

# The 46th Central Glass International Architectural Design Competition

## Theme: Glass Architecture in 2050

The theme of this time, "Glass Architecture in 2050," is not just about making projections for what the coming four decades will be like, but also about asking ourselves what considerations and actions we shall undertake in order to be able to shape the coming 40 years to our liking.

Contemplating on the ideal future in 2050 and realizing it require taking one step at a time in the processes of constructing the future from now. In the modern architectures, the main advantage of glass was that it could be used in the same way in any environment around the world. As time goes by, however, people started using glass in different ways in different regions, environments and applications, and utilize glass in different combinations with for instance double-glazing and louver showing its unknown capability. Such combinations will no doubt diversify further in the coming years. Moreover, the unique feature of glass—transparency—is likely to give rise to new designs as time goes by. At any rate, it is certain that glass will play an important role in the architecture of 2050.

[Prize Winner] Shuai Feng (U.K.)



## Responsible Care Report Social & Environmental Report

# 2012



Helping Create Prosperous Living Environments  
 **CENTRAL GLASS CO., LTD.**

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Helping Create Prosperous Living Environments  
 **CENTRAL GLASS CO., LTD.**

# We'll find the future through a crisis



## Environmental Principles & Action Guidelines

### Environmental Principles

Central Glass will help create a truly prosperous society through the production of goods and services, by giving consideration to 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 which 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 global resources and by recycling waste.
- 5 We will observe laws and regulations relating to 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.

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

### Conquering the crisis we are facing Addressing CSR with newfound resolve

In 2011, Japanese industries were hit hard by a multitude of misfortunes; nuclear disaster, electric power shortages, a strong yen, high crude oil prices, unstable European economies, flooding in Thailand causing cutoff of supply chain and so forth struck blow after blow to the Japanese economy already weakened by the Great East Japan Earthquake. Even today, the sense of uncertainty about the future of the Japanese economy as well as the overall global economy has not yet been allayed. Inevitably, the Central Glass Group suffered from the impact as well.

However, there must be ways for us to overcome this crisis we face now, just as we have been able to overcome hardships before. Rather than just being afraid of the crisis, it is vital to see it as a challenge that can be overcome by the spirit of “skilled manufacture,” manifested through ingenuity and effort. We should be looking toward a bright future after the crisis.

Central Glass believes that now is the time to work on further reinforcement of CSR (Corporate Social Responsibility) in order to protect the profits of all its stakeholders. In doing so, we intend to struggle even harder than before and contribute to the society and global environment around us through our “skilled manufacture.”

### Focusing on the environment, health and energy segments to contribute to the creation of sustainable society

Our mission as manufacturers is to constantly supply high-quality products at reasonable prices in order to contribute to the society. With this basic notion firmly in mind, Central Glass is always striving to create new technologies for the future, taking advantage of our wide range of accumulated technologies for “skilled manufacture”; and now, we are pouring our efforts into development of new products and expansion of business scale in fields especially related to environment, health and energy.

Our glass division entered the market of cover glass for solar photovoltaic power generation and increased the capacity of its production facilities for “eco-glass,” which brings about improved energy-saving effects due to its superior heat-shielding and insulating performance.

Our chemicals division went into full-scale operation of the Ube plant that manufactures lithium-ion battery electrolyte for environment-friendly vehicles. It also began enhancing the capacity of its domestic production facilities for high-performance electrolyte additives.

Last year, we established the “Future Fund,” a development budget specifically dedicated to creating next-generation products, and we are focusing more of our resources on research and development than ever before.

We intend to solve various social problems related to environment, health and energy and contribute to creation of a sustainable society, through development and supply of environment-conscious products that are highly competitive on the global markets.

### Reinforcing fostering of world-class human resources Living up to expectations of stakeholders in all over the worlds

In order to achieve their CSR goals, the corporations themselves must reinforce their business infrastructure and continue creating sustainable management environment. Moreover, for a company to grow soundly, it is essential to increase sales and secure certain profits. However, considering the advancement of declining birthrate and a growing proportion of elderly people in Japan and maturation of the market, we are compelled to pursue new growth opportunities overseas.

In 2012, we intend to get our business expansion in China and the US in gear more firmly and make use of our bases in India and South Korea more aggressively. In order to promote the facilitation of overseas businesses, the most important thing is to mutually recognize the culture and value of each other and respect diversity.

In our measures and policies, we are pouring more energy into fostering global human resources than ever before in order to accelerate our international operations. In terms of language capabilities, we are vigorously working on learning not only English, but also Chinese. Furthermore, we implement various educational programs to promote internationalization and versatility of our human resources.

The main assets of Central Glass is our technical prowess backed up by our long history as a company as well as by our stakeholders all over the world, such as customers, dealers, affiliated companies and regional societies.

We will carry out our responsibilities to all of our stakeholders around the world, show our true strength of “skilled manufacture” on the global stage for people and global environment, and contribute to the achievement of an affluent environment and productive society. We are happy to hear your honest opinions through our Social & Environmental Report.

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# Preparing for risk from disasters

In the event of natural disasters such as earthquakes, tsunamis, typhoons, lightning strikes, tornadoes, and heavy rains, or accidents such as explosions, fires, and leaks, the first priority is to ensure people's safety. Furthermore, it is necessary to limit the negative impact on surrounding areas and people and to minimize the extent of the damage to business. To do so, it is extremely important to have countermeasures to deal with risk in place ahead of time and to conduct realistic training drills.

The Great East Japan Earthquake that struck Japan in 2011, with the direct damage caused by the earthquake and tsunami as well as power shortages following the Fukushima nuclear disaster, had a devastating impact on businesses and personal lives alike.

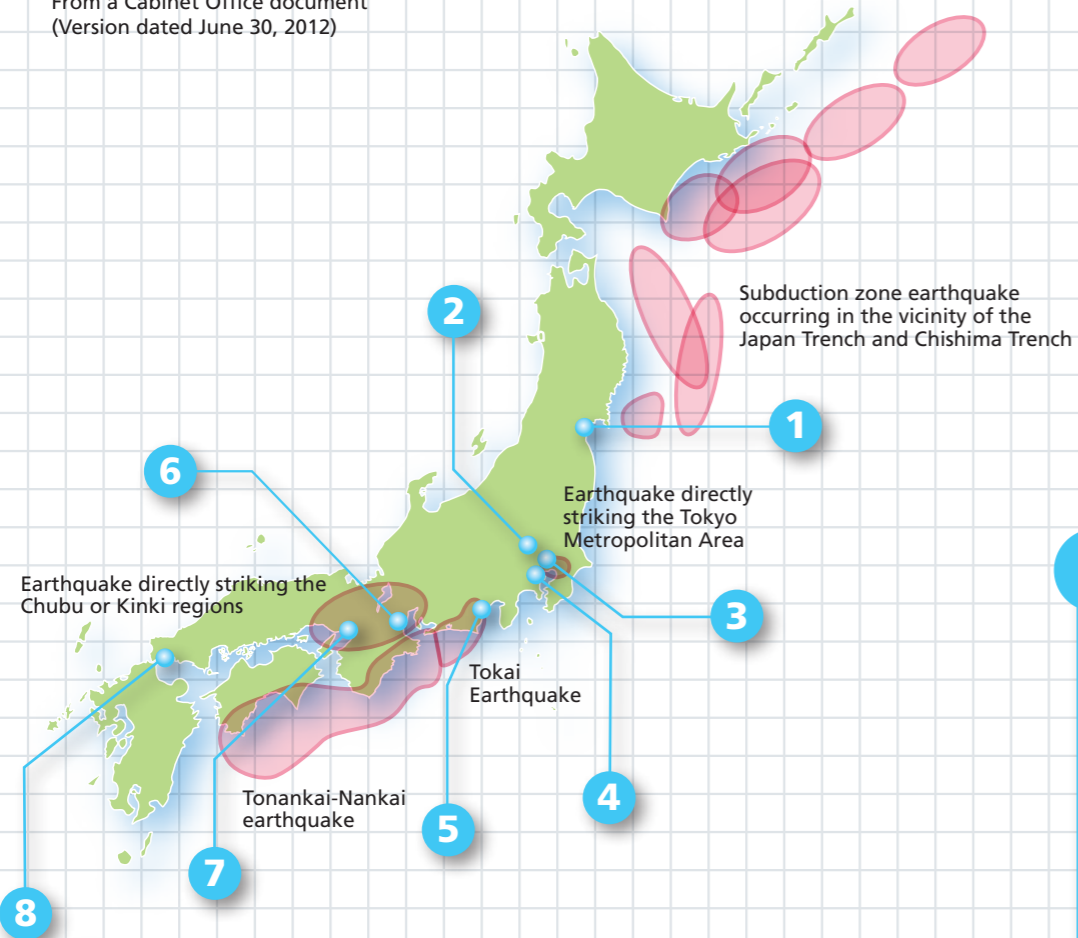
Several offices of the Central Glass group in the Tohoku and Kanto regions were damaged. Fortunately, the human suffering was relatively minor, but there was damage to manufacturing facilities and products, including stocked products. In addition, it became nearly impossible to get raw materials and fuel. It took three months to stabilize procurement.

We had safety and disaster prevention standards in place at each of our business offices since before the earthquake, but there are still doubts as to whether these standards were established with a disaster of such magnitude in mind. We shall use the lessons learned from the 2011 disaster and increase our level of preparedness to the degree that, even in the event of a severe disaster, we can respond swiftly and properly. We are in the process of drafting a BCP,\* which will form the core of our basic response policies, which we aim to complete within the 2012 fiscal year, after which we will have a completed plan, but one that will be continually improved upon over time.

\*BCP...Business Continuity Plan

## Anticipated Large-scale Earthquakes

From a Cabinet Office document  
(Version dated June 30, 2012)



### 1

#### Central Glass Tohoku Co., Ltd. (Sendai Plant) Responses immediately after the Great East Japan Earthquake

Right after the earthquake struck, at the Sendai Plant we immediately went about confirming the safety of our employees and their families. It took a very long time to locate everyone, but thankfully there was no loss of life. Although the Plant was not damaged by the tsunami, strong tremors of seismic intensity 6-weak lasted for several minutes, which destroyed most of the plate glass we had in stock and caused damage to some buildings and equipment. Furthermore, on April 7, right after the Plant was fully brought back online, there was a seismic intensity 6-weak aftershock, which again destroyed most of the plate glass in stock, and actually caused more building damage than the initial earthquake. We had had damage prevention measures to protect the plate glass in place since before the earthquake, but those measures were ineffective, and we were made painfully aware of the inadequacy of the predictions of the scale of the damage and the steps we had taken to counteract them. Furthermore, in addition to electricity, water, gas and other infrastructure outages, there was a severe lack of fuel for automobiles and other equipment, which impeded the restoration work. The experiences of the Great East Japan Earthquake have made us realize that the first priority should be the safe evacuation of personnel. To that end, as soon as we were able to, we installed in the factory earthquake early warning alarms, transmitters, and evacuation alarms. At the same time, we began conducting evacuation drills. We have formed a crisis committee to put the lessons learned in the recent disaster into practice in future responses to earthquakes, and we plan to continue to make use of what we have learned in times of disaster if and when they arise going forward.

### 2

#### Chemical Research Center (Tokyo) Responses to the rolling blackouts

The tremors experienced by the Chemical Research Center were seismic intensity 5-weak. Thankfully, there were no injuries and we were able to resume normal operations almost immediately. However, the three-hour long power outages due to the rolling blackouts and restrictions placed on power consumption were unprecedented for us. We needed power to operate the bench plants, but by that time, there were neither generators nor fuel to power them to be found in the Kawagoe area. Eventually, we were able to borrow two 45 kW generators and the fuel to run them from the Matsusaka Plant, which enabled us to continue working. Not long after, the rolling blackouts were replaced with restrictions on power consumption, shifting the focus to saving energy, which we dealt with by turning off the temperature controls in cleanrooms and other facilities when people were not using them, by reducing ventilation volume, and by installing power demand alarms. Learning from these lessons, we are currently in the process of installing new off-grid generators so we can maintain the bench plant operations even if the power goes out and use "peak-cut" compliant power supplies when it is not out. We are also planning further power-saving measures, such as replacing old and degraded boilers and freezers with newer energy-saving models.



The two generators supplied by the Matsusaka Plant

#### Head Office

Immediately after the earthquake, a disaster response task force headed by the president was established, and the tasks of confirming the safety of employees of the Central Glass group and of monitoring the damage were begun. We feel that our initial response was swift.

There were companies that were affected, but to minimize the inconvenience to customers, we put great effort into recovering as quickly as possible.

The following are measures we are currently taking at the Head Office:

- The permanent placement of helmets and other gear in places easily accessible to all employees
- The stockpiling of emergency food and beverages
- Rapid response in the event of a disaster and the establishment of a task force (the clarification of the chain of command and the departments to be in charge of gathering information)
- Evacuation drills under the direction of the Kanda Fire Department covering the entire building we occupy
- Plans are underway to draft a BCP during the current fiscal year.
- The possibility of creating a response manual for procuring raw materials and fuel during emergencies is being studied by a team headed by the Purchasing Department.

#### Dealing with risk to computer systems

To minimize the risk that our computer systems could go down in the event of a major disaster, Central Glass has installed the core systems themselves at an off-site data center. The characteristics and advantages are as follows:

- The data center is located in a place removed from active seismic faults.
- The data center is housed in a building designed to be earthquake resistant.
- The center has redundant off-grid power generators and uninterruptible power supplies (UPS).
- There are dual lines of access to power.
- The center is equipped with low-power-consumption servers and high-efficiency power supplies

The Head Office is making its computers redundant and taking similar steps to ensure that operations can continue even in the event of damage to hardware. Furthermore, extra precautions are being taken by installing backup lines in addition to the main lines that serve the network connecting the Head Office, the various plants, and the Research Center.

# Preparing for risk from disasters

3

## Central Glass Tokyo Co., Ltd. (Urayasu Plant) Improving rapid recovery capabilities

The bay area of Urayasu City, Chiba Prefecture, where the Urayasu Plant is located, is land that was reclaimed in the 1970s. It is an area that suffered extensive damage from ground liquefaction during the Great East Japan Earthquake. Fortunately, there were no lives lost among plant personnel, and the damage to the plate glass and equipment was fairly minor. Nevertheless, the ground outside the Plant did cave in (a maximum of 70~80 cm), and the water supply stopped, which rendered the Plant inoperable for a period of 10 days following the initial earthquake.

There were also rolling blackouts, but we were still able to bring the plant back online 18 days after the initial quake. The disaster drove home the importance of having the capability to recover and resume operations rapidly. What is more, the Urayasu Plant is situated along Tokyo Bay, and according to the predictions released by Chiba Prefecture in April of 2012, a tsunami hitting Urayasu City could reach as high as 2.5m. Hence, the measures we have to protect us from tsunamis need to be revisited as well. In addition, according to Urayasu City's flood hazard map, the area around the Plant could potentially flood due to torrential rains, so we are also studying steps to guard against flooding.



Land subsidence by liquefaction of land

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## Kawasaki Plant Preparing for risk from natural disasters

At the Kawasaki Plant, several times a year, we conduct plant-wide earthquake drills that take into account fires and leaks caused by earthquakes, we use intervals between operations to conduct plant evacuation drills, and we carry out disaster prevention education exercises for the staff assigned to disaster prevention in the Plant's own disaster and fire defense organization. The Ukishima Joint Disaster Prevention Board, an organization in the Ukishima area of Kawasaki City of which the Kawasaki Plant is a member, is organized on effective principles of mutual aid, such that if there is a fire or other disaster at one company's plant, other companies will help extinguish the fire or provide other assistance.



A joint training exercise with the Kawasaki City Rinko Fire Department

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## Central Glass Chubu Co., Ltd. (Shizuoka Branch) Installation of earthquake early warning alarms

In an effort to more properly deal with the risk of disaster in the event of a Tokai earthquake, the Shizuoka Branch of Central Glass Chubu Co., Ltd. has installed earthquake early warning alarms in its offices and plants. In addition, we have ensured that all employees are intimately familiar with the emergency response manual and that they know where the evacuation sites are.

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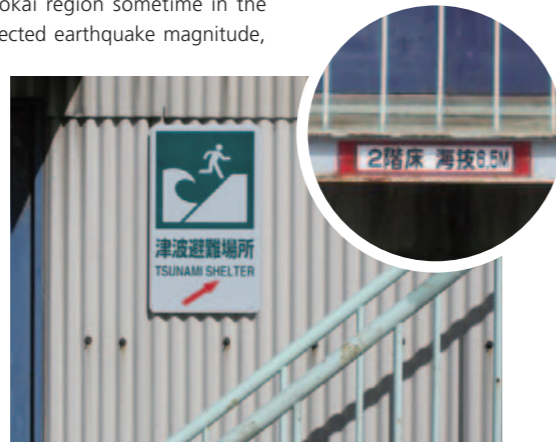
## Glass Research Center Natural disaster contingency plans

In the wake of the Great East Japan Earthquake, we updated our old disaster contingency plans. The most significant revisions were changes made to the primary evacuation sites. Because the previous plans were designed primarily to deal with building fires, the primary evacuation sites were parking lots and sports fields. To make it easier to take secondary shelter (on the third floor or higher at the Glass Research Center) in the event of a tsunami, the area outside the front of the Center building was made the primary evacuation site. Training drills are being planned to see how effectively we can get everyone to an initial place of safety.

## Matsusaka Plant Updating of earthquake and tsunami disaster contingency plans

In the wake of the Great East Japan Earthquake, we relied on guidelines for the Tokai-Tonankai-Nankai earthquake that is expected to hit the Tokai region sometime in the future, and conducted studies of the projected earthquake magnitude, etc. We then updated the earthquake and tsunami disaster contingency plans in the Plant regulations accordingly. Particular attention was given to tsunami height, the time it would take for a tsunami to reach land, evacuation methods, sites and times, methods for conveying information to our employees, and evacuation training. We also put up a notice of evacuation sites and altitude at the entrance of evacuation sites.

We revised the methods for the issuing of evacuation orders on days off or at night in the event of an emergency.



Notice of tsunami evacuation sites

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## Matsusaka Plant Sakai Mfg. Site Power-saving, security, and disaster prevention

In the winter of 2011 we received a request from the Kansai Electric Power Co. Inc., to conserve energy. The Sakai Mfg. Site decided to cooperate and instituted power-saving measures. Furthermore, to prepare for the possible occurrence of a Tokai-Tonankai-Nankai earthquake, the Sakai Mfg. Site updated its disaster prevention and preparedness standards. Since the 2011 disaster, we have stepped up education and training efforts for all personnel working at the site as well as those working at affiliated offices in an attempt to ensure that everyone is prepared.



Rolling up an oil spill containment boom after a drill in which the boom was extended.

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## Ube Plant Preparing for risk from natural disasters

At the Ube Plant, which is located in the Ube-Onoda industrial district, we believe that ceaseless efforts on the part of all involved are crucial to ensuring security. We are continually improving upon our security and disaster prevention system by regularly conducting disaster preparedness drills at each of the workplaces as well as comprehensive disaster preparedness drills together with affiliated companies. In addition, we also participate in the firefighting games held annually in the Ube area, which helps to increase disaster awareness and instills a deeper sense of duty on the part of staff charged with disaster prevention. We have renewed our awareness of the importance of keeping people safe, and shall ensure that every single employee, from the top to the bottom of the organization, understands the importance of stepping up and taking action when it comes to disaster prevention activities. We are deeply committed to our ongoing efforts at safety and security.



A drill to set up an oil spill containment boom

## Central Service Co., Ltd. Disaster support agreement with Ube City

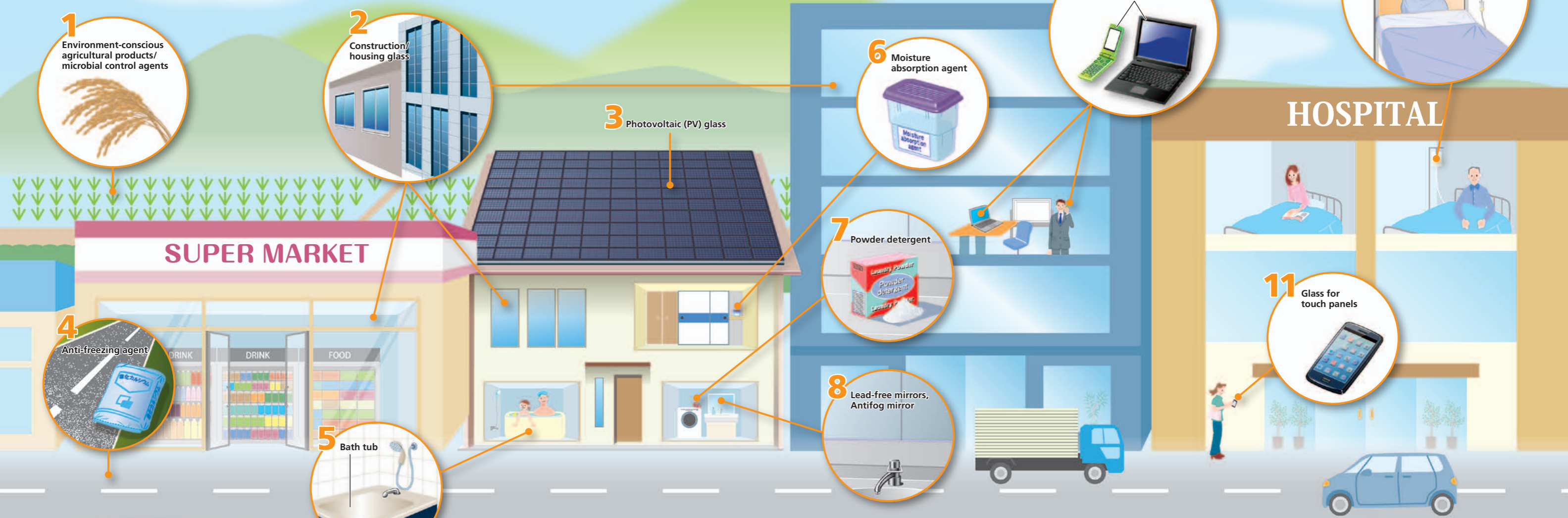
Central Service Co., Ltd., which does mainly landscaping, anti-weed and greening work, has entered into the following agreement with Ube City, Yamaguchi Prefecture:

**"Regarding the clearing of fallen trees in the event of a disaster, if there is a request from Ube City, the Company shall promptly provide the necessary cooperation."**

The company was sympathetic to the purpose of the agreement, which is to quickly remove obstacles to traffic in order to prevent secondary disasters, so we promised to provide cooperation in the form of services.

# Products of Central Glass

Our product is used for various uses, in order to live richly.



Central Glass supplies products related to the field 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 farm produce and medical drugs. Central Glass keeps on pursuing possibilities of 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 earth-conscious products and products that take people's health and safety into consideration.

- 1.Environment-conscious agricultural products/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 agrichemicals suitable for organic and low-chemical farming, because their application is not counted as the use of agrichemical spraying.
- 2.Construction/housing glass**  
Glass types that contribute to energy-saving and comfort in the rooms, such as eco-glass, crime-prevention glass, and soundproof glass
- 3.Photovoltaic (PV) glass**  
Our high transmission figured glass is used for crystalline silicon type solar cells, etc., thereby improving their efficiency.
- 4.Anti-freezing agent**  
Calcium chloride is used as anti-freezing agent for roads in winter.
- 5.Bath tub**  
(Manufactured by Central Glass Fiber Co., Ltd.)  
Continuous glass fiber is widely used in such diverse applications as fiber-reinforced plastic for bath tubs, housing, automobiles, ships, and electronics products.
- 6.Moisture absorption agent**  
Calcium chloride is also used as a moisture absorption agent.
- 7.Powder detergent**  
Soda ash is used in powder detergent.
- 8.Lead-free mirrors, Antifog mirror**  
(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.
- 9.Gases used in production of PCs and mobile phones**
  - Environment-friendly gas developed to replace SF<sub>6</sub>, which is used as cover gas for melting and casting magnesium alloys
  - Cleaning gas for semiconductor/LCD production equipment
  - Raw material gas/etching gas for semiconductor production
  - Semiconductor photoresist etc.
- 10.Active ingredient for pharmaceuticals and its intermediates**  
Central Glass supplies active ingredients and intermediates for such pharmaceuticals as anesthetics and ulcer treatment drugs utilizing fluorine chemistry and other in-house accumulated technologies.
- 11.Glass for touch panels**  
Extremely thin glass used for sensor substrates and glass covers for touch panels.
- 12.Automotive glass**  
Our automotive glass is used for windshields, side, rear and panorama roof windows in automobiles.
- 13.Automotive sound insulating material**  
(Manufactured by Central Glass Fiber Co., Ltd.)  
Short glass fiber is a noncombustible, fire-resistant material used as heat- and sound- insulating material for automobiles, rail cars, etc.
- 14.Lithium-ion battery electrolyte**  
Our electrolyte is used for automotive lithium-ion batteries used to power environmentally friendly electric motors.

# Corporate Governance & Compliance

The basic concept behind the corporate governance\*1 of Central Glass is to continually increase 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 the 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 established "Central Glass Group's Code of Conduct" as the internal code for conducting faithful business activities with stakeholders such as business partners, organizations concerned, customers, consumers, and employees. Every employee carries a card displaying this Code of Conduct, as to constantly enhance the awareness of compliance. The top executives also strive to set a good example in 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 several others: anti-monopoly law;

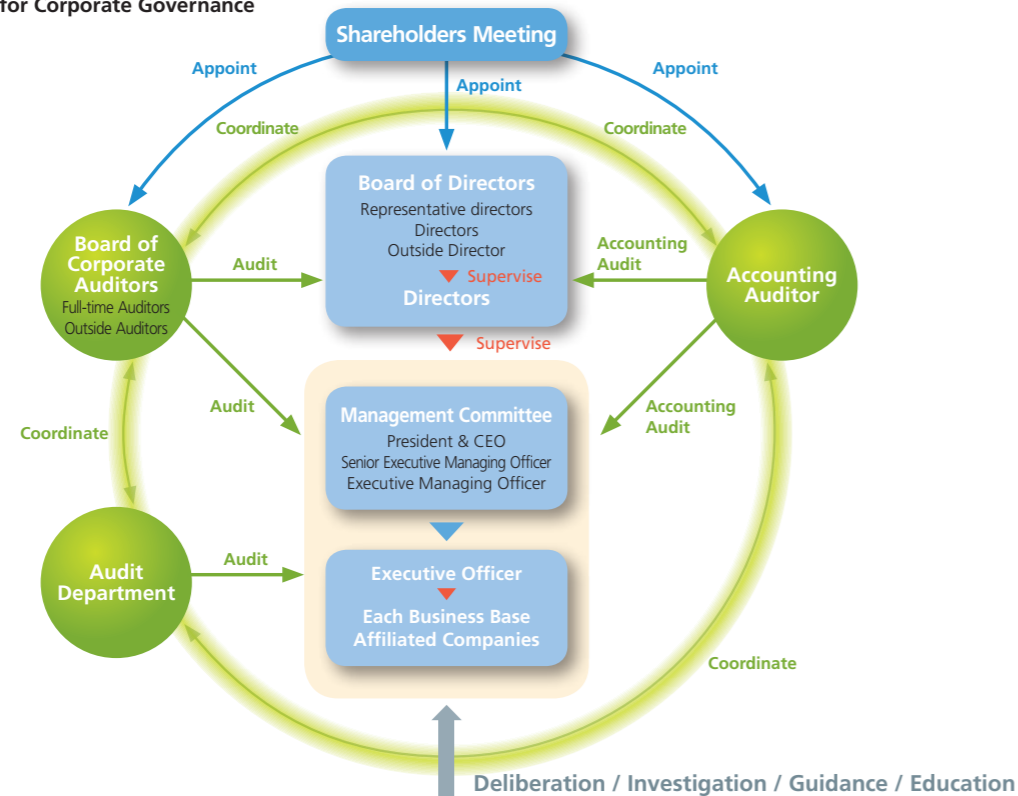
independence from antisocial forces; intellectual property rights; regulations on insider trading; environmental conservation; workplace environment; protection and management of information; and respect for human rights.

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 also established and started the operation of the Whistle Blowing System so that all employees can obtain guidance and consultation on issues and questions concerning compliance and 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 consciousness and implementation of 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



- Compliance Promotion Committee
- Environment Safety Promotion Committee
- Anti-Monopoly Law Observance Promotion Committee
- Safety & Health Committee
- Product Safety Committee
- Security Trade Control Committee
- Financial Reporting Risk Assessment Committee, etc

Central Glass Group's Code of Conduct

# Targets and Progress

FY2011 Results and FY2012 Plan

Progress: ☀️ ... Fulfilled ☁️ ... Additional measures required

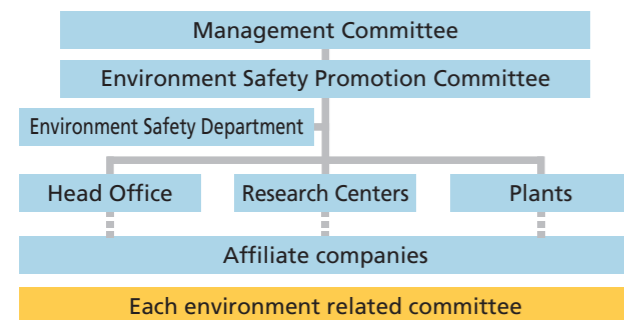
Item	Major Issues	Medium term target	FY 2011 Results	Rating	FY 2012 Plan
Environmental & Safety Management	Establishment & maintenance of environmental management system.	<ul style="list-style-type: none"> <li>Maintenance &amp; enhancement of ISO 14001 certification of main workplaces.</li> <li>Implementation of maintenance, renewal and new acquisition of certification in affiliates.</li> <li>Enhancement of self-management in non-certified affiliates.</li> </ul>	Ube Plant, Matsusaka Plant, Sakai Manufacturing Site and Kawasaki Plant maintained ISO14001 certification.	☀️	Maintain & update ISO14001 certification of main workplaces. Promote new acquisition of certifications.
	Compliance	<ul style="list-style-type: none"> <li>Listing applicable laws and regulations on a Group-wide scale.</li> </ul>	Implemented self-audits on environmental safety of 26 affiliates, using an environmental safety self-checklist.	☀️	Maintain & update ISO14001 certification in affiliates. Promote new acquisition of certifications.
	Promotion of awareness		Awards for Environmental contribution and Occupational safety were given.	☀️	List applicable laws & regulations on a Group-wide scale. Promote risk management for environmental safety.
Safety efforts	Chemicals and product safety	<ul style="list-style-type: none"> <li>Carry out PRTR survey completely.</li> <li>Establish a control system for chemical substance's safety.</li> <li>Extend range of (M)SDS.</li> </ul>	Complied with the Act on the Evaluation of Chemical Substances, Regulation of Manufacture Industrial Safety and Health Law (conducted the notifications required) and provided the affiliates with the relevant information. Sequentially improved (M)SDS.	☀️	Continue to comply with the applicable laws & regulations and revise our (M)SDS.
		<ul style="list-style-type: none"> <li>Promote Green Procurement</li> <li>Implement audits on chemical substance.</li> <li>Establish a system to respond to our customers.</li> </ul>	Confirmed management of chemical substance (compliance with laws) and response to customers on a Group-wide scale, using an environmental safety self-checklist.	☀️	Reduce the environmental impact of products by strengthening management of our information database and establish a reliable and prompt information service system for customers.
	Accident prevention	<ul style="list-style-type: none"> <li>Conduct voluntary safety audit by management on high pressure gas.</li> <li>Enhance proactive measures against disaster.</li> </ul>	Administrative inspections were done in our Plants (Ube, Matsusaka, Kawasaki and Sakai mfg. site). Conducted voluntary safety audits on high pressure gas. Earthquake and tsunami evacuation drill were reinforced. A small amount of fluorinated acid leaked from pipe joints in the Kawasaki plant.	☁️	Continue to comply with the law. Hand down safety technologies and know-how. Promote risk assessment by studying issues of other companies. The safety measures of equipment are performed preponderantly.
	Logistics safety	<ul style="list-style-type: none"> <li>Improve Yellow Cards System.</li> <li>Establish a risk management system for logistics safety.</li> <li>Educate carriers of our products.</li> </ul>	Revised current cards and added new cards. Thorough delivery to drivers and recorded management of the cards.	☀️	Review existing cards and create yellow container cards as required. Keep common carriers informed.
	Occupational safety and health	<ul style="list-style-type: none"> <li>No injury causing lost worktime.</li> <li>Enhance a risk management for occupational safety and health.</li> </ul>	The number of accidents that required lost working hours went up to 10 accidents throughout the entire group, including affiliated companies (7 accidents in 2010). Execute various enterprise-wide accident-prevention campaigns.	☁️	Implement proactive measures against accident based on analysis results of annual report on a Group-wide occupational accidents. Continue revision and establishment of disaster management system.
			Completed the registration of OHSAS18001 certification at Ube Plant as of April, 2011. Continued efforts for a risk management system for occupational safety and disaster prevention in Matsuzaka Plant and Kawasaki plant.	☀️	Continue to develop the system; spread horizontally throughout other workplaces.
Environmental efforts	Prevention of global warming (energy and resource saving)	<ul style="list-style-type: none"> <li>&lt;FY 2020 target&gt;</li> <li>Reduce CO<sub>2</sub> emissions by 15% from FY 2005</li> </ul>	CO <sub>2</sub> emissions from our main plants was 708,000 tons, down 25% from FY2005. Continued participating in trial emissions trading system (Sakai Mfg. Site)	☀️	Start working on reduction of CO <sub>2</sub> emissions in 2020 by 15% from 2005. Strengthen energy management on a Group-wide scale including affiliates. Continue to respond to the applicable laws (e.g. Revised Act on the Rational Use of Energy, etc.)
	Enhanced management of chemical substances	<ul style="list-style-type: none"> <li>Promote the substitute for environmental load substances and the detoxification of them (Asbestos, PCB and other environmental load substances).</li> </ul>	Implemented not-flying asbestos-containing materials were removed from manufacturing facilities at the renewal of them. Continued encouraging consultation for employees who previously were in the workplaces where asbestos-containing products were handled. Detoxification plan for stored PCB were on the menu.	☀️	Promote the revision of the standards regarding the control of chemical substances. Strengthen the control of stored PCBs and implement the disposal of them according to administrative guidance. Encourage to use low-concentrated PCBs. Promote risk assessment system.
	Reduction of waste	<ul style="list-style-type: none"> <li>&lt;FY 2015 target&gt;</li> <li>Reduce final landfill disposal volume by 65% from FY2000 on a company wide scale.</li> </ul>	Final landfill disposal volume of waste at our main plants was down 51% from FY2000. Increased the amount of recycling polluted mud into cement at Ube Plant.	☀️	Continue working on reduction of the final landfill disposal volume in 2015 by 65% from 2000. Continue developing the new technology for reducing the volume of wastes.
	Creation of recycling society	<ul style="list-style-type: none"> <li>Maintain zero emission at glass division. (Final landfill disposal volume / Total waste generation ≤ 0.01)</li> <li>Establish a recycling system for waste flat glass in collaboration with the Japan Automobile Manufacturers Association and Flat Glass Manufacturers Association of Japan.</li> </ul>	Maintained zero emission at glass division. Matsusaka plant continued receiving waste flat glass as an intermediate treatment trader of industrial waste.	☀️	Maintain zero emission at glass division.
Contribution to society	Social action program	<ul style="list-style-type: none"> <li>Expand communicative activities (Issue Social and Environmental annual report and Implement plant tours and regional dialogues).</li> <li>Organize the Central Glass International Architectural Design Competition.</li> <li>Participate in volunteer activities.</li> </ul>	Issued Social and Environmental annual report. Participated in the Regional Dialogue Workshop in Ube region and interacted with local residents.	☀️	Issue Social and Environmental annual report 2012. Participate in the community meeting in Ube region.
			Organized the 46th Central Glass International Architectural Design Competition. Implemented social action programs, such as donations to NPO. Participated in local and international volunteer activities in cooperation with our labor union. Continued to sponsor the Morino Chonai-Kai (Forest Neighborhood Association).	☀️	Continue and develop current social contribution activities.

### Environment and Safety Management Promotion System

As a company that manufactures and handles glass and chemical substances, Central Glass has introduced a management system based on the principles of

“environmental, health and safety” management activities throughout the lifecycle of products and promotes improvements in this system.

#### Environment and safety promotion system



#### Environmental Management System (ISO14001)

Ube Plant	Dec. / 2000
Matsusaka Plant	Apr. / 2000
Kawasaki Plant	May. / 2007
Carlex Glass Co.	Sep. / 2001
Apollo Scientific Limited	Feb. / 2012
Yue Sheng Industrial Co.	May. / 2001

### Environmental Accounting

Central Glass utilizes environmental accounting as a quantitative indicator for environmental preservation activities.

#### Environmental Preservation Costs

(Unit: million yen)

Article	2011		2010	
	Investment	Expense	Investment	Expense
(1) Business area cost	601	3,990	875	3,889
(a) Pollution prevention cost	299	2,271	816	2,374
(b) Global environmental preservation cost	63	101	20	110
(c) Resource circulation cost	239	1,618	39	1,405
(2) Cost for curving upstream/downstream environmental impact of production and service activities	0	26	0	5
(3) Environmental preservation cost associated with management activities	0	292	6	312
(4) Environmental preservation cost associated with R&D activities	23	367	6	567
(5) Environmental preservation cost associated with social activities	0	7	0	55
(6) Cost involved in dealing with environmental damage	0	0	0	0
<b>Total</b>	<b>624</b>	<b>4,682</b>	<b>887</b>	<b>4,828</b>

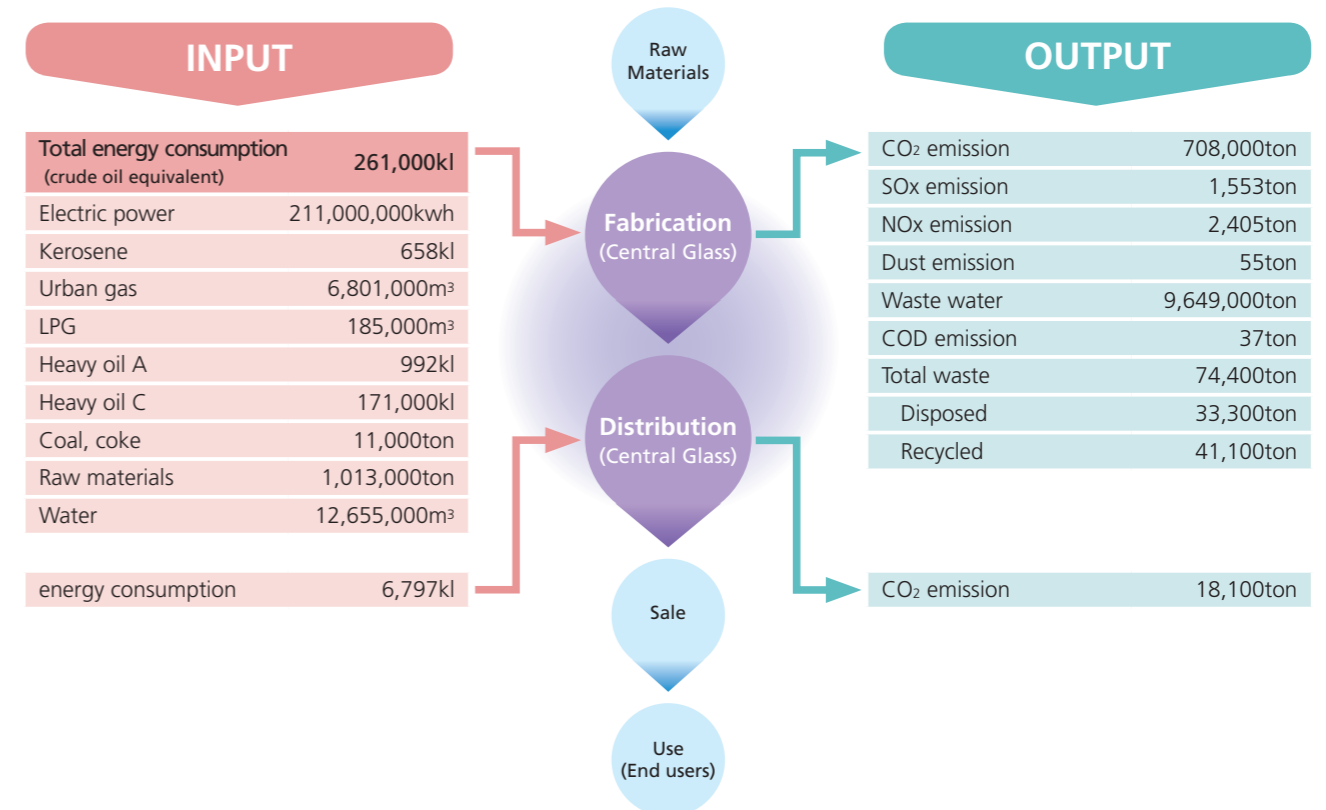
#### Environmental Preservation Effects - Environmental Impact Index

Article	Environmental impact substances	Emission in FY 2011 (ton)	Emission in FY 2010 (ton)	Change (%)
Greenhouse gas	CO <sub>2</sub>	745,000	661,000	13%
	SOx	1,553	1,317	18%
Environmental pollutants	NOx	2,405	2,832	-15%
	Ash Dust	55	63	-13%
	COD	37	42	-12%

### Relationship between Our Business Activities and the Environment

We quantitatively measure the environmental impact of our business activities to determine our environmental issues. We will implement activities for conservation and for construction of recycling systems. Specifically, the Glass Division

focuses on reduction of the environmental impact and prevention of global warming and the Chemical Division focuses on the development of environmentally-friendly products and the reduction of wastes.



### Our efforts to prevent global warming

We are pouring our efforts into reduction of emission of CO<sub>2</sub>, water pollutants and landfilled solid waste.

#### Emission of environmental impact substances

FY	CO <sub>2</sub>	Waste Disposal	SOx	NOx	Dust	COD	Total Nitrogen*1	Total Phosphate*2
1990	1,004,000	—	—	—	—	—	—	—
2000	—	67,500	—	—	—	—	—	—
2005	941,000	—	—	—	—	—	—	—
2007	896,000	62,600	2,533	3,730	84	42	70	1
2008	862,000	52,500	2,231	3,828	88	43	56	1
2009	670,000	36,500	1,361	2,857	53	35	51	1
2010	661,000	33,300	1,317	2,832	63	42	50	1
2011	708,000	33,300	1,553	2,405	55	37	44	1

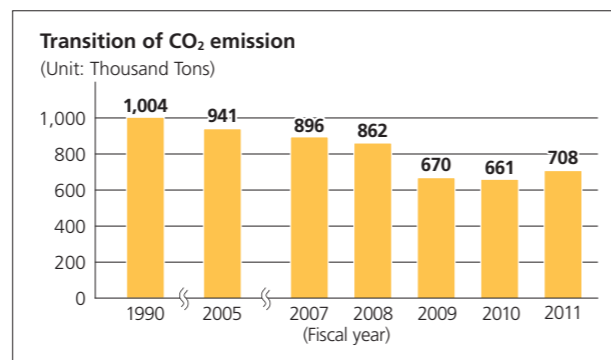
\*1 means total amount of amino acid, polypeptide, organic nitrogen (i.g. Urea) and protein and nitrogen of inorganic nitrogen (i.g. nitrous nitrogen) in water  
\*2 means total amount of organic / inorganic phosphate in water

### Our efforts to prevent global warming

Our mid-term to long-term reduction target of CO<sub>2</sub> emission is 15% in 2020 compared to 2005. In addition, our reduction target of landfilled solid waste is 65% in 2015 compared to 2000.

We will continue to actively pursue achievement of these targets in the future as well.

Moreover, the Sakai Manufacturing Site is participating in the "Japan's Voluntary Emissions Trading Scheme" initiative promoted by the Ministry of Economy, Trade and Industry and the Ministry of the Environment, and each place of business of the Central Glass group is working hard to reduce their individual CO<sub>2</sub> emissions.



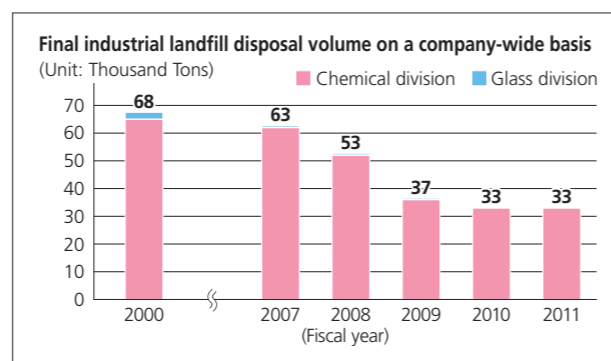
### Activities for waste reduction

Central Glass, as a waste generator, strictly complies with relevant laws and regulations (such as the Wastes Disposal and Public Cleansing Act) in waste sorting, storing, properly subcontracting waste processing to and monitoring industrial waste disposers, and management of manifestos.

Our chemical division accounts for most of the industrial waste discharged from plants and other manufacturing sites, with the glass division accounting for about one percent of waste discharge.

We have set our goal at reducing the amount of final waste disposed companywide by more than 65% compared with FY2000, and achieve zero emissions from the glass division

(Definition at Central Glass: 1% or less of the total waste discharge in FY2002) by FY2015.



### Safety of Chemical Substances

Taking environmental initiatives is now common world wide and the management of chemical substances is not exceptional. Central Glass co-shares data base such as Material Safety Data Sheet ((M)SDS) among parties concerned and works for upgrading technology infrastructure and managing and co-sharing the information of toxicity and risk assessment, in order to manage the risk of chemical substances properly and promote understanding of parties concerned. In addition, we designate persons responsible for management at the plants and research centers where the chemical substances are handled. We implement stricter control on the use and disposal, needless to say, complying with laws and regulations.

#### Material Safety Data Sheets (M)SDS

(M)SDS are data sheets designed for the supplier of chemical substances to provide users with information on chemical substances such as their properties, so as to assure the safety and health of the person handling such chemicals substances.

In Europe, restriction on used vehicle (ELV: End of Life Vehicle) which concerns the disposal of used cars and Restriction of the use of certain Hazardous Substances (RoHS) which restricts chemical substances used in electric and electronic products were enforced. In addition, we expect a new system, Globally Harmonized System of Classification and Labeling of Chemicals (GHS) to be promoted as a new global rule for the purpose of ensuring health and promoting international transactions. We are progressively working for the GHS as well.

We are storing the PCB-containing equipments under our strict rule based on the law related to PCB, and we are disposing the equipments appropriately in accordance with the law.

Central Glass also encourages the sharing of information concerning safety on a Group-wide scale by posting (M)SDS on its in-company database.

### The Initiative for Green Procurement

Upon increasing global interest in environment including regulations and others, we newly prepared "Green Procurement Guidelines". As an initiative on a company wide scale, we request our suppliers to answer the following two survey items for future reference.

- ① Whether suppliers have established an environmental management system.
- ② Whether raw materials or components purchased contain the voluntarily restricted substances (such as cadmium and others) specified by Central Glass.

In addition, we have established Green Procurement Database and utilize it in order to share the survey results. In the backdrop of RoHS directive in the EU, not only environmental friendliness at the plants but also environmental friendly approach to products themselves is now required. In another word, it is required that procured materials such as upstream materials and components do not contain substances with environmental impact to assure that our products do not contain and incorporate any substances with environmental impact.

### 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.

We implement regular disaster drills, such as fire extinguishing, report and call-out as countermeasures against supposed emergencies such as earthquakes, fire or explosion.

We enhance our employee's awareness of disaster prevention through not only office-scale disaster drills in accordance with the job nature and annual plan each office makes, but also

through workplace-scale drills and joint drills with local fire stations as well.



Water-drainage by a fire drill (at Matsusaka Plant)

### Logistics Safety

If the accident occurs at the time of transporting chemical substances, it might cause tremendous damage and inconvenience to people in the neighborhood and clients.

Central Glass implements periodical training and education not only for its employees but also employees in the workplaces to which we consign transporting in order to prevent accidents in transportation and to minimize the damage if accident occurs. For transportation of chemical substances such as toxic

materials, we prepared an emergency contact card in line with the Logistics Safety Guidelines, to limit the extent of the damage in case of accidents and mandate drivers of relevant vehicle to carry the card. On the card, the measures to be taken and contents to be reported are clarified so that person concerning transportation or person from the fire station or the police station can take an appropriate and prompt action at the occurrence of accident in transportation.



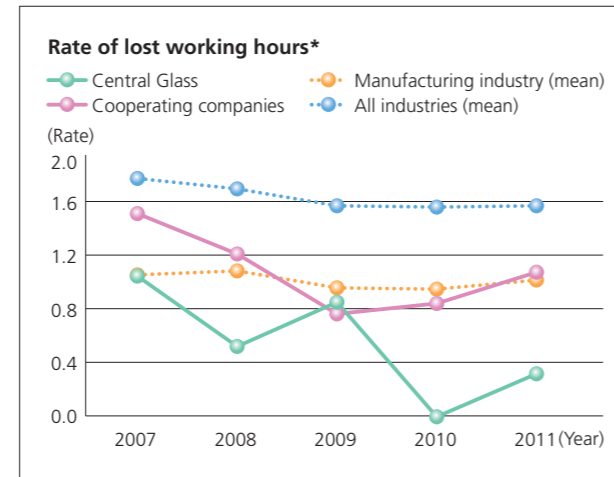
## Occupational Safety and Health

Central Glass Group promotes occupational safety and health activities in all workplaces, including affiliates, with a clear target of "no accidents" based on the understanding that assurance of safety serves as the foundation of all business activities.

For example, we make sure that all "near accidents" are reported and "hazard prediction activities" and "finger point and call" are conducted, provide education/training to operators and get them qualified, conduct voluntary inspections and patrols after beginning of operation, and continually review and upgrade manuals. In addition, we conduct thorough safety reviews whenever new plants are built or existing plants are expanded for the purpose of safe operation.

Moreover, in 2011 as well, we called attention to safety measures by means of a summer-time accident-prevention campaign as well as by issuing a white paper on "Occupational Accident". Furthermore, we presented safety operation awards to particularly safe operations to further motivate the awareness of occupational safety.

Needless to say, we will continue to make concerted efforts to work toward penetration of safety measures and providing life-long safety-related training in the future as well in order to improve the safety at our workplaces, aiming to achieve "no accidents" and "no illness" everywhere.



Rate of lost working hours = (Number of deaths and injuries / Total work hours) x 1,000,000 (\*Incidence of occupational accidents associated with lost working hours per one million working hours)

## Overseas afforestation volunteer activities (Philippines)

As part of our social contribution activities, we participate in various overseas volunteer afforestation activities. The activities were hosted by JEC, the umbrella organization of our labor union. This project is part of the support activities of the environmental preservation project "Children Forest Program" managed by the OISCA-International and was held for the 6<sup>th</sup> time this year.

In October 2011, the activities were conducted in Nueva Vizcaya in the Philippines, with aims of planting trees and interacting with children in the area. In the actual tree-planting activities, we spent about half an hour climbing up mountain paths and then planted more than 900 eucalyptus seedlings on the mountain slopes. "Dig a hole, plant a tree, and cover it firmly with soil" on steep slopes under the scorching sun. Repeating this procedure was very hard, but the feeling of accomplishment and fulfillment after completing the tree-planting efforts was second to none. We are looking forward to seeing the trees we planted grow. However, there are many areas devoid of vegetation at higher altitude than the location where we planted trees this time, and we strongly felt that

continuous tree-planting activities are required.

Afterward, we received a warmhearted welcome at local elementary schools and we were surrounded by children in no time. We made friends and worked on tree-planting with the children, and everybody had a great time. Although they are not living in a privileged environment like we Japanese by any standards, we were impressed with these children's wonderful smiles and shining eyes more than anything else.

Although the volunteer activities we participate in by visiting local areas may be trivial, the labor union still intends to continue taking part in such activities in order to contribute to the conservation of biodiversity and strive to contribute to the society.



Members participating in tree-planting activities

### Support Activities & Mutual Aid

Assistance grant funding to Peoples' HOPE Japan for supporting Pediatric Cardiovascular Surgery Program. (Thailand)

¥2 million

The contribution for the victim of an atomic bomb. (Ube branch of central Glass labor union)

¥113 thousand

## Participation in Regional Dialogue Workshop in the Ube district

Every year, five chemical companies located in the Ube district hold a regional dialogue workshop known as the "Ube District Regional Dialogue Workshop." This year's workshop was held in February 2012 at the Ube Plant of Kyowa Hakko Kirin Co., Ltd. and 62 people participated, including representatives from



Scene from the general plenary meeting

NPOs and local citizens from the district. As part of the introduction by Kyowa Hakko Kirin Co., Ltd., the participants were taken on

a bus tour of the Ube Plant premises followed by a tour of the production lines inside the factory.

At the subsequent general plenary meeting, the five participating companies presented their company profiles and described their efforts to protect the environment. The participants were later divided into two groups and exchanged opinions on (1) management of chemical substances and (2) odor and other annoyances. Both groups engaged in spirited debate on each subject, thus making this dialogue workshop a very productive one.

We intend to continue communicating with the people in our communities, in order to hear their opinions and to assure them that we are operating in the safest and most secure manner possible.

## Junior Science Class

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 public utility foundation Yamaguchi Industrial Promotion Foundation in the hope of showing children who have infinite possibilities in the future how interesting and fun science can be. The 23rd class in 2011 was held in 18 venues in Yamaguchi prefecture, collaborating with 14 related organizations including universities, technical colleges, and research institutes of companies. We wholeheartedly agree with the premise and collaborate actively in holding these classes every year. In fiscal year 2011, 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 participated. Under the theme of "Let's experience the wonder of heat," the children conducted various experiments using household items. Our young engineers

took the role of lecturers and the experiments were conducted in small groups so that all children were able to take part in the fun. During the class, the children put great effort into the experiments and sometimes gasped in surprise while their parents kept a close eye on them and marveled at the experiments throughout the venue. We hope to be able to continue to play an active role in hosting this class in the future as well, so that more and more children will learn how exciting science can be and grow up with an interest and curiosity in science.



Scene from the experiments

## Introduction of Education System

Central Glass established a system for dispatching employees to educational institutions in Japan in 2006, in order to foster specialists with sophisticated expertise. The system enables several people to complete a MOT<sup>\*1</sup> education every year.

MOT is also called "the engineer's version of MBA<sup>\*2</sup>," and employees completing this course obtain the skills to plan and execute strategies toward creating economic values in organizations via various aspects of economic management, including technology management.

This system enables us to foster human resources who can efficiently link research and development to commercial success

and promote the management necessary to continuously improve enterprise values.

\*1 Abbreviation of Management of Technology  
\*2 Abbreviation of Master of Business Administration



Presentation of employees who completed MOT education

# Corporate Outline & Overseas Subsidiaries and Affiliates

## Corporate Outline

Company Name	Central Glass Co., Ltd.
Established	October 10, 1936
Head Office	Kowa-Hitotsubashi Building 7-1, Kanda-nishikicho 3-chome Chiyoda-ku, Tokyo 101-0054, Japan <a href="http://www.cgco.co.jp/">http://www.cgco.co.jp/</a> <a href="http://www.cgco.jp.com/">http://www.cgco.jp.com/</a>
Paid-In Capital	¥18,168 million
Number of Employees	4,765 (consolidated)
Common Shares	Authorized 867,944,000 Issued 214,879,975
Business activities	Manufacture and sale of flat glass, fabricated glass and other glass products; soda, chlorine, organic and inorganic fluorine compounds, fertilizers, high-purity gas, solvents, medical and agricultural products; fiberglass products; and synthetic

### Members of the Board Representative Director, President & CEO

Shuichi Sarasawa

### Representative Director, Senior Executive Managing Officer

Masamichi Maruta

Hajime Nakai

### Director, Executive Managing Officers

Tatsuya Mori

Yoshiyuki Takahara

Isamu Kato

Takao Ayama

Motoyoshi Ogura

Tadashi Shimizu

### Outside Director

Teiichi Yamamoto

### Full-time Corporate Auditors

Yoichi Fujita

Wataru Horimukai

### Outside Corporate Auditors

Ken Tomonari

Shin Kawahara

Yoshio Ide

## Overseas Subsidiaries and Affiliates

Carlex Glass Company (U.S.A.) .....	Tel. +1-423-884-1105	Fax. +1-423-884-1041
Carlex Glass America, LLC (U.S.A.) .....	Tel. +1-615-350-7500	Fax. +1-615-350-7685
Central Glass America, Inc. (U.S.A.) .....	Tel. +1-423-884-1105	Fax. +1-423-884-1041
Central Glass International, Inc. (U.S.A.) .....	Tel. +1-408-573-6909	Fax. +1-408-573-6911
SynQuest Laboratories, Inc. (U.S.A.) .....	Tel. +1-386-462-0788	Fax. +1-386-462-7097
Northwestern Industries, Inc. (U.S.A.) .....	Tel. +1-206-285-3140	Fax. +1-206-285-3603
Yue Sheng Industrial Co.,Ltd. (Taiwan) .....	Tel. +886-37-871-811	Fax. +886-37-874-154
Taiwan Central Glass Co.,Ltd. (Taiwan) .....	Tel. +886-37-876-586	Fax. +886-37-876-448
Giga Gas & Electronic Materials Company (Taiwan) .....	Tel. +886-2-2311-6602	Fax. +886-2-2311-6607
Central Glass Trading (Shanghai) Co.,Ltd. (China) .....	Tel. +86-21-6219-9791	Fax. +86-21-6275-2691
Zhejiang Central Glass Chemspec Company Ltd. (China) .....	Tel. +86-570-388-8333	Fax. +86-570-388-8333
Central Glass Europe Limited (U.K.) .....	Tel. +44-161-406-0888	Fax. +44-161-406-0999
Apollo Scientific Limited (U.K.) .....	Tel. +44-161-406-0505	Fax. +44-161-406-0506
Central Glass Germany GmbH (Germany) .....	Tel. +49-5201-6613-0	Fax. +49-5201-6613-118
Thai Central Chemical Public Co.,Ltd. (Thailand) .....	Tel. +66-2-639-8888	Fax. +66-2-639-8999
Japan Vietnam Fertilizer Company (Vietnam) .....	Tel. +84-8-6290-5069	Fax. +84-8-6290-5066