

# Social & Environmental Report



Helping Create Prosperous Living Environments

## Interview with the President

# We Strive to Be a Company that Is Capable of Contributing to People and the Global Environment Based around the Pillars of Technological Development and the Cultivation of Human Resources

## Environmental Principles

Central Glass will help create a truly prosperous society through the production of goods and services by giving consideration to the global environment, health, and safety at all times.

**“Doing everything in the interests of humanity and the global environment.”**

## Action Guidelines

- 1 We will give consideration to the protection of the global environment and people’s health and safety on a group-wide scale in all activities spanning from R&D to production and sales.
- 2 We will build frameworks and systems that promote environmentally-conscious corporate activities and strive to make continual improvements.
- 3 We will make efforts to develop products and production technologies that are friendly to the global environment.
- 4 We will strive to build a recycling-based society by effectively using the earth’s resources and by recycling waste.
- 5 We will observe laws and regulations relating to the environment, health and safety, and make efforts in communicating with citizens.
- 6 As an employee of the company, each and every one of us will strive to contribute to society with a focus on the local community.

### Q1 What sorts of initiatives are being carried out in response to the global environment?

We take environmental measures in the manufacturing processes for our products, while also focusing on developing products that have been given functions that reduce their environmental impact.

We have developed our businesses based around the three keywords of the environment and energy, life science, and a comfortable lifestyle. Examples for this include our lithium-ion battery electrolytes in the environment and energy sector; agrochemicals and active ingredients and intermediates for pharmaceuticals in the life science sector; and fluorine-related products for electronic materials in the comfortable lifestyle sector. Moreover, we also offer products related to the two themes of the environment and energy and comfortable lifestyle, such as our “Eco-Glass” that boosts the heating and cooling efficiency of buildings and reduces energy consumption.

What is more, we are working to effectively use valuable resources in our manufacturing processes, such as by constructing systems that are capable of recycling and utilizing fluorite, which is the raw material for fluorine.

### Q2 What are your thoughts on human resource use and development?

We are working to set in place a variety of programs concerning support for rearing the next generation, such as our maternity and childcare leave programs, while also making our existing programs more flexible in the aim of improving the working environment for women. We support women in giving birth and raising children through systems such as shortened working hours during childcare, while also recommending that our male employees take advantage of this as well. These efforts are amassing positive results.

What is more, in order to further accelerate our advances into global markets, which we have been vigorously pursuing in recent years, we have been enhancing our study abroad program while also setting up an overseas occupational training program to establish a system for learning about things such as the business customs in certain countries through overseas training in said countries. We also hold administrative meetings for overseas affiliates in which our top executives of overseas subsidiaries come together to increase the number of occasions for sharing information with overseas.

In addition, we revised our re-employment system in 2012 to allow motivated employees to continue working on-site until the age of 65 in an effort to have them pass down their skills and knowledge, such as by giving instruction to the next generation.

# Interview with the President



## Q3 Tell us about your growth strategies for the future.

In May 2014 we formulated a new five-year plan that will last until FY2018. We also incorporated a strategy of focusing on growth businesses based around the three keywords I mentioned at the beginning of this interview into this medium-term management plan. We are also aiming to expand our "Future Fund" as a corporate R&D structure that will contribute to enlarging our business foundation ten years down the road, while also expanding into new growing business sectors. What is more, in addition to conventional product and technology development we are also focusing our efforts on the development of production technologies.

Furthermore, it will develop highly original environmentally responsive materials that combine our specialized technologies related to glass and inorganic materials with chemical technologies related to organic fluoride-related materials as well as rolling out "New-STEP," program which explores new domains by developing new functional materials. These efforts have gradually begun achieving results as the products for electronic materials which are developed through collaboration between our Chemical Research Center and Glass Research Center have entered the stage of mass production.

## Q4 It seems as if you are also focusing on global expansion, is that true?

When you look at its shrinking population and changing industrial structure, you cannot help but say that it would be difficult to expand Japan's domestic manufacturing industry. Thus far we have been proactively trying to advance into overseas markets, and we will make further efforts to move forward. We currently have overseas manufacturing bases located in the United States, the United Kingdom, Germany, Taiwan, and China, and in May 2014 we established a joint venture company to manufacture lithium-ion battery electrolytes in South Korea. The key points behind our advances into overseas markets are our technical prowess and ability to develop new products. Every one of our employees will come together in working to maintain our world-class level of quality.

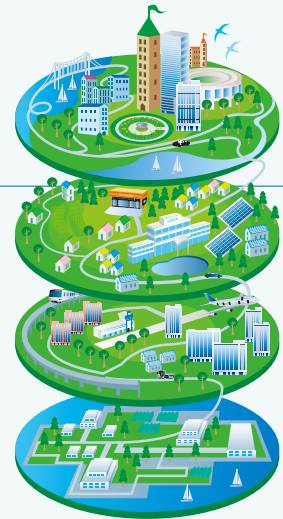
Under our slogan of "Achieve new growth by strengthening our business foundations and original technologies," which serves as the basic policy of our new medium-term management plan, we intend to join forces across the company as a whole to take up the challenge of attaining even greater growth.

*Shuichi Sarasawa*

Shuichi Sarasawa  
Representative Director, President & CEO  
Central Glass Co., Ltd.

# Responsible Care Report

Social & Environmental Report 2014



## Editorial Policy

We in the Central Glass Group have published this report with the objective of engaging in a dialog with all of our stakeholders by reporting on our social and environmental activities. In preparing this report our goal was to make it easy to read and understand in order to thoroughly inform readers of our activities.

Also, we referred to the Environmental Reporting Guidelines 2012 of the Ministry of the Environment, the Responsible Care (RC) Code of the Japan Responsible Care Council (JRCC), and ISO 26000 to prepare it.

**Report period** April 2013 to March 2014

**Scope of the report** Central Glass Group

(The scope of data was only gathered from the plants and research institutes of Central Glass Co., Ltd. along with some of its subsidiaries. The scope for overseas companies was from January to December 2013)

**Published** October 2014

**Inquiries** Environmental Safety Dept., Central Glass Co., Ltd.

Kowa-Hitotsubashi Bldg., 7-1 Kanda-Nishikicho 3-chome, Chiyoda-ku, Tokyo Japan  
TEL: +81-3-3259-7359 FAX: +81-3-3259-7394 <http://www.cgco.co.jp/>

## Business Outline

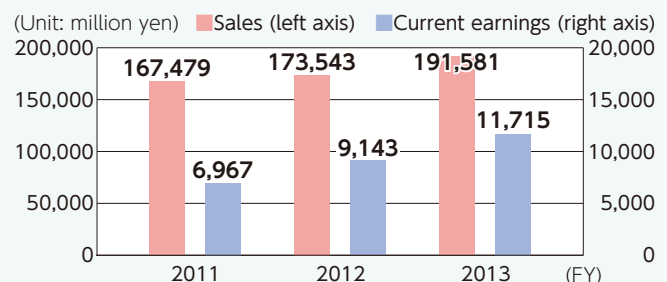
### Corporate Outline (as of March 31, 2014)

Company Name	Central Glass Co., Ltd.
Established	October 10, 1936
Number of Employees	1,545 (5,347 consolidated)
Paid-In Capital	¥18,168 million
Listed Stock Exchange	Tokyo Stock Exchange

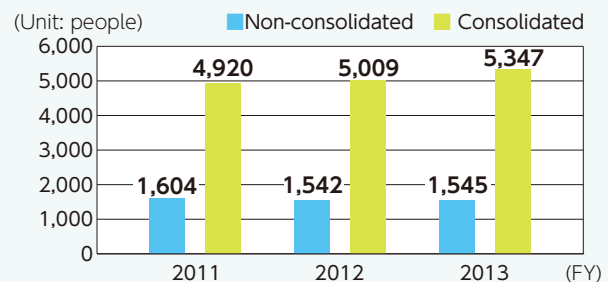
### List of Workplaces

Head Office	Kowa-Hitotsubashi Bldg., 7-1 Kanda-Nishikicho 3-chome, Chiyoda-ku, Tokyo Japan
Chemical Research Centers	5-17, 2-chome, Nakadai Kawagoe, Saitama 5253 Ooaza Okiube, Ube City, Yamaguchi
Glass Research Center	1510 Okuchi-cho, Matsusaka City, Mie
Ube Plant	5253 Ooaza, Okiube, Ube City, Yamaguchi
Matsusaka Plant	1521-2 Okuchi-cho, Matsusaka City, Mie
Matsusaka Plant Sakai Mfg. Site	6 Minami-machi, Chikkou, Sakai-ku, Sakai City, Osaka
Kawasaki Plant	10-2 Ukishima-cho, Kawasaki-ku, Kawasaki City, Kanagawa
Shanghai Rep. Office	2201 Yan An Road (West), Shanghai

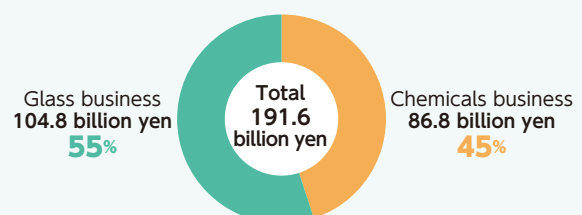
### Trends in sales and current earnings (consolidated)



### Trends in the number of employees



### FY2013 sales by segment (consolidated)





## What Is Responsible Care (RC)?

Most chemical companies voluntarily work to secure the environment, safety, and health throughout every process, from the development stage for chemical substances through to their manufacture, distribution, use, final consumption, and lastly their disposal. Those companies then publicize the results of these activities so as to engage themselves in dialog and communication with society. These activities are referred to as responsible care.



## About the Cover Design / Glass Apple

The cover illustration represents an image in which the bottommost of the four layers is the stage with Central Glass Group's plants and research institutes, which are underpinning the society where the streets, cities, and various industries are in harmony with lush nature on top of them. The glass apple on the top right serves as a symbol of the knowledge and technology that the Central Glass Group has amassed thus far, and has been used on the cover of this report since the FY2004 edition.



## CONTENTS

Interview with the President	P2
Editorial Policy	P4
Business Outline	P4
Special Feature 1 (Glass)	P6
Special Feature 2 (Chemicals)	P8
Our Products	P10
Corporate Governance and Compliance	P12
Targets and Progress	P13
Environment & Safety Management	P14
Environment	P18
Safety	P21
Society	P23
Employees	P26
Activities at Factory	P28

## Business Division/Segment/Major Products

Business Division		Major Products
Glass Business	Architectural glass	Float glass, figured glass, wired glass, heat reflective glass, fabricated glass (tempered glass, fire-resistant tempered glass, laminated glass, insulating glass units, crime-prevention glass), mirrors, anti-fog mirrors, decorated glass, photovoltaic (PV) glass
	Automotive glass	IR-cut glass, UV-cut glass, glass antennas, privacy glass, module glass, acoustic glass, glass with conductive heating defogger print, and other various safety glasses
	Display glass	Thin flat glass for LCDs, chemical tempered glass, powder glass and glass paste
Chemicals Business	Basic chemicals	Soda ash, calcium chloride, polyaluminum chloride, gypsum, hydrofluoric acid, fluorocarbon products
	Fine chemicals	Active ingredients & intermediates for pharmaceuticals/agrochemicals, Fluorinated organic/inorganic compounds, High purity gases, Electronic materials, Electrolytes for lithium-ion batteries, Fluorinated organic/inorganic reagents
	Fertilizers	NPK compound fertilizer, NK compound fertilizer, coated fertilizer, organic chemicals fertilizer, fertilizer materials, microbiological plant-protection agents/materials
	Glass fibers	Glass fiber, glass wool

## Subsidiaries and Affiliates

### 31 Domestic companies

Central Glass Hokkaido Co., Ltd.	Japan Tempered & Laminated Glass Co., Ltd.	Central Engineering Co., Ltd.
Central Glass Tohoku Co., Ltd.	Central Insulation Co., Ltd.	Ube Delivery Co., Ltd.
Central Glass Tokyo Co., Ltd.	Central Glass Fiber Co., Ltd.	Central Service Co., Ltd.
Central Glass Engineering Co., Ltd.	Mie Glass Industry Co., Ltd.	Ube Analytical Center Co., Ltd.
Tosho Central Co., Ltd.	Tokai Processing Center Co., Ltd.	Fuji Shipping Co., Ltd.
Niigata Yoshino Gypsum Co., Ltd.	(currently Central Glass Plant Services Co., Ltd.)	Ube Yoshino Gypsum Co., Ltd.
Central Chemical Co., Ltd.	Sowa Transportation and Warehouse Co., Ltd.	Ube Ammonia Industries Co., Ltd.
Central Saint-Gobain Co., Ltd.	Central Glass Kansai Co., Ltd.	Central Glass Kyushu Co., Ltd.
Central Glass Module Co., Ltd.	Kagi Shoten Co., Ltd.	Central Saint-Gobain Investment Co., Ltd.
Central Glass Chubu Co., Ltd.	Takada Co., Ltd.	Sun Green Co., Ltd.
Bishu Silica Sand Co., Ltd.	Ube Trading Co., Ltd.	

### 21 Companies Overseas

Northwestern Industries, Inc. (US)	Apollo Scientific Limited (UK)	Zhejiang Central Glass Chemspec Company Ltd. (China)
Central Glass International, Inc. (US)	Thai Central Chemical Public Co., Ltd. (Thailand)	Central Glass Trading (Shanghai) Co., Ltd. (China)
Central Glass America Inc. (US)	Japan Vietnam Fertilizer Company (Vietnam)	Saint-Gobain Central Sekurit (Qingdao) Co., Ltd. (China)
Carlex Glass Company, LLC (US)	Yue Sheng Industrial Co., Ltd. (Taiwan)	Central Glass Company India Private Limited (India)
Carlex Glass America, LLC (US)	Taiwan Central Glass Co., Ltd. (Taiwan)	Central Glass Korea Co., Ltd. (South Korea)
SynQuest Laboratories, Inc. (US)	Central Glass (Zhangjiagang) Co., Ltd. (China)	
Central Glass Europe Limited (UK)	Giga Gas & Electronic Materials Company (Taiwan)	
Central Glass Germany GmbH (Germany)	Giga Gas & Electronic Materials Trading (Shanghai) Co., Ltd. (China)	

# Achieving safer, more secure, and more livable societies.

We at Central Glass help to achieve affluent societies by providing our customer companies with high value-added glass products. Furthermore, we also aspire to achieve societies that are safer and more secure by means of developing glass products that have the functions required by said societies.

Encasing radioactive waste in glass

## Glass designed for disposing of radioactive waste Iron Phosphate Glass

### Disposing of Radioactive Waste

When it comes to the radioactive waste generated from places like nuclear power plants and reprocessing facilities, there are many different types of waste which depend on factors like their source and level of radioactivity. This radioactive waste is solidified in materials such as plastic, asphalt, mortar, or cement according to their respective characteristics and then disposed of. In particular, given its characteristics, glass is used around the world for the disposal of the highly radioactive liquid waste that is separated off during the reprocessing of spent fuel from power generation, and countries like France have already made progress with disposing of this through glass solidification at an industrial scale. And in recent years glass solidification, which is safer and offers a larger ratio of volume reduction, has been proposed even for low-level radioactive waste.

### Radioactive Waste Disposal Glass

Borosilicate glass has been internationally recognized as a type of glass for disposing of highly radioactive liquid waste. It offers outstanding resistance to thermal shocks and chemical durability, which makes it suitable for long-term stable storage. For this reason, glass solidification is already being used to dispose of the liquid waste at an industrial scale in France and other countries, and research geared towards its practical implementation in Japan is also moving forward. Conversely, given that various different elements are contained within radioactive waste, it has been discovered that there are some elements that are resistant to dissolving within borosilicate glass.

### Requirements for the Glass

Since glass does not have set ingredients nor adopt a set structure like with crystals various different ingredients can be enclosed within it as compared to with other materials. In other words, solidifying radioactive waste in glass means that the radioactive waste is not simply mixed in with the glass, but that it can be incorporated and integrated into the structure of the glass as one of its constituent ingredients. What this means is that radioactive materials can be safely encased in the glass, such that even if a solid body of the glass were to break, the radioactive materials would not be released. Requirements for glass used for this disposal via solidification include: (1) being capable of being filled with large quantities of radioactive waste, (2) being stable in both a chemical and thermal sense, and (3) offering radiation resistance. Borosilicate glass and iron phosphate glass have been proposed as disposal glass that meets these requirements.

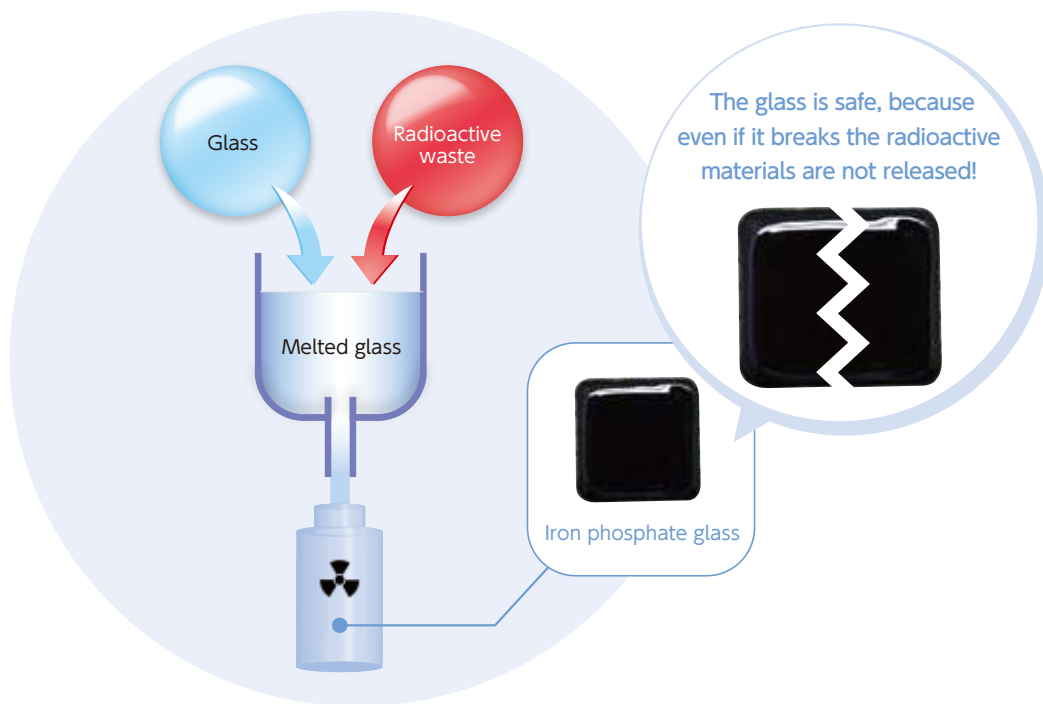
### Central Glass' Initiatives

Since FY2011 we have been studying iron phosphate glass as a glass for disposing of the sludge and other low-level radioactive waste generated from the treatment process for the reservoir water at the Fukushima Daiichi Nuclear Power Station together with the Japan Atomic Energy Agency and Ehime University. As a result, we have learned that it can be filled with large quantities of sludge components and also offers outstanding chemical durability.

There are still numerous challenges when it comes to stabilizing radioactive waste through glass solidification and other technologies, but we will carry on with this research into the future. We thereby intend to fulfill our corporate social responsibility as a company that has enjoyed the benefits of nuclear power by contributing to the development of technologies and materials for safely treating and disposing of radioactive waste.



■ Illustration for the disposal of radioactive waste



### What Is Iron Phosphate Glass?

The term “glass” is associated with “transparent glass,” such as windowpane glass. This is a characteristic that is obtained from the fact that glass is shapeless and amorphous, and that it does not have a grain boundary that scatters visible light rays like those of solid crystalline substances. Furthermore, glass does not conform to a restrictive structure or have limited structural components the way crystals do, and so therefore various different components can be incorporated within it. For example, by adding in coloring components you can manufacture colored transparent glass such as privacy glass windows in

the back of automobiles.

As its name implies, iron phosphate glass is a type of glass with the main ingredients of iron ( $\text{Fe}_2\text{O}_3$ ) and phosphate ( $\text{P}_2\text{O}_5$ ). Phosphate glass has the advantages that it can contain large quantities of components and can also be manufactured at low temperatures, but it had the drawbacks of having high hygroscopicity and poor chemical durability. Therefore, iron phosphate glass overcomes these drawbacks by incorporating  $\text{Fe}_2\text{O}_3$  within itself. Since  $\text{Fe}_2\text{O}_3$  also has properties as a coloring agent, iron phosphate glass has a black appearance.

# Achieving more effective use of precious resources.

Fluorine compounds are used for a wide variety of purposes throughout society and industry, and are therefore deeply intertwined in our everyday lives.

Based around our fluorination technologies, we in the Central Glass Group offer high-purity, high-performance fluorine compounds in a wide range of fields, including medical products and agricultural chemicals, the electronics sector, and the lithium-ion batteries equipped on electric vehicles and hybrid cars.

## Fluorite Recovery and Reuse For recycling scarce resources and reducing waste

### Fluorite

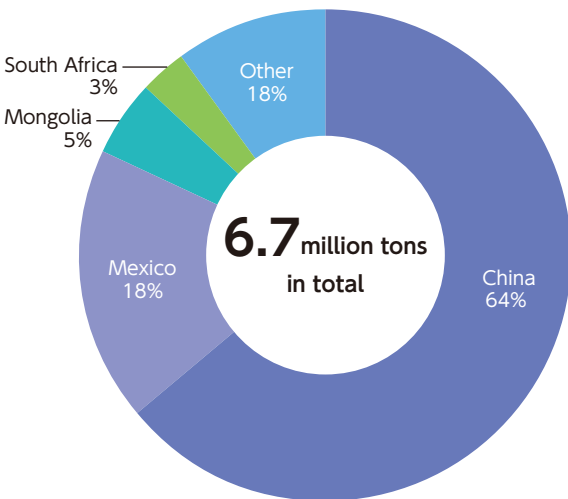
- The mineral that is the raw material for fluorine compounds -

Anhydrous hydrofluoric acid (HF) is the most important raw material in fluorine compounds. In the fluorine chemical industry, fluorite, which contains the calcium fluoride (CaF<sub>2</sub>) as its main component, is used as the fluorine resource to obtain HF through the reaction between fluorite and sulfuric acid.



Fluorite

### Amount of fluorite mined (2013)

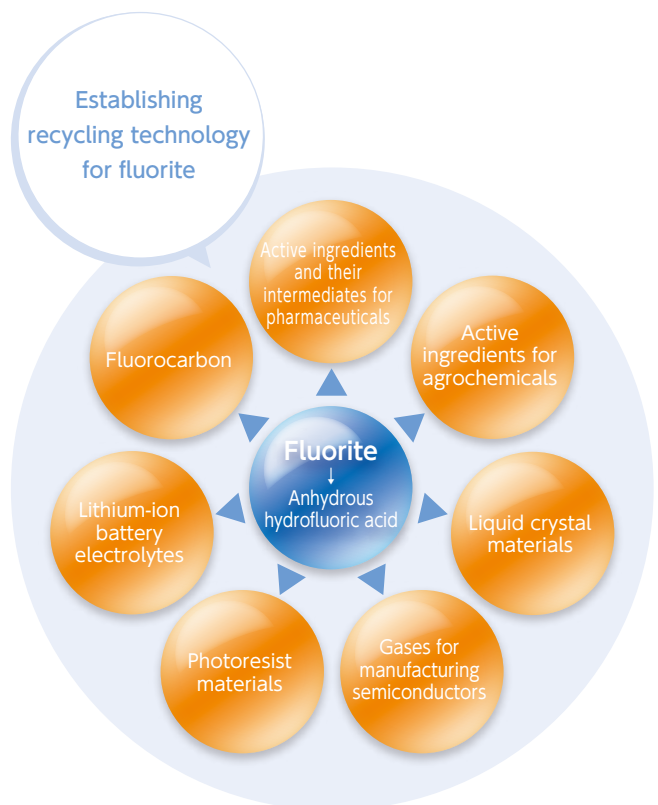


Source: U.S. Geological Survey  
Website: <http://www.usgs.gov/>

Fluorite is the raw material for Fluoride compounds. As it shows in the above graph, the amount mined in 2013 came to 6.7 million tons worldwide, with China accounting for 4.3 million tons (64%) of this. It is a mineral that is disproportionately distributed in certain regions. Japan depends on imports from China for most of the quantity it uses, and as such the stable procurement of fluorite is an important issue for the Japanese fluorine chemical industry, including Central Glass.

### Central Glass' fluorine chemical business

- Putting the raw material of fluorite to a variety of uses -







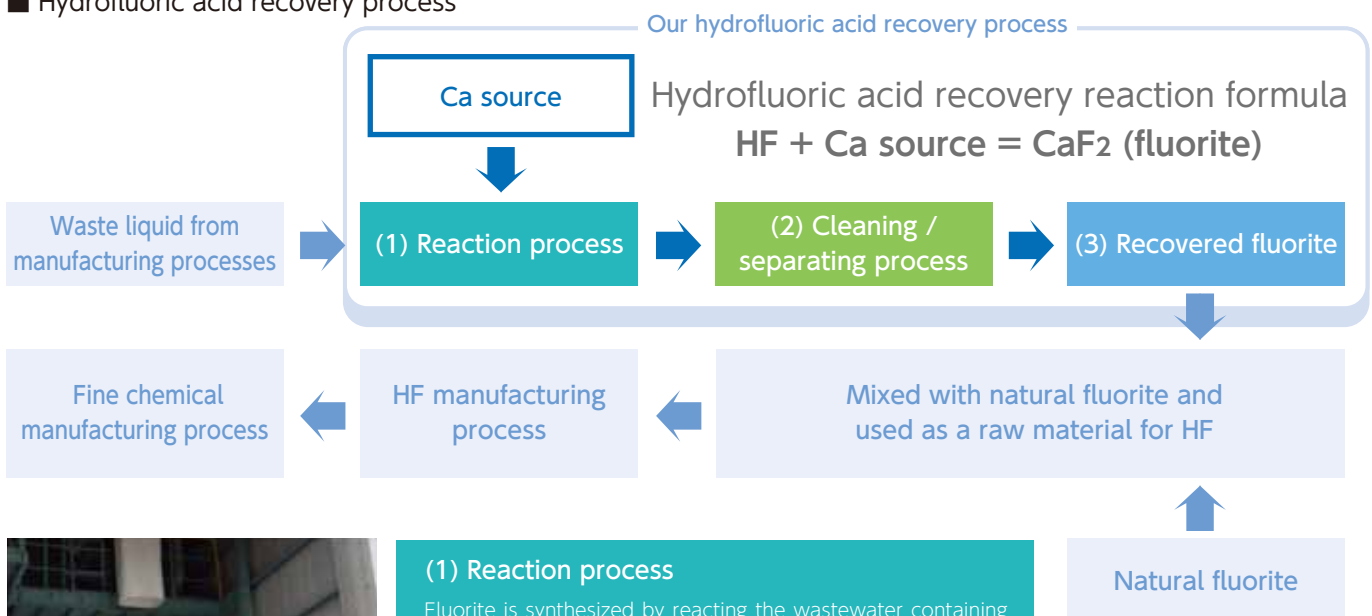
## Fluorite Recovery and Reuse

Fluorine compounds are used for a variety of purposes in settings that are familiar to us in our everyday lives. Their main ingredient of fluorite is a scarce resource that we are dependent on imports for. Therefore, we have developed a recycling technology for collecting fluorine in the form of fluorite from the wastewater containing hydrofluoric acid emitted during our manufacturing processes, thereby achieving the effective use of this resource as well as waste reductions. We will introduce the technology for recovering fluorite that we have established below.



Recovery equipment

### Hydrofluoric acid recovery process



#### (1) Reaction process

Fluorite is synthesized by reacting the wastewater containing hydrofluoric acid emitted during manufacturing processes with calcium preparation (Ca source)

#### (2) Cleaning / separating process

The fluorite obtained from the reaction process is cleaned and recovered fluorite that has the same quality as natural fluorite is obtained via a separator

#### (3) Recovered fluorite

The recovered fluorite obtained from the cleaning and separating process is used in place of natural fluorite as the raw material for HF

Recovered fluorite

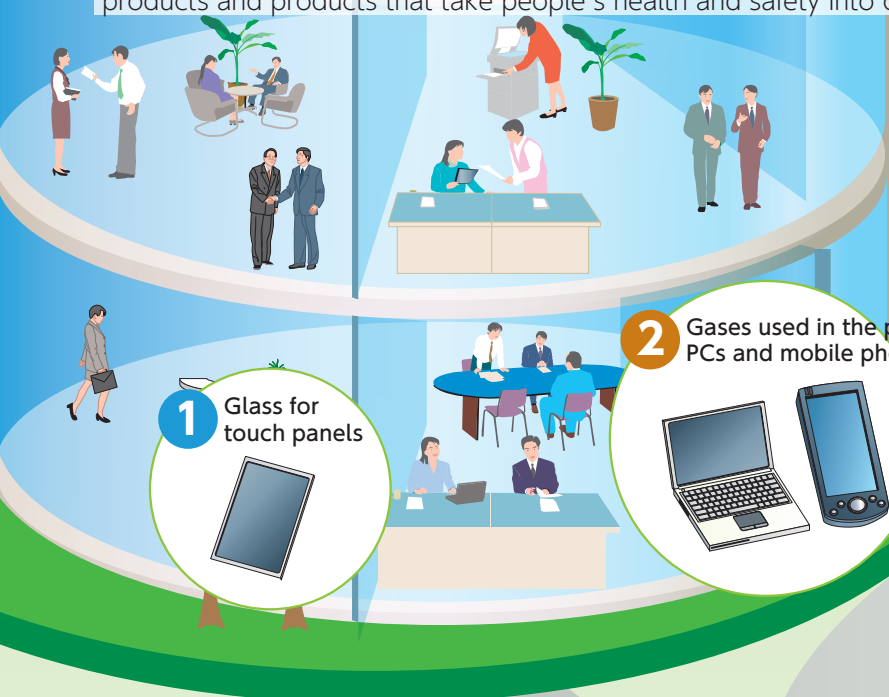
# Our Products

## Social & Environmental Report 2014

Central Glass Group products are used in various ways in order to enrich people's daily lives.

Central Glass Group supplies products related to the fields of glass and chemicals. Although the products of Central Glass may not be visible to the general consuming public, they support many aspects of a comfortable daily life, as well as a well-functioning society and industry. We provide raw materials for glass products used for buildings/residences and automotive glass products, as well as raw materials for industrial products, materials supporting industrial production processes, fertilizers for agricultural produce, and medical drugs. Central Glass keeps on pursuing possibilities for the manufacturing and technologies in which we excel, and will be pursuing challenging new fields in the future as well in order to develop and provide environmentally-friendly products and products that take people's health and safety into consideration.

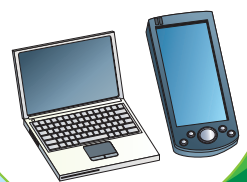
### Convenience store



### 3 Anti-freezing agent



### 2 Gases used in the production of PCs and mobile phones



### 1 Glass for touch panels



## Glass

### 1 Glass for touch panels

Extremely thin glass used for sensor substrates and glass covers for touch panels.

### 4 Photovoltaic (PV) glass

Our high transmission figured glass is used for crystalline silicon type solar cells, etc., thereby improving their efficiency.

### 5 Construction/housing glass

Glass types that contribute to energy saving and comfort indoors, such as eco-glass, crime-prevention glass, and soundproof glass.

### 7 Lead-free mirrors

**Anti-fog mirrors**  
(Manufactured by Mie Glass Industry Co., Ltd.)  
Our lead-free mirrors are environmentally friendly, as the back coating contains no harmful lead components. Our anti-fog mirror suppresses blurring due to a special functional coating applied on the mirror surface.

### 12 Automotive glass

Our automotive glass is used for windshields, side, and rear windows in automobiles.

## Chemicals

### 2 Gases used to produce PCs and mobile phones

Our ZEM-SCREEN is used as an environmentally friendly non-flammable cover gas used when manufacturing magnesium casting alloys.

### 3 Anti-freezing agent

Calcium chloride is used as an anti-freezing agent for roads in winter.

### 6 Powder detergent

Our soda ash is used as an alkali material in powder detergents.

### 9 Moisture absorption agent

Calcium chloride is used as the raw materials for moisture absorption agents.

**13** Environmentally-conscious agricultural products/microbial control agents



**Fine chemicals**

**10 Lithium-ion battery electrolytes**  
Our electrolytes are used for lithium-ion batteries used to power electric vehicles (EVs) and hybrid cars.

**14 Active ingredients for pharmaceuticals and their intermediates**  
We supply active ingredients and intermediates for such pharmaceuticals as anesthetics and ulcer treatment drugs by utilizing fluorine chemicals and other technologies that we have accumulated in-house.

**Fertilizer**

**13 Environmentally-conscious agricultural products/microbial control agents**  
[Coated fertilizer Cera-coat®R] (Manufactured and sold by Central Chemical Co., Ltd.) This is a coated fertilizer with adjustable fertilizer effects that was developed around the three concepts of offering ideal fertilizer effects, power savings and low cost, and being environmentally friendly. Its powerful fertilizer effects make it possible to reduce the amount used.

[Microbial control agents]  
Supporting higher levels of safety for humans, animals, and produce, these agents can be used until before harvest. Essentially, they are environmentally sound microbial agrochemicals suitable for organic and low-chemical farming, because their application is not counted as the use of agrochemical spraying.

**Glass fiber**

**8 Resin-reinforced materials (bath tubs, etc.)**  
(Manufactured by Central Glass Fiber Co., Ltd.) Glass fiber is widely used in such diverse applications as fiber-reinforced plastic for bath tubs, housing, automobiles, ships, and electronics products.

**11 Automotive sound insulating material**  
(Manufactured by Central Glass Fiber Co., Ltd.) Glass wool is a noncombustible, fire-resistant material used as heat- and sound-insulating material for automobiles, rail cars, etc.

# Corporate Governance and Compliance

Social & Environmental Report 2014

The basic concept behind the corporate governance\*1 of Central Glass Group is to continually increase the transparency and fairness of our overall management in order to enlarge corporate value, further increase profits, and make efforts to establish an efficient and reasonable organizational structure that can readily respond to changes in the management environment. See the figure below for our specific corporate governance system.

In order to absolutely prevent corporate misconduct, it is essential to raise our awareness of compliance,\*2 in addition to upgrading and reinforcing our corporate governance framework. To fulfill this purpose, Central Glass Group established the "Central Glass Group's Code of Conduct" as the internal code for conducting faithful business activities with stakeholders such as business partners, concerned organizations, customers, consumers, and employees. Every employee carries a card displaying this Code of Conduct to constantly enhance awareness of compliance. The top executives also strive to set a good example through their actions.

We also created a "Compliance Manual" to serve as a guide on dictating social norms and corporate ethics, and are using it to meet social demands. This manual covers a wide range of fields including, among others: anti-monopoly law;

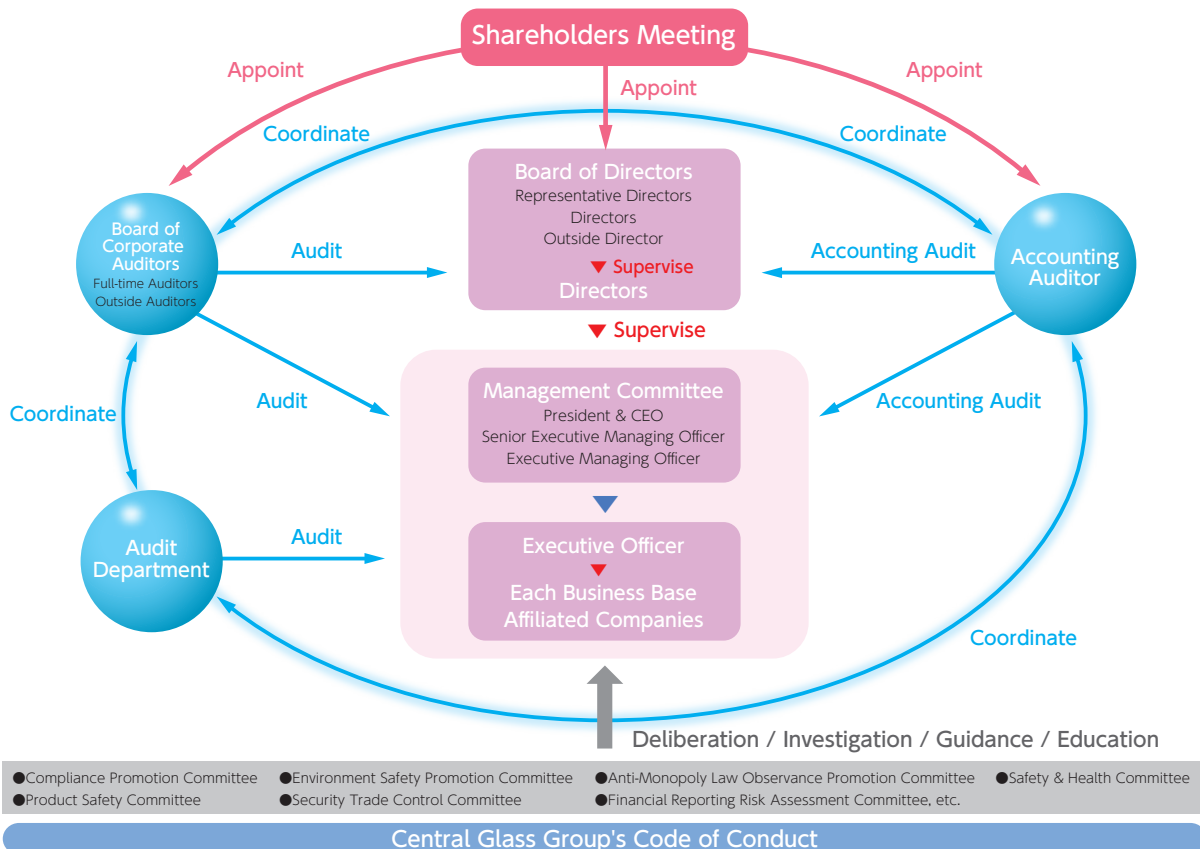
independence from antisocial forces; intellectual property rights; regulations on insider trading; environmental conservation; the workplace environment; the protection and management of information; and respect for human rights. Each item in the manual is reviewed and revised at regular intervals in accordance with the revisions of applicable laws and regulations and trends of social conditions. To supplement this manual, we improve the information by introducing the website of a law book publisher, so as to allow self-examination of questions and problems associated with corporate governance and compliance. Central Glass Group also established and started operating a Whistle Blowing System so that all employees can obtain guidance and consult on issues and questions concerning compliance so as to solve them before they become serious.

The effective use of these systems, together with regular education through internal training seminars, helps each employee gain a deeper understanding of relevant laws and regulations and take appropriate action when conducting business. Through these activities, Central Glass Group aims at enhancing both awareness and compliance.

\*1 Corporate governance: The way a corporation should be governed

\*2 "Compliance" refers not only to the observance of laws and regulations in a limited sense, but also includes the observance of a wide range of social norms when conducting business activities.

## Organization Chart for Corporate Governance





# Targets and Progress

## Social & Environmental Report 2014

Mid-Term Targets and Accomplishments in FY2013 Progress: ☀️...Accomplished ☁️...Additional measures required

Item	Major Issues	Mid-Term Targets	FY2013 Results	Ratings	FY2014 Plans	Pages
Environment & safety management	Establishment & maintenance of environmental management system	<ul style="list-style-type: none"> <li>Renewal and maintenance of certification at main workplaces</li> </ul>	Ube Plant, Kawasaki Plant, and Matsusaka Plant (including the Sakai Manufacturing Site) maintained ISO 14001 certification.	☀️	Renewal, maintenance, and acquirement of certification at main workplaces.	P.14
		<ul style="list-style-type: none"> <li>Renewal, maintenance, and acquirement of new certification at affiliates</li> <li>Enhancement of self-management at non-certified affiliates</li> </ul>	Conducted self-audits based on an environmental safety self-checklist at 24 affiliates.	☀️	Renewal, maintenance, and acquirement of certification at affiliates.	P.14
Environmental efforts	Prevention of global warming (energy and resource conservation)	(FY2020 target) <ul style="list-style-type: none"> <li>Reduction of CO<sub>2</sub> emissions by 15% from FY 2005.</li> </ul>	CO <sub>2</sub> emissions came to 675,000 tons, down 28% from FY2005.	☀️	Continue working on reducing CO <sub>2</sub> emissions by a target of 15% by FY2020 from 2005.	P.18
	Reduction of waste	(FY2020 target) <ul style="list-style-type: none"> <li>Reduction of final landfill disposal volume by 65% from FY2000.</li> </ul>	Final landfill disposal volume of waste at our main plants was down 56% from FY2000. Increased the amount of polluted mud recycled into cement at our Ube Plant.	☀️	Continue working on reducing the final landfill disposal volume by a target of 65% by FY2015 from FY2000. Examine new technologies for reducing waste.	P.20
Safety efforts	Chemical substance safety	<ul style="list-style-type: none"> <li>Implementation of appropriate management of chemical substances</li> </ul>	Compliance with the Act on the Evaluation of Chemical Substances, Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof, and Industrial Safety and Health Act, and provision of information to the concerned parties (requiring various submissions). Sequentially improved SDS.	☀️	Continued compliance with laws & regulations and revise our SDS.	P.21
		<ul style="list-style-type: none"> <li>Promotion of alternatives to or detoxification of environmental impact substances</li> <li>Asbestos</li> <li>PCBs</li> <li>Other environmental impact substances</li> </ul>	Removed and treated non-scattering asbestos containing materials from manufacturing facilities when upgrades are made. Completion of final disposal of high-concentration PCB machinery by three affiliates within the JESCO Toyota region.	☀️	Continued removal of asbestos used at workplaces when upgrades are made. Continued strict management of machinery containing PCBs, and their disposal according to local administrative guidance.	P.21
		(Promotion of Green Procurement) <ul style="list-style-type: none"> <li>Implementation of audits on chemical substances</li> <li>Prompt provision of information to customers</li> </ul>	Confirmation of chemical substance management (compliance with laws) and customer response status through an environmental safety self-checklist in each Group company, including affiliates, based on the "Green Procurement Guidelines."	☀️	Efforts to reduce the environmental impact of products by enhancing management of our database of information and to provide reliable and prompt information to our customers.	P.21
	Accident prevention	<ul style="list-style-type: none"> <li>Conducting voluntary safety audits on high-pressure gas by management</li> <li>Enhancement of preventative measures against disasters</li> </ul>	Periodic Inspections carried out by administrations at our Ube, Kawasaki, and Matsusaka Plants, and Sakai Manufacturing Site. Conducted voluntary safety audits on high-pressure gas.	☀️	Continue to comply with laws, and to pass on safety techniques and know-how. Efforts for establishing equipment safety measures.	P.22
	Occupational safety and health	<ul style="list-style-type: none"> <li>No injuries causing lost work hours (try various timely measures)</li> </ul>	The frequency rates of accidents that required lost working hours worsened in 2013. They were 0.58 at our company and 1.02 at cooperating companies. This was below average in the industry for our cooperating companies. Various accident prevention campaigns were carried out at Central Glass Group companies in Japan.	☁️	Implementation of proactive measures against accidents based on the analytical results of annual reports on Group-wide occupational accidents.	P.22
		<ul style="list-style-type: none"> <li>Enhance risk management for occupational safety and health</li> </ul>	Continued to maintain OHSAS18001 certification at our Ube Plant. Continued efforts for a risk management system for occupational safety and disaster prevention in our Kawasaki and Matsusaka Plants.	☀️	Continuation of initiatives and efforts to spread its implementation at other affiliates.	P.22

# Environment & Safety Management

## Social & Environmental Report 2014

Central Glass Group undertakes voluntary management activities aimed at making improvements by taking into consideration ensuring the environment, safety, and health and environmental protection over the total life cycle of our products, from the R&D stages through to the procurement of raw materials, production, distribution, use, and disposal. We pay meticulous attention in order to maintain, manage, and guarantee the quality of the products that we deliver to our customers, and have set in place structures for their production, transportation, and supply.

We promote management that is responsive to the social demands of every one of our stakeholders as we aspire to be a company that is truly beneficial and contributes to society.

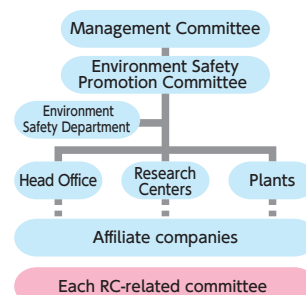
### Environment, Safety, and Quality Management Promotion Systems

The various supervisory departments listed below form the core when it comes to promoting the environment, safety, and quality management systems at Central Glass. They coordinate with other related departments in order to follow up on the various activities at our head office, plants, research centers, and affiliate companies.

Environmental safety aspects...Environment Safety Department  
 Product safety aspects...Quality Assurance Department  
 Education / human resource building aspects...Personnel Department  
 Occupational safety and health aspects...Personnel Department, Environment Safety Department  
 Social demands...Corporate Administration Department

As indicated in the figure on the right, our Environment Safety Promotion Committee forms the core of our responsible care activities, while our Environment Safety Department serves as the secretariat for this. They support and promote activities related to environmental and safety matters carried out by each of our departments.

#### Environment and safety management promotion system



### Environmental and Safety Audits

Central Glass carries out environmental and safety audits every year focusing on our workplaces and domestic affiliate companies. In FY2013, onsite audits were carried out at 16 of our workplaces, and we also instituted site visits, documentation checks, and hearings on matters of concern and important issues. Not only do we check to confirm compliance for environmental aspects and conduct risk assessments for safety, but also perform detailed checks from a CSR perspective on things such as the state of our

buildings and equipment, waste disposal, and responses during emergencies in the aim of confirming whether or not our workplaces are being managed appropriately. This contributes to improving our initiatives at each of our workplaces.

We continuously conduct documentation audits to make sure that there are no defects for environmental and safety aspects with a voluntary audit-style checklist that is carried out every year, even for those workplaces that are not targeted for onsite audits.

#### Acquisition Status for the Environmental Management System (EMS) and Other Certifications

Our plants and affiliate companies	Environmental Management System ISO 14001, etc.	Quality Management System ISO 9001, etc.
Ube Plant	○	○
Kawasaki Plant	○	○
Matsusaka Plant (including Sakai Manufacturing Site)	○	○
Central Glass Tokyo Co., Ltd. - Urayasu Plant		○
Central Glass Engineering Co., Ltd.		○
Central Chemical Co., Ltd. - Ube Plant	○	
Central Glass Module Co., Ltd.		○
Japan Tempered & Laminated Glass Co., Ltd.	○*1	○
Central Glass Fiber Co., Ltd. - Matsusaka Plant / Kasugai Plant	○ (Matsusaka Plant)	○
Mie Glass Industry Co., Ltd. - Matsusaka Plant / Oishi Plant	○	○ (Matsusaka Plant)
Tokai Processing Center Co., Ltd. (currently Central Glass Plant Services Co., Ltd.)	○	
Central Glass Kansai Co., Ltd. - Sakai Office / Shikoku Office	○ (Sakai Office)	○
Central Service Co., Ltd.		○
Carlex Glass Company, LLC (US)	○	○
Carlex Glass America, LLC (US)	○	○
Apollo Scientific Limited (UK)	○	○
Yue Sheng Industrial Co., Ltd. (Taiwan)	○	○
Taiwan Central Glass Co., Ltd. (Taiwan)		○
Giga Gas & Electronic Materials Company (Taiwan)		○

○ : Certification acquired \*1 Eco-Action 21



Environmental and safety onsite audit (Bishu Silica Sand Co., Ltd.)



## Education and Training for Environmental and Safety Aspects

Under the recognition that all of our employees are talented individuals and treasures to the company, each of the workplaces in the Central Glass Group focuses their efforts on education and training. Education and training are indispensable for deepening the understanding of every one of our employees on CSR and the environment as members of society, as well as for acting in a responsible manner or minimizing damage when disasters occur. We offer education and training at each workplace in a timely manner by choosing themes that are suited to the implementation period and targeted employees with the goal of raising their awareness of such environmental, safety, and other issues.

In FY2013 we carried out disaster drills and provided education related to the environment and safety at many of our workplaces on several occasions.

One of these was our education at Central Engineering (education on the regulations for managing the chemical substances in products), in which all 187 of the employees participated. This served as an excellent opportunity for them to realize the importance of chemical substance management.

A partial list of the education and training related to the environment and other issues that were offered at our head office, research centers, plants, and affiliate companies in FY2013 is shown in the table below.

### Examples of environmental education and training held in FY2013

Workplace	Overview of education and training	Targeted persons	Time held	Number of attendees
Chemical Research Center	Emergency report training	Center staff	September 2013	85 people
Chemical Research Center (Ube)	SDS / Yellow Card, MSDSplus guidance	Center staff	June 2013	61 people
Glass Research Center	Awareness-raising education for safe work (viewed a safety video)	Center staff	February 2014	15 people
Ube Plant	The Fifth Ube Plant Safety and Health Convention	Employees of the Ube Plant and affiliate companies participated	August 2013	220 people
Matsusaka Plant	CPR & AED course	Operational departments, safety leaders, personnel in charge	April 2013	94 people
Matsusaka Plant - Sakai Manufacturing Site	Night-time contact and report training	Sakai Manufacturing Site employees	June 2013	55 people
Kawasaki Plant	Comprehensive earthquake disaster drills (fires and leaks)	All employees and all cooperating workplaces	October 2013	110 people
Central Engineering	Education on the regulations for managing the chemical substances in products	All employees	June 2013	187 people

## Environmental Accounting

We undertake environmental accounting in order to assess the environmental costs related to our environmental preservation initiatives for the air, water, soil, and disposal of waste. We have expanded the range we tally this for from the FY2013 report, and have included data for major affiliate companies carrying out manufacturing in Japan (12 companies). The amount invested has increased relative to the previous fiscal year on account of the hydrofluoric acid recovery

equipment built at our Ube Plant and the costs of energy conservation measures at our Matsusaka Plant.

In terms of cost-performance, our costs for pollution prevention measures for the air and water were increased.

For the future, we, along with our affiliate companies, will promote environmental preservation measures with capital investments and environmental preservation costs.

### Environmental Preservation Costs

(Unit: million yen)

Category	Major initiatives	FY2012		FY2013	
		Investment	Costs	Investment	Costs
(1) Business area costs		460	3,612	871	3,930
Pollution prevention costs	Preventing the pollution of the air, water, soil, etc.	211	1,979	301	2,112
Global environmental preservation costs	Preventing global warming and measures to conserve energy, etc.	41	78	204	88
Resource recycling costs	Waste disposal and recycling treatment, etc.	208	1,555	366	1,730
(2) Upstream/downstream costs	Collection, recycling, and appropriate disposal of products, etc.	0	0	0	0
(3) Cost of management activities	Maintaining the EMS, environmental monitoring, and environmental education costs, etc.	118	291	2	236
(4) Cost of R&D activities	R&D of products involved in environmental preservation	9	523	8	494
(5) Cost of social activities	Improving the environment, contributing to local communities, etc.	0	4	0	2
(6) Cost of dealing with environmental damage	Restoring the environment, compensation for environmental preservation, etc.	0	0	0	0
	<b>Total</b>	<b>587</b>	<b>4,430</b>	<b>881</b>	<b>4,662</b>

### FY2013 Performance for Environmental Preservation Results - Environmental Impact Index

Business area results	Environmental impact	FY2012 emissions (tons)	FY2013 emissions (tons)	Change (%)
Greenhouse gas	CO <sub>2</sub> equivalent	786,000	782,000	+0
Environmental impact substances	Atmospheric pollution (SO <sub>x</sub> , NO <sub>x</sub> , ash dust)	4,321	3,827	-11
	Water pollution (COD, total phosphorous, total nitrogen)	76	84	+11

# Environment & Safety Management

Social & Environmental Report 2014

## Quality Initiatives

Central Glass Group carries out quality control activities that place customer satisfaction first in order to provide products and services that are beloved by our customers, and that they can use with peace of mind. Not only do we comply with laws and regulations, but we also accurately determine our customers' requirements and reflect these in our products and services.

At our workplaces we strive to make continuous improvements in order to attain the quality objectives established pursuant

to our quality policy. We check and assess the conformity with the requirements as well as the validity of our Quality Management System (QMS), manufacturing processes, and products through quality audits and reviews, while tying this into activities to improve upon them.

In every one of our business fields, we offer high quality products and services that our customers can use with peace of mind, while also striving to make continuous improvements.

## Quality Management and Quality Control Examination (QC/QM Exam)

Central Glass has encouraged employees to take QC/QM Exams across the entire company since FY2008 as an initiative to acquire knowledge related to basic management and improvement activities for quality. These are introduced on a regular basis via our internal newsletter, and we have begun initiatives in the sales

divisions along with the quality, manufacturing, technology, and research divisions of each workplace. Taking QC/QM Exams boosts our employees' awareness of quality, while the knowledge and techniques acquired are used for quality activities and are useful for promoting excellent manufacturing.

## The 31st Company-Wide QC Circle Rally

We held the 31st Company-Wide QC Circle Rally at our head office in November 2013.

President Sarasawa gave an opening address, where he stated that Central Glass' foundation is in its manufacturing sites. He went on to say that, "In order to compete with overseas companies that can produce goods with cheap labor costs, our company will have to come together as a whole to cut costs using our considerable wisdom, ingenuity, and cohesiveness. I am very much looking forward to everyone's presentations today."

The number of circles that took part in this rally was nine in total, including five circles from affiliate companies and four from our plant's manufacturing divisions.

The speeches on proposals for various different improvements and measures to cut costs from each circle, as well as the question and answer session with judges and the attendees, made for an active presentation session.

Following the presentations, Executive Officer Iwasaki gave an overview by saying, "On the whole I thought the contents of the speeches and presentations were outstanding. As this is the 31st such rally, I believe that our experiences accumulated through past rallies have resulted in this great performance." After this, he offered comments to each circle. As a result of the judging, three of the circles were awarded with the gold prize while six were given the silver prize.



Awards Ceremony

The 31st Company-Wide QC Circle Rally

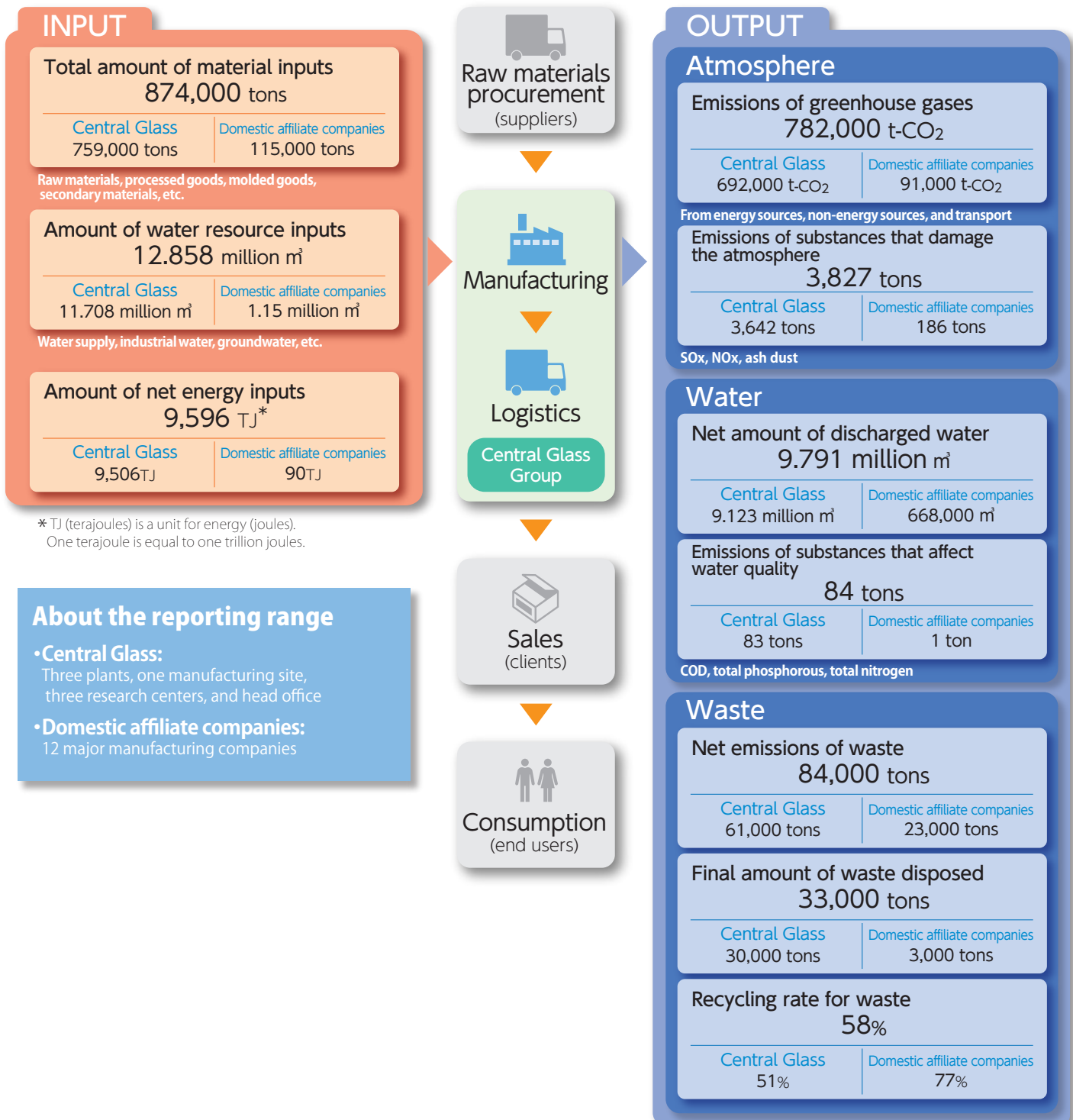




## The Flow of Substances at Central Glass Group

Central Glass Group quantitatively tracks the environmental impact of manufacturing processes in order to identify environmental issues and implement measures for making improvements in constantly striving to reduce the burden on the environment.

A huge amount of heat energy is needed to melt raw materials in the glass business, so its central issue is for measures to prevent global warming. The development of environmentally friendly products and reducing waste are the central issues of the chemicals business, and sustained efforts are being made for energy saving activities and to establish recycling systems.



# Environment

## Social & Environmental Report 2014

Central Glass, along with all of our affiliated companies, will strive to realize a rich society through measures that ensure the protection of the global environment and the health and safety of people in all of our activities ranging from the R&D stages to the purchasing of raw materials, manufacturing, distribution, use, disposal, and all other stages in the life cycle of our products.

### Our Efforts to Prevent Global Warming

Central Glass Group strives to reduce emissions of greenhouse gases emitted into the atmosphere through the manufacturing and shipper's transportation of goods in order to prevent global warming.

#### ◆Central Glass' Plants

Central Glass has set and is working towards the target of reducing the greenhouse gases given off from the use of fuel, purchased power, and raw materials for manufacturing by 15% relative to 2005 levels by 2020, with this serving as a mid-term initiative to prevent global warming. For FY2013 we reduced this by 28% compared to 2005 levels. Furthermore, we also calculate the greenhouse gas emissions from transportation by means of trucks, ships, railroads, and so on in relation to the domestic transportation of products.

Even though our greenhouse gas emissions from transportation rose relative to the previous fiscal year, hereafter we will continue to rationalize the energy we use for transportation.

#### ◆Central Glass Group

With respect to our emissions of greenhouse gasses (including those at our domestic and overseas affiliate companies), due to the increase in the number of our overseas manufacturing sites the greenhouse gas emissions for the Central Glass Group are on an upward trajectory.

No. of companies in Japan and overseas for which greenhouse gasses were tabulated		
2010 and before	2011	2012 and after
19 companies	20 companies	21 companies

Moving forward, we will continue to reduce emissions of greenhouse gasses in order to prevent global warming.

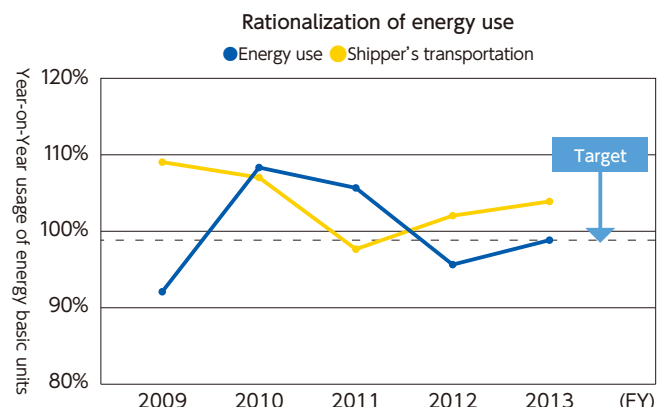
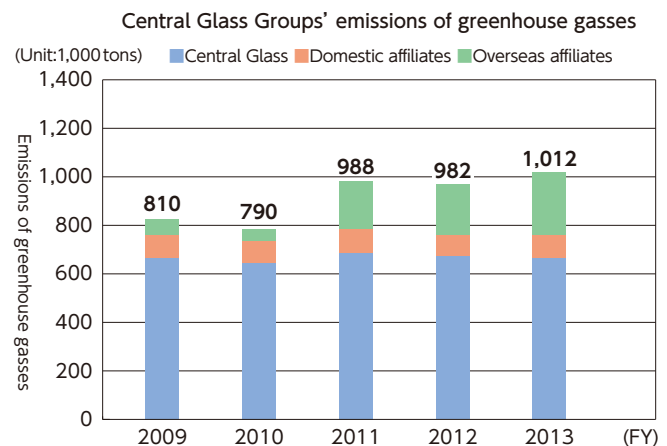
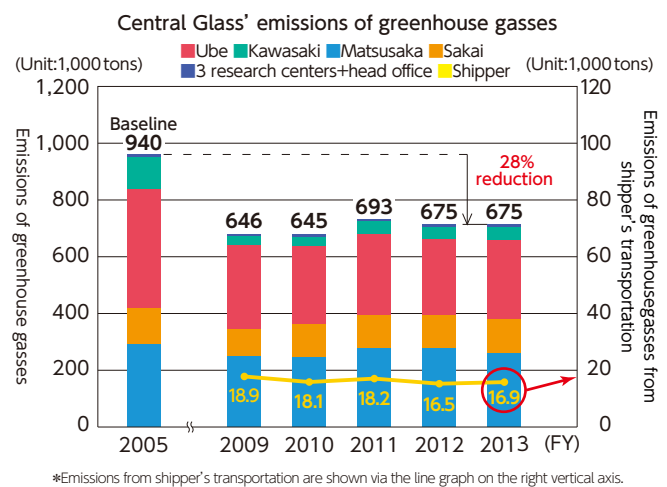
In order to calculate greenhouse gas emissions from purchased power at our overseas workplaces we used the emission coefficients of each country from the IEA CO2 Emissions from Fuel Combustion.

#### ◆Activities to Rationalize Energy

Pursuant to the Act on the Rational Use of Energy, Central Glass has targets to strive for rationalizing the use of energy such as fuel, purchased power, steam and so forth, as well as the energy involved in shipper's transportation. While we have not attained these targets at present, each of our workplaces continues to undertake activities to conserve energy in order to achieve these targets.

##### Major activities to rationalize energy

Item	Major rationalization activities
Energy use	Activities to conserve energy that include installing energy-saving equipment and modifying the operating conditions for the equipment, etc.
Shipper's transportation	Initiative that aims to improve our loading ratio through the simulation systems onboard our trucks Initiative to improve railroad and ship transportation over truck transportation



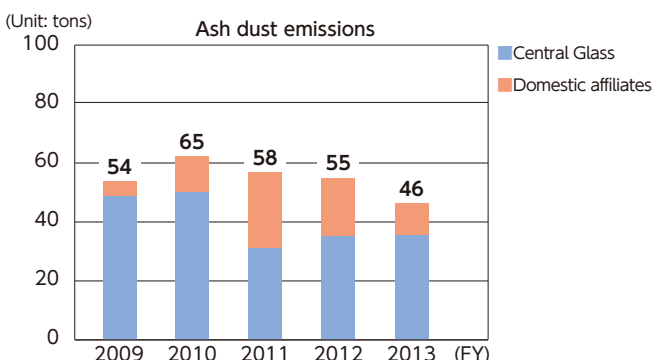
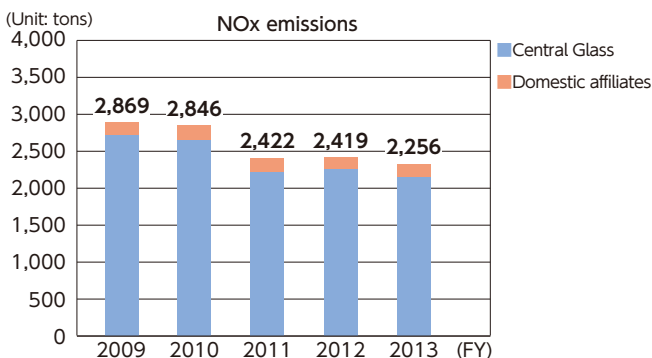
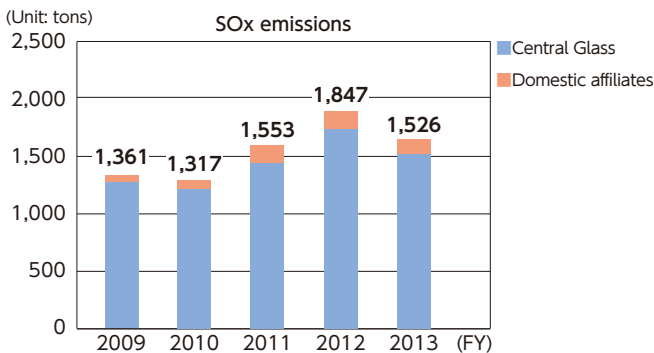


## Reducing Environmental Impact Substances

When it comes to Central Glass' manufacturing sites, our plants are operated in compliance with emissions standards for the atmosphere and water quality such as the Air Pollution Control Act, Water Pollution Control Act, and municipal government ordinances. Reducing environmental impact substances is an important challenge out of consideration for the global environment and human health and safety, and so for the future we will continue to undertake appropriate management for this.

### ◆Countermeasures Against Substances that Damage the Atmosphere

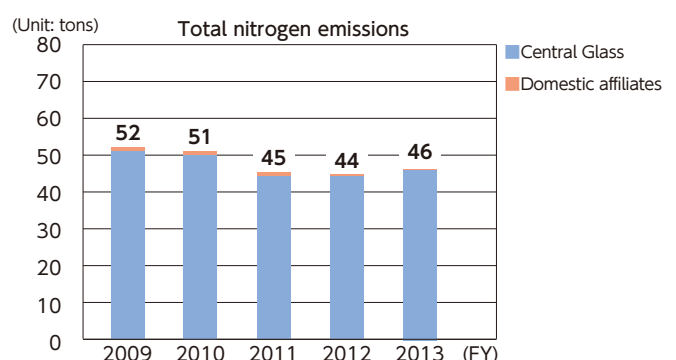
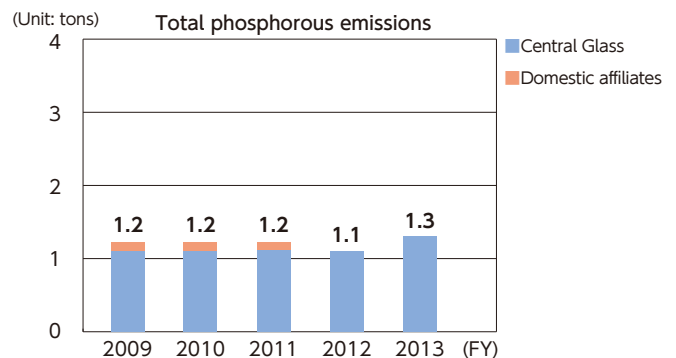
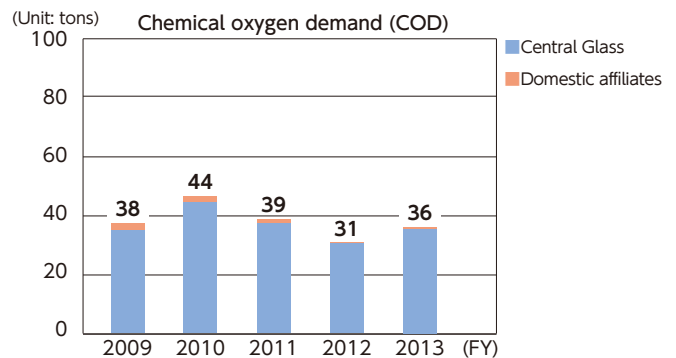
Of the substances that damage the atmosphere, trends in our emissions of sulfur oxide (SOx), nitrogen oxide (NOx), and ash dust are shown below. The variations in our emissions are largely due to our production output. In order to curb emissions of these substances, our plants have been installing abatement equipment and undertaking management to ensure that they fall well under environmental standards.



### ◆Countermeasures Against Substances that Affect Water Quality

Of the substances that affect water quality, trends in our emissions of chemical oxygen demand (COD), total phosphorous, and total nitrogen are shown below.

Our plants undertake management in order to curb emissions of these environmental impact substances and comply with emissions standards.



# Environment

## Social & Environmental Report 2014

### Initiatives to Reduce Industrial Waste

Central Glass soundly complies with the Wastes Disposal and Public Cleansing Act and other relevant laws when it comes to the sorting and storage of waste as a waste emitter, as well as the consignment, monitoring, and manifest management for proper disposal by industrial waste disposers, along with our Group companies both in Japan and overseas.

#### ◆Central Glass' Plants

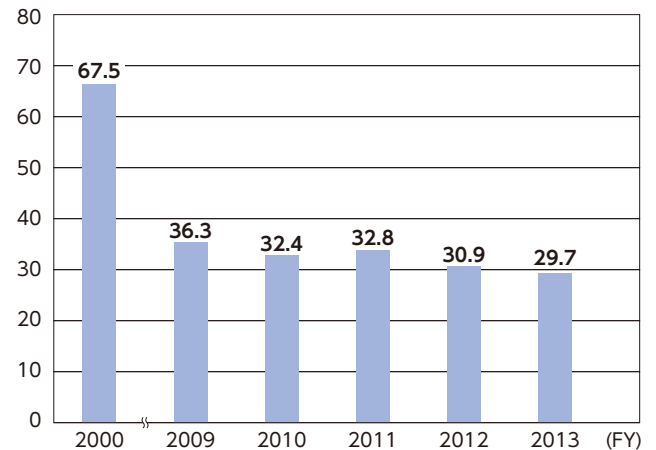
Central Glass' plants have held up "promoting reductions and recycling of industrial waste" as an important task for our responsible care activities since 1995, and we have been working to reduce waste across all of our workplaces. The amount of waste (final amount disposed) in FY2013 came to approximately 30,000 tons, for a 56% reduction compared to FY2000 levels. We have laid out the goal of reducing this by 65% compared to FY2000 levels by FY2015, and have been making efforts to achieve this target. By way of initiatives for recycling resources, for our chemicals business we began the full-scale operation of a treatment facility that recycles the sludge waste generated from our plants into the raw materials for cement in 2009. We are currently aiming to further increase the amount treated in this manner, and are presently implementing initiatives that would allow us to treat 10,000 tons each year. For our glass business, as things currently stand nearly 100% of the enormous volume of cullet generated at our plants is reused as raw materials.

#### ◆Central Glass Group

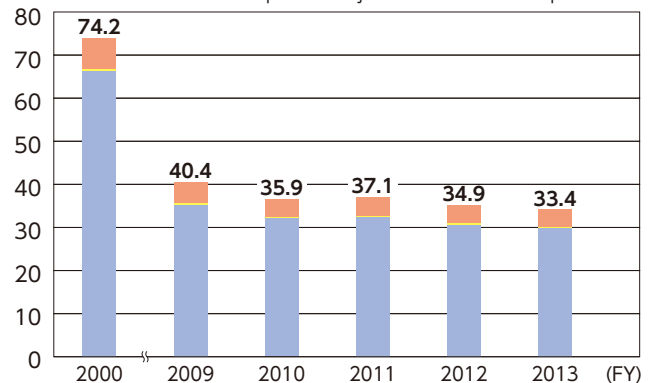
Each one of Central Glass Group's major domestic affiliate companies carries out its own original reduction measures, and as a result on the whole our major domestic affiliate companies have roughly halved their amount of waste (final amount disposed) in recent years relative to FY2000 levels. But over the last several years, we have been reaching the limits on how much this can be reduced.

We began tabulating our overseas affiliate companies starting in FY2013. Efforts to reduce waste are carried out by each individual company, and in particular our glass plants deployed overseas have been working to reuse a nearly 100% proportion of their glass, just like for our domestic plants.

Final amount of industrial waste disposed (Central Glass' plants)  
(Unit:1,000 tons)



Final amount of industrial waste disposed (Central Glass Group)  
(Unit:1,000 tons)



### Green Procurement

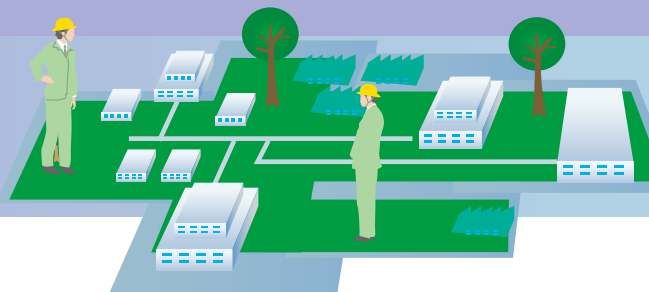
Central Glass and our domestic affiliate companies enacted "Green Procurement Guidelines" in 2006, and have begun giving priority to purchasing products and services from suppliers that strive to reduce their environmental impact. In March 2014, we revised the Central Glass Group's "Green Procurement Guidelines" given the fact that cases in which judgments could

not easily be made in a business sense arose, as did variance in the judgment criteria. In April 2014 we also clarified the judgment criteria and narrowed down the targeted items in order to allow for new green procurement efforts. We are forging ahead with such efforts so that green procurement will be deployed throughout the Central Glass Group in a phased manner.



# Safety

## Social & Environmental Report 2014



Central Glass Group recognizes safety of chemical substances, security and disaster prevention, and occupational safety and health as the most important challenges in our corporate activities and promotes initiatives for each of these.

### Safety of Chemical Substances

The regulations on chemical substances in countries around the world have grown more sophisticated with a view towards achieving the goal from the accord of the 2002 World Summit on Sustainable Development in Johannesburg of "Aiming to achieve, by 2020, the use and production of chemicals in ways that lead to the minimization of significant adverse effects on human health and the environment," with these including Europe's REACH regulations and Japan's revised Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. Furthermore, in recent years revisions to laws on chemical substances have been pushed forward in Asian countries, and so we must continue to comply with these in the proper manner. Against this background, Central Glass Group is working to ensure safety through a variety of different initiatives at every stage in which chemical substances are handled.

#### ◆Management of Chemical Substances

Central Glass has been surveying, aggregating, and reporting PRTR\*1 data voluntarily since 1995, prior to the enactment of the Chemical Substances Management Act\*2 (2000), in an effort to reduce emissions of chemical substances into the environment. The number of substances subject to notification in FY2013 at Central Glass and its domestic affiliate companies decreased by four substances compared with the previous fiscal year to 64 substances. What is more, we comply with laws and regulations such as the Occupational Safety and Health Act, the Poisonous and Deleterious Substances Control Act, and the High Pressure Gas Safety Act. Our affiliate companies in both Japan and overseas work to get a grasp of local laws and the chemical substances they handle in an effort to promote the management of chemical substances from a global perspective.

We will continue working to properly manage chemical substances.

\*1 PRTR: Pollutant Release and Transfer Register

\*2 Chemical Substances Management Act: Act on Confirmation, etc., of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof

#### ◆SDS

Central Glass and our domestic affiliate companies strive to provide information through SDSs\*1 that conform to GHS\*2 for chemical substances for which such provisions are not necessarily legally mandated, such as for chemical substances in the development phase. When handling chemical substances and the like, measures necessary for risk abatement can be taken based on the information listed in the SDSs, which is conducive to protecting safety and the environment. What is more, SDSs are uploaded to our internal databases to promote the sharing of safety information across the entire company.

\*1 SDS: Safety Data Sheet. These are data sheets that list information related to the hazardousness of chemical substances and the like as well as information concerning the environment.

\*2 GHS: The Globally Harmonized System of Classification and Labeling of Chemicals

#### ◆Handling Asbestos

Parts containing non-scattering asbestos have been used in some of the production facilities at Central Glass and our domestic affiliate companies in equipment such as the heat insulating material and packing for pipes. Therefore, we undertake appropriate management by identifying the target locations for said parts and removing them in sequence when the facilities are upgraded. Moving forward, we will continue to comply with laws and ordinances and promote appropriate measures for this.

#### ◆Handling PCB Waste

Central Glass and our domestic affiliate companies rigorously store and manage waste condensers and other equipment that contain PCBs (polychlorinated biphenyls) in compliance with the PCB Special Measures Law. The legally mandated disposal of the corresponding PCB waste is promoted at Japan Environmental Safety Corporation (JESCO) facilities in each district. In FY2013 three of our affiliate companies in the Tokai District completed the disposal of their PCB waste.

At the same time, we also undertake the appropriate management of what could be termed low-concentration PCB devices, which have been confirmed as having PCB intermixed in them.

#### ◆Initiatives for Green Procurement

Central Glass is promoting the following initiatives across the entire company in order to proactively advance "green procurement." Green procurement gives priority to procuring raw materials and materials that have less of an impact on the environment when obtaining such goods. Nowadays, as a result of moves like the enactment of Europe's REACH regulations and the revised Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc., thoroughly ensuring the management of chemical substances throughout the entire supply chain and sharing information related to the chemical substances contained in products have grown increasingly important. Through these initiatives we will promote the reliable management of chemical substances and accommodate requests for the public disclosure of information.

- ◆Select environmentally conscious raw materials from the R&D through to the trial manufacturing stages
- ◆Manage raw materials based on the "Green Procurement Guidelines" and the "Environmental Impact Substances Management Guidelines"
  - Confirm the environmental management systems of our suppliers
  - Confirm whether or not substances that we have voluntarily chosen to restrict are contained within the raw materials we purchase
- ◆Prevent the intermixing of environmental impact substances through appropriate process management
- ◆Product management (management of packaging materials and confirmation that targeted chemical substances are not contained within products)
- ◆Share information between the concerned parties through the creation and use of a "Green Procurement Database"
- ◆Provide education for the persons in charge of the relevant departments

# Safety

## Social & Environmental Report 2014

### Security and Disaster Prevention

Since most major plants of Central Glass are located in areas designated according to the Act on the Prevention of Disaster in Petroleum Industrial Complexes and Other Petroleum Facilities, each plant has established a full-scale security and disaster prevention system under the guidance of the authorities concerned with the environment, security, and disaster prevention in aiming to completely eliminate facility disasters. We make efforts to preemptively prevent accidents and disasters through efforts like activities at each plant that are based on the "Security and Accident Prevention Guidelines" compiled by the Japan Chemical Industry Association (JCIA) and the passing down of know-how to our young employees. We carry out drills at our plants and workplaces that simulate various different disasters and abnormal conditions in the aim of raising our level of disaster preparedness, with this including our employees and the employees of each plant's contractors.

What is more, we are sequentially moving forward with the formulation

of business continuity plans (BCPs) in each division in the event that an earthquake or similar disaster were to occur. BCPs are action plans for not only first responses such as securing employee safety and preventing secondary disasters, but also for continuing on with important businesses or restoring them in as short a time as possible.

We will continue with such activities on into the future with safety as our highest priority.



Fire drill  
(Kawasaki Plant)

### Occupational Safety and Health

Our belief that ensuring a workplace in which our employees can work safely without injury is the foundation of all our business activities. Therefore, we at Central Glass promote occupational safety and health activities at all of our workplaces, including at our domestic affiliate companies.

For 2013, we have carried on with activities based around the mainstay of our Policies on Safety and Health, which include items such as "raise awareness of safety" and "set in place work manuals and ensure thorough compliance with them." In addition, we called attention to safety measures by holding the "Summertime Industrial Accident Prevention Campaign," as well as by issuing a white paper on "Occupational Accidents" and awarded "Safe Operation Awards" in 2013 to further motivate awareness of occupational safety. However, the frequency rate of accidents that required lost working hours in 2013 worsened compared to 2012 both at Central Glass and our cooperating companies, with the end results for this at our cooperating companies\* in particular exceeding standards for the manufacturing business.

A characteristic of the industrial accidents at Central Glass is that many of them are similar. We feel that it is important to make steady efforts to prevent accidents, such as by continuing to learn from past cases of accidents and taking measures to raise risk awareness.

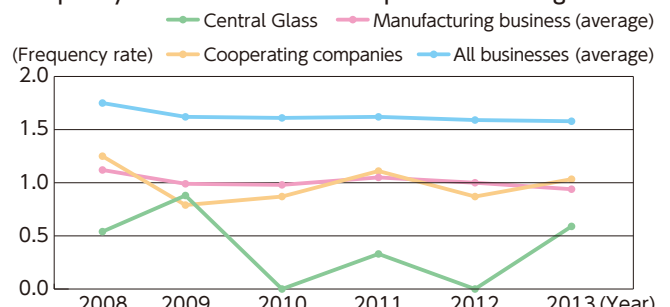
We will continue to make efforts to reduce the occurrence of accidents, including through such initiatives, into the future.

\*Cooperating companies: Affiliate companies and cooperating contra

#### <2013 Policies on Safety and Health-Priority Implementation Items>

- 1.Improve and raise awareness of safety (foster sensitivity towards risks through personal experiences, etc.)
- 2.Set in place basic operation manuals and ensure thorough compliance with them (the work of operating equipment in particular should be executed according to manuals)
- 3.Overhaul equipment and eliminate unsafe conditions and equipment
- 4.Establish a system for occupational safety and health management (risk assessments)
- 5.Enhance safety promotion activities and strengthen safety and health education and training
- 6.Prevent traffic accidents during everyday driving as well as commutes
- 7.Promote health care, the maintenance of health, and mental health care
- 8.Strictly comply with no-smoking rules in workplaces (encourage separate smoking areas and urge employees to quit smoking)
9. Comply with the reporting system for when accidents occur

#### Frequency rate of accident that require lost working hours



Frequency rate of accidents that require lost working hours  
= (Number of deaths or injuries by accident / Total work hours) x 1,000,000  
(The frequency rate of accidents that require lost working hours per one million working hours)

### Logistics Safety

Central Glass and its domestic affiliate companies implement periodical training and education not only for their employees but also employees in the workplaces to which they consign transporting. This is done to prevent accidents when transporting chemical substances and to minimize the damage if accidents occur. For example, at our Ube Plant when drivers are appointed to transport things like high-pressure gasses, the transportation managers educate them. Furthermore, our domestic affiliate companies that handle logistics for chemicals provide education via SDS at monthly safety meetings and the like.

For the transportation of chemical substances such as toxic materials by road, we prepared emergency contact cards (Yellow Cards) in line with our Logistics Safety Guidelines, and mandate drivers of the relevant vehicles carry the cards. On the cards, the measures to be taken to minimize damage and details to be reported are clarified, so that the transporter or firefighters or police officers can respond appropriately and promptly, should an accident occur during transportation by road. The details listed on these cards are periodically revised by the relevant departments.



The support of and harmony with members of the local community are absolutely essential for companies' continued existence. Central Glass will continue to build even better relations with every one of its stakeholders, starting with members of local communities and customers, while also growing and improving together with society towards realizing a sustainable society.

### Taking Part in the Regional Dialogue Workshop in the Ube District

The three chemical companies located in the Ube District hold a regional dialogue workshop every year. This year marked the 11th workshop, which was held on January 25, 2014 at the Ube City Cultural Hall, and 56 people from the administration, local NGOs, and local citizens participated.

First, the three participating companies gave presentations on outlines of their plants and their environmental initiatives, the JCIA explained chemical industry initiatives that aim for sustainable development, and officials from Ube City explained how they would inform the citizens in the event of a disaster at

an industrial complex. Afterwards, the participants were divided into three groups to discuss the theme "Expectations for Local Chemical Companies," on which they exchanged opinions. Each group engaged in spirited debate on the subject with specific opinions being exchanged on issues like security and the environment, and the local government provided information, thus making this dialogue workshop a very productive one. In order to hear their opinions and to assure them that we are operating in the safest and most secure manner possible, we intend to continue our communications with the people in our communities.



Presentation by Central Glass



Meeting to exchange opinions

### Junior Science Classes

The "Summer Vacation Junior Science Class" is held every year under the auspices of the Summer Vacation Junior Science Class Executive Committee and jointly hosted by the Yamaguchi Industrial Promotion Foundation in cooperation with universities, technical colleges, corporate research institutes, and more. It is held in the hope of showing children with infinite potential for the future how interesting and fun science can be. In 2013, it was held in 17 venues in Yamaguchi Prefecture in collaboration with 15 related organizations between July 25 and August 26. Central Glass wholeheartedly agrees with the premise, and on August 6 we held a class in the Chemical Research Center (Ube) in which 20 elementary and junior high school students from Ube City and other cities in Yamaguchi Prefecture participated. Under the theme of "Let's experience the wonders of heat and light," young researchers played the role of instructors and prepared numerous hands-on experiments using household items. It was structured so that all of the children could personally experience and enjoy science by having them form small groups. During the class, the children engaged enthusiastically in the experiments and sometimes gasped in

surprise while their parents kept a close eye on them, and many parents marveling at the experiments themselves were seen throughout the venue.

We hope to be able to continue playing an active role in hosting these classes in the future to provide opportunities for more children to learn how exciting science can be and grow up with an interest and curiosity in science.



Conducting experiments



### Beach Clean-Up Volunteer Activities

The Ube Branch of Central Glass Labor Union engages in a variety of volunteer activities to contribute to the local community. As one of such activities, every year in November it takes part in the volunteer clean-up of Nishikiwa Beach, which is sponsored by the Ube District Council of Workers' Welfare, with 2013 marking the fourth time it has taken part in this activity. Garbage that drifts ashore, driftwood, and other debris are scattered across the entire beach, therefore a large number of people is required to completely clear this off. For this reason, not only members of the Council including our labor union but also local people, who all have the same goal, carry out the clean-up activities. Though the work only lasts a short period of time, since everyone sets to work with a single mentality in the effort, the beach is beautified to the point that it is transformed beyond recognition.

As a separate goal of this initiative, it is meaningful in terms of fostering the recognition in our company employees that

they share close ties with the community. During the cleanup, employees enjoy communicating with local residents. By taking part in this initiative, the participants share a variety of experiences with their colleagues such as a sense of achievement or fulfillment from seeing the huge pile of garbage that they gathered themselves.

This is an activity that has been incorporated into the policy of the labor union, and we plan to continue our active involvement in this.



Clean-up activities

### Daishi Tobu Rokuchokai

Since our Kawasaki Plant is located in an exclusive industrial zone, it does not have many opportunities to hear the opinions of the local residents. But an exchange session with a nearby neighborhood association (the Six-Town Council for Eastern Daishi), which is hosted by the Ukishima Joint Disaster Prevention Board, of which the plant is a member, is held twice yearly (summer/winter), which offers it a rare occasion for communicating with the local residents.

The annual summer exchange session was held on a roofed pleasure boat, where attendees could offer various opinions and ask questions of the companies in attendance as they circled Yokohama's Minatomirai Region, thus making for an

extremely meaningful session.

The Kawasaki Plant will proactively take part in this in the future because the session allows it to directly hear the opinions of the local residents as it strives for greater communication with them.



Exchange session on a roofed pleasure boat

### Campaign to Send Used Clothing to Thailand and Laos

The Central Glass Labor Union engages in a variety of volunteer activities to contribute to local communities. In FY2013, it collected clothing that is no longer used by families and carried out the Campaign to Send Used Clothing to Thailand and Laos. When the participants were sorting the clothes, some gym suites with owner's names written in them were discovered. Picturing images of the local children in Thailand and Laos dressed in them brought warm feelings to the participants. On the whole, the Central Glass Labor Union collected a total of 28 boxes worth of clothes, including 22 large cardboard boxes and six medium ones, which were delivered to local sites in the countries through the Commission for the Solidarity with the Asian Underprivileged (CAS). At the same time, we also cooperated in raising money for the shipping, and provided cooperation worth 33,400 yen for the 28 boxes.

Through this initiative each and every one of the participants recognized that there are people who are in need of aid, and that they must not lose sight of a mentality of valuing things. The labor union's volunteer and charity activities are considered to occupy an important position for contributing to society, and we will continue working on these with the understanding and cooperation of all of our employees in the future.



Large quantities of the collected clothes





## Central Glass International Architectural Design Competition

Central Glass has been sponsoring competitions for architectural design ideas since 1966. Since the 10th competition in 1975, it became an international competition as the “Central Glass International Architectural Design Competition” to invite entries from overseas. The theme of the 48th competition in 2013 was “Bringing the Urban Environment into Architecture.” There were 312 entries in total, 205 entries from Japan and 107 from overseas (refer to the back cover for the First Place Prize design). The theme of the 49th International Architectural Design



Award ceremony after the final screening (First Place Prize)

Competition in 2014 is “A City Symbol Loved by Residents.” We live in a time in which we need to pursue economic efficiency and rationality while simultaneously preserving the natural environment and protecting historical and traditional culture. As a company that promotes architectural culture, we believe that it is highly meaningful for us to provide occasions to consider a desirable society and environment through this competition. Central Glass takes great pride in our continuing efforts to sponsor this competition for many years.

**Chief Judge :** Riken Yamamoto  
(Riken Yamamoto&Field Shop)

**J u d g e s :** Kiyoshi Sakurai  
(Sakurai Architects Studio-ETHNOS)  
Taro Ashihara  
(Taro Ashihara Architects)  
Teruo Kobayashi  
(Obayashi Corporation)  
Hiroshi Naito  
(Naito Architect & Associates)  
Kengo Kuma  
(Kengo Kuma & Associates)

**Coordinator :** Shozo Baba  
(Architectural critic)  
(Titles omitted, listed in random order)

## Major Cooperation and Aid Activities

**Sept.2013** 2 million yen was donated by Central Glass to the NPO People’s HOPE Japan to fund surgeries for heart diseases (ongoing support)

(The following activities were carried out by our labor union)

- July.2013** Campaign to aid atomic bomb survivors: 132,154 yen  
At the request of RENGO Local of Yamaguchi, donated to Yuda-en, a support center for atomic bomb survivors in Yamaguchi Prefecture
- Sept.2013** Campaign for the heavy rainfall disaster in Yamaguchi and Shimane: 110,366 yen  
At the request of RENGO Local of Yamaguchi
- Sept.2013** Ecocap movement (provided to collectors): 78,000 caps  
When converted to the costs for purchasing polio vaccines, this is enough for about 100 people; donated to an NPO
- O ct.2013** Roadway Clean-up Volunteers for the Ube Plant Festival: 60 participants  
Sponsored by the Ube Branch of the Central Glass Labor Union
- Dec.2013** Year End Welfare Campaign by Ube District Committee, the Chubu Regional Council, RENGO Local of Yamaguchi: 100,000 yen  
Donated to the Shinsei-kai Ube Kurumi-en, a social welfare corporation in Ube City via the Ube District Committee
- Dec.2013** RENGO Ai Campaign by the Japanese Federation of Energy and Chemistry Workers Unions (JEC): 278,184 yen
- Dec.2013** Donated 50,000 yen as activity expenses to the NPO “Mirai eno Kizuna”  
Donated as expenses for an exchange session with junior high school students in Fukushima Prefecture from the volunteer charity fund

# Employees

## Social & Environmental Report 2014

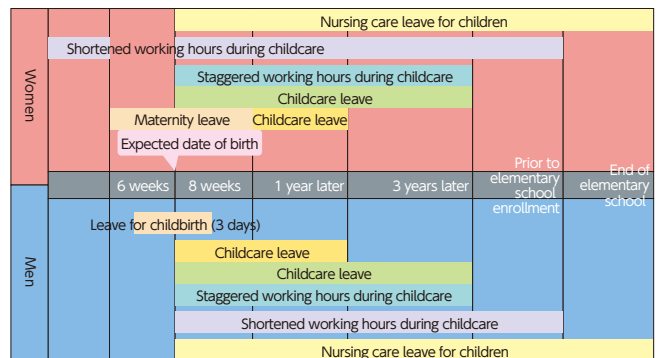
### Making Things Is about Developing Human Resources

Central Glass perceives “developing human resources” as being the foundation for our corporate development, and we strive to create an environment in which each one of our employees can demonstrate their capabilities and abilities to the utmost extent possible. We encourage voluntary capacity development through offering an educational system that supports employees in improving their skills as well as adopting Career Assessment for the Next! (CAN!), a personnel assessment system that performs multifaceted assessments of employees’ ability to accomplish tasks, their competencies, management by objectives, and more. We also institute a variety of health management and mental health care measures for all our employees to support them in maintaining both their physical and mental health. In addition, we promote initiatives to support childbirth and childrearing for our employees to achieve a well-rounded work-life balance.

### Initiatives to Support the Development of the Next Generations

In Japan, where birthrates are falling rapidly, it is absolutely essential that environments for rearing the children who will lead the next generations be set in place across society as a whole. Central Glass has introduced systems for shortened and staggered working hours during childcare in order to support employees in giving birth to and raising children across the company as a whole as a means of supporting the rearing of the next generation. For the future, we will continue endeavoring to create a work environment that allows employees to strike a balance between work and rearing children by valuing their opinions, while also promoting the creation of a corporate culture in which every employee can work in an active and positive manner.

■ List of schemes to support the development of the next generation



### Comment from a User of the System for Shortened Working Hours During Childcare

I have a two-year old son, and I am currently using the system for shortened working hours during childcare to shorten my work time by one hour (30 minutes each in the morning and evening). Since I was reinstated at the same workplace, my essential duties are the same as they were before taking maternity and childcare leave, but my awareness of how I work has changed enormously. Since my working time is limited, I make efforts to forge ahead with my tasks by performing meticulous scheduling, making efforts to advance my work along as efficiently as possible, and concentrating until I'm at a good stopping point. In using the system, I have received the cordial understanding of my boss and the other people around me in the workplace, who have made considerations and offered support in a variety of ways when it comes to my duties. I am also receiving cooperation from my family in this, and I intend to continue working in the future by valuing the time spent with my child.



Information & Computer Systems Department  
Emi Hada

### Language Education

It is essential that we improve the language proficiency of our employees amidst the accelerating tides of globalization. Central Glass provides support to its employees to enhance their language education and allow them to develop into human resources who are capable of responding to this globalization. In learning English, many of our employees take a learning program that uses Internet phone calls in the aim of improving their

communication abilities in English. We have also adopted the TOEIC IP test across the entire company as an indicator to measure English proficiency. We have set the target score at 600 points or higher, especially for employees who are under 35 years old, with everyone working hard to exceed the target score. In addition to English, we also offer language programs suited to working needs, such as Chinese, German, and Korean.



## Comment from a Participant in the English Learning Program

I am currently taking my company's English learning program that uses Internet phone calls. The teacher is a Canadian and I have one 50-minute session every week. Since I can take the lessons in a way that suits my schedule, I can continue to work on this with ease. The content of the lessons includes discussions on set themes and correcting the writing assignments that I submit prior to each class. While one lesson a week is not much, in each lesson the teacher gives me reading, listening, and writing assignments on the topics we touched on in the lesson, which I work on independently. Moreover, since the teacher points out areas where I tend to make mistakes in the post-lesson feedback and I am working to improve my knowledge and skills in such areas, I feel that I'm able to learn English efficiently. In my work, there are numerous opportunities to use English, such as when creating drafts of international contracts, translating the research reports and press releases of affiliate companies into English, and when providing English interpretation at international conferences. So I would like to continue further improving my English through this program.



International Business  
Department  
**Satoshi Kiriya**

## Overseas Occupational Training Program and Study Abroad Programs

We introduced our overseas occupational training program starting in 2011 to foster human resources who are capable of smoothly promoting our operations overseas. With this system, trainees receive occupational training at one of our overseas affiliate companies for a fixed period of time, where they learn things such as knowledge related to actual manufacturing sites, the business customs, communication skills, and culture of the country. With our short-term language study abroad program, we dispatch employees who require a high level of foreign language proficiency to carry out their duties to language schools in other countries for about three to six months. We also dispatch several people every year to study for MBA and MOT degrees in Japan and overseas in order to foster

specialists with advanced expertise and knowledge. Our MBA study abroad program is designed to foster candidates for high-level managerial positions, who will be responsible for the future development of Central Glass. Our MOT study abroad program is designed to foster human resources who are well versed in both technology and management, and who are capable of promoting strategic research and technical development.



Training at Carlex Glass America

## Comment from an Attendee of an MOT Course

For two years from April 2012 to March 2014, I attended the Part-Time Evening MBA Program (General Management) at the Waseda Business School. In this program, lectures are held on weekday nights and Saturday daytimes, with the first year consisting primarily of classes in general subjects related to business management in the form of lectures, case discussions, and group work. In the second year, I was placed in a seminar specializing in Management of Technology (MOT), where I conducted specialized research under the guidance of my professor. Through my seminar activities, I learned about methods for drafting technical strategies through scenario planning, strategic decision making, technical assessment methods, and innovation methods. Waseda Business School is not a professional graduate school for MOT, and since the attendees came from a variety of different occupations, age ranges, genders, and nationalities, it provided me with the invaluable opportunity to build wide-ranging personal networks. I would like to share and utilize the experiences I acquired from taking this program at Central Glass.



Glass Business Planning &  
Development Department  
**Yasutaka Tsuda**

# Activities at Factory

## Social & Environmental Report 2014



### Ube Plant

#### Plant Overview

Address	5253 Ooaza Okiube, Ube City, Yamaguchi
Number of employees	506 (as of March 31, 2014)
Major items produced	Soda ash, fertilizer, fluorine-related products, other chemicals
	Acquired ISO 14001 certification (December 2000) Acquired ISO 9001 certification (December 1997) Acquired OHSAS 18001 certification (April 2011)

#### Regional Activities

- Clean-up activities for city and prefectural roads on the plant's simultaneous 5S days (once a month)
- Clean-up activities for Tokiwa Park (once a year)
- Clean-up activities for Lake Ono (once a year)
- Activities to protect and raise grasslands at Akiyoshidai (once a year)
- Clean-up activities for Ube-Higashi Port (once a year)
- Forest improvement activities to protect water (once a year)
- Road clean-up activities using sweepers (every day)

The Ube Plant started producing soda ash and caustic soda in 1936, and expanded its operations into chemical fertilizer and inorganic chemical products. At present, it also produces active ingredients for pharmaceuticals and high purity fluoride gas, and is working to expand into fine chemicals as well. Since 2010, the plant has begun producing lithium-ion battery electrolytes for electric vehicles and so forth, and has been working to produce environmentally friendly products. In addition, the plant's green spaces have been furnished with rows of cherry blossom trees for their landscaping, and in the spring the local residents enjoy nature in harmony with the figures of beautiful cherry blossoms. Moving forward, it will continue striving to be a safe and open plant that members of the local community can look on with peace of mind.



General Manager of the Ube Plant  
Nobuyuki Tokunaga

#### PRTR

(Unit: kg/year)

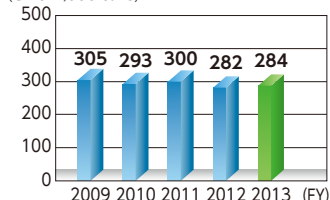
Ordinance designation No.	Substance name	Atmospheric emissions	Discharge into water	Discharge into soil	Quantity transferred
16	2,2'-Azodiisobutyronitrile	0	0	0	0
33	Asbestos	0	0	0	13,000
41	3'-Isopropoxy-2-trifluoromethylbenzanilide (also known as Flutolanil)	0	0	0	0
53	Ethylbenzene	1,800	0	0	0
80	Xylene	2,700	0	0	3
81	Quinoline	0	0	0	0
186	Dichloromethane (also known as methylene chloride)	4,800	0	0	17,000
232	N,N-Dimethylformamide	19	0	0	8
243	Dioxins (Unit: mg-TEQ/year)	0.065	0.0049	0	0
277	Triethylamine	0	0	0	1,400
281	Trichloroethylene	1,200	0	0	0
296	1,2,4-Trimethylbenzene	99	0	0	0
300	Toluene	2,200	0	0	7,500
349	Phenol	100	180	0	0
374	Hydrogen fluoride and its water-soluble salts	670	0	0	9,900
400	Benzene	4,400	0	0	0
411	Formaldehyde	0	0	0	0
438	Methylnaphthalene	39	0	0	0

The quantities emitted, discharged, or transferred are listed for those materials for which more than 1,000 kg is handled every year (except for dioxins)

#### Data on the Ube Plant

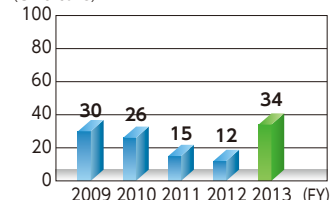
##### CO<sub>2</sub> emissions

(Unit: 1,000 tons)



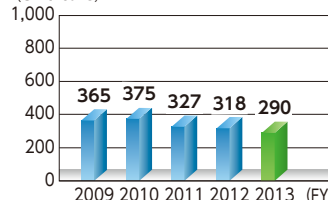
##### Emissions of sulfur oxide (SO<sub>x</sub>)

(Unit: tons)



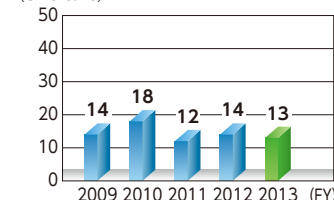
##### Emissions of nitrogen oxide (NO<sub>x</sub>)

(Unit: tons)



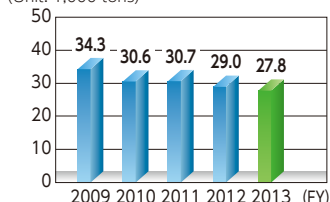
##### Emissions of ash dust

(Unit: tons)



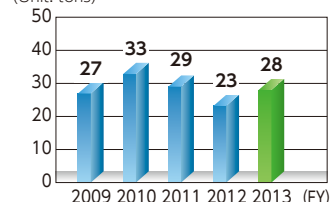
##### Final amount of industrial waste disposed

(Unit: 1,000 tons)



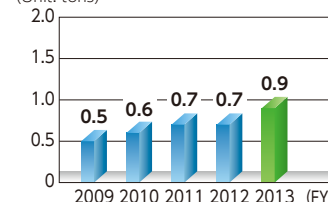
##### Chemical oxygen demand (COD)

(Unit: tons)



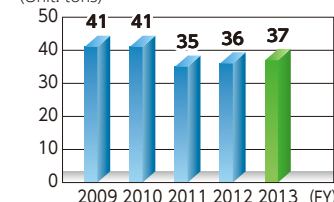
##### Emissions of total phosphorous

(Unit: tons)



##### Emissions of total nitrogen

(Unit: tons)







## Kawasaki Plant

### Plant Overview

Address	10-2 Ukishima-cho, Kawasaki-ku, Kawasaki City, Kanagawa
Number of employees	189 (as of March 31, 2014)
Major items produced	Inorganic chemicals, organic chemicals
	Acquired ISO 14001 certification (May 2007)
	Acquired ISO 9001 certification (July 2001)

### Regional Activities

- Roku Cho Kai (periodic get-togethers with nearby residents in Tono Town, Daishi District, etc.)
- Periodic clean-up activities for the roads around the plant
- Periodic information exchange sessions concerning the environment and safety with neighboring plants in the industrial complex
- Holds local environmental improvement activities related to environmental security through the Research Society for Environmental Protection Technology in Kawasaki Industrial Complex
- Participates in joint disaster drills with neighboring offices in Ukishima District

The Kawasaki Plant has recently made the switch from the electrolytic soda business to the fine chemical business. Currently its flagship products include HFC-245fa (a CFC alternative), for which it has the sole production process in the world, as well as pharmaceutical intermediates, cleaning gas for semiconductors, photoresist materials, and more. It consists of a system for stably supplying fine chemical products over a broad range.

Moreover, it has also started full-scale production of environmentally friendly products, such as 1233E, a CFC alternative with a low global warming coefficient, and the next-generation product of lithium-ion battery electrolytes.

While its products have changed with the times, the Kawasaki Plant's forethought for the environment and safe operations have remained the same throughout every era, and the entire plant will continue working with all its energy to achieve perfect marks for this.



General Manager of the Kawasaki Plant  
Yukinari Hashimoto

### PRTR

(Unit: kg/year)

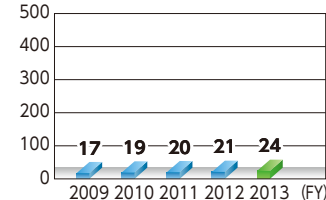
Ordinance designation No.	Substance name	Atmospheric emissions	Discharge into water	Discharge into soil	Quantity transferred
81	Quinoline	0.04	0	0	0
94	Chloroethylene (also known as vinyl chloride)	3,000	38	0	0
149	Tetrachloromethane	590	0.3	0	32,000
213	N,N-dimethylacetamide	22	0	0	62,000
243	Dioxins (Unit: mg-TEQ/year)	0.027	0.31	0	0
262	Tetrachloroethylene	0.11	0	0	3,500
280	1,1,2-trichloroethane	1	3.6	0	6,300
281	Trichloroethylene	0	0.1	0	1,200
374	Hydrogen fluoride and its water-soluble salts	0	0	0	9,000
392	n-hexane	0.54	0	0	8,300

The quantities emitted, discharged, or transferred are listed for those materials for which more than 1,000 kg is handled every year (except for dioxins)

### Data on the Kawasaki Plant

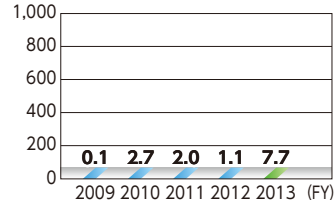
#### CO<sub>2</sub> emissions

(Unit: 1,000 tons)



#### Emissions of nitrogen oxide (NOx)

(Unit: tons)

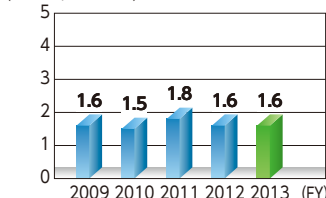


With regard to emissions of sulfur oxide (SO<sub>x</sub>) and ash dust, since these were emitted in extremely small quantities, graphs for them were not included.

The purification and treatment of groundwater originating from a leak of ethylene dichloride (in 1982) is still ongoing today.

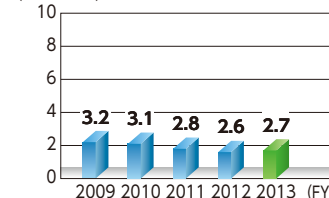
#### Final amount of industrial waste disposed

(Unit: 1,000 tons)



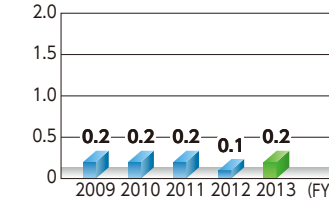
#### Chemical oxygen demand (COD)

(Unit: tons)



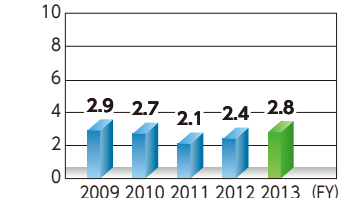
#### Emissions of total phosphorous

(Unit: tons)



#### Emissions of total nitrogen

(Unit: tons)





## Matsusaka Plant

### Plant Overview

Address	1521-2 Okuchi-cho, Matsusaka City, Mie
Number of employees	Plant : 151 (as of March 31, 2014)
Major items produced	Architectural and residential flat glass Architectural and residential wire-reinforced and wired glass Safety glass for automobiles, functional glass for electronic equipment
	Acquired ISO 14001 certification (April 2000) Acquired ISO 9001 certification (November 2003) Acquired ISO/TS 16949 certification (June 2004)

### Regional Activities

- Participates in Kids' ISO 14001 Program activities in Mie Prefecture
- Participates in the Clean-up Activities for Debris that has Drifted Ashore on Toshijima Island, Toba City by the Industrial Waste Countermeasures Promotion Council of Mie Prefecture
- Exhibits Eco-Glass at the Matsusaka Environmental Fair by the Matsusaka City Environmental Partnership Committee
- Voluntary close up the coastal levee for high tide water during such as typhoons
- Opens the grounds to youth sports associations and others free of charge
- Opens company-owned land for use as a temporary parking area to a neighborhood council free of charge
- Invites people from the neighborhood to the summer festival
- Participates in the Matsunase Beach Volunteer Clean-Up Activities of the Matsusaka Taki District Workers' Welfare Council (Matsusaka Branch of the Labor Union)
- Eco-cap movement (Matsusaka Branch of the Labor Union)

Our Matsusaka Plant manufactures polished plate glass via Duplex equipment that is the only one in the world to adopt a consecutive double-sided polishing method, as well as flat glass like highly permeable photovoltaic cover glass and processed glass for automobiles and industrial uses.

Since this plant consumes an enormous amount of energy and resources, it has conventionally been enthusiastic about carrying out environmental conservation activities.

Especially for end plate glass, almost the full amount of this is reused, which contributes to reducing energy and waste.

As for saving energy and power, the plant promotes initiatives such as reducing losses with a focus on standby power and so on, adopting power saving machinery in conjunction with large-scale renovations, and improving its operating techniques. This is done in conjunction with its efforts to cut down on CO<sub>2</sub>.

As for waste, some of this is converted into valuables (products) to reduce landfill disposal, which represents its final disposal. As a result of this, it has continued to achieve zero emissions since 2004.

Under the motto of "The Matsusaka Plant: gazing towards the future through glass and doing everything for people and the global environment," every one of the employees aims for growth through continual improvements. As such, the plant will continue to work in the future to contribute to the local community and be a plant that is extremely safe and abounds with smiling faces without losing gratitude.



General Manager of the Matsusaka Plant  
Shigeyuki Aoki

### PRTR

(Unit: kg/year)

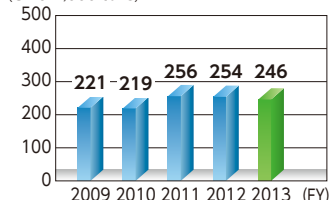
Ordinance designation No.	Substance name	Atmospheric emissions	Discharge into water	Discharge into soil	Quantity transferred
31	Antimony and its compounds	5	10	0	0
80	Xylene	120	0	0	0
296	1,2,4-Trimethylbenzene	140	0	0	0
405	Boron compounds	0	0	0	0
438	Methylnaphthalene	16	0	0	0

The quantities emitted, discharged, or transferred are listed for those materials for which more than 1,000 kg is handled every year

### Data on the Matsusaka Plant

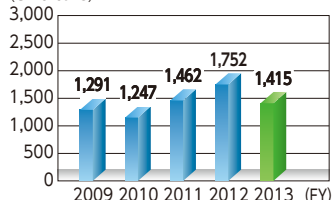
#### CO<sub>2</sub> emissions

(Unit: 1,000 tons)



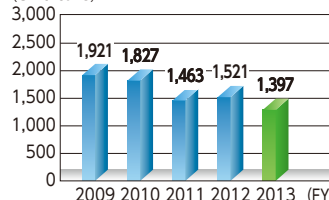
#### Emissions of sulfur oxide (SO<sub>x</sub>)

(Unit: tons)



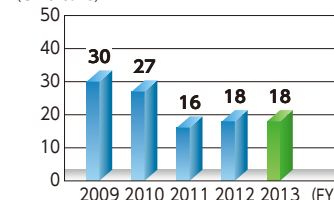
#### Emissions of nitrogen oxide (NO<sub>x</sub>)

(Unit: tons)



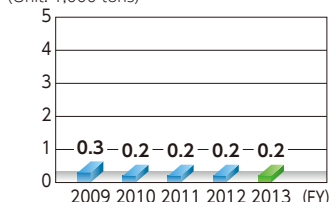
#### Emissions of ash dust

(Unit: tons)



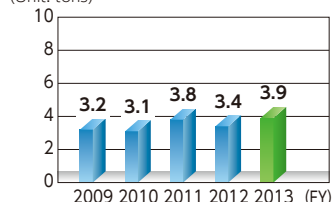
#### Final amount of industrial waste disposed

(Unit: 1,000 tons)



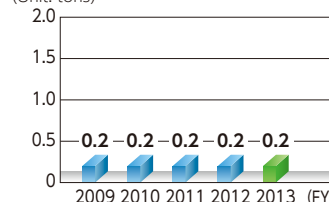
#### Chemical oxygen demand (COD)

(Unit: tons)



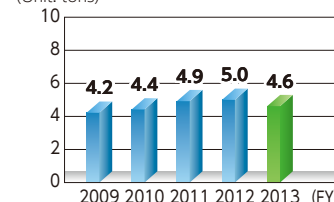
#### Emissions of total phosphorous

(Unit: tons)



#### Emissions of total nitrogen

(Unit: tons)





## Matsusaka Plant - Sakai Manufacturing Site

### Plant Overview

Address	6 Minami-machi, Chikkou, Sakai-ku, Sakai City, Osaka
Number of employees	Plant : 49 (as of March 31, 2014)
Major items produced	Architectural and residential flat glass, flat glass for electronic equipment, architectural frosted glass
	Acquired ISO 14001 certification (December 1999) Acquired ISO 9001 certification (February 1999)

### Regional Activities

- Works together with a flea market and donates the proceeds to social welfare activities
- Accommodates the dispatch of personnel for rescue, firefighting, relief, and similar activities during large-scale disasters as a plant that cooperates with Sakai City over firefighting
- Participates in comprehensive disaster drills in the Sakai / Senboku Coastal District
- Supports a project for the safety of sailing ships and environmental conservation in Sakai Senboku Port by the Osaka Prefectural Seikoukai
- Participates in conservation activities for the Nanbukyuryo green spaces sponsored by Sakai City



Conservation activities for the Nanbukyuryo green spaces sponsored by Sakai City

The Sakai Manufacturing Site is located in the center of the Coastal Industrial Zone of Sakai City, Osaka, where it has continued producing flat glass since 1959 as the original birthplace of Central Glass' flat glass division. In 1982 it changed its manufacturing method over to the float process and began producing high-grade flat glass. In 2007 it completed the second round of cold repair work (overall repairs from melting furnaces to its manufacturing lines). As part of this it carried out improvement work to cut CO<sub>2</sub> emissions by 3%, and resumed production in April 2008. In August 2009, it performed improvement work on its float baths, and began producing thin flat glass for electronics that were used in smartphones and other portable terminals. Furthermore, in May 2012 it finished installing spattering equipment, which can deposit a thin metallic membrane on glass surfaces, and so began producing Eco-Glass that can cut the cost of heating and cooling buildings. In addition, it continues to examine initiatives to recycle glass packing materials in order to cut waste. Moving forward, it will continue to address environmentally friendly manufacturing.



General Manager of the Sakai Manufacturing Site,  
Matsusaka Plant  
Tatsuo Kikuchi

### PRTR

(Unit: kg/year)

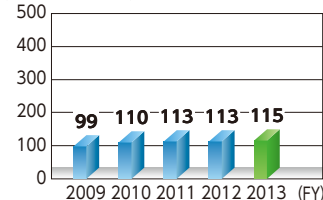
Ordinance designation No.	Substance name	Atmospheric emissions	Discharge into water	Discharge into soil	Quantity transferred
80	Xylene	70	0	0	0
296	1,2,4-Trimethylbenzene	81	0	0	0
438	Methylnaphthalene	7	0	0	0

The quantities emitted, discharged, or transferred are listed for those materials for which more than 1,000 kg is handled every year

### Data on the Sakai Manufacturing Site

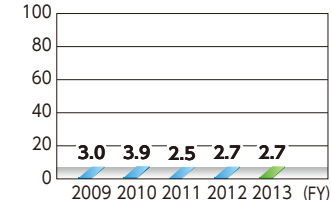
#### CO<sub>2</sub> emissions

(Unit: 1,000 tons)



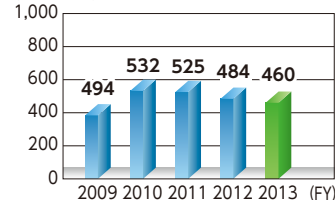
#### Emissions of sulfur oxide (SOx)

(Unit: tons)



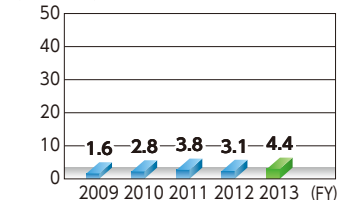
#### Emissions of nitrogen oxide (NOx)

(Unit: tons)



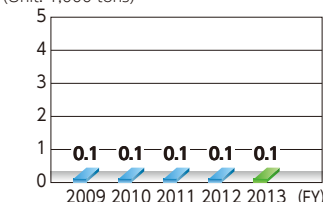
#### Emissions of ash dust

(Unit: tons)



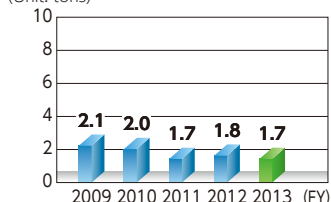
#### Final amount of industrial waste disposed

(Unit: 1,000 tons)



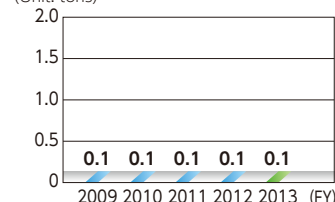
#### Chemical oxygen demand (COD)

(Unit: tons)



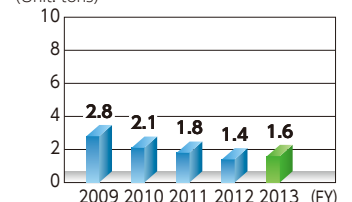
#### Emissions of total phosphorous

(Unit: tons)



#### Emissions of total nitrogen

(Unit: tons)





# 48th Central Glass International Architectural Design Competition

**Theme: Bringing the Urban Environment into Architecture**

First Place Winners: Ken Akatsuka and Gaku Inoue (Japan)

Architecture featuring outstanding design contributes to improving the urban environment. There are a variety of different approaches to how it contributes to this, and how it accommodates the urban environment and the results of this will vary depending on what sort of standpoint is adopted.

“Bringing the Urban Environment into Architecture” is not meant to merely suggest that architectural designs should be more exposed to the environment in the physical sense. The expectation is that the public will be drawn to such architecture by means of imbuing it with cultural appeal. Not only that, but ideally it will also engage the urban environment by means of adding value through its architectural design, consideration for the local community, the use of clean energy, and disaster preparedness with respect to the surrounding environment. Moreover, architects must pursue the idea to the point of considering what sorts of social systems will be ideal for promoting such architecture.

What sort of role should architecture play within the urban environment? This time, we solicited proposals for ways of thinking about this in terms of specific designs through the theme of “bringing the urban environment to architecture.”

(A related article appears on Page 25)



 **CENTRAL GLASS CO., LTD.**

Contact: **Environment Safety Dept.**

Kowa-Hitotsubashi Bldg, 7-1 Kanda-Nishikicho 3-chome, Chiyoda-ku, Tokyo, 101-0054 Japan

TEL: +81-(0)3-3259-7359 FAX: +81-(0)3-3259-7394 <http://www.cgc-jp.com/>