



Integrated Report 2018

For the year ended December 31, 2018

GLASS FOR FUTURE



Nippon Electric Glass



On the Publication of the Integrated Report 2018

Since fiscal 2015, we, Nippon Electric Glass (NEG), have strived to fully disclose information on our ESG efforts. In fiscal 2017, we changed the format to the “Integrated Report” and expanded the scope of disclosure.

In our Integrated Report 2018, we focus on the growth strategies of EGP2021, our new medium-term business plan, and clarify the relationship between our business activities and the Sustainable Development Goals (SDGs). This easy-to-read, narrative report tells of our initiatives to enhance our corporate value along the way to becoming the world’s leading manufacturer of special glass. We sincerely hope it gives you a better understanding of our group.

Motoharu Matsumoto, President

Contents

Value Creation

Message from the Chairman	2
History of Nippon Electric Glass	4
Value Creating Process	6
Manufacturing of Nippon Electric Glass	8
Relationship with Society throughout the Value Chain	10
Research and Development	12
Products and Technology	14

Management Strategy

Message from the President	16
Financial and Non-financial Highlights	22
Overview of Business	24

ESG

Governance	28
Directors, Corporate Auditors, Executive Officers	34
CSR Foundation	36
Environment	38
Diversity and Inclusion	43
Community Contribution	46
Other Initiatives	48

Financial & Corporate Information

Financial Review	50
Consolidated Financial Summary	52
Consolidated Financial Statements	54
Corporate Information	77

At Nippon Electric Glass, our corporate philosophy is a reflection of our founding mission, a statement of our devotion to creating products infused with the very best of human civilization for the betterment of society.

Our corporate philosophy

We strive to build a brighter future for the world by uncovering the unlimited possibilities of glass for more advanced creative manufacturing.

Firmly rooted in the traditions of our founding mission, the NEG corporate philosophy plots a path for our quest for sustainable growth. Thanks to material design, melting, forming, and processing technologies, glass can be infused with different properties for a broad range of functions.

We are dedicated to unlocking glass's potential to make life better and more comfortable for people and communities the world over.

Our slogan

GLASS FOR FUTURE

Our vision

The world's leading manufacturer of special glass

Our goal is to become the world's leading manufacturer of special glass, with the best talent, the best technology, and the best creative manufacturing ability. At the same time, we strive to run our company in a way that inspires pride among our workers and enables us to make a genuine contribution to the community. The way we see it, creative manufacturing is achieved through state-of-the-art technological development, the highest quality standards, efficient production, and a steady supply of products, all underpinned by a fundamental dedication to environmental sustainability.

Our values

● **Customer first**

Everything is based on accurate understanding and complete satisfaction of customers' requirements.

● **Get the job done**

We are dedicated to completing every task properly.

● **Broad minds and open communication**

We think beyond existing norms and encourage frank communication among all departments and generations.

● **High ethical standards**

We are bound to act ethically and in good faith in all situations.

● **Consideration for the environment**

We are constantly aware of the need to be considerate of the environment, and strive to reduce our footprint.

Editorial Policy

● **Organizations Covered**

The Nippon Electric Glass Group's 12 domestic companies and 15 overseas companies are covered in this report. In cases where the coverage area of the data differs, we have indicated the appropriate coverage areas respectively.

● **Period of Reporting**

Fiscal 2018 (January 2018 to December 2018)
Some qualitative information regarding fiscal 2019 has also been included in this report.

● **Publication, Next Scheduled Publication**

Issued in May 2019. Next scheduled issue in May 2020.

● **Editorial Guidelines**

IIRC International Integrated Reporting Framework and others

● **Disclosure Policy**

The Group Code of Conduct stipulates that our group will disclose necessary corporate information in a timely and appropriate manner to enhance communication with concerned parties. Following this policy, we will continue to disclose important information related to our group's activities to all stakeholders, including shareholders and investors, in a timely and appropriate manner.

● **Caution Concerning Forward-Looking Statements**

Statements in this Integrated Report with respect to our group's plans, outlooks, strategies, and other statements that are not historical facts, are forward-looking statements involving risks and uncertainties.

Let history, experience, and a deep consideration for the environment guide us as we work to build a brighter future for the world.

In December 2015, Nippon Electric Glass (NEG) formulated its corporate philosophy structure (see p1). One of the corporate values established within that structure is “Consideration for the environment.” Ever since our foundation in 1949, history and experience have shown us the importance of this value time and time again.

The origin of “Consideration for the environment”

“Consideration for the environment” is a consistent and core value of NEG, where it is manifested through ongoing efforts aimed at reducing our environmental footprint. This value also encompasses a consideration for local communities. Our concern for the environment and local communities springs from concrete origins, specifically the environmental problems faced in our Fujisawa and Shiga-Takatsuki plants.

Experience has taught us the importance of eco-friendly plants in harmony with communities

The years between 1960 and 1970 were a period of rapid economic growth in Japan where the size of industry as a whole expanded dramatically. As a result, energy and resource consumption ballooned, which meant exhaust gas, wastewater, and industrial waste also rapidly increased, turning pollution into a nationwide problem.

The Fujisawa Plant began operations in 1959, and within just a few years its production had grown to encompass five furnaces. This increased production, however, brought with it a significant increase in noise, smoke, and other environmental pollution about which many local residents complained. To address the issue of noise, various sound-dampening measures were taken, including putting concrete blocks around the sources of the noise, replacing the windows with highly sound-insulating glass blocks, and installing noise-insulating barriers around the plant perimeter. In 1963, the neighborhood association submitted a petition to the local government about damage to the local trees and foliage caused by the plant’s exhaust gas. The government determined that the cause of the damage was sulfur dioxide exhaust gas, despite the concentration of sulfur dioxide being

within the acceptable range set by the government, and ordered the plant to undertake measures to eliminate this gas. We submitted to the government a variety of pollution countermeasures which we then implemented; these included building an elevated smokestack, as well as replacing our fuel with class-A fuel oil, which is low in sulfur. This was around the time that NEG became the first company in the Japanese glass industry to start using electrostatic precipitators to remove soot and dust. Together with other initiatives, such as the introduction of reliable environmental facilities, the removal of fluorine from our operations, and the maintenance and greening of the land around the plant, relations between the Fujisawa Plant and the local community steadily improved until, in 1982, the last of our differences were deemed settled following local government-led mediation between the plant and the local residents.

The Fujisawa Plant started its operational existence with a bang, caught up in the wave of rapid economic growth that was taking place, but we are acutely aware that this was not balanced with adequate concern for the local community and environment, and that this contributed to environmental problems. The Fujisawa Plant later changed its name and then, in 2014, ceased operations altogether. Under the law today, the site of the former Fujisawa Plant is deemed to have several soil contamination issues, which we are addressing through soil improvement efforts to ensure local residents have no reason for concern.

In the case of the Shiga-Takatsuki Plant, which began operations in 1964, local farmers began complaining in the spring of 1966 about brown spotting on the leaves in their mulberry fields. This was at a time when production of black-and-white CRT glass was fully underway. The next year, further complaints came in, particularly about the poor growth

of the silkworms that ate the mulberry leaves. It was subsequently determined that a sulfuric acid mist contained in the plant's exhaust gas was responsible for the leaves turning brown, while the poor growth of the silkworms was due to the presence of fluorine in the exhaust gas.

The plant instituted every measure available to address these problems, including using a low-sulfur fuel, avoiding fluorite (calcium fluoride), and installing exhaust gas scrubbers. Unfortunately, these measures alone were not able to remove everything, thus necessitating extremely careful management to treat the minuscule amount of fluorine remaining in the raw materials and, thereby, eventually resolving the problem.

We recognize that the environmental problems stemming from these two plants significantly harmed their local communities, creating tremendous disruptions and hardships in the lives of those living in their vicinities. Even now, all these years later, I feel strongly motivated to apologize to the local residents of those areas for all that they endured. We will never forget the history of what happened, nor will we neglect the lessons that it has taught us about plant operation.

Taking steps to carefully protect and maintain nature at the Notogawa Plant

We took the lessons gleaned from painful experiences of Fujisawa and Shiga-Takatsuki and applied them to the design of the Notogawa Plant, which went into operation in 1971. The aim was to develop a model, thoroughly environmentally friendly plant for a new era. It adopted pollution prevention technology and facilities which were state-of-the-art at the time, and, moreover, it entered into a pollution prevention agreement with the local municipal government and set up dust and soot detectors at 17 sites around the town.

Since its first day of operation, the Notogawa Plant has remained in close communication with the local residents. The layout of the plant is designed to ensure that the natural features of those plant sites not used for production activities are left as they are. A stream running through the center of the plant premises has been left completely untouched from the day plant construction started. One elderly resident of the town who toured the plant even remarked that the stream looks "exactly the same as when I played here as a child." We also rent the forested land along the banks of the river adjacent to the plant where we make a concerted effort to preserve the natural flora, fauna, and appearance of the area. Additionally, when we create new green space, we avoid

artificial designs featuring lawns and rows of cedars; instead, we design potential natural vegetation, which incorporates the trees and greenery found in the forests of the local Suzuka Mountain Range. The bottom line is that, ever since our experiences dealing with environmental problems, we have made protecting biodiversity a vital and proactive part of our approach to plant operations.

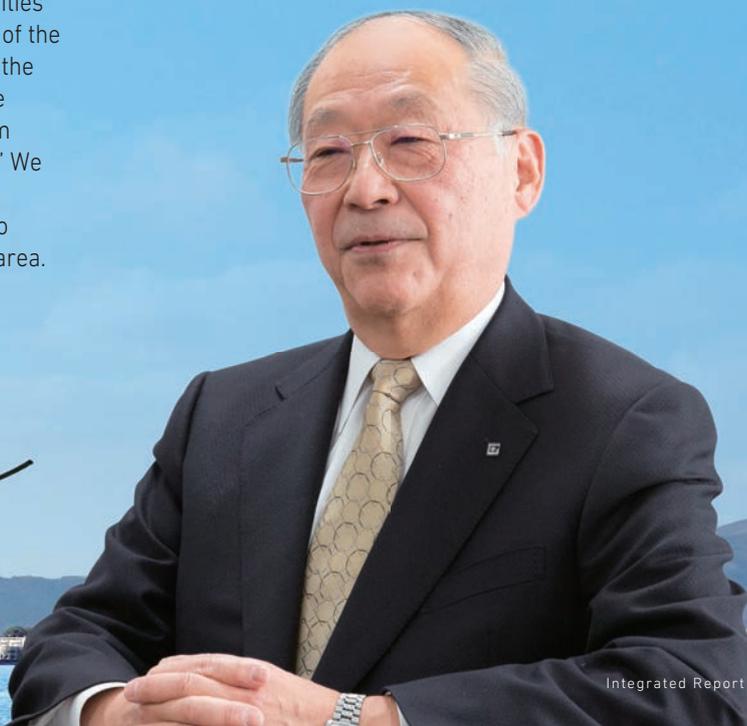
Striving to be a company recognized as indispensable to society

More and more companies are making a conscious effort to work towards the United Nations' sustainable development goals (SDGs) for addressing the key issues facing society. For NEG, however, consideration for local communities, consideration for the environment, and accepting the responsibilities of our history have been among the basic principles by which we have operated for more than 40 years.

A company can exist only with society's permission. When a company is a local company, the community surrounding it constitutes society; however, when a company operates globally, society becomes the entire global community. In this day and age, a company that pursues only profit with no concern for the needs and issues of society will have difficulty staying in existence.

We will not forget our experience with failure at Fujisawa and Shiga-Takatsuki, nor our experience at overcoming those failures; neither will we forget the concepts we have applied to the Notogawa Plant. As we move forward, we will continue to ensure that "Consideration for the environment" is a real and substantial part of how we operate.

Masayuki Arioka
Chairman of the Board
Nippon Electric Glass Co., Ltd.

Our History of Creating Value

Amid the chaos following the Second World War, Nippon Electric Glass (NEG) was established in 1949 in Otsu, Shiga Prefecture, with a total of some 90 employees. We started out with the production of vacuum tube bulbs for radios. Then our product line-up expanded to glass tubing for fluorescent lamps and pharmaceutical and medical use, glass for cathode-ray tubes (CRTs), glass fiber for reinforcing high-function engineering plastics, glass for optical communication and electronic devices, and glass for flat-panel displays (FPDs). Over the years, our line-up has grown and evolved to match the needs of the times and to develop and provide glass products that contribute to the betterment of everyday life. We will continue with our efforts to uncover the unlimited possibilities of glass and seek to create new value for society through advanced creative manufacturing.

From **1949**

Creating NEG's foundation

In 1949, the company separated from NEC Corporation as an independent company. Initially, we produced hand-blown vacuum bulbs for radios and communication equipment. We later succeeded in automating production of glass tubing, which enabled us to mass produce glass tubing for fluorescent lamps. After that, we began production of glass tubing with the use of tank furnaces, which stabilized our business foundation.



Our factory in the early days

From **1960**

Becoming a specialized glass manufacturer with a focus on CRT glass business

In 1965, we accomplished our aim of entering the CRT glass business. Entrance to the rapidly growing TV market helped expand our business even further. This was also when we started new businesses to offer products to various industries, such as glass-ceramics, glass fiber, and glass for electronic devices.



Start of production of CRT glass

From **1990**

The age of overseas business development

In the 1990s, to meet the increase in global demand for CRTs, we created a worldwide supply network, thus becoming one of the leading manufacturers of CRT glass. In the late 1990s, to adapt to the market shift to FPDs, we entered the FPD glass business.



Establishment of Nippon Electric Glass (Malaysia)

Towards our vision of "the world's leading manufacturer of special glass"

In 2019, we launched EGP2021, our new three-year medium-term business plan. Under a slogan of "Strong Growth," we are striving for solid growth in not just business performance but also in human resources, our core technologies, and R&D capabilities as we aim to be the world's leading manufacturer of special glass.

From 2015

For further growth

To seek further growth, we established a new corporate philosophy in 2015 and carried out a three-year medium-term business plan starting in 2016. To expand our glass fiber business, we acquired a European business in 2016 and an American business in 2017 from PPG Industries. As a result, glass fiber has joined FPD glass as one of our main businesses supporting the company.



Acquisition of a U.S. glass fiber business

From 2000

The age of FPDs

To meet the rapid increase of the FPD market, we started producing glass substrates for liquid crystal displays (LCDs) using the overflow process. We made efforts to match the advanced requirements of the FPD market, such as making larger and higher-quality glass substrates.



Production line for glass substrates for LCDs

From 2010

Creating a new business pillar for growth

With the deceleration of FPD glass sales, we expanded our glass fiber for reinforcing high-function engineering plastics, and glass tubing for pharmaceutical and medical use. We also launched various new products, such as glass for solar cells, cover glass for smartphones, and phosphor-glass composite. We also made progress in developing unique products, such as glass-ribbon and glass with a CTE (coefficient of thermal expansion) of zero.



ZERO™ glass with zero CTE

Utilizing six resources of capital for our business operations, we pursue the unlimited possibilities of glass while providing value to society through our innovative products. We will continue our efforts to realize sustainable societies.

Main Input

Manufactured Capital

Noncurrent assets
¥472.6 billion
 Capital expenditures
¥49.3 billion

Intellectual Capital

Patents
2,081
 R&D expenditures
¥7.0 billion

Human Capital

Number of employees
6,875

Financial Capital

Total assets
¥725.5 billion
 Cash and cash equivalents
¥116.2 billion

Social and Relationship Capital

Group companies
12 (domestic)
15 (overseas)

Natural Capital

Electricity
21,400 TJ
 Water
9,880 km³

Strengths of Nippon Electric Glass

See page 8
 "Manufacturing of Nippon Electric Glass"

Corporate Philosophy

We strive to build a brighter future for the world by uncovering the unlimited possibilities of glass for more advanced creative manufacturing.

Our Values

- Customer first
- Get the job done
- Broad minds and open communication
- High ethical standards
- Consideration for the environment

Outstanding features of glass

Glass is a unique material in that it can be customized to different shapes with a wide variety of functions by modifying its composition and by changing the methods of forming and processing. Moreover, it has an attractive surface texture and brilliant appearance. Today, numerous types of our glass—sheet glass, glass tubing, sphere glass, glass fiber, glass powder, glass containers—are used in various applications, such as home appliances, automobiles, ICT, construction, and medical care.

Strengths of our manufacturing

Our strength in manufacturing has two aspects. The first is our product development, which is based on cutting-edge core technologies. The second aspect is our proprietary technologies, which we have accumulated in our production facilities over the past 70 years since our establishment. At the same time, we pursue sustainable manufacturing by paying due consideration to the environment.

Strengths of our organization and culture

Since our establishment, we have nurtured and passed on our corporate ethos (simplicity and fortitude) and our corporate culture (an open workplace in which top executives and employees communicate freely with one another). Our ethos and culture support the company's growth in terms of our organizational capacity, teamwork, and responsiveness to change.

Product Markets



Automotive and Transportation



ICT and Semiconductors



Medical Care



Displays



Lighting



Energy



Social Infrastructure



Home Appliances and Housing Equipment

Value Provided to Society

As a global company, we also pursue the SDGs*. We address issues in the context of each country in an effort to bring about safer, more affluent, and more comfortable societies.

Reduction of environmental impact

Utilizing natural energy

Innovations in ICT

Advancement in medical care

Improvements in safety and comfort of daily life

Advancement in transportation

Creating a robust and durable social infrastructure

A fair work environment and human resource training to develop tomorrow's leaders

Meeting society's challenges

Sustainable Development Goals (SDGs)



Reinvestment

* The Sustainable Development Goals (SDGs) were adopted in 2015 by the United Nations with the goal of achieving common targets by 2030 such as overcoming poverty and halting climate change.

Over the years, we have developed a wide range of basic glass technologies used for material design and evaluation, melting, forming, and processing. These technologies are brought together in our production facilities, where we have been conducting R&D in new applied technologies. This R&D gives rise to unique, high-function glass products.

Cutting-edge R&D

Basic Research

Material design and evaluation

Glass is a material that can incorporate almost any element. We seek to make high-performance glass by considering the features of each element and adjusting its composition. To create optimally functional glass, we repeatedly carry out each stage of production—modifying the composition, test melting, processing, and evaluating.

We developed technology for analyzing traces of RoHS-designated hazardous substances contained in glass. In 2006, we acquired ISO/IEC 17025 testing laboratory certification. Analysis results obtained in our accredited testing laboratory meet global standards, thereby ensuring the quality of our products.

Process design and development

Melting

Our melting technology and the design of our melting furnaces involve advanced and precise furnace operations—for example, controlling combustion and temperature while reducing environmental burdens. These technologies help us to produce high-quality glass.

Forming

One thing that sets our group apart from the competition is our wide range of forming technologies. These technologies enable us to achieve high dimensional accuracy and high productivity. We can use the most suitable forming method for each product and respond to the various needs of our customers.

Processing

New functions and features are given to glass through a variety of working processes. These processes include reforming by heating and softening, crystallizing by firing, coating films, precision cutting and polishing, and compounding with crystals or organic substances.

Commercialization research

Through close cooperation among R&D departments, process technology departments, and departments in charge of commercializing new products, we strive for R&D that gets products to the market and thus turns dreams into reality.

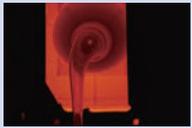
Applied Research

- Precision forming and processing
- Ultra-thin substrate forming
- Hybrid technologies (use of thin film and laminating with other materials)
- Ultra-large substrate manufacturing
- Crystallization

Glass with a Variety of Forms and Functions



Substrate



Tube



Sphere



Fiber



Powder



Molded



Hybrid products

Functions of special glass

- Optical** Light absorption, wavelength conversion, optical thin film
- Electro-magnetic** Insulation, dielectric, conductive film
- Thermal** Heat resistance, fire prevention, low-temperature sealing
- Mechanical** High strength by chemical strengthening or crystallization
- Chemical** Acid resistance, alkali resistance, sustained release of chemicals
- Others** Gas barrier, plastic and cement reinforcement

Business Areas

Expansion and reinforcement areas



Automotive and Transportation

- Lightweight materials
- Displays
- Vehicle cameras
- Vehicle lighting
- Self-driving vehicles
- Electronic devices



ICT and Semiconductors

- High-speed, large-capacity optical communication devices (5G compatible)
- Next-generation semiconductors (compact and high definition, advanced functions)



Medical Care

- Advanced pharmaceutical containers
- Advanced medical equipment and facilities



Displays

- Next-generation displays (high definition, thin and lightweight, flexible)

Strategic development areas



Lighting

- Next-generation lighting (energy saving, high luminance, high output)



Energy

- Renewable-energy systems
- Secondary batteries



Social Infrastructure

- High-function fire-rated equipment
- High-performance structural materials (safe, durable, lightweight)



Home Appliances and Housing Equipment

- High-function home appliances, housing materials
- Multifunction wall materials

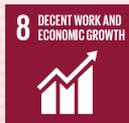
The world's leading manufacturer of special glass

Relationship with Society throughout the Value Chain

In each process of the value chain, we strive to increase the positive effects of our business activities and decrease the negative effects. We will continue to work hand-in-hand with our stakeholders in order to raise corporate value, solve society's problems, and achieve the SDGs.

Increase positive effects				<ul style="list-style-type: none"> 1 <ul style="list-style-type: none"> • Donations to local communities • Support for the socially vulnerable (in South Korea, e.g.) 3 <ul style="list-style-type: none"> • Health and productivity management 4 <ul style="list-style-type: none"> • Endowment course at University of Shiga Prefecture • Science education for schools (send NEG employees to teach) • Support for the Biwako Floating School • Factory tours • Hiring and training of the disabled • Systems for employee education and training, self-development programs 
	Raw materials	Suppliers	Procurement and distribution	Operations
Decrease negative effects	 <ul style="list-style-type: none"> 12 <ul style="list-style-type: none"> • Using resources effectively • Recycling water and raw materials • Reduction of environmentally harmful substances 	 <ul style="list-style-type: none"> 1 8 <ul style="list-style-type: none"> • Avoiding use of conflict minerals • Forbidding of child labor 10 <ul style="list-style-type: none"> • Compliance with the U.K.'s Modern Slavery Act 16 <ul style="list-style-type: none"> • Thorough enforcement of basic procurement policy (open and fair business dealings) 	 <ul style="list-style-type: none"> 7 <ul style="list-style-type: none"> • Thorough enforcement of green procurement guidelines 12 <ul style="list-style-type: none"> • Recycling packaging 13 <ul style="list-style-type: none"> • Modal shift in procurement 	 <ul style="list-style-type: none"> 3 <ul style="list-style-type: none"> • Manufacturing using no harmful substances • Preventing pollution of the atmosphere, waterways, and soil • Health and safety activities • Employee health improvement activities 5 <ul style="list-style-type: none"> • Helping women reach their full potential • Support for raising the next generation 6 <ul style="list-style-type: none"> • Strict control of wastewater (protecting water quality) 10 <ul style="list-style-type: none"> • Human rights initiatives • Committee on Human Rights Issues • Shiga Prefecture Human Rights Issues Liaison Committee (corporate board member) • Compliance with the U.K.'s Modern Slavery Act • Compliance with Japan's Equal Employment Opportunity Act

- 8 Diversity initiatives
- 8 Contribution to cutting-edge science and technology
- 8 Occupational health and safety activities, work-style reforms



- 3 Glass tubing for pharmaceutical use
- 3 Radiation-shielding glass for patient diagnosis

- 7 Resin-reinforced glass fiber to reduce the weight of automobiles
- 7 Resin-reinforced glass fiber for wind turbine blades
- 7 Glass substrates for FPDs, ultra-thin glass
- 7 Lamion™ lightweight composite material
- 7 Lumiphous™ phosphor-glass composite, glass substrate with IEL

Note: See page 42 for details on our environmentally friendly products.

- 9 ARG Fiber for reinforcement in construction
- 9 Development and sales of glass for optical communication and electronic devices

- 11 Lamion™ for train station platform doors
- 11 FireLite™ fire-rated glass for fireproof public facilities
- 11 ARG Fiber for reinforcement in construction
- 11 Glass fiber for resin railroad ties



Sales

Product use

Final product disposal



- 12 Recycling water and raw materials
- 12 Capture and reuse of exhaust gas
- 12 Pursuit of highly efficient manufacturing
- 12 Extending the life of facilities

- 13 Reduction of CO₂ emissions
- 13 Environmental education

- 15 Supporting local forestry association activities
- 15 Removal of non-native fish species in Lake Biwa
- 15 Forest conservation around factories

- 16 Formulation and dissemination of our corporate philosophy structure, thorough compliance
- 16 Human rights initiatives



- 12 Recycling packaging

- 13 Modal shift in shipping



- 12 Reuse of waste glass

Uncovering the Unlimited Possibilities of Glass

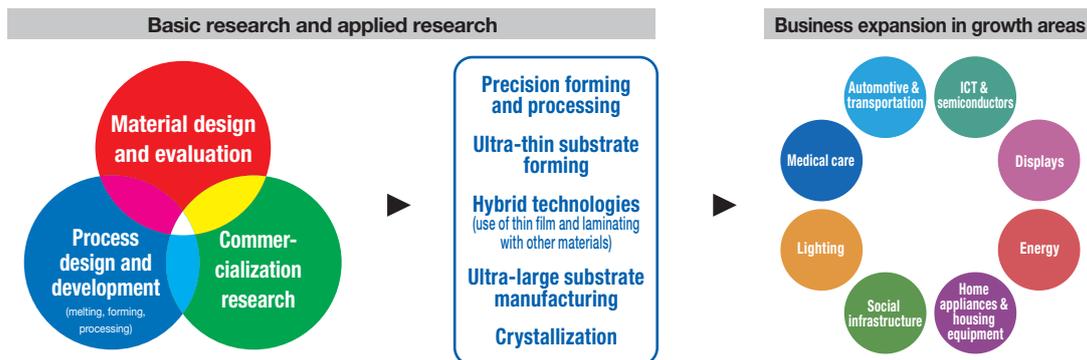
Glass is a unique material that can be customized into different shapes with a wide variety of functions by modifying its composition and altering the various forming and processing methods used. We develop a wide range of glass technologies and create various high-function glass products using our hybrid technologies.

R&D Policy

For basic research, we carry out material design and evaluation, process design and development, and commercialization through prototypes and modification. With this basic research we combine applied research in areas including precision forming and processing, ultra-thin substrate forming, and ultra-large substrate manufacturing. We aim to develop glass products that provide value for society, as we focus on expanding business in growth areas such as automotive, ICT, medical care, and displays.

Under our EGP2021 medium-term business plan, we are making research and development a top priority. Our goal is research and development that turns dreams into reality through an integrated development structure for products, glass technologies, and manufacturing processes, and the further strengthening of ties among company departments.

R&D and Business Development



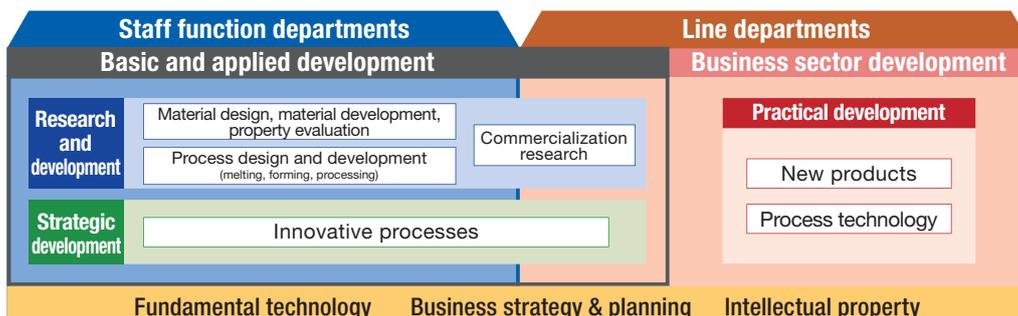
R&D Organization

Our staff function departments (Research & Development Group, Process Development & Engineering Group) carry out R&D such as material design and development, property evaluation, and process design and development. Meanwhile, the line departments carry out practical development such as commercialization of new products, product improvement, and devising advanced functions. The staff function departments and the line departments collaborate on strategic development aimed at solving medium-term development issues.

The Fundamental Technology Division works with institutions around the world in material science, the foundation of glass research.

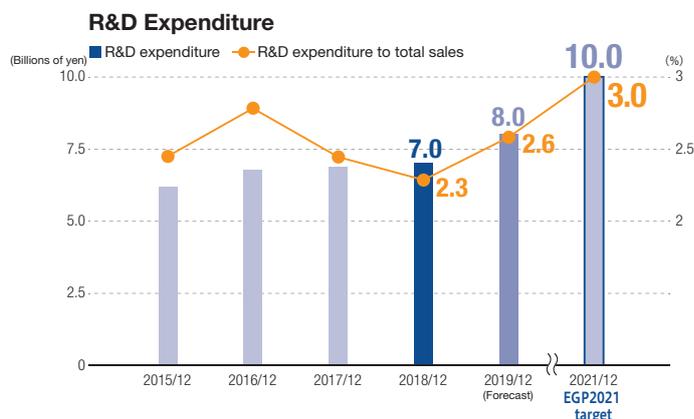
As the first step in EGP2021, to increase the speed of product development and commercialization, we conducted organizational reform under which starting in January 2019 three departments (in charge of research and development, process technology, and commercialization of new products) are integrated so as to better work together as one.

Collaboration between Departments



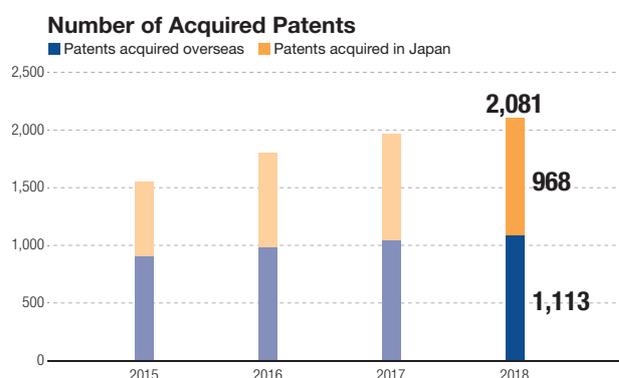
R&D Investment

We are working tirelessly in R&D in order to realize our corporate philosophy: "We strive to build a brighter future for the world by uncovering the unlimited possibilities of glass for more advanced creative manufacturing." We also aim to integrate and evolve our manufacturing processes and product development, and reflect the results in our management strategy in order to realize medium-to-long-term growth. Our R&D expenditure was 7.0 billion yen in fiscal 2018. We will continue boosting our R&D activities.



Intellectual Property

Enhancing our strength in intellectual property is a keystone of our business strategy. Focusing on key business areas and future business development, we are steadily increasing the number of patents we own in Japan and overseas, and actively utilizing licenses and other agreements.

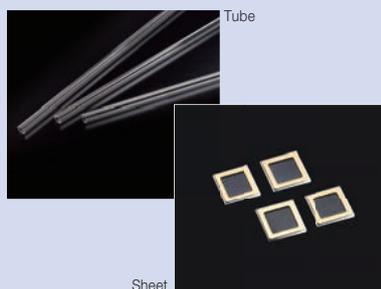


R&D News

Development of high-efficiency deep UV-transmitting glass (released on March 1, 2018)

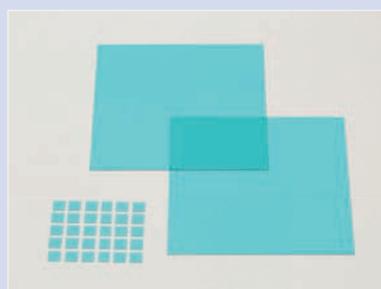
Special lamps are used to transmit deep UV* for antiseptic purposes in places such as hospitals and food processing factories. Deep UV-transmitting glass is used to effectively transmit the deep UV and also protect the lamp's light source. Besides achieving high transmittance in the deep UV region, the deep UV-transmitting glass we developed can be processed at a lower temperature than silica glass, a competing material.

*Deep UV has antiseptic properties and a comparatively shorter wavelength in UV light.



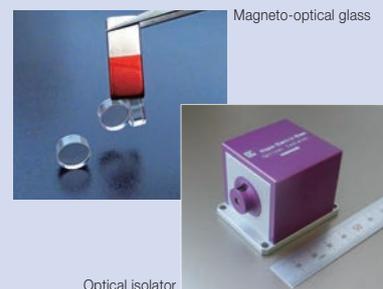
Development of infrared absorbing filter with world's highest visible light transmittance (released on March 8, 2018)

We developed an infrared absorbing filter that provides the world's highest visible light transmittance (based on in-house testing) while absorbing the infrared rays with high efficiency. Used as the cover glass for image sensors in smartphone cameras and other mobile devices, it enables more natural colors for video and still images and contributes to making these devices thinner and smaller.



Development of world's smallest optical isolator for high-power fiber lasers (released on October 22, 2018)

The use of fiber lasers for the marking and micromachining of various materials has spread in recent years. Optical isolators are used on these fiber lasers to block the returning laser light. Our newly developed optical isolator uses a proprietary magneto-optical glass with approximately twice the magneto-optical performance of conventional materials, thus providing higher performance and a significant reduction in size.



Stronger. Lighter. Glass Fiber that Automobiles and Infrastructure Can Depend Upon

Chhatrapati Shivaji Maharaj International Airport (Mumbai, India)



Automobile engine bay

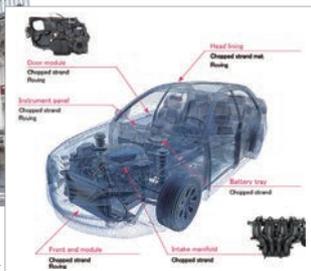
Glass fiber is a material made up of thin glass filaments ranging in diameter from a few to a few dozen micrometers (μm^*) but with a high mechanical strength that produces exceptional composite materials when incorporated into resins and concrete. For example, glass fiber is used to reinforce the resins in automobiles, electronics, and housing and construction-related equipment, but its strengthening, durability enhancing, and weight reducing contributions are seen in a great many more areas than these. In fact, it is currently even being used in construction and civil engineering as a reinforcing material for new concrete products that do not require reinforcing steel.

* μm : 1/1,000th of a millimeter

Main Products and Applications



Example of ARG Fiber construction
Ginza Kabukiza Theater, Tokyo



Automobile utilizing E Glass Fiber

NEG uses continuous, single-fiber filaments of a few to a few dozen micrometers in diameter to manufacture a range of glass fiber products marketed for a variety of applications. The product we produce the most of is E Glass Fiber. This fiber has an outstanding balance of properties, such as mechanical strength, electrical characteristics,

General Manager,
Research & Development Division,
Glass Fiber Group, Production
Masanori Otani



chemical durability, and affordability, which have helped it find adoption in a wide variety of fields, including automotive components and electrical/electronic components. It accounts for more than 90% of the glass fiber used for resin reinforcement. There is also ARG Fiber, which is used as a reinforcing material in cement and mortar thanks to a special composition featuring a large proportion of zirconium oxide, which gives it excellent alkali-resistant properties.

NEG Manufacturing Process and Technological Strengths

Glass fiber is manufactured using the spinning process. This involves first weighing out and blending clay, silica sand, limestone, and other natural minerals into their target proportions; continuously feeding this mixture of raw materials into a melting furnace to produce large quantities of glass; and then continuously extruding this molten glass through hundreds or even thousands of small nozzles. Because every step in this process is seamlessly connected, from melting the raw materials to extruding the glass fibers, it has enabled mass production at a reduced cost which, in turn, has led to dramatic growth in the popularity of glass fiber and the development of the glass fiber market.



Spinning process

Filaments extruded from the nozzles are rapidly cooled and then coated with a surface treatment agent called a binder. The filaments are then gathered into strands (fiber bundles) of several dozen to several thousand filaments. The process then diverges into several different stages, depending on the desired result. For example, strands may be twisted together to make yarn; they may be cut into segments between 1.5 and 25 mm long to make chopped strands; a prescribed number of strands may be arranged in parallel and wound around a cylinder to create a roving; or they may be cut into roughly 50 mm segments, dispersed homogeneously, and treated with a polyester secondary binder to create sheets of chopped strand mats.



Chopped strands for high-function resin

Roving for reinforced resin

Chopped strand mat

In order to ensure the glass fiber used as a resin-reinforcing material performs optimally, it is essential that there is good adhesion between the glass fiber and the resin along their boundary surface. Because the surface of the glass fiber is smooth, almost no physical adhesion between it and the resin can be expected. Also, there is a significant difference in the thermal expansion coefficient of the organic resin and the inorganic glass fiber. This is thought to create significant stress along the boundary surface where the two connect. In order to improve surface adhesion, the surface of the glass fiber must be chemically treated, and this is why the binder used for surface treatment is one of the determining factors in the performance of glass fiber-reinforced resin. At NEG, our many years of experience have resulted in superior binder technology and expertise that continue to give us the lead in the glass fiber industry.

Research and Development Initiatives

In the field of thermoplastic resin reinforcement (i.e., reinforcing resins which soften when heat is applied), there is a growing need for improved strength and warpage reduction for the thinner housings and structural elements accompanying the increasingly smaller-sized electronic devices of recent years. While conventional chopped strands have a round cross section, a special processing method can be applied to produce chopped strands, called Flat Glass Fiber, with an elliptic cross section. This means that these fibers have both fibrous properties and tabular properties, thereby imbuing glass fiber-reinforced resin with a high degree of strength while significantly limiting warpage, as well as improving surface smoothness. Currently at NEG, we are working on mass production of Flat Glass Fiber as a product with future growth potential.



Flat Glass Fiber cross section

Wind turbine blades

Also, in the field of thermosetting resin reinforcement (i.e., reinforcing resins which solidify when heat is applied and change into a hardened substance), there is demand for glass fiber that is highly resistant to deformation and that can be used to reduce flexure in large wind turbine blades. In order to meet this demand, we developed INNOFIBER XM, a glass fiber highly resistant to deformation and having a tensile elasticity 10% greater than that of E Glass Fiber. Our U.S. subsidiary has begun manufacturing and supplying clients with rovings of this glass fiber, for which significant sales growth is projected.

Product and Technology News

Using glass fiber-reinforced resin to help popularize fuel-cell vehicles—the ultimate eco-friendly vehicles

Fuel-cell vehicles (FCVs) use the power created from the chemical reaction of hydrogen with oxygen to generate electricity to run the vehicle's motor. Thus, these vehicles' only emissions are water and steam. FCVs are resupplied with hydrogen at hydrogen fueling stations similar to gasoline fueling stations for gasoline-powered vehicles; however, the hydrogen is kept under high pressure. Specialized tanks are required for storing the highly pressurized hydrogen at both the stations and within the vehicles. To contain the high-pressure hydrogen, the tanks utilize a three-layer construction, with the safety of the surface layer being carefully ensured through the use of glass fiber-reinforced resin.



On-board hydrogen tank protected by a surface layer of glass fiber-reinforced resin

Hard at Work on EGP2021, the New Medium-term Business Plan for Being the World's Leading Manufacturer of Special Glass

Fiscal 2019 marks the start of our new medium-term business plan: EGP2021. Our previous medium-term business plan, EGP2018, has given us much to review, and EGP2021 gives us much to look forward to.



Motoharu Matsumoto
President
Nippon Electric Glass Co., Ltd.

M. MATSUMOTO

Fiscal 2018 saw increased sales but decreased profits

Results for fiscal 2018, the final year of our previous medium-term business plan, EGP2018, show that net sales increased 6.3% from the previous fiscal year to ¥300.3 billion, which exceeded our medium-term business plan target of ¥300.0 billion. This growth is attributable to increased shipments of glass for flat-panel displays (FPDs) and the impact of M&A in our glass fiber business. In fiscal 2017, operating profit greatly exceeded the planned target of ¥30.0 billion; however, in fiscal 2018, operating profit was severely impacted by a variety of negative factors, such as underperformance by our North American glass fiber manufacturing subsidiary and larger-than-expected cost increases for raw materials and fuel, resulting in a 22.8% decrease from the previous fiscal year to ¥24.8 billion.

Summary of EGP2018

EGP2018 launched in fiscal 2016 with management targets of ¥300 billion in net sales, ¥30 billion in operating profit, and an operating margin of 10%. For net sales, we reached our target in the final fiscal year of the plan, producing good results. For operating profit as well, I believe that we have put in place a sufficient foundation to enable us to meet our future targets.

Reviewing our basic policies and measures, specifically to “Strengthen profitability of display-related business,” “Expand glass fiber-related business,” and “Constructive investments,” our assessment is that a certain level of results has been achieved. On the other hand, however, our efforts to “Expand business related to optical and electronic devices, medical care, and heat-resistant and building materials” and “Reinforcement of R&D” partially fell just short of our targets and have been made an important development focus of the EGP2021 new medium-term business plan.

Something else to note is that growth in our glass fiber business has facilitated year-on-year diversification of our business portfolio, which has traditionally overemphasized FPD glass-centric business. In fiscal 2018, we achieved an almost even parity of 51:49 between the FPD glass-centered Electronics and Information Technology sector and the glass fiber-centered Performance Materials and Others sector. We deem this to be one of the major fruits produced from EGP2018.

Overview of EGP2021 and outlook for fiscal 2019

With EGP2021 now underway, our basic policy focus remains to “Pursue further growth toward becoming the world’s leading manufacturer of special glass.” Our goal is increased sales and profits, with performance targets of ¥350 billion in net sales, ¥35 billion in operating profit, and

Outline of the EGP2021 New Medium-term Business Plan

Basic Policy

Pursue further growth toward becoming the world’s leading manufacturer of special glass

Slogan

Strong Growth—Raise Aspirations and Break through Walls

Growing our operations, our human resources, our technological foundation, and our developmental strengths. Making “strong” corporate fundamentals our priority.

Priority Areas

- (1) Research and development
- (2) Business strategies
- (3) Strategic investments
- (4) CSR

Performance Targets

Net sales ¥350 billion

- Electronics and Information Technology: ¥175 billion (glass for displays, glass for optical and electronic devices, etc.)
- Performance Materials and Others: ¥175 billion (glass fiber, medical care, heat-resistant, building materials, etc.)

Operating profit ¥35 billion

Operating margin 10%

an operating margin of 10%. To achieve these results, we have chosen four new priorities to focus on: research and development, business strategies, strategic investments, and CSR.

Fiscal 2019 is the first year of EGP2021, and with the effects of last autumn’s economic downturn in Europe and China still being felt, the year is shaping up to be difficult. Nevertheless, if the market slump is not a protracted one, I believe we can sufficiently recover and, after some patient waiting and watching during the first half, our group as a whole can rally in the second half to meet our targets.

Embodying the slogan of “Strong Growth”

There are two new initiatives which we are implementing with EGP2021. The first is the adoption of a new slogan: Strong Growth—Raise Aspirations and Break through Walls. We felt “Strong” was an apt choice when heading into an era of unpredictable risks and when considering the challenges which became evident again during the three years of EGP2018. It embodies a will to pursue strong growth that allows us to quickly navigate a course through major changes and a will to further strengthen the technological foundations and R&D capacity that make such growth possible.

EGP2021 initiatives are focused on realizing five key factors



Also, while surely not unique to NEG, it seems we are facing a challenge in terms of the growing number of people adopting an overly conservative and territorial approach to their jobs. Thus, we included “break through walls” as a message meant to inspire employees to actively seek out challenges and strive to achieve more.

Five key factors elicited from the next generation of NEG leaders

The second new initiative which we undertook was the identification of five factors key to the future of NEG. Regardless of how unpredictable the era we are entering may be, it is still not such a difficult task to make three- or five-year projections for existing business. However, it is next-to-impossible to predict how new technologies and products should be factored in or, despite the existence of a

number of seed ideas for research and development, how to quantitatively assess what—if any—results they will have. So to help us in dealing with these questions, we launched a project which utilizes a reversed approach: we asked ourselves what society will look like in the year 2050, roughly 30 years from now, and what roles glass will play in that society, and then we asked ourselves what we need to be doing now in preparation for that future. The core members of the project were drawn from among employees currently in their 30s who will be NEG’s corporate leaders 30 years from now; we had them discuss these questions amongst themselves and with upper management. From the vision of the future 30 years hence which took shape from these discussions, we extrapolated back to the present to identify those factors essential for our growth moving forward. These factors are Corporate



Goal, Research and Development, Manufacturing Processes, Environmental Preservation, and Human Resource Development. EGP2021 makes these five key factors, and the initiatives needed to successfully conceptualize and realize them, a priority.

Initially, this project was envisioned as something to be carried out once every three years to coincide with our medium-term business plans; however, we found that it was a valuable opportunity for employees normally focused exclusively on the job in front of them to step back and look at the bigger picture. Because of the significant feedback we have received about how this project opened employees' eyes to the challenges facing the company and how it made them think about the company's future in a way they never had before, we will run the project again this year with a different topic.

Four priorities and policies

1) Research and development: Turning dreams into reality

All glass-related engineers—not just those at NEG—are constantly thinking of ways to benefit future generations by making glass better and imbuing it with new properties. However, it goes without saying that ideas on their own do not lead to anything. To make them a reality, you must determine what sort of research is needed, what sorts of intellectual property must be investigated, what sorts of manufacturing processes must be applied, and—assuming it is a truly novel type of glass—where it can be sold and for how much. We have therefore made “Pursuing research and development that makes dreams come true” one of our guiding policies so that we remain focused on, and capable of, envisioning everything needed to turn dreams into tangible products.

Moreover, while products, technologies, and manufacturing processes have thus far operated as to their own separate, intuitive functions, a new, three-Group development structure has been established, with the Research & Development Group developing glass composition, the Process Development & Engineering Group developing production facilities, and the Electronic Products Group developing commercialization strategies for new, cutting-edge products. It is hoped that this structure will serve as a cradle for future growth and innovation, producing new values for a new era.

With regard to research and development expenditures, ¥10 billion is anticipated to be spent in 2021, which is an increase of 43% from fiscal 2018. As a company that advocates technology, our plan is to spend roughly 3% of

our net sales on research and development annually. Currently, our business comes primarily from providing glass products, but we are actively pursuing the development of devices which utilize glass as a functional component, such as laser-sealed packaging or next-generation secondary batteries (solid-state sodium-ion secondary batteries). We are also working to expand our marketing functions aimed at high-value-added manufacturing that is closer to the market.

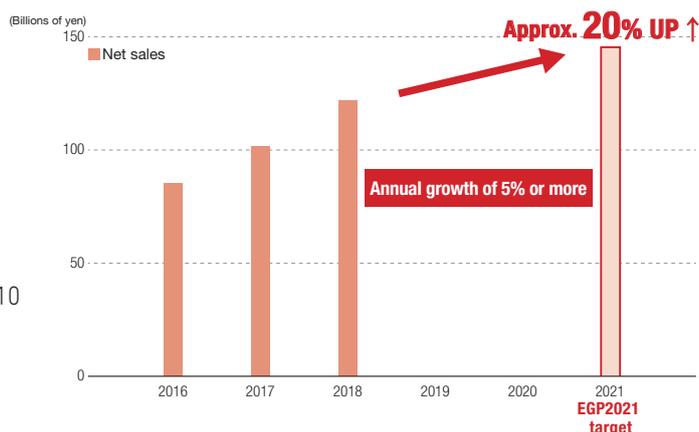
2) -1 Business strategy: Glass fiber business Bearing fruit from M&A synergy

Our glass fibers are used in a wide array of applications, from automotive parts and electronic devices to construction and civil engineering. In particular, our strategic investment in acquiring the European glass fiber business of U.S. company PPG Industries in 2016, followed by acquisition of its U.S. business in 2017, gave us a global production and supply structure comprised of four key bases around the world (Japan, Malaysia, Europe, and the U.S.) that has dramatically boosted our market presence.

Within this, our share of the growing global market for automotive engineering plastics and glass fibers used in wind power generator turbine blades is large, and we are working to further increase our performance in such specialized areas. Demand centered on automobiles, wind turbines, and housing is predicted to grow in the U.S. and Europe, where NEG has acquired bases of operation, and we anticipate the glass fiber business as a whole to grow by 5% or more annually.

During the three years of EGP2021 we must ensure we plant our roots firmly so that the synergy produced from our M&A will bear fruit. More than ever we will work to ensure a stable supply matching the growing demand from our major customers as well as accurately respond to their various development needs.

Envisioned growth of glass fiber business



2) -2 Business strategy: FPD glass business

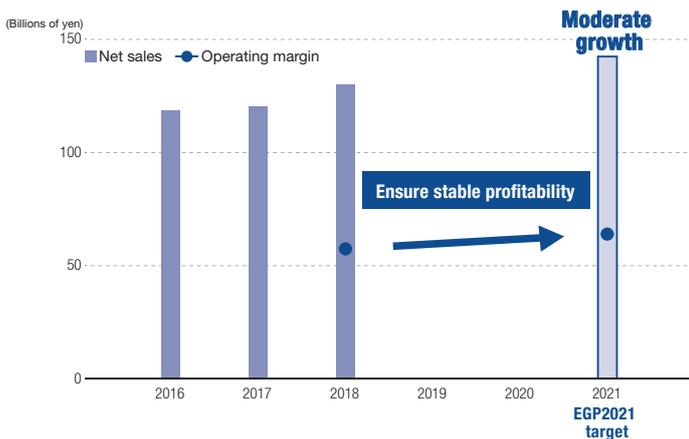
Enhancing competitiveness through technological innovation

The market for FPD used in television and smartphone screens is expected to continue its stable growth. Within this, we are carefully examining the Chinese market, which shows particular growth promise, and we are working on ways to further strengthen our FPD glass presence there.

The competitive environment surrounding FPD glass is a difficult one, with growing volume on one hand and declining prices on the other; thus, even if we are able to maintain the same amount of market share, it is difficult to see growth in sales or profits. Therefore, we have committed ourselves to finding ways to improve our

productivity and quality, and our efforts have resulted in the increased competitiveness of our products. And in order to continue improving that competitiveness, we are working on switching to a new manufacturing process. This process will enable us to dramatically reduce our environmental footprint within the community and the world at large by, among other things, reducing our consumption of raw materials and energy so that we can switch over to more compact facilities. In addition, the success of this innovative process technology for FPD glass will benefit more than just our display business, as we anticipate it will offer lateral, cross-sector applications.

Envisioned growth of FPD glass business



3) Strategic investments

Pursuing enhanced corporate value

Similar to EGP2018, we have established a three-year, roughly ¥50 billion strategic investment framework targeting investments outside the normal scope of capital expenditure. This framework was created with future growth-focused M&A and corporate tie-ups in mind, and in EGP2018, it led to our acquisition of glass fiber business in Europe and the U.S. We are currently considering a number of M&A and alliance proposals. While none of these proposals matches the size of ¥50 billion, having such a large reserve means we are always ready to move as soon as an opportunity presents itself.

Moving forward, our aim is to utilize organic means (existing resources) and non-organic means (M&A, etc.) to further enhance our corporate value while achieving sustainable growth.

Main CSR initiatives for EGP2021

Environment

- ◆ Development and sales expansion of environmentally friendly products
- ◆ Expanded implementation of highly efficient manufacturing processes contributing to reduced CO₂ emissions
- ◆ Promotion of green procurement
- ◆ Support for local forest conservation efforts
- ◆ Eradication of non-native fish in Lake Biwa



Diversity and Inclusion

- ◆ Percentage of employees with disabilities: Achievement of twice the legally mandated rate
- ◆ Platinum Kurumin Certification (Act on Advancement of Measures to Support Raising Next-Generation Children)
- ◆ Promotion of telecommuting and the re-employment system
- ◆ Restructuring of the rehiring system



Community Contribution

- ◆ Ongoing collaboration with the University of Shiga Prefecture
- ◆ Support for the Biwako Floating School initiative
- ◆ Active participation in local events
- ◆ Educational support for local schools
- ◆ Enhancement of scientific education events



4) CSR

Environmental, diversity, and community-related initiatives

In this day and age, ESG and SDGs are indicators which have a powerful impact on how a company is assessed. Of these, we view “environment,” “diversity and inclusion,” and “community contribution” to be key priorities for our CSR activities. We make sure to continually remind ourselves of their background and importance as we undertake a variety of initiatives related to them.

First of all, as a company that practices energy-intensive manufacturing, we regard consideration for the environment to be an obligation. If we do not take the initiative to reduce our environmental footprint, even simply continuing our business becomes difficult. It is with full recognition of the urgency of this situation that we are undertaking initiatives aimed at reducing CO₂ and NO_x emissions, as well as raw materials, fuel and water consumption, within our manufacturing process.

With regard to “diversity and inclusion,” we are focused on increasing the percentage of persons with disabilities in our workforce as well as on restructuring our rehiring system. Even now around 70% of our workforce past the age of mandatory retirement is rehired in our group, as effectively utilizing senior-aged personnel is indispensable to ensuring our competitive strength.

For “community contribution,” we will continue to make the next generation’s education one of our main priorities through such initiatives as educational support to local

schools and hosting scientific education events. For over 10 years we have maintained a collaborative arrangement with the University of Shiga Prefecture, and we plan on continuing it well into the future. We believe that this university is among the top glass-related research institutions in Japan. In addition, in 2009 we donated ¥100 million to the construction of the *Uminoko* ship under the Biwako Floating School environmental education initiative for children held by Shiga Prefecture. And starting this current fiscal year we have become one of the sponsors of the Biwako Floating School.

To shareholders and investors

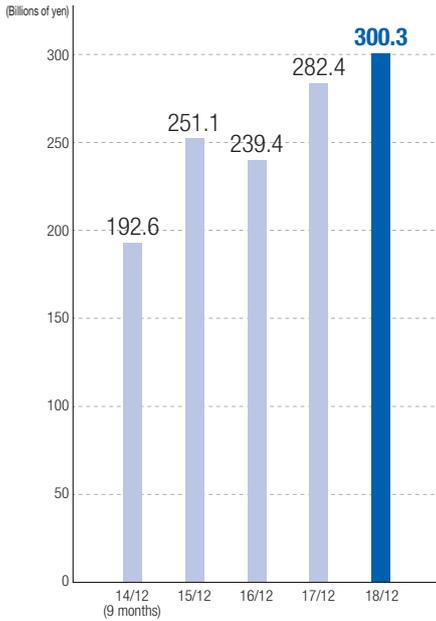
We regard returning profits to shareholders as a key management issue, and it is a fundamental policy of ours to provide stable, ongoing dividends to investors. Having said that, we take a flexible approach to providing returns to our shareholders, depending on the amount of progress made on the medium-term business plan. In fiscal 2018, we obtained for the first time ¥10 billion in treasury stock for the purpose of rewarding our shareholders.

Fiscal 2019 is the first year of EGP2021. During the three years encompassed by this plan, our focus is on the next 20 and 30 years, for which we will work to build a solid manufacturing foundation that enables us to provide real value contributing to the development of society. With this in our minds, and undimmed enthusiasm in our hearts, we will continue to move forward towards the goals that we have set for ourselves. We look forward to your ongoing support.

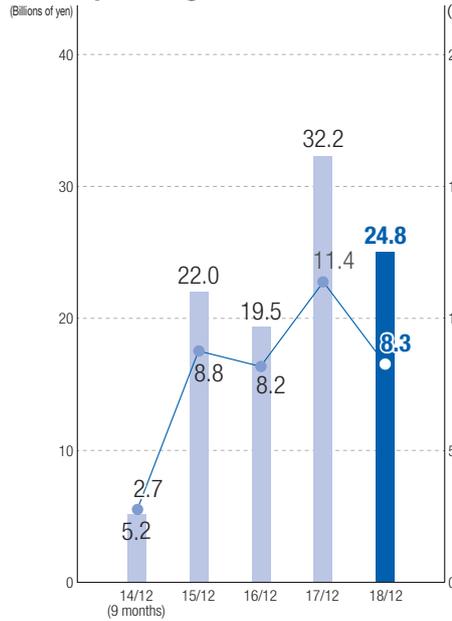


Financial Highlights (Consolidated)

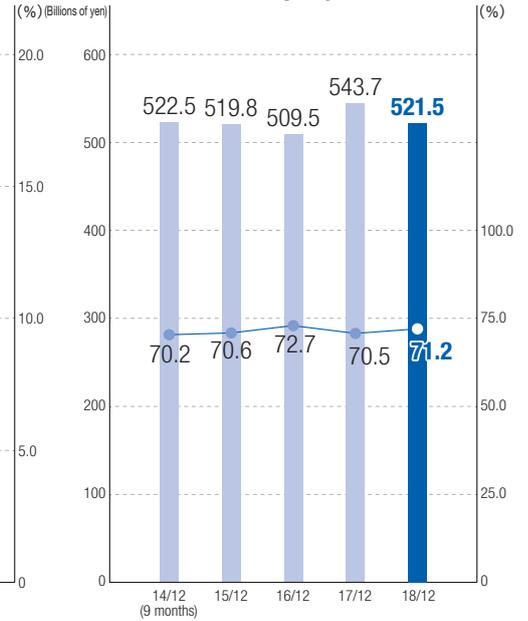
Net Sales



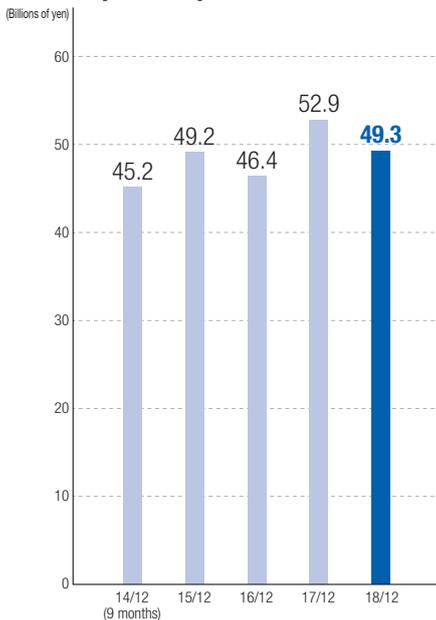
Operating Income, Operating Income Ratio



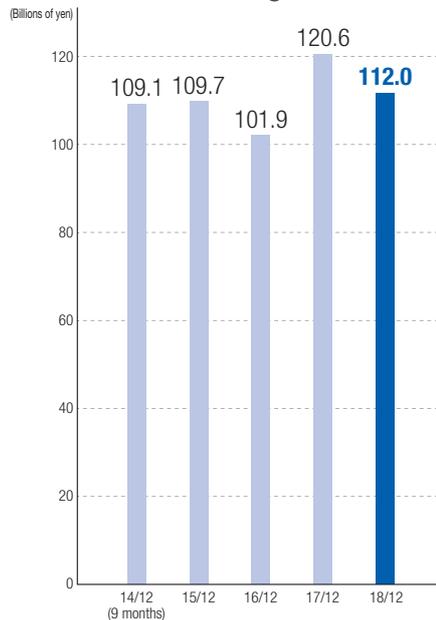
Net Assets, Equity Ratio



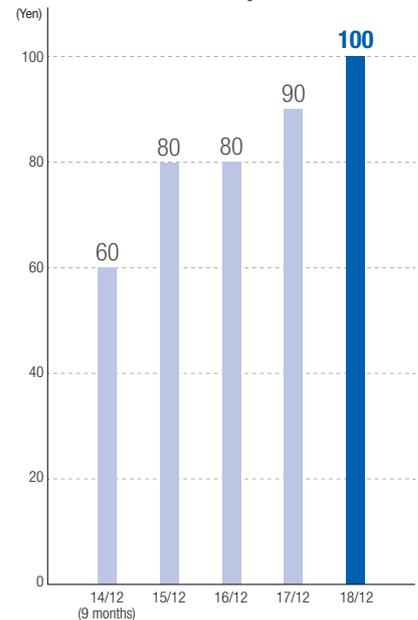
Capital Expenditures



Interest-bearing Debts

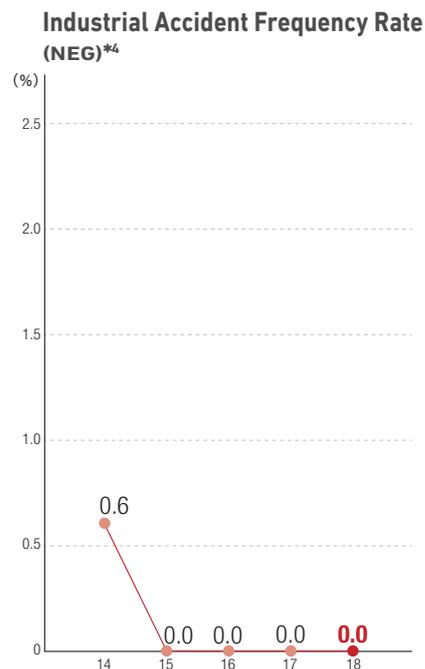
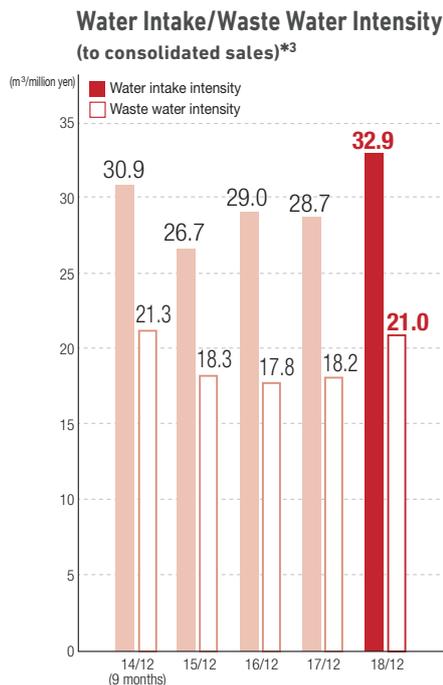
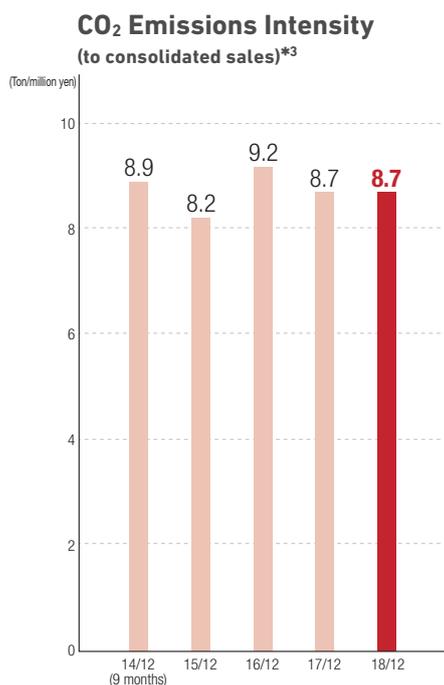
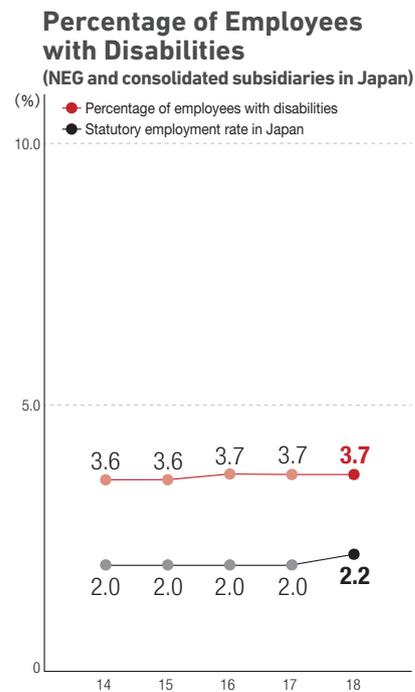
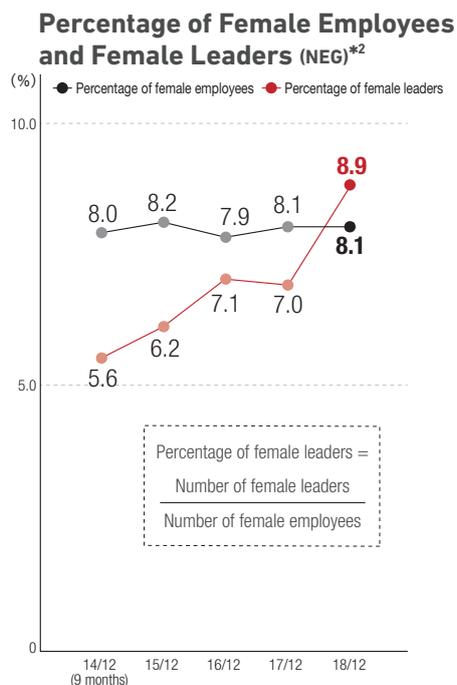
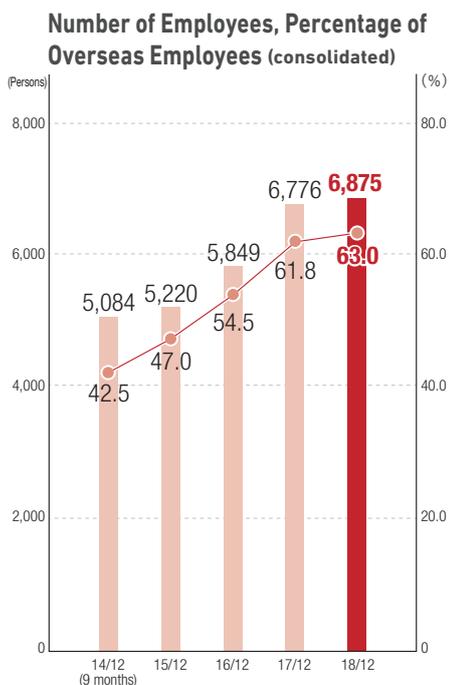


Cash Dividends per Share*1



*1: Per share of common stock amounts are retroactively adjusted for subsequent stock consolidation. On July 1, 2017, common shares were consolidated at a ratio of 5 to 1 based on the number of shares held by shareholders of record as of June 30, 2017.

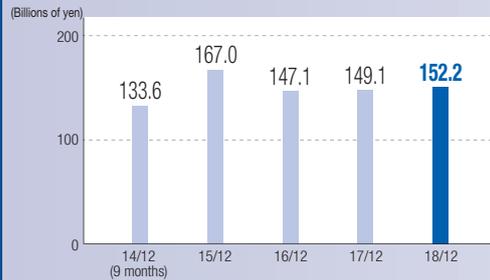
Non-financial Highlights



*²: Some of the calculations have been revised and the previous years' figures have been corrected. A female leader is a female employee who oversees and manages subordinates.
 *³: The figure for fiscal 2017 has been revised to include the figures for the U.S. glass fiber business acquired in September 2017. *⁴: Counted January–December every year.

Electronics and Information Technology

Net Sales (year)



Net Sales (quarter)



Display-Related Business

Main Products Glass for flat-panel displays (FPDs), glass for chemical strengthening, glass for solar cells

Business Overview

For fiscal 2018, shipments continued to be strong for glass for FPDs as demand exceeded initial forecasts. In particular, thanks to increased sales to new customers in China and to key existing customers, sales by screen surface area were up significantly over the previous year. Shipments of glass for chemical strengthening were up due to factors including more models incorporating this glass and the start of use of this glass as the back cover of smartphones. Demand for glass for solar cells was sluggish.

In operating profit, product prices declined at only a moderate pace, while continuing efforts to extend the life of production facilities and improve productivity have gradually come to fruition. The result was an increase in the operating margin.

Reflecting on EGP2018 Medium-term Business Plan

On the whole, we succeeded in our key tasks of improving productivity, smoothly shifting production overseas, and managing with a focus on our bottom line. Above all, the start of operations went smoothly at our new melting furnace in Xiamen, China, which has made a major contribution to increased shipments in the growth market of China. In the second half of fiscal 2018, we achieved our initial target of having 50% of our forming operations overseas (25% in South Korea, 25% in China).

EGP2021 New Medium-term Business Plan and Outlook for Fiscal 2019

The early stages of fiscal 2019 will see business results recoil from the strong previous year. However, we expect demand to bounce back in the second half and slight growth for the whole year. We will respond promptly and smartly to demand rebounds as we strive to increase sales.

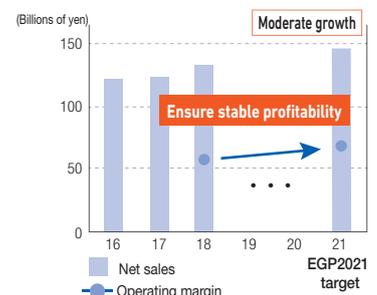
Results of Productivity Improvements



FPD Glass Forming Capacity Ratio



Envisioned Growth of FPD Glass Business



Akihisa Saeki
Director and Senior Vice President, Group General Manager of Display Glass Group

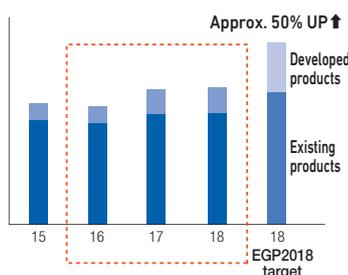
The FPD market has settled down into stable growth and no one is predicting major growth in glass for this field in the foreseeable future. Against this background, the key to continued business success is how profitable we can be. Under EGP2021, we will stabilize and grow business by further improving quality and innovating productivity. We will also strive to boost our presence in the growth market of China by expanding sales through strategic action.



Optical and Electronic Device-Related Business

Main Products Glass for electronic devices, glass for optical devices

Net Sales during EGP2018



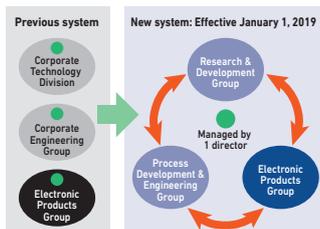
Business Overview

In the business for glass for electronic devices in fiscal 2018, there was moderate growth in powdered glass and precision glass tubes in tandem with demand for these in home appliances and automobile parts. Solid growth continued in cover glass for image sensors, mainly for interchangeable-lens cameras. However, glass for supporting semiconductor wafers failed to live up to expected demand. In glass for optical devices, sales of glass for lenses of FTTH equipment were sluggish, but all other glass in this category performed well overall. Meanwhile, phosphor-glass composite, a light wavelength-converting material, enjoyed strong sales, especially for car headlights.

Reflecting on EGP2018 Medium-term Business Plan

Under EGP2018, we strove to quickly commercialize new products in addition to expanding sales of existing products. While we achieved moderate growth in existing products, we were not able to commercialize products we developed as fast as we had hoped, and this remains a task for this fiscal year.

Structure of Integrated Development System

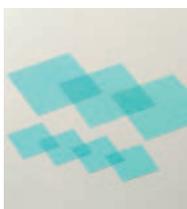


EGP2021 New Medium-term Business Plan and Outlook for Fiscal 2019

In fiscal 2019, we will strive to boost net sales by responding smartly to demand increases in electronic devices and increasing sales of a number of new products scheduled to reach the market.

Our Electronic Products Group is playing a crucial role in R&D, one of the priorities of EGP2021. Having considered the results of EGP2018, our previous medium-term plan, we will strengthen ties between departments in charge of glass composition development and process development in order to speed up commercialization of products we develop. Our goal for fiscal 2021, three years down the road, is an increase in net sales of at least 50% over fiscal 2018, with new products making the main contribution.

New Product Development



Infrared absorbing filters



High-efficiency deep UV-transmitting glass



Masahiro Kobayashi

Performance Materials and Others

Net Sales (year)



Net Sales (quarter)



Glass Fiber Business

Main Products Glass fiber

Business Overview

The first half of fiscal 2018 saw a continuation of strong shipments, but the second half brought a decrease, mainly due to seasonal factors and lower demand from Europe, China, and some other regions. However, the U.S. glass fiber business acquired in September 2017 contributed to sales for the year and fiscal 2018 net sales were up over the previous fiscal year.

In operating profit, however, factors including up-front investment costs generated in relation to productivity improvement and production increase at the U.S. subsidiary, lower production efficiency than expected at the U.S. subsidiary, and goodwill amortization exerted downward pressure on operating profit.

Reflecting on EGP2018 Medium-term Business Plan

To realize M&A and alliance strategies that would create new business opportunities and growth synergy, we acquired the European glass fiber business of U.S. company PPG Industries in October 2016, followed by the acquisition of PPG's American glass fiber business in September 2017. Following these acquisitions, we steadily revamped and increased capacity at these production facilities to have them swiftly produce results. However, production efficiency increases were slower than expected and this remains a task for this fiscal year.

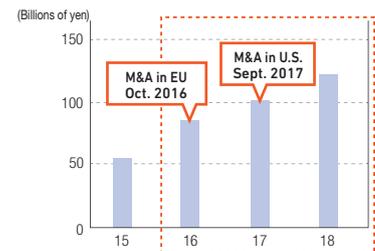
On the bright side, we have been able to build a global production and supply system that comprises bases in Japan, Malaysia, Europe, and the U.S., and this will be the foundation for future business growth.

EGP2021 New Medium-term Business Plan and Outlook for Fiscal 2019

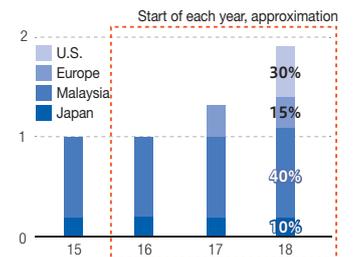
Although the outlook for fiscal 2019 is increasingly murky due to factors such as weak demand at the beginning of the term centered on the European and Chinese markets, we will respond smartly to demand trends through our integrated sales and production system. The top priority is boosting production efficiency at our European and U.S. subsidiaries. Success here will lead to expanded sales.

EGP2021 will achieve synergy between our bases and allow us to expand business. Compared to fiscal 2018, we are aiming for at least 5% in growth in net sales in fiscal 2019 and 20% growth in 2021, three years from now.

Net Sales Growth

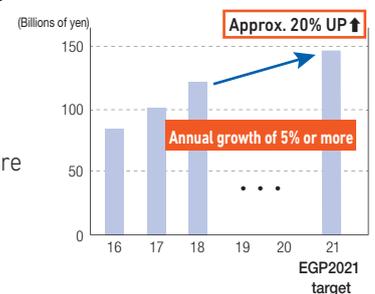


Expansion of Global Production Capacity



Note: Using 2015 production capacity as an index of 1.

Envisioned Growth of Glass Fiber Business



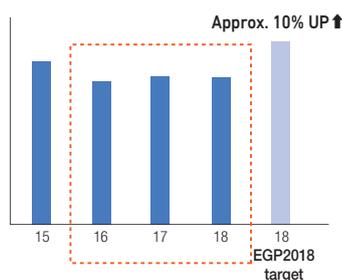
Norio Nakamura
Senior Vice President and Group General Manager of Glass Fiber Group



Medical Care, Heat Resistance, and Building Material-Related Business

Main Products Glass for medical care, heat-resistant glass, glass for building materials

Net Sales during EGP2018



Business Overview

For heat-resistant glass, performance in fiscal 2018 was sluggish overall, due to factors including our glass for top plates of cooking appliances being affected by inventory adjustments by companies in related industries. In glass tubing for pharmaceutical and medical use, we increased shipments of our high-quality glass medical containers with outstanding chemical resistance in response to increasing demand in the Chinese market against a background of medical advances in that country.

Our fire-rated glass boasts excellent thermal-shock resistance and safety, and we enjoyed increased shipments of this product thanks to highlighting its benefits for the construction industry.

Reflecting on EGP2018 Medium-term Business Plan

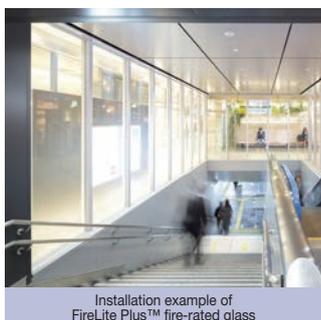
Under EGP2018, we strove to grow business through sales expansion and investments. While these efforts allowed us to achieve a degree of success in EGP2018's priorities of increased sales of glass tubing for pharmaceutical and medical use to China and fire-rated glass for construction, results fell short of initial expectations in the fields of glass for construction, heat resistance, and medical as a whole. We must therefore strive to achieve these results under EGP2021.

EGP2021 New Medium-term Business Plan and Outlook for Fiscal 2019

Under EGP2021, we are focusing on glass tubing for pharmaceutical and medical use to China and heat-resistant glass for top plates of cooking appliances in Europe. We are also promoting the excellent properties of our fire-rated glass as we make aggressive pushes into markets in Japan and around the world.



BS-A Dark™ pharmaceutical glass tubing (with high light-shielding properties)



Installation example of FireLife Plus™ fire-rated glass

In fiscal 2019, we aim to put EGP2021 policies into action to raise net sales. It is also crucial that we steadily raise production efficiency and improve quality in the fields of glass for construction, medical, and heat resistance. By thoroughly implementing the strategies of EGP2021, we aim to expand sales and raise profitability.



Akira Kishimoto

We will strengthen management supervisory functions and invigorate Board of Directors meetings, which will help our group boost competitiveness and achieve the goals of EGP2021, our new medium-term business plan.

Our Corporate Governance Policy

We believe that to increase corporate value and achieve sustainable growth, it is essential to continue to ensure managerial transparency and strengthen supervisory functions regarding the execution of business affairs. This is our basic policy on corporate governance and we will strive to improve our organization and business systems in accordance with this policy.

Corporate Governance Structure

Board of Directors

The Board of Directors makes decisions on important management affairs of our group and supervises the execution of business affairs.

As of March 28, 2019, the Board of Directors consists of nine members (including two representative directors, four inside directors, and three outside directors). To achieve clarity of management responsibility and develop a flexible management system capable of responding to changes in the business environment, our group has shortened the term of Directors to one year. Regular Board of Directors meetings are held monthly, and extraordinary Board of Directors meetings are held when necessary. In addition, at the budget meeting held once a year, the Board of Directors monitors management by hearing explanations directly from the

respective executive officers about the business outcomes of the current fiscal year and the budget of the next fiscal year.

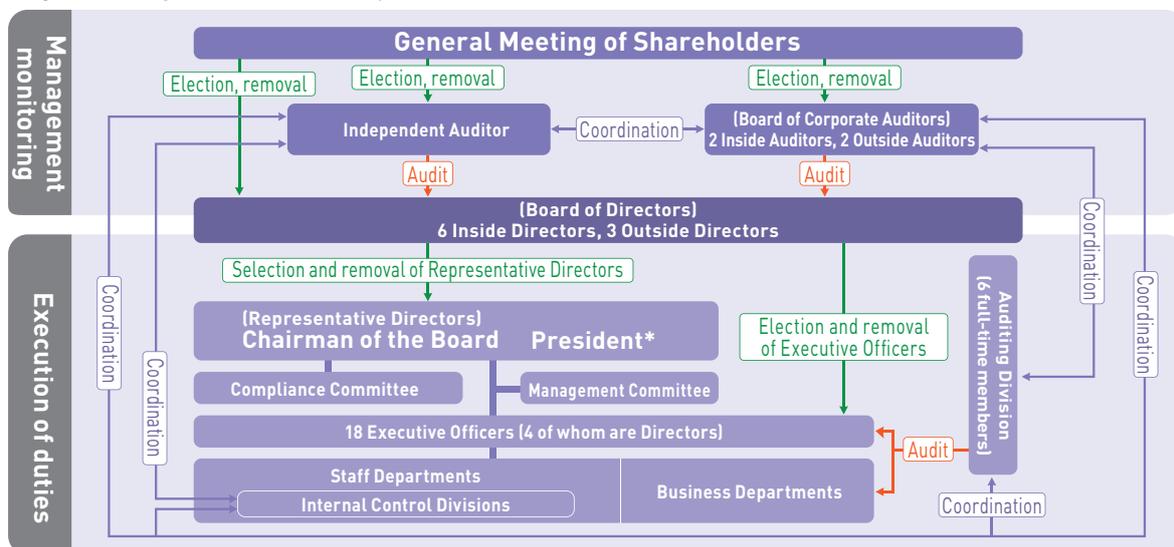
We have disclosed the reasons for the appointment of each director in the Notice of the 100th General Meeting of Shareholders (held on March 28, 2019), which is available on our website.

(https://www.neg.co.jp/uploads/sites/2/201903_100_notice_en.pdf)

Board of Corporate Auditors

Our group adopts a corporate auditor system. As of March 28, 2019, the Board of Corporate Auditors consists of four Corporate Auditors, two of whom are outside Corporate Auditors. Corporate Auditors conduct audits of the Directors' execution of their duties through assessing business affairs and corporate assets and setting important audit issues according to auditing policies, plans, and assignment of duties established by the Board of Corporate Auditors. They also participate in Board of Directors meetings. Meetings of the Board of Corporate Auditors are held monthly in principle, and Corporate Auditors share information and exchange opinions at these meetings. Corporate Auditors endeavor to improve the effectiveness of their audits by deepening their understanding about the company's business operations. For this purpose, the Corporate Auditors take various measures, such as attending the annual budget meeting and periodically questioning Directors and Executive Officers about their duties and handling of business affairs.

Diagram of Corporate Governance System (as of March 28, 2019)



*Person responsible for execution of duties

Management Committee

The Management Committee deliberates on our company's important managerial affairs and draws up detailed action plans regarding the decisions made at the Board of Directors meetings. Management Committee meetings are held twice a month and when deemed necessary.

Executive Officers

Our group adopts an executive officer system to promote faster decision making, ensure managerial transparency, and enhance the execution of business affairs. As of March 28, 2019, there are 18 Executive Officers (four of whom are Directors). The President is responsible for execution of duties and the other Executive Officers execute the duties assigned to them by the President. Each Executive Officer serves for a term of one year.

Outside Directors and Corporate Auditors

As of March 28, 2019, there are three outside Directors and two outside Corporate Auditors within our company. Outside Directors make up one-third of all Directors.

One of the outside Directors is an economist who has expertise and broad experience in the field of global economics. Another outside Director has a long track record in corporate management, and vast knowledge and experience in that area. The third outside Director is a scientific researcher with extensive expertise and experience in agriculture. The outside Directors provide objective advice and professional opinions at Board of Directors meetings. Their appointments further

Attendance of Board of Directors and Board of Corporate Auditors Meetings in Fiscal 2018

	Name	Board of Directors	Board of Corporate Auditors
Representative Directors	Masayuki Arioka	14/14 meetings (100%)	—
	Motoharu Matsumoto	14/14 meetings (100%)	—
Directors	Hirokazu Takeuchi	14/14 meetings (100%)	—
	Akihisa Saeki	14/14 meetings (100%)	—
	Koichi Tsuda	14/14 meetings (100%)	—
	Hiroki Yamazaki	14/14 meetings (100%)	—
Outside Directors	Sumimaru Odano	14/14 meetings (100%)	—
	Shuichi Mori	14/14 meetings (100%)	—
	Reiko Urade	Assumed office March 2019	—
Full-time Corporate Auditors	Masahiko Ohji	14/14 meetings (100%)	13/13 meetings (100%)
	Yoshihisa Hayashi	Assumed office March 2019	—
Outside Corporate Auditors	Katsuhiro Matsui	11/11 meetings (100%)	10/10 meetings (100%)
	Tsukasa Takahashi	Assumed office March 2019	—

strengthen management supervisory functions.

Outside Corporate Auditors consist of one certified accountant and tax accountant and one attorney at law, who are both independent from the company and are highly experienced in their respective fields. They proactively perform their auditing duties and reinforce supervisory functions.

When hiring outside Directors and Corporate Auditors, we base our selection on whether candidates satisfy requirements set for independent directors/corporate auditors in accordance with the Tokyo Stock Exchange's rules and regulations. At the same time, we also take into account the importance of avoiding any risks or conflicts of interest with our general shareholders. We have registered all our outside executives as independent directors/corporate auditors with the Tokyo Stock Exchange.

Analysis and Evaluation of the Effectiveness of the Board of Directors

All of our Directors respond to an annual questionnaire to investigate the effectiveness of the Board of Directors. We found that the Board of Directors is viable and functioning effectively. We will continue to conduct such surveys to rate the Board's effectiveness and ensure that deliberations are effectively conducted at Board of Directors meetings.

Policy on Deciding Directors' and Corporate Auditors' Remuneration

Remuneration is paid to inside Directors on a monthly salary and bonus basis, and through grant of restricted stock (the latter was introduced at the 100th General Meeting of Shareholders held on March 28, 2019). Bonuses take into account overall factors such as performance and job description, and the total for bonuses is decided at the General Meeting of Shareholders. Outside Directors and Corporate Auditors are compensated on a monthly salary basis and receive no bonuses.

Total Amount of Directors' and Corporate Auditors' Remuneration in Fiscal 2018

Category	Total amount of remuneration (millions of yen)	Total amount for each type of remuneration (millions of yen)		Number of eligible Board Members
		Base remuneration	Bonuses	
Directors (outside Directors excluded)	331	251	80	7
Corporate Auditors (outside Corporate Auditors excluded)	43	43	—	2
Outside Directors and Corporate Auditors	25	25	—	5

To maintain public trust and to achieve sustainable growth, every employee and executive of our group is expected to comply with laws and international rules, and consistently act in accordance with our organization's high ethical standards.

Compliance System

We have a compliance committee, a specialized organization that makes sure all of our group employees are informed to ensure their compliance with laws and corporate ethical standards. The committee is responsible for the following activities:

- Drafting revisions to the Group Code of Conduct and Principle of Activities
- Collecting and analyzing information on compliance and providing compliance training
- Installing and managing an internal whistleblowing system (NEG Hotline)

Compliance Program

Group Code of Conduct and Principle of Activities

To ensure that all employees are informed on compliance matters, we have established the Group Code of Conduct and Principle of Activities. Wallet-sized cards printed with the Corporate Philosophy Structure, Code of Conduct, Principle of Activities, and an introduction to the NEG Hotline are distributed to employees of group companies in Japan.

NEGグループ企業行動憲章 ～誠実な行動～	
<p>1. お得意先第一 ○お得意先のご要望を理解し、そのご要望にどこまでもお応えします。 ○社会に役立ち、かつ安全でお得意先の満足と信頼を得られる製品を提供します。 ○新たな技術開発に挑戦し、文明の進歩と豊かな未来に寄与します。</p> <p>2. 達成への執念 ○執念をもって課題を成し遂げます。</p> <p>3. 自由闊達 ○前例にとらわれない自由な発想と、部門や世代にとらわれない自由な発言を尊重します。</p> <p>4. 高い倫理観 ○内外の法令、国際ルールを遵守し、常に高い倫理観をもって誠実に行動します。 ○政治、行政との健全かつ正常な関係を保ち、反社会的勢力、団体には毅然と対応します。 ○公正、透明、自由な競争、適正な取引を行います。 ○会社資産を適正、確実に管理します。</p>	<p>5. 自然との共生 ○自然と共存することを常に意識し、企業活動に伴う環境負荷の低減に努めます。 ○地球環境の保全と循環型社会の実現に寄与します。</p> <p>6. 社会貢献 ○健全な企業活動を通して利益を生み出し、社会の持続的発展に貢献します。 ○企業活動を行う国や地域社会の文化を尊重し、良き企業市民として行動します。</p> <p>7. 人権尊重 ○人権を尊重し、差別的取り扱い、児童労働、強制労働を認めません。 ○安全で、従業員一人ひとりが十分に能力を発揮できる環境を確保します。</p> <p>8. 情報発信 ○適時、適切に、必要な企業情報を開示するとともに、広く関係先とのコミュニケーションを図ります。</p> <p style="text-align: right;">以上</p> <p style="text-align: right;">1998年 8月1日制定 2006年 2月1日改訂 2015年12月1日改訂</p>

Internal Whistleblowing System

An internal whistleblowing system called NEG Hotline has been installed. Its purpose is to prevent any illegal violations, wrongdoings, or unethical acts and to promote early detection and quick resolution should such acts occur.

We have established two consultation hotlines, one that connects employees to the compliance committee (internal contact point) and another that connects to an attorney's office (outside contact point). The confidentiality of the informants is strictly protected at both contact points, so that no unfair treatment will occur.

This whistleblowing system has been set up at some of our overseas subsidiaries and we are currently working to have it at all NEG group companies in the future.

「大切にしている価値観」の実践で、コンプライアンスの更なる強化を

お得意先第一
達成への執念
自由闊達
高い倫理観
自然との共生



コンプライアンス強化月間

2018年10月1日～31日

日本電気硝子株式会社 コンプライアンス委員会

Ensuring Compliance

To raise compliance awareness (for example, for high ethical standards and respect for human rights) throughout our group, each year we carry out compliance training as a part of an education program for newly hired employees and antitrust seminars for employees engaged in sales activities. We also ensure awareness among management by holding workshops for directors and executive officers. At these sessions, participants take the opportunity to discuss themes such as governance and compliance.

In addition, we have designated October as the month for strengthening compliance. We conduct compliance-related lectures and workshops throughout our group companies both in Japan and overseas, and also put up compliance awareness posters throughout our facilities. Moreover, we ask all executives and employees in Japan and overseas to provide us with signed declarations promising that they will abide by the Group Code of Conduct. This gives them the opportunity to reflect on how they carry out their work in terms of compliance. Thanks to these efforts, no affairs subject to legal actions, such as bribery, anticompetitive acts, or other violations occurred in fiscal 2018.



Compliance lecture at the Otsu Plant



Compliance workshop at Electric Glass (Korea)

Compliance Education, Workshops, and Lectures Held in Fiscal 2018

	Name	Intended Persons	No. of Times	No. of Participants	Themes
Japan	Education for new employees	All new employees	1	37	<ul style="list-style-type: none"> • Corporate Philosophy, Group Code of Conduct, Principle of Activities • What is compliance? • Antitrust laws • Internal whistleblowing system • Case studies, etc.
	Workshop	Managers at our company and domestic subsidiaries (Participants shall inform other employees in their workplace of the content.)	4	146	<ul style="list-style-type: none"> • Other company cases • Leak of personal information • Sexual harassment • Overtime work • Internal whistleblowing system, etc.
	Lecture	Executives and department managers at our company, representatives of domestic subsidiaries, district managers	1	50	<ul style="list-style-type: none"> • Plea bargaining system in Japan
	Mock press conferences	Executives, plant general managers, division general managers, regional administrative managers, public relations general manager	1	24	<ul style="list-style-type: none"> • Hypothetical factory accident
	Antitrust seminar for sales departments	All employees of our company engaged in sales activities	5	71	<ul style="list-style-type: none"> • Antitrust laws • Current status and cases in each country • Important points • Case studies
Overseas	Workshop	Managers at subsidiaries in China, South Korea, and Taiwan	8	243	<ul style="list-style-type: none"> • Importance of compliance • Other company cases • Familiar examples of compliance violations

Implementing BCP

To be prepared for disasters such as earthquakes, typhoons, floods, and fires, we created a disaster management manual based on the company's disaster preparedness regulations, and we carry out emergency drills periodically. In the wake of the 2011 Great East Japan Earthquake, we reviewed our disaster management measures and implemented seismic reinforcement to our buildings, production facilities, and equipment.

In 2015, we began using Business Continuity Planning (BCP), which replaced the previous disaster preparedness regulations. To facilitate the processes necessary for BCP, a manual providing information on detailed preparation procedures and actions that should be taken when an emergency or disaster strikes was created. In accordance with the implementation of BCP, we have also introduced a system that will efficiently confirm the whereabouts of all domestic employees and their families in case of an emergency. Moreover, in order to resume production and

continue to supply our customers in the aftermath of a disaster, we are working to strengthen our risk management system of procurement.

At the BCP response training held in November 2018, we strove for practical application by simulating a situation in which, immediately following a disaster, task force members are mobilized and a videoconference system is set up among a number of our sites in Japan to share information.

Basic Policy of BCP

- 1.To protect each employee and their families and to secure their safety.
- 2.To protect production equipment, to prevent the spread of damage as well as secondary disasters from occurring within the company and the adjacent communities, and to help with rescue efforts.
- 3.To resume providing clients with products and services as rapidly as possible.



BCP response training



Mock press conference

Risk Management

Our group reviews business risks on a periodic basis, based on our policy on internal control, and takes the necessary steps to manage such risks. In cases involving any business risks that are deemed significant,

responsible divisions or specialized committees formulate regulations and guidelines, conduct training, prepare manuals, and undertake additional activities as deemed necessary.

Business Risks

Risk	Description	Response
1. Drastic changes in demand and market structure	Contracted demand for existing products due to technological innovation, or fluctuation of price or supply of products due to intensified competition.	Speed up R&D, respond to new needs through aggressive sales.
2. Capital expenditure risks	Significant change in demand forecast, shortage of plant capacity, sudden change in price of major equipment or materials.	When and however necessary, build new production facilities and continuously upgrade them.
3. Risks related to certain products	Change in investment or sales plan or material procurement policy of our major customers.	Diversify our customer base.
4. Risks related to procurement of materials and other items	Tight supply or delay of special raw materials or materials whose suppliers are limited, or escalating price of such materials.	Maintain good relations with suppliers, find new suppliers, increase the number of suppliers, and switch to general-purpose materials.
5. Risks related to legal restrictions	Violation of the laws or regulations of the country or region where we operate.	Comply with laws and regulations, survey changes in legal revisions, and hold periodic in-house education and audits.
6. Risks related to intellectual property rights	A litigation related to intellectual property rights.	Obtain intellectual property rights useful for business, survey and monitor other companies' intellectual property rights, develop alternative technologies, and take over or license intellectual property from other companies.
7. Environmental risks	A shift to stricter environmental regulations, or more corporate responsibilities related to the environment demanded by society.	Develop environmentally friendly products, ensure that facilities and management systems exert minimal impact on the environment, raise production efficiency, and practice the 3Rs (reduce, reuse, recycle).
8. Risks related to fluctuations in exchange and interest rates	Change in exchange or securities market, or interest rate environment.	Utilize forward exchange contracts, properly manage interest-bearing debt, and carry out interest rate swap transactions.
9. Risks related to overseas business operations	Unanticipated change in laws or regulations, international tax risk, particular trade practices, change in political or social conditions, social turmoil due to terrorism or war, or others.	Facilitate close communication between overseas subsidiaries and local authorities, and get advice from experts.
10. Securing human resources	Difficulty in securing human resources appropriate for future business.	Aggressively hire and train a diverse range of people; secure an optimal, effective workforce that matches our efforts to save labor through automation.
11. Impairment accounting for fixed assets	Occurrence of impairment loss of fixed assets due to the impact of business profitability or market trends.	Conduct capital expenditure aimed at profitability and recouping investment; reorganize, sell, or transfer idle fixed assets.
12. Risks related to information management	A filed claim for damages due to the leak of confidential information, which our group obtained in the course of business; tarnished corporate reputation due to such problems; or a decline in competitiveness due to a leak of information on newly developed technology.	Establish an Information Management Committee, utilize security systems, hold in-house education, and comply with the EU's GDPR (General Data Protection Regulation).
13. Risks related to natural disasters and accidents	Delay of production or shipment caused by natural disasters (such as earthquakes or typhoons), fires, or other accidents; and repair costs for damage to facilities caused by such disasters.	Implement a BCP, seismically reinforce buildings, implement disaster preparedness measures, and disperse duties among manufacturing sites.

Directors, Corporate Auditors, Executive Officers

Directors



Chairman of the Board
(Representative Director)
**Masayuki
Arioka**

Apr. 1978 Joined Nippon Electric Glass
Mar. 1997 Appointed as General Manager of Glass Fiber Division, Production
Jun. 1999 Appointed as Director (incumbent)
Jun. 2002 Appointed as Vice President
Jun. 2004 Appointed as Senior Vice President
Apr. 2008 Appointed as Executive Vice President
Jun. 2009 Appointed as President
Mar. 2015 Appointed as Chairman of the Board (incumbent)



President
(Representative Director)
**Motoharu
Matsumoto**
[Auditing]

Apr. 1982 Joined Nippon Electric Glass
Jun. 2003 Appointed as CEO of Technoglass Inc.
Feb. 2005 Appointed as General Manager of Accounting Division
Apr. 2008 Appointed as Vice President
Jun. 2011 Appointed as Director (incumbent) and Senior Vice President
Apr. 2013 Appointed as Executive Vice President
Mar. 2015 Appointed as President (incumbent)



Director and
Executive Vice President
**Hirokazu
Takeuchi**
(Research & Development,
Process Development &
Engineering, Electronic
Products Business)

Apr. 1982 Joined Nippon Electric Glass
Apr. 2010 Appointed as Vice President and Group General Manager of Electronic Products Group
Jun. 2013 Appointed as Director (incumbent) and Senior Vice President
Jan. 2016 Appointed as Group General Manager of Glass Fiber Group (incumbent)
Jan. 2017 Appointed as Executive Vice President (incumbent)



Director and
Senior Vice President
**Akihisa
Saeki**
(Display Glass Business,
Thin Film Business)

Apr. 1982 Joined Nippon Electric Glass
Apr. 2012 Appointed as Vice President and General Manager of LCD Glass Division, Production
Oct. 2013 Appointed as General Manager of Display Glass Division, Production
Jun. 2014 Appointed as Director (incumbent) and Senior Vice President (incumbent)
Mar. 2015 Appointed as Group General Manager of Display Glass Group (incumbent)



Director and
Senior Vice President
**Koichi
Tsuda**
(Accounting, Purchasing,
Sales Management)
[Corporate Strategy,
Administration,
Human Resources,
Information Systems,
Tokyo Branch Office,
Security Trade Control]

Apr. 1982 Joined Nippon Electric Glass
Apr. 2011 Appointed as Vice President and General Manager of Administrative Division
Mar. 2015 Appointed as Director (incumbent) and Senior Vice President (incumbent)



Director and
Senior Vice President
**Hiroki
Yamazaki**
[Fundamental Technology,
Intellectual Property,
Environmental Management,
Quality Auditing,
Product Safety Management,
Cooperation in Research &
Technology]

Apr. 1984 Joined Nippon Electric Glass
Oct. 2006 Appointed as General Manager of Technical Division
Apr. 2011 Appointed as Vice President
Jan. 2016 Appointed as Group General Manager of Corporate Technology Group (incumbent)
Mar. 2016 Appointed as Director (incumbent) and Senior Vice President (incumbent)



Outside Director
(Independent Director)
**Sumimaru
Odano**

Apr. 2000 Became Professor, Faculty of Economics, Shiga University
Apr. 2003 Appointed as Director of Center for Risk Research, Faculty of Economics, Shiga University
Apr. 2011 Became Emeritus Professor (incumbent) and Specially Appointed Professor of Faculty of Economics, Shiga University
Mar. 2015 Appointed as outside Director of Nippon Electric Glass (incumbent)
Nov. 2017 Appointed as Director of KEA Institute Co., Ltd. (incumbent)



Outside Director
(Independent Director)
**Shuichi
Mori**

Apr. 1972 Joined Sumitomo Corp.
Jun. 2008 Appointed as Executive Vice President (Representative Director) of Sumitomo
Mar. 2011 Left Sumitomo
Mar. 2011 Appointed as President (Representative Director) of Jupiter Telecommunications Co., Ltd.
Jan. 2014 Appointed as Chairman (Representative Director) of Jupiter Telecommunications
Jun. 2015 Left Jupiter Telecommunications
Mar. 2016 Appointed as outside Director of Nippon Electric Glass (incumbent)
Jun. 2017 Appointed as outside Director of Tokai Cable Network (incumbent)



Outside Director
(Independent Director)
**Reiko
Urade**

Apr. 2010 Became Professor, Graduate School of Agriculture, Kyoto University
Apr. 2018 Became Emeritus Professor, Kyoto University (incumbent) and Research Professor, Institute for Integrated Radiation and Nuclear Science, Kyoto University (incumbent)
Mar. 2019 Appointed as outside Director of Nippon Electric Glass (incumbent)

Executive Officers

Akira Kishimoto
Senior Vice President
[Consumer Glass Products Business]

Kiyohide Takeuchi
Vice President
[Electric Glass Building Materials Co., Ltd.]

Tomonori Kano
Vice President
[Display Glass Business (Production)]

Takuo Horiuchi
Vice President
[Display Glass Business (Sales)]

Norio Nakamura
Senior Vice President
[Glass Fiber Business]

Kunihiro Nakagawa
Vice President
[Electronic Products Business (Sales)]

Masaaki Kadomi
Vice President
[Research & Development]

Masahiro Kobayashi
Vice President
[Electronic Products Business]

Haruki Matsumiya
Senior Vice President
[Process Development & Engineering]

Hiroaki Nomura
Vice President
[Glass Fiber Business (Sales), Sales Management]

Mamoru Morii
Vice President
[Accounting, Purchasing]

Toshimasa Kanai
Vice President
[Thin Film Business]

Masaya Kubo
Vice President
[Nippon Electric Glass (Malaysia) Sdn. Bhd.]

Masashi Takahata
Vice President
[Consumer Glass Products Business (Sales)]

Note: () means "supervising" and [] means "in charge" indicating work assignments of executive officers.

Corporate Auditors



Full-time

Masahiko Ohji

Apr. 1982 Joined Nippon Electric Glass
Oct. 2010 Appointed as General Manager of Development Division
Jan. 2015 Appointed as Special Assistant to President
Mar. 2015 Appointed as full-time Corporate Auditor (incumbent)



Full-time

Yoshihisa Hayashi

Apr. 1986 Joined Nippon Electric Glass
Mar. 2015 Appointed as General Manager of Administration Division
Mar. 2019 Appointed as full-time Corporate Auditor (incumbent)



Outside (Independent Corporate Auditor)

Katsuhiro Matsui

Oct. 1990 Joined Showa Ota Audit Corporation (now Ernst & Young ShinNihon LLC)
Aug. 1994 Registered as certified public accountant
Oct. 2010 Left Ernst & Young ShinNihon
Nov. 2010 Registered as certified tax accountant, established Matsui-jicpa (incumbent)
May 2011 Became Representative Partner of Sakura Horwath LLC (incumbent)
Mar. 2018 Appointed as outside Corporate Auditor of Nippon Electric Glass (incumbent)



Outside (Independent Corporate Auditor)

Tsukasa Takahashi

Apr. 1989 Registered as attorney at law and joined Katsube Law Office (now Katsube Takahashi Law Office)
Jul. 2012 Became Representative Partner of Katsube Takahashi Law Office (incumbent)
May 2013 Appointed as outside Corporate Auditor of Aeon Delight Co., Ltd. (incumbent)
Mar. 2019 Appointed as outside Corporate Auditor of Nippon Electric Glass (incumbent)

Messages from Outside Directors

NEG's EGP2018 medium-term business plan covered the three-year period from fiscal 2016. Fiscal 2016 marked the start of EGP2018, but it has now concluded and NEG is starting on EGP2021 from this fiscal year.

Although NEG met its sales targets for EGP2018, it fell just short of its operating profit targets. During the fiscal 2016 to 2018 period, geopolitical factors produced tangible uncertainty in the global economy, and it is reasonable to assume that this uncertainty has had a not inconsequential impact on NEG's attainment of its profit targets. During the past three fiscal years, NEG has carried out M&A in line with its corporate vision for the future. It has broadened the scope of its Asia-focused overseas production activities to include Europe and North America. This decision is a welcome one, given the solid growth and performance of NEG's display glass business and glass fiber business in Asia, as it will contribute greatly to NEG's medium and long-term growth-focused international expansion.

The new medium-term business plan, EGP2021, is built upon a careful examination of past experience as well as ideas solicited from younger employees during the early planning phases about what the future might look like and how NEG can expand the scope of its conventional materials-focused business in response. This plan makes a point of reaffirming NEG's corporate vision of being the world's leading manufacturer of special glass and of highlighting the key challenges to be addressed in order to meet the company's sales and operating profit targets. The emphasis on actively bolstering initiatives involving the key factors put forward in the plan shows management's firm commitment to making NEG a truly global company with robust production systems in each of its target areas overseas. In particular, the fact that both R&D and human resource development are explicitly stated indicates that management sees these as two key pillars when considering the company's future. NEG's production activity areas and operations are many and varied, and there is no doubt that they will continue to grow in complexity. This makes stronger corporate governance with more robust checking functions essential. I recognize the great pains NEG goes to in ensuring the transparency of its internal communications and building a good corporate culture. By continuing to refine its culture and traditions, I expect that the company as a whole will be able to work together to achieve its targets for EGP2021.

Sumimaru Odano

Over the past three years, NEG has worked hard on its EGP2018 medium-term business plan with the aim of realizing the vision—to be the world's leading manufacturer of special glass—codified into its corporate philosophy structure.

Of particular note are the bold purchases which the company has made through M&A of glass fiber businesses in Europe and the United States. These purchases increased the sales ratio for the Performance Materials and Others sector, which is the key focus of NEG's glass fiber business, from 33% in fiscal 2015 to 49% in fiscal 2018, putting it almost on par with the Electronics and Information Technology sector, which is the key focus of display glass business. Thus, the balanced business portfolio NEG sought in its medium-term business plan was achieved. Meanwhile, within NEG's display glass business, which represents the company's key products, the goal of transferring production overseas in order to achieve local production for local consumption was advanced by the establishment of a wholly owned, glass melting and forming subsidiary in Xiamen, China. In fiscal 2016, the first phase of investment was used to bring facilities online, and in the first half of fiscal 2018, the second phase of investment was used to complete facility expansion and reinforcement. This subsidiary has become a strong production hub contributing to NEG's business in the growing Chinese market.

Moreover, it is worth noting that the company conducted its first-ever stock buyback in order to return profits to shareholders. This was a change from the dividend-only policy that it held until recently.

Looking at the company's performance, it achieved its sales target of ¥300 billion; however, as a result of various factors, including prior investments made to meet production increases in its key businesses, operating profit did not meet its target. Nevertheless, a foundation is in place to enable NEG to meet the targets it has set itself in the new EGP2021 medium-term business plan.

If the company takes full advantage of this business foundation and ensures all employees in Japan and overseas work together towards making NEG the world's leading manufacturer of special glass, we can expect to see dramatic growth as a result of EGP2021.

Shuichi Mori

We will contribute to realizing a sustainable society by working on three priority themes: the Environment, Diversity and Inclusion, and Community Contribution.

The History and Themes of Our CSR Activities

Our work on pollution problems at our Fujisawa Plant in the early 1970s taught us to undertake environmental conservation as an issue crucial to the sustainability of our operations. A particular characteristic of special glass manufacturers is the consumption of large amounts of energy and resources, and the emission of carbon dioxide. Accordingly, environmental conservation continues to be an issue of the utmost importance for our group. At the same time, we have engaged in contribution to the community mainly by assisting with the education of local human resources and through active involvement in employment of the disabled.

Based on this historical background, and in order to further advance our CSR activities, we have established a “way of thinking” that forms the foundation of these activities, which we have set forth in our CSR priority themes.

Our Fundamental Way of Thinking Regarding CSR

CSR is a key area in our corporate activities and cannot exist separate from our corporate philosophy structure. Accordingly, we carry out our CSR activities in accordance with the intention of our corporate philosophy structure and, through the implementation of CSR activities, we aim to raise our corporate value and realize a sustainable society. We have established both of these approaches as our fundamental way of thinking in regard to CSR.

Our Way of Thinking on CSR

We promote CSR with our corporate philosophy structure as the basic principles. Through our CSR activities we will raise our corporate value and realize a sustainable society.

Three Priority Themes

We have established the Environment, Diversity and Inclusion, and Community Contribution as the three priority themes of our CSR. These themes have a strong association with the priority issues that we have focused on so far (environmental conservation, community contribution, employment of the disabled). We have reconfirmed the background and importance of these three themes and have clarified the future direction for scaling up our initiatives on a broader scale. In addition, we will place emphasis on these themes, as we believe they are directly linked to the United Nations' Sustainable Development Goals (SDGs).

Environment

Environmental conservation is a duty for a company like ours whose operations incur a high environmental burden, so we advocate “consideration for the environment” and “efficient manufacturing processes lead to environment-friendly manufacturing.” Furthermore, we maintain the attitude that it is unthinkable for our operational activities to not include environmental conservation activities.

Diversity and Inclusion

The basis of our thinking on Diversity and Inclusion is that the integrated strength of personnel with diverse backgrounds and values—whether in terms of gender, race, or so on—is the driving force behind corporate growth. Of course, employment of the disabled is also included in this theme. At the same time, we will do our utmost for all these employees by providing personnel training and maintaining a safe and healthy working environment for them.

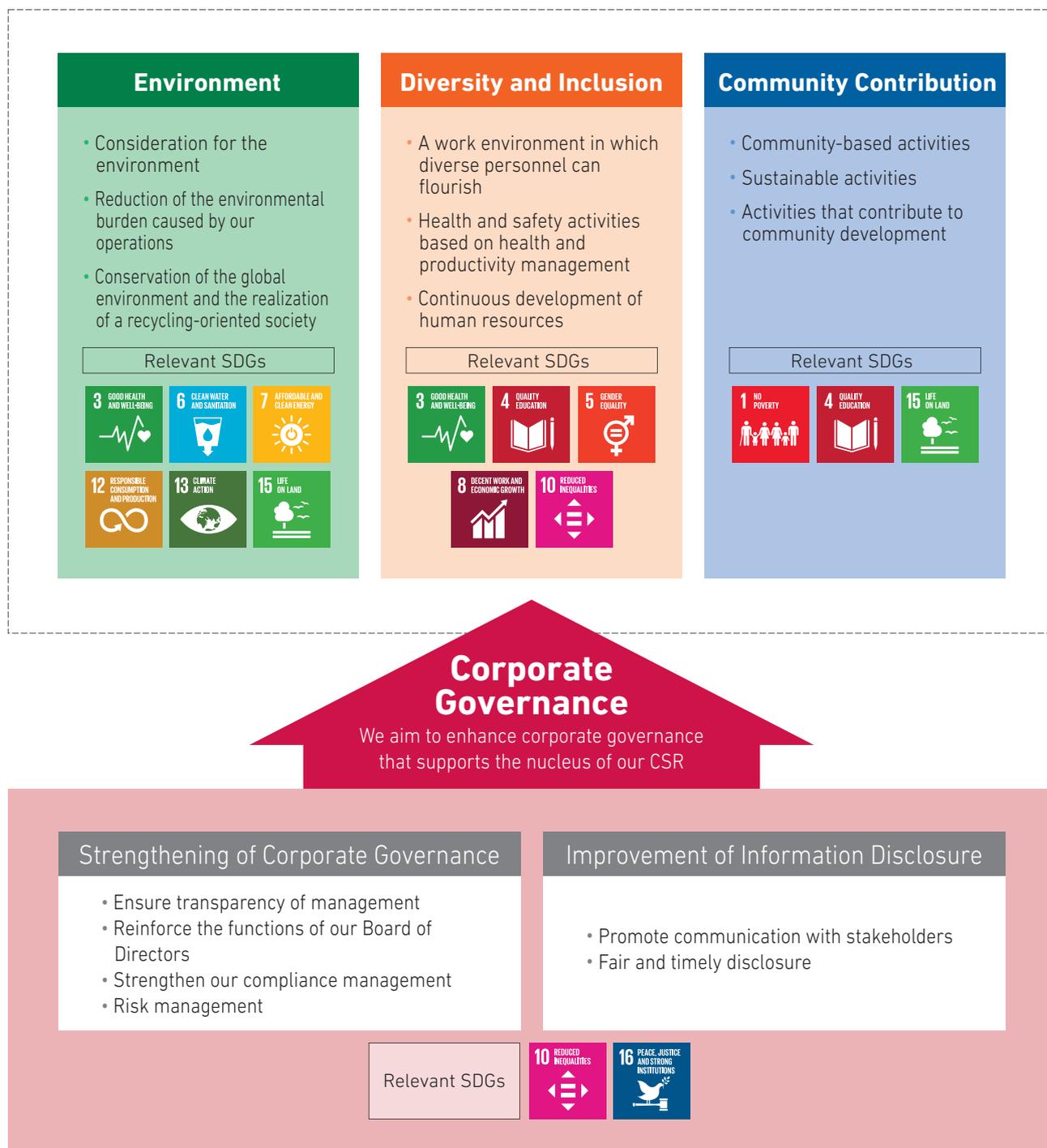
Community Contribution

A good relationship with the community is essential for sustainable business. Therefore, we believe it is important to engage with local communities to gain their trust and appreciation. We will continue to actively participate in local activities, and also provide support for the disadvantaged and for human resource development in the communities we serve.

The Basic Policy of Our Priority Themes

In order to further clarify the direction of our CSR activities, we have determined a basic policy regarding our priority themes. Furthermore, we have identified corporate governance as what supports the nucleus of CSR and positioned it within the framework of our CSR.

See page 20 for the initiatives we are carrying out during our EGP2021 new medium-term business plan.



By designating our basic CSR policy to include our way of thinking on CSR and the three priority themes, and by proactively promoting CSR activities even more than before, we aim to realize a sustainable society and to improve our corporate value.

With “Consideration for the environment” as one of our key values, we will continue to manufacture products in an environmentally friendly way.

Our Way of Thinking on Environmental Conservation



We hold global environmental conservation as an important value and have always been conscious of our coexistence with nature through our operations. Furthermore, we have managed our business based on the belief that practicing the world’s most efficient manufacturing process is, in fact, the key to realizing the world’s most environment-friendly manufacturing.

Against this backdrop, we endeavor to not only reduce our burden on the environment, but also tackle various issues, including sustainable development and conservation of biodiversity.

The Environmental Charter is our fundamental policy on the environment and sets forth the direction we need to follow in enacting our initiatives for environmental conservation. In accordance with our Environmental Charter, through our glass business, and together with our group companies, we will continue to be instrumental in helping to preserve the global environment and realize a recycling-oriented society.

Motoharu Matsumoto, President

Environmental Charter

Environmental Principles

Preservation of the global environment is extremely important and indispensable for the prosperity of civilization and humanity in the 21st century. Nippon Electric Glass, upholding the Corporate Philosophy of “To build a brighter future for the world by uncovering the unlimited possibilities of glass for more advanced creative manufacturing” and adhering to “Consideration for the environment” as one of its essential corporate values, strives to be and remain the world’s leading manufacturer of special glass by ensuring the state-of-the-art technological development, the highest quality standards, efficient production, and steady product supply. Nippon Electric Glass and its group companies are committed to contributing to the preservation of the global environment and realization of a recycling-based society by adopting high-efficiency and environmentally responsible processes.

Action Plan

1. We will honor and observe all environment-related laws and regulations and the environment-related agreements and conventions that we have signed, and establish and enforce our own and voluntary environmental restrictions.
2. We will endeavor to reduce our environmental impact in all aspects of our corporate activities and in all stages of the product life cycle, including procurement, manufacturing, transportation, sales, use, reuse, treatment, and disposal.
3. We will attain the world’s highest-level manufacturing to more effectively utilize natural resources and energy sources, thereby contributing to preservation of biodiversity and reduction of greenhouse gas emissions.
4. We will strive to adapt our activities to the requirements of 21st-century society to prevent pollution, thereby optimizing our presence in society.
5. We will set environmental objectives and targets and attain them through optimization of our essential operations and environmental protection activities in which all employees participate. We will also continuously improve our environmental management system to enhance our environmental protection performance.

This Charter is informed to all employees and affiliated companies, and is made available to parties outside the Company at their request.

Promoting the Environmental Management Plan

In fiscal 2018, in order to improve environmental performance, all domestic plants set 36 objectives, of which 35 were attained. A total of 36 objectives have been set for fiscal 2019. The topics we are working on are directly connected to our essential operations and to priority issues.

ISO 14001 Certification Status

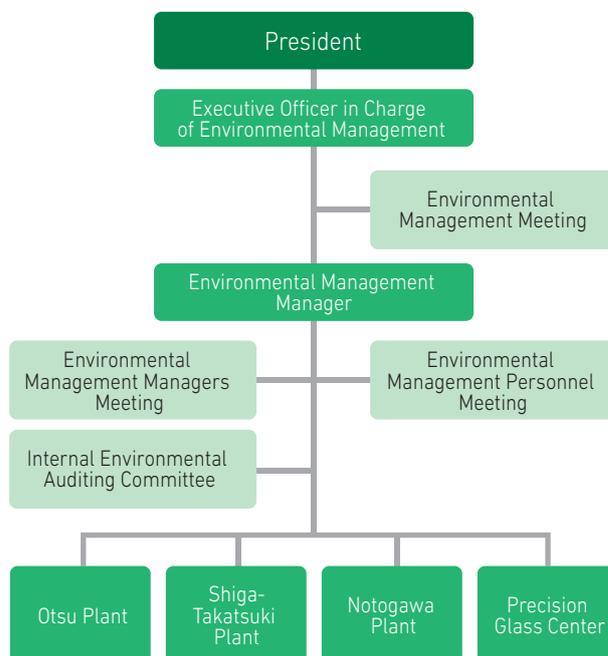
Adapting to New ISO 14001:2015 Standards

The international environmental standard ISO 14001 was revised in 2015 in order to ensure the efficacy of ISO application. From January 2017 we implemented a new Environmental Management System (EMS), which incorporates the new standard and, after undergoing the auditing process, we received accreditation renewal in August 2017.

ISO 14001 Certification Status of Our Group

Company name	Date of certification
Nippon Electric Glass Co., Ltd. (multi-certification at four plants)	Aug. 27, 1999
Group companies	Date of certification
Japan	
SGS Engineering Co., Ltd.	Jan. 19, 2001
Nichiden Glass Processing Company, Limited	Nov. 1, 2002
Shiga Nichiman Company, Limited	Feb. 15, 2013
Overseas	
Techneglas LLC	Jan. 31, 2000
Nippon Electric Glass (Malaysia) Sdn. Bhd.	Jan. 12, 2002
Nippon Electric Glass Taiwan Co., Ltd.	Sep. 18, 2006
Paju Electric Glass Co., Ltd.	Aug. 28, 2007
Nippon Electric Glass (Korea) Co., Ltd.	Oct. 9, 2007
Electric Glass (Shanghai) Co., Ltd.	Dec. 21, 2009
Electric Glass (Korea) Co., Ltd.	Dec. 9, 2014
Electric Glass (Guangzhou) Co., Ltd.	Nov. 11, 2015
Electric Glass (Xiamen) Co., Ltd.	Apr. 17, 2017
Electric Glass Fiber NL, B.V.	May 22, 2017
Electric Glass (Nanjing) Co., Ltd.	Apr. 13, 2018

Environmental Management Activity Organization Chart



Environmental Management Meeting

The executive officer in charge of environmental management serves as chair, and the President and representatives of each operational department attend this meeting. Representatives from overseas subsidiaries also participate as necessary. Specific environmental conservation activities based on the President's environmental policies, performance reports, and promotion updates are shared. Deliberation on our group's environmental conservation activities is carried out at this meeting.

Environmental Education

As environment-related laws are revised and regulations are strengthened, it is necessary to accurately ascertain those changes in order to ensure legal compliance. In fiscal 2019 we plan to emphasize education of such laws.



Environmental Management Logo

This logo was created in June 1993 and it is used when making internal postings about our EMS activities and Environmental Charter. The design was selected from among internal suggestions. The green leaves represent environmental technology, nature, and the hands of our employees, while the blue circle depicts the sky and the earth, environmental equipment made by our employees, and the community and society surrounding us.

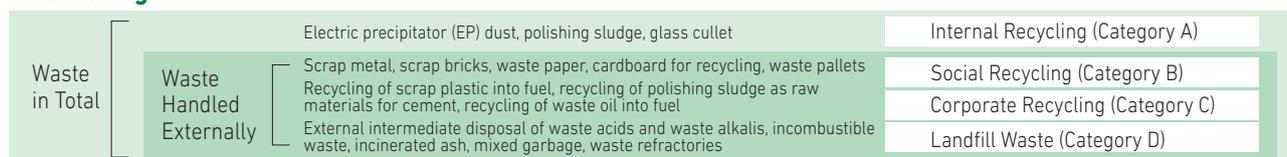
Environmental Business Plan

Our environmental business plan is an original activity that applies our operational management approach to environmental conservation activities. Waste, water, and exhaust gas are the main themes of the plan, under which we work to reduce environmental burdens that result from our glass production operations.

Waste Reduction

Since we began this activity in 2000, we have steadily decreased the amount of solid waste destined for landfill (Category D). Since 2009, the amount of solid waste destined for landfill disposal resulting from normal production activities at our facilities in Japan has been equivalent to 0.1% (or less) of the total weight of products sold. We are currently also actively reducing corporate recycling (Category C), which we outsource.

Waste Categories



Water Reduction

We believe that the level of manufacturing is represented in the way water is used. Consequently, by managing our water usage we are increasing our understanding of the entire glass manufacturing process and further improving our process technology and equipment.

Reducing Evaporated Glass Components in Glass Melting Furnaces

The exhaust gas from melting furnaces contains evaporated components derived from the raw materials of glass production. These evaporated components can be recycled if captured. By combining the reduction of evaporation from melting furnaces and efficient capture of the evaporated components, we are applying best practices to improve our melting process and energy conservation technology.

Our Global Warming Countermeasures

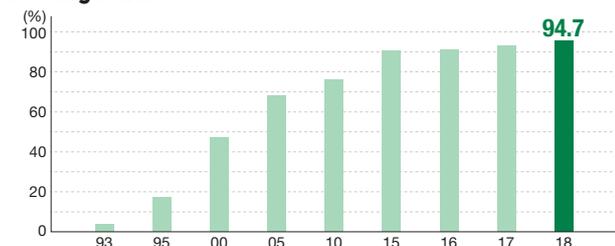
A significant amount of energy is used to melt glass. Therefore, we consider it our duty to further improve the energy efficiency of our melting furnaces.

Oxy-fuel Firing Glass Melting Furnaces

Compared to air combustion furnaces, oxy-fuel firing furnaces remove more excess nitrogen. This has reduced the amount of exhaust gas (exhaust heat) and consequently lowered fuel and energy consumption. It has also reduced emissions of CO₂ and thermal nitrogen oxides (NO_x).

In 1993, we installed the first oxy-fuel firing glass melting furnace in Japan. This technology has now been installed in almost all of our furnaces.

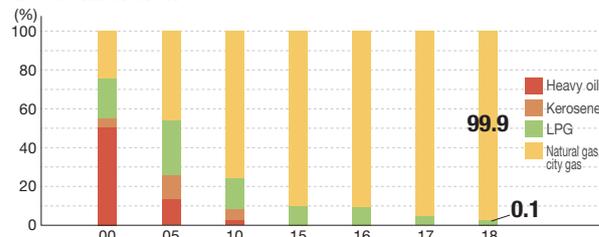
Percentage of Oxy-fuel Firing Furnaces among All Melting Furnaces



Fuel Conversion in Glass Melting Furnaces

We have been switching to fuels with less environmental impact to operate our glass melting furnaces. We have switched from heavy oil to LPG and ultimately to natural gas and city gas, thus reducing CO₂ emissions.

Fuel Conversion

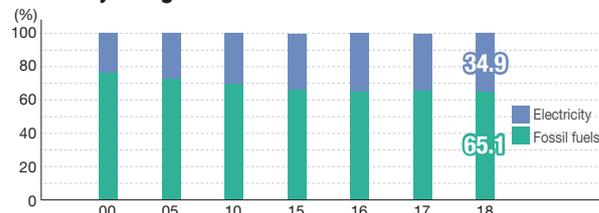


Increasing Electricity Usage in the Glass Melting Process

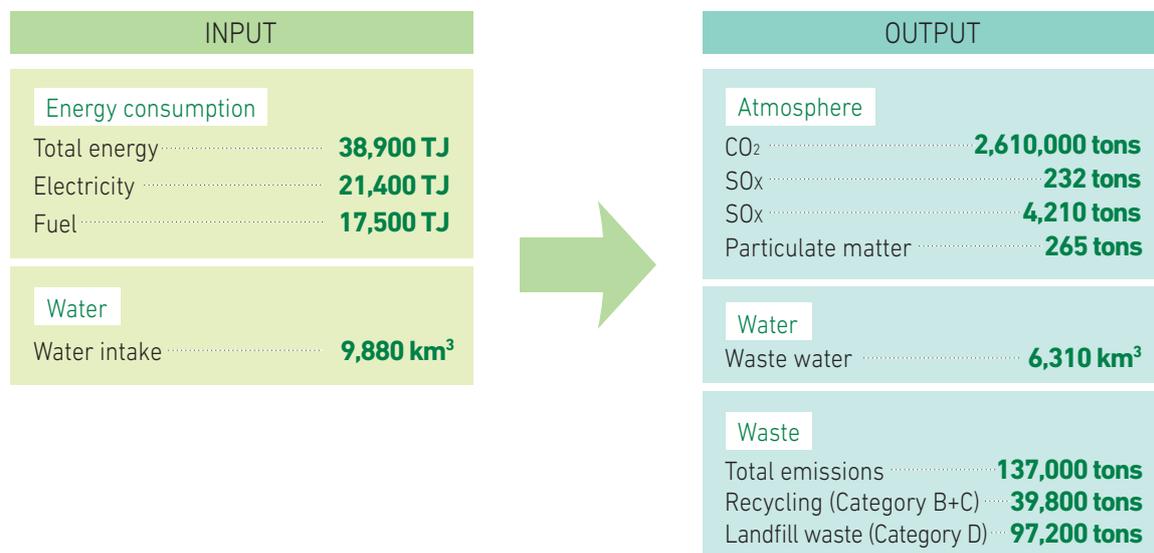
In the melting process, both gas and electricity are used. In electric heating, unlike that using gas fuel, electrodes are directly inserted into the molten glass, resulting in excellent thermal conductivity of the glass. Also, in heating with electricity, the amount of exhaust gas (exhaust heat) can be substantially reduced compared with that generated by heating with fossil fuels. Thus, if electricity usage is increased in percentage terms, energy savings and reductions in CO₂ emissions can be achieved.

We are continuing with group-wide activities aimed at increasing electricity as an energy source used to melt glass.

Electricity Usage



Analysis of Environmental Impact (fiscal 2018 consolidated basis)



Environmental Accounting (NEG)

(Millions of yen)

Category	Main Activities	2017		2018			
		2017.1.1-2017.12.31		2018.1.1-2018.12.31			
		Investment	Expenses	Investment	Expenses		
(1) Costs within operational area	Costs to reduce environmental burden of production activities within operational area	Breakdown	① Anti-pollution maintenance and management costs	273	4,348	74	4,366
			② Global environmental conservation costs	205	621	67	571
			③ Resource recycling costs	1	1,532	6	1,779
(2) Upstream and downstream costs	Costs to reduce environmental burden of upstream and downstream production activities		67	2,195	1	2,016	
(2) Upstream and downstream costs	Costs to reduce environmental burden of upstream and downstream production activities		–	179	–	297	
(3) Costs of management activities	Environmental conservation costs within management activities		4	779	2	689	
(4) Research and development costs	Environmental conservation costs of R&D activities		149	718	17	605	
(5) Costs for social initiatives	Environmental conservation costs of social initiatives		–	197	–	136	
(6) Environmental remediation costs	Costs to deal with damage to the environment		–	41	–	42	
(7) Other costs	Other costs relating to environmental conservation		–	–	–	17	
Total			426	6,262	93	6,152	

Note 1: Regarding expenses and investment, only costs clearly arising directly from environmental concerns have been aggregated. In regard to production facilities and R&D, only sections related to the environment have been included.

Note 2: Figures for fiscal 2017 were adjusted after revising expenses in the categories of "Upstream and downstream costs" and "Costs of management activities."

(Millions of yen)

Item	Contents	2017	2018
Total investment	Scheduled repair of glass melting furnaces and production rationalization investment, investment to improve manufacturing productivity of major products	19,850	15,819
Total research and development costs	Development and improvement of process technology, and development of products, including FPD glass and glass for electronic devices	6,897	6,958
Proceeds from sales of valuable resources related to ③ of (1)	Sales of scrap metal, scrap bricks, etc.	18	8
Proceeds from sales of valuable resources related to (2)		0	0

Environmentally Friendly Products

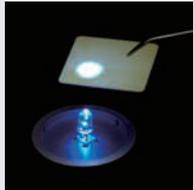
We contribute to a sustainable society by providing products that help conserve the global environment.

Saving energy and labor



E Glass Fiber
(Chopped strands)

Used in plastic automobile parts, this material helps make cars lighter.



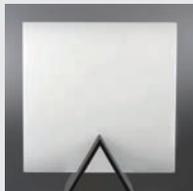
Lumiphous™
Phosphor-glass composite

This wavelength-converting material helps expand the range of applications for energy-saving LED lighting.



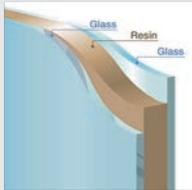
G-Leaf™
Ultra-thin glass

Just micrometers thin, it helps make devices lighter. It also expands the possibilities of labor saving in manufacturing through its use in a roll-to-roll process.



Substrate glass with scattering layer for OLED lighting

This substrate glass is used to effectively enhance light extraction efficiency in OLED lighting, a promising next-generation energy-saving light source.



Lamion™
Ultra-thin glass laminated on resin

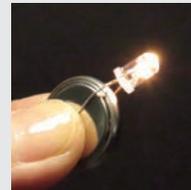
This material combines the superb properties of glass and resin. It is used on train station platform doors thanks to its strength and light weight.

Creating energy



E Glass Fiber
(Roving)

This material is used as reinforcement for the plastic blades of wind turbines. It also holds promise as reinforcement in the hydrogen gas tanks of fuel-cell vehicles.



Solid-state sodium-ion secondary battery
(Under development)

This product uses a cathode material made of sodium-based crystallized glass. The material is highly safe and can be reliably procured.

Reducing environmental impact



High-efficiency deep UV-transmitting glass

Used for LED antiseptic lamps, this glass can contribute to the replacement of antiseptic lamps that use environmentally harmful mercury.

News

NEG purchases J-Credit of forestry cooperative in Shiga Prefecture

We purchased J-Credit (CO₂ absorption credits) from the Konze Forestry Association of Ritto City, Shiga Prefecture. The association has received certification for its J-Credit project from Japan's central government. On March 20, 2018, we received a J-Credit purchase certificate at the Shiga Prefecture Office.

The association manages approximately 480 hectares of forest and is the only entity in Shiga Prefecture whose project has received the government certification needed for the buying and selling of credits.

We purchased 50 tons of credit (500,000 yen worth) from the association with the aim of contributing to environmental conservation in our home base of Shiga Prefecture. Profits from the trading of credits will go towards local forest preservation.



Purchase certificate presentation ceremony

NEG receives Shiga Biodiversity Award

Our company received three stars, the highest possible rating, in the 2018 Shiga Biodiversity Awards.

Run by the Shiga Prefectural Government, the Shiga Biodiversity Awards system uses a checklist to confirm how business activities at companies with head offices or other business sites in Shiga Prefecture are contributing to protecting biodiversity and the sustainable use of natural resources. The number of biodiversity initiatives determines a company's rating of either one, two, or three stars.



Shiga Biodiversity Award certificate (3-star rating)

NEG wins Shiga Prefecture Low-carbon Society Development Award

As a business making outstanding efforts in reducing greenhouse gas emissions, our Shiga-Takatsuki Plant was given a Shiga Prefecture Low-carbon Society Development Award by the governor of Shiga Prefecture. This honor is testament to the reputation we enjoy for successfully carrying out proactive energy-saving and CO₂-reduction activities.



Awards ceremony at the Shiga Prefecture Office

Diversity and Inclusion

We maintain a safe and healthy working environment for all employees and strive to develop competent human resources.

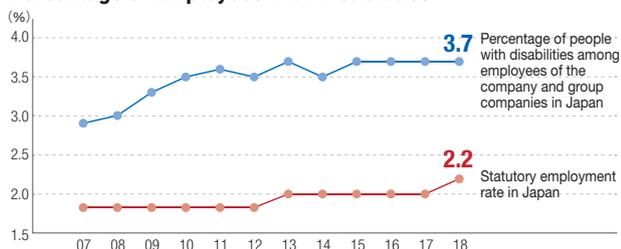
Recruitment and Workplace Environment Maintenance

In addition to our continued commitment to provide employment for people with disabilities, we also strive to cultivate a work environment in which the diverse backgrounds and values of employees are respected and in which employee welfare and happiness is a priority.

Employment of People with Disabilities

In 1980, we established a special-purpose subsidiary aimed at employing people with disabilities. We were among the first six companies in Japan to do so. For its outstanding action in hiring and training young people, this subsidiary was in 2018 granted Youth Yell certification from Japan's Ministry of Health, Labor and Welfare, the second special-purpose company in Japan to be certified. As of the end of 2018, our group had achieved a 3.7% employment rate for people with disabilities. We are now working to raise this to 4.4%, which is double the statutory requirement.

Percentage of Employees with Disabilities



Support for Raising the Next Generation

In February 2019, we received Platinum Kurumin accreditation under the Act on Advancement of Measures to Support Raising Next-Generation Children in Japan. In the past, we had received Kurumin accreditation four consecutive times, testament to our support of employees raising children. This time, we were accredited under the stricter requirements of the Platinum Kurumin mark in recognition of the efforts we made with our Fifth Action Plan (ending in 2018), under which we implemented measures encouraging employees to take annual paid leave and male employees to take childcare leave, and to build a pleasant working environment.

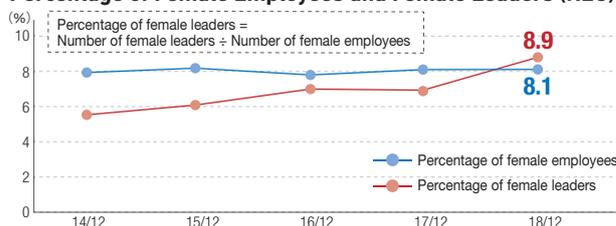
In addition to striving for a workplace where all employees can achieve a work-life balance, under our Women's Empowerment Project we hold events for female employees to exchange information and opinions with staff at other firms. We are also working to nurture female leaders for positions in management.

6th Action Plan (Outline) (April 1, 2018 to March 31, 2021)

- Childcare leave
Women: To achieve more than 75% utilization rate
Men: To achieve more than 13% utilization rate of those whose spouse has given birth
- Introduction of a new system, and strengthening of existing systems, to allow diverse work styles
- Measures to reduce overtime work
- Promotion of use of annual paid leave



Percentage of Female Employees and Female Leaders (NEG)



Note: Some of the calculations have been revised and the previous years' figures have been corrected. A female leader is a female employee who oversees and manages subordinates.

Responding to Globalization

In order to respond to the rapid globalization of our operations, we are actively hiring foreign nationals and cultivating global personnel who can work effectively anywhere in the world. We are also improving group synergy via personnel exchange between Japan and overseas subsidiaries, and among some overseas subsidiaries. In the future, we are considering creating a global human resource system in order to gain even greater synergy.

Number of Foreign Employees in Japan (cumulative)



Global Meeting of Glass Fiber Group

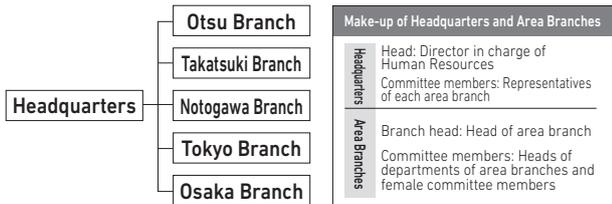
Human Rights Initiatives

In line with the spirit of our corporate philosophy structure, respect for human rights are set forth in our Code of Conduct and Principles of Activities. Led by our committee on human rights issues, we perform human rights training and participate in and dispatch executives to projects run by administrative and external groups. Our company is a board member of the Shiga Prefecture Human Rights Issues Liaison Committee. Based in Shiga Prefecture, where our main operations are located, this committee allows us to play a leading role in promoting human rights in the region.



Human rights training

Organization Chart of the Committee on Human Rights Issues



Health and Productivity Management

Since we believe that taking measures to improve the health of all employees leads to corporate growth, we are developing health and safety activities based on health and productivity management. We are also implementing work-style reforms. In recognition of initiatives that we carried out based on our health and productivity management, we were certified in the large enterprise category (White 500) in the 2019 Certified Health and Productivity Management Outstanding Organizations Recognition Program. The selections for certification are made jointly by the Ministry of Economy, Trade and Industry and the Nippon Kenko Kaigi.

Health and Safety

Regarding health and safety, our Principles of Activities state that “We put safety first in everything we do, and we abide by all rules and regulations regarding health and safety.” Under our company-wide health and safety program, our health and productivity management philosophy forms the basis for an action policy aimed at maintaining and improving the mental and physical health of each employee. This allows us to create a vibrant working environment that increases the creativity and productivity of the entire corporation.

In addition to periodic workplace patrols, we also implement educational awareness campaigns, hazard prevention activities, and information sharing among all operational sites both in Japan and overseas, so that we can increase awareness of health and safety issues and achieve our zero-accident benchmark. Furthermore, for all employees we have an EAP (Employee Assistance Program), mental health classes, and stress checks as part of our measures concerned with mental health.

Industrial accident frequency rate (NEG)

Zero accidents for four consecutive years

Organization Chart of Health and Safety for Each Area



Work-style Reforms

We started promoting work-style reforms in February 2017. By eliminating unnecessary and duplicated work through task inventory checks and maximizing use of IT, we have improved efficiency. These efforts have enabled us to reduce overtime work and increase the taking of paid leave. The benefits of these efforts have been returned to our employees via an expanded welfare program and a special, one-off bonus payment.

Main Initiatives

- Task inventory checks
- Active use of IT
- Conference reforms
- Usage of five consecutive days of leave
- Full implementation of no-overtime days
- Adoption of flexible work rules

Newly established systems (from February 2018)

- Work-at-home system
- Re-employment system

Number of Paid Leave Days Taken

	Days Taken	Percentage of Days Taken
Fiscal 2018	13.8	58%

Human Resource Development

In order to attain our goal of being the world's leading manufacturer of special glass, our human resources must also be the world's best. We help our employees to better themselves by offering them a range of study opportunities, such as on-the-job training, level-specific training, global human resource training, skills training, and self-development programs that include acquiring industry certification.



Training Programs

Category	Items
Level-specific training	New employee training, young and mid-career employee training (3rd, 5th, 10th year), managerial position training (new managers), mid-level management training, training for employees over the age of 50 (career development seminar, life plan seminar)
Global human resource training	Global Communications Program (GCP, practical business English training), overseas training for newly hired administrative employees, skills development language training (English, Chinese)
Skills training	Intellectual property training, accounting seminars, lectures on glass basics
Others	Compliance training, information security training, industry certification and other self-development programs

Voices

Message from an Overseas Subsidiary



Bing Luo
President, Electric Glass (Shanghai) Co., Ltd.

Electric Glass (Shanghai) Co., Ltd. (EGS) was established as a local subsidiary of the Nippon Electric Glass Group in 2006 with the aim of expanding LCD business in China. At the time of its launch, I was the vice president, and between then and now both the company and myself have gone through—and grown stronger as a result of—a great many experiences, including misunderstandings stemming from significant cultural and value differences between Japan and China and the global repercussions of the Lehman Brothers bankruptcy in 2009. I would say that period was the most challenging one of my career, but I would also say that it was the greatest period of growth and reward. It was through the clash of culture and values that I gained a better understanding of just what the NEG corporate culture and philosophy is. Of NEG's core values, I believe that it is our commitment to "Get the job done" and "Broad minds and open communication" has driven our ceaseless quest for technology and quality and has enabled us to grow from being a small factory established 70 years ago into one of the world's leading manufacturers of special glass today. One of the reasons I have continued to work for NEG for over 10 years is that its corporate culture resonates with me.

Compared with 10 years ago, NEG has a clearer vision of what it means to be the world's leading manufacturer of

special glass. It has also changed significantly in terms of the global scope of its business and the diversity of its workforce. Creating an environment in which a diverse array of employees can work effectively requires innovation in terms of human resource management and internal communications. At EGS, although we source our top management locally, we still need to ensure smooth communications with the NEG Head Office, not only through regular meetings but also through daily interactions with local staff and staff in the Head Office departments. By facilitating active dialogue between Japanese and local management, regional and cultural barriers are overcome and a relationship of mutual trust and understanding is cultivated. This, I believe, helps provide the driving force needed for further group growth.

The glass manufactured by EGS is intended for smartphones and other such devices, which means rapid technological evolution is a challenge that we must deal with head-on. The only way we can improve our competitiveness is if we are able to make quick business decisions while finding ways to continually improve the quality of our products and reduce costs. At EGS, we push ourselves to aim higher by working harder to "Get the job done" and practicing a team-oriented culture built around the 3Ts of "Trying, Team Building, and Training." Cultivating human resources, particularly global human resources, is an extremely important challenge for the NEG Group's growth strategy, but it is one that can be met through personnel exchanges with overseas subsidiaries, short-term placements, and other innovative human resources policies.

News

White 500 2019 Health and Productivity Management Outstanding Organization certification

NEG and the NEG Health Insurance Society were both certified in the White 500 category in the 2019 Certified Health and Productivity Management Outstanding Organizations Recognition Program. The selections for certification are made jointly by the Ministry of Economy, Trade and Industry and the Nippon Kenko Kaigi.

This certification system recognizes companies that engage in strategic health and productivity management for their employees.

At NEG, we view the wellbeing of all of our employees as integral to corporate growth and therefore continually strive to implement safety and health activities and work-style reforms from a health and productivity management standpoint.



Platinum Kurumin certification

NEG received Platinum Kurumin certification as a company that meets the requirements of the Act on Advancement of Measures to Support Raising Next-Generation Children.

Prior to this, we had received Kurumin certification four times in a row. This year, the results of our fifth action plan (April 1, 2015–March 31, 2018), which introduced and facilitated the use of better child-rearing and work-life balance support systems for employees, were recognized as meeting the high standards required of a company providing excellent child-rearing support to its employees.



Certification announcement ceremony

Youth Yell certification for E.G. Univer Support

E.G. Univer Support Co., Ltd. was awarded a certificate of recognition as a Youth Yell company from the Director of the Shiga Labor Bureau. This certification is given to companies recognized for outstanding efforts in hiring and training young people and in their employment management, according to the stipulations of the Youth Employment Promotion Act of Japan. E.G. Univer Support is the second special-purpose company dedicated to employing persons with disabilities that has received this certification nationwide.



Community Contribution

We contribute to the development of local communities through initiatives based on activities rooted in those communities. Our main activities include local clean-ups, plant tours, educational support, and involvement in community events.

Supporting the Younger Generation

Welcoming Visitors to Our Plants and the Showroom

We welcome local children, students, and neighborhood councils to visit our plants and showroom. This supports the development of the younger generation and deepens the community's understanding of our business activities. In 2018, we welcomed about 210 people to tour our plants in Japan. For the year as a whole, a cumulative total of 530 local residents visited facilities that we opened to the public.



Students of Tohoku Institute of Technology visit our Otsu Plant



Family Day at Electric Glass (Shanghai)



Students from Indonesia's Medan Institute of Technology (ITM) visit Nippon Electric Glass (Malaysia)

Visiting Lessons

Every year, we co-sponsor and cooperate with Otsu City Science Museum in their IF (Innovation for the Future) Class program. We give visiting lessons to local elementary and junior high school students, in which they can learn about the characteristics and functions of glass, and also enjoy the experience of cutting glass. In 2018, in addition to lessons at the Science Museum, we invited students to tour our Otsu Plant. By taking students to learn about glass in the showroom and to experience firsthand the wonders of manufacturing on-site, the program provided excitement and fun for the youngsters.



IF Class visiting lesson



Students visit our showroom

Academic-industrial Collaboration

We concluded a comprehensive university-industry collaboration agreement with the University of Shiga Prefecture in 2007. Based on that agreement, we have been collaborating with the university on a variety of ongoing projects which include the establishment of an endowment course, joint research and technological exchange on glass engineering, and supporting the development of tomorrow's leaders. In 2018, Chairman Arioka gave a lecture to students and faculty at the university on the topic "Why was NEG established and what is its mission?", which was followed by a lively question and answer session.



Lecture by Chairman Arioka

Coexistence with Local Communities

To strengthen our ties with local communities, we carry out volunteer activities such as cleaning and planting greenery, host various events to which we invite local residents, and hold donation and support activities. See the table on the right for our activities in Japan in 2018.

Employees joining local clean-ups	324
People visiting our summer festival and other events	Approx. 2,450
People joining dialogue between NEG and neighborhood councils	104

Photographs of Main Events and Support Activities



Fishing tournament at Lake Biwa to remove non-native fish, Otsu Plant



Donation to a local festival by Electric Glass (Xiamen)



Children playing in Takatsuki Industrial Park (a park managed by Shiga-Takatsuki Plant that is free to use)



A summer festival to which we invited local residents, Otsu Plant



Donation of books to a social welfare facility by Paju Electric Glass



A social gathering between employees of Electric Glass (Korea) and a local senior citizens group

Other Initiatives

We will continue working to enhance our corporate value by maintaining active communication with various stakeholders.

We declare in our Group Code of Conduct that we disclose necessary corporate information in a timely and appropriate manner, and communicate on a broad basis with stakeholders. To enhance our corporate value, we strive to maintain active communication and deepen mutual understanding with various stakeholders.

Communicating with Shareholders and Investors

General Meeting of Shareholders

On March 28, 2019, the 100th General Meeting of Shareholders was held in the conference room at our head office. Following a report on the fiscal year results and the state of our business, our management responded in a sincere manner to issues raised by our shareholders.



The 100th General Meeting of Shareholders

Communicating with Investors

We communicate with institutional investors, both in Japan and overseas, by way of various activities, including interviews, teleconferences, financial results briefing sessions, and participation in IR-related events organized by securities firms. The opinions and requests that we received from investors are fed back to our management and utilized to help improve our investor relations activities.

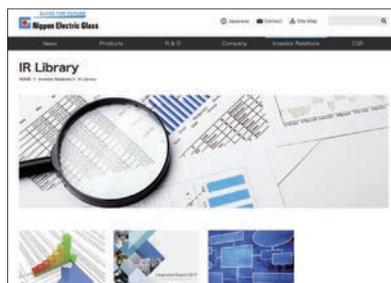
Fiscal 2018 Results

Total number of dialogues carried out: 173 companies

Information Disclosure Tools

We ensure prompt disclosure of information through use of the Tokyo Stock Exchange's Timely Disclosure Network (TDnet) and by posting information on our website in a timely fashion. Furthermore, we make active use of news releases and web pages to present information that we believe will assist our stakeholders to gain a better understanding of our group. Such information is also

disclosed in a prompt, appropriate, and fair manner in accordance with the Fair Disclosure Rules in Japan.



Communicating with Customers

The principle of "customer first" is a key value in our corporate philosophy structure. Under the management policy that forms the basic principle of our business operations, we are also committed to being the world's best for customer satisfaction, and we aim to further improve customer satisfaction as we supply safe, reliable, and high-quality products.

Product Safety Management Committee

We are carrying out activities to ensure the safety of our products. We have established internal rules for the promotion of product safety and set up a product safety management committee. A committee member is elected from each business operation group that is involved in product manufacture and sales, and from corporate divisions in charge of development in technology and engineering.

Product Safety Management Committee Initiatives

- Exchange of information beneficial to product safety activities
- Consideration of issues related to product safety activities that should be examined by the group as a whole
- Requesting reports from each department on the situation of their product safety activities and checking of those reports
- Interdepartmental sharing of information on measures to conform with various laws and regulations related to product safety

Quality Assurance

Each business operation group that is involved in product manufacture and sales conducts product quality assurance. Those activities center on quality control and quality assurance procedures based on a quality management system that originates from ISO 9001.

Participation in Exhibitions

Aiming to communicate with as many customers as possible and also to create business opportunities, we participate in many exhibitions every year both in Japan and overseas.



API China

Communicating with Business Partners

Basic Procurement Policy and Request to Our Business Partners

Under the basic procurement policy that we have established, we seek to build up reliable relationships with business partners in Japan and overseas who can provide us with products and services of superior quality and price competitiveness. In order to enhance the performance and efficiency of the entire supply chain, we ask our business partners to work to improve their competitiveness and to comply with laws and regulations.

Basic Procurement Policy	<ol style="list-style-type: none"> 1) Open and fair business dealings 2) Harmonious mutual prosperity with partners 3) Compliance with social norms 4) Environmental consciousness (green procurement)
Request to Our Business Partners	<ol style="list-style-type: none"> 1) Competitiveness of purchasing products 2) Compliance with laws, regulations, and social norms 3) Environmental preservation and operational safety 4) Appropriate information security 5) Sound corporate management

In addition, we place great importance on responsible procurement practices aimed at mitigating the risk of sourcing so-called conflict minerals. (Minerals such as tantalum, tin, tungsten, and gold, which may, either directly or indirectly, finance armed groups abetting human rights violations in the Democratic Republic of the Congo and adjoining countries.) We are working together with our business partners to eliminate materials or parts containing conflict minerals from the supply chain by enhancing supply chain transparency.

Note: Details of our basic procurement policy, request to our business partners, and policy regarding conflict minerals are disclosed on our website.

Briefing Sessions for Business Partners and Global Meeting of Procurement Divisions of Our Group

Each year, we hold a briefing session for business partners in order to improve communication with these partners. We also hold a global meeting at which all the procurement divisions from manufacturing sites around the world gather to discuss the procurement policy of our group and to share ideas on compliance and other issues.



Briefing session for business partners

Major Exhibitions in Fiscal 2018

Name of Exhibition	Period	Location	Outline of Exhibition
International Automotive Electronics Technology Expo	Jan. 17–19	Japan	Advanced technologies for cars
JEC World	Mar. 6–8	France	A global trade fair for composite materials
HPBExpo	Mar. 8–10	United States	North America's largest trade fair for stoves
OFC	Mar. 13–15	United States	Most influential specialty show for optical communications industry
CITE	Apr. 9–11	China	One of China's largest for displays and electronic parts
API China	Apr. 11–13	China	China's largest on pharmaceutical packaging
International Technical Exhibition of Medical Imaging	Apr. 13–15	Japan	Comprehensive radiology exhibition
Chinaplas	Apr. 24–27	China	One of Asia's largest for plastics
Touch Taiwan	Aug. 29–31	Taiwan	Touch panels and optical films
ICG	Sept. 23–26	Japan	International symposium on glass science and technology
CEATEC Japan	Oct. 16–19	Japan	One of Asia's largest for IT and electronics
Fakuma	Oct. 16–20	Germany	International trade fair for plastics processing
Biwako Environmental Business Exhibition 2018	Oct. 17–19	Japan	One of Japan's largest for environmental industries
SEMICON Japan	Dec. 12–14	Japan	Electronic device manufacturing

Financial Review

Business Climate and Operating Results

For fiscal 2018, the global economy saw continued economic recovery in the U.S., driven in large part by robust employment and consumer spending, but also showed stronger signs of an economic slowdown in Europe and China. The Japanese economy continued to undergo a modest recovery, due to such factors as improved employment figures and consumer spending.

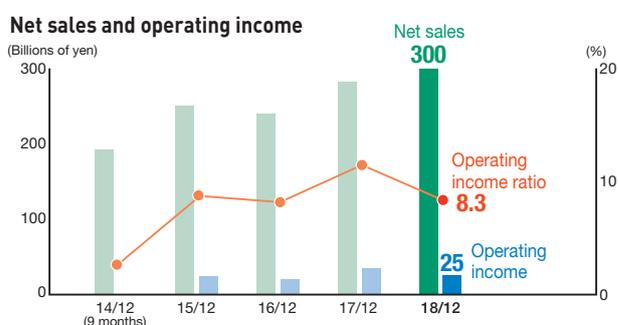
Against this backdrop, during fiscal 2018, which coincided with the final year of the medium-term business plan (EGP2018), we saw continued new customer development in the display field thanks to the growing Chinese market, where the new facilities of Electric Glass (Xiamen) Co., Ltd. (EGX), our subsidiary for melting and forming glass for flat-panel displays (FPDs), started operations in the first quarter of fiscal 2018. In the Performance Materials and Others sector, we worked to expand the production capacity of our glass fiber business by upgrading and expanding the production facilities of our U.S. subsidiary, Electric Glass Fiber America, LLC. (EGFA), which we acquired in September 2017. New products and R&D-related output from the NEG Group included high-efficiency deep UV-transmitting glass, infrared absorbing filters with the world's highest level of visible light transmittance, and the world's smallest optical isolator for high-power fiber lasers.

Looking at business results for fiscal 2018, the Electronics and Information Technology sector maintained healthy performance, due to continued, robust shipments of glass substrates for liquid crystal displays, despite a mild drop in price, and expanded adoption of mobile device cover glass (chemically strengthened glass). Glass for electronic devices saw modest growth in line with market trends for household consumer electronics and other segments, while glass for optical devices maintained a satisfactory level of performance, with the exception of some products. On the other hand, however, sales of glass for solar cells remained low. In the Performance Materials and Others sector, glass fiber for high-function resin received a boost in sales with the acquisition of EGFA; however, sales were negatively impacted during the fourth quarter of fiscal 2018 due to reduced demand, primarily from the European and Chinese markets. Heat-resistant glass saw an overall downturn in sales, due in part to ongoing inventory adjustment by some major customers and other factors; however, pharmaceutical glass tubing experienced growing sales focused on the Chinese market, while sales of glass for building materials were strong thanks to fire-rated glass applications. All of these factors combined to produce net sales of ¥300,327 million (\$2,706 million), a 6.3% increase over the previous fiscal year.

Looking at gains and losses, operating income was affected by an increase in the cost of raw materials and fuel as well as a variety of up-front costs, including upgrading and expanding the production capacity of EGFA and bringing the new facilities of EGX online. In addition to these, EGFA's production capacity was not able to meet the original projections, which was compounded by the amortization of goodwill, contributing to a gross profit of ¥67,093 million (\$604 million), a 5.0% decrease from the previous fiscal year and operating income of ¥24,866 million (\$224 million), a 22.8% decrease from the previous fiscal year. As a result, the operating income ratio was 8.3%, representing a decrease of 3.1 points from the

previous fiscal year. For the net amount of other income and other expenses, we experienced gains of ¥563 million (\$5 million). This figure was derived chiefly from reversal of reserve for special repairs of ¥3,775 million (\$34 million), gain on sales of investment securities of ¥1,942 million (\$17 million), and interest and dividend income of ¥1,913 million (\$17 million). Other expenses included foreign exchange losses of ¥4,950 million (\$45 million), interest expense of ¥1,630 million (\$15 million), and loss on suspension of production facilities of ¥951 million (\$9 million). These factors resulted in income before income taxes of ¥25,429 million (\$229 million), a 22.1% decrease from the previous fiscal year.

The company recorded ¥4,873 million (\$44 million) in current income taxes and ¥4,869 million (\$44 million) as deferred income taxes. This resulted in a profit attributable to owners of parent of ¥15,200 million (\$137 million), a 44.1% decrease from the previous fiscal year. Profit attributable to owners of parent per share was ¥154.26 (\$1.39), compared with ¥273.29 (\$2.46) in the previous fiscal year.



Financial Position

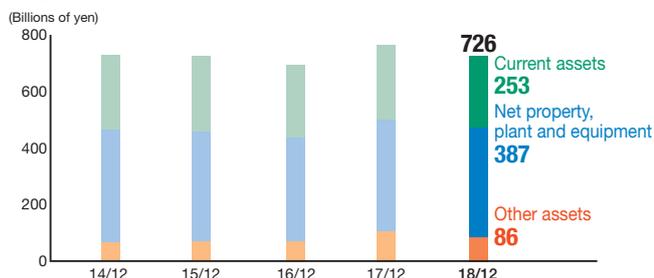
Total assets at the end of fiscal 2018 were ¥725,575 million (\$6,537 million), a decrease of ¥38,845 million (\$350 million) from the previous fiscal year. Current assets saw a decrease for notes and accounts receivable, as well as a decrease for finished and purchased goods. Noncurrent assets saw a decrease for tangible fixed assets, due primarily to depreciation. Intangible fixed assets decreased due to a decrease in goodwill stemming primarily from amortization. Investments and other assets decreased primarily as a result of a partial sale of investment securities and a drop in the market value of investment securities.

Total liabilities at the end of fiscal 2018 were ¥204,027 million (\$1,838 million), a decrease of ¥16,604 million (\$150 million) from the previous fiscal year. For current liabilities, long-term liabilities with a debt repayment period of one year or less were transferred to short-term debt, but short-term debt decreased due to repayment. Unsecured bonds redeemable within one year were transferred from long-term liabilities to current liabilities, and this resulted in an increase in unsecured bonds redeemable within one year. Long-term liabilities saw a decrease in bonds and long-term debt in line with the previously mentioned transfers. Additionally, some equipment and facilities underwent repair while it was canceled for others, resulting in reversal of reserve for special repairs.

Total net assets at the end of fiscal 2018 were ¥521,548 million (\$4,699 million), a decrease of ¥22,241 million (\$200 million) from the previous fiscal year. Although share dividends were paid, there was an increase in retained

earnings due to the profit attributable to owners of parent. Treasury stock was obtained as return to shareholders. In addition, there was a decrease in valuation on net unrealized holding gains on securities as well as foreign currency translation adjustments.

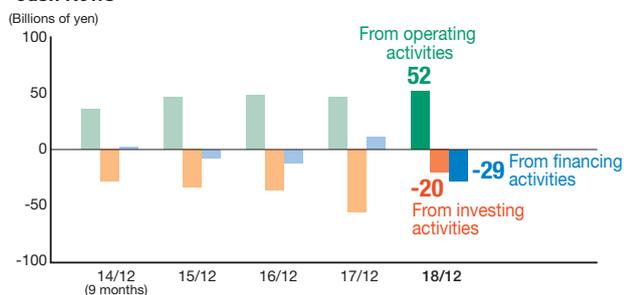
Assets



Cash Flow Analysis

Looking at the NEG Group's cash flows for fiscal 2018, cash flow from operating activities saw a decrease in income before income taxes but an increase in depreciation. Some equipment and facilities underwent repair while it was canceled for others, resulting in reversal of reserve for special repairs, and, at the same time, foreign exchange losses were incurred. All these factors led to a total of ¥52,002 million (\$468 million) in net cash provided by operating activities, an increase of ¥5,842 million (\$53 million) over the previous fiscal year.

Cash flows



As regards cash flow from investment activities, net cash used for investment activities in fiscal 2018 was ¥19,551 million (\$176 million), a decrease of ¥49,093 million (\$442 million) from the previous fiscal year. This was mainly due to capital investment in EGX and EGFA, as well as proceeds from sales of marketable and investment securities.

These activities resulted in a free cash flow (the total of cash flows from operating activities and investment activities) of ¥32,451 million (\$292 million), an increase of ¥54,935 million (\$495 million) over the previous fiscal year.

Regarding cash flow from financing activities, some short-term debt was repaid. Some income was derived from long-term debt, but some long-term debt repayment was also made. Acquisition of treasury stock resulted in expenditures. In addition, dividends were paid to shareholders as well as to noncontrolling interests at subsidiaries. All these factors contributed to a total of ¥28,503 million (\$257 million) in net cash utilized for financing activities in fiscal 2018, an increase of ¥38,300 million (\$345 million) over the previous fiscal year. After factoring in a reduction of ¥1,534 million (\$14 million) due to exchange rate changes on cash and cash equivalents,

the balance of cash and cash equivalents at the end of fiscal 2018 was ¥116,249 million (\$1,047 million), an increase of ¥2,414 million (\$22 million) over the total for the end of the previous fiscal year.

Capital Expenditure

The NEG Group invested ¥49,340 million (\$445 million) in capital expenditure during fiscal 2018. Key expenditures included production facility construction, production facility capacity enhancement, equipment replacement to improve productivity, and the periodic repair of glass melting furnaces.

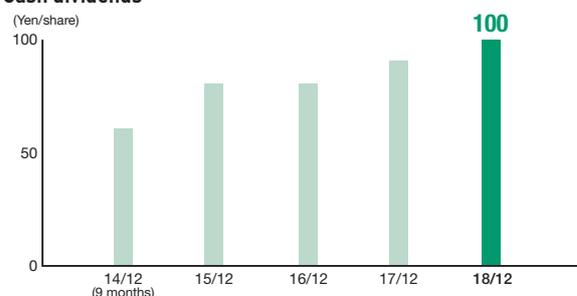
In the Electronics and Information Technology sector, the primary investment expenditure was the construction of production facilities at EGX, while in the Performance Materials and Others sector, the primary investment expenditure was the improvement and expansion of production facilities at EGFA.

Dividend Policy

The company views shareholder returns as a key management priority. We seek to ensure that shareholder dividends are not seriously affected by fluctuations in business results but have long-term stability. We determine the dividend amount in light of the company's financial position and other factors, while aiming for a dividend on equity (DOE) ratio of at least 2%. We also maintain flexibility in our dividend policy so that we can adapt and adjust to how well we have met the goals in our medium-term business plan. Our basic policy is to pay dividends of surplus twice a year: an interim dividend and end-of-term dividend.

The end-of-term dividend for fiscal 2018 was ¥50 (\$0.45) per share. When combined with the interim dividend of ¥50 (\$0.45), the annual dividend for fiscal 2018 amounted to ¥100 (\$0.90) per share, which was ¥10 (\$0.09) more than the ¥90 (\$0.81) annual dividend for the previous fiscal year, for which stock consolidation went into effect from July 1, 2017 at a ratio of five to one. The company plans to further increase this dividend by ¥10 (\$0.09) for the next fiscal year, raising it to ¥110 (\$0.99) per share.

Cash dividends*



* Per share of common stock amounts are retroactively adjusted for subsequent stock consolidation. On July 1, 2017, common shares were consolidated at a ratio of 5 to 1 based on the number of shares held by shareholders of record as of June 30, 2017.

Consolidated Financial Summary

Nippon Electric Glass Co., Ltd. and Consolidated Subsidiaries for the Ten Most Recent Years

*Fiscal year ended December 31, 2014 was a nine-month period due to a change in the Company's fiscal year-end.

	2010/3	2011/3	2012/3	2013/3
For the year				
Net sales	¥ 332,388	¥ 390,196	¥ 338,214	¥ 287,304
Operating income	98,426	117,471	61,639	24,968
Profit attributable to owners of parent	54,927	68,609	19,409	10,603
Depreciation and amortization	48,167	52,699	54,785	46,105
Capital expenditures	93,079	110,025	98,788	37,487
Research and development	3,589	4,553	6,464	6,833
At year-end				
Total assets	¥ 646,444	¥ 692,622	¥ 687,070	¥ 697,386
Current assets	228,625	238,908	224,416	243,577
Net property, plant and equipment	385,170	417,423	420,311	395,376
Current liabilities	153,874	142,327	135,200	88,038
Interest-bearing debts	99,827	94,273	86,812	102,604
Net assets	406,307	468,038	475,736	495,295
Cash flows				
Net cash provided by operating activities	¥ 118,721	¥ 133,391	¥ 83,737	¥ 55,111
Net cash used in investing activities	(86,847)	(96,822)	(79,827)	(46,545)
Net cash provided by (used in) financing activities	(35,135)	(11,774)	(14,731)	7,667
Cash and cash equivalents at end of year	91,668	116,366	105,210	121,741
Per share of common stock (yen and dollars)				
Profit attributable to owners of parent	¥ 552.05	¥ 689.59	¥ 195.09	¥ 106.58
Net assets	4,043.75	4,660.87	4,727.33	4,914.84
Cash dividends	55.00	65.00	75.00	80.00
Operating income ratio (%)	29.6	30.1	18.2	8.7
Equity ratio (%)	62.2	66.9	68.4	70.1
Return on equity (%)	14.6	15.8	4.2	2.2

Notes: 1. Profit attributable to owners of parent per share and net assets per share are calculated based on the average number of shares outstanding during each year and the number of shares outstanding at the end of each year, respectively.
2. As there was no dilutive stock outstanding during these years, diluted profit attributable to owners of parent per share was not calculated.
3. U.S. dollar amounts have been translated from Japanese yen solely for the convenience of the reader using the prevailing exchange rate at December 31, 2018 of ¥111 to U.S. \$1.00.
4. As of December 31, 2018, Nippon Electric Glass Co., Ltd. had 27 consolidated subsidiaries and 1 affiliated company accounted for by the equity method.

(Millions of yen and thousands of U.S. dollars, except per share figures)

	2014/3	2014/12*	2015/12	2016/12	2017/12	2018/12	
	¥ 252,548	¥ 192,692	¥ 251,178	¥ 239,412	¥ 282,447	¥ 300,327	\$ 2,705,648
	16,171	5,224	22,035	19,571	32,202	24,866	224,018
	12,432	5,938	9,637	4,969	27,184	15,200	136,937
	35,891	28,420	37,154	31,256	28,735	29,776	268,252
	46,962	45,214	49,212	46,429	52,913	49,340	444,505
	6,920	5,527	6,183	6,658	6,898	6,959	62,694
	¥ 707,021	¥ 731,185	¥ 726,938	¥ 693,918	¥ 764,420	¥ 725,575	\$ 6,536,712
	247,502	264,001	267,430	254,870	262,932	252,886	2,278,252
	393,751	397,273	386,013	367,399	393,818	386,541	3,482,352
	86,970	82,701	105,400	86,025	103,836	112,992	1,017,946
	99,492	109,141	109,731	101,997	120,661	112,005	1,009,055
	510,807	522,577	519,801	509,564	543,789	521,548	4,698,631
	¥ 46,700	¥ 38,837	¥ 46,797	¥ 48,261	¥ 46,160	¥ 52,002	\$ 468,486
	(33,843)	(29,264)	(32,638)	(36,139)	(68,644)	(19,551)	(176,135)
	(11,190)	1,699	(7,892)	(17,624)	9,797	(28,503)	(256,784)
	123,888	129,823	133,856	126,167	113,835	116,249	1,047,288
	¥ 124.97	¥ 59.69	¥ 96.88	¥ 49.95	¥ 273.29	¥ 154.26	\$ 1.39
	5,057.28	5,163.32	5,159.30	5,069.60	5,416.93	5,346.03	48.16
	80.00	60.00	80.00	80.00	90.00	100.00	0.90
	6.4	2.7	8.8	8.2	11.4	8.3	
	71.2	70.2	70.6	72.7	70.5	71.2	
	2.5	1.2	1.9	1.0	5.2	2.9	

5. Capital expenditures for FY2014/12 were calculated based on the periods from April 1, 2014 to December 31, 2014 for the company and its domestic consolidated subsidiaries and January 1, 2014 to December 31, 2014 for the Company's overseas consolidated subsidiaries.

6. Per share of common stock amounts are retroactively adjusted for subsequent stock consolidation. On July 1, 2017, common shares were consolidated at a ratio of 5 to 1 based on the number of shares held by shareholders of record as of June 30, 2017.

Consolidated Financial Statements

Consolidated Balance Sheets

Nippon Electric Glass Co., Ltd. and Consolidated Subsidiaries
December 31, 2017 and 2018

ASSETS	Millions of yen		Thousands of U.S. dollars (Note 1)
	December 31, 2017	December 31, 2018	December 31, 2018
Current assets:			
Cash and time deposits (Note 5, 9 and 16)	¥ 117,068	¥ 116,786	\$ 1,052,126
Notes and accounts receivable – trade (Note 5)	61,146	56,796	511,676
Allowance for doubtful receivables	(164)	(191)	(1,721)
Inventories (Note 10)	69,367	68,116	613,658
Deferred tax assets (Note 12)	5,511	5,144	46,342
Other current assets (Note 5)	10,004	6,235	56,171
Total current assets	262,932	252,886	2,278,252
Property, plant and equipment:			
Land	13,034	12,745	114,820
Building and structures	160,350	165,698	1,492,775
Machinery and equipment	706,730	726,468	6,544,757
Construction in progress	29,839	13,405	120,766
Total property, plant and equipment	909,953	918,316	8,273,118
Accumulated depreciation	(516,135)	(531,775)	(4,790,766)
Net property, plant and equipment	393,818	386,541	3,482,352
Intangible assets:			
Goodwill	21,848	19,073	171,829
Other intangible assets	13,172	12,864	115,892
Total intangible assets	35,020	31,937	287,721
Investments and other assets:			
Investment securities (Note 5 and 6)	62,686	46,415	418,153
Investment in affiliates (Note 6)	3,213	3,296	29,694
Deferred tax assets (Note 12)	2,896	1,587	14,297
Other assets	3,855	2,913	26,243
Total investments and other assets	72,650	54,211	488,387
Total assets	¥ 764,420	¥ 725,575	\$ 6,536,712

The accompanying notes to the consolidated financial statements are an integral part of these statements.

LIABILITIES AND NET ASSETS

	Millions of yen		Thousands of U.S. dollars (Note 1)
	December 31, 2017	December 31, 2018	December 31, 2018
Current liabilities:			
Short-term debt, including current portion of long-term debt (Note 5 and 11)	¥ 37,607	¥ 45,351	\$ 408,568
Notes and accounts payable (Note 5):			
Trade	37,990	38,774	349,315
Construction and other	8,885	10,859	97,829
Accrued expenses	11,858	11,376	102,486
Accrued income taxes	1,994	2,451	22,081
Reserve for loss on plant closing	2,930	2,063	18,586
Other reserves	108	105	946
Other current liabilities (Note 5)	2,464	2,013	18,135
Total current liabilities	103,836	112,992	1,017,946
Long-term liabilities:			
Long-term debt (Note 5 and 11)	83,054	66,654	600,487
Deferred tax liabilities (Note 12)	3,992	2,606	23,477
Reserve for special repairs	23,278	17,775	160,135
Reserve for loss on plant closing	823	-	-
Other reserves	36	20	180
Net defined benefit liability (Note 14)	1,900	1,666	15,009
Other long-term liabilities (Note 5 and 13)	3,712	2,314	20,847
Total long-term liabilities	116,795	91,035	820,135
Net assets (Note 15):			
Shareholders' equity:			
Common stock			
Authorized – 240,000,000 shares in Dec. 2017 and Dec. 2018			
Issued – 99,523,246 shares in Dec. 2017 and Dec. 2018	32,156	32,156	289,694
Capital surplus	34,320	34,365	309,595
Retained earnings	443,668	448,909	4,044,225
Treasury stock at cost			
53,734 shares in Dec. 2017			
2,918,451 shares in Dec. 2018	(307)	(10,308)	(92,865)
Total shareholders' equity	509,837	505,122	4,550,649
Accumulated other comprehensive income:			
Net unrealized holding gains on securities	30,124	19,482	175,513
Deferred gains (losses) on hedges	(209)	109	982
Foreign currency translation adjustments	(1,280)	(8,261)	(74,423)
Remeasurements of defined benefit plans	347	-	-
Total accumulated other comprehensive income	28,982	11,330	102,072
Noncontrolling interests	4,970	5,096	45,910
Total net assets	543,789	521,548	4,698,631
Contingent liabilities (Note 17)			
Total liabilities and net assets	¥ 764,420	¥ 725,575	\$ 6,536,712

The increase in treasury stock of 2,864,717 shares is due to the purchase of 2,864,100 shares based on the resolution of the Board of Directors on July 30, 2018 and the purchase of shares of less than one unit in the amount of 617 shares.

Consolidated Statements of Income

Nippon Electric Glass Co., Ltd. and Consolidated Subsidiaries
Years Ended December 31, 2017 and 2018

	Millions of yen		Thousands of U.S. dollars (Note 1)
	December 31, 2017	December 31, 2018	December 31, 2018
Net sales	¥ 282,447	¥ 300,327	\$ 2,705,648
Cost of sales	211,788	233,234	2,101,207
Gross profit	70,659	67,093	604,441
Selling, general and administrative expenses	38,457	42,227	380,423
Operating income	32,202	24,866	224,018
Other income (expenses):			
Interest and dividend income	1,856	1,913	17,234
Interest expense	(701)	(1,630)	(14,685)
Gain on sales of property, plant and equipment, net	1,309	231	2,081
Gain on sales of investment securities, net (Note 6)	1,942	1,942	17,495
Reversal of reserve for special repairs	-	3,775	34,009
Foreign exchange gains (losses)	1,521	(4,950)	(44,595)
Loss on closing of plant	(3,431)	-	-
Gain on revision of retirement benefit plan (Note 14)	-	966	8,703
Loss on suspension of production facilities	-	(951)	(8,567)
Restructuring expense	(107)	(169)	(1,522)
Other, net (Note 6)	(1,958)	(564)	(5,081)
Total other income	431	563	5,072
Income before income taxes	32,633	25,429	229,090
Income taxes (Note 12):			
Current	4,293	4,873	43,901
Deferred	651	4,869	43,865
Total income taxes	4,944	9,742	87,766
Profit	27,689	15,687	141,324
Profit attributable to noncontrolling interests	505	487	4,387
Profit attributable to owners of parent	¥ 27,184	¥ 15,200	\$ 136,937
	Yen		U.S. dollars (Note 1)
Amount per share of common stock:			
Profit attributable to owners of parent (Note 2)	¥ 273.29	¥ 154.26	\$ 1.39
Diluted profit attributable to owners of parent (Note 2)	-	-	-
Cash dividends applicable to the year (Note 15)	90.00	100.00	0.90

The accompanying notes to the consolidated financial statements are an integral part of these statements.

Per share of common stock amounts are retroactively adjusted for subsequent stock consolidation.

On July 1, 2017, common shares were consolidated at a ratio of 5 to 1 based on the number of shares held by shareholders of record as of June 30, 2017.

Consolidated Statements of Comprehensive Income

Nippon Electric Glass Co., Ltd. and Consolidated Subsidiaries
Years Ended December 31, 2017 and 2018

	Millions of yen		Thousands of U.S. dollars (Note 1)
	December 31, 2017	December 31, 2018	December 31, 2018
Profit	¥ 27,689	¥ 15,687	\$ 141,324
Other comprehensive income (Note 4):			
Net unrealized holding gains (losses) on securities	7,566	(10,642)	(95,874)
Deferred gains on hedges	209	318	2,865
Foreign currency translation adjustments	7,369	(6,846)	(61,676)
Remeasurements of defined benefit plans, net of tax	80	(347)	(3,126)
Share of other comprehensive income of associates accounted for using equity method	95	(135)	(1,216)
	15,319	(17,652)	(159,027)
Comprehensive income	¥ 43,008	¥ (1,965)	\$ (17,703)
Comprehensive income attributable to:			
Owners of the parent	¥ 42,503	¥ (2,452)	\$ (22,090)
Noncontrolling interests	505	487	4,387

The accompanying notes to the consolidated financial statements are an integral part of these statements.

Consolidated Statements of Changes in Net Assets

Nippon Electric Glass Co., Ltd. and Consolidated Subsidiaries

Years Ended December 31, 2017 and 2018

	Thousands of shares	Millions of yen									
	Number of shares of common stock issued	Common stock	Capital surplus	Retained earnings	Treasury stock	Net unrealized holding gains (losses) on securities	Deferred gains (losses) on hedges	Foreign currency translation adjustments	Remeasurements of defined benefit plans, net of tax	Non-controlling interests	Total net assets
Balance at January 1, 2017	497,616	¥ 32,156	¥ 34,320	¥ 424,442	¥ (293)	¥ 22,558	¥ (418)	¥ (8,744)	¥ 267	¥ 5,276	¥ 509,564
Profit attributable to owners of parent	-	-	-	27,184	-	-	-	-	-	-	27,184
Cash dividends paid	-	-	-	(7,958)	-	-	-	-	-	-	(7,958)
Acquisition of treasury stock	-	-	-	-	(15)	-	-	-	-	-	(15)
Disposition of treasury stock	-	-	(0)	-	1	-	-	-	-	-	1
Other	-	-	-	(0)	-	-	-	-	-	-	(0)
Net changes in items other than shareholders' equity	-	-	-	-	-	7,566	209	7,464	80	(306)	15,013
Stock consolidation (Note 2 and 15)	(398,093)	-	-	-	-	-	-	-	-	-	-
Balance at January 1, 2018	99,523	¥ 32,156	¥ 34,320	¥ 443,668	¥ (307)	¥ 30,124	¥ (209)	¥ (1,280)	¥ 347	¥ 4,970	¥ 543,789
Profit attributable to owners of parent	-	-	-	15,200	-	-	-	-	-	-	15,200
Cash dividends paid	-	-	-	(9,947)	-	-	-	-	-	-	(9,947)
Acquisition of treasury stock (Note 15)	-	-	-	-	(10,001)	-	-	-	-	-	(10,001)
Capital increase of consolidated subsidiaries	-	-	45	-	-	-	-	-	-	-	45
Other	-	-	-	(12)	-	-	-	-	-	-	(12)
Net changes in items other than shareholders' equity	-	-	-	-	-	(10,642)	318	(6,981)	(347)	126	(17,526)
Balance at December 31, 2018	99,523	¥ 32,156	¥ 34,365	¥ 448,909	¥ (10,308)	¥ 19,482	¥ 109	¥ (8,261)	¥ -	¥ 5,096	¥ 521,548

	Thousands of U.S. dollars (Note 1)										
	Common stock	Capital surplus	Retained earnings	Treasury stock	Net unrealized holding gains (losses) on securities	Deferred gains (losses) on hedges	Foreign currency translation adjustments	Remeasurements of defined benefit plans, net of tax	Non-controlling interests	Total net assets	
Balance at January 1, 2018	\$ 289,694	\$ 309,190	\$ 3,997,009	\$ (2,766)	\$ 271,387	\$ (1,883)	\$ (11,532)	\$ 3,126	\$ 44,775	\$ 4,899,000	
Profit attributable to owners of parent	-	-	136,937	-	-	-	-	-	-	136,937	
Cash dividends paid	-	-	(89,613)	-	-	-	-	-	-	(89,613)	
Acquisition of treasury stock (Note 15)	-	-	-	(90,099)	-	-	-	-	-	(90,099)	
Capital increase of consolidated subsidiaries	-	405	-	-	-	-	-	-	-	405	
Other	-	-	(108)	-	-	-	-	-	-	(108)	
Net changes in items other than shareholders' equity	-	-	-	-	(95,874)	2,865	(62,891)	(3,126)	1,135	(157,891)	
Balance at December 31, 2018	\$ 289,694	\$ 309,595	\$ 4,044,225	\$(92,865)	\$ 175,513	\$ 982	\$(74,423)	\$ -	\$ 45,910	\$ 4,698,631	

The accompanying notes to the consolidated financial statements are an integral part of these statements.

On July 1, 2017, common shares were consolidated at a ratio of 5 to 1 based on the number of shares held by shareholders of record as of June 30, 2017.

Consolidated Statements of Cash Flows

Nippon Electric Glass Co., Ltd. and Consolidated Subsidiaries
Years Ended December 31, 2017 and 2018

Millions of yen

Thousands of
U.S. dollars (Note 1)

	December 31, 2017	December 31, 2018	December 31, 2018
Cash flows from operating activities:			
Income before income taxes	¥ 32,633	¥ 25,429	\$ 229,090
Depreciation and amortization	28,735	29,776	268,252
Loss on suspension of production facilities	-	951	8,567
Loss on closing of plant	3,431	-	-
Gain on sales of investment securities, net	(1,942)	(1,942)	(17,495)
Increase (decrease) in reserve for special repairs	151	(5,503)	(49,577)
Interest and dividend income	(1,856)	(1,913)	(17,234)
Interest expense	701	1,630	14,685
Foreign exchange (gains) losses	(2,316)	3,819	34,405
Decrease (increase) in notes and accounts receivable, trade	(6,176)	2,693	24,261
Decrease (increase) in inventories	(2,182)	71	640
Increase in notes and accounts payable	1,327	2,971	26,766
Other, net	(4,125)	(2,546)	(22,937)
Subtotal	48,381	55,436	499,423
Interest and dividends received	1,856	1,902	17,135
Interest paid	(782)	(1,460)	(13,153)
Income taxes paid	(3,295)	(3,876)	(34,919)
Net cash provided by operating activities	46,160	52,002	468,486
Cash flows from investing activities:			
Decrease in time deposits, net	2,595	2,692	24,252
Proceeds from sales of marketable and investment securities	3,025	3,449	31,072
Purchases of property, plant and equipment	(16,516)	(25,477)	(229,523)
Payments for investments in capital of subsidiaries and associates	(1,575)	-	-
Purchase of shares of subsidiaries resulting in change in scope of consolidation (Note 8)	(59,389)	-	-
Other, net	3,216	(215)	(1,936)
Net cash used in investing activities	(68,644)	(19,551)	(176,135)
Cash flows from financing activities:			
Increase (decrease) in short-term debt, net	7,476	(4,893)	(44,081)
Proceeds from long-term borrowings	21,135	5,592	50,378
Repayment of long-term borrowings	-	(8,927)	(80,423)
Redemption of unsecured bonds	(10,000)	-	-
Acquisition of treasury stock	(14)	(10,001)	(90,099)
Cash dividends paid	(7,959)	(9,942)	(89,568)
Cash dividends paid to noncontrolling interests	(811)	(416)	(3,748)
Other, net	(30)	84	757
Net cash provided by (used in) financing activities	9,797	(28,503)	(256,784)
Effect of exchange rate changes on cash and cash equivalents	355	(1,534)	(13,820)
Net increase (decrease) in cash and cash equivalents	(12,332)	2,414	21,747
Cash and cash equivalents at beginning of year	126,167	113,835	1,025,541
Cash and cash equivalents at end of year (Note 9)	¥ 113,835	¥ 116,249	\$ 1,047,288

The accompanying notes to the consolidated financial statements are an integral part of these statements.

Notes to Consolidated Financial Statements

Nippon Electric Glass Co., Ltd. and Consolidated Subsidiaries

1. Basis of presenting consolidated financial statements

The accompanying consolidated financial statements of Nippon Electric Glass Co., Ltd. ("the Company") and its consolidated subsidiaries have been prepared in accordance with the provisions set forth in the Japanese Financial Instruments and Exchange Law and its related accounting regulations and in conformity with accounting principles generally accepted in Japan ("Japanese GAAP"), which are different in certain respects as to application and disclosure requirements from International Financial Reporting Standards.

The accompanying consolidated financial statements have been restructured and translated into English with certain expanded disclosures from the consolidated financial statements of the Company prepared in accordance with Japanese GAAP and filed with the appropriate Local Finance Bureau of the Ministry of Finance as required by the Japanese Financial Instruments and Exchange Law. Certain supplementary information included in the statutory Japanese language consolidated financial statements, but not required for fair presentation, is not presented in the accompanying consolidated financial statements.

The translations of Japanese yen amounts into U.S. dollar amounts are included solely for the convenience of the readers outside Japan, using the prevailing exchange rate at December 31, 2018, which was ¥111 to U.S. \$1.00. The translations, provided for convenience, should not be construed as representations that the Japanese yen amounts have been, could have been or could in the future be converted into U.S. dollars at this or any other rate of exchange.

2. Significant accounting policies

(a) Consolidation policies

Under Japanese GAAP, companies are required to consolidate all significant equity investments over which they have the power of control through a majority of voting rights or the existence of certain other conditions evidencing control.

The accompanying consolidated financial statements include the accounts of the Company and substantially all of its subsidiaries. All significant intercompany transactions and account balances are eliminated upon consolidation.

Investments in unconsolidated subsidiaries and affiliates are accounted for by the equity method or by cost. If the equity method of accounting had been applied to the investments in these companies accounted for by cost, the effect on the accompanying consolidated financial statements would not have been material.

(b) Translation of foreign currencies

All short-term and long-term monetary receivables and payables denominated in foreign currencies are translated into Japanese yen at the relevant exchange rates at the balance sheet date.

The financial statements of the Company's overseas consolidated subsidiaries are translated into Japanese yen at the current rates for assets and liabilities and at historical rates for shareholders' equity accounts. Average yearly rates are used for the translation of income and expense amounts. Foreign currency translation adjustments are recorded in net assets.

(c) Cash and cash equivalents

In preparing the consolidated statements of cash flows, cash on hand, deposits placed with banks on demand and short-term highly liquid investments with maturities of three months or less when deposited or purchased are considered to be cash and cash equivalents.

(d) Marketable and investment securities

Available-for-sale securities with observable fair market values are stated at fair market value. Unrealized gains and losses on these securities are reported, net of applicable income taxes, as a separate component of net assets. Realized gains and losses on the sale of such securities are calculated using moving average cost.

(e) Allowance for doubtful receivables

Allowance for doubtful receivables is provided in an amount sufficient to cover possible losses on collection. For regular receivables, it consists of an estimated amount based on the historical ratio of bad debt losses. For receivables from customers in financial difficulty, it consists of the estimated noncollectable amounts of specific doubtful receivables.

(f) Inventories

Inventories are stated principally at the lower of cost or net realized value, with cost determined by the moving average method.

(g) Property, plant and equipment (except for leased property)

Property, plant and equipment are stated at cost.

Depreciation of property, plant and equipment of the Company and its domestic consolidated subsidiaries is calculated by the declining balance method at rates based on the estimated useful life of the assets. Buildings, excluding facilities attached to buildings, acquired after March 31, 1998, are depreciated using the straight-line method. Facilities attached to buildings and structures acquired after March 31, 2016, are also depreciated using the straight-line method. Depreciation of property, plant and equipment of overseas consolidated subsidiaries is calculated principally by the straight-line method based on the estimated useful life of the assets. The estimated useful life of machinery and equipment is generally from 6 to 9 years.

(h) Intangible assets (except for leased property)

Intangible assets are amortized by the straight-line method.

(i) Reserve for directors' bonuses

To provide a reserve for directors' bonuses, the Company and its consolidated subsidiaries record the amount estimated to be paid to directors after the balance sheet date for their services rendered during the fiscal period.

(j) Severance and retirement benefits

The Company and its consolidated subsidiaries, excluding certain consolidated subsidiaries, principally use a simplified method for calculating projected benefit obligation which provides for accrued retirement benefits for voluntary retirement at the end of the fiscal year because there are few employees who have applied for the defined benefit pension plans.

The allowance for employees' severance and retirement benefits is recognized in an amount after deducting pension assets from retirement benefits for the net defined benefit liability in certain consolidated subsidiaries. Net defined benefit liability and retirement benefit costs are as follows.

(1) Allocation of projected retirement benefit obligation

In calculating the retirement benefit obligation, the benefit formula method is used to allocate the projected retirement benefit obligation to the estimated years of service of the eligible employees.

(2) Method for amortizing actuarial gain or loss

Depending on each company's situation, actuarial gain or loss is amortized at the time of occurrence or by the straight-line method over a period not exceeding the estimated average remaining service years of employees from the next year following the time of occurrence.

(k) Directors' retirement benefits

To provide for directors' retirement benefits, the Company and its consolidated subsidiaries had recorded the amount that was required by internal corporate policy at the end of the current fiscal year. However, the directors' retirement benefits system was abolished in June 2004, and the Company has ceased recording these provisions since July 2004.

(l) Reserve for special repairs

To be prepared for significant repairs of glass-melting furnaces that occur on a periodic basis, estimated costs for the next repairs are accrued within the period between the previous repair and the next such envisioned repair.

(m) Reserve for loss on plant closing

To provide for loss on plant closing, the Company recorded the estimated cost of closing the plant.

(n) Income taxes

The tax effects of loss carryforwards and temporary differences between the financial statement basis and the tax basis of assets and liabilities are recognized as deferred tax assets and liabilities. The provision for income taxes is computed based on the pretax income included in the consolidated statements of income.

(o) Research and development

Costs related to research and development activities are charged to income as incurred and amounted to ¥6,898 million and ¥6,959 million (\$62,694 thousand) for the fiscal years ended December 31, 2017 and 2018, respectively.

(p) Profit attributable to owners of parent per share

The computations of profit attributable to the owners of the parent per share are based on the average number of shares of common stock outstanding during each year. Diluted profit attributable to the owners of the parent per share of common stock is computed based on the average number of shares outstanding, increased by the number of

shares that would be outstanding assuming all dilutive convertible bonds were converted at the beginning of the year at the current conversion price. As there were no dilutive shares outstanding during the year, the computation of diluted profit attributable to the owners of the parent per share was not calculated.

Per share of common stock amounts are retroactively adjusted for subsequent stock consolidation. On July 1, 2017, common shares were consolidated at a ratio of 5 to 1 based on the number of shares held by shareholders of record as of June 30, 2017.

(q) Derivatives and hedge accounting

The Company and its consolidated subsidiaries state derivative financial instruments at fair value and recognize changes in the fair value as gain or loss, unless the derivative financial instruments are used for hedging purposes.

Forward foreign exchange contracts and interest rate swap contracts that meet the criteria for hedge accounting as provided in the "Accounting Standard for Financial Instruments" are accounted for using deferral hedge accounting, which requires unrealized gain or loss to be deferred as net unrealized gain or loss on the contract as a component of net assets until the loss or gain related to the hedged item is actually recognized.

The Company and its consolidated subsidiaries enter into forward foreign exchange contracts and interest rate swap contracts to hedge the risk of exchange rate fluctuations in forecasted foreign currency transactions and fluctuations in interest rates on borrowings, respectively. For forecasted foreign currency transactions, the suitability for hedging is confirmed by pretesting and post-testing with consideration for whether the transaction is highly likely to be executed. The Company and its consolidated subsidiaries use derivative transactions solely for the purpose of managing risks and not for speculation. The counterparties are major financial institutions, therefore, the Company and its consolidated subsidiaries consider the credit risk to be minimal. The derivative transactions are entered into by each company in accordance with accounting policies and decisions made by each company's management.

(r) Goodwill

Goodwill is amortized by the straight-line method over the period it is expected to have an effect.

(s) Reclassification and restatement

Certain prior period amounts have been reclassified to conform to the current year presentation. These reclassifications had no impact on the previously reported results of operations or retained earnings.

3. Changes in accounting policies

Application of revenue from contracts with customers (IFRS 15)

Effective from current fiscal year, the overseas consolidated subsidiaries excluding in U.S. applied "revenue from contracts with customers" (IFRS 15) and revised accounting for revenue recognition.

The effect of these changes on consolidated financial statements was immaterial.

4. Accounting standards for presentation of comprehensive income

The components of other comprehensive income for the fiscal years ended December 31, 2017 and 2018 were as follows:

	Millions of yen		Thousands of U.S. dollars
	2017/12	2018/12	2018/12
Net unrealized holding gains and losses on securities			
Increase (decrease) during the year	¥12,971	¥(13,312)	\$(119,928)
Reclassification adjustments	(1,942)	(1,857)	(16,730)
Subtotal, before tax	11,029	(15,169)	(136,658)
Tax (expense) benefit	(3,463)	4,527	40,784
Subtotal, net of tax	7,566	(10,642)	(95,874)
Deferred gains and losses on hedges			
Increase (decrease) during the year	(107)	250	2,252
Reclassification adjustments	409	196	1,766
Subtotal, before tax	302	446	4,018
Tax (expense) benefit	(93)	(128)	(1,153)
Subtotal, net of tax	209	318	2,865
Foreign currency translation adjustments			
Increase (decrease) during the year	7,369	(6,846)	(61,676)
Remeasurements of defined benefit plans			
Increase (decrease) during the year	137	(16)	(144)
Reclassification adjustments	(31)	(446)	(4,018)
Subtotal, before tax	106	(462)	(4,162)
Tax (expense) benefit	(26)	115	1,036
Subtotal, net of tax	80	(347)	(3,126)
Share of other comprehensive income of entities accounted for using equity method			
Increase (decrease) during the year	95	(135)	(1,216)
Total other comprehensive income	¥15,319	¥(17,652)	\$(159,027)

5. Financial instruments

(a) Status of financial instruments

(1) Policy on financial instruments

As a Group policy, the Company and its consolidated subsidiaries restrict investments of surplus cash, if any, to safe financial assets such as bank deposits. Funds required by the Company are obtained mainly through bank borrowings and the issuance of bonds. Derivatives are used to avoid the risks described below and are not entered into for speculative purposes.

(2) Details of financial instruments, associated risks and risk management structure

Notes and accounts receivable – trade, which are operating receivables, are exposed to customer credit risk. The Company, pursuant to the Company's Credit Control Regulations, manages credit risk by managing relative due dates and outstanding balances of each counterparty and by monitoring the credit status of major counterparties. Consolidated subsidiaries perform similar procedures in conformity with the Company's Credit Control Regulations.

Operating receivables denominated in foreign currencies, which arise from the Company's global business development, are exposed to foreign exchange fluctuation risk. The Group enters into forward foreign exchange contracts mainly for accounts receivable associated with export transactions of finished goods to manage fluctuation in future foreign exchange rates.

Investment securities consist mainly of equity securities of companies with which companies in the Group have business relationships and are exposed to market price fluctuation risk. The Company, pursuant to the Company's Shareholdings Regulations, monitors the fair values of such securities and regularly reviews its holdings.

Notes and accounts payable – trade, which are

operating debt, are settled within one year.

Regarding borrowings, short-term debt is issued mainly to obtain funds for operating transactions, and bonds and long-term debt are issued mainly for capital expenditures. Some borrowings have floating interest rates and are exposed to interest rate fluctuation risk against which long-term debt is partially hedged through interest rate swap contracts.

In addition, borrowings denominated in foreign currencies are exposed to foreign exchange fluctuation risk, which the Company uses currency swap and interest rate and currency swap contracts to manage.

For details regarding hedge accounting of derivatives such as hedging instruments and hedged items and hedging policy, refer to Note 2 (q), "Significant accounting policies – Derivatives and hedge accounting."

Matters regarding derivative transactions are determined by executives in charge of accounting at each consolidated Group company in accordance with the regulations of each company. Approval for transactions that exceed a certain scope is granted by the Company's management committee. Operations and management pertaining to the execution of derivative transactions are carried out by each company's accounting department, and such operations are managed through a check and balance system. With derivative transactions, the Company enters into contracts only with financial institutions with high ratings to reduce credit risk.

Operating debt and borrowings are exposed to liquidity risks. The Group manages such risks by cash management forecasting at each Group company.

(3) Supplementary explanation for fair values of financial instruments

The notional amounts of derivatives in Note 7, "Derivatives" does not indicate the market risks pertaining to the derivatives themselves.

(b) Fair values of financial instruments

The tables below show the book values of financial instruments recorded in the consolidated balance sheet, their fair values and any differences between the book value and fair value as of December 31, 2017 and 2018. Financial instruments whose fair values were deemed to be extremely difficult to estimate were not included. [See in the notes to the tables below – Notes 3, “Financial instruments whose fair values are deemed to be extremely difficult to estimate.”]

2017/12	Millions of yen		
	Book value	Fair value	Difference
(1) Cash and time deposits	¥ 117,068	¥ 117,068	¥ -
(2) Notes and accounts receivable – trade	61,146	61,146	-
(3) Investment securities: Other securities	62,684	62,684	-
(4) Short-term debt: Short-term debt	(28,681)	(28,681)	-
Current portion of long-term debt	(8,926)	(8,938)	(12)
(5) Notes and accounts payable – trade	(37,990)	(37,990)	-
(6) Long-term debt: Unsecured bonds	(30,000)	(30,272)	(272)
Long-term borrowings	(53,054)	(52,942)	112
(7) Derivatives Derivatives not accounted for with hedge accounting	(1,527)	(1,527)	-
Derivatives accounted for with hedge accounting	(352)	(352)	-

2018/12	Millions of yen		
	Book value	Fair value	Difference
(1) Cash and time deposits	¥ 116,786	¥ 116,786	¥ -
(2) Notes and accounts receivable – trade	56,796	56,796	-
(3) Investment securities: Other securities	46,413	46,413	-
(4) Short-term debt: Short-term debt	(23,585)	(23,585)	-
Current portion of long-term debt	(11,766)	(11,766)	(0)
Current portion of unsecured bonds	(10,000)	(10,024)	(24)
(5) Notes and accounts payable – trade	(38,774)	(38,774)	-
(6) Long-term debt: Unsecured bonds	(20,000)	(20,175)	(175)
Long-term borrowings	(46,654)	(46,705)	(51)
(7) Derivatives Derivatives not accounted for with hedge accounting	(102)	(102)	-
Derivatives accounted for with hedge accounting	68	68	-

2018/12	Thousands of U.S. dollars		
	Book value	Fair value	Difference
(1) Cash and time deposits	\$ 1,052,126	\$ 1,052,126	\$ -
(2) Notes and accounts receivable – trade	511,676	511,676	-
(3) Investment securities: Other securities	418,135	418,135	-
(4) Short-term debt: Short-term debt	(212,478)	(212,478)	-
Current portion of long-term debt	(106,000)	(106,000)	(0)
Current portion of unsecured bonds	(90,090)	(90,306)	(216)
(5) Notes and accounts payable – trade	(349,315)	(349,315)	-
(6) Long-term debt: Unsecured bonds	(180,180)	(181,757)	(1,577)
Long-term borrowings	(420,307)	(420,766)	(459)
(7) Derivatives Derivatives not accounted for with hedge accounting	(919)	(919)	-
Derivatives accounted for with hedge accounting	613	613	-

Notes: Fair value measurements of financial instruments and matters regarding marketable securities and derivatives

1. Amounts for "Book value" and "Fair value" in parentheses indicate net liabilities.
2. Measurements of fair value for financial instruments and matters regarding marketable securities and derivatives

(1) Cash and time deposits and (2) Notes and accounts receivable – trade

The fair value of these items approximates the book value because of their short-term nature. Thus, the book value is used as the fair value.

(3) Investment securities

The fair value of equity securities is based on market prices on public exchanges.

For information on investment securities, refer to Note 6, "Marketable and investment securities."

(4) Short-term debt and (5) Notes and accounts payable – trade

The fair value of these items, excluding the current portion of long-term debt and unsecured bonds, approximates the book value because of their short-term nature. Thus, the book value is used as the fair value. The current portion of long-term debt and unsecured bonds, which are included in short-term debt, is measured by the methods used in "(6) Long-term debt" below and classified as such.

(6) Long-term debt

The fair value of unsecured bonds issued by the Company is measured based on the market price if available and the present value calculated by discounting the total amount of principle and interest outstanding at an appropriate rate considering the time to maturity and the credit risk if the market price is not available.

The fair value of long-term borrowings is measured by discounting the total amount of principle and interest outstanding at an estimated interest rate for similar new borrowings.

(7) Derivatives

Refer to Note 7, "Derivatives."

3. Financial instruments whose fair values are deemed to be extremely difficult to estimate

Equity securities issued by affiliates, investments in capital of subsidiaries and associates and nonlisted equity securities are not included in "(3) Investment securities" because their fair values were deemed extremely difficult to estimate, they had no quoted market prices and it was not possible to estimate their future cash flows. For information related to these securities, refer to Note 6, "Marketable and investment securities."

6. Marketable and investment securities

(a) Acquisition cost and book value of securities with observable market values at December 31, 2017 and 2018 were as follows:

2017/12	Millions of yen		
	Acquisition cost	Book value	Difference
Available-for-sale securities:			
Securities with book value exceeding acquisition cost: Equity securities	¥ 20,982	¥ 62,493	¥ 41,511
Securities with book value not exceeding acquisition cost: Equity securities	221	191	(30)
	¥ 21,203	¥ 62,684	¥ 41,481

2018/12	Millions of yen		
	Acquisition cost	Book value	Difference
Available-for-sale securities:			
Securities with book value exceeding acquisition cost: Equity securities	¥ 19,165	¥ 45,590	¥ 26,425
Securities with book value not exceeding acquisition cost: Equity securities	936	823	(113)
	¥ 20,101	¥ 46,413	¥ 26,312

Thousands of U.S. dollars

2018/12	Acquisition cost	Book value	Difference
Available-for-sale securities:			
Securities with book value exceeding acquisition cost: Equity securities	\$ 172,658	\$ 410,721	\$ 238,063
Securities with book value not exceeding acquisition cost: Equity securities	8,432	7,414	(1,018)
	\$ 181,090	\$ 418,135	\$ 237,045

(b) Book values of securities with no available market values at December 31, 2017 and 2018 were as follows:

	Millions of yen		Thousands of U.S. dollars
	2017/12	2018/12	2018/12
Available-for-sale securities:			
Equity securities issued by affiliates	¥ 1,684	¥ 1,684	\$ 15,171
Investments in capital of subsidiaries and associates	1,529	1,612	14,523
Nonlisted equity securities, other	2	2	18
	¥ 3,215	¥ 3,298	\$ 29,712

(c) Sales of available-for-sale securities sold in the years ended December 31, 2017 and 2018 were as follows:

	Millions of yen		Thousands of U.S. dollars
	2017/12	2018/12	2018/12
Total sales amounts	¥ 3,025	¥ 3,449	\$ 31,072
Gains on sales	1,942	1,942	17,495

(d) Impairment loss on investment securities

The Company recognized impairment loss of ¥735 million and ¥85 million (\$766 thousand) on equity securities for the fiscal years ended December 31, 2017 and 2018, respectively.

If the fair market value as of the end of each financial quarter has dropped by more than 30% from the acquisition cost, all of the loss on impairment is recognized.

7. Derivatives

The fair values of derivative contracts used by the Company and its consolidated subsidiaries at December 31, 2017 and 2018 were as follows:

(a) Derivative transactions not accounted for under hedge accounting

Currency related transactions

2017/12		Millions of yen			
Classification	Type of transaction	Notional amount	Portion due after 1 year	Fair value	Unrealized gain (loss)
Nonmarket transactions	Forward foreign exchange				
	Buy	¥ 142	¥ -	¥ 1	¥ 1
	Currency swap	7,070	4,130	(164)	(164)
	Interest rate and currency swap	28,250	28,250	(1,364)	(1,364)
		¥ 35,462	¥ 32,380	¥ (1,527)	¥ (1,527)

2018/12		Millions of yen			
Classification	Type of transaction	Notional amount	Portion due after 1 year	Fair value	Unrealized gain (loss)
Nonmarket transactions	Forward foreign exchange				
	Buy	¥ 161	¥ -	¥ (3)	¥ (3)
	Currency swap	230	-	(99)	(99)
		¥ 391	¥ -	¥ (102)	¥ (102)

2018/12		Thousands of U.S. dollars			
Classification	Type of transaction	Notional amount	Portion due after 1 year	Fair value	Unrealized gain (loss)
Nonmarket transactions	Forward foreign exchange				
	Buy	\$ 1,451	\$ -	\$ (27)	\$ (27)
	Currency swap	2,072	-	(892)	(892)
		\$ 3,523	\$ -	\$ (919)	\$ (919)

Note: Fair value is based on prices obtained from financial institutions.

(b) Derivative transactions to which hedge accounting has been applied

Currency related transactions

2017/12		Millions of yen			
Method of hedge accounting	Type of transaction	Hedged item	Notional amount	Portion due after 1 year	Fair value
Deferral hedge accounting	Forward foreign exchange				
	Sell	Forecasted transactions for accounts receivable denominated in foreign currencies	¥ 15,802	¥ 2,591	¥ (160)
			¥ 15,802	¥ 2,591	¥ (160)

2018/12		Millions of yen			
Method of hedge accounting	Type of transaction	Hedged item	Notional amount	Portion due after 1 year	Fair value
Deferral hedge accounting	Forward foreign exchange				
	Sell	Forecasted transactions for accounts receivable denominated in foreign currencies	¥ 57,132	¥ 9,182	¥ 178
			¥ 57,132	¥ 9,182	¥ 178

2018/12		Thousands of U.S. dollars			
Method of hedge accounting	Type of transaction	Hedged item	Notional amount	Portion due after 1 year	Fair value
Deferral hedge accounting	Forward foreign exchange				
	Sell	Forecasted transactions for accounts receivable denominated in foreign currencies	\$ 514,703	\$ 82,721	\$ 1,604
			\$ 514,703	\$ 82,721	\$ 1,604

Note: Fair value is based on prices obtained from financial institutions.

Interest related transactions

2017/12			Millions of yen		
Method of hedge accounting	Type of transaction	Hedged item	Notional amount	Portion due after 1 year	Fair value
Deferral hedge accounting	Interest rate swap	Interest on borrowings	¥ 27,500	¥ 20,000	¥ (192)

2018/12			Millions of yen		
Method of hedge accounting	Type of transaction	Hedged item	Notional amount	Portion due after 1 year	Fair value
Deferral hedge accounting	Interest rate swap	Interest on borrowings	¥ 20,000	¥ 10,000	¥ (110)

2018/12			Thousands of U.S. dollars		
Method of hedge accounting	Type of transaction	Hedged item	Notional amount	Portion due after 1 year	Fair value
Deferral hedge accounting	Interest rate swap	Interest on borrowings	\$ 180,180	\$ 90,090	\$ (991)

Note: Fair value is based on prices obtained from financial institutions.

8. Payments for purchases of shares of subsidiaries

Payments for purchases of shares of subsidiaries at December 31, 2017 were as follows:

	Millions of yen
Current assets	¥ 9,858
Noncurrent assets, except for goodwill	34,094
Goodwill	20,383
Current liabilities	(4,411)
Noncurrent liabilities	(534)
Cost of share acquisition	59,390
Cash and cash equivalents	(1)
Payment for acquisition of the American glass fiber business of PPG	¥ 59,389

There were no payments for purchases of shares of subsidiaries in the year ended December 31, 2018.

9. Cash and cash equivalents

Cash and cash equivalents at December 31, 2017 and 2018 were as follows:

	Millions of yen		Thousands of U.S. dollars
	2017/12	2018/12	2018/12
Cash and time deposits on consolidated balance sheets	¥ 117,068	¥ 116,786	\$ 1,052,126
Time deposits due over three months	(3,233)	(537)	(4,838)
Cash and cash equivalents in consolidated statements of cash flows	¥ 113,835	¥ 116,249	\$ 1,047,288

10. Inventories

Inventories at December 31, 2017 and 2018 consisted of the following:

	Millions of yen		Thousands of U.S. dollars
	2017/12	2018/12	2018/12
Finished and purchased goods	¥ 44,156	¥ 40,498	\$ 364,847
Work-in-process	1,606	1,583	14,261
Raw materials and others	23,605	26,035	234,550
	¥ 69,367	¥ 68,116	\$ 613,658

11. Short-term and long-term debt

Short-term debt, including the current portion of long-term debt, at December 31, 2017 and 2018 consisted of the following:

	Millions of yen		Thousands of U.S. dollars
	2017/12	2018/12	2018/12
Short-term bank borrowings, average rate 1.1% per annum	¥ 26,681	¥ 21,585	\$ 194,460
Commercial paper, average rate -0.0% per annum	2,000	2,000	18,018
Current portion of long-term borrowings, average rate 0.2% per annum	8,926	11,766	106,000
Current portion of unsecured bonds, average rate 0.7% per annum	-	10,000	90,090
	¥ 37,607	¥ 45,351	\$ 408,568

Long-term debt at December 31, 2017 and 2018 consisted of the following:

	Millions of yen		Thousands of U.S. dollars
	2017/12	2018/12	2018/12
Borrowings, principally from banks and insurance companies due from 2020 through 2024, average rate 0.3% per annum	¥ 61,980	¥ 58,420	\$ 526,307
0.7% unsecured bonds, due in 2019	10,000	10,000	90,090
0.3% unsecured bonds, due in 2020	10,000	10,000	90,090
0.6% unsecured bonds, due in 2022	10,000	10,000	90,090
	91,980	88,420	796,577
Less current portion of long-term borrowings	(8,926)	(11,766)	(106,000)
Less current portion of unsecured bonds	-	(10,000)	(90,090)
	¥ 83,054	¥ 66,654	\$ 600,487

The aggregate annual maturities of long-term debt at December 31, 2018 were as follows:

Years ending December 31	Millions of yen	Thousands of U.S. dollars
2019	¥ 21,766	\$ 196,090
2020	12,825	115,540
2021	26,037	234,568
2022	12,837	115,649
2023	12,937	116,550
2024	2,018	18,180
	¥ 88,420	\$ 796,577

For flexible financing purposes, the Company has committed credit facilities with certain banks. The maximum aggregate credit facility available to the Company is ¥25,000 million (\$225,225 thousand). The credit facility has not been used as of December 31, 2018.

12. Income taxes

The Company is subject to a number of taxes based on income, which, in the aggregate, indicate a statutory tax rate in Japan of approximately 30.7% for the fiscal years ended December 31, 2017 and 2018.

The significant differences between the statutory tax rate in Japan and the effective tax rate of the Company and its consolidated subsidiaries for financial statement purposes for the fiscal years ended December 31, 2017 and 2018 were as follows:

	2017/12	2018/12
Statutory tax rate in Japan	30.7%	30.7%
Non taxable dividend income	(16.2)	(18.0)
Difference in tax rates for overseas consolidated subsidiaries	(6.3)	(1.9)
Permanent difference	(0.3)	1.3
Undistributed earnings of overseas consolidated subsidiaries	(1.0)	(2.7)
Effect of elimination of dividend income	16.3	18.2
Changes in statutory tax rates on the Company and its consolidated subsidiaries	1.7	(0.3)
Overseas withholding tax	2.4	2.4
Effect of elimination of unrealized gains	(0.7)	(0.3)
Movement of valuation allowance	(10.7)	8.2
Other	(0.7)	0.7
Effective tax rate	15.2%	38.3%

Significant components of the Company's and its consolidated subsidiaries' deferred tax assets and liabilities as of December 31, 2017 and 2018 were as follows:

	Millions of yen		Thousands of U.S. dollars
	2017/12	2018/12	2018/12
Deferred tax assets:			
Reserve for special repairs	¥ 7,101	¥ 5,421	\$ 48,838
Capital allowances	5,356	2,546	22,937
Depreciation in excess of tax limit	4,024	3,512	31,640
Tax losses carried forward	1,697	2,882	25,964
Unrealized gain on property, plant and equipment	3,016	2,831	25,504
Loss on devaluation of inventories	2,188	2,443	22,009
Loss on valuation of investment securities	1,294	1,237	11,144
Long-term prepaid expenses	266	171	1,541
Accrued bonuses	419	365	3,288
Reserve for loss on plant closing	1,151	629	5,667
Other	3,561	3,653	32,909
Subtotal deferred tax assets	30,073	25,690	231,441
Less valuation allowance	(5,180)	(6,870)	(61,892)
Total deferred tax assets	24,893	18,820	169,549
Deferred tax liabilities:			
Depreciation of overseas consolidated subsidiaries	(6,621)	(5,818)	(52,414)
Net unrealized holding gains on securities	(11,357)	(6,830)	(61,532)
Undistributed earnings of overseas consolidated subsidiaries	(2,392)	(1,701)	(15,324)
Other	(108)	(346)	(3,117)
Total deferred tax liabilities	(20,478)	(14,695)	(132,387)
Net deferred tax assets	¥ 4,415	¥ 4,125	\$ 37,162

13. Asset retirement obligations

(a) Asset retirement obligations recorded on the consolidated balance sheets

(1) Outline of asset retirement obligations

Recorded asset retirement obligations are expenses such as the costs for disposal of machinery and equipment owned by the Company that contain PCB (polychlorinated biphenyl) and the costs for removal of asbestos from buildings owned by the Company when they are demolished.

(2) Basis for calculating asset retirement obligations

Asset retirement obligations are based on estimates provided by specialty companies such as construction companies.

(3) Changes in the total amount of asset retirement obligations during the fiscal years ended December 31, 2017 and 2018 were as follows:

	Millions of yen		Thousands of U.S. dollars
	2017/12	2018/12	2018/12
Beginning balance	¥ 320	¥ 306	\$ 2,757
Decrease due to the fulfillment of asset retirement obligations	(9)	(10)	(90)
Change in estimated asset retirement obligations	(5)	(15)	(135)
Other	0	5	45
Ending balance	¥ 306	¥ 286	\$ 2,577

(b) Asset retirement obligations not recorded on the consolidated balance sheets

Regarding some factory sites and other properties being used under real estate leasing agreements, the Company and its consolidated subsidiaries have obligations related to the cost of restoring such properties to their original state at the time of business termination or moving out. However, since there are uncertainties regarding the lease periods of the properties to which such obligations apply because there are no plans to move out at this time, it is impossible to reasonably estimate the related asset retirement obligations. Therefore, no asset retirement obligations are recorded for such obligations.

14. Severance and retirement benefits

The Company and its domestic consolidated subsidiaries provide mainly defined contribution pension plans. However, certain employees are provided unfunded lump-sum payment plans. The overseas consolidated subsidiaries provide funded lump-sum payment plans, defined contribution pension plans and defined benefit pension plans. Furthermore, an overseas consolidated subsidiary revised its retirement benefit plan. Following the change, gain on revision of retirement benefit plan was recorded in the amount of ¥966 million (\$8,703 thousand) as other income for the fiscal year ended December 31, 2018.

Under defined benefit pension plans, the reconciliation of opening and ending balances for projected benefit obligation for the fiscal years ended December 31, 2017 and 2018 were as follows:

	Millions of yen		Thousands of U.S. dollars
	2017/12	2018/12	2018/12
Projected benefit obligation at beginning of year	¥(31,600)	¥(37,811)	\$ (340,640)
Service cost	(732)	(651)	(5,865)
Interest cost	(593)	(504)	(4,541)
Actuarial differences	(2,630)	(138)	(1,243)
Benefits paid	867	152	1,369
Decrease from revision of retirement benefit plan	-	35,940	323,784
Other	(3,123)	1,322	11,911
Projected benefit obligation at end of year	¥(37,811)	¥ (1,690)	\$ (15,225)

Under defined benefit pension plans, the reconciliation of opening and ending balances for pension assets for the fiscal years ended December 31, 2017 and 2018 were as follows:

	Millions of yen		Thousands of U.S. dollars
	2017/12	2018/12	2018/12
Pension assets at beginning of year	¥ 30,038	¥ 35,910	\$ 323,514
Expected return on pension assets	549	468	4,216
Actuarial differences	2,711	1	9
Contributions paid by employer	355	268	2,414
Benefits paid	(762)	-	-
Decrease from revision of retirement benefit plan	-	(35,391)	(318,838)
Other	3,019	(1,232)	(11,099)
Pension assets at end of year	¥ 35,910	¥ 24	\$ 216

Under defined benefit pension plans, the reconciliation of ending balances for projected benefit obligations and pension assets and the balances for net defined benefit liability recognized in the consolidated balance sheets for the fiscal years ended December 31, 2017 and 2018 were as follows:

	Millions of yen		Thousands of U.S. dollars
	2017/12	2018/12	2018/12
Projected benefit obligations of funded plans	¥(36,809)	¥ (616)	\$ (5,549)
Pension assets	35,910	24	216
	(899)	(592)	(5,333)
Projected benefit obligation of unfunded plans	(1,001)	(1,074)	(9,676)
Net liabilities for severance and retirement benefits recognized in the consolidated balance sheets	(1,900)	(1,666)	(15,009)
Net defined benefit liability	(1,900)	(1,666)	(15,009)
Net liabilities for severance and retirement benefits recognized in the consolidated balance sheets	¥ (1,900)	¥ (1,666)	\$ (15,009)

Under defined benefit pension plans, components of severance and retirement benefit expense for the fiscal years ended December 31, 2017 and 2018 were as follows:

	Millions of yen		Thousands of U.S. dollars
	2017/12	2018/12	2018/12
Service cost	¥ 732	¥ 651	\$ 5,865
Interest cost	593	504	4,541
Expected return on pension assets	(549)	(468)	(4,216)
Amortization of actuarial differences	(8)	107	963
Severance and retirement benefit expense for defined benefit pension plans	768	794	7,153
Gain on revision of retirement benefit plan	¥ -	¥ (966)	\$ (8,703)

Under defined benefit pension plans, remeasurements of defined benefit plans for the fiscal years ended December 31, 2017 and 2018 were as follows:

	Millions of yen		Thousands of U.S. dollars
	2017/12	2018/12	2018/12
Actuarial differences	¥ 106	¥ (462)	\$ (4,162)
Total	¥ 106	¥ (462)	\$ (4,162)

Under defined benefit pension plans, the accumulated amounts for remeasurements of defined benefit plans for the fiscal years ended December 31, 2017 and 2018 were as follows:

	Millions of yen		Thousands of U.S. dollars
	2017/12	2018/12	2018/12
Unrecognized amount for actuarial differences	¥ (462)	¥ -	\$ -
Total	¥ (462)	¥ -	\$ -

Under defined benefit pension plans, the percentage composition by asset class of total plan assets for the fiscal years ended December 31, 2017 and 2018 was as follows:

	2017/12	2018/12
Equity securities	51%	51%
Bonds	49%	11%
Others	0%	38%
Total	100%	100%

The current and expected allocation of plan assets as well as the current and expected long-term rates of return for the various assets that constitute the plan assets are considered when determining the long-term expected rate of return on plan assets.

Under defined benefit pension plans, principal actuarial assumptions for the fiscal years ended December 31, 2017 and 2018 were as follows:

	2017/12	2018/12
Discount rates	Mainly 1.8%	Mainly 1.0 – 3.3%
Long-term expected rates of return on plan assets	Mainly 1.8%	1.0%
Expected rates of pay raises	Mainly 2.0%	Mainly 2.0 – 4.0%

The total amounts that the Company and its consolidated subsidiaries needed to contribute to the defined contribution pension plans were ¥1,463 million and ¥1,633 million (\$14,712 thousand) for the fiscal years ended December 31, 2017 and 2018, respectively.

15. Net assets

Under Japanese laws and regulations, the entire amount paid for new shares is required to be designated as common shares. However, a company may, by a resolution of the Board of Directors, designate an amount not exceeding one half of the price of the new shares as additional paid-in capital, which is included in capital surplus.

Under The Japanese Corporate Law ("the Law"), in cases in which a dividend distribution of surplus takes place, the smaller of an amount equal to 10% of the dividend or the excess, if any, of 25% of common shares over the total of additional paid-in capital and legal earnings reserve must be set aside as additional paid-in capital or legal earnings reserve. The legal earnings reserve is included in retained earnings in the accompanying consolidated balance sheets. Under the Law, both of these appropriations generally require a resolution of the shareholders' meeting.

Additional paid-in capital and legal earnings reserve may not be distributed as dividends. Under the Law, all additional paid-in capital and all legal earnings reserve may be transferred to other capital surplus and retained earnings, which are potentially available for dividends, by a resolution of a shareholders' meeting.

Per share of common stock amounts are retroactively adjusted for subsequent stock consolidation. On July 1, 2017, common shares were consolidated at a ratio of 5 to 1 based on the number of shares held by shareholders of record as of June 30, 2017.

The maximum amount that the Company can distribute as dividends is calculated based on the nonconsolidated financial statements of the Company in accordance with Japanese laws and regulations.

The Company purchased treasury stock of 2,864,100 shares based on the resolve of the Board of Directors held on July 30, 2018.

At the annual shareholders' meeting held on March 28, 2019, the shareholders approved cash dividends amounting to ¥4,830 million (\$43,514 thousand), or ¥50.00 per share. In addition, the Company paid interim cash dividends of ¥4,973 million (\$44,802 thousand), or ¥50.00 per share, on August 31, 2018.

16. Assets pledged as collateral and associated liabilities

The assets pledged as collateral and associated liabilities at December 31, 2017 and 2018 were as follows:

	Millions of yen		Thousands of U.S. dollars
	2017/12	2018/12	2018/12
Assets pledged as collateral:			
Time deposits	¥ -	¥ 306	\$ 2,757
Liabilities associated with assets pledged as collateral:			
Guarantee of liability	-	276	2,486

17. Contingent liabilities

Contingent liabilities at December 31, 2017 and 2018 were as follows:

	Millions of yen		Thousands of U.S. dollars
	2017/12	2018/12	2018/12
Notes receivable discounted			
Guarantees of employees' housing loans	¥ 52	¥ -	\$ -
Guarantees of bank loans for affiliated company accounted for by the equity method	183 3,249	142 3,038	1,279 27,369

18. Segment information

Information by segment for the fiscal years ended December 31, 2017 and 2018 was as follows:

(a) Segment information (by management approach)

Outline of reportable segment

The Company has adopted a business division system in which each business division develops a comprehensive strategy for the products it handles and conducts business activities based on such strategy. The Board of Directors periodically reviews decisions regarding the allocation of management resources to each business division and evaluates business performance.

Although it may be considered that the Group consists of multiple business segments that are handled by various business divisions, in general the "glass products" made by the Group companies are similar in terms of characteristics, manufacturing methods, market and industry, customer type and marketing factors. Therefore, the Group has consolidated these segments into a single "Glass Business" segment. Accordingly, except for information given in the "Outline of reportable segment", information for other segments has been omitted.

(b) Related information

(1) Information by products and services

2017/12	Millions of yen		
Sales to external customers	Glass Business		Total
	Electronics and Information Technology	Performance Materials and Others	
		¥ 149,157	¥ 133,290

2018/12	Millions of yen		
Sales to external customers	Glass Business		Total
	Electronics and Information Technology	Performance Materials and Others	
		¥ 152,226	¥ 148,101

2018/12	Thousands of U.S. dollars		
Sales to external customers	Glass Business		Total
	Electronics and Information Technology	Performance Materials and Others	
		\$ 1,371,405	\$ 1,334,243

(2) Geographical information

Net sales

2017/12

Millions of yen

Japan	China	Korea	U.S.	Europe	Other areas	Total
¥ 50,139	¥ 62,313	¥ 59,722	¥ 26,489	¥ 40,289	¥ 43,495	¥ 282,447

2018/12

Millions of yen

Japan	China	Korea	U.S.	Europe	Other areas	Total
¥ 49,690	¥ 72,456	¥ 53,792	¥ 45,899	¥ 41,760	¥ 36,730	¥ 300,327

2018/12

Thousands of U.S. dollars

Japan	China	Korea	U.S.	Europe	Other areas	Total
\$ 447,658	\$ 652,757	\$ 484,613	\$ 413,505	\$ 376,216	\$ 330,899	\$ 2,705,648

Notes: 1. The classifications of countries and areas are based on the location of customers.
2. The main country classified as "Other areas" is Taiwan.

Property, plant and equipment

2017/12

Millions of yen

Japan	China	Korea	Malaysia	Other areas	Total
¥ 200,814	¥ 61,102	¥ 47,080	¥ 43,215	¥ 41,607	¥ 393,818

2018/12

Millions of yen

Japan	China	Korea	Malaysia	Other areas	Total
¥ 189,771	¥ 64,922	¥ 46,291	¥ 40,757	¥ 44,800	¥ 386,541

2018/12

Thousands of U.S. dollars

Japan	China	Korea	Malaysia	Other areas	Total
\$ 1,709,649	\$ 584,883	\$ 417,036	\$ 367,180	\$ 403,604	\$ 3,482,352

Notes: 1. The classifications of countries and areas are based on the location of property, plant and equipment.
2. The main countries classified as "Other areas" are countries in U.S. and Europe.

(3) Information by major customers

Sales

Millions of yen

Thousands of U.S. dollars

	2017/12	2018/12	2018/12	Related segment
LG Display Co., Ltd.	¥ 45,617	¥ 42,576	\$ 383,568	Glass Business

(c) Information on amortization of goodwill and unamortized balance

Millions of yen

2017/12

	Glass Business	Total
Amortization of goodwill	¥ 859	¥ 859
Balance at end of year	21,848	21,848

2018/12

Millions of yen

	Glass Business	Total
Amortization of goodwill	¥ 2,205	¥ 2,205
Balance at end of year	19,073	19,073

2018/12

Thousands of U.S. dollars

	Glass Business	Total
Amortization of goodwill	\$ 19,865	\$ 19,865
Balance at end of year	171,829	171,829

19. Significant subsequent events

Introduction of remuneration for Grant of Restricted Stock to Directors (excluding Outside Directors)

At the Board of Directors' meeting held on February 20, 2019, the Company resolved to introduce a restricted stock remuneration plan (the "Plan"), which and the Plan was approved by resolution of the 100th Ordinary General Meeting of Shareholders held on March 28, 2019.

(a) Purpose of the Plan

The Plan is intended to provide incentives to the Directors of the Company (excluding Outside Directors, the "Eligible Directors") to sustainably increase the Company's corporate value and to promote shared values between shareholders and the Eligible Directors.

(b) Overview of the Plan

All of the monetary remuneration claims to be provided by the Company under the Plan shall be paid in the form of property contributed in kind, and the Eligible Directors shall receive common shares of the Company that shall be issued or disposed of by the Company.

The total annual amount of monetary remuneration claims given to the Eligible Directors under the Plan shall be up to ¥100 million (\$901 thousand), excluding the monetary remuneration referenced above, and the total number of common shares newly issued or disposed of by the Company shall be up to 50,000 shares per year. However, in the event of a stock split, including allotment without contribution, or a stock consolidation of the Company, the effective date of which is on or after the date of the resolution at the shareholder meeting, the total number shall be reasonably adjusted as required.

The paid-in amount per share shall be decided reasonably, not to advantages for the Eligible Directors, based on the closing price of the Company's common shares on the Tokyo Stock Exchange on the business day preceding the date of the relevant resolution by the Board of Directors. If no such shares are traded on such day, the closing price on the immediately preceding day will be used.

Furthermore, for issuance or disposal of the common shares of the Company pursuant to this proposal, an agreement on allotment of shares with transfer restrictions as summarized below (the "Allotment Agreement") shall be entered into between the Company and each Eligible Director.

Summary of Allotment Agreement

- (1) The Eligible Director shall not transfer, create security interests in, or otherwise dispose of the common shares of the Company allotted under the Allotment Agreement during the period from the day of allotment of the Allotted Shares until the day that the relevant Eligible Director resigns as the Director of the Company.
- (2) If the Eligible Director resigns from the position of the Director of the Company before the period designated by the Company's Board of Directors expires, the Company shall automatically acquire such Allotted Shares without contribution, unless the Board of Directors of the Company deems the reason for resignation to be justifiable.

Independent Auditor's Report



Independent Auditor's Report

To the Board of Directors of Nippon Electric Glass Co., Ltd.:

We have audited the accompanying consolidated financial statements of Nippon Electric Glass Co., Ltd. and its consolidated subsidiaries, which comprise the consolidated balance sheets as at December 31, 2018 and 2017, and the consolidated statements of income, statements of comprehensive income, statements of changes in net assets and statements of cash flows for the years then ended, and a summary of significant accounting policies and other explanatory information.

Management's Responsibility for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of these consolidated financial statements in accordance with accounting principles generally accepted in Japan, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in Japan. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on our judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, we consider internal control relevant to the entity's preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances, while the objective of the financial statement audit is not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of Nippon Electric Glass Co., Ltd. and its consolidated subsidiaries as at December 31, 2018 and 2017, and their financial performance and cash flows for the years then ended in accordance with accounting principles generally accepted in Japan.

Convenience Translation

The U.S. dollar amounts in the accompanying consolidated financial statements with respect to the year ended December 31, 2018 are presented solely for convenience. Our audit also included the translation of yen amounts into U.S. dollar amounts and, in our opinion, such translation has been made on the basis described in Note 1 to the consolidated financial statements.

KPMG AZSA LLC

April 15, 2019
Kyoto, Japan

KPMG AZSA LLC, a limited liability audit corporation incorporated under the Japanese Certified Public Accountants Law and a member firm of the KPMG network of independent member firms affiliated with KPMG International Cooperative ("KPMG International"), a Swiss entity.

Corporate Information

Global Network



Corporate Profile (as of December 31, 2018)

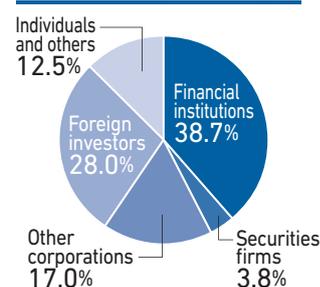
Founded	December 1, 1949
Company Name	Nippon Electric Glass Co., Ltd.
Head Office	7-1, Seiran 2-chome, Otsu, Shiga 520-8639, Japan Tel: +81-77-537-1700 Fax: +81-77-534-4967
Sales Headquarters (Osaka)	10F, Sumitomo Seimei Shin-Osaka Kita Bldg., 1-14, Miyahara 4-chome, Yodogawa-ku, Osaka 532-0003, Japan Tel: +81-6-6399-2711 Fax: +81-6-6399-2731
(Tokyo)	9F, Shinagawa Grand Central Tower, 16-4, Konan 2-chome, Minato-ku, Tokyo 108-0075, Japan Tel: +81-3-5460-2510 Fax: +81-3-5460-2525
Plants (in Japan)	Otsu, Shiga-Takatsuki, Notogawa, Precision Glass Center
Capital	32,155 million yen
Number of Employees	6,875 (consolidated)
Stock Exchange Listings	Tokyo Stock Exchange (1st Section)
Stock Code	5214
Fiscal Year	January 1 to December 31 of each year
General Shareholders Meeting	Held each year in March
Transfer Agent for Common Stock	Sumitomo Mitsui Trust Bank, Ltd.

Stock Information (as of December 31, 2018)

Information about NEG Stock

Total number of shares authorized to be issued	240,000,000 shares
Total number of shares issued	99,523,246 shares
Shares per unit	100 shares
Total number of shareholders	13,460

Distribution of Shares by Shareholder Type



Major Shareholders

Shareholder	Number of shares held (thousands of shares)	Shareholding ratio (%)
NIPRO CORPORATION	12,715	13.2
The Master Trust Bank of Japan, Ltd. (Trust Account)	10,951	11.3
Japan Trustee Services Bank, Ltd. (Trust Account)	6,443	6.7
Trust & Custody Services Bank, Ltd. (Securities Investment Trust Account)	1,814	1.9
THE BANK OF NEW YORK MELLON 140051	1,726	1.8
Japan Trustee Services Bank, Ltd. (Trust Account No. 5)	1,697	1.8
The Shiga Bank, Ltd.	1,617	1.7
JAPAN SECURITIES FINANCE CO., LTD.	1,477	1.5
STATE STREET BANK WEST CLIENT-TREATY 505234	1,390	1.4
JP MORGAN CHASE BANK 385151	1,212	1.3

Notes 1. NEG holds 2,918,451 shares of treasury stock but it is not included in the list of major shareholders.
2. Shareholding ratio is calculated after deducting treasury stock.

GLASS FOR FUTURE



<https://www.neg.co.jp/en/>

7-1, Seiran 2-chome, Otsu, Shiga 520-8639, Japan
TEL: (81) 77-537-1700 FAX: (81) 77-534-4967



This report is printed on paper certified by the Forest Stewardship Council® and printed using a vegetable-based ink which reduces VOC compound emissions.