25% of environment-friendly product sales against our total turnover in fiscal 2005.



$$\text{Percentage of sales of e-f new products} = \frac{\text{Sales of e-f new products in FY 2002}}{\text{Sales in FY 2002 of all new products introduced FY 1999 to 2002}}$$

$$\text{Sales of e-f new products} = \frac{\text{Sales in FY 2002 of e-f new products introduced FY 1999 to 2002}}{\text{Percentage of sales of e-f new products}}$$

## ■Our Efforts for Development of Environmental Conservation and Recycling Technologies

We are developing new technologies to help solve environmental problems such as global warming and waste disposal and to create a better environment, utilizing and upgrading our basic molding and composite technologies. We were well over our target for the period fiscal 1999 to fiscal 2002 by completing 21 against the planned 10 themes. Examples are shown below:

	Environment-friendly technologies	Outline Trade names in parentheses	PP	
Housing Company	Inorganic polymer technology (inorganic exterior wall which does not require painting)	Technology to make a fine and stable hard structure by combination of kaolin and special binder (Durastone Wall)	35	
	Tool for analysis of lot environment	Software to forecast sunshine, wind direction and velocity from the construction site and building plan	—	
Urban Infrastructure and Environmental Products Company	SPR system	No-dig method to form a resin layer onto the inside surface of aged sewerage pipes. Waste, usual in dig method, is not generated.	42	
	Omega Liner system			
	Application of lumber to cascade-type recycling	Structure from recycled lumber	Technology to make structure material for housing by making waste lumber into long-sized wood chips (REW)	43
		Extrusion of densely filled powdered-lumber	Technology to form parts by mixing powdered-lumber and plastics	45
	Aggregate from waste plastics		Recycling technology to improve adhesion property to cement of waste plastics by crushing them and applying special treatment of external surfaces	—
		Extrusion of 3-layer products with foam interlayer	Single process to extrude 3-layer products by foaming recycled material in the middle layer (3-Layer Foamed Core Pipe)	46
		Sound-proof sheet	Material technology to secure sound insulation by applying thin film only (Calmoon)	44
High Performance Plastics Company	Sandwich injection molding	Injection molding of 3-layer products with recycled material used for the inside layer	59	

## ●Quantitative assessment by LCA method

We are using the LCA (Life Cycle Assessment) method to implement quantitative assessment of the environmental impacts through the entire life cycle of a product. According to results of our housing assessment, for example, which showed that CO<sub>2</sub> emission is greatest during the household stage, we have started to utilize the LCA method to achieve reduction during the household stage (P32).

Our LCA Study Meeting aims to implement and establish this method, in order to conduct quantitative assessment of all our environment-friendly products at the development stage in the future. In fiscal 2002, we implemented LCA on the model products of our three internal companies, and grasped the situation regarding its implementation.

The LCA method will be incorporated in our Product Assessment for Environmental Impacts, in order to implement precise assessment of the entire life cycle of our products.

### 3R's: Contribution to a Resource Recycling-based Society

We are promoting our activities for zero emission and waste reduction at our plants and house construction sites. Zero emission was achieved by all of our 33 targeted plants, and by 22 house sales subsidiaries.

#### 3R's at the Production Stage: Zero Emission Activities

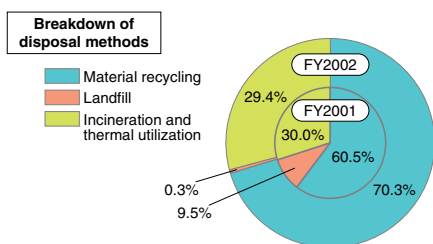
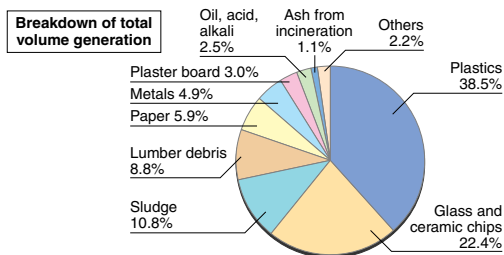
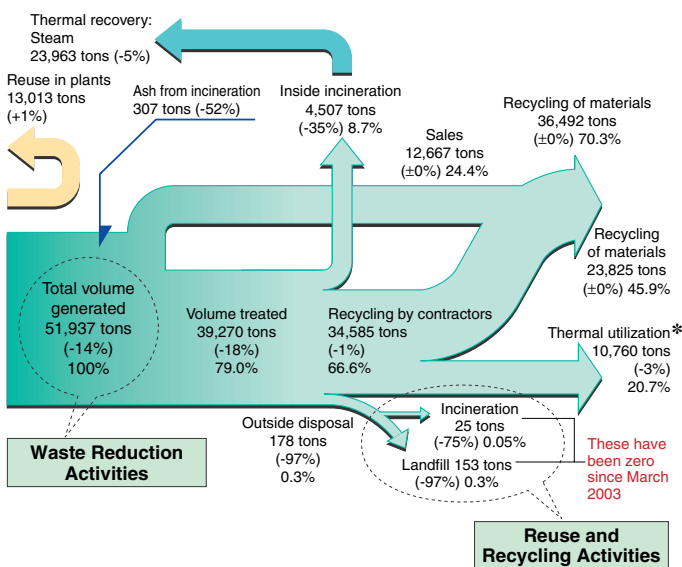
As a manufacturer, our mission is to achieve maximum reduction, reuse and recycling of all waste generated at the production stage of our products, thereby realizing the most effective use of resources.

#### Status of waste generation and treatment

In fiscal 2002 we greatly reduced outside disposal and inside incineration, compared to fiscal 2001, by promoting zero emission and abolishing inside incineration.

The total rate of inside incineration, outside incineration and thermal utilization from incineration was almost equal to that of fiscal 2001, but the rate of material recycling was elevated by 10 percentage points.

#### Status of waste generation and treatment (at plants in FY 2002)

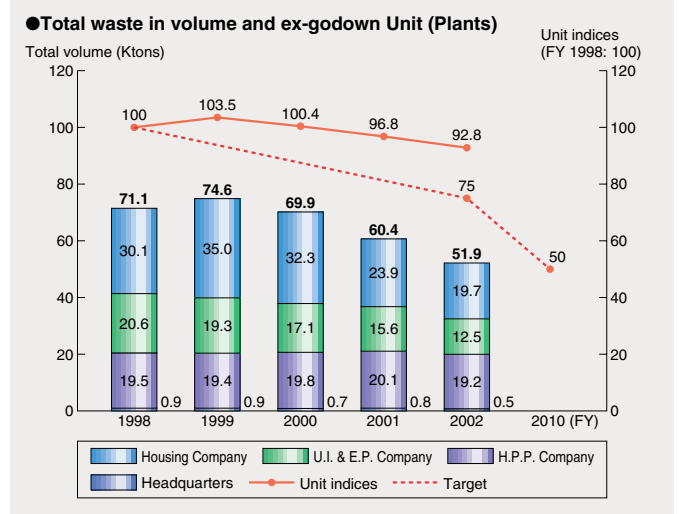


\*: Thermal utilization includes:  
 ① Use as substitute fuel  
 ② Use of steam, etc. obtained from incineration

#### Activities for waste reduction

Our target was a 25% minimum reduction per ex-godown Unit to be achieved by the end of fiscal 2002 against fiscal 1998, but our result was a reduction of only 7.2%.

This was due to decreases in our sales prices and decreases in sales amount after business restructuring, and further the manufacture of products with larger ex-godown Unit and small-scale production increased waste generation. These factors adversely effected our improvement activities for cut-offs reduction and raw material recycling. Our waste generation decreased by 27% in volume against fiscal 1998. We further continue our efforts to reduce ex-godown Unit of waste generation by across the board improvement.



#### Examples of our activities effective for waste reduction

Company	Our activities effective for reduction of waste generation
Housing Company	<ul style="list-style-type: none"> <li>Reuse of lumber cut-offs for short-sized parts</li> <li>Change of packaging materials from corrugated cardboard boxes to reusable containers for transportation of parts from plants to house construction sites</li> <li>Change of corrosion preventive treatment of lumber from pre-fabrication to post-fabrication stage for reduction of treated cut-offs</li> <li>Reduction of waste paint by improvement in robotic method for external wall painting</li> <li>Introduction of drying machinery to reduce the weight of sludge generated at the external wall production stage</li> <li>Improvement of woodchips recycling rate by introducing secondary separation equipment for cut-offs of our Relief External Wall (composed of woodchips and cement)</li> <li>Package saving for parts delivery</li> <li>Abolition of surface treatment of unit frames by introducing new paints and adhesives</li> </ul>
Urban Infrastructure and Environmental Products Company	<ul style="list-style-type: none"> <li>Recycling of formed product cut-offs and sawdust</li> <li>Utilization of cut-offs as starting materials at change-over to other product items</li> <li>Reduction of waste paints by improving painting conditions</li> </ul>
High Performance Plastics Company	<ul style="list-style-type: none"> <li>Introduction of drying machinery to reduce the weight of sludge</li> <li>On-line collection and recycling of cut-offs</li> <li>Recycling of product cut-offs and sawdust</li> <li>Collection and recycling of paper cores</li> </ul>
Organizations under Headquarters' Management	<ul style="list-style-type: none"> <li>Improvement of the collection channel at the change-over to prevent mixing of the former item with the new item</li> <li>Reduction of inappropriate products by the "Inappropriate Products 1/10 Plan" activity</li> </ul>

### ●Activities for reuse and recycling of waste

In fiscal 1998 we started zero emission activities such as aiming at the reuse and recycling of all wastes. We aimed at a target achievement by the end of fiscal 2002 to recycle all wastes at 33 plants, including those of our subsidiaries, and at the construction sites of our house sales subsidiaries.

### ●Zero emission achievement criteria

- ①All outside incineration must include thermal utilization, and no landfill outside or inside of facilities (Recycling ratio 100%).
- ②Contractors must be specified, and recycling methods be made precise.

We have also established uniform evaluation criteria named "The Zero Emission Achievement Evaluation List". In addition to the above standards, we conduct our internal examination according to this list on strict observance of related laws and regulations, complete rules and systems for waste segregation as well as clearly legible signs, adequate facilities for waste treatment and planning for and control of waste reduction. Only those that have achieved the designated level are certified by the President as zero emission workplaces.

### Zero emission at plants

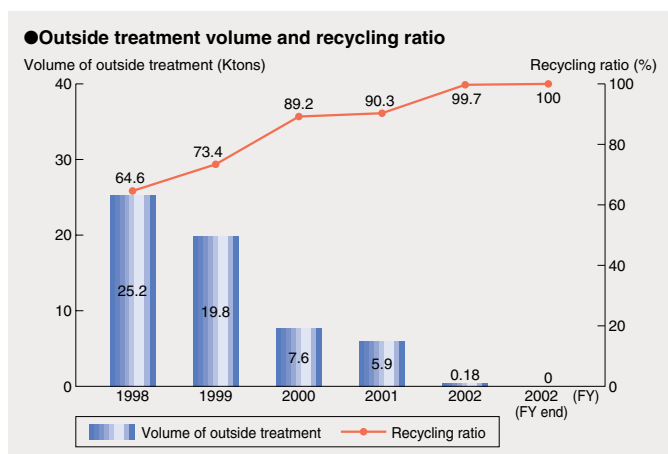
Starting with the achievement at our 6 plants in fiscal 1999, we had achieved zero emission at 26 plants including all plants of Sekisui Chemical Co., Ltd. and those of our house production subsidiaries by the end of fiscal 2001.

As 7 plants of our resin processing subsidiaries achieved zero emission in fiscal 2002, all 33 plants achieved zero emission as targeted in STEP-21, our Middle Term Environmental Plan.

We are extending our targeted workplaces to our R&D institutes and Headquarters in order to achieve zero emission by the end of fiscal 2005.

Targeted workplaces	Targeted number (note)	Cumulative total of target achieved plants			
		FY1999	FY2000	FY2001	FY2002
Plants of Sekisui Chem. Co., Ltd.	7 (note)	2	4	7 (completed)	7 (maintained)
Subsidiaries	House production plants	10	2	5	10 (completed) (maintained)
	Resin processing plants	16	2	2	9 (completed)
Plants total	33	6	11	26	33 (completed)

Note: Including Sakai Plant (now closed due to amalgamation)



### Zero emission at house construction sites (P37)

At the model bases of our house sales subsidiaries, we expected to achieve 100% of recycling in fiscal 2001. However, with the renewal of our achievement criteria and the enhancement of our activities by setting new target values for reduction of waste generation in fiscal 2002, some of the bases did not achieve the target. In fiscal 2002, 22 out of 40 bases achieved zero emission. The remaining 18 have attained the target in the first half of fiscal 2003.

### ■3R's at Other Stages

At all other stages, from new product development to eventual disposal of used products, we are promoting collection and recycling to contribute to a recycling-based society.

#### ●Development of products and technologies

<b>Reduce</b>	<ul style="list-style-type: none"> <li>● Long term support system of 60 years for housing (P35)</li> <li>● Longer life of housing parts (P34)</li> <li>● Pipeline restoration (P42) (SPR system, Omega Liner system)</li> <li>● Reusable container (P56) (Sekisui e-Container)</li> </ul>
<b>Reuse</b>	<ul style="list-style-type: none"> <li>● Reuse system of housing units (P36)</li> </ul>
<b>Recycle</b>	<ul style="list-style-type: none"> <li>● PVC to PVC pipe and 3-layer foamed core pipe (P46)</li> <li>● PET to sewer pit covers</li> <li>● Utilization of waste lumber in cascade-type recycling (P43)</li> <li>● Products by sandwich injection molding (P59)</li> <li>● Aggregate from waste plastics</li> </ul>

#### ●Collection and recycling of used products

	Products	Status in FY2002
Housing Company	Waste from demolition	Formula for contracts and official reports on house renovation/demolition.
Urban Infrastructure and Environmental Products Company	PVC pipe & fittings (P46)	Production of recycled pipe at Shiga-Ritto Plant and Sekisui Chemical Hokkaido, partaking in the recycling system operation set up by the Japan PVC Pipe & Fitting Association. The association's recycling ratio was 48%.
	LP pipe (P46)	Separation works of steel pipe and PVC pipe at Shiga-Ritto Plant, partaking in the recycling system operation set up by the Japan Water Steel Pipe Association. The association's recycling ratio was 32%.
	FRP bathtubs	Structure of our recycling system completed in the Kinki and Kanto districts.
	Rain gutters	Trial operation in the Kanto and Tokai districts.
	Roofing tiles	Preparation of the system operation in Okayama prefecture.
High Performance Plastics Company	Agricultural PE film "Hanayaka"	Grasp of movements in the industry for our future planning.

## Prevention of Global Warming

Our carbon dioxide emission at the production stage was reduced by approx. 5% in total volume, but increased by approx. 20% in ex-godown Unit compared to that of fiscal 1998. We continue our activities for further reduction of its emission.

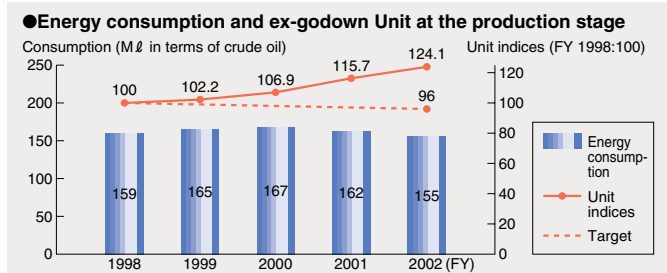
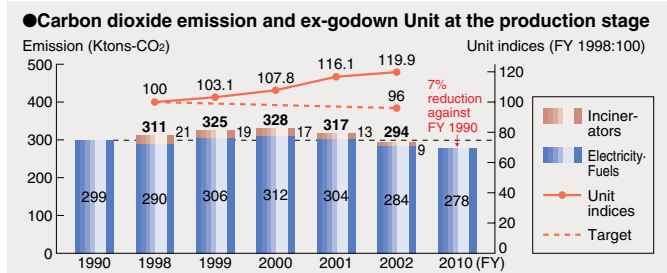
### Reduction of Carbon Dioxide Emission at the Production Stage

We promoted our activities for the target of minimum 4% reduction in ex-godown Unit per produced sales amount of carbon dioxide emission and energy consumption respectively compared to fiscal 1998. While product items requiring more energy consumption at the production stage increased, the sales of houses, the energy consumption of which is relatively small, decreased, resulting in an increase by approx. 20% in ex-godown Unit in both targets.

On the other hand, we achieved more than 5% reduction of carbon dioxide emission in total volume, compared to fiscal 1998. This is due to the effect from shifting the fuel for large-sized boilers at Shiga-Minakuchi Plant from heavy oil to city gas, in addition to the effect of the abolition of incinerators and condensing of plant operations. We expect further reduction in fiscal 2003, effected by the change of fuel and introduction of a co-generation system in Shiga-Minakuchi Plant.

In future, we will implement various measures including utilization of ESCO(\*) business, and aim at achievement of our target in fiscal 2010, namely, a 7% reduction compared to fiscal 1990.

(\*) ESCO: Energy Service Company



(Note) In calculating the volume of carbon dioxide emission and energy consumption, we use the conversion coefficient decided in fiscal 2002 by the Greenhouse Effect Gas Emission Calculation Method Study Meeting of the Japanese Ministry of the Environment and by the revised Energy Conservation Law.

### Energy Saving Activities at Head Offices and R&D Institutes

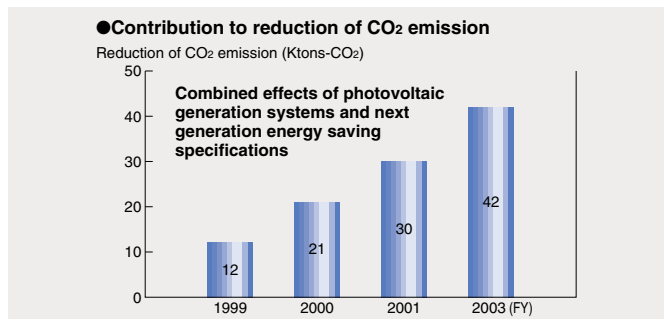
As well as at our plants, we promoted our energy saving activities at our two head offices and four R&D institutes to reduce electric power consumption by 4% in fiscal 2002 compared to fiscal 1998. We achieved our target at the two head offices and two R&D institutes. At the other two R&D institutes increased R&D activity required longer operating hours of equipment; therefore our targets were unable to be met.

Workplaces	Power consumption (MWh)		Results	Target
	FY1998	FY2002		
Osaka Head Office	812	702	-14%	-4%
Tsukuba R&D Site & Development Center	5,052	3,990	-21%	
Kyoto R&D Laboratories	7,098	7,084	-0.2%	
Minase Research Laboratories	3,375	4,144	+23%	
Total of 4 Institutes	15,525	15,218	-2.0%	
Tokyo Head Office	1,720 (FY2000)	1,304	-24%	-2%

### Reduction of Carbon Dioxide Emission by Households

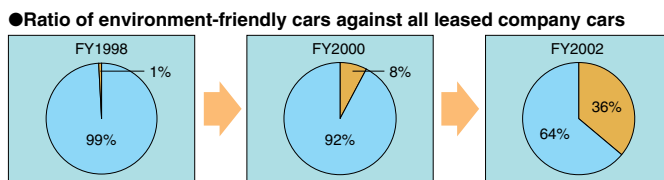
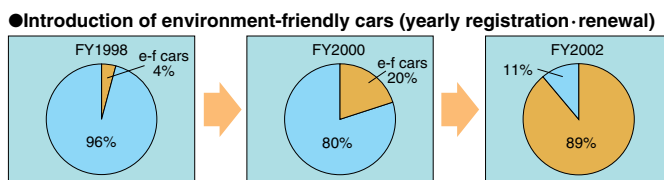
With respect to housing the most important item for prevention of global warming is to reduce carbon dioxide emission by households.

For our Sekisui Heim and Two-U Home, we have established standardization of next generation energy saving specifications and popularized energy saving and generating houses equipped with our photovoltaic generation systems (P32). By the end of fiscal 2002, we had sold more than 20,000 detached houses in cumulative total equipped with our photovoltaic generation systems, which has brought us to the leading seller position in this field in Japan. This provides a reduction effect of 40,000 tons approx. per year of carbon dioxide emission when combined with the insulation effects.



### Increased Use of Environment-friendly Cars meeting with the Green Taxation Plan

With respect to company cars leased from Sekisui Lease Co., Ltd., we have been shifting to energy saving cars and low polluting cars. Our target in fiscal 2002 was a minimum of 50% shifting of all registered or renewed cars, but we achieved 89%, far above the target.



\*Up to fiscal 2000, cars meeting with the present Green Taxation Plan and cars equipped with direct-injection engines are included.

### Green Distribution

Our products are many and diversified, so the transportation methods differ according to the product type. Accordingly, the manners of approach to reduction of environmental loads differ. For example, for transportation of house units, we are continuing our efforts to improve the loading efficiency and enlarge the truck sizes. For packaging tape, we are implementing a combined delivery system in cooperation with Sekisui Jushi Corporation and Sekisui Seikei Co., Ltd. By sharing the depots with them, it has become feasible to reduce environmental loads such as exhaust gases and carbon dioxide. We are planning to establish a system to come into effect by the end of fiscal 2005 to grasp the volume of carbon dioxide emission.



## Environmental Conservation in Local Communities

We are making every effort possible to prevent environmental contamination in local communities. However, should any contamination occur, we will act appropriately to limit and intercept it.

### Emergency Management

For prevention of environmental contamination and its expansion in cases of accident or natural disaster, each workplace regularly trains designated employees for proper response. The number of main training sessions held in fiscal 2002 are shown below.

#### Imagined state of emergency and response training

Imagined state of emergency	Number of training sessions
Leak/outflow of oil, etc.	38
Solvent emission to atmosphere	3
Fire	51
Earthquake	16

#### Training example

(Treatment of raw material outflow: at Shiga-Minakuchi Plant)



Confirmation of treatment procedures before the start of training



Training for removal of effluent

### Environment-related Complaints (and Mishaps)

No mishaps in fiscal 2002.

Complaints were received regarding odor emitted from two plants and regarding noise from one plant. As to odor, we are implementing a regular patrol to verify the source at one plant, and studying to establish a permanent measure at the other plant. As regards noise, we have already completed measures to prevent its reoccurrence.

### Abolition of Incinerators

Eleven out of the thirteen plants operating incinerators in fiscal 2001 abolished totally incineration in fiscal 2002. At present only two of our plants are operating incinerators and are doing so with constant maintenance and utmost control.

### Use and Storage of Apparatus containing PCB

There is apparatus containing PCB stored in 16 of our plants, e.g. transformers, and 2 plants use fluorescent lamp stabilizers, all of which we strictly control. We will continue to keep them under strict guard and seek proper treatment methods as soon as possible.

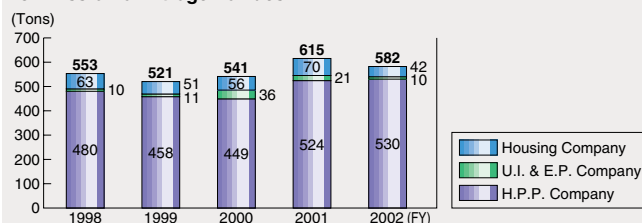
### Air Pollution Control

By our proper maintenance of every facility and periodic checking, we are steadily meeting all legal requirements for air pollution control, and making efforts to further reduce air pollutants emission. In fiscal 2002, we cleared all legal requirements related to air pollution.

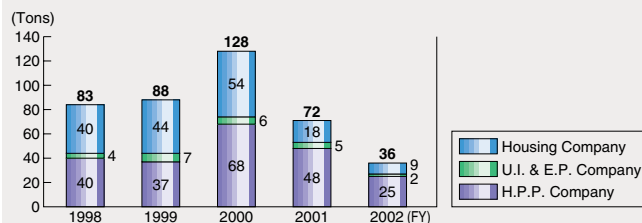
SOx emission was largely reduced by changing from A-type heavy oil to a lower sulfur content type at Gunma Plant of Sekisui Board Co., Ltd., and to city gas at Shiga-Minakuchi Plant (see graph below\*).

Release of soot and dust was also largely reduced due to abolition of incinerators at our plants (see graph below\*\*).

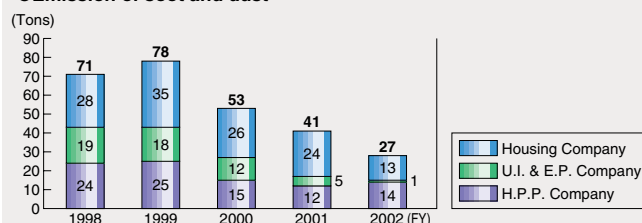
#### Emission of nitrogen oxides



#### Emission of sulfur oxides\*



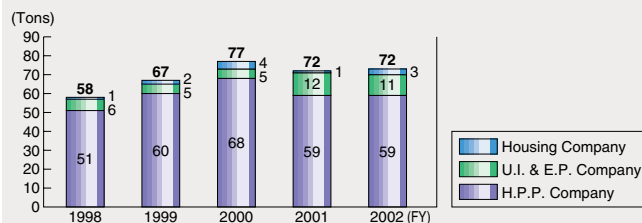
#### Emission of soot and dust\*\*



### Water Pollution Control

We have installed equipment to eliminate pollutants in effluent and to prevent contamination. In fiscal 2002, however, three plants reported incidents of pollutant emission above the maximum limits (P60). Taking immediate appropriate action, we solved the problem. We are installing improved treatment equipment to prevent reoccurrence. COD emission was the same in volume approx. as in fiscal 2001.

#### Total COD in effluent



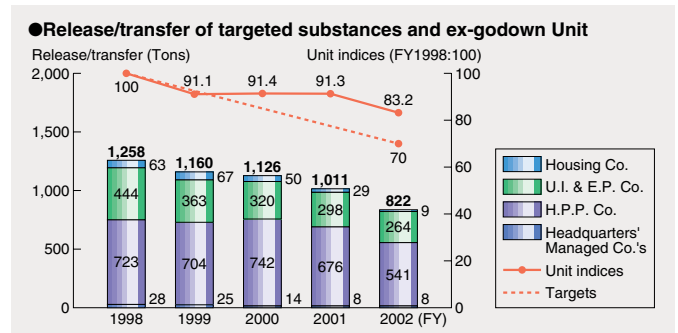
## Appropriate Management of Chemical Substances

In fiscal 2002, we reduced release and transfer of targeted pollutants by 436 tons (35%), compared to fiscal 1998, including total abolition of dichloromethane for washing use. However, reduction in terms of ex-godown Unit was 17%, which was below the target of 30%.

### Reduction of Release and Transfer of Pollutants

With respect to release of chemical substances, and transfer of their non-recyclable waste specified as Class 1 in the Japanese PRTR Law, we implemented various methods for improvement with the target of a 30% reduction in fiscal 2002 over fiscal 1998 in terms of ex-godown Unit.

As a result of eliminating the use of solvent in raw materials (P54) and the use of dichloromethane for washing use, and improvement in equipment, we reduced release and transfer of pollutants by 436 tons (35%) in fiscal 2002 compared to fiscal 1998. However, our entire reduction in terms of ex-godown Unit was 17%, due to a decrease in our Housing Company's produced sales amount, whose release and transfer of pollutants are relatively small per produced sales amount.



### Summation results according to PRTR Law. Used volume minimum 1 ton at each targeted workplace (PP 64-65)

(Tons)

No.*	Chemical Substances	Used volume	Release				Transfer			Innocuous treatment
			To atmosphere	To water	To soil**	Landfill**	Sewerage	Transfer as waste		
								Disposal	Recycling	
3	Acrylic acid monomer	17.0	0	0	0	0	0	0	1.4	0
7	Acrylonitrile monomer	5.9	0.076	0	0	0	0	0	2.26	0
9	Bis (2-ethylhexyl) adipate	6.7	0	0	0	0	0	0	0.0067	0
11	Acetaldehyde	264.0	0.19	0	0	0	0	0	0	79.0
25	Antimony compounds	23.3	0	0	0	0	0	0	2.8	0
30	Bisphenol A type epoxy resin (liquid)	323.9	0	0	0	0	0	0	0	0
43	Ethylene glycol	3.0	0	0	0	0	0	0	0	0
45	Ethylene glycol monomethyl ether	6.4	0.0020	0.0050	0	0	0	0	0.58	0
63	Xylene	134.1	42.6	0	0	0	0	0	11.3	39.0
77	Vinyl chloride monomer	110,925.0	7.1	0.68	0	0	0	0	0.0001	0
84	HCFC-142b	86.8	86.8	0	0	0	0	0	0	0
85	HCFC-22	45.7	45.7	0	0	0	0	0	0	0
86	HCFC-124	3.0	3.0	0	0	0	0	0	0	0
100	Cobalt compounds	1.6	0	0	0	0	0	0	0	0
132	HCFC-141b	7.1	1.1	0	0	0	0	0	0.10	0
145	Dichloromethane	686.6	50.0	0	0	0	0	0	2.6	0
172	N,N-dimethylformamide	3.0	0	0	0	0	0	0	0	0
176	Organic tin compounds	59.6	0	0.0006	0	0	0	0	0.55	0
177	Styrene monomer	4,776.9	71.8	0.14	0	0	0	0	1.2	0
197	Decabromodiphenyl ether	62.6	0	0	0	0	0	0	7.6	0
205	Terephthalic acid	75.0	0	0	0	0	0	0	0	0
227	Toluene	2,285.5	509.9	0.19	0	0	0	0	93.6	487.3
230	Lead compounds	762.9	0.0004	0.0096	0	0	0.0001	0.51	2.5	0
236	Nitroglycerin	1.1	0	0	0	0	0	0	0.37	0
242	Nonylphenol	1.9	0	0	0	0	0	0	0	0
270	Di-n-butyl phthalate	1.4	0.14	0	0	0	0	0	0	0
272	Bis (2-ethylhexyl) phthalate	58.4	1.5	0	0	0	0	0	2.2	0
310	Formaldehyde	8.9	0	0	0	0	0	0	0	0
314	Methacrylic acid monomer	20.2	0	0	0	0	0	0	0	0
320	Methyl methacrylate monomer	231.8	0.16	0	0	0	0	0	0.16	0
321	Methacrylonitrile	4.3	0.034	0	0	0	0	0	2.69	0
	<b>Total</b>	<b>120,893.5</b>	<b>820.1</b>	<b>1.0</b>	<b>0</b>	<b>0</b>	<b>0.0001</b>	<b>0.51</b>	<b>132.0</b>	<b>605.3</b>
179	Dioxins (unit:mg-TEQ)	—	595.5	4.0	0	0	0	0	288.6	0

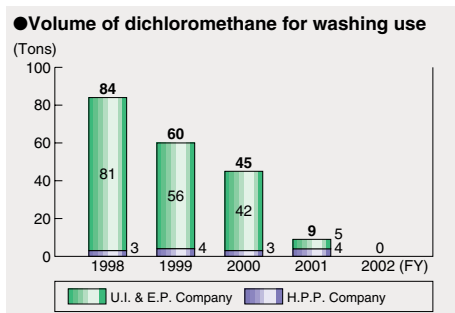
\*Specification No. \*\*On the premises

## ■Reduction of Targeted Substances

Besides reduction of chemical substances specified as Class 1 in the Japanese PRTR Law and released/transferred to the environment, we are promoting activities to totally abolish the use of dichloromethane, a chlorinated organic solvent, and substitute flons (HCFCs) that cause disruption of the ozone layer.

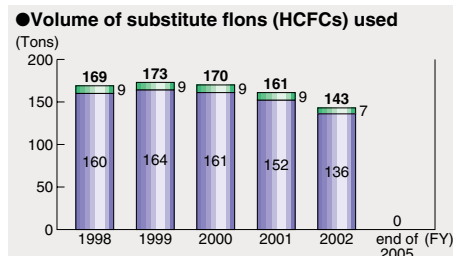
### ●Total abolition of dichloromethane for washing use

We completed abolition of dichloromethane for washing use in fiscal 2001, a year ahead of target. We continue our activities to abolish dichloromethane contained in adhesives under use in the manufacturing processes of our products.



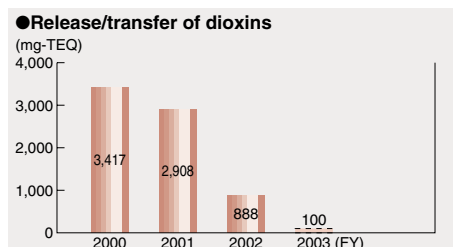
### ●Total abolition of substitute flons (HCFCs)

For substitute flons (HCFCs) that are used as foaming agents for making our thermal insulating products, we have finished selection of alternative materials. We will implement the change step by step to realize total abolition in fiscal 2005.



### ●Reduction of dioxins emission

In fiscal 2002, dioxins emission was reduced by 74% compared to fiscal 2000, by abolition of incinerators in our plants. We estimate that the reduction in 2003 will result in one-tenth of the 2002 emission.



## ■Survey Results of Soil Contamination and our Future Activities

### ●Reasons for surveys

We are systematically implementing autonomous surveys for soil contamination. Environment and safety are among the most important subjects in our business management as we are aiming at becoming an environmentally creative organization by implementing activities to reduce environmental loads and environmental risks systematically and autonomously in every aspect of our business activities.

One of the most important stakeholders in our business operations is the environment of the local communities in or near which our workplaces are located. In this respect our plants are particularly significant, so we are aggressive in taking such pertinent action as the structuring and operation of environmental management, reduction of release and transfer of chemical substances, and zero emission of waste, in order to reduce environmental loads and environmental risks pursuant to our production activities.

### ●Results of surveys

In fiscal 2002, we completed surveys at our former Sakai Plant, former Fujieda Plant of Sekisui Technol Molding East Japan Co., Ltd. and former Daito Plant of Sekisui Film Co., Ltd. In accordance with Standards for Application of Examination/Countermeasure Guidelines for Soil and Underground Water Pollution (Environment Agency of the Japanese government, January, 1999). We focused our surveys on all 26 substances for which the environmental standards of soil and underground water are specified. The results of our surveys, as given below, have been reported to relevant administrative bodies. At our Shiga-Minakuchi Plant, we are still continuing surveys.

In our former Sakai Plant results showed that for 20 substances we were below the limit. However, in one part, lead and arsenic were found to be 9 times more than the maximum specified amounts, and in a more limited area chromium (VI) was 3 times more than the maximum specified amount. As regards the environmental standards for under-

ground water, in another limited area tetrachloroethylene was 33 times more than the maximum specified amounts, trichloroethylene 3 times, and cis-1,2-dichloroethylene 93 times.

With respect to the 9 types of heavy metal as specified by the relevant Japanese laws, our survey verified that no part of the plant exceeded the standard limit.

As a result of these surveys, we have confirmed that the part exceeding the maximum limit of the environmental standards remains within the site, judging from the data obtained at each measuring point and the underground water flow direction. As the plant site surface is covered with asphalt and other protective materials, this will prevent the transfer of heavy metals in the soil by dispersion.

As regards the cause of contamination, it is considered that arsenic was contained in soil that was dredged from Osaka Bay and brought to the site for landfill use. Regarding other substances the causes were unable to be verified.

As countermeasures for volatile organic compounds such as tetrachloroethylene, we purify underground water by pumping it up and by separating and removing the volatile organic compounds. For heavy metals, we continue periodic checking for any changes in underground water conditions.

At our former Fujieda Plant of Sekisui Technol Molding East Japan Co., Ltd., there was no substance found exceeding the standard limit at any survey point on the site, so we have judged that there is no contamination.

At our former Daito Plant of Sekisui Film Co., Ltd., there was no substance found exceeding the standard limit at any survey point on the site, so we have judged that there is no contamination.

### ●Future plans

We systematically continue autonomous surveys at the sites owned by our Group. In fiscal 2003, we are carrying out surveys at three of our plants.

## Occupational Health and Safety · Accident Prevention

Aiming at zero danger in every section of our workplaces, we are structuring and operating OHSMS (Occupational Health and Safety Management System).

In order to realize zero danger, we are promoting activities for occupational health and safety, and accident prevention, at every section of our workplaces. In our new concept we regard our safety activities from the perspective of the elimination of any potential for danger from our workplaces,

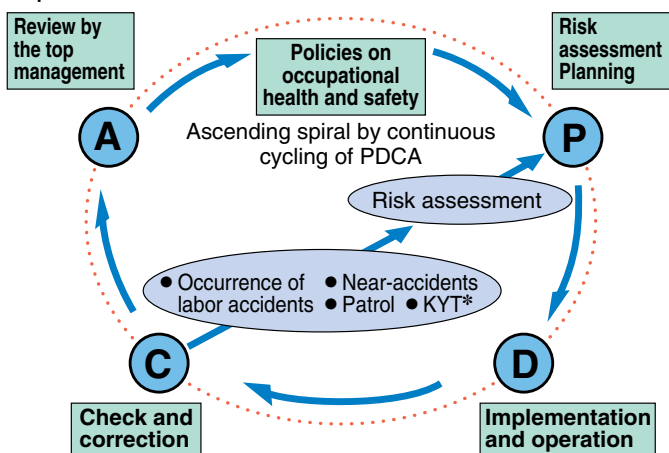
coupled with the need to maintain measures for protection from any unanticipated occurrence of danger.

Based upon this concept, we have been promoting the structuring and operation of OHSMS in each plant as a unit since fiscal 1999, aiming at maintaining "Zero Danger Work Sites".

### ■Promotion of OHSMS Structure and its Operation

OHSMS is not intended to introduce an entirely new management system, but aims at defining the health, safety and accident prevention functions of management to be implemented at each of our workplaces.

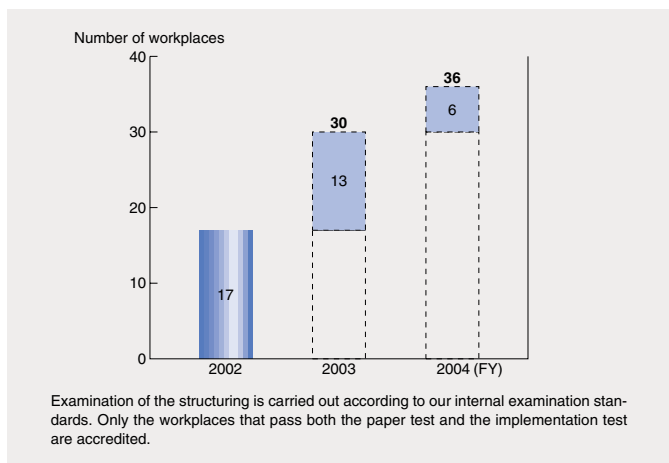
#### ●Operation of OHSMS



\*Risk awareness and prevention training

#### ●OHSMS structuring progress and plans

In fiscal 2002, we targeted the completion of the structuring at 21 workplaces, 17 of which achieved completion and started OHSMS operation. We intend to complete the structuring at the remaining 4 workplaces by the end of fiscal 2003.



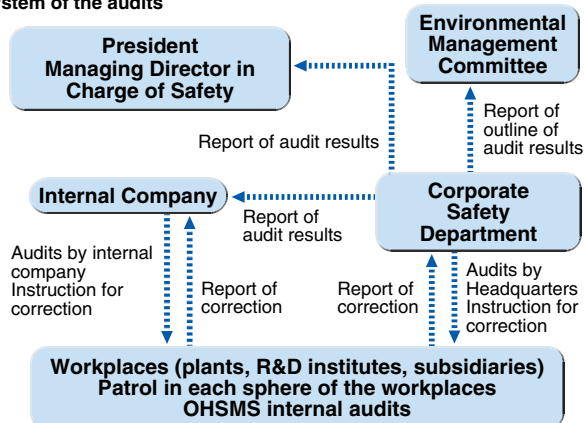
#### ●Training of OHSMS auditors

In order to check if OHSMS structured by a workplace is implemented and operated appropriately there, we are training staff to become system auditors. At present we have 230 such auditors in cumulative total, who are engaged in their duties at respective workplaces.

### ■Health, Safety and Accident Prevention Audits

To realize our corporate policy on the environment and safety, we perform health, safety and accident prevention audits at our 38 plants and R&D institutes, once a year in principle. The audits are performed quantitatively according to our own Health, Safety and Accident Prevention Evaluation Sheet that comprises 88 evaluation items in total.

#### ●System of the audits



### ■Education on Health and Safety

In order to maintain safe and comfortable workplaces by the effective functioning of the occupational health and safety system and the performing of appropriate activities for total safety each day, it is most important to enhance the education of our employees to promote a sense of health and safety and to upgrade their techniques in each sphere of the workplaces.

#### ●Contents of our education on health and safety

Education based on relevant laws	Education in each sphere of the workplaces
1) Internal education <ul style="list-style-type: none"> <li>At commencement of employment</li> <li>At relocation</li> <li>Education for shift leaders, etc.</li> </ul> 2) External education <ul style="list-style-type: none"> <li>Education of group leaders</li> <li>Specific skill training</li> </ul>	(Internal and external) <ul style="list-style-type: none"> <li>Seminar for top management on accident prevention</li> <li>Seminar for managers on health and safety management</li> <li>Training for OHSMS leaders</li> <li>Training for OHSMS internal auditors</li> <li>Training for key persons in health and safety</li> <li>Zero Accident study meeting, etc.</li> </ul>



#### ●Zero Accident study meeting

We have been holding these meetings periodically since 1979 for the purpose of promoting our health and safety activities at the respective workplaces and to educate the activity leaders. The attendants are educated in risk awareness and prevention training implementation.

◀A Zero Accident study meeting



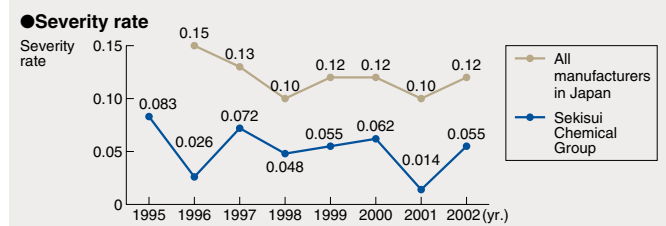
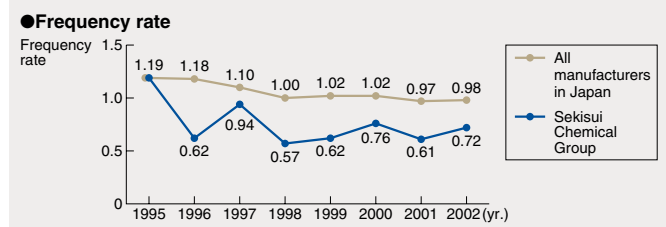
## ■Results of Health, Safety and Accident Prevention Activities

In 2002, we promoted our activities under the entire Sekisui Chemical Group's catchphrase: "Step up our activities for health, safety and accident prevention to aim at zero danger in our workplaces".

We will steadily operate our OHSMS that we are now structuring, and continuously cycle the PDCA, to aim at an ascending spiral of health and safety and accident prevention management activities.

### ●Labor accidents

In 2002, our result was slightly inferior to that of the previous year, both in frequency rate and severity rate. To brake this tendency, we are promoting the structuring and operation of OHSMS systematically in 2003.



Source of data on all manufacturers in Japan: "Trend Survey of Labor Accidents" issued by the Japanese Ministry of Health, Labour and Welfare

The data of Sekisui Chemical Group are the summation of 38 plants and R&D institutes for each calendar year (January - December).

## ■Health, Safety and Accident Prevention Accounting

Based on the concept of environmental accounting, we have calculated expenditures and investments and effects (safety results) with respect to health, safety and accident prevention.

We are still at the trial stage in expressing our health, safety and accident prevention activities in terms of accounting. We believe that grasping these activities through our accounting will be effective for risk communication, and that year-by-year grasping of quantitative data will enable more effective deployment of health, safety and accident prevention activities.

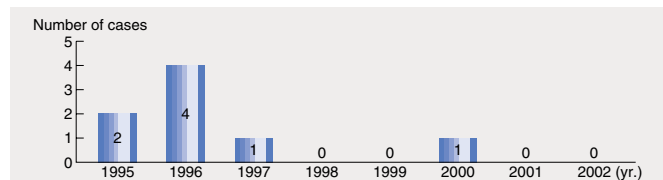
### ●Health, Safety and Accident Prevention Activities Costs (¥1 million)

Category	Items Main projects	Sekisui Chemical Group	
		Expenditures	Investments
1) Within workplaces	Health and safety measures, rescue, protectors, measurement to assess working environment conditions, health care, labor accident insurance, etc	640	356
2) Management activities	Education on health and safety, OHSMS structuring and operation, personnel expenses, etc.	741	0
3) Others	In-company commendation, awards, etc.	7	0
<b>Total</b>		<b>1,388</b>	<b>356</b>
Entire group's total investment during the corresponding period		—	13,044
Ratio of investment in health, safety and accident prevention against total investment (%)		—	2.7

(Note 1) The scope of summation is the scope of summation on P12 minus 4 house sales subsidiaries.

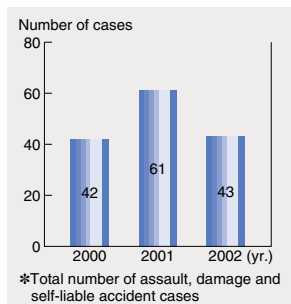
### ●Equipment incidents

Succeeding the previous year, no equipment incident occurred in 2002. Occasional incidents which occur, but are too small to be categorized, must never be overlooked and the causes must be found and eliminated in order that no repercussions can develop. It is important to thoroughly implement equipment management and regular detection of danger sources.



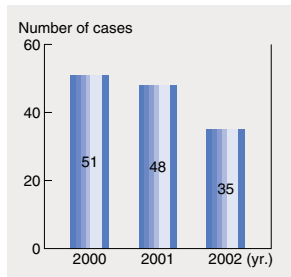
### ●Commutation accidents

The number of accident cases greatly decreased compared to 2001. We owe this result to the implementation, in each of our workplaces, of activities aimed at achieving safe commutation, e.g. the compilation of danger awareness guidelines for commutation routes.



### ●Long term absenteeism due to sickness

Long term absenteeism has been decreasing since 2000, 50% of which now occurs from lifestyle type sicknesses common to the over 45 year old age group. We will make further efforts to enhance the daily health management of every employee.



### ●Activities and effects (safety results) in fiscal 2002

- (1) The costs related to health, safety and accident prevention activities were ¥1,388 million for expenditure and ¥356 million for equipment investment respectively by our own summation method.
- (2) The actual results in 2002 of labor accidents, equipment incidents, commutation accidents and long term absenteeism due to sickness are as described above. The amount of losses caused by these accidents and long term absenteeism<sup>(Note 2)</sup> was ¥162 million.
- (3) We are taking countermeasures against the labor accidents and non-categorized equipment incidents that have occurred by means of improvement of equipment and work procedures and relevant education in order to prevent their reoccurrence.

(Note 2) Amount spent in response to labor accidents and equipment incidents, and amount lost per man-hour by labor accidents, commutation accidents and long term absenteeism by sickness.

### ●Future proceedings

- (1) We will compile future year-by-year data with that of fiscal 2002 as the benchmark, in order to deploy our health, safety and accident prevention activities most effectively.
- (2) Regards effects, we intend to review the items and calculation method, and continue to work on health, safety and accident prevention accounting that contributes to the realization of "Zero Danger Work Sites".

## Nature Protection and Social Contribution Activities

We are promoting social contribution widely both inside and outside Japan, with nature protection as the main pillar.

In commemoration of the company's 50th anniversary in 1997, we placed our nature protection activities as the main pillar of our social contribution activities. We organized the "Executive Committee for Nature Protection Activities" in the company, which has been aggressively promoting these activities both inside and outside Japan.

### ■Support to NGOs' Nature Protection Activities

In cooperation with Keidanren Nature Conservation Fund (a charitable trust), we have been supporting nature protection activities conducted by environmental NGOs since 1997. The projects we supported by the end of fiscal 2002 amount to 26 in cumulative total.

In fiscal 2002, we made financial contributions to 5 projects, including marine conservation and diverse creature survey activities in Indonesia. We continued the assignment of one of our staff to work full time with Nippon Keidanren Committee on Nature Conservation, a trustee of Keidanren Nature Conservation Fund. As chairperson of this committee, Mr. Okubo, President of Sekisui Chemical Co., Ltd. visited several project sites supported by the committee.

#### ●Projects we supported in fiscal 2002

Areas	Projects	NGOs
Indonesia	Development of a Marine and Coastal Conservation Center in Bali	The Nature Conservancy
China and Indonesia	Biodiversity survey and protected area planning in Indonesia and China	Wild Bird Society of Japan
Bangladesh	Conservation and Monitoring of Wildlife Biodiversity in the Tanguar Ha	Nature Conservation Management
Japan	Activities of maintenance of Odanuki Wetland in Mt. Fuji's Forest	Society for Observing the Nature of Mt. Fuji
Asia	Formation of Asian Wetland Initiatives	Ramsar Center Japan

### ■Making a Biotope, Space for Wild Fauna and Flora

In order to realize environmentally symbiotic plants integrating both environmental conservation activities and nature protection activities, we have promoted the establishment of biotopes and miniature sanctuaries. Kyushu Sekisui Industry Co., Ltd., designated as the model plant of our group, celebrated its third anniversary of the opening of a biotope that it had developed in cooperation with the local community (P48).

Through Sekisui Chemical's Nature Study Course, we started to make miniature sanctuaries to provide spaces for wild birds. We are extending our activities to other plants to make by hand spaces for wild fauna and flora, for example by utilizing the green in the plant sites and making feeding stands and nest boxes for wild birds.

#### Making a miniature sanctuary on Sekisui Chemical's Nature Study Course



▲Making bird nesting boxes (Kyoto R&D Laboratories)



▲Planting fruit bearing trees to attract birds (Shiga-Ritto Plant)

### ■Sekisui Chemical Co., Ltd. Research Fund for the Development of Technologies from Nature

Utilization of biomass which requires futuristic technological development and designing technology for functional materials is in growing demand to reduce environmental loads. Based on the scientific knowledge which has been accumulated through studies of nature, we have started a program to aid research which utilizes natural functions.

We are financially assisting the pursuit of biomimetics, biotechnology, materials science which utilizes recyclable resources and all their related technologies which conserve the global environment, substitute depleted subterranean resources, and will play important roles in achieving a high quality life style for society in the future.

In fiscal 2002, we received 124 applications among which we aided 13 themes.

Publication of fund program



Selection of themes under advice from external specialists



1 year research grant awarded per theme



Presentation of the study results

Contact:  
Sekisui Integrated Research Inc.  
e-mail: shizen@simet.co.jp

## ■Nature Protection and Social Contribution Activities in Local Communities

Local workplaces of Sekisui Chemical Group are taking part in nature protection and social contribution activities in conjunction with local communities. In fiscal 2002, too, various activities were conducted widely, such as local clean-up operations, forest conservation and the cleansing of rivers and streams. The number of participants from our plants since fiscal 1999 reached 4,093 (83.2% of our plant employees) in cumulative total. According to the indices of the activities at each workplace in terms of level and frequency, all 30 targeted workplaces achieved 10 Activity Points which was the full goal for the four years from 1999.

### ●Forest conservation and beautification/cleaning activities

In fiscal 2002, employees of Higashinohon Sekisui Industry Co., Ltd. participated in the sapling plantation activity sponsored by "The Society to Conserve Beeches & Waters of ZAO", an NPO. Employees of Tokuyama Sekisui Industry Co., Ltd., as volunteers, are continuing their care for the municipally-owned woodland that they have rented to make Sekisui Forest, a forest for observation where local people can enjoy observing wild birds and insects.

Employees of Tokyo Plant are registered members of a volunteer group sponsored by Saitama prefecture to perform cleaning of nearby roads regularly as their "foster parents". Employees of Shiga-Ritto Plant are participating in the cleaning activities for the nearby rivers and streams. Employees of our 26 workplaces in total are participating in cleaning activities sponsored by respective local governments, or cleaning neighboring areas autonomously.



▲"Foster parents" cleaning the roads (Tokyo Plant)



▲Participating in the plantation activity of the NPO "The Society to Conserve Beeches & Waters of ZAO" (Higashinohon Sekisui Industry Co., Ltd.)



◀Cleaning a nearby river (Shiga-Ritto Plant)

### ●Other social contribution activities

We are implementing various social contribution activities, such as opening to the public our sports grounds, cooperating with welfare facilities, participating in local community events, and opening our plants for tours by elementary and junior high school students as part of their social science courses.

## ■House Making Course for Children

For the school curriculum of "comprehensive learning" introduced in fiscal 2002 for junior high school students, Sekisui Chemical Co., Ltd. started a house making course by using a miniature of Sekisui Heim.

The aims of the course are that:

- Children appreciate the importance of house design through the miniature model
- Based on knowledge acquired at school and experiences obtained, children design and make their own miniature models with layouts to deal with environmental and barrier-free issues and family lifestyles
- Children enjoy the activity of designing and making.

In fiscal 2002, we implemented the course with 3rd grade students of Nishihama Municipal Junior High School in Chigasaki, Kanagawa prefecture.

On the first day, a lecture was held to explain the house making, and divided into groups students discussed house design. On following days they built miniature houses, receiving guidance for each part of the house, such as external walls, stairs and windows, eagerly engaged in the work and advising each other. On the final day their work was evaluated. All miniature houses had excellent features and the best house was decided by a ballot among all participating children.

In Hasuda-minami Municipal Junior High School in Hasuda, Saitama prefecture, the house making course was conducted in its general curriculum as an optional handcraft course. We intend to make this activity available to any interested school.



Sekisui Heim salesman explaining house making

Making their original miniature houses



A brochure (in Japanese): "Children's Miniature House Making Contest" This describes the course procedure at its introduction in fiscal 2001. Available free of charge upon request.

Contact:  
Sekisui Chemical Co., Ltd.  
PR Group  
Corporate Communication Department  
FAX:+81-3-5521-0786

URL:[http://www.sekisui.co.jp/general/area\\_index.html](http://www.sekisui.co.jp/general/area_index.html)  
(Japanese language only)



## Communication

Through various activities and community events, we are providing our knowledge of environmental affairs to concerned bodies and to the public.

### ■Communication with the General Society

#### ●Guided plant tours

- Zero emission: 8 occurrences, 95 persons
- Environmental activities: 17 occurrences, 618 persons (elementary, junior high and high school students)
- Plant and production processes: 25 occurrences, 4,578 persons

#### ●Interaction with local communities

Interaction sessions and participation in events: 24 occurrences (e.g. Kanto Sekisui Industry Co., Ltd. to Kasama Nebuta Festival)



Participating in Kasama Nebuta Festival

#### ●Exhibitions

We exhibited panels and products at "Eco-Products 2002", where we had the opportunity to give environmental explanations to school children of all ages as well as to the public. We also participated in "Enviro-Shiga 2002", the 5th International Environmental Business Exhibition of products and technology.



ECO-Products 2002  
(School children listening to a presentation at our booth)

#### ●Contest of "Eco-friendly Life at my Home"

Under the theme, "Tell us about your Environment-friendly Life", we invited the public to send us accounts of experiences in their daily life relating to environmental conservation, such as the environmental awareness of their family, usage of environment-friendly devices, heat insulation, effects of photovoltaic generation systems, etc. Among the 377 letters we received, we selected 2 for the Ecology Grand Prize, 5 for the Most Excellent Prize, and 20 for the Excellent Prize.

#### ●Publications

- Environmental Report 2002
- Sekisui Heim Environmental Series: Cherish our Earth (trans.)



Environmental Report 2002



Sekisui Heim Environmental Series  
"Cherish our Earth (trans.)"  
Vol. 1-7 (continuing)

Our Environmental Reports from the second edition (2000) to 2002 can be accessed at our website:

Please visit: <http://www.sekisui.co.jp/general/english/eco/>

#### ●Product information presentation

- MSDS (Material Safety Data Sheet)

This paper explains the hazards and toxicity of products and sets out precautions for handling.

526 MSDS's were newly issued or revised in fiscal 2002.

- Yellow Card

This paper describes emergency measures for accidents during transportation of hazardous products and is handed to truck drivers at the time of shipping.

### ■Commendations, Awards and Prizes

The environmental conservation activities and products of Sekisui Chemical Group were awarded the following commendations and prizes.

#### ●Environment

"Zero Emission House" Excellence Prize, by the Architectural Institute of Japan: Re-building System House

6th Environmental Report Excellence Prize: Environmental Report 2002, Sekisui Chemical Co., Ltd.

Recycle Promotion Commendation for Valuable Activities by the Chairman of the Reduction, Reuse and Recycle Promotion Council: Shiga-Ritto Plant, Gunma Plant, Tokyo Plant, Nara Business Control Center, (Ryuseki Jubi Industry Co., Ltd. and Sekisui Life-Tec Co., Ltd.), Higashinohon Sekisui Industry Co., Ltd., Kansai Sekisui Industry Co., Ltd., Chugoku Sekisui Industry Co., Ltd., Gunma Plant of Sekisui Board Co., Ltd., Okayama Sekisui Industry Co., Ltd., Sekisui Chemical Hokkaido Co., Ltd., Shikoku Sekisui Industry Co., Ltd., Nagoya Plant of Sekisui Film Co., Ltd. and Tokuyama Sekisui Industry Co., Ltd.

#### ●Occupational health, safety and accident prevention

Commendation by the Chairman of Shin-nanyo City Safety of Hazardous Materials Association: Tokuyama Sekisui Industry Co., Ltd. Minister of Health, Labour and Welfare Excellence Prize (Occupational health measures for hazardous working): Shiga-Minakuchi Plant

Director-General of the Labor Bureau in Hokkaido District Commendation (Promotion of comfortable workplace making): Sekisui Chemical Hokkaido Co., Ltd.

50th Anniversary Commemoration Award by the Chairman of Kyoto City Safety of Hazardous Materials Association: Kyoto R&D Laboratories No Accident for 3 Months Campaign by Nara Labor Standards Association: Kansai Sekisui Industry Co., Ltd.

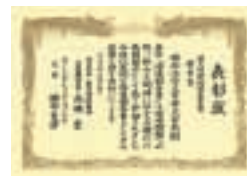
Nationwide Occupational Health Week (for Meritorious Services) by Director-General of the Labor Bureau: Toshimi Uesaka of Kansai Sekisui Industry Co., Ltd.

#### ●Social contribution

Gratitude Award by the Japanese Red Cross (Contribution for more than 20 years to its blood donation campaign): Tokyo Plant



6th Environmental Report Award - Awards Ceremony





## ■Education of Employees

Various education activities are available to all employees in order to promote the environmental conservation effectively. For example, the Basic Training in Environmental Technology course is available to engineers early in their careers, so that they will pay attention to the environment during the course of development work. The EMS Internal Auditor Training course is available to responsible persons of environmental management at individual facilities or offices. In addition, information is distributed to the whole of Sekisui Chemical Group on the intranet and utilized by every workplace for its own environmental education programs.

### ●Environmental education and enlightenment conducted in fiscal 2002

Courses	Available to:	Month	Number of attendants	Cumulative number
New Employee Training	New employees	5	15	109
Basic Training in Environmental Technology	Intermediate staff	11	4	62
EMS Internal Auditor Training, in-company	Management / intermediate staff	6 times / year	137	460
EMS Internal Auditor Training, ex-company	Management / intermediate staff	As needed	19	96
Sekisui Chemical's Nature Study Course	Management / intermediate staff	4 times / year	50	257
Company Journal, Lectures / Seminars	All in Sekisui Chemical Group	As needed	All in Sekisui Chem. Grp.	—
OHSMS Internal Auditor Training	Management / intermediate staff	4 times / year	117	230

### ●Publicly Certified Specialists (as of March 31, 2003)

Fields		Staff certified in FY 2002	Total certified staff
CEAR* Registered Examiner	Chief Examiner	1	4
	Examiner	0	1
	Assistant Examiner	3	10
Pollution Controller	Air Pollution Classes 1 to 4	1	50
	Water Contamination Classes 1 to 4	8	116
	Noise	7	44
	Vibration	8	22
Energy Controller (Heat, Power)		7	69
High Pressure Gas Safety Controller, Classes 1 to 3		14	339
Certified Environmental Measurer		2	6
Odor Judgement Technician		0	2

\*Center of Environmental Auditors Registration (CEAR) in Japan Environmental Management Association for Industry

## ●Education of sales staff (Housing Company)

Our Housing Company compiled a booklet for internal reference only titled the "Sekisui Standard Book" in fiscal 2002 to be used in education and training of its sales staff. This booklet covers a wide range of knowledge, not only that necessary for Sekisui Heim as products, but also knowledge of the environmental issues and subjects that the housing industry are facing at present, and also information on the environmental activities that Sekisui Chemical Group and Housing Company are promoting.



SEKISUI STANDARD BOOK

## ■Sekisui Chemical's Nature Study Course: Leadership Training for Nature Protection

In order to train leaders at our workplaces who promote nature protection activities in their respective local communities, we periodically hold sessions under "Sekisui Chemical's Nature Study Course" with the cooperation of the Wild Bird Society of Japan. This started in 1997, and by the end of fiscal 2002 the sessions had been held 22 times and attended by a cumulative total of 257 persons (310 gross attendance), far exceeding the 250 attendants planned for in our middle term environmental plan.

In fiscal 2002, we started to hold sessions at our own workplaces so that more of our employees could attend, and we widened the program range to include miniature sanctuary making and nature observation together with children in the local communities.

In addition, we started a follow-up training course for the leaders in our workplaces who have attended these sessions, to study the know-how of plan making, in order to implement the nature protection activities autonomously at their respective workplaces.



▲Bird watching at the coast



▲Individual guidance on bird watching for children

(Both pictures show scenes of the Nature Study Course held at Chubu Sekisui Industry Co., Ltd.)

## ■Internal Evaluation System

Previously we honored such achievements as ISO 14001 acquisition and zero emission attainment as part of overall contributors to business results. In fiscal 2002, we established a separate category to commend environmental achievements in their own right in that they contribute to supporting the environmental corporate management and mission of Sekisui Chemical Group.

In the future, aiming at the advancement of our employees' awareness and the reform of our management system, we plan to introduce environmental indicators for results evaluation and a system that can be an incentive to the development of environment-friendly products and the improvement of environmental activities.

## Opinions and Comments on our Environmental Report 2002 and our Responses

We received opinions and comments on our Environmental Report 2002 in the Third Party Examination Report by the Wild Bird Society of Japan, and also in the replies to our questionnaire accompanying the Japanese language edition. Following are our replies to the main opinions and comments.

### ■Opinions in the Third Party Examination Report (The opinions are summarized)

	Opinions and Comments received	Our Responses
Summarized results of examination	Material Recycling should be given priority in zero emission.	We agree. We are promoting improvement of material recycling rate by thorough segregation as a priority in plants.
	The expression "thermal recycling" is inadequate.	We revised this to "thermal utilization from incineration" (P16).
	Merely selling waste is not taking full responsibility for it. It is necessary to follow up the destination of this waste.	Only our plants which meet all standards set down on our zero emission achievement evaluation sheet (P17) are certified as zero emission plants. One such standard obligates the plants to monitor and control the destinations of all waste including that which is sold.
	It is recommended that you set a quantitative target for reduction of dioxins emission and attain it.	While we have not set a quantitative target, we are substantially reducing its emission by means of systematic abolition of inside incinerators (P21).
	Use of dichloromethane other than for washing use and other chemical substances is yet to be reduced. It is important to study and develop environment-friendly materials and products.	Most of dichloromethane other than for washing use is as raw material for our adhesive products, so reducing it is beyond our control. However, we are developing adhesives which do not include dichloromethane and proposing such substitute to our customers. As to other chemical substances, we are making efforts to reduce them by e.g. process change of Kraft tape to hot-melt process. We review our qualification standards for environment-friendly products by reducing chemical substances emission in production and in use.
	For making a sustainable society as set out in your booklet, "Think it over. You can be a Leader in creating your Town" (trans.), you should display your leadership in your business deployment in harmony with the local climate and nature.	We continue to study how to overcome difficulties in establishing leadership roles.
Opinions and comments from each committee member	[M. Seto] In structuring a sustainable society, I hope you will display your leadership in activation of local communities. As regards problems which a private enterprise can not solve alone, I hope you will devote a page to problem-solving activities with citizens.	There are restrictions to what a private enterprise may or may not do, and problems regarding expression. Therefore, we are not yet in a position to meet with your expectations.
	[S. Teranishi] Environmental accounting should not be simply a statement of cost and benefit inside the company, but must show to the general public the accountability of your business activities from the environmental aspects.	Our Environmental Report is also characterized as communication means inside our group. In consideration of internal incentives, we edited the report in the same manner as the previous year. As an environmental effect to society, we have newly added estimation of electric power saving effect from houses equipped with our photovoltaic generation systems. (P13, Table 4)
	[T. Ozawa] The aim of environment-friendliness is to reduce the consumption of resources and energy. The judgment criteria are primarily the reduction of total volume.	We also think that environmental impacts are directly related to reduction of total volume of CO <sub>2</sub> and chemical substances specified in the PRTR Law, and have set the reduction target in total volume in our new Middle Term Environmental Plan, STEP-2005 (P8). The reduction targets for energy and waste are regarded as scales for our technological levels and management effectiveness, and so have been set in terms of ex-godown Unit.
	[O. Kobayashi] 1. Key points must stand out, and not be buried under the rich range of contents. 2. Consistency between the corporate and the three internal companies should be clarified. 3. Readers should be informed that your environmental activities were carried out under severe economic circumstances.	1. We edited our report focusing on the main subjects in our internal companies. 2. The business characteristics and main subjects differ according to internal companies, resulting in different policies (objectives) respectively. Considering that this was the reason for the assumed lack of consistency, we have rearranged the characteristics and policies of each internal company (P4). 3. The effect of decrease in produced sales amount to the ex-godown Unit has been expressed in each relevant item.

For details of the Third Party Examination Report, please refer to our Environmental Report 2002, PP54-55. ([http://www.sekisui.co.jp/eco/report2002\\_e/report2002\\_e.html](http://www.sekisui.co.jp/eco/report2002_e/report2002_e.html))

### ■Opinions and Comments arising from our Questionnaire

We received answers to our questionnaire from 52 readers, 16 of whom gave us opinions and comments for improvement.

Opinions and Comments received	Our Responses
Information is too abundant, with too much detail, hence difficult to read.	To fully meet the demands of society regards information disclosure, we consider all items detailed in the guidelines (P64) to be necessary. We will pay attention to make their presentation more readable.
What about supplementing detailed data on your website, rather than putting them in the tables?	We considered your suggestion, but came to the opinion that as much data as possible should be given in our printed report in order to secure fairness of our information. Furthermore, if we provide the data on the website instead of in print, it may cause inconvenience as readers will have to refer to two sources to obtain full information. However, we may implement this system in future to provide more specific and timely information.
<Regarding the framework for the entire Group and internal companies> ● To the outside, only the part for the entire group is sufficient. ● Classification by company has little significance. (Classification by plant or workplace is more significant to relevant local communities.) ● It is sufficient if your environment-awareness is merely clearly explained. <Regarding the part for internal company> ● Lay-out of details concerning internal companies renders information difficult to comprehend. ● Business characteristics should be presented together on 2 pages. ● Inscriptions for each company are similar. Revision is requested. ● Reduce the over-documentation by focusing on only the significant points. ● Uniformity of presentation is required. ● Contents should be unified among companies, at least titles in the table of contents.	Since fiscal 2002, we have set the framework of our report in part for the entire group and the companies. The reasons are: ① The products and customers of each company are different, and therefore the policies and subjects to be promoted are also different. It is our desire that such differences are understood by our readers (editorial policy introduced on the back of the front cover). ② Comparability is a necessary feature in an environmental report. In our Environmental Report 2002, we treated each internal company as independent, making the same framework as for the entire group, so that its relation to business and environment, environmental subjects and activity results could be clearly seen. Possibly, such framework appeared to be repetitive or lacking uniformity to our readers. Based on the opinions and comments we received, we have done the following in our Environmental Report 2003. ① We have kept the framework separate for the entire Group and the companies. ② Characteristics of each company are specified (P4). ③ In the sections for each company, focus is placed on respective main subjects.
It is questionable that emission rate of the PRTR substances is different according to plants.	The rate differs according to differences in usage of the substances. The reasons are explained in this report (P63).

# Housing Company



- **Outline of Businesses**
- Sekisui Heim
- Sekisui Two-U Home
- Crastina
- Refurbishing & Remodeling
- Interior & Exterior Decoration
- Real Estate
- Nursing Care and Independent Care Room

## Message from Company President

As a leader in environmental conservation we are providing increased levels of comfort with diminished environmental loads throughout the entire life cycles of our houses.



**Tomohiko Yasuda**

President  
Housing Company

The housing industry is inextricably related to the environment and as a leader in housing we have readily assumed a leadership role in environmental conservation. We were able to immediately comply fully with the requirements of the 2002 Japanese Construction Materials Recycling Law by our strategic measures for waste disposal and energy consumption problems, including power shortages and carbon dioxide emission.

We have always been dedicated to the supply of houses with low environmental loads and resources saving and energy saving features. As a result of our constant research and development we are now able to make available environment-friendly houses that provide safe, healthy and comfortable homes with a life span of sixty or more years.

The attributes of our Resource-recycling Housing System which we have structured to deal with matters concerning waste disposal, include the development of longer life components, the attainment of zero emission at all of our plants, the provision of a comprehensive long term support system, and the unique Rebuilding System.

In the field of energy saving, all our houses incorporate next generation specifications as standard features and we are popularizing our photovoltaic generation systems and our "Eco-Cute" hot water units of high energy efficiency. The cumulative total of our houses equipped with the photovoltaic generation system reached 20,000 in March 2003 and the resulting estimated reduction of CO<sub>2</sub> emission, combined with that of the energy saving specifications, reached 40,000 tons per year.

The achievement of high levels of interior comfort in houses used to require increased energy consumption resulting in increased CO<sub>2</sub> emission. We have turned this situation around and in December 2002 we set forth a new concept we described as "zero-energy-cost houses". This phrase conveys to the customers the benefits of our houses which, incorporating highly functional modules, highly efficient energy-saving equipment and the utilization of natural energy, provide a high level of interior comfort at low cost and with low environmental loads.

As a leader in environmental conservation in the housing industry we are devoted to fulfilling the above-mentioned measures and to pursuing ever-increasing environmental friendliness. In so doing we will be main-

taining and developing the excellent relationship we enjoy with society.

We trust that from this report readers are able to see that environmental conservation is at the heart of our endeavors. We look forward to receiving your comments and advice to assist us in these endeavors.

## ENVIRONMENTAL POLICY

### Our Basic Concept

Our Housing Company contributes to the society with our environment-friendly residential houses that can be lived in safely and comfortably for at least 60 years.

### Activity Guidelines

#### 1. To offer houses with low environmental loads:

We are dedicated to the continual improvement of the durability and the comfort of our houses and to the utilization of natural energy and materials with low environmental loads, so that we can supply residential houses with healthy conditions which have minimum impact on the environment.

#### 2. To build resources/energy saving houses:

We pay full attention to achieving the most effective use of resources and energy, to the promotion of waste reduction and material recycling and to the development of a Resource-recycling Housing System.

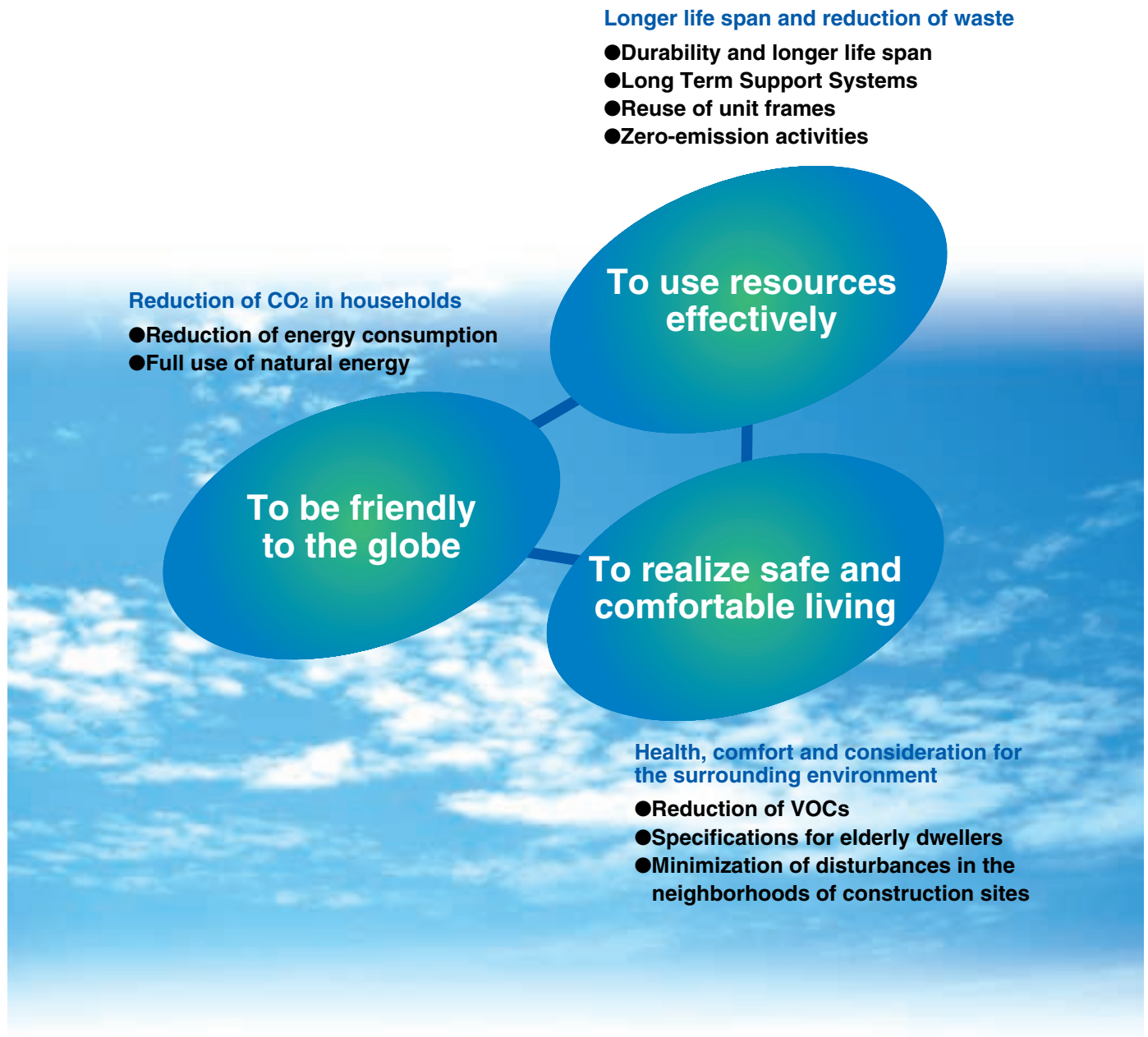
#### 3. To supply houses that best suit their surrounding communities:

We minimize the environmental impacts of construction and development on residential areas and fully observe all laws, paying efforts to develop excellent relations with local communities.

February 1, 2003



Eminent technology to minimize environmental loads through the life cycle of houses. As a leader in environmental conservation, we are dedicated to realizing: Reduction of CO<sub>2</sub> emission, resources saving and total consideration for the surrounding environment.



## Reduction of CO<sub>2</sub> Emission

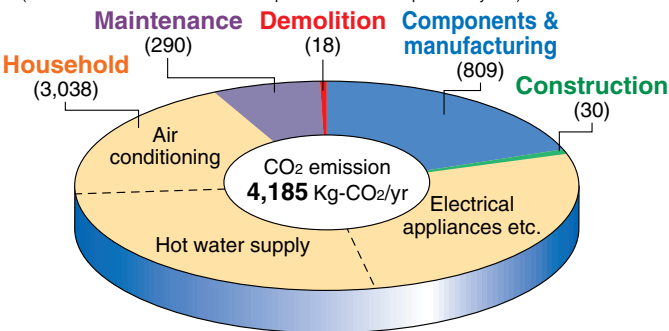
We substantially contribute to the reduction of CO<sub>2</sub> emission through the life cycle of our houses.

### Efforts to Reduce CO<sub>2</sub> Emission

70% of the CO<sub>2</sub> emission from residential houses during their life cycles is attributed to energy consumption for air conditioning, hot water supply and electrical appliance usage. We put importance on energy saving during the manufacture of modular units and we focus our efforts on the above mentioned three categories of energy usage of households, through improvement of insulation of houses and development and installation of solar energy systems. Thus we reduce energy consumption while maintaining comfortable living conditions. By switching household energy use to that of less CO<sub>2</sub> emission, we are further reducing CO<sub>2</sub> emission.

#### LCA of detached house

(LCCO<sub>2</sub> based on a model house of April 2000 with a life span of 60 years)



#### List of CO<sub>2</sub> reducing measures for households

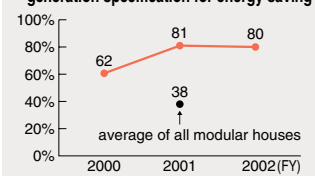
	Mode of Saving	Technical Method	Activities
①	Reduction of energy consumption	Effective insulation and air-tightness	Next-generation specification for energy saving
②	Efficient use of energy	Highly efficient devices	"Eco-Cute" hot water system
③	Utilization of new energy	Photovoltaic generation system	Popularization of photovoltaic system
④	Use of natural conditions	Air-circulating windows	Heat elimination by air intake and exhaust
⑤	Proposal of "Zero-energy-cost House"	Concept of total energy cost	Employment of energy cost calculation software

### Reduction of CO<sub>2</sub> Emission in Households

#### Setting of efficient insulation specifications

In our detached houses, the next generation specifications for energy saving are set as a standard option and actual employment is above the average level of all modular houses sold in Japan, which was 38% in fiscal 2001. Highly insulating aluminum-plastic composite windows, which reduce heat loss, are a further option we are promoting.

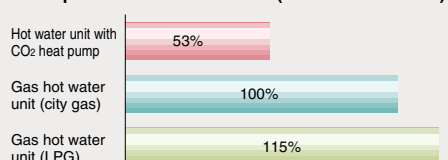
#### Level of employment of the next generation specification for energy saving



#### Popularization of "Eco-Cute", a hot water unit with CO<sub>2</sub> heat pump

A heat pump, which utilizes atmospheric heat, will catch 3 times as much heat energy as the electric energy it consumes and will reduce CO<sub>2</sub> emission to half that of a city gas boiler. In the latter half of fiscal 2002, 20% approx. of our detached houses employed "Eco-Cute".

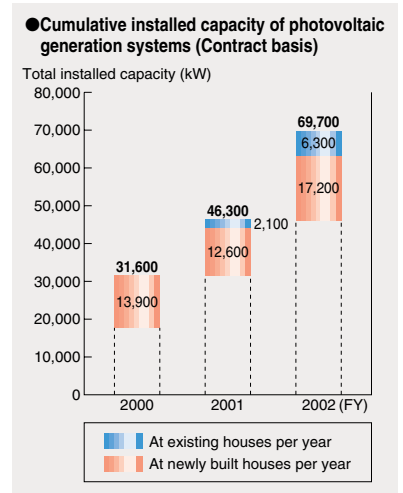
#### Comparison of CO<sub>2</sub> emission (Data from CRIEPI\*)



\*CRIEPI = Central Research Institute of Electric Power Industry

### Popularization of photovoltaic generation systems

We have been promoting the increase of photovoltaic generation systems, as both standard installation at the time of housing starts and, through our after-sales service operations, as additional installations to existing houses. With the increase in the number of installed units and the average capacity increase per unit, the total capacity increased substantially to 69,700 kW by the end of March 2003.



In fiscal 2002, the increase of photovoltaic generation systems was supported by the improvement of power conditioners and the development of our slant step roof which results in greater power generation for small houses. This roof is incorporated in the design of Zero-energy-cost House, "Two-U Le" which was put on the market in April 2003.



Zero-energy-cost House "Two-U Le"



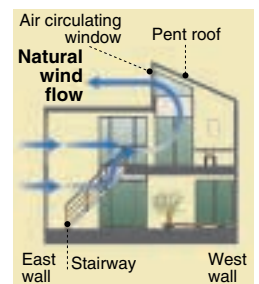
Slant step roof increases the size of south facing area.

#### Use of natural air circulation

A new air ventilation concept, air circulating windows placed just below the eaves at the top of a building combined with a vaulted ceiling was introduced in "Heim BJ". It creates a comfortable space with natural air ventilation.

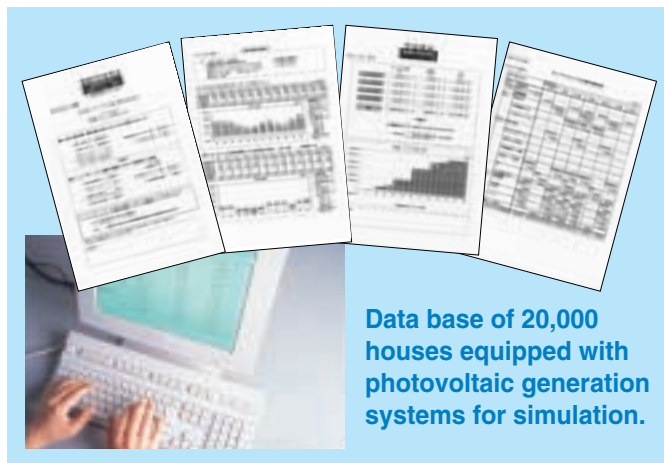


"Heim BJ"



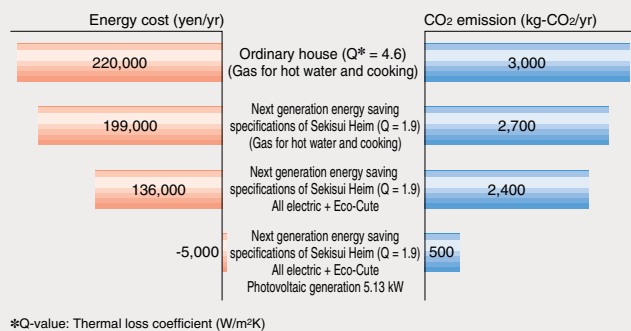
### ⑤ Proposal of Zero-energy-cost House

In December 2002, we introduced our "Zero-energy-cost House" to the market, which is equipped with the highly efficient insulation specifications: "Eco-Cute", photovoltaic generation system and other features to realize greater environmental conservation and reduced energy costs for the residents. A simulation software was developed to anticipate energy cost and CO<sub>2</sub> emission, taking the customized setup of an individual house and the hourly change in power costs into account. Easy display of the advantages of the selected set-ups will help popularize Zero-energy-cost Houses.



Data base of 20,000 houses equipped with photovoltaic generation systems for simulation.

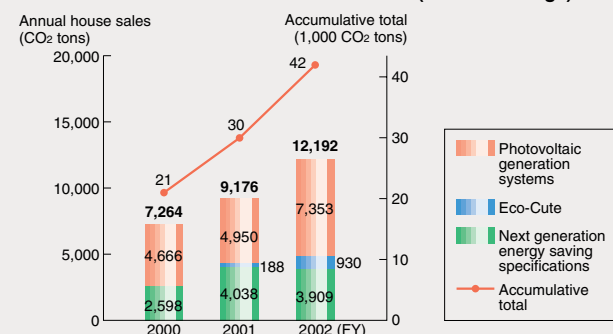
### ● Example of Zero-energy-cost House simulation



### ● Actual reduced CO<sub>2</sub> emission tonnage

The reduction effect of CO<sub>2</sub> emission attributed to our houses was 42,000 tons in fiscal 2002. This result is more than the emission from our house manufacturing plants (34,000 tons) and is equal to the absorption by 3,000 ha. of Japanese forest.

### ● Contribution to reduction of CO<sub>2</sub> emission (Annual tonnage)

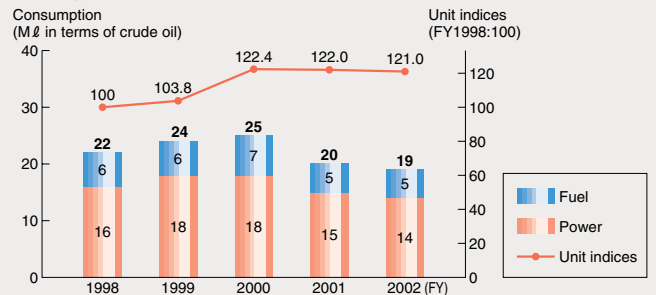


### ■ Energy Saving Activities at our Plants

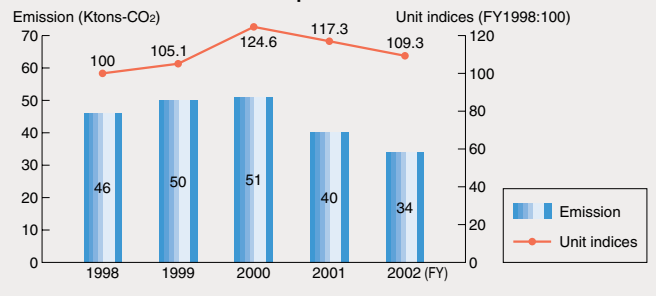
For the reduction of CO<sub>2</sub> emission in production processes, we focus our efforts on energy saving.

By means of rearrangement of production lines, abolition of incinerators and minimization of machine loss time etc., we curtailed power and fuel consumption. The decrease of production tended to push up the emission per production Unit but we succeeded to bring it down. The energy consumption is leveling off and CO<sub>2</sub> emission has been decreasing since fiscal 2002.

### ● Energy consumption and production Unit



### ● Carbon dioxide emission and production Unit



### ● Use of photovoltaic generation systems at our plant offices

Three of our plant offices use photovoltaic generation systems. Solar cells are installed in the roofs to partially supply power to the office. For example, the estimated power supply by this system for Kansai Sekisui Industry Co., Ltd. (see photo below) is 10%.

Plants	Capacity	Start of use
Kitanihon Sekisui Industry Co., Ltd.	8kW	July 2001
Kansai Sekisui Industry Co., Ltd.	30kW	March 2003
Nishinihon Sekisui Industry Co., Ltd.	20kW	March 2003



This display panel in the office hall shows the current generation wattage.



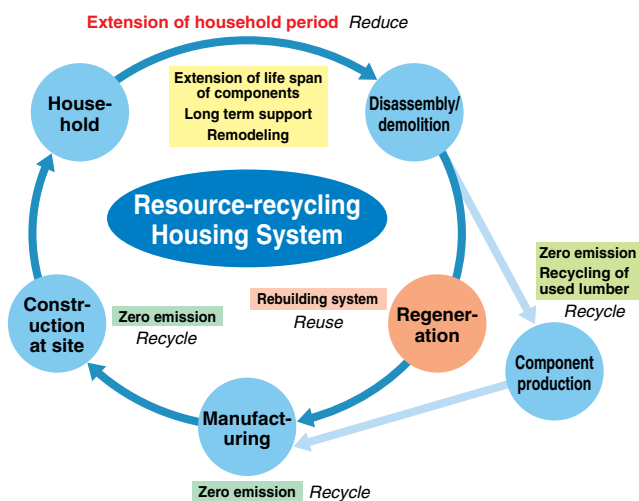
## Extension of Life Span and Reduction of Building Waste (I) Long Life Components and Support Systems

For resource saving, we develop components to extend the life span of houses and offer maintenance and remodeling services as long term support systems.

### Waste Reduction and Resource Saving

Average volume of waste of a demolished detached house is about 40 tons. Lessening the frequency of demolition will reduce the load on the environment from waste materials. So we have developed long life exterior walls and roofs, which can be used for a variety of house structures and can accommodate any changes in the life style of the residents and any interior renovations. We are continuing to develop better parts and support systems.

### Scheme of Resource-recycling Housing System



### Long Life Components

#### Durable stainless steel roof that reduces maintenance expense.

For flat roofs, we use SUS445 stainless steel which is one of the most durable stainless steels available, such as used in Tokyo Big Sight, Osaka Dome, Saitama Super Arena and Seibu Dome in order to reduce maintenance expense.

#### Tiled exterior wall



#### "Relief" exterior wall with UVA coating



#### "Durastone" exterior wall



#### "ZAM", anti-corrosive dip-plated steel.

"ZAM" is highly durable, dip-plated steel of Zinc/Aluminum/Magnesium alloy and we use it in the unit frames of steel-structured Heim. "ZAM" has 2 to 3 times as much corrosion resistance as the conventional zinc plated steel. These are the key points to making components more durable, contributing to lighter environmental loads, e.g. resource saving and energy saving.



**●Tiled exterior wall**

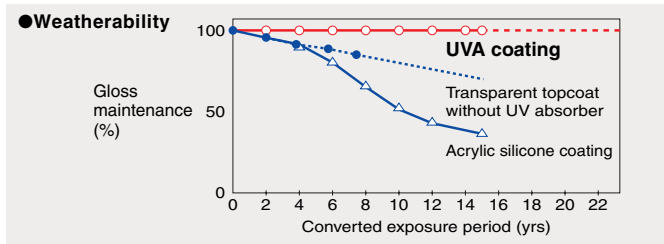
Porcelain tiles are adopted, which are resistant to UV, scratching and low temperature damage and do not require painting. The quality is assured since they are applied at our plants.

**●"Relief" exterior wall with UVA coating**

This is a new, wood-chip filled, hard cement board with a transparent coating of high weather resistance, which we started to use in 2002. The transparent coating over the colored layer protects the tone and eliminates weather damages. In an accelerated 15 year equivalent exposure test, it maintained its initial gloss. Its beautiful tone will remain for many years with periodic washing.

**●Comparison of coating structure**

Conventional coating	UVA Coating	UV
Colored enamel coating	Weatherability + Color	Weatherability
Primer coating	Waterproofing	Color + waterproofing
Sealant layer (Reinforcement & waterproofing)		Transparent topcoat
SFC Board (Wood-chip filled, hard cement board)		Colored enamel coating
		Sealant layer (Reinforcement & waterproofing)
		SFC Board (Wood-chip filled, hard cement board)



**●"Durastone" wall**

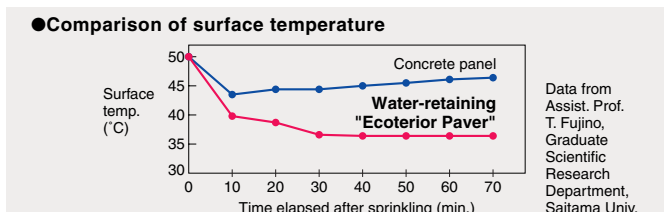
"Durastone" wall is a new exterior wall developed by our epoch-making inorganic polymer technology. This new material does not require any coating due to its excellent durability and has many other advantages. As the "Durastone" wall consists of almost the same material as natural stone, it will endure for more than 60 years with no need of replacement.

**■Exterior Decorating Product: "Ecoterior" Series of Ceramic Water Retainer**

More than 70% of this product consists of such refuse as metal casting slugs or Oya Stone dust. It is paving material for balconies or patios, composed of water retaining ceramics which have fine holes of 48% by volume and absorbs rainwater or sprinkled water rapidly. The absorbed water evaporates gradually to maintain a cool surface of more than 10 degrees lower than a conventional concrete panel.



Distributed by Sekisui Exterior Co., Ltd.

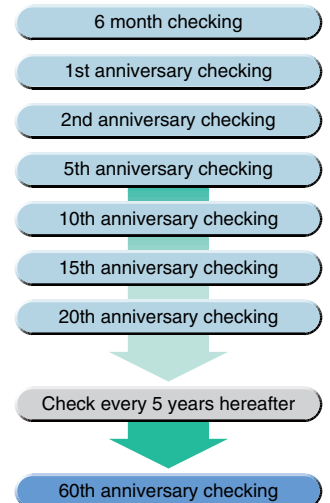


**■Long Term Support Systems**

To maintain house quality it is essential for a house to receive periodic checking to find any fault at an early stage. We have started customer support systems to plan for maintenance. We always try to improve the quality and durability of our modular houses and at the same time offer long term guarantee and checking plans.

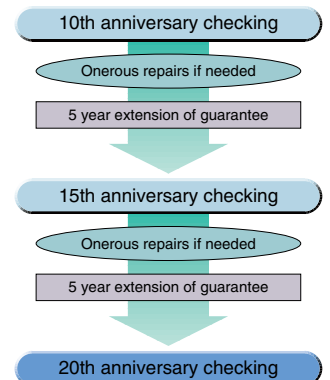
**●60-year checking system**

This is a unique system to check our houses, both interior and exterior, every 5 years for a period of 60 years, starting 5 years after hand-over according to our after-sales service standards. This is in addition to our original checking system which provides checks, both interior and exterior, three times within 2 years from hand-over. The new prolonged system which entails exact investigative checking, enables maintenance work to be planned in good time to ensure that the living conditions of the residents can continue at a consistently high level of comfort.



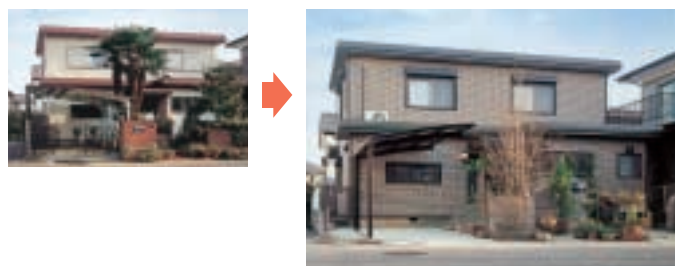
**●20-year guarantee system**

This system is proof of the high quality and long durability of our modular houses. Regarding the guarantee of the structural frames and/or waterproofing, should any defect occur in the 10 years after hand-over, we carry out repairs free of charge. Should a need for repairs to or preventive measures against deterioration of these appear out of the 10 and 15 year checks, we carry out the necessary work according to the customer's agreement who will bear the cost. The guarantee period for these is then extended for 5 years.



**■Renovation Systems**

We can offer various plans and flexible ideas for renovation, because our Unit Technology uses steel structural frames of high endurance, the walls and interiors of which can be replaced. Renovation can include installation of state-of-the-art equipment and, of course, renewal and repair of damages incurred over the years.



## Extension of Life Span and Reduction of Building Waste (II) Reuse of Unit Frames and Zero Emission

Resource-recycling Housing System is being promoted by the reuse of structural unit frames which is unique to Sekisui Heim and the reduction and recycling of wastes at the plants and construction sites.

### Resource Saving by Reuse

#### Rebuilding System of the resource-recycling housing system

In the Rebuilding System, customers may trade in their Sekisui Heim for a new Sekisui Heim or a Sekisui Two-U Home. The original Sekisui Heim is disassembled, returned to the plant, inspected, repaired as necessary and rebuilt into new modules. By this method 70% in weight of the original house is reused while the roof, interior fixtures, units and decoration are all new material. One Rebuilding System house will reuse about 14 tons of steel structure, lumber, plaster boards and glass panes, which results in a great reduction of building wastes.

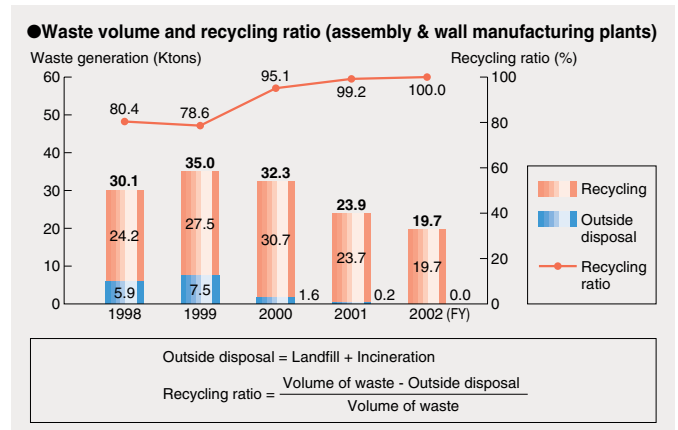


### Zero Emission Activities at our Plants

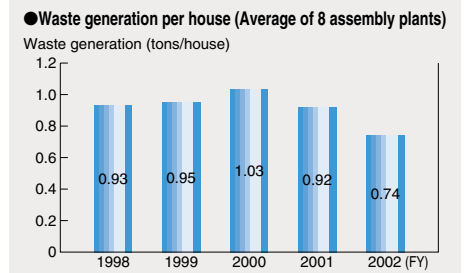
In conventional house construction, waste is generated mainly at the site. However with our Unit Technology, a high percentage of construction is completed in the plant; therefore a relatively small amount of waste is generated at the site. At present the average amount of waste generated by construction per our unit house is 1.6 tons approx., of which 0.7 ton is in the plant and 0.9 ton is at the site.

#### Promotion of our zero emission activities

As a first step zero emission (100% recycling of wastes) was attained at all 10 plants (8 assembly and 2 exterior wall manufacturing) by September 2001.



Our second step is to reduce the volume of waste, on which we are now concentrating our efforts. As of March 2003, the generation ratio was brought down to 70% of the level of fiscal 2000. We are continuing our efforts to reduce excess shipment of components from plants to sites, and to save packaging materials.



#### Example of waste reduction by reuse



Cut-offs of exterior walls are used as vibration control blocks. (Higashinohon Sekisui Industry Co., Ltd.)



Switch to repeatedly usable cover sheets for module shipment. (Kansai Sekisui Ind. Co., Ltd.)

#### Abolition of internal incinerators

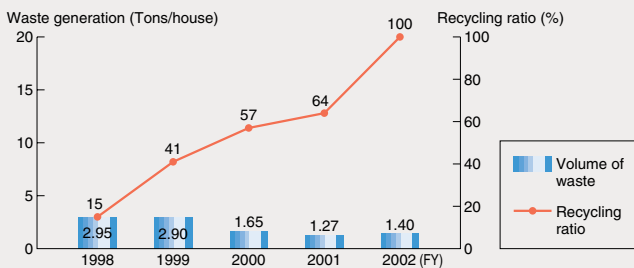
3 plants used their own incinerators until March 2001 but all had abolished them by the end of November 2002. From the beginning of April to the end of November 2002, we incinerated 1,100 tons of waste, which was 5.6% of all wastes. Since the beginning of December 2002, all waste is recycled by outside contractors.

## Zero Emission Activities at House Construction Sites

### Certification criteria

Our strict zero emission requirements for construction sites serve as the criteria for the President's certification of zero emission house sales subsidiaries. The 2001 requirements were based on the recycling ratio but in fiscal 2002 they were upgraded to accord with the 3R Activities for Zero Emission, assessment of which includes a minimum 25% reduction of waste generation, and material recycling ratio and disposal/treatment cost targets.

### Waste generation and recycling ratio of the selected sales subsidiaries



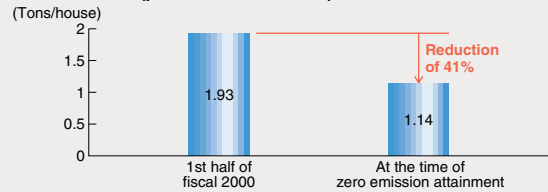
### Attainment of zero emission

Although attainment of zero emission by all 40 construction subsidiaries was the target of fiscal 2002, only 22 met that target due to heightened stringency of the criteria. However, by the end of the first half of fiscal 2003 all remaining 18 had attained zero emission.

### Reduction of waste generation

25% reduction which is one of the requirements of zero emission, has been attained by 22 subsidiaries with the actual average reduction being as much as 41%.

### Waste generation at construction sites of subsidiaries attaining zero emission (per 140m<sup>2</sup> floor area)



### Recycling of waste from disassembly

The implementation of the Construction Materials Recycling Law at construction sites is now established and the actual recycling ratio of waste from disassembly is 77% approx.

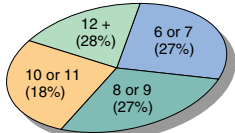
### Disposal method of waste at new house construction sites (by our recommendation)

#### Primary segregation



At construction sites, waste is segregated into types, from 6 to 13, for collection. Exact segregation brings higher recycling ratio and greater reduction of waste.

#### No. of segregated waste types



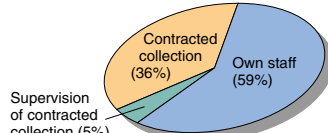
22 zero emission attained subsidiaries

#### Collection by own staff



Main method is truck collection by own staff. Trucks are utilized for other purposes such as recovery of excess components and delivery of lacking components in order to realize fuel efficiency. Drivers are responsible for waste segregation instructions, control of waste volume, and component delivery.

#### Method of collection



22 zero emission attained subsidiaries

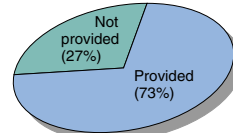
#### Own waste storage facility (Re-segregation, proper control of disposal amount and complete manifestation)



#### Secondary segregation

Wastes transported to own storage facility is re-segregated according to the relevant standards. Very small volumes of wastes can be accumulated for later proper disposal. Complete manifestation is issued.

#### Provision of own waste control facility



22 zero emission attained subsidiaries

Collection/transportation contractors

Recycling contractors

### Staff of Sekisui Heim Saitama, Ltd.



From left to right: Mr. Yoshida, Asst. Mgr. of Safety and Environment, Eco-staff, Messrs. Otsuka, Koyama, Yoshida, Orihara

In our zero emission activities, we targeted and succeeded in complete waste segregation, recovery of excess components and selection of appropriate recycling contractors. We concluded that collection of waste from construction sites which is of utmost importance has always to be performed by ourselves. Now, the four of us key staff (Eco-staff) devote full efforts to maintaining zero emission through our routine work.



The character displayed on our three waste collecting trucks, which appeals even to children, shows us to be "A Leader in Environmental Conservation".



We do our best to improve the safety and comfort of the home environment.

■A Healthy and Comfortable Indoor Environment

Sick house syndrome has been a prominent issue in recent years. We have promptly dealt with this problem and provide a healthy indoor environment in all our houses.

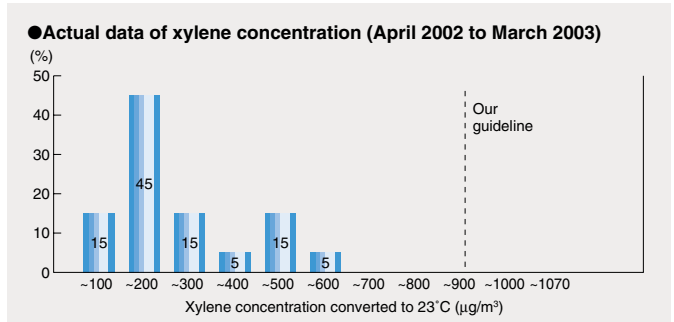
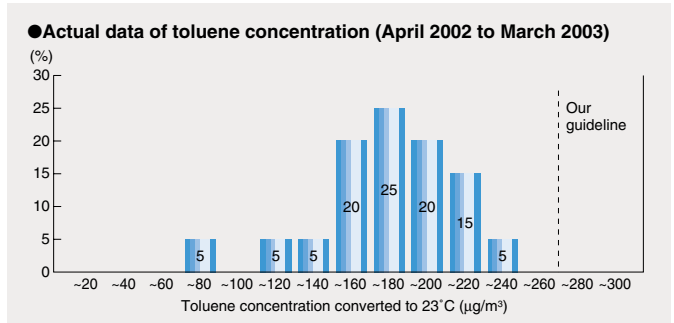
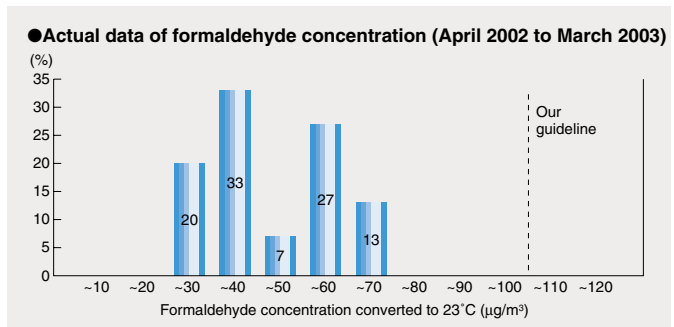
Our internal guidelines regarding hazardous chemical concentration in the atmosphere at room temperature has been set at less than the guideline concentration of the Japanese Ministry of Health, Labour and Welfare and we have attained this target for the three specially hazardous chemicals, formaldehyde, toluene and xylene.

Our interior decoration finishes use water-borne paint and wall paper printed with water-borne ink, and non-solvent adhesives. Our interior building materials meet the formaldehyde requirements of the severest JIS/JAS standards. Our 24 hour ventilation system provides a round-the-clock air circulation system. The effects of these countermeasures are checked after the completion of house construction.

In 2003 an amendment to the Japanese Building Standard Law was enforced to further decrease sick house syndrome occurrences. We immediately took action to totally comply with this amendment.

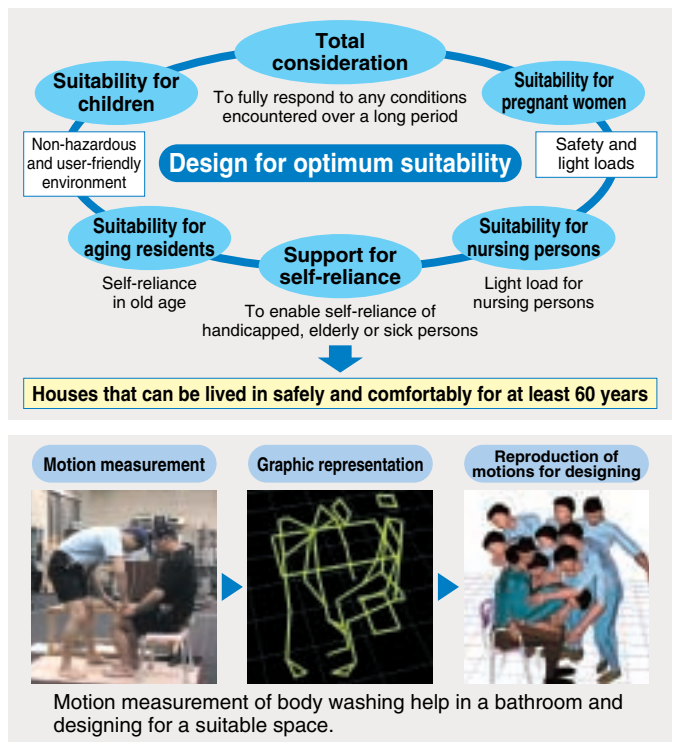
Our guidelines (at 23°C, 50%RH)

Formaldehyde	0.08 ppm (100 µg/m³)
Toluene	260 µg/m³
Xylene	870 µg/m³



■Design for Optimum Suitability

In accordance with the demographic trend of the aging society, we have long been engaged in designing houses to meet the demands of all age groups, especially with consideration for the needs of residents who are physically challenged, who need nursing care and who have low mobility. The basic design for healthy, happy independent living and the design for individual needs are separately studied to develop a harmonized living environment. We are pursuing human engineering, such as the conducting of motion measurement, physiological measurement and subjective measurement on a wide spectrum of people. Resulting data are fundamental to our provision of houses which can comfortably accommodate people of different physiques, different levels of mobility and with various individual needs, and which can easily be converted to adapt to the changing needs of the residents. The user-friendliness of our houses is evaluated in this regard, with the aid of computer simulations, in order that we can achieve optimum suitability for all residents.



■Consideration to Neighbors of Construction Sites

Modules of our Unit Technology are 80% finished in the factory and are all equipped with exterior walls, windows and other fixtures at the time of shipping. The assembly and weather proofing works at the construction site take place in one day. Also interior/exterior finishing work is completed within a short period, so the entire construction noise is much less compared to other construction methods. Yet to minimize the disturbance to neighbors, each sales/construction subsidiary has set up the following procedures as a part of the Environmental Management System of ISO 14001:

During construction:

- limit daily working hours
- control vehicle parking
- rent adjacent land, as needed
- prevent dirt efflux

In the finished house:

- direct efflux of exhaust of fan, hot water unit etc. away from neighboring houses



# Urban Infrastructure & Environmental Products Company



# URBAN INFRASTRUCTURE & ENVIRONMENTAL PRODUCTS COMPANY

## ■ Outline of Businesses Piping Materials Business

- PVC Pipe & Fittings
- Plastic Sewer Pit
- Polyethylene Pipe
- Reinforced Plastic Composite Pipe
- Synthetic Wood
- Plastic Valves
- Restoration Materials and Work Methods for aged Pipes

## ■ Building Materials Business

- Building Materials  
(Rain Gutters, Balcony/Patio Flooring Materials, Roofing Tiles)
- Residential House Equipment, Appliances and Fixtures  
(Bath Core, Hot Water Unit, Septic Tank)
- Garbage Treatment Systems

## Message from Company President

We aim at becoming an environment-solution company, solving environmental problems together with our customers and contributing to the structuring of a resource recycling-based society.



**Toyoo Manabe**

President  
Urban Infrastructure &  
Environmental Products Company

Our company has always developed our businesses with the importance of water quality and the maintenance of a healthy living environment as our fundamental aim. Building on this, we have recently renewed our policy in order to become "an environment-solution company", developing businesses based on the need for environment solutions. We have recognized the importance of, not only public utilities investments and house construction markets, but also the importance of the environmental field. Therefore we are utilizing our leading technologies and systems to provide solutions to all the environmental concerns of our customers and of society.

At present we are concentrating on the development of businesses in three environment-solution areas: water resources, environment-friendly pipe relining and wood resources. Utilizing our accumulated know-how and leading technology in product development, design, installation and maintenance, we are providing solutions for safe and efficient management of water. Utilizing our long term experience and excellent technology and systems, namely SPR method and Omega Liner method, we are relining aged pipes with a minimum of environmental disruption. Utilizing our cascade type circulation technology we are recycling waste wood for use in the production of structural wood. Furthermore, based in our Kyoto R&D Laboratories, we are engaged in the development of next generation technologies for the creation of new environment-solution businesses into the future.

We pay utmost attention to our environmental performance, ensuring that our products are environment-friendly through their entire life cycles, from design to production, use and disposal. We continue our efforts for the most effective use of resources, the reduction of environmental loads and the structuring of a resource recycling-based society. All our workplaces acquired ISO 14001 certification in fiscal 2001 and achieved zero emission in fiscal 2002. We are dedicated to ever-improving our performance and ever-increasing our contributions in all areas of environment-friendliness.

## Policy on the Environment

### <Our Basic Concept>

Urban Infrastructure & Environmental Products Company will contribute, with our eminent technologies, to the creation of a living environment which is friendly to human beings and to the earth, through the manufacture of environment-friendly products and the structuring of systems.

### <Activity Guidelines>

#### 1. We aim at becoming an environment-solution company.

- We will solve environmental problems together with our customers and contribute to the structuring of a resource recycling-based society.
- We are paying special attention to three environment-solution business fields, i.e. recycling of waste wood, effective utilization of water resources and the restoration of aged pipes.
- We respond to the expectations of society by creating new businesses based on our leading environment-friendly technologies.

#### 2. We have utmost concern for the well-being of the environment and this concern permeates our research, development and production activities.

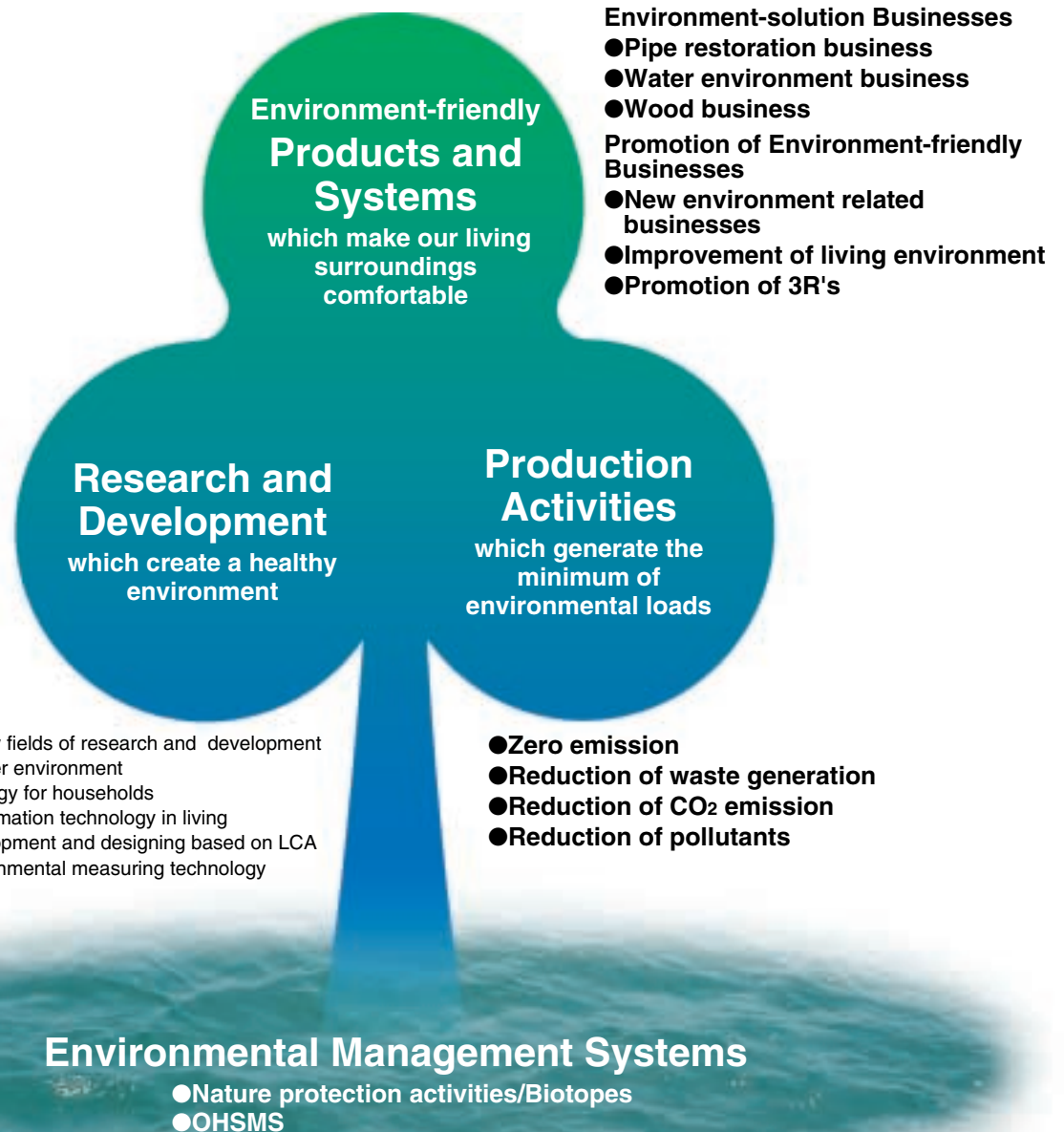
- We conduct research and development always from the standpoint of the environmental impacts and safety of our products through their entire life cycles.
- We are dedicated to reducing environmental loads derived from production activities through the promotion of energy saving and through the enhancement of zero emission for reuse and recycling of resources.
- We not only observe laws and regulations, but also proactively set our own objectives and targets based on our environment management systems, which results in the continual improvement of our environmental performance.

#### 3. We promote activities for symbiosis with the environment.

- We work in close cooperation with communities and society and with administrative bodies and industry. By keeping in good communication with them, we maintain their trust.
- We participate in nature protection activities and keep in harmony with local communities.

April 1, 2003

We respond to the expectations of society by the manufacturing of environment-friendly products and system structuring based on our eminent technologies, immediately grasping the requirements and demands of present and potential customers.



## Environment Solution Businesses

We operate our environment solution businesses in three fields: restoration of worn pipes, effective use of water resources and recycling of waste wood. We are dedicated to providing solutions to the environmental problems of modern society with our eminent technologies.

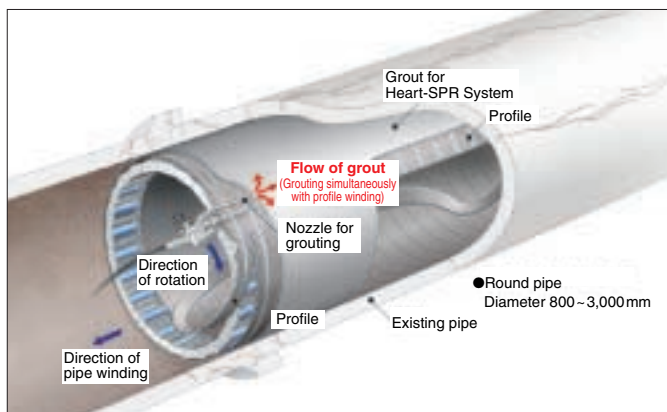
### ■Pipe Restoration Business

**We reline and renew aged pipes without digging, which results in minimum environmental impact.**

We have developed a variety of relining systems and non-corrosive piping materials to comply with the repairing of aged pipes for public water supply, sewerage, irrigation, and so forth, which are essential for daily living. By using these systems, generation of industrial waste can be reduced to a minimum and environmental impact on the surroundings, such as vibration, noise, traffic buildup, and so forth can be reduced to a minimum.

### ●SPR System is applicable to pressure pipelines as well for its excellent water tightness.

A strip of PVC profile is spirally wound to make a pipe inside an existing pipe. After relining, the new pipe is highly durable and has excellent resistance to earthquake damage. This system is applicable to round, rectangular or horseshoe shaped pipes and can be carried out without stopping the water flow.



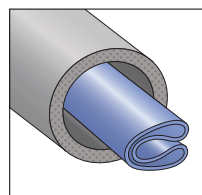
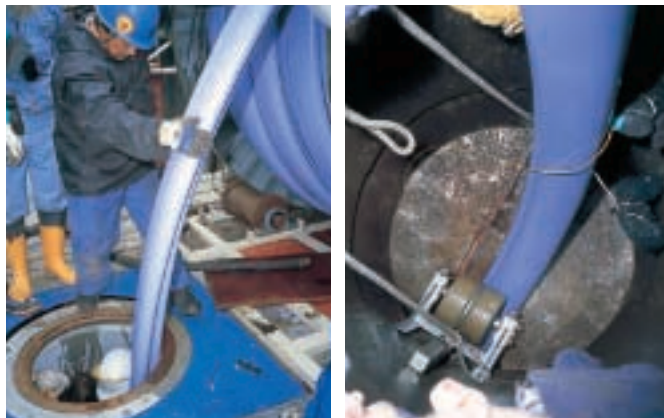
▲A new work method, Heart-SPR System, capable of relining a pipe and grouting at the same time.



▲Relining of a sewer pipe while effluent flows

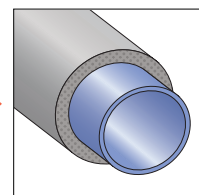
### ●Eslon Omega Liner System: the omega shaped pipe returns to a round shape when heated with steam.

PVC pipe, that has the property of shape memory, is folded in a Ω (omega) shape, which returns to a round shape when heated with steam at the site, and thus relines a worn existing pipe. As no organic solvent is used in the work, there is no danger of odor nor fire.



▲Folded pipe in Ω shape

Heating



▲Returned to a round shape



▲Work in a built-up residential area

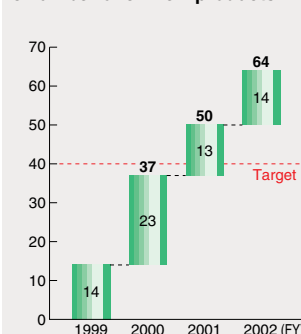


▲Heating with steam

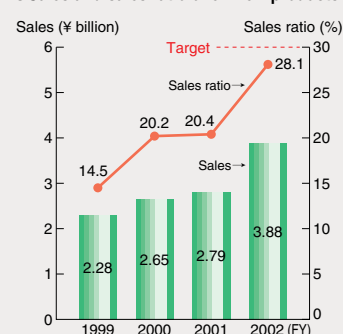
Urban Infrastructure & Environmental Products Company develops environment-friendly (e-f) new products. Our aim was to have 40 items (cumulative) of such products on the market by the end of fiscal 2002 with their sales ratio being a minimum of 30% of all new product sales. The actual number of items put on the market has reached 64 items (cumulative), which is well over the targeted number, but the sales ratio was 28.1%, which is slightly below the target.

As a company that sells such products and systems that are closely related to our daily lives, we will continue our efforts to increase the sales ratio of environment-friendly products.

### ●Number of e-f new products



### ●Sales and sales ratio of e-f new products





**Water Environment Business**

We offer total systems from product development to designing, installation, and maintenance, aiming at the restructuring of the water circulation environment.

In order to effectively utilize the limited water resources, the restructuring of the water circulation environment is needed. Our company has accumulated a wide range of technologies that are necessary to effectively utilize water resources, such as technologies for water supply and sewer systems, turfing of rooftops as a measure against the heat-island phenomena, rainwater management systems of local areas, highly efficient waste water treatment systems, and so forth. Making the most of such technologies for water management, water storage, irrigation and water treatment, we will contribute to the creation of a better water environment.

**"Sekisui Synclear" to reduce garbage incineration**

This is a garbage treatment system combining a disposer and equipment for sewage and waste water treatment. Household garbage is broken down by a disposer installed in the kitchen sink, and after decomposition by microorganisms, is discharged to the sewage pipe.



**Roof turfing system utilizing stored rainwater**

Rainwater after falling on the green area is collected and channeled into a storage tank through pipelines laid underneath the area, and it is pumped up through the same pipelines for irrigation when necessary. This is a lightweight, easily maintained system, making repeated use of rainwater.



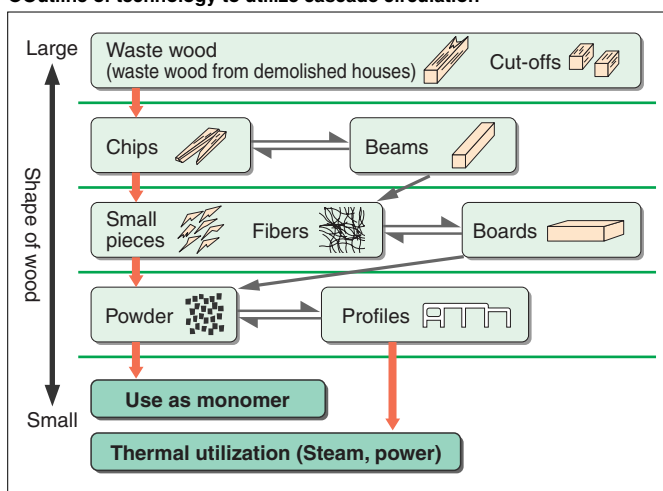
**Wood Business**

We are developing new products aiming at repeated recycling and circulation of wood resources.

**Recycling technology to utilize cascade circulation of a wide range of wood resources**

This is a recycling technology to produce beams, boards or profiles from wood waste and cut-offs generated at construction sites and plants. The kind of recycled items produced depends on the shape of material, i.e. chips, small pieces or fiber, and powder. Recycled beams are broken after use into small pieces to produce boards, which can be recycled again to make profiles. Waste wood is repeatedly recycled to produce building materials as illustrated below.

**Outline of technology to utilize cascade circulation**



**REW (Recycled Engineered Wood), waste wood generated when houses are demolished is recycled to produce building materials.**

Waste wood generated from the housing industry is broken into chips to produce engineered wood, which is excellent in strength and is dimensionally stable. We aim at using it for the main building materials of houses, such as pillars and joists.



▲ Wood chips segregated from other materials



▲ Recycled engineered wood

## Environment-friendly Businesses

We respond to customers' needs with our eminent technologies for the enhancement of living environments, waste treatment, energy saving, resource saving and effective energy utilization, and we work with customers to solve environmental problems.

### ■New Environment Related Businesses

We offer such products that contribute to the improvement of living environments and that can be easily treated for recycling.

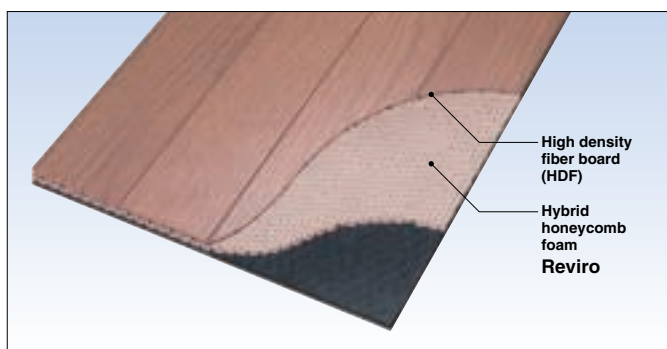
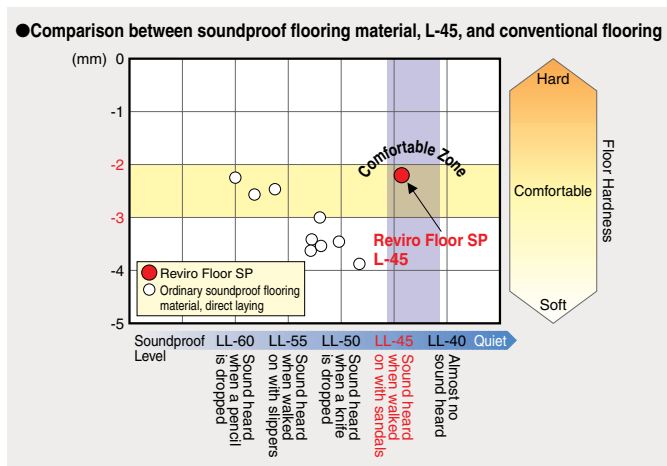
<Improvement of living environment>

●"Calmoon", a soundproof sheet that reduces sound and vibration conducted through walls and floors.

"Calmoon" provides high soundproof effects against noise from adjacent rooms. No adhesive is required for its installation.

●"Reviro Floor SP", a soundproof flooring material that exhibits excellent sound insulation property.

"Reviro", a hybrid honeycomb foam, is sandwiched as the soundproof layer in "Reviro Floor SP". This product provides the two properties of both absorption of lightweight striking sounds and the right hardness to give a comfortable walking surface.



<A single material that has the strength and functions of a composite material>

●"Z Foam", that can be easily recycled.

"Z Foam" is a rigid foam of 100% polyolefin applicable to the products that require mechanical strength, heat resistance, chemical resistance, lightweight, and so forth. It has been confirmed that this material can be recycled to manufacture plastic pallets.

●Ultra-oriented sheet, a single material that exhibits excellent strength

This product is an ultra-oriented sheet of 100% polyolefin that exhibits excellent strength without using such reinforcing materials as glass fiber, carbon fiber, and so forth. Segregation is not necessary for its recycling. It can be used for a wide range of applications, such as surface reinforcing materials and formed products by lamination of the sheet.

### ■Household Energy Business

We promote the effective utilization of atmospheric heat, reduction of CO<sub>2</sub> emission, and energy saving.

●"Hot Water Unit with CO<sub>2</sub> Heat Pump" utilizing natural heating medium, CO<sub>2</sub>

By utilization of atmospheric heat and natural heating medium, CO<sub>2</sub>, this unit makes hot water very efficiently. It emits little CO<sub>2</sub> (P32) and is highly valued for its economy of energy.



▲"Eco-Cute", a hot water unit with CO<sub>2</sub> heat pump

### ■Information Systems Business

A wide range of power and communication cable conduits contribute to building safer and more pleasant cities.

In order to build safer and more pleasant cities, underground cables are desired to provide more space for traffic, to improve city views, to avert secondary disasters from power failure owing to typhoon or lightning strikes, and so forth. We contribute to the promotion of laying cables underground by supplying a wide range of non-corrosive piping materials.



▲IT Box



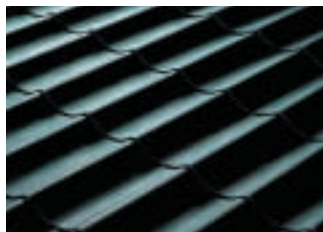
▲C.C. Box

### ■Roofing Materials Business

We have developed asbestos free and lightweight roofing tiles, which are friendly to human health and the environment.

●Lightweight "Roofing Tiles U" and "Brook", that impose lighter loads on houses

"Roofing Tile U" weighs about one third of conventional clay roofing tiles and "Brook" weighs about a half.



▲"Roofing Tile U"



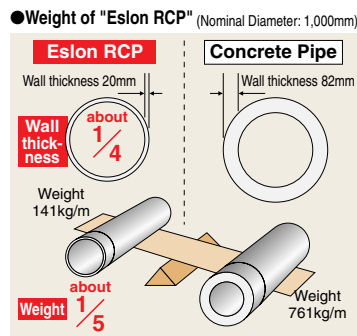
▲"Brook"

## ■Reinforced Plastic Pipe Business

We contribute to the reduction of environmental loads by offering our own installation methods and the properties of reinforced plastic composite pipe.

### ●"Eslon RCP" reduces soil waste and energy consumption.

A one size smaller "Eslon RCP" is capable of carrying water of the same volume as a one size larger conventional pipe, therefore it requires less excavation to lay "Eslon RCP", resulting in the reduction of soil waste. Its joints have excellent water tightness which lessens the amount of water seeping in, keeping the energy consumption required for treatment to a minimum. As "Eslon RCP" is non-corrosive, it is serviceable for a long time. In addition, "Eslon RCP" is used for combined sewer systems as a countermeasure against floods.



## ■FFU Business

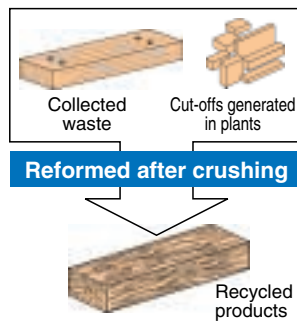
We have achieved material recycling with our synthetic wood.

### ●"FFU" has the features of both wood and plastics.

"Neo Lumber FFU" is superior to natural wood in durability. It contributes to the reduction of waste and is reusable by a simple fabrication of its surface. Its recycling technology has already been established to produce structural materials.



Reinforcement work of a water treatment tank cover after use for about 20 years



## ■Bath Core Business

In keeping with our 3R policy, our bath cores are lightweight and composed of materials which are recyclable or easily treated.

We have established a complete 3R system from production to disassembling and segregated collection to promote material saving and recycling of the product, by making its floor lightweight, reducing packaging materials, using the same packaging pallets repeatedly, recycling FRP, putting material labels on each component for easy separation, and so forth. We achieved the reduction of waste at construction sites by a large margin (70% reduction against fiscal 2000).



▲"Bath Saloon"

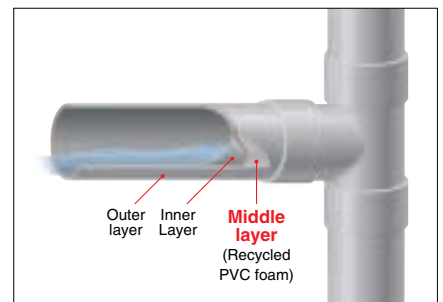
## ■Water Supply and Drainage System Business

We promote material recycling and improvement of product performance.

We aggressively promote the material recycling activities of PVC pipe and LP pipe as a part of our environment-friendly activities, and develop new products made from recycled material. We complied with the lead dissolution standard, established by the Japanese Ministry of Health, Labour and Welfare which came into effect in April 2003, by completing a lead-free piping system using gunmetal fittings for cross-linked polyethylene pipe, which is becoming the leading water and hot water piping system for residential houses.

### ●"Eslon 3-layer Foamed Core Pipe" made from recycled PVC

This has been designated as one of the "specified procurement items" in the Law on Promoting Green Purchasing (P46). We provide a large assortment of building drain pipes and sewer pipes.



## ■Building Materials Business

We contribute to the efficient utilization of limited resources through our development of highly durable building materials, which are essential to the extension of the life spans of our houses.

### ●"Art Face", highly weather resistant rain gutter and downspouts with longer lasting color

By covering the surface with special resin, its resistance to fading by sunlight has been drastically improved to maintain color quality for 3 times longer than that of previous products.



▲"Eslon Art Face"

### ●"Rifare EX", a synthetic balcony flooring material produced by the effective utilization of sawdust generated in saw mills

This product exhibits excellent property against fading and corrosion. It also contributes to the conservation of wood resources.



▲"Rifare EX"



## Promotion of PVC Recycling

We promote PVC product recycling to support the structuring of a recycling-based society.

### Recycling of PVC Products

PVC is an excellent material to fabricate and recycle that consumes relatively small oil resources and energy in manufacturing of resin and products.

We use PVC material mainly for producing consumer durables making the best use of its features. We also endeavor to recycle used PVC products for effective utilization of resources.

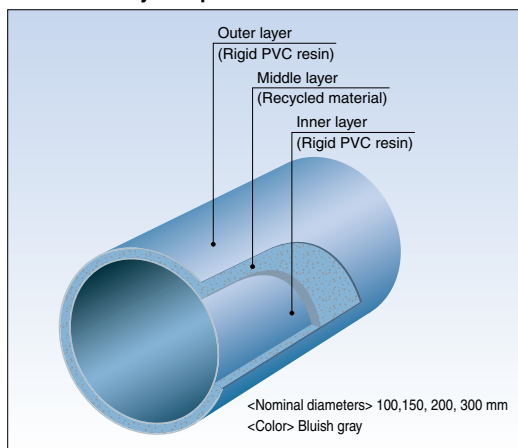
#### Activities by Sekisui Chemical Group companies

At each plant we enhance zero emission activities and also the recycling of waste from the plants. We contribute to the structuring of recycling systems for PVC products in the industry.

##### <Shiga-Ritto Plant>

We have developed the extrusion technology for 3-layer PVC pipes and are currently producing and selling recycled 3-layer foamed core pipe and recycled 3-layer pipe, which are used for drainage and ventilation pipes in buildings and also for sewerage branch pipes. Our technology for the production of these pipes from recycled piping material accords with the recycling system established by the Japan PVC Pipe and Fittings Association of which we are a founding member.

#### "Eslon 3-layer Pipe"



As for the recycling system of LP pipe (steel pipe lined with PVC pipe) structured by the Japan Water Steel Pipe Association, a subsidiary in Shiga-Ritto plant has separated steel pipe from PVC pipe.

##### <Sekisui Chemical Hokkaido Co., Ltd.>

We actively promote recycling of PVC waste in the plant with the aim of zero release from the plant. There were 141 tons of PVC waste in fiscal 2001 that were treated by landfill or recycled by contractors. We could reduce it to 109 tons in fiscal 2002.

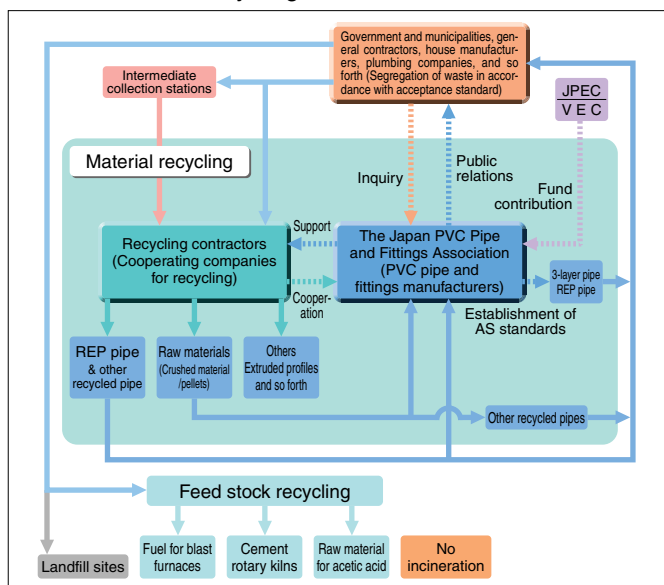
Being the only PVC pipe and fittings plant in Hokkaido, this plant plays an important role in the production of recycled pipe.

##### <Tokyo Plant and Gunma Plant>

PVC pipe manufactured by Gunma Plant is conveyed to Tokyo Plant for final fabrication into sewer pits and manholes. The cut-offs generated during the fabrication is no longer recycled by external contractors, but since fiscal 2002 have been returned to Gunma Plant for recycling to pipe.

### Recycling system of PVC pipe and fittings

The Japan PVC Pipe and Fittings Association has been promoting material recycling, operating recycling bases throughout the nation, such as intermediate collection stations. This resulted in a recycling ratio of 48% in fiscal 2002.



AS Standard: Standard of the Japan PVC Pipe and Fittings Association  
 JPEC: Japan PVC Environmental Affairs Council  
 VEC: Vinyl Environmental Council  
 REP pipe: Pipes conforming to AS Standards

We, as a manufacturer of PVC pipe and fittings, produce recycled PVC pipe in Shiga-Ritto Plant and Sekisui Chemical Hokkaido Co., Ltd.

### Recycled PVC pipes have been designated as "specified procurement items" in the Law on Promoting Green Purchasing.

Recycled rigid PVC pipe for drainage was designated as a specified procurement item under the Law on Promoting Green Purchasing in February 2003.

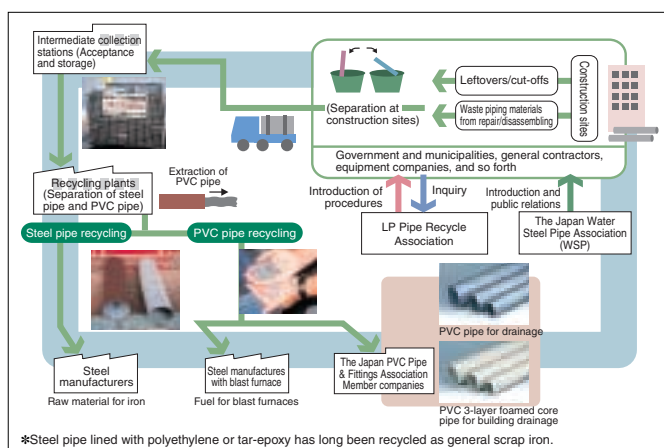
Classification: Public works

Material: Recycled rigid PVC pipe for drainage

Criteria: Rigid PVC pipe for drainage to be used inside and outside buildings, and minimum 30% of the total product weight is of the recycled PVC raw material from used PVC pipe.

### Recycling system for LP pipe

The Japan Water Steel Pipe Association, of which we are a member, has extended its recycling bases throughout the nation. This resulted in a recycling ratio of 32% in fiscal 2002.



\*Steel pipe lined with polyethylene or tar-epoxy has long been recycled as general scrap iron.



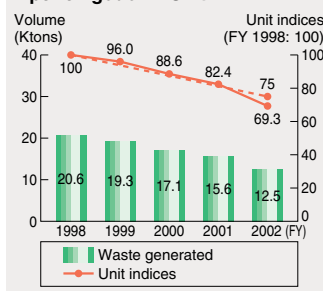
## Production Activities with the Minimum of Environmental Loads

Zero emission was achieved at all object plants as targeted in fiscal 2002. We will continue our efforts to reduce waste generation and environmental loads.

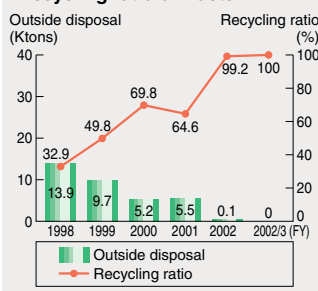
### ■3R Activities to Reduce, Reuse and Recycle Waste from Plants

We continued our efforts to achieve zero emission at 10 plants (cum.) by the end of fiscal 2002, and successfully attained the target by achieving zero emission at Chiba Plant of Vantec Co., Ltd. and also at Ota Plant of Toto Sekisui Co., Ltd. in fiscal 2002. As to the reduction of waste generation, we reduced waste by 39% (8,100 tons) and ex-godown Unit by 31% in fiscal 2002 compared to fiscal 1998, which was well over the target of 25% set in our middle term plan.

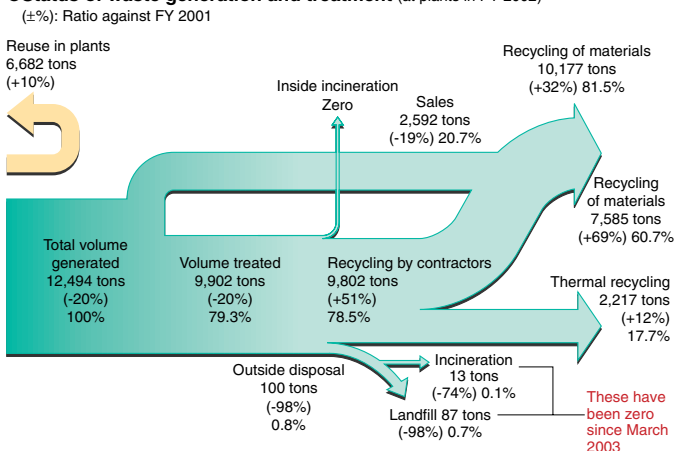
#### ●Waste generation in volume and per ex-godown Unit



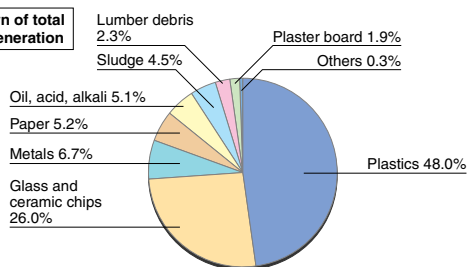
#### ●Outside disposal volume and recycling ratio of waste



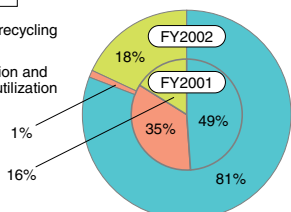
#### ●Status of waste generation and treatment (at plants in FY 2002)



#### Breakdown of total volume generation



#### Breakdown of disposal methods



### ■The Plants that Achieved Zero Emission in Fiscal 2002.



#### Chiba Plant, Vantec Co., Ltd.

Mitsuo Matsumoto

Kaizen Group Manager, Planning & Control Department

We started our zero emission activities in fiscal 2001. As most of our waste had previously been disposed of for landfill, our staff were not under pressure to follow segregation methods. In order to raise the level of consciousness of the importance of segregation of waste and zero emission demands, we decided to segregate our waste into 33 kinds, which is more than necessary for recycling purposes.

We also started our survey on recycling methods and suitable recycling contractors. It took much time to solve the problem of recycling gelled FRP waste and sweepings mixed with PVC, but we could achieve zero emission owing to the cooperation we received from those plants that had already achieved zero emission.

We will devote further efforts to reduce the total volume of waste and treatment costs, aiming at becoming a plant where our zero emission activities are clearly visible to others.



#### Ota Plant, Toto Sekisui Co., Ltd.

Takashi Okumura

Manager, Maintenance Department

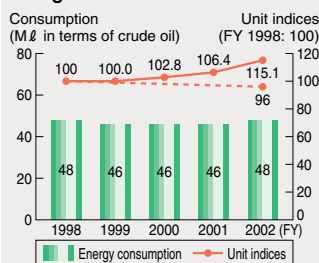
We have promoted our zero emission activities through weekly meetings attended mainly by zero emission promotion members designated by each department. We spent most time in establishing our segregation procedures, discussing in the meetings the classification of waste, descriptive labeling of segregated waste, ways of disposing waste, and so forth. We reached decisions in the meetings regarding the monitoring of central collection stations, change of stations' layouts, the reduction of waste volume by crushing, and so forth.

We have achieved the recycling ratio of 100% but the total treatment costs have gone up due to the increase of treatment unit cost. Having achieved zero emission, we will continue our activities to decrease the total waste generation, to reduce treatment costs and to increase the material recycling ratio.

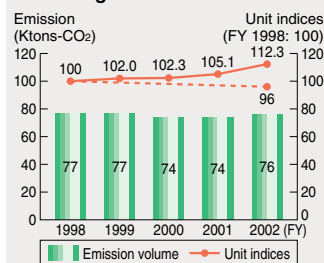
### ■Results of Other Activities

Both energy consumption and CO<sub>2</sub> emission increased due to the change of product mix, etc. in spite of the energy saving activities by each plant. By the end of fiscal 2001, we had totally abolished dichloromethane for washing use, and in 2002 we attained our reduction target of pollutant release and transfer.

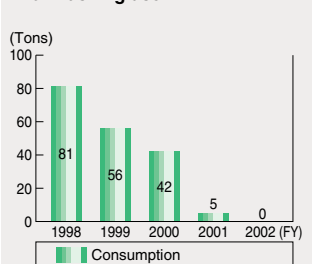
#### ●Energy consumption and ex-godown Unit



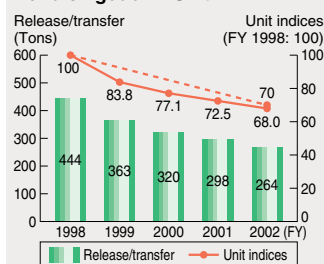
#### ●Carbon dioxide emission volume and ex-godown Unit



#### ●Consumption of dichloromethane for washing use



#### ●Pollutant release and transfer and ex-godown Unit



## Symbiosis with the Environment: Biotope Activities

Biotores made by the hands of our employees are growing steadily as "Home Town Woods".

### Biotope at Kyushu Sekisui Industry Co., Ltd.



**Hotsumi Oda**  
Chairman of Biotope Committee  
Managing Director  
Kyushu Sekisui Industry Co., Ltd.  
(Qualification of biotope  
establishment and management,  
level II)

It has been three years since we started developing a biotope to establish a natural environment with local plant species on the premises of Kyushu Sekisui Industry Co., Ltd. Last year we named it "Home Town Woods", and mainly with the help of the Green Scouts of Chiyoda town we have started to conduct tree planting twice a year. Some of the elementary school children from the local community who participated in planting trees three years ago have become junior high school pupils. The trees have steadily grown up too. Some trees that were about 1 meter in height at the time of planting by the children have grown to the height of over 4 meters. Such trees as *Aphananthe aspera* and



Chinese tallow trees, whose seeds were carried there by wild birds, and *Mallotus japonicus* that started to sprout naturally, have reached the height of over 2 meters. In this year we found about 20 young second generation trees such as *Quercus glauca*, *Quercus acutissima* and *Quercus serrata*, which started to grow from the nuts that fell from the existing trees last year. Around the edge of the ponds and in the grass, *Phragmites australis*, *Typha angustifolia*, *Miscanthus sinensis* (Japanese pampas grass), and so forth grow. The variety of plants in Home Town Woods have become richer, but about 25% of the plants that have taken root there are not actually native Japanese species.

Many people have visited Home Town Woods and have given us various comments, both positive and negative. Regarding the latter, for example, such criticism as "unkempt" emphasizes the need for a change in perception of what is most valuable when creating a biotope. Our objective is to provide a natural habitat for plants and creatures native to the Saga region. An environment where these may both flourish



does not necessarily coincide with the conventional perception of a beautiful view.

Ruddy-breasted crakes and spot-billed ducks flew into our biotope to breed again this year, too. Also kingfishers sometimes arrive. We sincerely hope that this biotope will be a "home town" for such wild creatures. We will carefully develop this biotope to become a "home town of the heart" where human beings can come into contact with a variety of wild life.

We will continue to dedicate our efforts for the enhancement of the environment in our local community because we believe that the soundness of a business enterprise has to be measured by the depth of its commitment to the health of its surroundings and to the global environment as a whole.

### Biotope at Shiga-Ritto Plant



**Tadashi Tanaka**  
**Haruo Nakagawa**  
(Facilities/Environment &  
Safety Department)  
Shiga-Ritto Plant

We established a biotope in November 2002, aiming at becoming a plant symbiotic with the environment. We made the biotope with the aim that it should become a place to protect the variety of natural plant and animal life in this region.

Making use of an empty lot in the courtyard of the plant, the biotope was handmade by voluntary employees, who prepared the land and arranged stones as necessary. We completed it little by little from June to November 2002 by utilizing our spare time during lunch-hours and after work. In spring this year we planted some trees and



grass there, and we are very happy that it now looks like a biotope. We have set a handmade sign on which is written "Ritto Biotope" at the entrance. We placed feed tables for wild birds in the biotope, and now we can closely watch many birds, such as dusky thrushes, silver-



eyes, Japanese bush warblers, oriental turtle doves, titmice and of course tree sparrows. We could also observe a rare species of white-bellied green pigeons. There are marsh snails in the pond and killifish swim there, growing bigger these days.

On 22 and 23 November 2002, the 21st Nature Study Course was held in Shiga-Ritto Plant, in which a teacher from a local elementary school and 15 employees from our plant participated. We built many bird nesting boxes and feeding tables on that occasion.

In addition to the biotope activities, we conduct cleaning campaigns monthly in the areas nearby the plant to enhance local beautification. About 50 employees conduct cleaning half yearly of the Nakanoi river that flows in front of the plant. We thus promote not only nature protection activities but also cooperation with the local community.

We will continue developing and enjoying our biotope activities.

# High Performance Plastics Company



## ■Outline of Businesses

Adhesives

High performance resins

(ceramics binder, functional beads, etc.)

Interlayer film

(for laminated glass for windows of vehicles and buildings)

Engineered fine parts, Plastic containers

Adhesive tapes (for packaging, industrial use)

Marking film, Sheets for decorative purposes

Foamed polyethylene

Packaging & agricultural film

Plastic home products

(for cleaning, bathroom, toilet, kitchen and storage goods)

Vacuum blood collection tubes, Medical tapes, Diagnostics

HIGH  
PERFORMANCE  
PLASTICS  
COMPANY

## Message from Company President

We aim at minimal environmental loads in our business activities, and we provide our customers with products in order that they can realize environment-friendliness making best use of our expert technologies.



**Gen Endo**

President  
High Performance  
Plastics Company

Our company manufactures products for a wide range of applications, including IT, automobile, medical, construction and household.

Through our long history we have built up technology which is second to none, and we regard our role as being a provider of the most appropriate solutions to our customers, supplying them with technology packages to exactly meet their needs in the successful operations of their businesses, according to the sentiment expressed in our slogan, "Chemistry for Your Win".

We are dedicated to achieving and maintaining the most excellent environment-friendliness in all our products, in their applications and in their manufacturing processes. In fiscal 2002, we put on the market "S-Lec Solar Control Film", a heat insulation interlayer film, which contributes to energy saving, and "Environment-friendly Paroi", a high quality decorative sheet, which is polyolefin based and certified as non-flammable material. In that year our sales of environment-friendly products reached 7.4 billion yen.

We have attained our targets of reduction of carbon dioxide and pollutants emission per production Unit as laid out in the Middle Term Environmental Plan, "STEP-21", which we started in fiscal 1999. As for waste, we could not attain the target of reduction of waste generation per production Unit, although zero emission was successfully attained by all targeted workplaces as planned. We could also reduce the environmental loads in production by changing the production method of kraft paper tapes.

The new Middle Term Environmental Plan, "STEP-2005" started this year. We will continue our efforts to reduce environmental loads in all our operations, which will contribute to the enhancement of our business efficiency. In this respect, we are providing our customers with total solutions based on the technology packages of highly effective function technology of material surfaces, precision synthesis technology, nano-technology, photosynthesis technology, control technology of adhesion strength, and others. We are supplying intermediate materials and functional parts to support our customers in their development of environment-friendly products. We are committed to our promise "Chemistry for Your Win", thereby fully cooperating with our customers to enable them to win in these keenly competitive times.



The Concept of High Performance Plastics Company is  
"Chemistry for Your Win"

Utilizing our unique technologies  
we provide our customers with best solutions



We provide our customers with total solutions complying with their needs based on a technology package, and supply intermediate materials and strategic parts to support our customers in their development of environment-friendly products.

All our operations, from material selection to production, transportation and material recycling of wastes, are carried out in accordance with our aim to reduce environmental loads. Our production is governed by our management systems complying with the ISO 14001 standards in order to continue our efforts for reduction of carbon dioxide emission and of waste generation.

We aim at developing technologies with lighter environmental loads to protect the air, water, and soil of the earth. We will continue our full utilization of the core technologies of material, molding/fabrication and evaluation technology and offer to customers technology packages of our unique nano-technology, control technology of adhesion strength, highly effective function technology of material surfaces, among others.

## Reduction of Environmental Loads (I) Reduction of Wastes

We aggressively promote the effective utilization of resources in our business activities.

### Reduction of Environmental Loads in Production

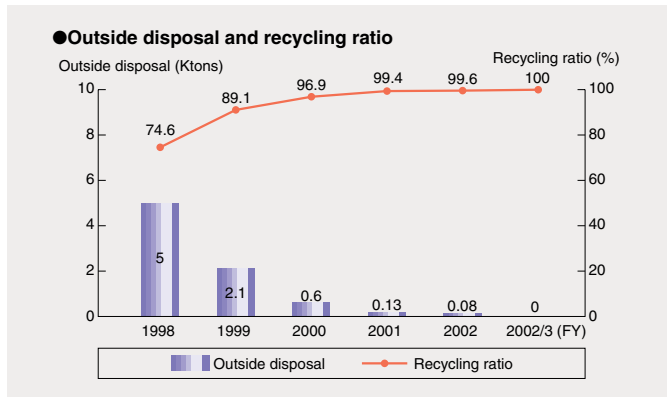
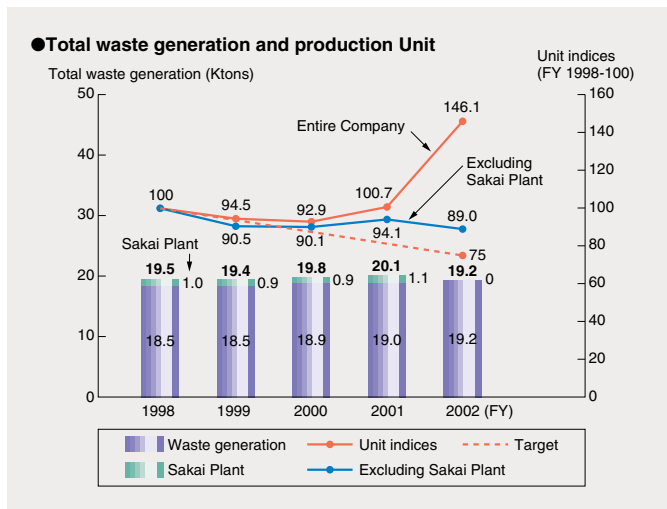
Among Sekisui Group companies, High Performance Plastics Company generates a relatively larger volume of waste and consumes more energy in the production of high performance resins, the fabrication of such plastic goods as adhesive tapes, films, foams, and precision molded goods, and the production of medical goods. We also handle a variety of chemical substances.

Therefore, the reduction of environmental loads in production is of utmost importance to us, e.g. the emission of carbon dioxide and chemical substances, and the generation of waste.

### Reuse and Recycle of Waste and Reduction of Waste

#### Reduction of waste generation

In fiscal 2002 the waste generation per production Unit increased sharply by 46% against fiscal 1998. This is due to the closure of Sakai Plant, that occupied the production volume of about 40% of the entire company but its production Unit was only 1/10 of the average of other plants. When computed excluding Sakai Plant, the waste generation per production Unit decreased by 11%, which is below the target of 25% set in the middle term plan. We will make our best efforts to reduce waste generation by decreasing the amount of, and by reusing, cut-offs.



### Achievement of Zero Emission

In fiscal 1998 we started our zero emission activities with the aim to recycle the entire waste generated from our 12 plants by the end of fiscal 2002. The following 5 plants newly achieved zero emission in fiscal 2002, bringing the total to 12 as targeted.

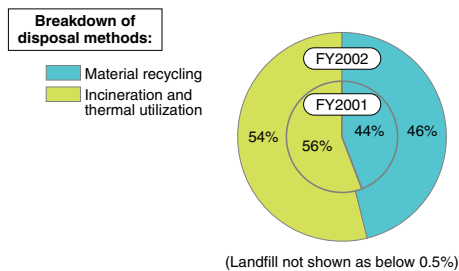
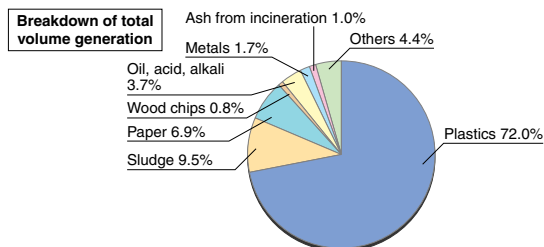
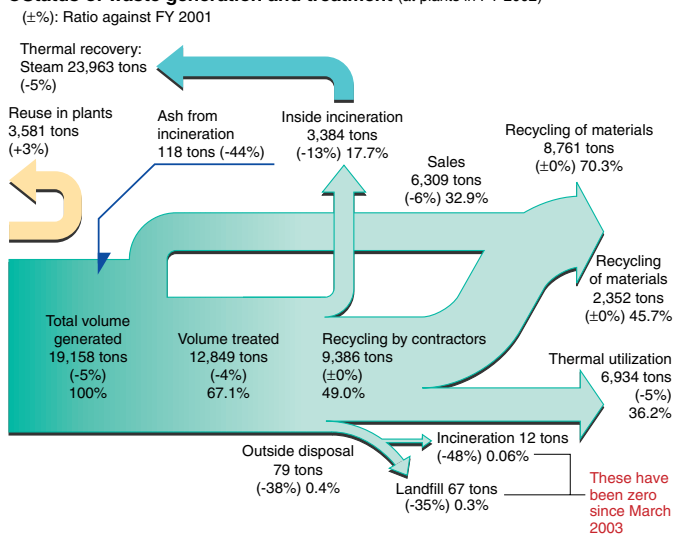
#### The plants that achieved zero emission in fiscal 2002.

Oigawa Plant, Sekisui Technol Molding East Japan Co., Ltd.	September 2002
Nara Plant, Sekisui Technol Molding East Japan Co., Ltd.	October 2002
Sendai Plant, Sekisui Film Co., Ltd.	September 2002
Shinshu-Takato Plant, Sekisui Film Co., Ltd.	March 2003
Sekisui Film Kyushu Co., Ltd.	March 2003

#### Status of waste generation and treatment

The status of waste generation and treatment in fiscal 2002 is shown below. Distinctive features of our company is that the ratio of plastic waste is high and thermal utilization is also high. In the course of zero emission activities we will continue our efforts to reduce waste generation and at the same time to convert thermal utilization to material recycling.

#### Status of waste generation and treatment (at plants in FY 2002)



(Landfill not shown as below 0.5%)

## Example of Efficient Utilization of Resources

### Cut-offs of tapes, polyethylene foams, etc. are recycled to produce solid fuel.

Our Musashi Plant produces adhesive tapes such as cellophane tapes, kraft paper tapes, and so forth, and foamed polyethylene that are used for interior parts for cars and as components for building materials. Most of the products are manufactured in the form of rolls, which are then cut or punched to marketable sizes. Although we constantly pay utmost attention in designing and production to minimize the generation of cut-offs and increase production efficiency, cut-offs of tapes and foamed polyethylene are still generated in a relatively large volume.

From the viewpoint of effective utilization of resources, it is important to reuse the cut-offs generated in the production processes in our plant as they are, or to separate them for recycling to materials. In fiscal 1999, we achieved 100% recycling of the waste generated from our plant, but the costs were high for thermal utilization. We have continued our efforts to increase material recycling in the course of promoting zero emission activities since fiscal 1998. However, it is very

difficult to separate the materials in the cut-offs of adhesive tapes as they are a mixture of adhesives and paper, or cellophane or plastic films. Furthermore, in the case of foamed polyethylene, the cut-offs are very bulky compared to their weight.

Therefore, in fiscal 2002, in order to solve these problems we started commercial production of RPF (Refuse Paper & Plastic Fuel) by introducing equipment to produce RPF, a solid fuel made by breaking cut-offs into small pieces and processing them. They are crushed and then compressed under high pressure into small solid pieces of fuel greatly reducing their volume.

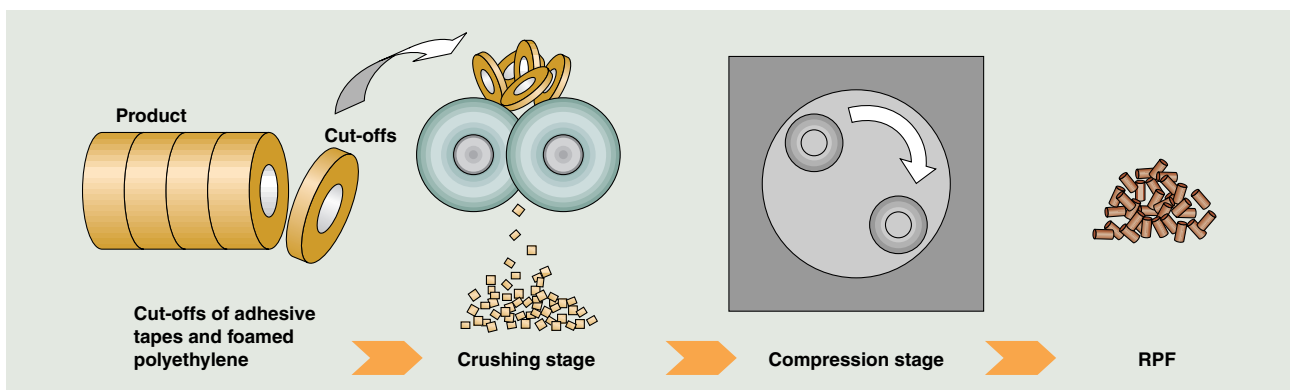
RPF made from waste plastics is uniform in quality as it is strictly separated, and has high calorific value. Therefore in recent years equipment to use RPF in place of coal and other fossil fuel has become more wide spread. We check and confirm the quality of our RPF, for such as water content, specific gravity, and calorific value, and ship to companies that have facilities capable of using RPF.



▲RPF production equipment



▲RPF



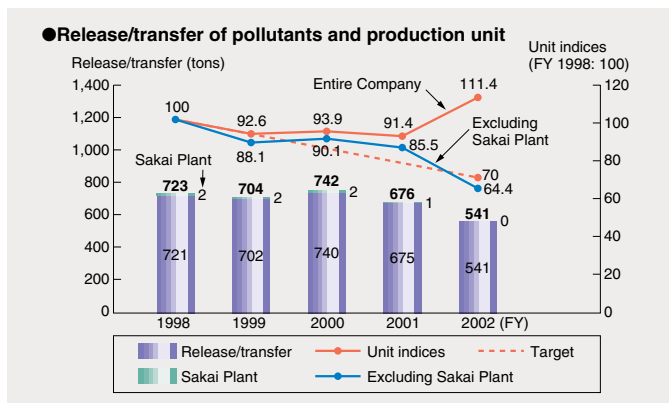
We are systematically taking drastic measures which result in much reduced carbon dioxide emission and pollutant release.

**Reduction of Release/Transfer of Pollutants**

Our company manufactures chemical products of highly functional plastics and handles a variety of chemical substances. We also use a large amount of organic solvents and so forth in our production processes, and our release and transfer of these substances are quite large among Sekisui Chemical Group.

In fiscal 2002, in order to reduce the release of pollutants, we changed the production method of kraft paper tapes, the main item of our adhesive tape products, to a totally new method that does not use organic solvents for adhesive coating. The production method of foamed polyethylene is now undergoing change to a new method that does not use any substitute flons.

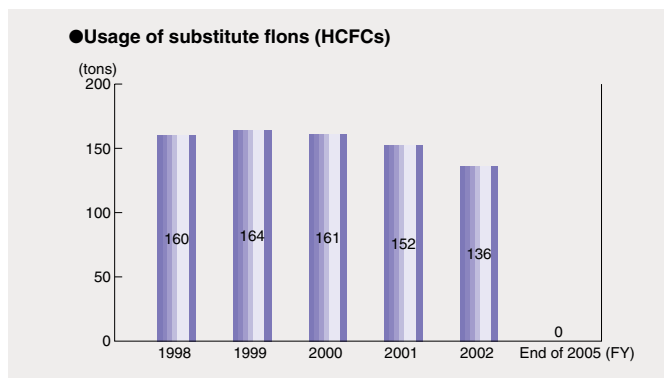
The release/transfer was reduced by 25% in fiscal 2002 compared to fiscal 1998 and its per production Unit was reduced by 36%, excluding Sakai Plant.



**Total Abolition of Substitute Flons (HCFCs)**

Among our polyethylene foams for heat insulation application, etc., there are certain grades that use substitute flons as foaming agents. The Montreal Protocol of 1987 stipulated that the use of substitute flons be abolished by 2014, and Sekisui Chemical Group aims at abolishing them by the end of fiscal 2005.

In fiscal 2002, we reviewed a new production method of using an organic foaming agent, to which we changed from substitute flons for some grades. We will continue to change grade by grade until we totally cease the use of substitute flons as we have scheduled.

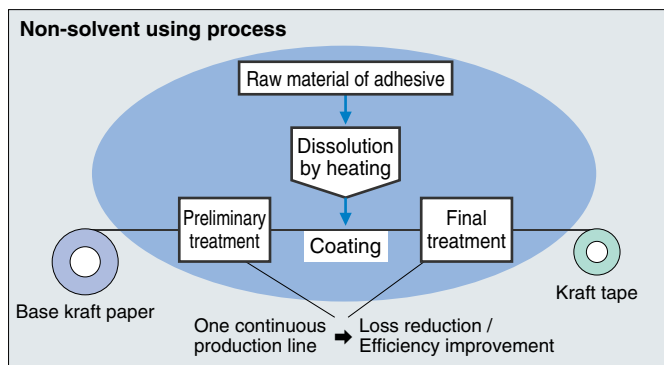
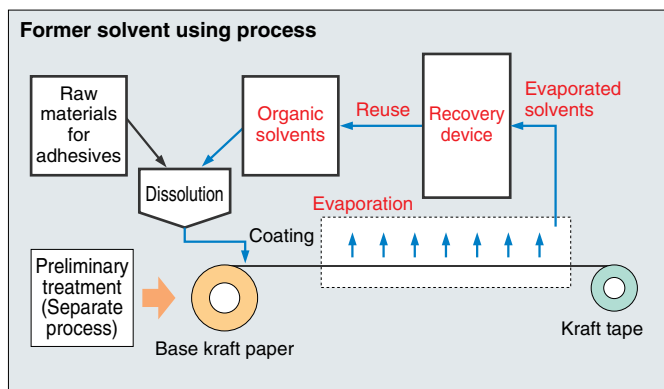


**Example of Reduction of Pollutants Release**

**Change over to non-solvent production method (Hot-melt method) for kraft paper tapes**

Formerly we produced kraft paper tapes by applying adhesives that had been dissolved in solvents to facilitate the coating on the surface of the kraft paper, and the solvents evaporated, to be recovered for reuse.

We have introduced a new method whereby the adhesives are liquefied at a high temperature without prior dissolution in solvents and the liquefied adhesive is coated directly on the surface of the kraft paper. For the treatment of the non-adhesive surface of tapes, we have used non-solvent type material. We are also reducing material losses by operating one production line, from the preliminary treatment on the base paper to the final rolled products.





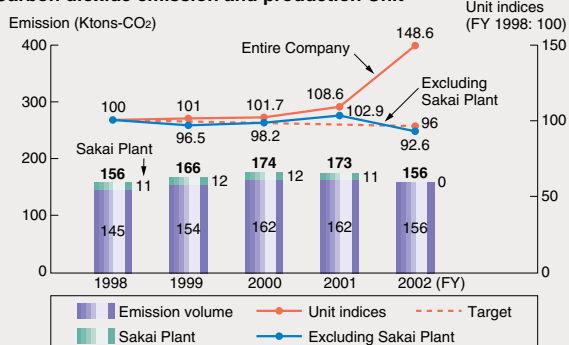
## ■Activities for Reduction of Carbon Dioxide Emission and Energy Saving

In fiscal 2002 the emission of carbon dioxide and energy consumption decreased in total volume compared to fiscal 2001, and the production Unit excluding Sakai Plant also decreased more than the target of 4%.

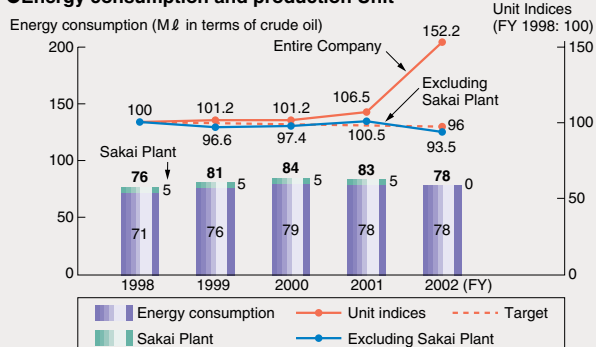
For the last one year, some plants suspended their production, resulting in the reduction of energy consumption in total. Each workplace, however, continued the activities of energy saving, and Shiga-Minakuchi Plant that consumes the most energy among our plants shifted its boiler fuel and introduced a co-generation system. Shiga-Minakuchi Plant completed the shift of its boiler fuel from heavy oil to city gas in December 2002.

By taking these measures, we expect to achieve a reduction of carbon dioxide emission by about 12,000 tons a year, which will be equivalent to a reduction of 7% approx. of our company compared to the period before such measures were taken.

### ●Carbon dioxide emission and production Unit



### ●Energy consumption and production Unit



### ●CO<sub>2</sub> emission is reduced by the shift to city gas

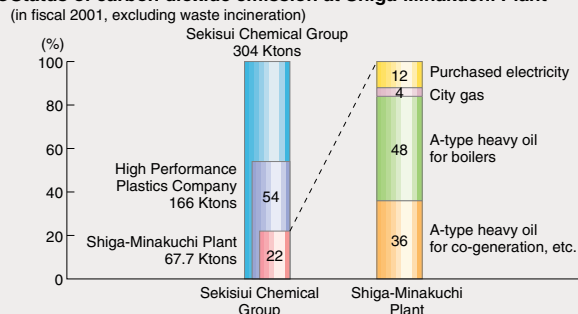
City gas is mainly composed of natural gas, the main component of which is methane (CH<sub>4</sub>). Methane contains less carbon than coal or petroleum fuel in any given weight, and methane generates more calories than the same amount of other fuels. To obtain the same calorific output, methane emits much less carbon dioxide.

City gas contains a very small quantity of sulfur (S) and nitrogen (N), therefore emission of SO<sub>x</sub> and NO<sub>x</sub> can be reduced to a large extent (P19).

## ■Examples of Drastic Measures for Reduction of Carbon Dioxide Emission

Shiga-Minakuchi Plant, one of the main plants of our company, consumes the most energy among all plants in Sekisui Chemical Group. It has the production facilities to synthesize/polymerize highly functional resins, the manufacture of which consumes much energy, and its carbon dioxide emission reached 40% approx. of our company, equal to 22% approx. of all Sekisui Chemical Group in fiscal 2001. In addition, the production amount of this plant was increased by the transfer of a certain amount of manufacturing from Sakai Plant after closure.

### ●Status of carbon dioxide emission at Shiga-Minakuchi Plant



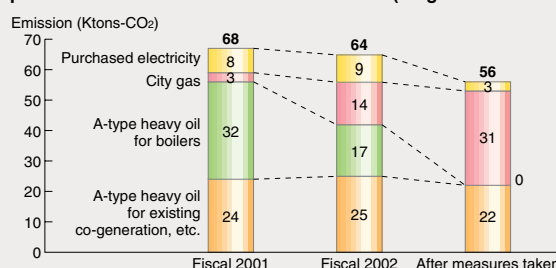
### ●Shift of boiler fuel from heavy oil to city gas

To comply with the production increase due to the production transfer from Sakai Plant, and so forth, Shiga-Minakuchi Plant increased its boiler capacity. Formerly we used A-type heavy oil for our boilers at Shiga-Minakuchi Plant, but we modified the boilers to shift the fuel to city gas, which emits much less carbon dioxide. The modified boilers started operation in December 2002, and marked the reduction of carbon dioxide emission by 3,500 tons during the first 4 months compared to the same period in the previous year.

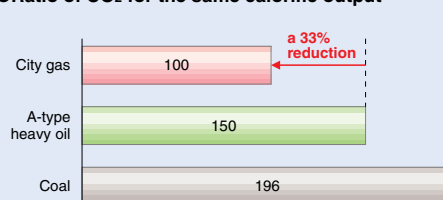
### ●Introduction of co-generation system

We introduced a city gas fueled co-generation system to comply with the increase of production at Shiga-Minakuchi Plant. It has been in operation since May 2003.

### ●Expected reduction of carbon dioxide emission(Shiga-Minakuchi Plant)



### ●Ratio of CO<sub>2</sub> for the same calorific output



## Environment-friendly Products

### "Chemistry for Your Win"

Our technologies for minimal environmental impact provide our customers with products that give them a competitive-edge while supporting them in their environment-friendly performance.

#### ■Our Customers Win with our Support

The slogan of High Performance Plastics Company is "Chemistry for Your Win", which means that, by making best use of our eminent technologies accumulated over many years, we support our customers to win against their competitors. We are confident that all of our technologies will provide a "Win" for all our customers.

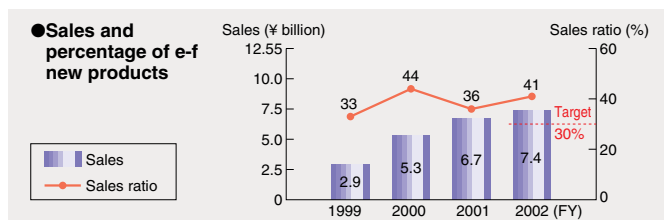
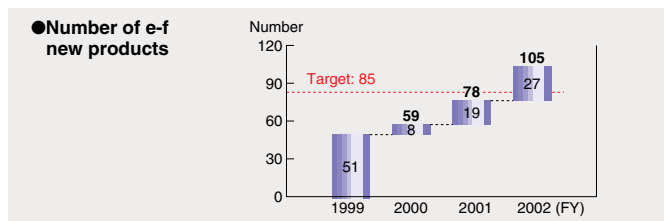
We provide a new package of highly effective function technology for material surfaces, precision synthesis technology, nano-technology, photochemical reaction technology and control technology of adhesion strength, effectively utilizing our fundamental technologies of material, production, and assessment. In this way we are supporting our customers in their win and being their partner in their achievement of environment-friendliness.

#### ■Development of Environment-friendly New Products

In the development of new products, our company conducts DR (design review) at each stage of survey and planning, development, trial mass production and commencement of full scale production. In addition to the assessment of the functionality, performance, and economic features of the products, we also conduct environmental assessment based on our corporate criteria, "Product Assessment of Environmental Impacts", to confirm the level of pollutant emission, environment-friendliness and safety in production and in use.

#### ■Results of Development of Environment-friendly New Products

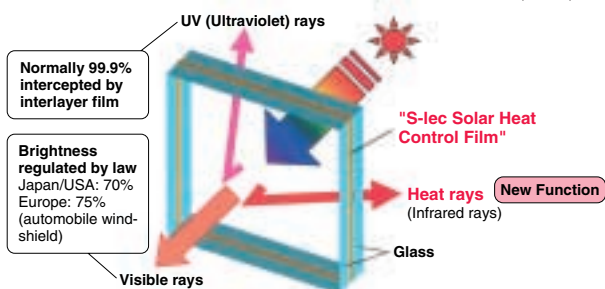
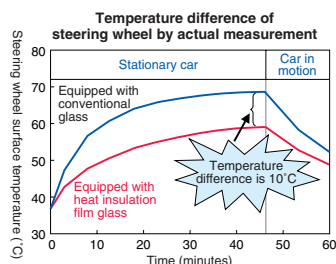
We have successfully developed and put on the market environment-friendly new products, resulting in 27 new items put on the market in fiscal 2002, making the accumulative total of 105 items since 1999. Our sales amount reached ¥7.4 billion and the sales ratio of environment-friendly products 41%, which are better than the targets laid out in the middle term plan.



### Introduction of Environment-friendly Products

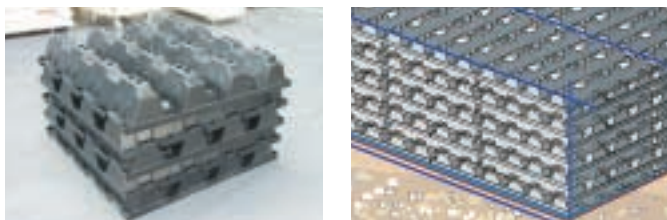
#### ●"S-lec Solar Heat Control Film" (Heat insulation interlayer film)

We have developed a PVB interlayer film with heat insulation properties by uniformly dispersing a heat ray shielding agent in it. The use of this laminated glass in cars will alleviate extreme heat accumulation resulting in decreased usage of coolers.



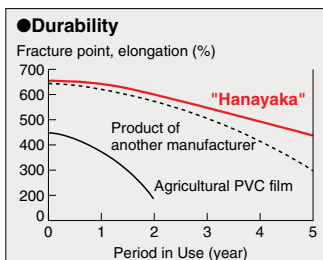
#### ●"Cross-Wave" (Underground rainwater storage system)

This is a storage system for rainwater collected underground, for example under a parking lot, under a road in a facility, under a school playground, etc. The special feature of this system is the structure which can bear the load of vehicles passing overhead.



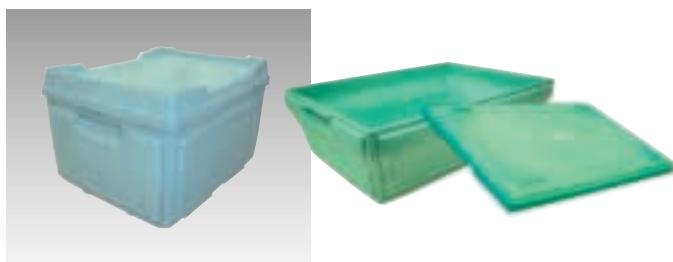
#### ●"Vegitalon Hanayaka"

This agricultural film which forms the roofs and walls of green houses has excellent properties in its durability, heat insulation, easiness of water drops to drain, and dust-proofing, owing to a special surface coating on polyolefin base film. Its long life contributes to a more effective use of resources.



#### ●"Sekisui-e-Container" (Returnable heat insulated containers)

This product is light-weight and has excellent heat insulation properties with a hard outer surface and an inner insulation layer, which are formed in one process by our new technology. As the outer surface and the inner layer are made of the same polypropylene material, it is easily recyclable. Being durable and washable, "Sekisui-e-Containers", are suitable for repeated use, unlike conventional foamed polystyrene containers.



## ■Countermeasures against Sick House Syndrome with Adhesives

### ●Amendment to Building Standard Law

The phenomena where indoor air conditions can cause health disorders to the residents has become a primary cause of great concern. The amended Building Standard Law that was enforced in July 2003 regulates the level of formaldehyde in building materials and prohibits the use of chlorpyrifos.



●Sekisui Bond and Sekisui Sealant for house interior use  
Environment-friendly products harmless to health recommended by Sekisui

### ●Countermeasures by Sekisui Chemical Group

Prior to the amendment of the Building Standard Law we have been supplying adhesives that already met the requirements in that they do not contain any of the 13 kinds of volatile organic compounds specified in "Guidelines for Indoor Air Concentration of Chemical Substances", established by the Japanese Ministry of Health, Labour and Welfare.

### ●Labeling corresponding to the amended Building Standard Law

According to the amendment of the law, building materials for indoor finishing are classified into four groups based on their emission level of formaldehyde: one that the emission of which is so high that it is prohibited for house interior application, two that are limited in application space, and one that has minimum emission so can be used with no limit.

Adhesives are used for a variety of applications both in the production of interior building materials and at construction sites. According to the star ranking system of JIS\* and JAIA\*\*, we clearly mark our adhesives which have minimum emission with four stars so that they are easily distinguishable as adhesives recognized by the Building Standard Law. We market them as the adhesives most suited to achieving compliance with JIS.

[Examples of Labels]

F★★★★JIS K 6804/ JIS A 5583

Sekisui Woodworking Bond for house interior use

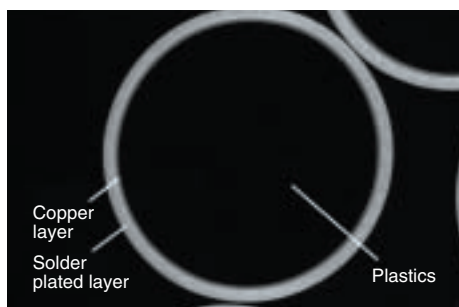
JAIA F☆☆☆☆(Registration No. 001204)

Sekisui Interior Bond, Elastic Adhesive, for house interior use

\* JIS: Japanese Industrial Standards \*\* JAIA: Japan Adhesive Industry Association

### ●"Micropearl SOL"

These are spherical fine particles of plastics plated with solder, which are used as parts to mount IC chips on substrates. They have the excellent property of stress relaxation, containing uniform plastic cores. We have solved the problems related to conventional solder balls that were apt to crack or have irregular spacing, and so forth. The use of such conventional solder balls can now be abolished. We also supply a lead-free type in response to customers' environmental considerations.



### ●Sealing Tape for Cans, "No. 458H" (Polyolefin Type)

This is a damp-proof tape to seal cans. Special materials in the polyolefin group are used for the tape base.



### ●Cloth Tape, "No. 600R"

This tape uses 100% recycled PET fibers for its warp and weft and is impervious to water. It can be used for a wide range of packaging from lightweight to heavyweight articles. (The item complies with the Law on Promoting Green Purchasing)



### ●"Ecora Pack Kraft Tape, No. 501"

These tapes are composed of 40% recycled paper, and bear the Eco-mark.



### ●"Ecora Pack Recycle Kraft Tape, No. 500 RC"

These tapes are no longer laminated with polyethylene on the surface and water-soluble adhesives are used, therefore used cartons can be recycled with these tapes adhered to them. These tapes are labeled with the Eco-mark.





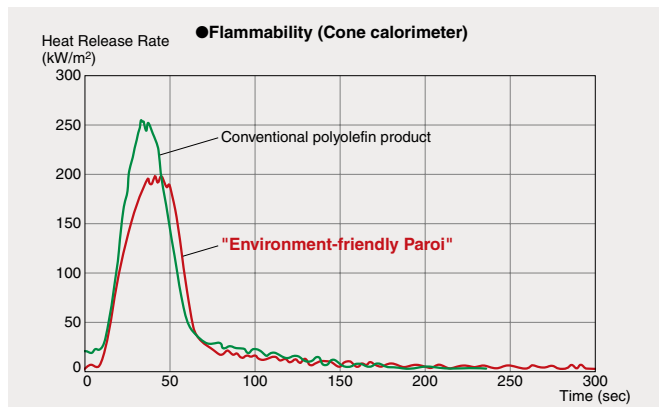
**■Acquisition of Non-flammability Certification for "Environment-friendly Paroi"**

"Paroi", an interior decorative sheet, has been widely used for building interior applications owing to its decorative features and easiness of installation.

In recent years we received strong requests for polyolefin based decorative sheets from users and contractors. Ahead of all other companies in the industry, we developed and put on the market "Environment-friendly Paroi" which has the non-flammable certification, but does not use the flame retardant agents of the halogen or the phosphorus families, by combining a special polyolefin based material and our advanced forming technology. Non-flammability can be attained by laminating this product on an incombustible base material at a site.

**◆Special features**

- "Environment-friendly Paroi" received the Non-flammability Certification No. NM-0403 from the Japanese Ministry of Land, Infrastructure and Transport.
- Our leading technology enabled us to produce a polyolefin based material without halogen/phosphorus flame retardant agents.
- "Non-flammability" can be attained by laminating this product on any type of incombustible base material at a site.
- This product does not contain such flame retardant agents as chlorine, bromine, or phosphorus, nor plasticizers, nor formaldehyde.
- As this product is made from polyolefin based material, it does not become soft and stretchy in hot weather nor hard and brittle in cold weather.



**●"Eco-Palette Haru-Color, Environment-friendly Type"**

This is a marking film for signs and decorative purposes, utilizing special polyolefin group materials.



**●"Eco-Palette Tack-Paint"**

This is a marking film for outdoor use, made of polyolefin resin, a unique material we developed to meet the demand of the market.



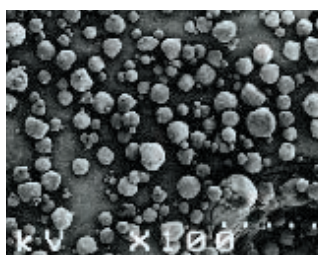
**●"CS Film"**

"CS Film" (clear soft film) is a multi-layer film made of special polyolefin, having the excellent features of gloss, clearness, softness, flexibility and comfort to the touch. It is little affected by changes in temperature and moisture, and is easy to fabricate. (The picture shows an apron made of this film).

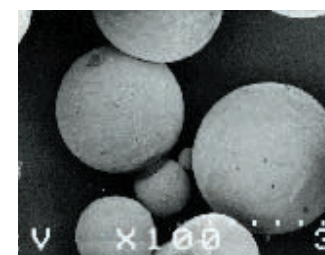


**●"Advancel" (foamed particles used for environment-friendly wallpaper)**

Making use of our multiple-layer technology for fine particles, we developed fine particles that can be foamed. These fine particles are used as a foaming agent for polyolefin type wallpapers. These can also be applied to lighten a variety of materials and parts.



▲Before foaming



▲After foaming



## Recycling of Resources in Cooperation with our Customers

**We established a system for resource recycling in cooperation with our customers, making best use of our sandwich injection molding technology.**

● **Answering the need for the recycling of plastic containers**

In the course of increasing concern over environmental problems, we are expected to maximize the utilization of resources by reducing waste generation and to promote material recycling.

Customers to whom we supply plastic containers use them repeatedly for carrying raw materials to their plants or for shipping their products from their plants. When no longer usable these containers were previously disposed of as industrial waste.

● **The sandwich injection molding technology that enables resource recycling.**

Our company has been engaged in the development of sandwich injection molding technology whereby recycled material forms a core and new material covers this core. In ordinary injection molding, we charge plastic raw material of several millimeters in diameter into an injection molding machine, where the raw material is molten and injected into a mold to shape a final product.

In sandwich molding, we charge recycled material and new material into the machine so that the recycled mate-

rial forms the core and new material covers the entire surface of the core, making three layers.

By this technology we have established a resource recycling system to collect used containers from customers and to recycle them to produce new containers for their use again.

The features of our sandwich injection molding technology are:

- Collected products are broken into small pieces, which are used without processing,
- Color difference between recycled material and surface material is not a problem,
- The appearance and strength of recycled containers are equivalent to conventional containers. Surface labeling and card rack attachment can be done in the same manner as with conventional ones.

By this technology it has become possible for us to recycle the products that customers use for their further use. We will continue our efforts to contribute to the structuring of a recycling-based society hand in hand with our customers.



## Measurement Results of Items Regulated by Laws (Air and Water Quality)

We disclose the status of our observance of the laws and regulations on air and water quality at each plant. At three plants we found excesses over the limits but appropriate countermeasures were immediately taken and the limits are being maintained.

- ① Due to limited space, only the representative items are listed. There is no excess over the regulated values in items that are not listed here.  
 ② The mark "—" shows that there is no regulated value or there is no such facility. The value in ( ) shows that there is no regulated value but we autonomously took measurements for our control.

Items	Unit	Development Center /Tsukuba R&D Site		Kitanihon Sekisui Industry Co., Ltd.		Higashinihon Sekisui Industry Co., Ltd.		Kanto Sekisui Industry Co., Ltd.		Tokyo Sekisui Industry Co., Ltd.		Chubu Sekisui Industry Co., Ltd.		Kansai Sekisui Industry Co., Ltd.				
		Reg. V.	Msd.V.	Reg. V.	Msd.V.	Reg. V.	Msd.V.	Reg. V.	Msd.V.	Reg. V.	Msd.V.	Reg. V.	Msd.V.	Reg. V.	Msd.V.			
Emitted Gases	Boiler, etc.	SOx (Sulfur Oxides)	K value	—	—	—	—	—	—	—	—	2.34	0.108	—	—			
			Nm <sup>3</sup> /hr	—	—	0.8	0.12	0.65	0.1	5.2	0.022	1.362	0.037	—	—			
		NOx (Nitrogen Oxides)	ppm	180	68	180	49	180	88	180	130	230	110	260	83	—	—	
		Soot and dust	g/Nm <sup>3</sup>	0.3	<0.005	0.3	<0.01	0.3	0.025	0.3	0.02	0.35	0.013	0.15	0.012	—	—	
	Incinerator	SOx (Sulfur Oxides)	K value	—	—	—	—	—	—	—	—	—	2.34	0.14	—	—		
			Nm <sup>3</sup> /hr	—	—	—	—	—	—	—	—	7.992	0.168	—	—	9.81		
		NOx (Nitrogen Oxides)	ppm	—	—	—	—	—	—	—	—	250	250	250	76	(250)		
			Soot and dust	g/Nm <sup>3</sup>	—	—	—	—	—	—	—	0.5	0.15	0.25	0.14	0.25		
			HCl (Hydrogen Chloride)	mg/Nm <sup>3</sup>	—	—	—	—	—	—	—	700	410	100	67	700		
			Dioxins (*1)	ng-TEQ/Nm <sup>3</sup>	—	—	—	—	—	—	—	80	0.56	80	13	80		
																(*)3		
Drained Water Quality	Public Water Area	pH (Hydrogen Ion)	—	5.8-8.6	6.8-7.5	—	—	5.8-8.6	7.0	5.8-8.6	7.0	5.8-8.6	6.8-7.1	6.0-8.5	7.2	5.6-8.6	10.3 (*4)	
		BOD (Biochemical Oxygen Demand)	mg/ℓ	10	6.7	—	—	20	5.8	20	1	150	3.8	10	3.1	70	117 (*4)	
		COD (Chemical Oxygen Demand)	mg/ℓ	10	12	—	—	—	—	20	7	160	13	10	5.8	(160)	83.8	
		SS (Suspended Substance)	mg/ℓ	15	82 (*2)	—	—	25	18	30	3	180	46	10	2	100	45	
		n-Hexane extract	Mineral oil	mg/ℓ	3	<0.1	—	—	—	—	—	—	—	—	—	—	—	—
			Animal & vegetable oil	mg/ℓ	—	—	—	—	—	—	10	5	—	—	1	0.5	5	1.9
			Nitrogen content	mg/ℓ	—	—	—	—	—	—	—	—	—	—	120	1.2	—	—
			Phosphorus content	mg/ℓ	—	—	—	—	—	—	—	—	—	—	16	0.01	—	—
			Coliform group number	Pcs./cm <sup>3</sup>	—	—	—	—	—	—	—	—	—	—	1,500	30	—	—
			Dioxins (*1)	pg-TEQ/ℓ	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Sewerage	pH (Hydrogen Ion)	—	5.0-9.0	8.3	(5.2-8.8)	8.2	—	—	—	—	5.0-9.0	6.7-8.3	—	—	5.0-9.0	— (*5)	
		BOD (Biochemical Oxygen Demand)	mg/ℓ	600	50	(540)	11	—	—	—	—	600	330	—	—	1,500	323.3	
		SS (Suspended Substance)	mg/ℓ	600	35	(540)	10	—	—	—	—	600	305	—	—	1,500	75.6	
		n-Hexane extract	Mineral oil	mg/ℓ	5	<1.0	(4.5)	0.5	—	—	—	—	5	1	—	—	5	— (*5)
			Animal & vegetable oil	mg/ℓ	30	2.7	—	—	—	—	—	—	30	20	—	—	—	—
			Nitrogen content	mg/ℓ	—	—	—	—	—	—	—	—	—	—	—	—	240	— (*5)
	Phosphorus content	mg/ℓ	—	—	—	—	—	—	—	—	—	—	—	—	32	— (*5)		

Notes \*1: The regulated values have become severer since December 2002, therefore those plants that ceased to use relevant substances before the amendment state the old values in the table, and those Prefectural Office agreed to our proposal to clean the pit immediately and verify the effect. The water quality at the final discharge maintains the limit. \*3: No measurement was made in fiscal 2002, as we had stopped using it and pH and BOD are maintained at 7.6 and 2.7 respectively. \*5: Nara City conducts the water quality tests, but did not test in fiscal 2002. \*6: This was caused by waste water from steaming

Items	Unit	Toto Sekisui Co., Ltd., Ota Plant		Okayama Sekisui Industry Co., Ltd.		Shikoku Sekisui Industry Co., Ltd.		Kyushu Sekisui Industry Co., Ltd.		Ryuseki Jubi Industry Co., Ltd. / Sekisui Life-Tec Co., Ltd.		Amagasaki Plant		Musashi Plant				
		Reg. V.	Msd.V.	Reg. V.	Msd.V.	Reg. V.	Msd.V.	Reg. V.	Msd.V.	Reg. V.	Msd.V.	Reg. V.	Msd.V.	Reg. V.	Msd.V.			
Emitted Gases	Boiler, etc.	SOx (Sulfur Oxides)	K value	—	—	—	—	3.5	0.37	—	—	—	—	—	—			
			Nm <sup>3</sup> /hr	—	—	2.2	0.13	—	—	—	—	17.5	0.18	—	—			
		NOx (Nitrogen Oxides)	ppm	—	—	180	67	180	65	—	—	—	—	15.95t/Y	7.1t/Y	70	55	
		Soot and dust	g/Nm <sup>3</sup>	—	—	0.3	0.019	0.3	<0.01	—	—	—	—	0.1	<0.002	0.05	0.001	
	Incinerator	SOx (Sulfur Oxides)	K value	—	—	—	—	—	—	—	—	—	—	—	—	—		
			Nm <sup>3</sup> /hr	—	—	—	—	—	—	—	—	—	—	—	—	—		
		NOx (Nitrogen Oxides)	ppm	—	—	—	—	—	—	—	—	—	—	—	—	—		
			Soot and dust	g/Nm <sup>3</sup>	—	—	—	—	—	—	—	—	—	—	—	—		
			HCl (Hydrogen Chloride)	mg/Nm <sup>3</sup>	—	—	—	—	—	—	—	—	—	—	—	—		
			Dioxins (*1)	ng-TEQ/Nm <sup>3</sup>	—	—	—	—	—	—	—	—	—	—	—	—		
Drained Water Quality	Public Water Area	pH (Hydrogen Ion)	—	(5.8-8.6)	4.9 (*7)	5.8-8.6	8.8 (*8)	5.8-8.6	6.8-7.1	5.8-8.6	7.8	—	—	—	—	6.5-8.5	7.9-7.5	
		BOD (Biochemical Oxygen Demand)	mg/ℓ	(25)	620 (*7)	60	14	160	10	120	1.6	—	—	—	—	—	5ppm	2.1
		COD (Chemical Oxygen Demand)	mg/ℓ	(25)	380 (*7)	60	20	160	12	—	—	—	—	—	—	—	—	
		SS (Suspended Substance)	mg/ℓ	(50)	41	90	10	200	2.4	150	4.0	—	—	—	—	50ppm	<10	
		n-Hexane extract	Mineral oil	mg/ℓ	(5)	1	5	0.5	5	<0.4	(4)	Not Detected	—	—	—	—	Not Detected	Not Detected
			Animal & vegetable oil	mg/ℓ	—	—	—	—	—	—	—	—	—	—	—	—	—	—
			Nitrogen content	mg/ℓ	—	—	120	58	120	5.1	(60)	0.76	—	—	—	—	18ppm	1.5
			Phosphorus content	mg/ℓ	—	—	16	5.3	16	0.1	(8)	1.16	—	—	—	—	1.5ppm	0.76
			Coliform group number	Pcs./cm <sup>3</sup>	(3,000)	2100	—	—	—	—	(2,400)	19	—	—	—	—	—	—
			Dioxins (*1)	pg-TEQ/ℓ	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sewerage	pH (Hydrogen Ion)	—	(5.8-8.6)	8.0	5.8-8.6	5.8	—	—	—	—	—	—	(5.7-8.7)	7.7	5.0-9.0	8.6		
	BOD (Biochemical Oxygen Demand)	mg/ℓ	(90)	8.0	20	3.8	—	—	—	—	—	—	(300)	16	600ppm	219		
	SS (Suspended Substance)	mg/ℓ	—	—	—	—	—	—	—	—	—	—	(300)	21	600ppm	70		
	n-Hexane extract	Mineral oil	mg/ℓ	—	—	—	—	—	—	—	—	—	—	(5)	<2	30ppm	<2.5	
		Animal & vegetable oil	mg/ℓ	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
		Nitrogen content	mg/ℓ	—	—	—	—	—	—	—	—	—	—	—	—	120ppm	22	
	Phosphorus content	mg/ℓ	—	—	—	—	—	—	—	—	—	—	—	—	16ppm	2.1		

\*7: At one of four drain holes, it exceeded the autonomous control limit. Although the water drained through this hole is about 1% of the total volume of drained water, we will take measures

③ In the case that there are multiple facilities for regulation, the following values are listed.

Emitted gasses: the value in the facility that emitted most in the year. Drained water: the highest measured value. In the case that the regulated values for these facilities are different, the measured values that are closest to the regulated values are listed.

Chugoku Sekisui Industry Co., Ltd.	Nishinon Sekisui Industry Co., Ltd.	Sekisui Board Co., Ltd.						Shiga-Ritto Plant		Gunma Plant		Tokyo Plant		Kyoto R&D Laboratories		Vantec Co., Ltd. Chiba Plant		Sekisui Chemical Hokkaido Co., Ltd.	
		Reg. V.	Msd.V.	Reg. V.	Msd.V.	Reg. V.	Msd.V.	Reg. V.	Msd.V.	Reg. V.	Msd.V.	Reg. V.	Msd.V.	Reg. V.	Msd.V.	Reg. V.	Msd.V.	Reg. V.	Msd.V.
—	—	—	—	—	—	—	—	8.76	<0.1	—	—	—	—	—	—	—	—	—	—
1.09	0.028	—	—	—	—	2.23	0.136	—	—	—	—	—	—	—	—	—	—	2.8	0.12
150	57	—	—	150	60.5	175	150	150	37.7	—	—	—	—	1,000	162	—	—	250	59
0.25	0.04	—	—	0.1	<0.01	0.15	0.007	0.1	<0.02	—	—	—	—	0.05	Not Detected	—	—	0.3	0.01
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5.8-8.6	7.4	—	—	—	—	6.5-8.5	7.9	6.0-8.5	6.6-7.2	6.5-8.5	7.1	—	—	—	—	5.8-8.6	8.3	(6.4-7.7)	7.3
60	4.3	—	—	—	—	10	9	15	7.1	10	<1	—	—	—	—	10	1.8	(144)	11
—	—	—	—	—	—	—	—	15	2.9	—	7	—	—	—	—	10	3.3	(144)	30
90	6	—	—	—	—	10	8	20	3.7	10	2	—	—	—	—	20	5.8	(180)	8.8
5	Not Detected	—	—	—	—	3	<2	3	0.7	3	<1	—	—	—	—	2	Not Detected	(4.5)	0
—	—	—	—	—	—	—	—	8	2.6	—	—	—	—	—	—	120	0.2	—	—
—	—	—	—	—	—	—	—	0.5	<0.1	—	—	—	—	—	—	16	0.11	—	—
—	—	—	—	—	—	—	—	—	—	—	<10	—	—	—	—	3,000	Not Detected	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	5.0-9.0	7.4	5.0-9.0	7.5	—	—	5.0-9.0	6.0-8.7	—	—	(5.5-8.8)	5.0 (*6)	5.0-9.0	7.1-8.4	—	—	—	—
—	—	600	104	600	280	—	—	600	180	—	—	(600)	474	—	—	—	—	—	—
—	—	600	34	600	370	—	—	600	160	—	—	(600)	183	3,000	<5	—	—	—	—
—	—	30	4	5	1.4	—	—	5	1.6	—	—	(4)	<2.5	5	0.8	—	—	—	—
—	—	—	—	30	5	—	—	30	16	—	—	(25)	56 (*6)	30	17	—	—	—	—
—	—	—	—	60	9	—	—	60	24	—	—	—	—	—	—	—	—	—	—
—	—	—	—	10	1.0	—	—	10	5.9	—	—	—	—	—	—	—	—	—	—

still using them state the amended values. \*2: This is the datum taken in a rainwater pit connected to a permeation pit. Impurities accumulated in the rainwater pit were considered to be its cause. The Ibaraki stopped its use before our periodical measurement. The results of measurement in fiscal 2001 are stated in our Environmental Report 2002. \*4: Our use of alkali detergent was the cause. We immediately meat in the kitchen. After the manual was amended to more rigidly separating oil from waste water, pH has been kept at 7.3-7.8, and n-Hexane extract at less than 9.3. (Autonomous control item)

Shiga-Minakuchi Plant	Minase Research Laboratories	Sekisui Technol Molding East Japan						Sekisui Film Co., Ltd.						Sekisui Film Kyushu Co., Ltd.		Tokuyama Sekisui Industry Co., Ltd.			
		Reg. V.	Msd.V.	Reg. V.	Msd.V.	Reg. V.	Msd.V.	Reg. V.	Msd.V.	Reg. V.	Msd.V.	Reg. V.	Msd.V.	Reg. V.	Msd.V.	Reg. V.	Msd.V.		
—	—	1.75	0.01	—	—	—	—	17.5	2.2	1.75	0.15	—	—	—	—	—	—	—	—
28	0.28	—	—	—	—	—	—	—	—	—	—	2.8	0.17	—	—	—	—	—	—
950	939	180	33	—	—	—	—	—	—	180	52	250	120	—	—	—	—	—	—
0.1	0.012	0.3	0.003	—	—	—	—	—	—	0.3	0.008	0.3	0.013	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10	0.58	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10	1.3
6.0-8.5	7.8	5.8-8.6	7.9	(6.0-8.5)	7.6	(5.8-8.6)	8.0	5.8-8.6	8.1	5.8-8.6	7.5	5.8-8.6	6.5-8.4	—	—	5.8-8.6	7.3-8.0	5.8-8.6	7.4
20	3.3	65	31	(8)	0.6	(160)	31	20	1.2	15	5.5	160	3	—	—	160	1.9	—	—
20	6.5	65	4.9	—	—	(160)	16.2	—	—	15	4.6	—	—	—	—	160	1.3	135.3kg/D	8.5
70	4.1	110	<5	(50)	<1	(200)	19.4	25	0.9	15	2.0	200	4.7	—	—	200	0.6	10	2.9
5	<0.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20	<0.5	20	1.4	—	—	(5)	<0.5	—	—	—	—	5	1	—	—	5	<0.5	—	—
8	1.4	60	2.1	—	—	—	—	—	—	—	—	—	—	—	—	30	3.8	25.2kg/D	1.0
1	0.1	4	0.07	—	—	—	—	—	—	—	—	—	—	—	—	16	0.22	0.4	0.24
—	—	—	—	—	—	—	—	—	—	1500	30	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10	0.55	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5.0-9.0	7.3	9.0-5.0	7.8	—	—	—	—	5.7-8.7	8.5	—	—	—	—	5.0-9.0	7.7-8.1	—	—	—	—
600	93.7	600	<1	—	—	—	—	300	66	—	—	—	—	600	30	—	—	—	—
600	150	600	<5	—	—	—	—	300	48	—	—	—	—	600	15	—	—	—	—
5.0	<0.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
30	2.9	30	<0.5	—	—	—	—	5	0.6	—	—	—	—	5	0.5	—	—	—	—
(60)	13.5	240	1.1	—	—	—	—	30	5.7	—	—	—	—	60	8.7	—	—	—	—
(10)	0.9	32	0.1	—	—	—	—	—	—	—	—	—	—	10	0.46	—	—	—	—

for the permanent solution to this problem. (Autonomous control item) \*8: This is caused by drained water (alkali) from boilers. By pH adjustment of boiler water, it has been kept at 7.0-8.0.

## Release and Transfer Data of Pollutants at Each Workplace

The results of workplaces handling more than one ton of Class 1 Chemicals as designated by the Japanese PRTR Law (more than 0.5 ton of the Specified Class 1 Chemicals).

Unit: kg (dioxins mg-TEQ)

	Workplace	Specification No.	Chemicals	Used Volume (Produced volume)	Release				Transfer			Innocuous treatment	
					To atmosphere	To water	To soil	Landfill	Sewerage	As waste			
										Disposal	Recycling		
Housing Company	Higashinohon Sekisui Industry Co., Ltd.	63	Xylene	1,256	1,256	0	0	0	0	0	0	0	
	Tokyo Sekisui Industry Co., Ltd.	30	Bisphenol A type epoxy Resin (liquid)	3,456	0	0	0	0	0	0	0	0	
		179	Dioxins (unit:mg-TEQ)	—	40	0	0	0	0	0	0.51	0	
	Chubu Sekisui Industry Co., Ltd.	63	Xylene	1,972	1,952	0	0	0	0	0	0	0	
		227	Toluene	2,423	2,399	0	0	0	0	0	0	0	
	Kansai Sekisui Industry Co., Ltd.	179	Dioxins (unit:mg-TEQ)	—	476	0	0	0	0	0	0	274	0
		270	Di-n-butyl phthalate	1,400	140	0	0	0	0	0	0	0	0
	Nishinohon Sekisui Industry Co., Ltd.	179	Dioxins (unit:mg-TEQ)	—	12	0	0	0	0	0	0	0.015	0
		227	Toluene	3,419	3,419	0	0	0	0	0	0	0	0
	Sekisui Board Co., Ltd.	Gunma Plant	30	Bisphenol A type epoxy Resin (liquid)	101,490	0	0	0	0	0	0	0	0
30			Bisphenol A type epoxy Resin (liquid)	30,800	0	0	0	0	0	0	0	0	
Minakuchi Plant		43	Ethylene glycol	3,000	0	0	0	0	0	0	0	0	
Urban Infrastructure & Environmental Products Company	Shiga-Ritto Plant	63	Xylene	28,688	23,438	0	0	0	0	0	5,250	0	
		100	Cobalt compounds	1,583	0	0	0	0	0	0	0	0	
		145	Dichloromethane	38,692	37,092	0	0	0	0	0	1,600	0	
		176	Organic tin compounds	13,700	0	0	0	0	0	0	68	0	
		177	Styrene monomer	1,605,000	43,000	0	0	0	0	0	0	0	
		227	Toluene	88,578	88,578	0	0	0	0	0	0	0	
		230	Lead compounds	178,770	0	0	0	0	0	0	870	0	
	Gunma Plant	272	Bis (2-ethylhexyl) phthalate	3,810	0	0	0	0	0	0	1,905	0	
		176	Organic tin compounds	13,100	0	0.6	0	0	0	0	217.5	0	
	Tokyo Plant	230	Lead compounds	95,100	0	2.4	0	0	0	0	551	0	
		63	Xylene	2,730	273	0	0	0	0	0	0	0	
	Chiba Plant, Vantec Co., Ltd.	132	HCFC-141b	7,080	1,060	0	0	0	0	0	100	0	
		176	Organic tin compounds	25,130	0	0	0	0	0	0	190	0	
		227	Toluene	3,350	340	0	0	0	0	0	0	0	
		230	Lead compounds	166,000	0.4	0	0	0	0.1	0	450	0	
	Sekisui Chemical Hokkaido Co., Ltd.	176	Organic tin compounds	2,500	0	0	0	0	0	0	0.62	0	
		177	Styrene monomer	36,000	346	0	0	0	0	0	1215	0	
	Ota Plant, Toto Sekisui Co., Ltd.	230	Lead compounds	84,000	0	3.3	0	0	0	2.3	297	0	
		177	Styrene monomer	1,992	358	0	0	0	0	0	1.0	0	
	Okayama Sekisui Industry Co., Ltd.	230	Lead compounds	86,525	0	0.3	0	0	0	0	81	0	
		145	Dichloromethane	5,812	5,812	0	0	0	0	0	0	0	
	Kyushu Sekisui Industry Co., Ltd.	230	Lead compounds	100,800	0	0	0	0	0	504	0	0	
		63	Xylene	15,714	15,714	0	0	0	0	0	0	0	
		177	Styrene monomer	472,400	18,896	0	0	0	0	0	0	0	
		205	Terephthalic acid	75,000	0	0	0	0	0	0	0	0	
	Ryuseki Jubi Industry Co., Ltd.	227	Toluene	20,304	20,304	0	0	0	0	0	0	0	
		242	Nonylphenol	1,900	0	0	0	0	0	0	0	0	
176		Organic tin compounds	5,200	0	0	0	0	0	0	69	0		
Ryuseki Jubi Industry Co., Ltd.	177	Styrene monomer	164,700	652	0	0	0	0	0	0	0		
	230	Lead compounds	42,500	0	3.5	0	0	0	0	253	0		
Ryuseki Jubi Industry Co., Ltd.	177	Styrene monomer	363,500	7,270	0	0	0	0	0	0	0		

### ●Differences in data between our Environmental Report 2002 and our Environmental Report 2003

In our Environmental Report 2002 (the results of fiscal 2001), the number of object plants was 29 and the object substances were 119 (cum. total) but in this report of the fiscal 2002 results the object plants decreased to 24 and the object substances to 83. Main reasons are mentioned below.

#### 1) Decrease of object plants

- Plants that ceased their production by the end of fiscal 2001: Sakai Plant, Fujieda Plant of Sekisui Technol Molding East Japan Co., Ltd.

- Removed from object plants due to abolition of incinerators and decreased usage of object substances: Kanto Sekisui Industry Co., Ltd., Chugoku Sekisui Industry Co., Ltd., Shinshu-Takato Plant of Sekisui Film Co., Ltd.

#### 2) Decrease of object substances

- Closure of the two plants: 14 substances
- Object substances we have stopped handling or of which we have decreased usage: Decrease of 19 substances (cum. total)



Unit: kg (dioxins mg-TEQ)

	Workplace	Specifi- cation No.	Chemicals	Used Volume (Produced volume)	Release				Transfer		Innocuous treatment		
					To atmosphere	To water	To soil	Landfill	Sewerage	As waste			
										Disposal		Recycling	
Urban Infrastructure & Environmental Products Company	Shikoku Sekisui Industry Co., Ltd.	9	Bis (2-ethylhexyl) adipate	6,650	0	0	0	0	0	0	6.7	0	
		84	HCFC-142b	6,825	6,825	0	0	0	0	0	0	0	0
		85	HCFC-22	3,675	3,675	0	0	0	0	0	0	0	0
		177	Styrene monomer	17,280	17	0	0	0	0	0	0	0	0
		230	Lead compounds	9,178	0	0	0	0	0	0	0	26	0
		272	Bis (2-ethylhexyl) phthalate	44,600	0	0	0	0	0	0	0	45	0
		314	Methacrylic acid monomer	20,200	0	0	0	0	0	0	0	0	0
		320	Methyl methacrylate monomer	51,920	0	0	0	0	0	0	0	0	0
	Amagasaki Plant	63	Xylene	45,000	0	0	0	0	0	0	6,000	39,000	0
		236	Nitroglycerin	1,060	0	0	0	0	0	0	367	0	0
		227	Toluene	499,000	3,300	0	0	0	0	0	18,700	477,000	0
	Musashi Plant	3	Acrylic Acid monomer	13,900	0	0	0	0	0	0	1,390	0	0
		25	Antimony compound	23,300	0	0	0	0	0	0	2,800	0	0
		84	HCFC-142b	80,000	80,000	0	0	0	0	0	0	0	0
		85	HCFC-22	42,000	42,000	0	0	0	0	0	0	0	0
		86	HCFC-124	3,000	3,000	0	0	0	0	0	0	0	0
		197	Decabromodiphenyl ether	62,600	0	0	0	0	0	0	7,600	0	0
		227	Toluene	410,300	336,400	0	0	0	0	0	73,900	0	0
	Shiga-Minakuchi Plant	3	Acrylic Acid monomer	3,100	0	0	0	0	0	0	0	0	0
		11	Acetaldehyde	264,000	190	0	0	0	0	0	0	79,000	0
		30	Bisphenol A type epoxy Resin (liquid)	188,200	0	0	0	0	0	0	0	0	0
		45	Ethylene glycol monomethyl ether	6,400	2.0	5.0	0	0	0	0	580	0	0
		63	Xylene	38,700	3.0	0	0	0	0	0	2.0	0	0
		145	Dichloromethane	642,100	7,100	0	0	0	0	0	1,000	0	0
		172	N,N-dimethylformamide	3,000	0	0	0	0	0	0	0	0	0
		177	Styrene monomer	1,879,000	1,200	140	0	0	0	0	0	0	0
		227	Toluene	1,204,900	2,000	190	0	0	0	0	1,000	10,300	0
		310	Formaldehyde	8,900	0	0	0	0	0	0	0	0	0
320		Methyl methacrylate monomer	163,600	0	0	0	0	0	0	0	0	0	
179	Dioxins (unit:mg-TEQ)	—	66	4.0	0	0	0	0	14	0	0		
Sekisui Film Co., Ltd.	Sendai Plant	227	Toluene	7,200	7,200	0	0	0	0	0	0	0	
	Nagoya Plant	227	Toluene	29,400	29,400	0	0	0	0	0	0	0	
Sekisui Film Kyushu Co., Ltd.	227	Toluene	16,600	16,600	0	0	0	0	0	0	0	0	
H.Q.	Tokuyama Sekisui Industry Co., Ltd.	7	Acrylonitrile monomer	5,880	76	0	0	0	0	0	2,264	0	
		77	Vinyl chloride monomer	110,925,000	7,072	675	0	0	0	0	0.14	0	
		177	Styrene monomer	237,000	47	0	0	0	0	0	20	0	
		320	Methyl methacrylate monomer	16,300	158	0	0	0	0	0	155	0	
		321	Methacrylonitrile	4,320	34	0	0	0	0	0	2,689	0	
		179	Dioxins (unit:mg-TEQ)	—	1.5	0	0	0	0	0	0.033	0	

Other object workplaces, not handling the object substances, are not listed above.

●Ratio between used quantity and released quantity

Each plant has a different ratio between its used quantity and released quantity for a same substance, because each plant uses the substance in different ways. For instance;

1) At each plant in our Housing Company and our Urban Infrastructure & Environmental Products Company, toluene and xylene are used as solvents for paints and so forth. As they are vaporized in the drying process, used quantity and released quantity are approximately the same.

2) Shiga-Minakuchi Plant produces adhesives, a component of which is toluene. As it is carried out of the plant in the products, its released quantity is far less than its used quantity. In Amagasaki Plant, it is used as a solvent for the production of adhesive tapes, and most of it receives innocuous treatment at the plant, as it is burnt in a catalytic combustion facility.

## Objects of Environmental Report 2003

Object range: Dates of and target schedule for our acquisition of the ISO 14001 certification and for attainment of zero emission, and our main products

### Objects of Environmental Report 2003

**1. Object period:** The data collection period was from April 1, 2002 through March 31, 2003 (fiscal 2002). However, some activity examples include the activities carried out in the period of STEP-21 (from fiscal 1999 to fiscal 2002), as fiscal 2002 fell in the final year of STEP-21.

**2. Object workplaces:** They are as stated on this page. The object workplaces for submission of environmental performance data are shown in **thick blue letters**. (Names are as of April 1, 2003)

**3. Scope of themes:** We take up mainly our environmental activities, and in addition our activities for occupational health and safety, and our social contribution activities as a part of our responsibilities to society as a whole. We are now considering to extend reportage of our social activities and to take up economic aspects of our activities from next year. We referred to the following publications for compilation of this Report:

- "Environmental Reporting Guidelines" (fiscal year 2000 version) published by the Japanese Ministry of the Environment
- "Sustainability Reporting Guidelines 2002" published by GRI (Global Reporting Initiative)

	Workplace	Corporate Relations <Note 1>		ISO14001 certification	Zero emission attainment	Address	Main Products in FY 2002	
		◎	*					
Housing Company	Tsukuba R&D Site	◎	*	Nov. 2002	FY 2010	32 Wadai, Tsukuba-shi, Ibaraki-ken	—	
	<b>Kitanihon Sekisui Industry Co., Ltd.</b>	○	*	Sept. 1998	Mar. 2001	4-144-1 Higashicho 2-jo, Iwamizawa-shi, Hokkaido	Sekisui Heim, Two-U-Home	
	<b>Higashinihon Sekisui Industry Co., Ltd.</b>	○	*	Aug. 1998	Sept. 2001	55 Aza Dannokoshi, Okumatazawa, Watari-cho Watari-gun, Miyagi-ken		
	<b>Kanto Sekisui Industry Co., Ltd.</b>	○	*	Oct. 1998	Sept. 2001	287 Kitayoshihara, Kasama-shi, Ibaraki-ken	Two-U-Home	
	<b>Tokyo Sekisui Industry Co., Ltd.</b>	○	*	Nov. 1997	Mar. 2001	3535 Oaza Kurohama, Hasuda-shi, Saitama-ken	Sekisui Heim, Exterior walls for Sekisui Heim	
	<b>Chubu Sekisui Industry Co., Ltd.</b>	○	*	June 1998	Mar. 2001	3-22 Akemicho, Toyohashi-shi, Aichi-ken	Sekisui Heim, Two-U-Home	
	<b>Kansai Sekisui Industry Co., Ltd.</b>	○	*	Nov. 1997	Aug. 2001	4-3-1 Nishikujocho, Nara-shi, Nara-ken	Sekisui Heim	
	<b>Chugoku Sekisui Industry Co., Ltd.</b>	<b>Head Office Plant</b>	○	*	Aug. 1998	Sept. 2001	189 Kozujuku, Okayama-shi, Okayama-ken	Sekisui Heim
		<b>Kuban Plant</b>					557-3 Kuban, Okayama-shi, Okayama-ken	Two-U-Home
	<b>Nishinihon Sekisui Industry Co., Ltd.</b>	○	*	June 1998	Mar. 2000	1760 Todorokimachi, Tosu-shi, Saga-ken	Sekisui Heim, Two-U-Home, Exterior walls for Sekisui Heim	
	<b>Sekisui Board Co., Ltd.</b>	<b>Minakuchi Plant</b>	○	*	Mar. 1998	Mar. 2000	1259 Izumi, Minakuchi-cho, Koka-gun, Shiga-ken	Exterior walls for Sekisui Heim / Two-U-Home
		<b>Gunma Plant</b>	○	*	Mar. 1999	Sept. 2001	54 Shimofuchina, Sakaimachi, Sawa-gun, Gunma-ken	
	Date of and target schedule for acquisition of the ISO 14001 certification of house sales subsidiaries (The underlined companies attained zero emission in fiscal 2002.)							
Mar. 1999 ○Sekisui Heim Tokyo Co., Ltd. ○Sekisui Heim Kanagawa Co., Ltd. ○Sekisui Heim Chiba Co., Ltd. ○Sekisui Heim Saitama Co., Ltd.								
Feb. 2001 ○Sekisui Heim Osaka Co., Ltd.								
Mar. 2001 ○Nagoya Sekisui Heim Co., Ltd. ○Mie Sekisui Heim Co., Ltd. ○Sekisui Heim Keiji Co., Ltd. ○Sekisui Heim Hanna Co., Ltd. ○Sekisui Heim Chugoku Co., Ltd. Okayama Branch <Note 2> ○Shikoku Sekisui Heim Co., Ltd. ○Kyuseki Sekisui Heim Co., Ltd. ○Nagasaki Sekisui Heim Co., Ltd.								
Apr. 2001 ○Gunma Sekisui Heim Co., Ltd.								
May 2001 ○Kumamoto Sekisui Heim Co., Ltd.								
July 2001 ○Hokkaido Sekisui Heim Co., Ltd.								
Aug. 2001 ○Kagoshima Sekisui Heim Co., Ltd.								
Oct. 2001 ○Fukushima Sekisui Heim Co., Ltd. ●Ibaraki Sekisui Heim Co., Ltd. ○Gifu Sekisui Heim Co., Ltd. ○Kitakinki Sekisui Heim Co., Ltd. ○Wakayama Sekisui Heim Co., Ltd. ●Sekisui Heim Sanyo Co., Ltd. ○Sekisui Heim Chugoku Co., Ltd. Hiroshima Branch, Sanin Branch <Note 2>								
Nov. 2001 ○Oita Sekisui Heim Co., Ltd.								
Dec. 2001 ○Fukuoka Sekisui Heim Co., Ltd.								
Jan. 2002 ○Sekisui Heim Chugoku Co., Ltd. Yamaguchi Branch <Note 2> ●Kochi Sekisui Heim Co., Ltd.								
Mar. 2002 ○Tohoku Sekisui Heim Co., Ltd. ○Kitanihon Sekisui Heim Co., Ltd. ○Hokuriku Sekisui Heim Co., Ltd. Tokushima Sekisui Heim Co., Ltd.								
Apr. 2002 ○Sekisui Heim Nishitohoku Co., Ltd. ●Tochigi Sekisui Heim Co., Ltd. ●Sekisui Heim Shinetsu Co., Ltd. Kagawa Sekisui Heim Co., Ltd.								
FY 2003 ○Sekisui Heim Yamanashi Co., Ltd.								
Established an independent EMS ●Sekisui Heim Tokai Co., Ltd.								

<Note 1> ◎: Sekisui Chemical Co.'s plants/R&D institutes ○: Consolidated subsidiaries ●: Subsidiaries to which the equity method was applied in consolidation  
\*: Workplaces given internal environmental audits by Headquarters

<Notes 2-5> The business reorganization and so forth brought about the following changes in fiscal 2002 compared with fiscal 2001.

<Note 2> Sekisui Heim Chugoku Co., Ltd. was established in April 2003 by the merger of the following four house sales companies, which have become branches of the new company.  
The ISO 14001 certification has been taken over by the present branches.  
Yamaguchi Sekisui Heim (→Yamaguchi Branch), Hiroshima Sekisui Heim (→Hiroshima Branch), Okayama Sekisui Heim (→Okayama Branch), Sanin Sekisui Heim (→Sanin Branch)

<Note 3> Shikoku Sekisui Industry Co., Ltd. stopped PVC pipe production in December 2002.

<Note 4> To Shiga-Minakuchi Plant the production of sealing material and of plasticizer for interlayer film was transferred from Sakai Plant, following its closure in July 2002.

<Note 5> Nara Plant of Sekisui Technol Molding East Japan Co., Ltd. transferred the production of vehicle parts in July 2002 to the newly built Mie Plant.

## Basis for Selection of Object Workplaces

### 1. Basis for selection

From the viewpoint of the scale of environmental loads on and concern for local communities, mainly plants of Sekisui Chemical Co., Ltd. and its subsidiaries were chosen as object workplaces for our environmental management.

### 2. Object workplaces for summation of environmental performance data in this report

They are such plants as are nominated in our Middle Term Environmental Plan, STEP-21, for improvement of their environmental performance.

### 3. Object workplaces for audit by Headquarters

Mainly plants are the object workplaces but such R&D institutes that should pay attention to environmental loads in their product development activities are also included.

### 4. Object workplaces acquiring ISO 14001 certification

ISO 14001 certification acquisition started at our plants but we have extended it to our R&D institutes due to the necessity of environmental concern in their development work, and also to house sales subsidiaries due to the necessity for environmental attention in their design/construction of houses. Outside Japan, the certification acquisition has been promoted mainly by our overseas plants.

### 5. Object workplaces for zero emission

To promote the recycling of industrial waste, we chose, as object workplaces for zero emission, plants of Sekisui Chemical Co., Ltd. and of our consolidated subsidiaries, and new house construction sites of house sales subsidiaries. However, Nitta Plant and the Fujieda Plant of Sekisui Technol Molding East Japan Co., Ltd. are not included in the object workplaces as they discontinued their production during their zero emission activities.

	Workplace	Corporate Relations <Note 1>	ISO14001 certification	Zero emission attainment	Address	Main Products in FY 2002	
Environmental Products Company	Shiga-Ritto Plant	◎ *	Oct. 1998	Feb. 2002	75 Nojiri, Ritto-shi, Shiga-ken	PVC pipe, LP pipe, synthetic wood, balcony flooring	
	Gunma Plant	◎ *	Mar. 1999	Oct. 2001	54 Shimofuchina, Sakai-machi, Sawa-gun, Gunma-ken	PVC pipe & fittings, PE pipe & fittings	
	Tokyo Plant	◎ *	Oct. 1998	Feb. 2002	3-15-1 Negishidai, Asaka-shi, Saitama-ken	Plastic valves/fittings, pits and manholes, rain gutters	
	Kyoto R&D Laboratories	◎ *	Jan. 2000	FY 2005	2-2 Kamichoshicho, Kamitoba, Minami-ku, Kyoto-shi, Kyoto-fu	—	
	Vantec Co., Ltd. Chiba plant	○ *	Oct. 2000	Feb. 2003	2082 Uruido, Ichihara-shi, Chiba-ken	PVC pipe, containers for clean rooms	
	Sekisui Chemical Hokkaido Co., Ltd.	○ *	Feb. 2000	Feb. 2002	234 Higashicho 2-jo, Iwamizawa-shi, Hokkaido	PVC pipe & fittings, plastic window frames	
	Toto Sekisui Co., Ltd., Ota Plant	○ *	Apr. 2000	Jan. 2003	231 Oaza Kanai, Nitta-cho, Nitta-gun, Gunma-ken	PVC pipe & fittings, PE pipe, balcony flooring, interior parts for housing	
	Okayama Sekisui Industry Co., Ltd.	○ *	Apr. 1999	Mar. 2002	210 Kozujuku, Okayama-shi, Okayama-ken	Bathroom parts, roofing tiles, fire-proof interior housing materials	
	Kyushu Sekisui Industry Co., Ltd.	○ *	Mar. 2000	Mar. 2000	225-1 Oaza Yanagishima, Chiyoda-cho, Kanzaki-gun, Saga-ken	PVC pipe, septic tanks	
	Ryuseki Jubi Industry Co., Ltd.	○ *	Dec. 1998	Mar. 2002	4-1-1 Sanjoohji, Nara-shi, Nara-ken	Bath units	
High Performance Plastics Company	Shikoku Sekisui Industry Co., Ltd. <Note 3>	○ *	June 1999	Mar. 2002	880 Himiotsu, Saijo-shi, Ehime-ken	PVC pipe, flooring material, synthetic wood PE foam	
	Amagasaki Plant	◎ *	Oct. 1997	Mar. 2001	5-8-6 Shioe, Amagasaki-shi, Hyogo-ken	Adhesive tapes, medical tapes, Marking film	
	Musashi Plant	◎ *	July 1997	Mar. 2000	3535 Oaza Kurohama, Hasuda-shi Saitama-ken	Adhesive tapes for industrial and packaging use, PE foam	
	Shiga-Minakuchi Plant <Note 4>	◎ *	Mar. 1998	Mar. 2000	1259 Izumi, Minakuchi-cho, Koka-gun, Shiga-ken	Interlayer film for laminated glass, adhesives, functional resin, fine chemical products, sealing material, plasticizer for interlayer film	
	Minase Research Laboratories	◎ *	Mar. 2000	FY 2005	2-1 Hyakuyama, Shimamoto-cho, Mishima-gun, Osaka-fu	—	
	Sekisui Technol Molding East Japan Co., Ltd.	Oigawa Plant	○ *	Sept. 1999	Sept. 2002	864-1 Hanfuchi, Oigawa-cho, Shida-gun, Shizuoka-ken	Injection molded parts for vehicles
		Nara Plant <Note 5>	○ *	Dec. 2000	Oct. 2002	1135-5 Oaza Kubota, Ando-cho, Ikoma-gun, Nara-ken	Injection molded products: containers for industrial use, vehicle parts
	Sekisui Film Co., Ltd.	Sendai Plant	○ *	Mar. 2001	Sept. 2002	1-1 Aza Tanako, Okumakoya, Watari-cho, Watari-gun, Miyagi-ken	Polyethylene films for agricultural use, heavy-duty packaging and food packaging
		Nagoya Plant	○ *	Dec. 1999	Mar. 2002	2-2 Aza Ichiubara, Ogawa, Higashiura-cho, Chita-gun, Aichi-ken	Laminated products, sanitary film, interior material for vehicles
		Shinshu-Takato Plant	○ *	Dec. 2000	Mar. 2003	2435-50 Oaza Kamiyamada, Takato-machi, Kamiina-gun, Nagano-ken	Laminated non-woven fabric with fibers in two or three directions
		Taga Plant	○ *	Dec. 1999	Mar. 2000	510-5 Aza Suwa, Oaza Shide, Taga-cho, Inukami-gun, Shiga-ken	Polyethylene films for packaging and sanitary use
	Sekisui Film Kyushu Co., Ltd.	○ *	Oct. 1999	Mar. 2003	485 Kamichishikicho, Izumi-shi, Kagoshima-ken	Polyethylene films for packaging and agricultural use	
	Sekisui Life-Tec Co., Ltd.	○ *	Dec. 1998	Mar. 2002	4-1-1 Sanjoohji, Nara-shi, Nara-ken	Plastic household goods	
Tokuyama Sekisui Industry Co., Ltd.	○ *	Mar. 2000	Mar. 2002	4560 Kaiseicho, Shinnanyo-shi, Yamaguchi-ken	Vacuum blood tubes, medical treatment and examination equipment, PVC resin, functional polymers		
H.Q.	Development Center	◎ *	Mar. 2000	FY 2005	32 Wadai, Tsukuba-shi, Ibaraki-ken	—	

Other object workplaces for summation of environmental performance data

◎Nitta Plant (Suspension of production since end June 2001) ◎Sakai Plant (Closure in July 2002)

○Fujieda Plant, Sekisui Technol Molding East Japan Co., Ltd. (Closure in April 2002)

Other plants that acquired ISO 14001 certification

○Shizuoka Plant, Sekisui Aqua System Co., Ltd. (July 2000) ○\*Tosu Plant, Hinomaru Co., Ltd. (January 2003) ○Eslon B.V. (June 1998)

○Bloomsburg Plant, Kleerdex Company (October 2001) ○Sekisui-Alveo B.V. (July 1996) ○Methyr Plant, Sekisui (U.K.) Ltd. (January 1997)

## A Third Party Examination Report

In succession to last year, Sekisui Chemical Co., Ltd. underwent an examination by the Wild Bird Society of Japan, the largest environmental NGO in Japan, on our environmental activities and this Environmental Report 2003.

We had our environmental activities and this Environmental Report 2003 examined in order to confirm whether there was any important omission or inadequacy in our environmental activities, and whether our activities and results were appro-

priately described in this Report, including the improvements we made based on the opinions expressed from the examination of our Environmental Report 2002.

### Third Party Examination Report on the Environmental Report 2003 of Sekisui Chemical Co., Ltd.

July 4, 2003

Mr. Naotake Okubo  
Representative Director and President  
Sekisui Chemical Co., Ltd.

Takashi Kosugi (Sealed)  
President  
Wild Bird Society of Japan

In response to your request for a third party examination of your "Environmental Report 2003", we have conducted this examination, through which we will be able to contribute to the elevation of our respective activities for environmental conservation, in recognition of the importance of enhancing the cooperation between NGOs and enterprises for this common objective.

We hereby submit the summary of our examination and related comments from each committee member as our third party examination report.

#### 1. Purpose of Examination

To frankly assess from the viewpoint of an NGO whether the management's intentions and philosophy on the environment are thoroughly carried out by all workplaces in the company, and how these environmental activities shape the actual business operations of the headquarters and workplaces.

#### 2. Examination Procedures

① A committee was formed by the following members, specialists in the field of environmental conservation, and they conducted the examination.

Chairman: **Shunichi Teranishi**, Professor, Graduate School of Hitotsubashi University, (Environmental Economics and Policies)

Member: **Masayuki Seto**, Professor, Tokyo University of Agriculture and Technology, (Ecological Conservation)

Member: **Sanae Hara**, Visiting Lecturer, Faculty of Economics, Saitama University, (Consumer Affairs)

Member: **Osamu Kobayashi**, Director General, Wild Bird Society of Japan

② At the beginning of the examination, a consultation was held with Mr. Naotake Okubo, President of Sekisui Chemical Co., Ltd. on the views of the management of the company regarding environmental issues. We received explanations from and exchanged opinions with staff of the Environmental Management Department on several occasions. We visited Tokyo Plant and inspected the actual develop-

ment of their environmental activities.

③ After a full exchange of opinions among the committee members, each member conducted the examination from his/her specialist standpoint. This report is based on a summary of their examinations. Opinions written by each member were also added to this report.

#### 3. Summary of Results of Examination

Sekisui Chemical Co., Ltd. promoted its environmental conservation activities for four years from fiscal 1999 to fiscal 2002 based on its Middle Term Environmental Plan, STEP-21. This Report shows the results of its activities in the final year (fiscal 2002) of STEP-21. The in-company targets set in STEP-21 have been generally achieved, which we highly evaluate as the results of strenuous and steady efforts made by each workplace and the people concerned. On this premise, we below list some problems and subjects that we would like to see tackled in future.

(1) As mentioned above, the in-company targets set in STEP-21 have been generally achieved, but there are still some targets that have not been attained (9 items out of 35). Regarding these, further efforts are expected. It is necessary to make a thorough analysis of the reasons for the failure to achieve these targets and to show more concretely the measures to be taken in future.

(2) Further study is needed on the items whose targets were achieved. To take as an example the activities to reduce waste generation, it is stated that 33 workplaces have achieved zero emission as targeted in the middle term plan. This achievement, however, is limited to waste, and the recycling methods include outside incineration to utilize incineration heat (thermal recycling), and recycling by outside contractors. When we look at this more closely from the aspect of dioxin emission, most of the reduction achieved (74% reduction against fiscal 2000) is from the abolition of incinerators inside plants, and we can not deny the possibility that dioxins are generated outside by the outside incineration. The definition of "zero emission" is no emission at all of any harmful substance, including not only waste, but also waste water and waste gas, inside and outside of workplaces. We hope zero emission according to this definition will be attempted. We also



Plant inspection (Tokyo Plant)



The consultation with President Okubo



expect that the monitoring system for outside incineration and for the recycling by outside contractors will be strengthened so that the parties entrusting such work to outside contractors will take full responsibility for the environmental impacts of this work.

- (3) According to the reported data on the emission of such chemical substances specified as Class 1 in the PRTR Law, there is a considerable number of these substances released into the atmosphere in substantial quantities. Therefore it can not be generally accepted that zero emission as defined in (2) has been attained.
- (4) Today the promotion of responsible activities for environmental conservation is strongly desired. This is not limited to the inside of an enterprise or a workplace and it will definitely not be enough to merely "clean one's own yard". Environmental responsibility will refer increasingly to areas beyond the immediate environment. During recent years, Sekisui Chemical Co., Ltd. has undertaken its environmental responsibilities within the company with satisfactory results. However, from now on, the company will be expected to put greater priority on taking environmental responsibility for its overseas operations and for every aspect of its activities to the fullest extent.
- (5) As with previous Reports, this Report sets forth adequate data on the environmental effects of the company's activities within the company, but is lacking in data regarding such effects outside the company. As stated in the President's message, the internal companies of Sekisui Chemical Co., Ltd. provide the market with a variety of products, such as houses, plastic goods, and so forth, that are very closely connected to people's daily lives and to society as a whole. Therefore, it is recommendable that the company takes the bold step of finding the means to communicate more transparently with customers, consumers, related NGOs and the general public, which should include such matters as environmental conservation activities regarding products manufacture, clear indications of product quality standards and appropriate disclosure of environmental information relevant to the products. This is especially important in order to become an enterprise that enjoys the total confidence of society, and that "is continually relied upon by the whole of the society to fully meet every expectation and demand".
- (6) Finally, this Report indicates the policies and subjects for future activities based on the new Middle Term Environmental Plan, STEP-2005, which started in April 2003. A very eager posture is shown there toward enhancing further activities for environmental conservation through practicing the philosophy of "environmental corporate management" aiming at becoming an environmentally creative organization. The philosophy will no doubt become more important in coming years. The real objective of the philosophy is the search for and creation of ecologically sound and sustainable economies.

We have great expectations that Sekisui Chemical Co., Ltd. will courageously challenge these future subjects and play the role of a leading company as an environmental pioneer.

#### 4. Comments from each Committee Member



**S. Teranishi**  
Chairman

In this Report "environmental accounting" is defined as "the tool for the purpose of effective environmental corporate management" and "for our stakeholders' understanding, by fulfilling our accountability regards precise disclosure of all relevant information", but the original definition refers to a tool to show to the general public the accountability of the whole of the business activities of a company from the environmental aspects. A reconsideration of this point is requested. As to "eco-efficiency" introduced on trial in this Report, only reciprocals of ex-godown Unit for each environmental load (the volume of generated waste, CO<sub>2</sub> emission, and so forth) are shown. It is necessary to review further the concept of eco-efficiency.



**M. Seto**  
Committee Member

"Structuring of a sustainable society" is the target to which the highest priority should be given over any other human activity. We should make assessments from the long term and wide range viewpoints. I hope Sekisui Chemical Co., Ltd. will take the leadership through its business activities based on such a target. For instance, regarding housing development, local communities could be activated by the use of local natural building materials, regaining the merits of past houses. However, there are limits to what a private enterprise may do. As for these, I would like the company to analyze the causes of restricting circumstances and find solutions and communicate this to the general public. I trust that Sekisui Chemical's Nature Study Course which has already started will be further developed based on such a viewpoint and target.



**S. Hara**  
Committee Member

This Report conveys very well the eagerness of Sekisui Chemical Co., Ltd. for environmental conservation. However, there are two points about which I am concerned. One point is the area of communications with customers and consumers. There must surely be frequent communications with them; however there is little reporting of this. Another point is the quality of communications with society as a whole, which may cause in the future a lack of appreciation for the development and marketing of environment-friendly products and for the establishment of environmental policies. For instance, this Report does not efficiently present Sekisui as a company which can be immediately associated with the management of chemical substances such as PVC, formaldehyde of sick house syndrome, or the structuring of recycling systems, and so forth. Future Reports should contribute to the clarification of such information and to the enhancement of its communication to the public.



**O. Kobayashi**  
Committee Member

I express my respect for your efforts to take a variety of environmental measures under the difficult economic conditions when the consolidated annual turnover and consolidated number of employees decreased against the previous year. It is noteworthy that a great amount of environmental data has been arranged in order, and that a great effort has been made to make the expressions understandable year by year. As environmental reports of enterprises are widely read by shareholders and other people, it is necessary to reconsider the use of expressions used in the "Communication" section that can not be shown by figures and the use of special in-company terms. I believe it is necessary to let readers know that the current costs for environmental conservation are planned to benefit the corporate management and the global environment in the long term, and this leads to the concrete realization of the corporate management policies and the following of activity guidelines for environmental conservation and safety.

The Wild Bird Society of Japan is an environmental NGO whose activities focus on concern for and protection of wild birds, with the aim of creating a sustainable society where human beings and nature can coexist forever.

#### **Setsushi Nakamura**

Managing Director in Charge of Environmental Management

The opinions of the examiners last year are as much as possible reflected in this Report. This year the opinions indicate the importance of reducing environmental loads

taking society as a whole into consideration, of enhancing communications with the outside and of making the best use of these in our activities. We will endeavor to apply these opinions to the development and elevation of our future operations and to our relationship with society.



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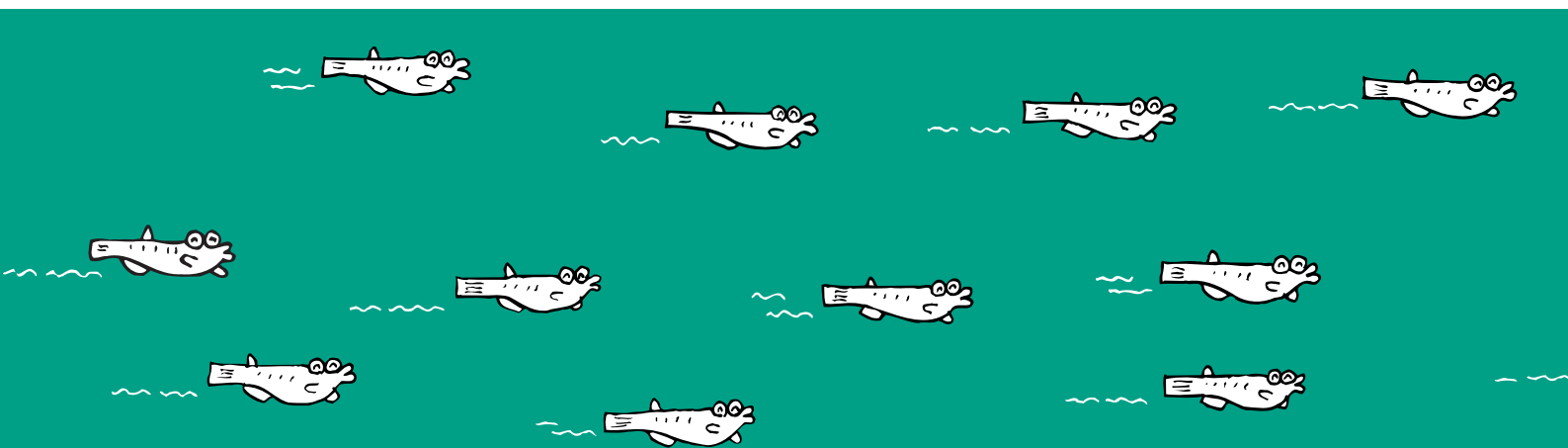
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## ■Front Cover: Bring back the Medaka

The sketches on the front cover are of Medaka, fresh water killifish, which until recently could be seen in streams everywhere in Japan. They were so familiar that they feature in a Japanese children's song. Now decreasing in number, they have been designated a "Threatened Species (Category II)" (Red Data Book on threatened species by the Japanese Ministry of the Environment). Water quality degradation by agrochemicals and drainage from residential buildings, and a decrease in spawning areas due to concrete reinforcement of riverbanks, have been cited as causes. We are expressing by this illustration our strong desire and determination for restoring and creating an environment where Medaka can multiply and live vigorously. We are adding one Medaka fish each year to our 2001 version.



Environmental consideration is given to printing and bookbinding of this report as follows:

- ①100% recycled paper of 70% white chromaticity (uncoated paper) is used.
- ②CTP (Computer to Plate) method is adopted in the plate making processes in order that no film remains as a waste material.
- ③Soy ink is used in the printing processes because it generates little VOC (volatile organic compound) and is excellent in biodegradability and deinking property. Further, "waterless printing" is adopted that generates no hazardous waste liquid.
- ④In the bookbinding processes glue that does not become an obstacle to recycling of paper is used.

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