

2019

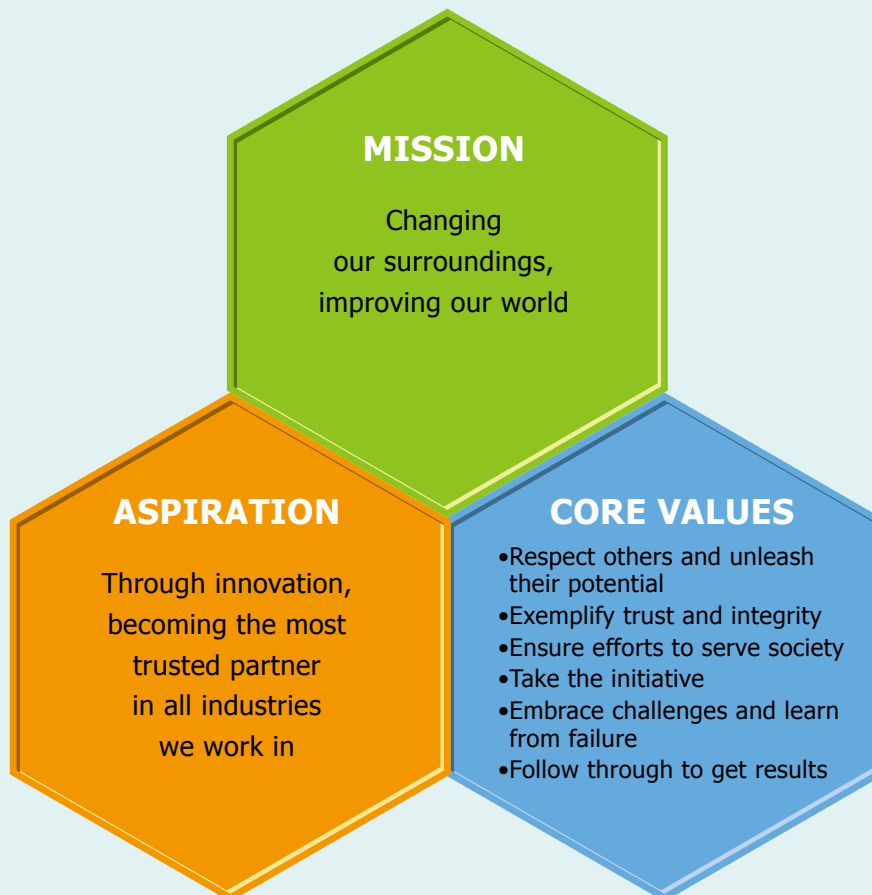
# INTEGRATED REPORT

FISCAL YEAR ENDED MARCH 31 2019

**NSG Group is one of the world's largest manufacturers of glass and glazing products for the Architectural, Automotive and Technical Glass sectors. With around 27,000 employees, NSG Group has principal operations in approximately 30 countries around the world and sales in over 100 countries.**

## **Our Vision**

NSG Group announced its new management principles "Our Vision" at the company's 100th anniversary in November 2018. "Our Vision" comprises Mission (our core purpose), Aspiration (our desired future position) and Core Values (the basis on which we work and conduct ourselves).



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Value Creation Story

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Value Creation Strategies

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Foundations Supporting the Corporate Value

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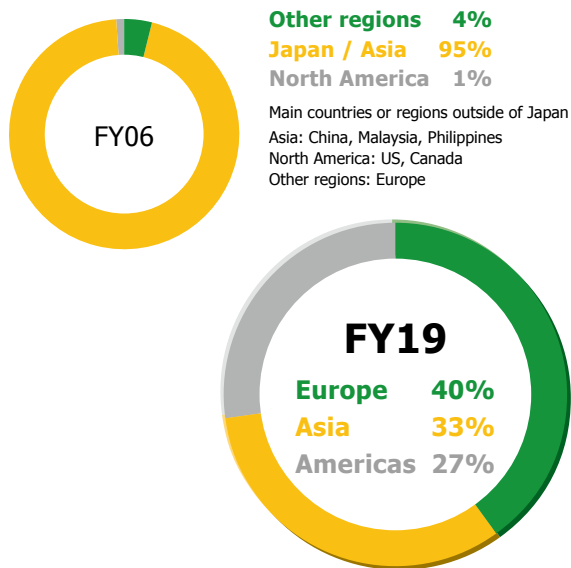
Other Information

# NSG GROUP TIMELINE

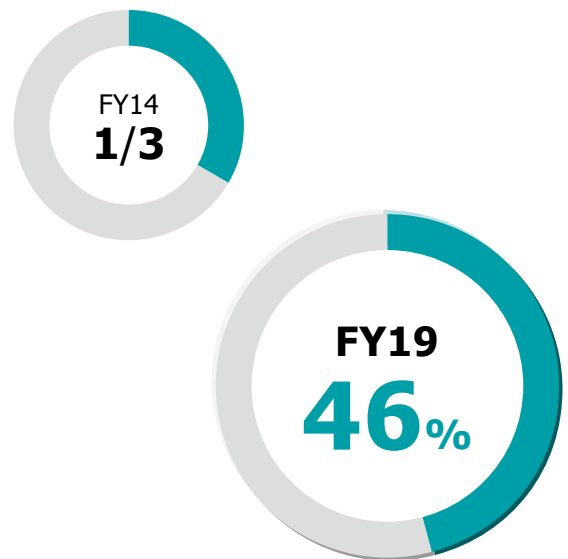
—Accelerating globalization and VA transformation—

NSG Group celebrated its 100<sup>th</sup> anniversary in 2018. Since our founding in 1918, we have continued to embrace the business spirit of the 400-year-old Sumitomo Group and tap into the potential of glass as a material in pursuing the creation of comfortable living spaces. With the 2006 acquisition of the major UK glass manufacturer Pilkington plc, we became one of the world's largest companies in the flat glass industry. After the global financial crisis and the

## Global sales weightings

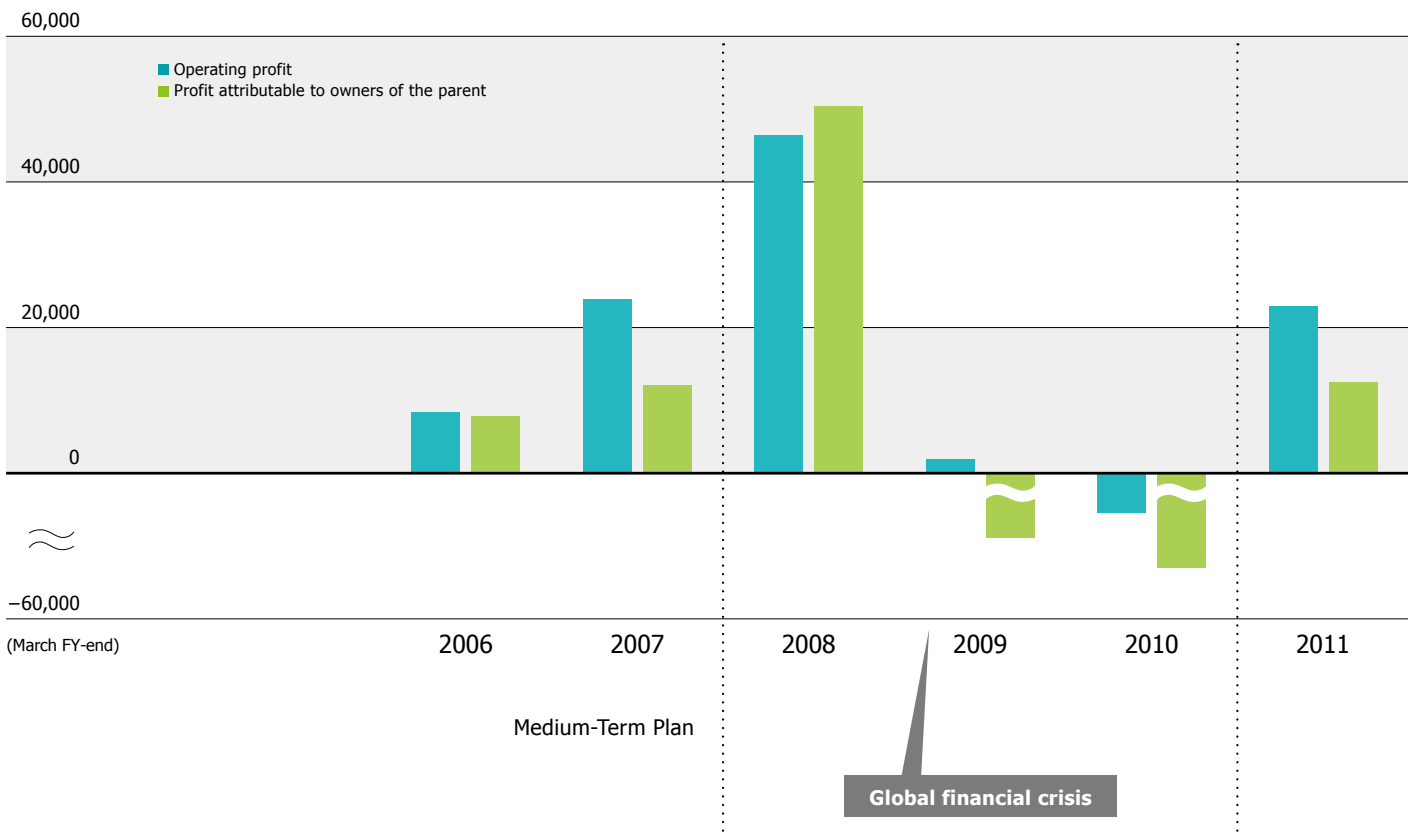


## Change in VA transformation



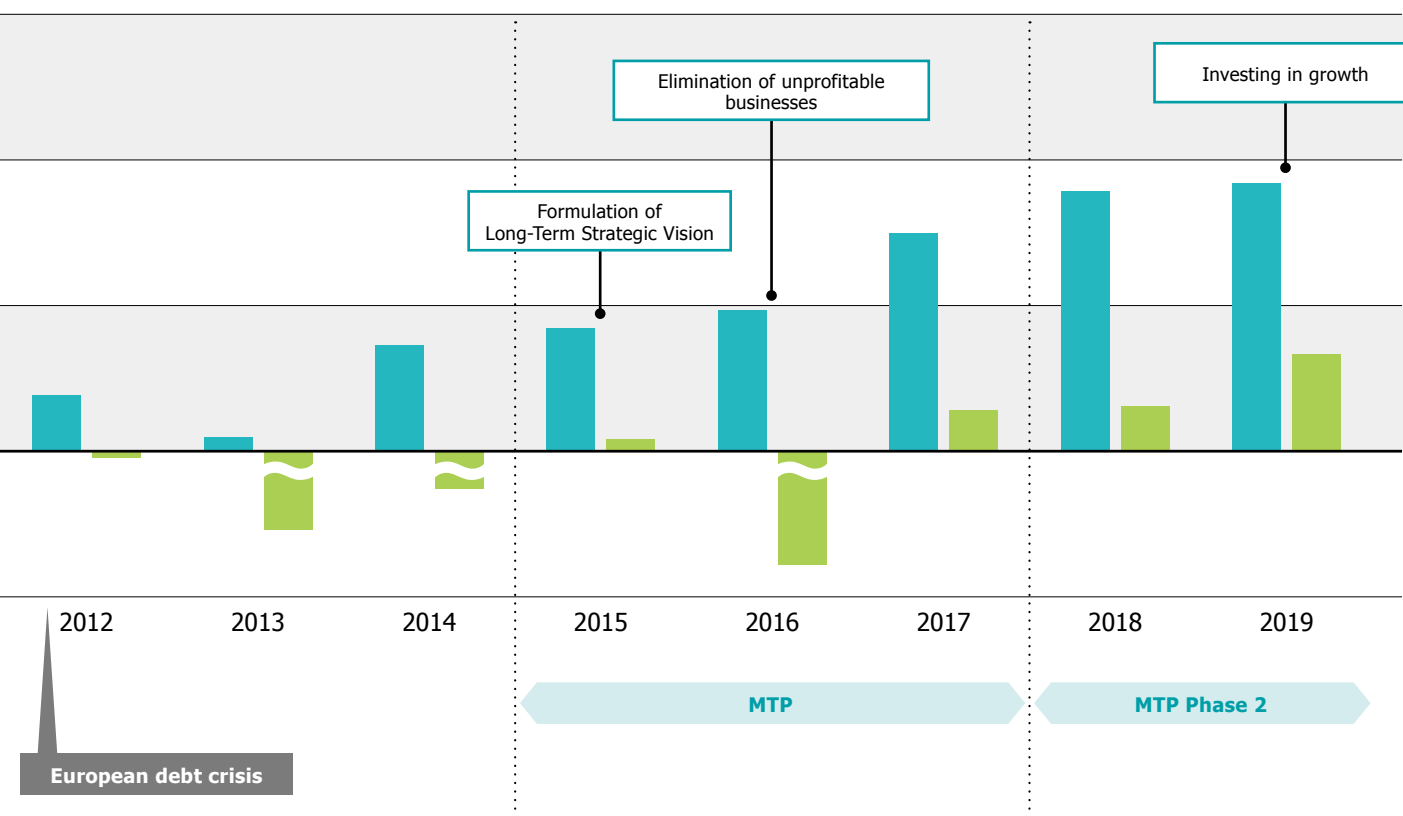
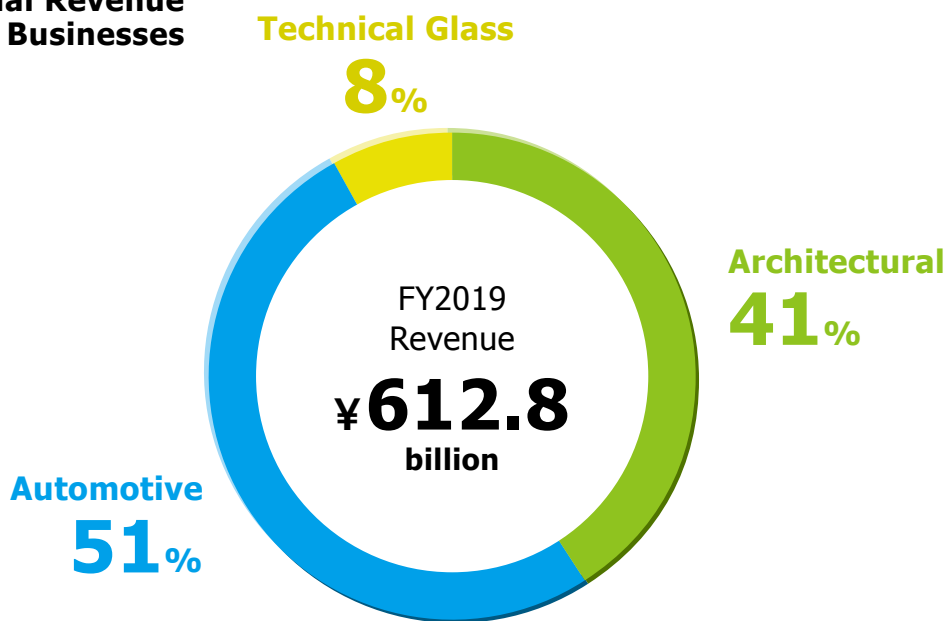
## Business Results

(unit: ¥ mn)

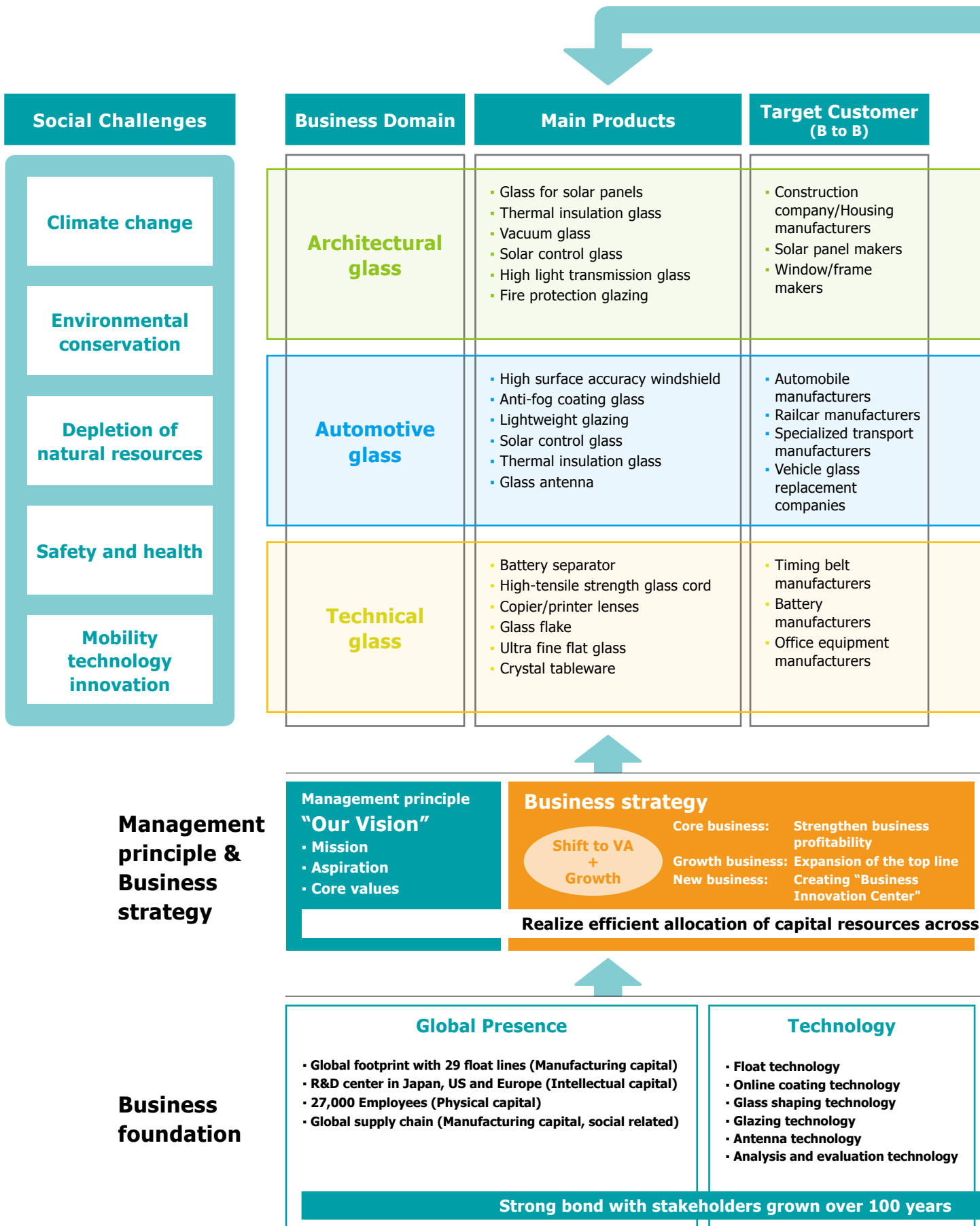


European debt crisis, we launched the Medium-Term Plan (MTP) in FY2015 with the goal of realizing a shift to Value-Added (VA) products based on the Long-Term Strategic Vision of “transforming into a VA glass company”. Since the launch of the MTP, earnings have gradually improved owing to efforts to expand VA sales, ongoing efficiency improvements, and cost-cutting measures. As a result, we chalked up six straight years of operating profit growth to FY2019.

**External Revenue Group Businesses**



# VALUE CREATION PROCESS OF NSG GROUP



Re-investment

### Responsibility

<p><b>Contribute to:</b></p> <ul style="list-style-type: none"> <li>Energy saving</li> <li>Renewable energy (Photovoltaic)</li> <li>Safe, comfortable, and clean living space</li> <li>Environmental contribution through glass recycling</li> </ul>	<p>Energy use and GHG emission reduction</p>
<p><b>Contribute to:</b></p> <ul style="list-style-type: none"> <li>Energy saving</li> <li>Safe and comfortable mobile space</li> <li>Realization of mobile society</li> </ul>	<p>Employee safety</p> <p>Employee labor conditions and human rights</p> <p>Reduction in landfill waste</p>
<p><b>Contribute to:</b></p> <ul style="list-style-type: none"> <li>Energy saving</li> <li>Energy creation</li> <li>Making devices smaller and lighter</li> <li>Durability enhancement (Resource saving)</li> <li>Connected society</li> </ul>	<p>Anti-corruption and competitive behavior</p> <p>Human resources development</p>

### SDGs

SUSTAINABLE DEVELOPMENT GOALS  
17 GOALS TO TRANSFORM OUR WORLD

### Outcome

# MTP Phase2

#### Financial Performance

**Attain MTP targets**

- Establish financial sustainability
- Transform into a VA glass company

**Financial targets**

- Net debt/EBITDA ratio: 3
- ROS > 8%

**Guideline**

- Shareholders' equity ratio: 20%
- ROE: 10%
- The VA ratio of sales: > 50%
- ¥50-¥60 billion in trading profit

### Sustainability strategy

**Sustainability Policy** Identifying and addressing material issues for NSG Group and stakeholders

the global business structure

### Core Values

- Respect others and unleash their potential
- Exemplify trust and integrity
- Ensure efforts to serve society
- Take the initiative
- Embrace challenges and learn from failure
- Follow through to get results

### Corporate Governance

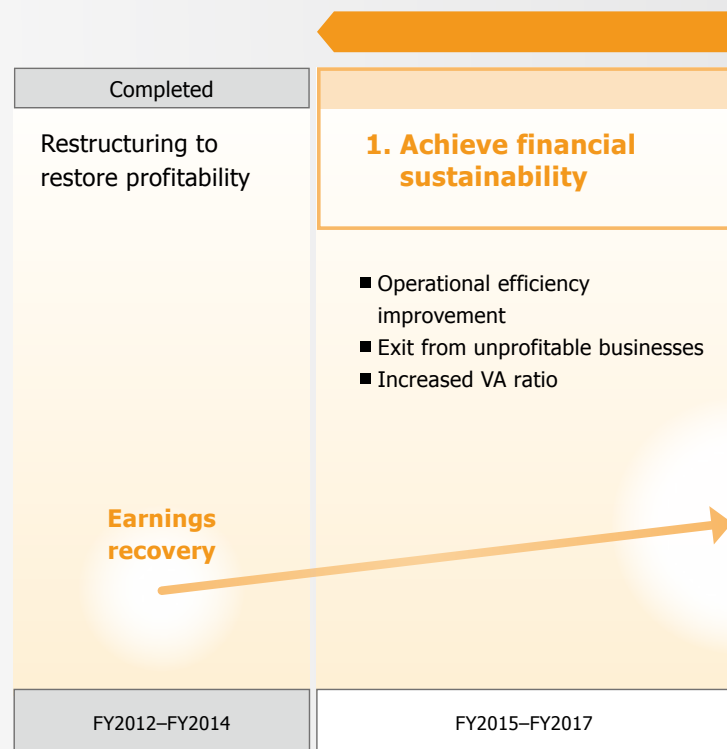
( Company with a committee governance structure, separation of execution and management, and oversight by mostly independent external directors, Corporate Governance Guidelines)

## Strategy

### Currently executing MTP Phase 2 to achieve the Long-Term Strategic Vision of “transforming into a VA Glass Company”

NSG Group is currently executing Phase 2 of the Medium-Term Plan (MTP), which will end in FY2020 with the goal of achieving the Long-Term Strategic Vision of “transforming into a VA Glass company”. Key targets of the MTP are to achieve financial sustainability and start the transformation into a VA glass company.

The targets announced in the FY2020 forecast are not expected to be fully achieved. Key targets of MTP Phase 2 (achieving financial sustainability and starting the transformation into a VA Glass Company) are unchanged and we will continue to do what is required to transform our business structure under the policy of “Shift to VA + Growth”.



## Sustainability

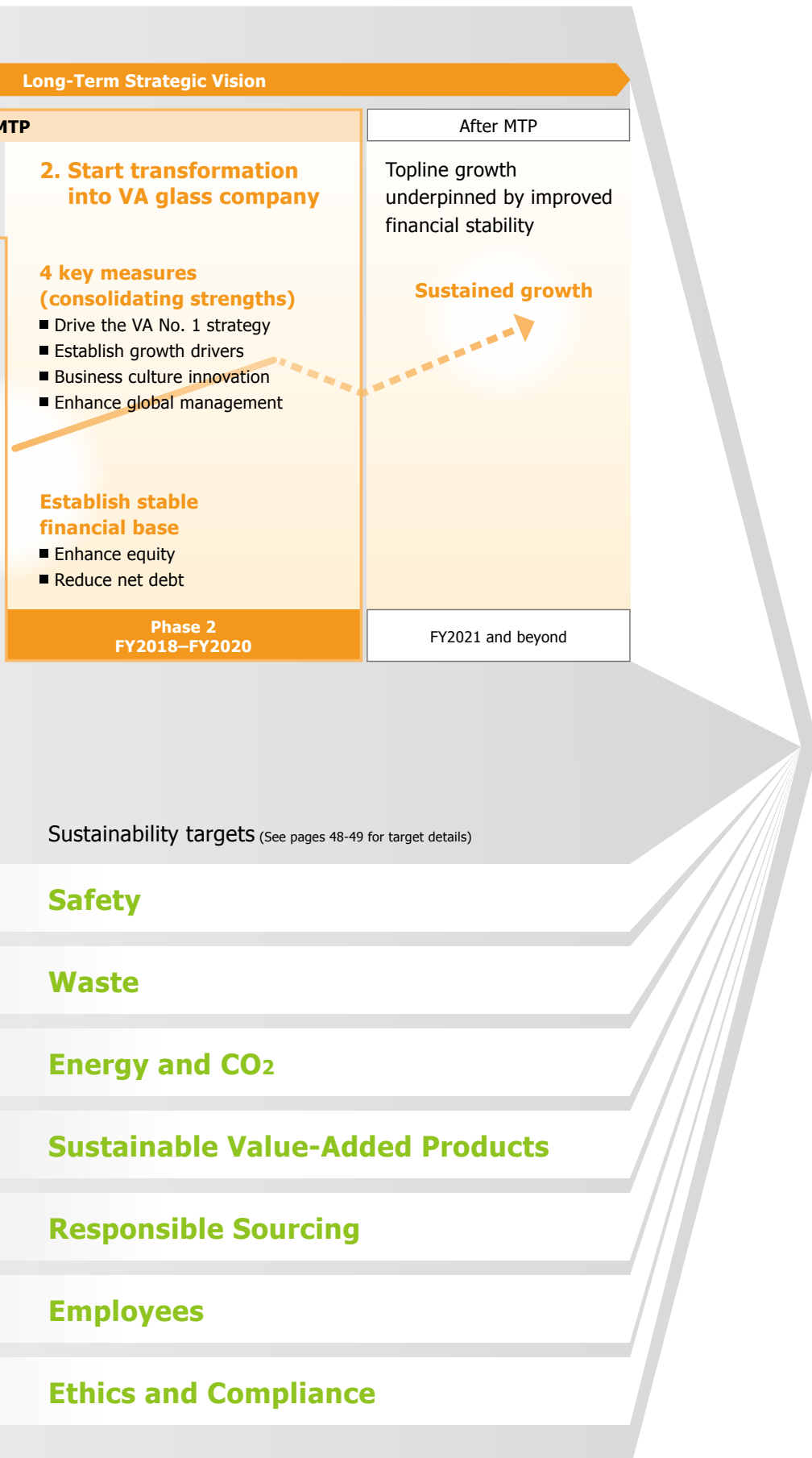
### Building a favorable relationship with key stakeholders, including shareholders, investors, customers, employees, suppliers and local communities, is critical to our sustainable business activities.

The ongoing efforts to realize sustainability are integral to reducing costs and expanding market opportunities. At NSG Group, sustainability targets are set by the Sustainability Committee which determines the material issues based on the input by key stakeholders and the impact of corporate activities on the economy, environment and society. By achieving the sustainability targets, the Group aims to build a favorable relationship with key stakeholders, including shareholders, investors, customers, employees, suppliers and local communities.

Key Stakeholders







# VA Glass Company

Less susceptible to economic cycles

More profitable

VA = Value-Added

# PROGRESS ON KEY MEASURES

# 1

## Drive VA No. 1 Strategy

—Achieving competitive advantages with focus on growth areas and technology

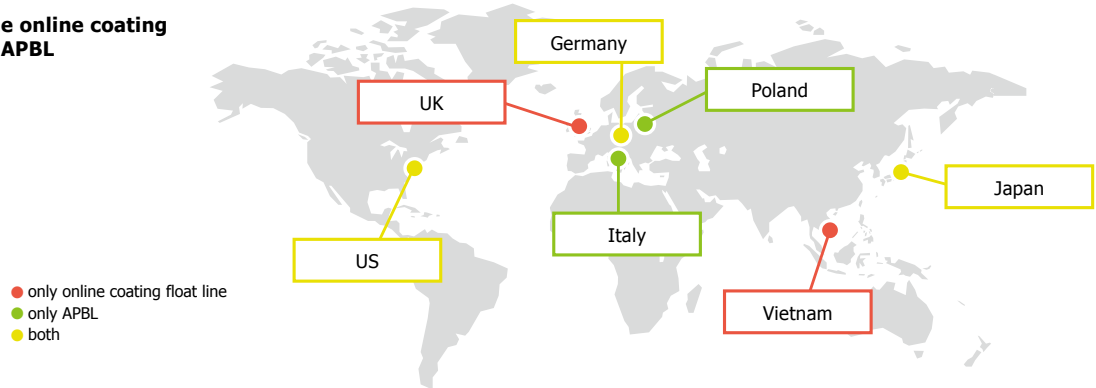
NSG Group is focused on the production of VA products by developing a wide range of proprietary technologies. The online coating process for depositing a transparent conductive oxide (TCO) on the surface of high-temperature glass during or immediately after fabrication is well-suited to volume production of highly durable TCO glass used in solar panels and other applications.

The high-precision press method for automotive glass not only expands the possibilities of design when molding complex

shapes such as windshields, but also contributes to the manufacturing of high surface accuracy glass required for use with driver-assistance systems such as Head-Up Displays or collision-avoidance cameras.

NSG Group is also building a VA No.1 position in various other fields; For example, with Optiwhite™, a highly transparent new composition glass, and in the domain of technical glass used in precision equipment.

### Locations of the online coating float lines and APBL



# 2

## Establish Growth Drivers

### Smart windows to improve energy efficiency in buildings

In the US, more and more office buildings and airport terminals are installing smart windows that employ electrochromic materials to control the tint and opacity of glass when an electric current is applied. Smart windows help conserve energy use and improve indoor environments without the use of blinds by automatically adjusting the contrast of the glass based on the amount of sunlight.



The Boston Logan Airport installation, Electrochromic windows by View, Inc. with NSG Group TEC™ glass

### Creating renewable energy with BIPVs

NSG Group agreed to jointly develop architectural window glass capable of generating solar power by harnessing the ClearView Power™ technology of US-based Ubiquitous Energy, a leader in transparent solar power technology. The company's coating technology allows renewable energy to be generated from Building-Integrated Photovoltaics (BIPVs).



Pilkington Sunplus™ BIPV Vision

### Sales launch of PicoGene® PCR1100

The PicoGene® PCR1100 is a portable gene testing device that can be used anywhere, not just in the lab. It was developed for the purpose of enabling convenient and fast on-site primary screening of pathogenic bacteria in food, such as E. coli or the norovirus.



PicoGene® PCR1100

# 3

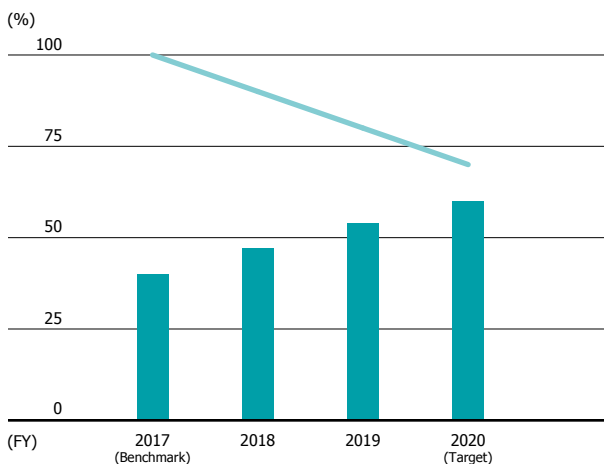
## Business Culture Innovation

—Improving productivity of automotive glass processes by enhancing manufacturing excellence

Finding ways to enhance manufacturing excellence forms part of NSG Group’s business culture innovation. One example of this is how we enhanced production efficiency by drastically reducing inefficiencies at our automotive glass manufacturing sites and improving the ratio of Value-Added activities performed by all workers. We have improved in both indicators that measure efficiency: VAA\*<sup>1</sup> is the percentage of a person’s Value-Added work hours and MMP\*<sup>2</sup> is the number of person-hours required to produce one piece of glass.



■ Glass production efficiency indicators



\*1 The percentage of working hours accounted for by Value-Added labor. Calculated as Value-Added Operation divided by total work time. A higher value indicates greater efficiency.  
 \*2 The time required to produce one piece of glass. Calculated as total person-hours divided by number of sheets manufactured. A lower value indicates greater efficiency. The FY2017 data serves as the benchmark (100) in the index graph.

# 4

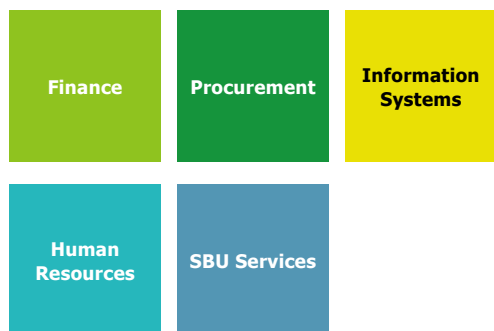
## Enhance Global Management

—Four shared service centers around the world consolidate our global business processing

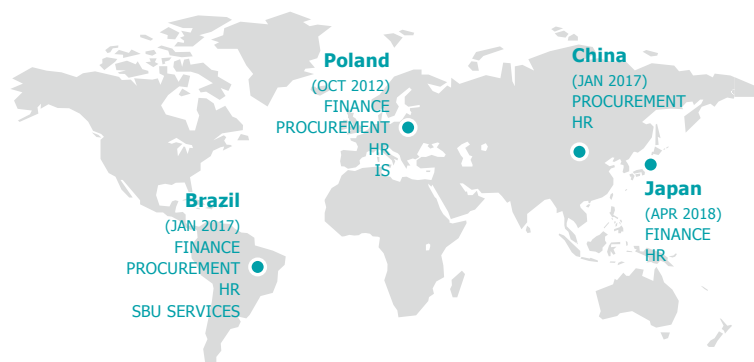
We have established shared service centers in Poland, Japan, China and Brazil for the purpose of streamlining business processing and other operations at our main manufacturing sites located in roughly 30 countries. The shared service

centers contribute to more efficient operations by delivering accounting, procurement, information systems, personnel, and strategic business unit services, at each site.

■ Group Shared Services



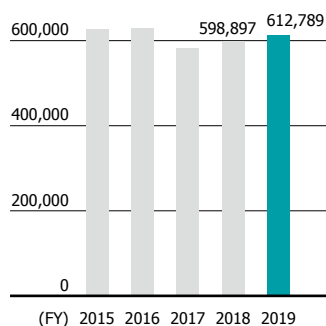
■ Where We Are



# FINANCIAL HIGHLIGHTS

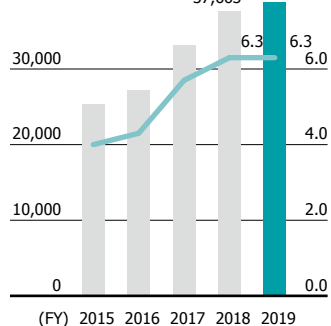
## Revenue

(Millions of Yen)  
800,000



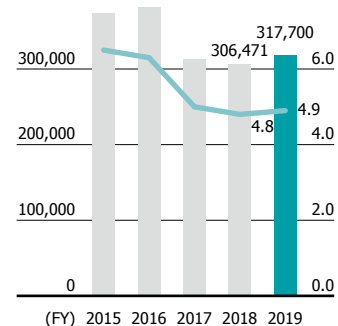
## Trading profit\*1 Return on sales\*2

(Millions of Yen) 40,000 (%)



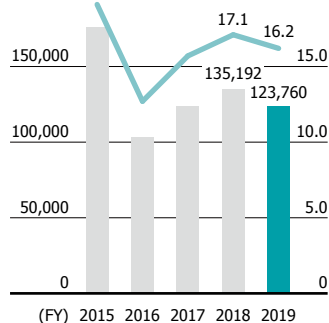
## Net debt Net debt / EBITDA

(Millions of Yen) 400,000 (Times) 8.0



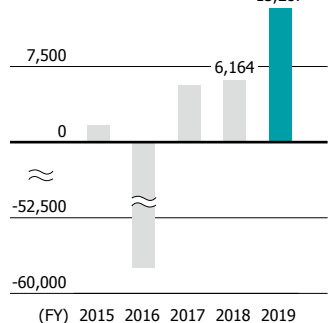
## Shareholders' equity Shareholders' equity ratio

(Millions of Yen) 200,000 (%) 20.0



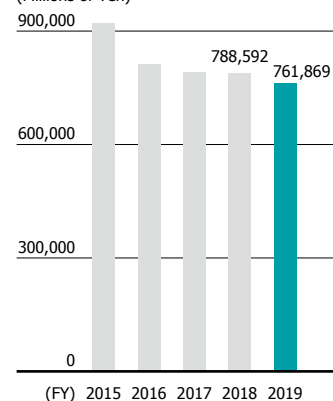
## Profit attributable to owners of the parent

(Millions of Yen) 15,000



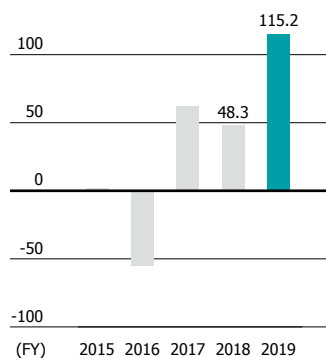
## Total assets

(Millions of Yen)



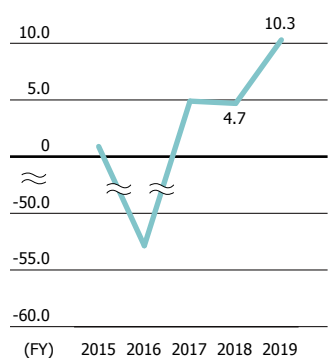
## Earnings per share\*3

(Yen) 150



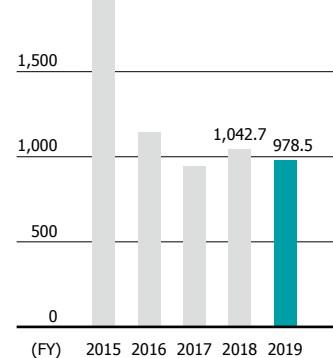
## Return on equity

(%) 15.0



## Book value per share\*3

(Yen) 2,000



\*1 Operating profit before the amortization of intangible assets arising on the acquisition of Pilkington plc

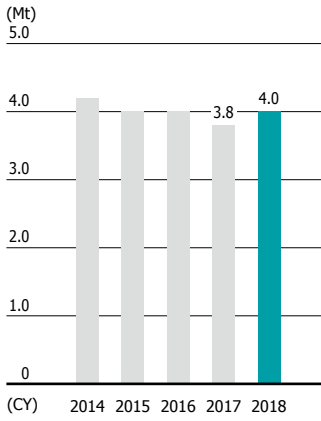
\*2 Trading profit

\*3 Effective October 1, 2016, the Company conducted a share consolidation in which every ten common shares were consolidated into one share. The per-share data has been adjusted retrospectively to reflect the share consolidation for all periods presented.

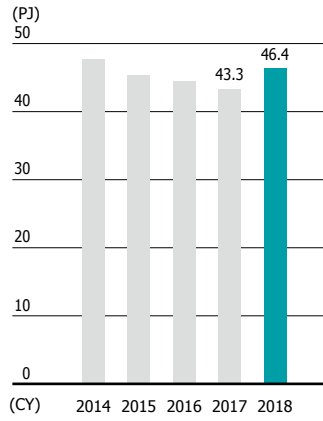
The data for FY2018 and past years are restated as a result of adopting IFRS 15 'Revenue from Contracts with Customers.'

# NON-FINANCIAL HIGHLIGHTS

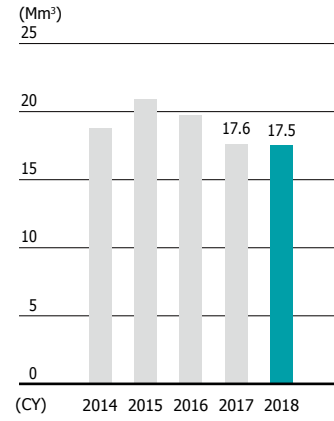
## CO<sub>2</sub> emissions



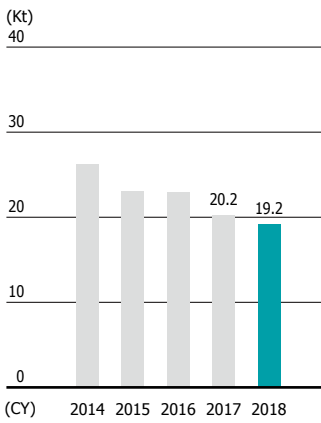
## Energy usage



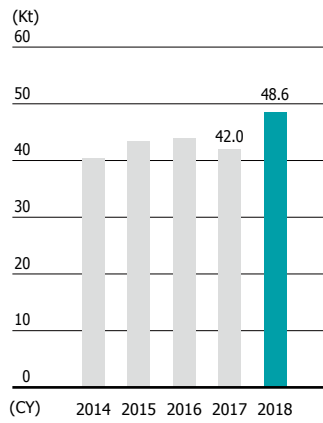
## Water usage



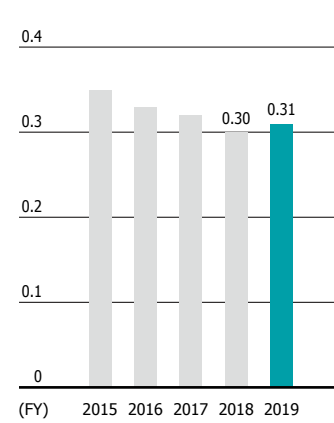
## Operational waste to landfill\*<sup>4</sup>



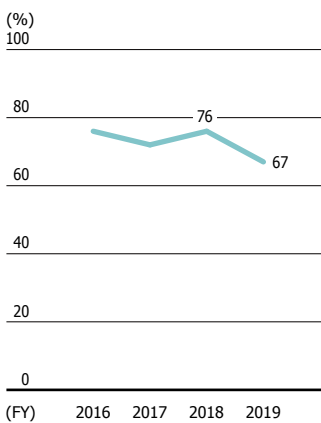
## Recycling (not glass)



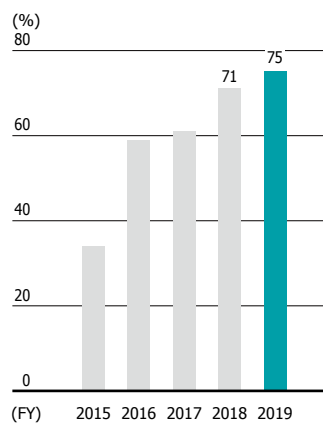
## Significant injury rate (SIR)



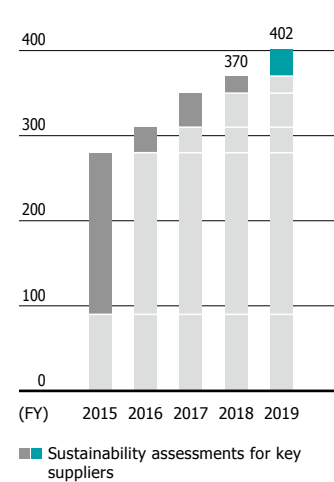
## Employee engagement



## SCoC\*<sup>5</sup> acceptance rate



## Supplier sustainable assessment



\*<sup>4</sup> Indicates total amount of glass and non-glass landfill waste  
 \*<sup>5</sup> Supplier Code of Conduct

# CEO MESSAGE



## Shigeki Mori

Representative Executive Officer,  
President and CEO, NSG Group

With “Our Vision”, the new management principle of NSG Group, we will aim at the realization of a sustainable society through a variety of Value-Added (VA) products to reduce the impact of climate change and improve safety and comfort.

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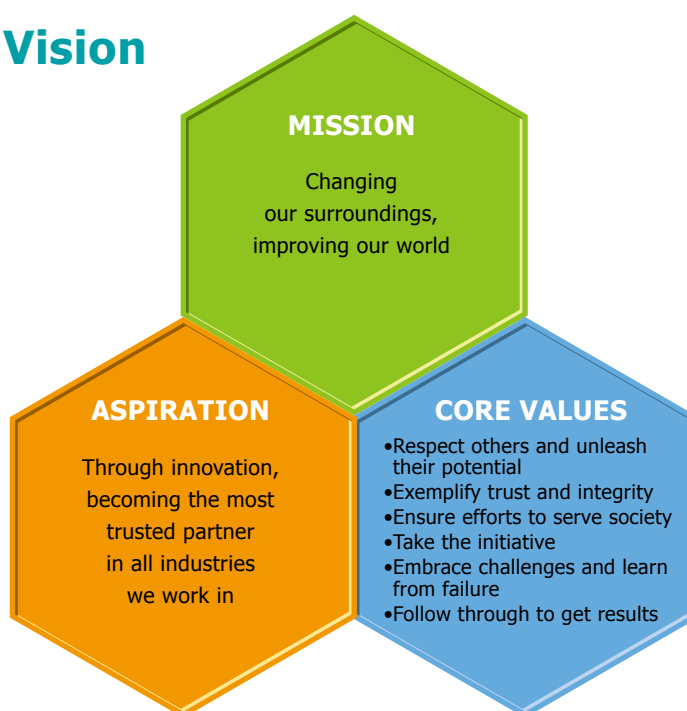
### About: “Our Vision”

Announced at the 100<sup>th</sup> anniversary of NSG Group in November 2018, “Our Vision” comprises: Mission, “Changing our surroundings, improving our world”; Aspiration, “Through innovation, becoming the most trusted partner in all industries we work in” and Core Values, “Respect others and unleash their potential; Exemplify trust and integrity;

Ensure efforts to serve society; Take the initiative; Embrace challenges and learn from failure and Follow through to get results”.

With “Our Vision”, we are striving to improve our surroundings by creating new value with glass to meet the growing needs of our customers and society.

## Our Vision



### Medium-Term Plan (MTP) Phase 2

Based on the Group's Long-Term Strategic Vision to transform NSG Group into a VA Glass Company, we are currently executing the Medium-Term Plan (MTP) Phase 2 over a period of FY2018 through FY2020. The objectives of MTP Phase 2 are to achieve financial sustainability and start the transformation into a VA Glass Company. The two financial targets are net financial debt / EBITDA of 3X and operating return on sales (ROS) of greater than 8 percent. We also envision a return on equity (ROE) of greater than 10 percent and a shareholders' equity ratio of around 20 percent when the financial targets are achieved.

\*Note: Calculated based on trading profit.

The actions under MTP Phase 2 consist of growth measures and financial measures. The growth measures include the following four actions.

1. Drive VA No.1 Strategy to aim for a leading market position in "high growth potential areas where the Group has core strengths".
  2. Establish growth drivers by focusing resources selectively.
  3. Promote business culture innovation for building a lean business structure.
  4. Enhance global management to optimize the Group's operations and advance global management effectiveness.
- The financial measures have been implemented to enhance equity and reduce net debt.

The financial measures include the enhancement of capital and reduction of net debt.

### FY2019 Earnings and Progress of MTP Phase 2

Although the Group's performance in FY2019 was affected by higher energy costs, weaker South American currencies and weakening of the automotive market in Europe, in the second half, both revenue and profits increased year on year in an overall robust market environment, particularly in Europe, with a higher VA sales ratio. Revenues improved to ¥612.8 billion (up 2.3 percent from FY2018) and trading

profit to ¥38.8 billion (up 3.4 percent from FY2018). The profit attributable to owners of the parent company was ¥13.3 billion (up 115.6 percent from FY2018). Trading profit grew for the sixth straight year, while the profit attributable to the owners of the parent company remained in the black and there has been an overall profit increase for the last three years.

### Drive VA No.1 Strategy

- Win leading position in those areas with “high growth potential” and “core strength”
- How:
  - Focus resources on VA shift in the areas where NSG Group technology and brand have the biggest advantage
  - Enhance customer relationships, build strategic alliances

### Establish Growth Drivers

- Launch multiple, promising growth drivers
- Target areas:
  - Architectural Glass (energy saving/generation, health, design)
  - Automotive Glass (ADAS, connected, UV/IR shield, light weight)
  - Technical Glass (new products/applications with proprietary technology)

## VA Glass Company

### Business Culture Innovation

- Build leaner business structure
- How:
  - Optimize all work processes
  - Enhance manufacturing excellence in each region
  - Optimize global R&D with customer viewpoints
  - Strengthen customer-oriented marketing

### Enhance Global Management

- Advance global management to achieve the Group’s optimization
- How:
  - Drive talent development, promote diversity
  - Enhance faster decision-making with flexible organization management
  - Continue to reduce cost across the Group

Free cash flow decreased from the previous fiscal year to ¥0.9 billion, partly due to an increase in working capital.

In FY2019, the second year of MTP Phase 2, the actions for achieving targets were accelerated with the policy of “Shift to VA + Growth”. The sales ratio of VA products increased to 46 percent, contributing to the improvement in operating profit. With a view to further growth, we are expanding the production capacity of glass for solar panels in Vietnam and North America and building a new float glass line in Argentina, to supply emerging markets in South America. To accelerate the initiatives for developing new businesses and generating new customer value, we launched our Business Innovation Center (BIC) in July 2018. BIC is focused on the development of new businesses in the promising fields of life science and Industry 4.0.

In light of the improved progress in transitioning to a financial structure capable of generating stable profits and cash flow, the year-end dividend (DPS ¥20 for ordinary shares) was distributed in FY2018 — the first dividend payment since FY2012. With the policy to secure dividend

payments based on sustainable business results, a year-end dividend for FY2019 (DPS ¥20 for ordinary shares) was also paid.

In FY2019, Class A shares worth ¥5.0 billion were redeemed in December 2018. We will continue to redeem Class A shares while maintaining financial stability by balancing generated profits and cash flow with the demand for funds for investment projects. Accordingly, the additional ¥5.0 billion of Class A shares were redeemed in June 2019.

We will maintain the basic policy on dividends even after all Class A shares have been redeemed in the future and endeavor to continuously pay dividends in targeting a consolidated dividend payout ratio of 30 percent.

Good progress was made on implementing the growth initiatives of MTP Phase 2. In the area of “VA No. 1 Strategy”, we have further improved our advantageous position in online coating products for architectural glass, while orders for VA automotive glass continued to increase. In establishing growth drivers, we are accelerating the commercialization of new businesses by managing promising



development themes as “Star Projects”. In the area of business culture innovation, productivity was improved in the manufacturing of automotive glass by enhancing manufacturing excellence, and “customer-first” thinking was expanded beyond our sales divisions with the reinforcement of marketing. To enhance global management, shared service centers were set up in four global locations to consolidate administrative functions. Based on our statement on Inclusion and Diversity, we continue to promote greater diversity and participation in our workforce.

Progress towards our FY2020 targets during MTP Phase 2 is as follows.

<b>FY2019 ROS</b>
of 6.3 percent (versus target of at least 8 percent)
<b>FY2019 net debt/EBITDA ratio</b>
of 4.9 (versus target of 3.0)

\*Note: FY2019 ROE was 10.3 percent and shareholders’ equity ratio 16.2 percent

## FY2020 Outlook and Issues to be Addressed

Through FY2019, we achieved a trading profit growth for the sixth straight year and kept the profit attributable to owners of the parent company in the black for the third consecutive year with a greater sales ratio of VA products, ongoing improvements in capacity utilization and cost reductions. However, we do not expect to achieve the financial targets (ROS and net debt/EBITDA ratio) we set for FY2020, the final year of MTP Phase 2, mainly because of increasing energy and other input costs, delays in launching new products, delays in VA shift in some markets, and frontloaded investments for future growth.

The targets of MTP Phase 2 to achieve financial sustainability and start the transformation into a VA glass company still remain valid. In FY2020 we will continue to do

what is required to transform our business structure under the policy of “Shift to VA + Growth”.

I believe the Group must address the following two issues: (1) Transform the business structure into one that can flexibly respond to market changes and steadily generate profits, even in the midst of economic uncertainties and instabilities; and (2) Establish a robust earnings platform to realize sustained growth. To this end, we are steadily executing the four key measures of MTP Phase 2 (Drive VA No. 1 strategy, Establish growth drivers, Business culture innovation, and Enhance global management) and pushing ahead with the transformation from a commodity/mass-volume business model to one that is centered on high value (transformation into a VA glass company).





We will also carry out strategies to deliver sustained growth. The potential applications of glass are almost infinite — in addition to the traditional functionalities of light, heat, sound transmission and control, glass can now be used to relay information through displays, sensors and optical communications.

In the architectural market, we are expected to increase our growth in the construction of Zero-Energy Buildings (ZEBs). The amount of energy used by a ZEB is roughly equal to the amount it generates. We hope to expand sales of our energy-saving glass and glass substrates for solar panels used in ZEBs. We also see new business opportunities in the growing uptake of IoT (Internet of Things) and AI-based “smart” windows. In the automotive sector, CASE (Connected, Autonomous, Shared, Electric) is taking the

industry by storm and we are looking to expand sales of our sophisticated VA glass products to meet the respective needs of these four disciplines. In the area of Technical Glass, sales of separators used for ISS batteries, hybrid cords for engine timing belts, and Metashine™ products are growing. And through our newly established Business Innovation Center, we have plans to make forays into the domains of life science, IoT/cloud services, energy conversion, and Industry 4.0.

Also, the Strategic Risk Committee was established last year and its new Chief Risk Officer will complement the existing bottom-up approach to risk management and deepen our discussions about how to address risks on a corporate level.

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### Initiatives for realizing a society with Sustainable Growth

Under the Group’s new management principles “Our Vision”, we have embraced the Mission of “Changing our surroundings, improving our world”. We are actively implementing initiatives aimed at realizing sustainable growth for society. As a signatory to the United Nations Global Compact, we support all of its principles and actively contribute to its Sustainable Development Goals.

In 2016, we identified the material issues and incorporated them into our sustainability goals. Our decisions were based on

the considerable impacts that our Group activities have on the economy, the environment and society, as well as the opinions we receive from stakeholders over the course of the year. Of the items of materiality, reducing greenhouse gas (GHG) emissions (CO<sub>2</sub>) is the environment-related initiative of greatest concern to stakeholders and of most importance to our business operations.

By supplying VA products — one of our growth strategies — we can contribute to both energy conservation and

generation, and at the same time, play a part in the reduction of GHG emissions. Meanwhile, we are actively working to reduce CO<sub>2</sub> emitted by our glass manufacturing processes. In July 2018, the Group became a signatory to the Science-Based Targets initiative (SBTi), which we expect will further accelerate the pace of our strategies for reducing GHG emissions.

We will also continue to train and develop our people. Based on the recognition that “the key to our business is the power created by our diverse human resources”, the Group’s management is committed to promoting Inclusion and Diversity. We also strive to fulfill our social mission and responsibility as a good corporate citizen by ensuring that our employees understand the NSG Group Code of Ethics and implementing our Supplier Code of Conduct compliance assurance program.

I believe the key to leveraging our Group’s strengths hinges on every employee having an equal understanding of our policies and issues, which is why every year I visit our offices around the world to engage in two-way

communication with employees. I also regularly post messages on our intranet site to convey my own thoughts to all Group employees and keep them updated on things happening within the Group.

We continue to work hard towards contributing to the realization of a sustainable society by pursuing effective governance with transparency and objectivity ensured under the oversight of the Board of Directors. In light of the amendments made to Japan’s Corporate Governance Code in July 2018, the Group is taking steps to establish more effective corporate governance with the aim of enhancing corporate value.

As a result of our initiatives, NSG Group acquired the highest “Gold” rating for the first time in 2018 from France-based CSR rating agency EcoVadis. The Group was ranked in the top 7 percent in the glass industry thanks to favorable assessments in the categories of environment, labor practices & human rights, fair business practices, and sustainable procurement.



## Final remarks

In November 2018, NSG Group celebrated its 100<sup>th</sup> anniversary. A century of continuous operation was made possible by the support of all our stakeholders and the fruits of our ongoing efforts as a socially responsible company to realize a sustainable society.

Currently, we are developing the business strategy after MTP Phase 2. With the management principles “Our Vision”, we are re-evaluating the material issues based on societal expectations for the realization of a sustainable society. Reflecting the reassessment, we will develop post-MTP Phase 2 strategies and action plans with a focus on the newly-defined material issues concerning the environment, safety and quality of products/services, compliance/ethics, and human capital. Financial sustainability and corporate governance remain critical for NSG Group and will underpin the abovementioned strategies and action plan going forward.

I believe that NSG Group must deliver innovative solutions in anticipation of societal changes if we are to play a role in

the realization of a sustainable society. After the completion of MTP Phase 2, shifting the Group’s business portfolio will present an important challenge as we manage various social challenges and new trends, including: environmental problems; an ageing society in developed countries; the emergence of developing countries; technological innovation; and the borderless nature of information.

We will announce the next Medium-Term Plan to all stakeholders in due course following discussion and approval by the Board of Directors.

I firmly believe that the continued development of our activities will not only contribute to a sustainable society but also drive the growth of NSG Group. I look forward to the continued support and understanding of all our stakeholders.



**Kenichi Morooka**

Representative Executive Officer  
Executive Vice President and CFO

## Stabilizing our financial base and stepping up strategic investments aimed at future growth

### FY2019 Review and Outlook for FY2020

The automotive glass markets of Europe and North America slowed in the second half of the fiscal year ending March 31, 2019, but remained stable in other regions. Other business markets were also stable, and we managed to boost sales volume and increase sales prices in some regions. As a result, revenue was up 2 percent year on year to ¥612.8 billion, or up 6 percent if stripping out the impact of forex. Trading profit before exceptional items and amortization relating to the acquisition of Pilkington plc grew 3 percent year on year to ¥38.8 billion, the sixth straight year of profit growth. In addition, profit attributable to owners of the parent improved by a healthy ¥7.1 billion to reach ¥13.3 billion and ROE came to 10.3 percent thanks to financial cost-cutting benefits, solid earnings at Cembrace (Brazil), and the dropout of one-off tax expenses booked in FY2018.

Despite the considerable improvement in net profit and higher asset values, owing to the application of hyperinflationary accounting in Argentina, total equity decreased ¥11.2 billion to ¥132.5 billion. Accordingly, the shareholders' equity ratio dipped slightly year on year to 16.2 percent.

Net debt rose ¥11.2 billion to ¥317.7 billion, mainly reflecting an increase in working capital. The Group also held unused credit lines of ¥74.6 billion at the end of

FY2019. Free cash flow held steady at +¥900 million, mainly as a result of operating profit falling short of our initial plan and the increase in working capital. Even though we forecast tough market conditions in FY2020, we are targeting revenue of ¥620 billion (+1.2 percent YoY) on the back of higher sales of Value-Added (VA) products. We forecast a 5 percent decline in trading profit to ¥37 billion because we expect to be unable to pass-on the impact of higher fuel, raw material, and distribution costs.

#### ■ Outlook for FY2020

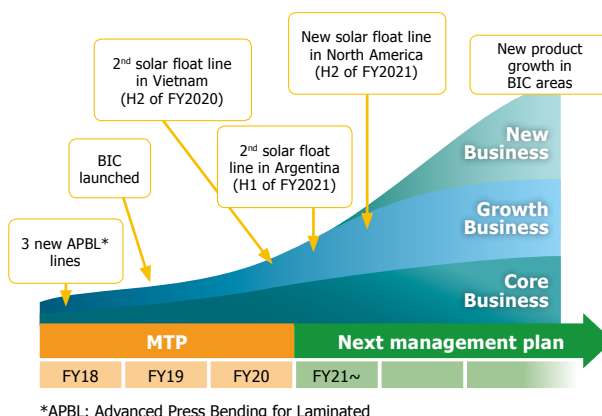
(billions of yen)

	March 31 2018 (actual)	March 31 2019 (actual)	March 31 2020 (forecast)
Revenue	598.9	612.8	620.0
Trading profit	37.7	38.8	37.0
Profit attributable to owners of the parent	6.2	13.3	11.0
Shareholders' equity ratio	17.1%	16.2%	—
ROE	4.7%	10.3%	—

## Strategic investments

In FY2019, we started to prepare for the growth phase that will follow Phase 2 of our Medium-Term Plan (MTP). We took the decision to increase production capacity for solar panel glass in Vietnam and North America and also expand capacity at our float glass plant in Argentina, an emerging South American market. These strategic investments are essential for realizing future growth and we plan to spend a further ¥60 billion in FY2020. Furthermore, we launched our Business Innovation Center with the aim of developing and nurturing new businesses in line with our policy of accelerating the commercialization of growth fields such as life sciences and Industry 4.0.

### Strategic Investments Decided for Growth



## Capital policy

The Group issued Class A shares to the tune of ¥40 billion on March 31, 2017 which drastically lowered net borrowings, improved borrowing terms in FY2017, and nearly achieved its goal of reducing financial expenses to ¥13.0 billion from ¥19.1 billion one year earlier than planned in FY2019. Moreover, in aiming to lighten the burden of paying preferred dividends on Class A shares, we acquired and cancelled 5,000 shares worth ¥5 billion in December 2018 and again in June 2019 (for a total ¥10 billion). We aim to redeem all of the remaining Class A shares (worth ¥30 billion) as soon as possible while giving due consideration to profit attributable to owners of the parent, dividends on common stock, and the Group's financial stability. We believe this will help improve per-share profit attributable to owners of the parent.

Following the resumption of FY-end common share dividends in FY2018, we paid an interim dividend of ¥10 per share in FY2019 to commemorate NSG Group's 100<sup>th</sup> anniversary and a year-end dividend of ¥20 in light of stable earnings. Accordingly, the annual DPS for common stock in FY2019 was ¥30 for a consolidated dividend payout ratio of 26 percent. In FY2020, we plan to leave the year-end dividend unchanged at ¥20. Going forward, the Group's basic policy on profit distribution is to pay steady dividends based on sustainable business earnings. We will maintain our basic policy on dividends even after all Class A shares have been redeemed in the future and endeavor to continuously pay dividends in targeting a consolidated dividend payout ratio of 30 percent.

## Medium and long-term financial strategy

FY2020 is the final year of MTP Phase 2. Regrettably, we do not expect to achieve the financial targets of ROS of at least 8 percent and a net debt-to-EBITDA ratio of 3.0. We have fallen short of our ROS target mainly because of delays in launching new products and the slow transition to VA products in some businesses. On top of this, higher-than-expected raw material costs and a failure to achieve lower costs by way of streamlining, also had an impact. The main reasons for missing the net debt-to-EBITDA ratio target include insufficient cash flow generation from profit improvement and a one-time increase in net borrowings for strategic investments executed in FY2019.

The financial targets called for in our MTP are still appropriate for the direction in which the Group is headed and our policy going forward will be to address the key challenge of achieving financial sustainability. From a medium and

long-term perspective, however, improvement in our financial position is not possible without growth. Even though net borrowings temporarily increase when we make strategic investments, we have no plans to ease up on implementing our initiatives in aiming to realize future financial improvements. We will continue to stick to our plan while striking the right balance between stabilizing our financial base and executing strategic investments necessary for growth.

In addition to securing returns from strategic investment projects, we will work towards achieving a lasting cycle of financial improvement by enhancing our ability to generate cash by further lowering our cost base with a higher sales weighting for VA products and more efficient manufacturing. We hope to build momentum for renewed growth from as early as FY2021 when our strategic investments begin to contribute to earnings.

# BUSINESS OVERVIEW

**“Changing our surroundings, improving our world”  
— NSG Group’s mission is the foundation of our efforts to achieve the objectives of MTP (Medium-Term Plan) Phase 2 with the expanded offering of VA products and services.**



**Clemens Miller**  
Representative Executive Officer  
Executive Vice President and COO

## Domain

### Architectural

A leader in architectural glazing and glass for solar energy products



The Boston Logan Airport installation, Electrochromic windows by View, Inc. with NSG Group TEC™ glass

### Automotive

Leading supplier of glass to original equipment (OE) and automotive glass replacement (AGR) market



Photo by Jaguar Land Rover

### Technical Glass

Leading player in thin glass for displays, lenses and light guides for printers, glass cord for timing belts and separators for batteries



### Other

Small-scale businesses not included in the above segments

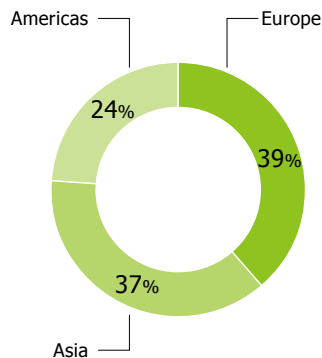
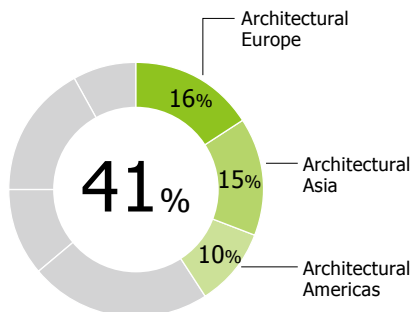


**Main Products**

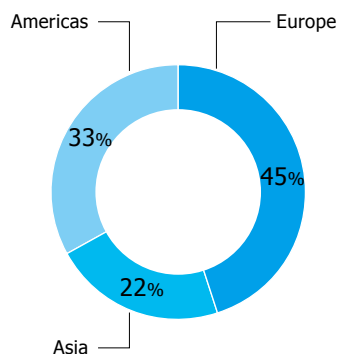
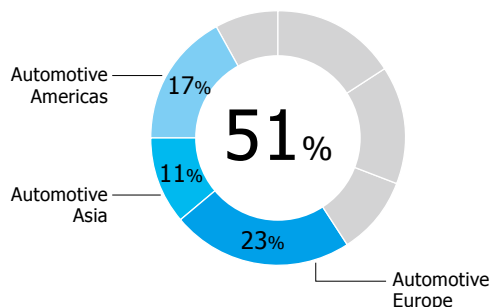
**External Revenue**  
(Contribution to Group revenue)

**Revenues by Region and by Sector** (FY2019)

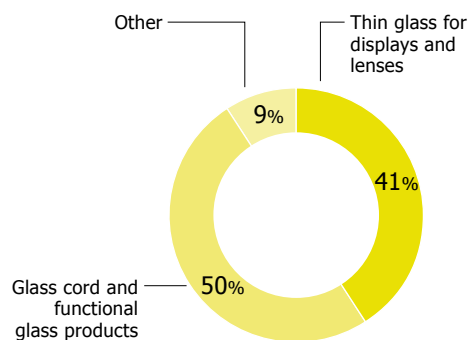
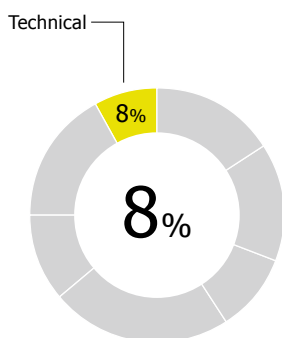
- Glass for solar panels
- Thermal insulation glass
- Vacuum glass
- Solar control glass
- High light transmission glass
- Fire protection glazing



- High surface accuracy windshield
- Anti-fog coating glass
- Lightweight glazing
- Solar control glass
- Thermal insulation glass
- Glass antenna



- Battery separator
- High intensity glass cord for timing belts
- Copier/printer lenses
- Glass flake
- Ultra fine flat glass
- Crystal tableware



Less than  
**1%**

# ARCHITECTURAL



The Boston Logan Airport installation, Electrochromic windows by View, Inc. with NSG Group TEC™ glass



**Through its leading glass technology, Architectural Glass SBU provides a range of glass products for various applications, such as glass for solar power, that improves the energy efficiency of buildings throughout the world.**

## Jochen Settelmayer

Senior Executive Officer  
Head of Architectural Glass SBU

## Business Results

Architectural Glass revenue was up 4 percent from the previous year to ¥247.3 billion. Due to increased input costs and the impact of weak South American currencies, profit was down ¥0.5 billion to ¥25.8 billion.

In Europe, robust demand, higher volume and favorable pricing lifted revenues. Profit increase was small, however, due to increased energy costs and the effect of a float repair in Germany.

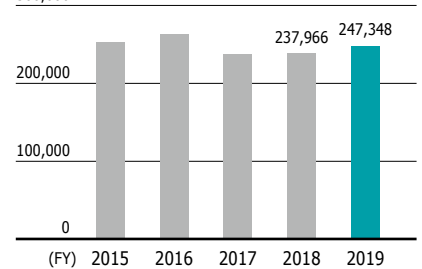
In Asia, while affected by increased input costs, the performance in Japan improved due to higher volume, product mix and pricing, despite a sluggish market. In South East Asia, increased demand for solar glass contributed to profit, although it was offset by higher input costs.

In North America, revenues improved with robust market demand and the restarted operation at the Ottawa Plant in the US. South American markets remained strong, resulting in higher revenues and profits. Due to the weak currency and hyperinflationary accounting adjustments, however, revenues and profits from South America declined after conversion to Japanese yen.

The trading profit for Architectural Glass overall was down slightly from the previous year. Despite higher input costs and weak Argentinian Peso, the business still achieved a double-digit ROS in FY19, reflecting underlying strength of the business, favorable market conditions and cost-reduction efforts.

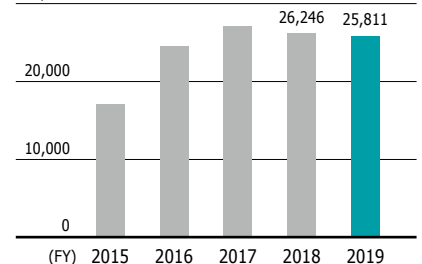
### Revenue

(Millions of Yen)  
300,000



### Trading profit

(Millions of Yen)  
30,000





## Business Environment

### By region

Construction markets in all regions developed positively. Customer demands were strong in North America and Europe, though Japan remained rather weak. The business performance in South America and South East Asia was positive.

### By application

Architectural Glass technology provides a platform for solar energy in various applications, to generate or save energy in buildings and to enhance technical equipment.

### Glass for solar panels

Solar panels offer alternative solutions for a range of energy requirements, from small scale domestic applications to large

scale solar power stations. Glass is an integral and important element of these solar panels and a wide range of NSG Group products is used in the leading solar technologies.

### Energy Saving Glass for Buildings

NSG Group works closely with governments and authorities on framing building standards. Energy issues are crucial to the building glass industry, as glass products can make an important contribution to combating climate change.

### Technical Equipment

NSG Group continues to develop new market opportunities outside traditional glass applications. The focus on "technical equipment", such as digital signage, white goods and touchscreens, provides consumers with added-value.

## Strategy

### Being a regional business

The Architectural Glass business is regional by nature. It is about providing the regional markets with leading glass products – exterior or interior – for the entire building world. Because of the regional orientation of the business and multiple manufacturing processes, the competitive advantages vary from one region to another.

### Focusing on customers and adding value

Over the years, the Architectural business has shifted to a customer-first approach to provide more Value-Added (VA) products. In Q4 FY19, for the first time ever, Architectural

Glass achieved a VA share of 50 percent worldwide. With its advanced products, NSG Group strives to help customers become more competitive.

### Supporting leading edge technologies

Internet of things (IoT) enables an intensive data exchange and real-time communication. The above-mentioned "technical equipment" provides an expanded platform for information and user-friendly surfaces. Many devices and technical applications use on-line coated, electrically conductive or low-reflective glass for leading technology and service to end users.

## Value-Added Products

### Pilkington MirroView™

Pilkington MirroView™ is an innovative semi-transparent video and digital display glass for low light applications. It gives digital displays, including television and video screens, a clean, modern, transitional look. It is ideal for concealing video, touch and digital displays screens for commercial and residential applications. It can be used as a traditional mirror with a small video screen concealed beneath. When the screen is turned 'off' the product maintains a mirrored appearance. When the screen is turned 'on', the picture on the video screen shows through. Pilkington MirroView™ is compatible with all touch screen technologies, making it ideal for smart mirrors. It is very durable and can be easily handled, cleaned, transported and processed. Due to its pyrolytic coating, it does not degrade over time, giving the product a virtually unlimited shelf-life and it allows applications even in a humid environment.



# AUTOMOTIVE



Photo by Jaguar Land Rover



**Our automotive business is one of the world's largest suppliers of automotive glass, serving the original equipment, aftermarket glass replacement, and specialized transport markets**

### Tony Fradgley

Senior Executive Officer  
Head of Automotive AGR SBU and Head of Automotive OE SBU

## Business Results

The Automotive business recorded sales of ¥314,645 million.

In the Automotive business, revenues were up one percent from the previous year to ¥314.6 billion and profits also increased to ¥15.1 billion with strong European results experienced during the earlier part of the year.

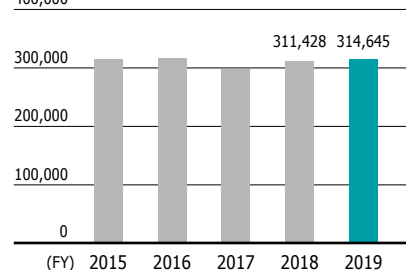
In Europe, results improved in the Group's original equipment (OE) business, although demand softened markedly from the third quarter of the year, affected by both a decline in domestic light-vehicle sales and weakening exports of luxury vehicles. Results also improved in the Automotive Glass Replacement (AGR) business with an increase in volumes and an improving mix of VA products from the previous year.

In Asia, revenues and profits both increased from the previous year. In Japan, light vehicle sales were similar to the previous year. The Group's OE revenues improved despite interruptions to the automotive supply chain caused by natural disasters. Results in the AGR business improved as a consequence of increased volumes.

In the Americas, revenues and profitability were both slightly higher than the previous year. In North America, the Group's OE volumes reflected a progressive weakening during the year of light-vehicle sales in the region. Profitability improved in South America, with a further recovery of volumes from the previous year in Brazil. In Argentina, the Group's automotive results were impacted by the adoption of hyperinflationary accounting.

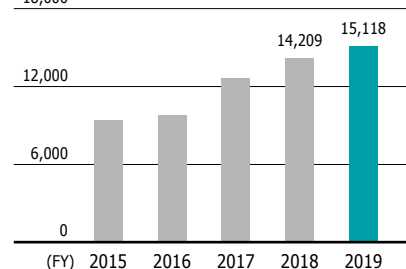
### Revenue

(Millions of Yen)



### Trading profit

(Millions of Yen)



## Business Environment

NSG Group supplies all the world's major automotive and specialized transport vehicle manufacturers. Global automotive markets have faced headwinds from slowing economic growth, trade tensions and the impacts of tightening legislation from Worldwide Harmonized Light Vehicle Test Procedure (WLTP/CO<sub>2</sub>) rules.

Markets in Europe are likely to remain subdued, reflecting generally weak consumer confidence. Japan is facing pressure on input costs while North American markets are

expected to continue the softening experienced during the latter half of FY2019. South American markets continue to benefit from improving vehicle sales in Brazil.

In the medium term, automotive markets are changing rapidly as technology is changing the way people use vehicles. Our Automotive business continues to explore new opportunities for business growth as advancements in vehicle technology make glass an integral part of protecting vehicle occupants and other road users.

## Strategy

These are exciting times for the Automotive industry. Through our VA strategy we are working closely with our customers to lead the change in vehicle and glass technology. The impact of CASE technologies (Connectivity, Automation, Shared Mobility, Electrification) are having a positive impact on the design and sustainable use of vehicles.

Glass has always been a key component in vehicle safety, and CASE advancements are extending our products to be an integral component in actively protecting occupants and pedestrians. One example is the sensors used for ADAS (Advanced Driver Assistance Systems) that require a windshield with high optical quality to ensure their accurate performance. Another is the Head-Up-Display(HUD) that

highlights critical driver information and requires the glass component to operate as part of a fully integrated system.

The Group's supply chain extends into the aftermarket where NSG Group is a global operator in the distribution and supply of automotive glazing. Aftermarket glass replacement requires customer-focused services, and our customers value our well-established distribution channels and ability to supply a full range of products and services with a fast response.

Our Automotive business will continue to offer a full range of glass solutions to our customers, who value our reliability as a supply partner, to deliver innovative technology through our global supply chain.

## Value-Added Products

### VA Products

Our segment exclusive Head-Up-Display technology is featured in the all-new 2019 GMC Sierra and 2019 Chevrolet Silverado models; the first full-size trucks to ever offer this technology. NSG Group's proprietary advanced press bending technology supports the production of complex shaped, laminated windshields with HUD, an increasingly popular option in the market.

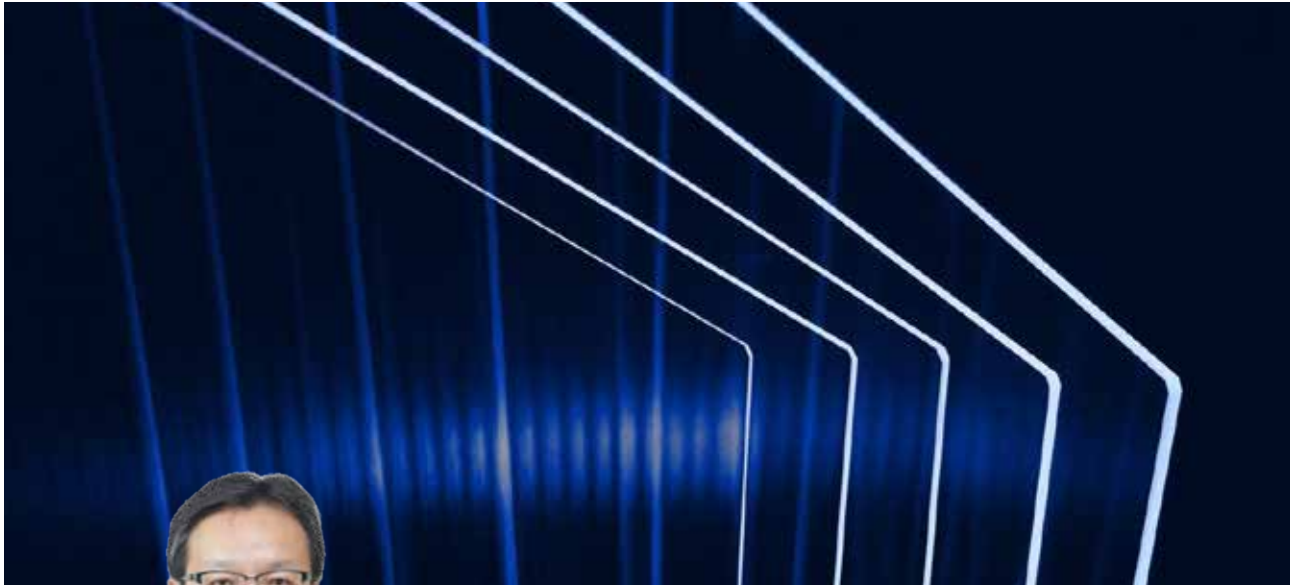


### VA Services

NSG Group has recently extended its aftermarket service network in Brazil. We are leveraging our position to further grow the network, successfully opening 25 new outlets in FY19, improving our proximity to the final consumer, raising the quality and safety standards of the industry and embracing Inclusion and Diversity.



# TECHNICAL GLASS



**Technical Glass SBU is a world leader in thin glass for display and various applications and optical devices for office machinery, as well as glass fiber for battery separators and timing belts.**

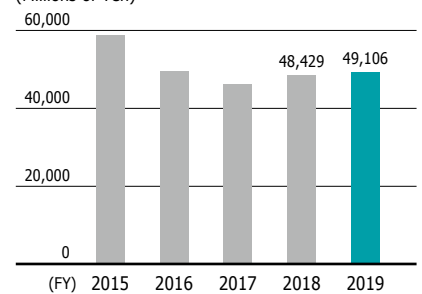
**Hiroshi Nishikawa**  
Senior Executive Officer  
Head of Technical Glass SBU

## Business Results

Following FY18, profit in the Technical Glass business has significantly improved. Especially in our Fine Glass (former Display) business, which improved significantly through cost reductions, increased productivity and improved VA product sales. In other areas, our printer lens business remained in strong demand maintaining high profitability through production cost reduction - despite the strong Yen's exchange rate. Similarly, demand in our battery separator business remains firm. Idling Stop and Start System (ISS) demand in Japan is still growing particularly for aftermarket; demand for the high performance separator for ISS is expanding. Although glass cord for engine timing belts was affected by economic slowdown in EU and China, Metashine® for new applications, such as car paint, has been successfully expanding. As a result, the Technical Glass business recorded revenues of ¥49,106 millions and an operating profit of ¥8,062 millions.

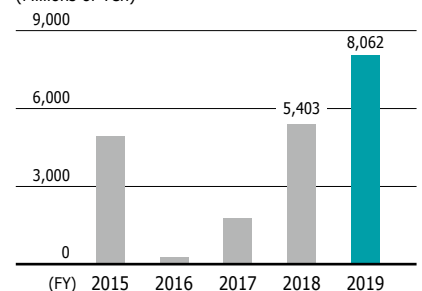
### Revenue

(Millions of Yen)



### Trading profit

(Millions of Yen)



## Business Environment

The Technical Glass market has been favorable throughout FY19. Our Fine Glass products are in demand for display on white goods, signage and so on. Furthermore, we are investigating other prospective markets and applications such as anti-glare glass. Glass cord for the engine belts market looks set for growth in China and Europe; car paint demand

for Metashine® is in great demand globally because of its beauty and functionality; the battery separator for our Idling Stop and Start System (and replacement application) shows stable growth in Japan, which is expected to spread to other countries - particularly in China and North America for our VRLA type battery using our AGM separator.

## Strategy

Our target is to continue to evolve our portfolio, to introduce new innovations to our existing products and to develop complementary products in adjacent markets. We will improve productivity and cost competitiveness, whilst maintaining the highest quality, in order to meet customer expectations and enhance profitability. We will enhance marketing to identify new fields in which to exploit our

technologies. Our Technical Glass business has many advantages and strengths that can be utilized in such areas as automated optical inspection, automotive interior and separators for idling stop/start car batteries. The challenge for the future will continue with an effort to expand footprint of select businesses to a global scale.



Glass cord



PE separator



METASHINE®

## Value-Added Products

### SELFOC® Lens Array for automated optical inspection (AOI)

Technical Glass is active in the area of automated optical inspection. Generally CCD (Charge-Coupled Device) camera is used for the application worldwide. However automated optical inspection unit with our SELFOC® Lens Array has a huge advantage on its cost, keeping same quality as current camera. SELFOC® Lens Array is mainly used for printer scanner and we developed it for automated optical inspection field. We are confident that this new inspection system will soon have various applications all over the world.



Courtesy of Tichawa Vision GmbH 



## Discussion with External Directors on Corporate Governance

— Enhancing NSG Group's corporate value —



**Günter Zorn**

External Director  
Chairman of the Board

**Toshikuni Yamazaki**

External Director  
Chairman of the Audit Committee

Two of NSG Group's External Directors — Günter Zorn (Chairman of the Board) and Toshikuni Yamazaki (Chairman of the Audit Committee) — discuss how the Group's Corporate Governance seeks to enhance corporate value.

## Corporate Governance and Board of Directors

Q1

**Mr. Zorn, you have been a director for five years and Mr. Yamazaki for four years. As Independent External Directors, firstly, how do you think corporate governance should function and secondly, how do you evaluate the current corporate governance and Board of Directors of NSG Group?**

**Mr. Zorn (Chairman of the Board):** When establishing a robust governance system, not only is the role of the Board very important, but crucially, it also creates a system whereby the External Directors can check whether the process is secure. Board meetings should be held in a venue where each Director can express their opinions frankly and engage in an open discussion.

**Mr. Yamazaki (Chairman of the Audit Committee):** Corporate governance is a necessary mechanism for the Board to function properly. As stipulated in Japan's Corporate Governance Code, the Board owes a fiduciary duty to the Company's shareholders and I believe that it must oversee management so that the Company can achieve sustainable growth and enhance corporate value over the medium to long term and also improve profitability and capital efficiency. In addition to this, the Board must ensure that governance is functioning and being implemented systematically.

**Mr. Zorn:** Following the acquisition of Pilkington in 2006, our aim was to adopt a sophisticated governance structure inline with a global company, shifting to a committee-based governance structure in 2008. This system may not be suitable for all companies, but it works well for us, which is why I place great value on it. The Board oversees management and the Executive Officers are in charge of business execution. The three committees (the Compensation Committee, the Audit Committee, and the Nomination Committee), of which the majority of members are External Directors, each play their respective roles.

At NSG Group, an Independent External Director assumes the position of Chairman of the Board of Directors, which is my role at present. Some people may think that a person from within the Company, who is more familiar with the business should be the Chairman, but for us, because management supervision and business execution are clearly separated, I think it is right that an Independent External Director serves as Chair.

**Mr. Yamazaki:** Executive officers run the Company, the Board oversees it, and the Audit Committee works closely with Internal Audit and auditing firms to conduct audits. In this way the Company's governance structure can be rated very highly. However, one of our challenges from now on is to facilitate improved corporate value over the medium to long term.

Q2

**One new External Director has just been appointed. Please tell us what you think about the composition of the Board of Directors.**

**Mr. Zorn:** Director candidates are selected by the Nomination Committee. The Nomination Committee is chaired by an Independent External Director, and the only member of that committee hailing from inside the Company is the CEO. For the selection of External Directors, they have been and will be selected only from among those candidates whose qualifications and experts are diverse enough in terms of internationality, gender diversity, global management and academic achievements. As an External Director, Dr. Jörg Raupach Sumiya, brings diversity and a wealth of experience and knowledge as an academic and a business person. As a professor at the Faculty of Business Administration at one of the major universities in Japan, he will strengthen the Company's governance. At the same time, we recognize that gender diversity within the Board is a continuous challenge for us.

**Mr. Yamazaki:** If the Board alone tried to find External Directors, we would be limited in what we could do, so we decided to make active use of outside consultants to introduce candidates to us. That is why it is hard to imagine somebody who is on friendly terms with the CEO becoming an External Director. Currently, we have External Directors with different backgrounds, which in my view ensures that the composition of the Board is very balanced. The addition of Dr. Raupach Sumiya will further strengthen governance from a different perspective and we expect it will contribute to the Company's sustainable growth.

### Appointment/Dismissal and Compensation System of Senior Management

Q3

#### How is the CEO appointed?



**Mr. Zorn:** We prefer to appoint the CEO from within the Company, but if necessary, we will also consider external candidates. Candidates are selected by the Nomination Committee which is chaired by an External Director. The criteria for selecting CEOs have been established over the years, and because the right image of the CEO changes depending on the business environment, e.g. consolidation versus growth phase, it is not an absolute standard and should be adjusted as necessary. In addition, the opinions of experienced external consultants are also helpful. The CEO is appointed in a highly objective and transparent process, without being influenced by personal preferences.

**Mr. Yamazaki:** The term of the Directors and Executive Officers of the Company is one year. In other words, each year at appointment time, the suitability of the CEO is put into question and in that respect the role the Nomination Committee plays is a major one, making it a highly transparent system.

Q4

#### In terms of the compensation scheme for the senior management, please tell us how you ensure fairness.

**Mr. Zorn:** There are objective standards determined by the Compensation Committee for the basic payment and performance-related compensations of our Executive Officers. The Compensation Committee uses these criteria to make its evaluations. It is chaired by an Independent External Director, and the only member of the committee who is an Internal Director is the CEO. The CEO himself cannot take part in discussions about his own compensation. Performance-related compensation is determined on the basis of short-term results such as yearly performance, and achieving long-term goals such as improved profitability and progress on growth strategies. In addition, the long-term incentive plans, or LTIPs, which are based on long-term results, the Executive Officers are required to invest 50 percent of LTIP proceeds to purchase the Company's shares. The purpose of this is to further align the interests of Executive Officers and shareholders. We have also introduced Malus and Clawback





systems to reduce or cancel this incentive if any inappropriateness is detected at a later stage, even after compensation has been paid. There are various ways of thinking about the level of compensation and incentives, but I think that it should serve as a means to improve motivation. Since we operate globally, it is especially important that senior management's compensation be at a competitive level for each of the different regions. That is why we have set the medium level as the standard, referring to the standard compensation level in each country.

**Mr. Yamazaki:** Senior management will never be allowed to determine its own compensation. It is a highly transparent compensation system. However, we do not have enough information in our Company about the right levels of competitive compensation to secure necessary personnel, which is why we also use information from external consultants to help us. On the other hand, incentives should be continuously reviewed. As the business environment is always changing, we also need to consider changes in order to be effective in advancing our current strategies.

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## Highly Effective Audit System and Group Governance

Q5

### Please tell us about the features of the Company's auditing system and the activities you conduct.

**Mr. Yamazaki:** The main feature of our Audit Committee is that everyone who sits on the committee is a part-time Independent External Director. There are no full-time members. But the full-time staff members of the Audit Committee Office, which serves as the secretariat, properly relay required information to the Audit Committee. It is a supporting framework so it functions very well. Ultimately, the role of the Audit Committee is to make an audit report confirming, at the AGM (Annual General Meeting of Shareholders), that the Board of Directors is fulfilling its fiduciary responsibilities. For that purpose, four members of the Audit Committee attend the required meetings, read through the necessary paperwork, hear from the relevant people, and if required, make site visits, either in Japan or overseas, to carry out their checks. However, the basic premise for the activities of the Audit Committee to carry meaning is a strong governance system. The Audit Committee takes steps to approve the Internal Audit's audit plan, while the external accounting firms also examine its content. The accounting auditors also appropriately perform audits on management's internal controls (J-SOX) regarding financial reporting. Because of this, we think the conditions within the Company are suitable for auditing activities to be carried out safely.

**Mr. Zorn:** It is very important that the Chairman of the Audit Committee has financial expertise. Also, because no Internal Directors sit on the Audit Committee, there is the added advantage that they are able to talk openly and directly with people when visiting a site to conduct an audit. The accounting auditors can also have more honest discussions when only talking with External Directors. These advantages are achieved only because the Audit Committee consists solely of Independent External Directors.

q6

### The Company has many subsidiaries and affiliated companies, including overseas subsidiaries, but what is your view on the Group governance?

**Mr. Yamazaki:** Internal Audit, the Audit Committee, and accounting auditors all have their own respective functions. As such, I believe that the global Group governance framework is robust in terms of internal control of subsidiaries, including those overseas. But no matter how strong the governance system is, not all minor wrongdoings can be prevented. Our in this context it should be whistleblowing system allows hidden issues to be properly followed up. We also liaise as much as possible with local accounting auditors in regions where our Group companies are based. Better governance can be realized with checking by both the Audit Committee and local accounting auditors.

**Mr. Zorn:** The Audit Committee holds monthly meetings and conducts interviews with Executive Officers and other key personnel. The Committee checks to see whether there are any discrepancies in the information they receive from the management team and what is actually happening on the ground. That being said, it does not aim to carry out audits on trivial issues — it lets local management handle them. The committee's focus is on more important things, such as material issues, serious problems, or potentially significant matters.

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## Challenges for the Group and Future Direction

q7

### In light of the Group's current situation, what issues do you recognize to be most important at present?

**Mr. Zorn:** There are two important issues to recognize. The first, naturally, is to develop a growth strategy. The Company's aim is to generate corporate value over the medium to long term to satisfy the expectations of its shareholders, employees, society, and all other stakeholders. To that end, it is necessary to make effective use of the Company's resources to encourage the creation of new business opportunities. With our efforts over the past several years, the Group has achieved a certain level of financial stability, and we are finally at the stage where we can make investments to secure growth opportunities.

The second is risk management. As well as economic risks, we are exposed to environmental risks (such as resource and energy problems and climate change) and geopolitical risks (such as trade wars). The Company's risk management has been strengthened and is in a good position, but we must always consider what we can and should do going forward.

**Mr. Yamazaki:** The purpose of the Company is to achieve sustainable growth and, based on this, enhancement of corporate value. Until now, financial stability had been a priority. The Company struggled to find and invest in new growth opportunities, which meant the whole Company was in a contracted state. But with the resumption of dividends on common shares, like Mr. Zorn, I now think it is a good time to actively pursue growth investments. An important role of the Board is to ensure that no undue risks are taken, but if anything, I think it may be necessary for the Board to think of ways to assess the risk-taking of the executive side a little more positively.

## Finally, what are your thoughts on the future direction of the Group?

**Mr. Zorn:** The Company's management base is very robust. Products, technology, manufacturing, R&D, and governance are all at a high level for a global company. Now the focus is on increasing our sales ratio of Value-Added products and I believe we need to further accelerate such initiatives. Within the Company, a manufacturing culture where the customer comes first has taken root, but I think it is necessary to foster a culture that will further develop the market even more aggressively.

We command a strong market position in providing Value-Added products in the fields of architectural, automotive and technical glass, but this is not enough if we consider future growth. I believe we need to actively branch out into new fields, beyond the traditional business fields. Setting the Company in this direction is probably the most important role for the Board up ahead, a good example is the recent establishment of the Company's Business Innovation Center (BIC).

**Mr. Yamazaki:** We are now at a turning point, from defensive to proactive. But in order to grow aggressively, the mindset of not only the senior management, but also of the employees is important. From now on, we need to think about things positively, that is, we have to become a Company where employees are more proactive in coming up with ideas, where they look for better ways of doing things. Creating such an atmosphere and making the Group even more vibrant than before will be a major management task up ahead. To what extent this will be included in the next medium-term management plan is something I would like the Board to work on through discussions with Executives.



## Board of Directors



### ① Chairman of the Board

#### Günter Zorn

NC Member	AC Member	CC Member
External	Independent	

#### [Reasons for recommendation]

Mr. Günter Zorn's career and experience include serving in management of major international companies and as Representative Director and President of their Japanese entities. In addition, he is a Representative Director and President of his own consulting firm. He has vast international experience as well as a broad understanding of business management.

### ② External Director

#### Masatoshi Matsuzaki

NC Chairman	AC Member	CC Member
External	Independent	

#### [Reasons for recommendation]

Mr. Masatoshi Matsuzaki's career and experience include serving as both Representative Executive Officer and subsequently Chairman of the Board of a major international manufacturing company, which, similar to NSG Group, has adopted a governance system of "Company with Three Committees". He has a vast experience, and a broad understanding of both sides of executive and supervisory functions of companies that have this type of Committee system.

NC: Nomination Committee AC: Audit Committee CC: Compensation Committee

### ③ External Director

#### Toshikuni Yamazaki

NC Member	AC Chairman	CC Member
External	Independent	

#### [Reasons for recommendation]

Mr. Toshikuni Yamazaki's career and experience include serving as Representative Director, Executive Vice President (in charge of finance, investor relations and accounting) and full-time corporate auditor of a major international manufacturing company, and a member of the Investment Advisory Committee of the Government Pension Investment Fund, Japan (GPIF). He has vast experience as well as a broad understanding of business management and finance and accounting.

### ④ External Director

#### Yasuyuki Kimoto

NC Member	AC Member	CC Chairman
External	Independent	

#### [Reasons for recommendation]

Mr. Yasuyuki Kimoto's career and experience include serving as Chairman of the Board of a major international manufacturing company. The majority of that Board consisted of Independent External Directors. As well as leading the Board, he liaised with several non-Japanese Independent External Directors of the UK subsidiary of a major Japanese financial institution. He has vast international experience, and a broad understanding of business management.



⑤ External Director  
**Yuji Takei**

External

**[Reasons for recommendation]**

Mr. Yuji Takei initially joined the Long-Term Credit Bank of Japan Ltd. (now, Shinsei Bank Limited) and then, moved to an international consulting firm. He subsequently worked as a partner in an investment fund among other interests. He has experience of engaging in corporate management as an External Director in several companies and has vast experience and a broad understanding of business management.

⑥ External Director  
**Jörg Raupach Sumiya**

CC Member

External

Independent

**[Reasons for recommendation]**

Dr. Jörg Raupach Sumiya has international experience in the fields of both business and academia, and is currently a professor at the college of business administration, Ritsumeikan University, one of Japan's most famous private universities. He has vast experience both in the academic world and business management.

⑦ Representative Executive Officer,  
President and CEO  
**Shigeki Mori**

⑧ Representative Executive Officer,  
Executive Vice President and COO  
**Clemens Miller**

⑨ Representative Executive Officer,  
Executive Vice President and CFO  
**Kenichi Morooka**

Executive Officers (Excluding Representative Executive Officers)

[Senior Executive Officers]

Tony Fradgley, Koichi Hiyoshi, Satoshi Ishino,  
Hiroshi Nishikawa, Jochen Settelmayer, Phil Wilkinson.

[Executive Officers]

Hiroshi Kishimoto, Yutaka Nakashima, Tim Bolas,  
Mike Greenall, Shiro Kobayashi, John Mercer,  
Iain Smith, Milena Stanisci.



## Corporate Governance Overview

NSG Group believes that achieving and maintaining an advanced level of corporate governance is a key management agenda. We adopt the Company with the Three-Committee structure to promote separation of the executive and the supervisory functions; enhance management transparency, improve the level of corporate governance and thereby becoming a company trusted by our shareholders. We have created and adopted "NSG Group Corporate Governance Guidelines", supporting and endorsing the spirit and principles of the Corporate Governance Code provided by Tokyo Stock Exchanges. These Guidelines are intended to define and embed the basic principles and framework of our corporate governance in the organization. To further secure such purpose, the Group has also adopted a self-disciplinary approach for the Guidelines which, among others, requires it to give a reasonable account to our shareholders if the Group should proceed with any actions deviating from these Guidelines. For more detail, please visit our corporate website for the NSG Group Corporate Governance Guidelines.

<http://www.nsg.com/en/about-nsg/governance/approach>

### Fundamental Principles

#### (1) Structure

- a) The Group's ultimate parent company, Nippon Sheet Glass Company Limited (the "Company", "NSG" or "We") adopts the committee-based governance structure under the Companies Act of Japan (the "Companies Act") and the Company hence establishes the Board of Directors (the "Board"), Nomination Committee, Audit Committee, Compensation Committee (individually referred to as "Committee") and Executive Officers.
- b) It is the intention of the Board that the Executive Officers should be authorized to determine the businesses and affairs of the Company within the scope as permitted by law, thereby facilitating separation of execution from oversight, enhancing transparency of management process and further strengthening oversight function over executive management.
- c) The Company will establish and maintain an effective internal control system operating on a Group-wide basis including the system in relation to financial reporting (J-SOX).

#### (2) Stakeholders Communication

- a) The Group aims to be judged by being best in class by our many stakeholder groups in a variety of settings across the whole Group (including shareholders, customers, suppliers and local communities) from their own perspectives and will also develop, maintain and enhance good relationships with any such groups.
- b) In relation to the matter of disclosure of corporate information, whether or not it is to be made according to legal requirements, the Group always aims to act in a timely and appropriate manner both in terms of the substance and form, with a view to maintaining and invariably enhancing transparency of management of the Group.

#### (3) Code of Conduct

The Group sets its Code of Conduct to be followed by all entities and employees. Reviewed regularly for its content and implementation, the Code of Conduct reflects the Group's values and ethical standards.

#### Our actions to date aiming for an advanced level of corporate governance

2008	<ul style="list-style-type: none"> <li>Changed the company's fundamental governance structure from the traditional Statutory-Auditor system to the current three-Committee structure</li> <li>Four Independent External Directors were elected accordingly</li> </ul>
2010	<ul style="list-style-type: none"> <li>Created and adopted our original and stringent criteria for the independency of External Director, taking into account not only the standard of Tokyo Stock Exchanges but also those similar rules in other major jurisdictions</li> </ul>
2012	<ul style="list-style-type: none"> <li>All three (Nomination, Audit and Compensation) Committees were chaired by Independent External Directors</li> </ul>
2013	<ul style="list-style-type: none"> <li>Board of Directors became chaired by an Independent External Director</li> </ul>
2014	<ul style="list-style-type: none"> <li>Made the independency criteria for External Directors more specific and publicly disclosed it</li> <li>Incorporated the share purchase element into Long Term Incentive Plan</li> <li>Set shareholding targets for Executive Officers</li> </ul>
2015	<ul style="list-style-type: none"> <li>Established NSG Group Corporate Governance Guidelines</li> </ul>
2016	<ul style="list-style-type: none"> <li>Started annual board effectiveness evaluation process</li> </ul>
2018	<ul style="list-style-type: none"> <li>Revised the "NSG Group Corporate Governance Guidelines"</li> </ul>
2019	<ul style="list-style-type: none"> <li>Of the nine members of the Board of Directors, the majority are the five Independent External Directors</li> </ul>

#### Our Approach to TSE Corporate Governance Code

NSG Group complies with all but one principle of the Corporate Governance Code (revised in June 2018) provided by Tokyo Stock Exchange.

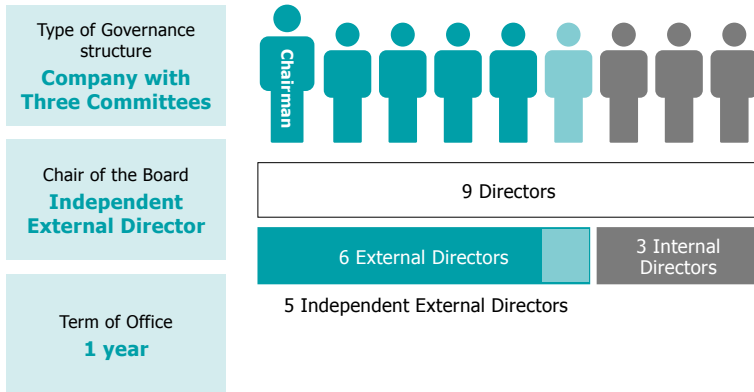
#### Reasons for Non-compliance with the Principles of the Corporate Governance Code [Principle 4.11 Preconditions for Board and Kansay-aku Board Effectiveness]

We have been working on global projects focused on Inclusion & Diversity since 2017 and continue promoting diversity at our corporate body, including the Board of Directors. As we have not found female candidates that we believe are suitable, currently there are no female directors on the Board, although we continue to focus on promoting diversity including addressing this particular issue.

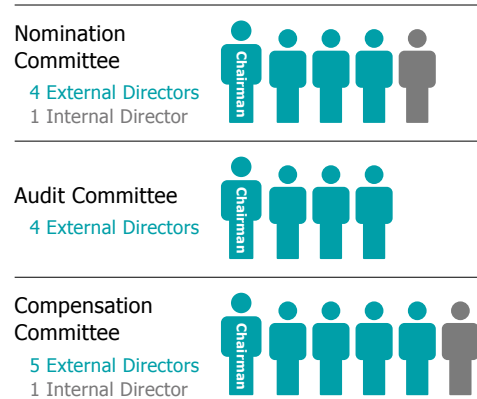
For details, please visit our corporate website and refer to our Corporate Governance Report.

<http://www.nsg.com/en/about-nsg/governance/approach>

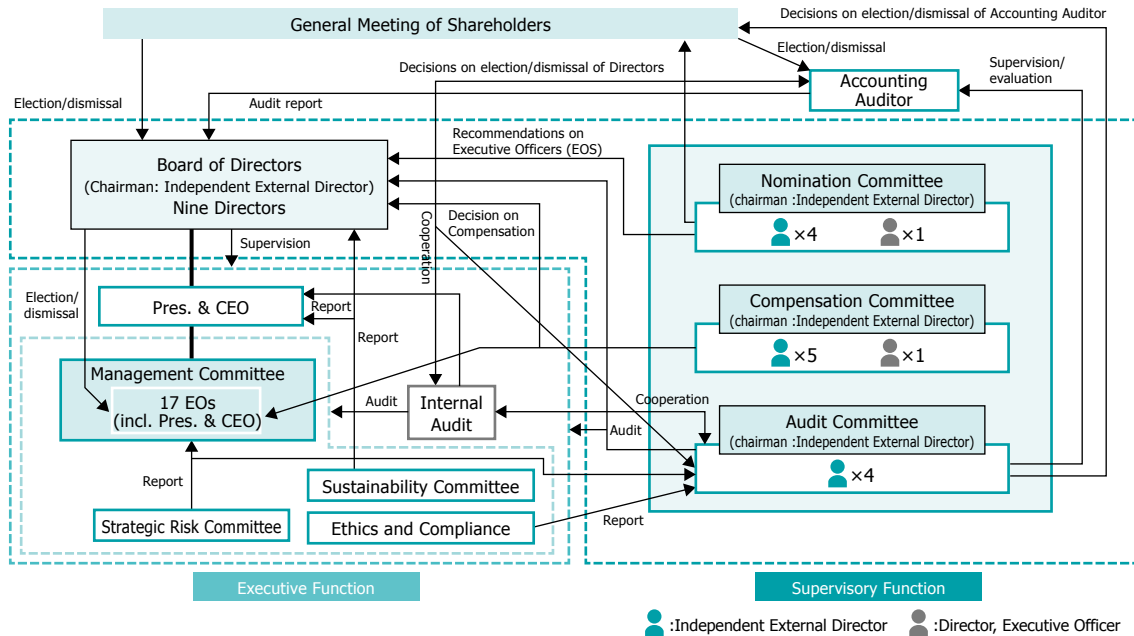
**■ Outlines of our Management Structure** (as of July 1, 2019)



**■ Composition of the Three Committees**



**■ Management System**



**■ Composition of the Board and Committees**

Name	Position	Attribute	Current Responsibilities at NSG Group	Record of attendance at Board meetings and each Committee as of March 31, 2019.			
				Board	NC	AC	CC
Günter Zorn	Chairman of the Board	External Independent	Chairman of the Board, NC Member, AC Member, CC Member	100% (11/11)	100% (5/5)	100% (11/11)	100% (5/5)
Shigeki Mori	Representative Executive Officer, President and CEO		NC Member, CC Member	100% (11/11)	100% (5/5)		100% (5/5)
Clemens Miller	Representative Executive Officer, Executive Vice President and COO			100% (11/11)			
Kenichi Morooka	Representative Executive Officer, Executive Vice President and CFO			100% (11/11)			
Toshikuni Yamazaki	Chairman of the AC	External Independent	NC Member, AC Chairman, CC Member	100% (11/11)	100% (5/5)	100% (11/11)	100% (5/5)
Yasuyuki Kimoto	Chairman of the CC	External Independent	NC Member, AC Member, CC Chairman	100% (11/11)	100% (5/5)	100% (11/11)	100% (5/5)
Masatoshi Matsuzaki	Chairman of the NC	External Independent	NC Chairman, AC Member, CC Member	100% (11/11)	100% (5/5)	91% (10/11)	100% (5/5)
Yuji Takei	–	External		100%(11/11)			
Jörg Raupach Sumiya	–	External Independent		Appointed June 2019			Appointed June 2019

NC: Nomination Committee AC: Audit Committee CC: Compensation Committee

## Supervisory Function

Diverse and highly independent in its structure, the Board of Directors is responsible for making decisions on the Group's material matters and supervising the execution of business.

<b>Board of Directors</b>	Role	The Board of Directors is responsible for making decisions on the Group's material matters, such as basic policies for business management, internal control system and duty allocation among Executive Officers, and supervision over business execution by executives.
<b>Nomination Committee</b>	Role	The Nomination Committee is responsible for making decisions on the General Meeting of Shareholders agenda items regarding the appointment and removal of Directors. It also oversees the succession plans for key executives, including President and CEO, and provides advice and recommendations for the Executive Officer candidates.
<b>Audit Committee</b>	Role	The Audit Committee is responsible for auditing the execution of duties by Directors and Executive Officers, preparing audit reports, and deciding details of proposals concerning appointment, removal or not reappointing the Accounting Auditor.
	Audit methodology and cooperation with others	<ul style="list-style-type: none"> <li>Audit by Audit Committee is such that it interviews executives, attends material executive meetings such as Management Committee, and inspects business operations and financial status of the company and major subsidiaries, being assisted by Audit Committee Office, in accordance with its audit policy and plans, as well as periodically monitoring and reviewing status of development and operation of the Group's internal control system.</li> <li>Audit Committee meets with Accounting Auditor and the internal audit function on a regular and as needed basis to receive reports on items such as progress of audits, exchange views and gather information.</li> </ul>
<b>Compensation Committee</b>	Role	The Compensation Committee is responsible for making decisions on a compensation policy for Directors and Executive officers as well as individual elements of compensation for Directors and Executive Officers.

## Board Effectiveness Evaluation

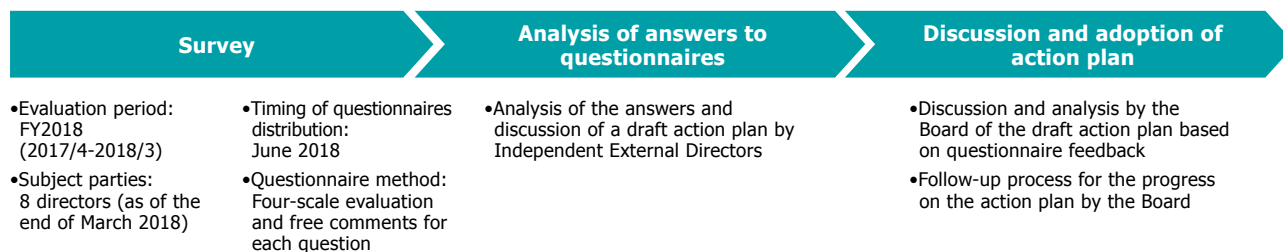
NSG Group started an annual evaluation process for the Board effectiveness in FY2016, in order to further and constantly improve performance and effectiveness of the Board of Directors and Nomination, Audit and Compensation Committees.

### ■ For FY2018

#### Evaluation process

The effectiveness review of the Board and the Committees was conducted following feedback and views taken from each Director, addressing composition, status of management, agenda-setting and the direction of the role of the organization. It is led and supervised by the Independent Directors (led by the Chairman of the Board) to ensure its adequacy and independence.

### ■ Overview of evaluation and analysis process





### Summary results of evaluation, and Action plan

The effectiveness score regarding the Board and Committee meetings has improved since FY2017. The evaluation process concluded that their procedure was "appropriate and adequate", and therefore the effectiveness of the Board of Directors and Committees had been well maintained.

Based on specific recommendations that were made throughout the process, the Board developed an action plan including the following points:

- Increase discussion on the critical business strategies of the Group (e.g. growth and financial strategy, talent development/human resources)

- Continue efforts to enhance risk management process and reporting
- Improve diversity of the Board members
- Enhance succession plans for the CEO and other senior executives

### ■ For FY2019

#### Evaluation process

The Board effectiveness evaluation is underway (as of the date of this report), taking into consideration the appraisal of the FY2018 results, recommendations and feedback, and the action plans developed through the last evaluation process.

## Executive Function

A diverse group of 17 Executive Officers (as of July 1, 2019) carrying out the Group's business activities

<b>Executive Officer</b>	Role	The Business execution of NSG Group
	Composition	Three Representative Executive Officers (Chief Executive Officer (CEO), Chief Operation Officer (COO) and Chief Financial Officer (CFO), respectively), 6 Senior Executive Officers and 8 Executive Officers
<b>Management Committee</b>	Role	The Management Committee leads the Group's business operation and oversees the implementation status of businesses in order to realize the policies and targets set out by the Board of Directors efficiently and appropriately.
	Composition	The Management Committee mainly consists of the Executive Officers.
	Number of times met in FY2019	11
<b>Sustainability Committee</b>	Role	The Sustainability Committee builds the sustainability strategies, presides over all of the Group's sustainability-related activities, and ensures effective communication with various stakeholders.
	Composition	The Group Sustainability Committee is chaired by the CEO or a person who is nominated by CEO and composed of the CEO, COO, CFO, Group Sustainability Director, the Heads of each Strategic Business Unit, Chief Development Officer (CDO), Chief Human Resources Officer (CHRO), Chief Legal Officer (CLO), Chief Corporate Planning Officer (CCPO), Chief Communication Officer (CCO) and the Heads of relevant Group Functions.
	Number of times met in FY2019	2
<b>Strategic Risk Committee</b>	Role	The Strategic Risk Committee periodically reviews policies, strategies and frameworks concerning risk management throughout the Group, and appropriately takes into account the results of such review in forming the organization strategy and goals, in order to enhance the Group's business management.
	Composition	The Strategic Risk Committee is chaired by the Chief Risk Officer (CRO) and composed of CEO, COO, CFO, CRO, the Heads of each Group Function, and the Heads of each Strategic Business Unit.
	Number of times met in FY2019	3

## Appointment and Dismissal of CEO, CEO's Succession Plan

The Nomination Committee, chaired by an Independent External Director and comprising five (5) Directors including the Chairperson, four (4) of whom are Independent External Directors, clarifies, pursuant to the Policy and Procedure on Appointment and Dismissal of the CEO and Executive Management, and the qualifications of the Chief Executive Officer's succession plan.

### ■ Appointment and Dismissal of CEO

The Nomination Committee clarifies, pursuant to the Policy and Procedure on Appointment and Dismissal of Executive Management, the necessary qualifications for CEO and its procedure for appointment on the basis of which the Nomination Committee makes recommendation on CEO candidates for the Board of Directors and then Board of Directors decides such appointment with such

recommendations. In case the incumbent CEO is appointed as a member of recommendations Committee, he/she will not be involved in any decision or discussion as to the recommendations regarding the appointment of the CEO, except where he/she expresses his/her opinion in response to a specific request from a member of the Nomination Committee.

In case any early dismissal of the CEO is contemplated (including the case where unexpected failure to renew the term is contemplated for the purpose of this subject-matter) the Nomination Committee, which consists of four Independent External Directors and a CEO, deliberates and then tenders a recommendation on their findings to the Board of Directors, that then makes its ultimate decision on the matter based on the committee's recommendation. In case the incumbent CEO is appointed as a member of The Nomination Committee, he/she will not be involved in any decision or discussion as to such recommendation relating to his/her dismissal, except only where he or she expresses his/her opinion in response to a specific request from the

Nomination Committee.

### ■ Appointment and Dismissal of the senior management and the nomination of Director candidates

The Company will decide the candidate for director at the Nomination Committee and submit the details to the ordinary general meeting of shareholders as a proposal. In addition, the Board of Directors will, on the basis of recommendations rendered by the Nomination Committee in advance, appoint or dismiss senior executive managers including Executive Officers.

### ■ Succession plan for CEO and senior management

As part of the CEO's succession plan, the nomination committee clarifies the candidates' expected qualifications and character. Management Leadership development training and promotion planning are also in place. In addition, succession plans for other executives are being developed, reviewed and maintained.

## Compensation System for Executive Officers and Director

The Compensation Committee, chaired by an Independent External Director and composed of six Directors including the Chairperson, five of whom are Independent External Directors, has formulated and been operating the executive

remuneration system that determines the amounts, based on "Principles of Compensation for Directors, and Executive Officers".

### ■ Compensation System for Executive Officers

<b>Objectives</b>	<ul style="list-style-type: none"> <li>To ensure that packages of employment terms and conditions are market competitive and designed in such a way as to attract, retain and motivate Executive Officers of the highest world-class caliber in an international business</li> <li>To ensure that each individual's basic salary and incentives are aligned with the performance of the Group and interests of the shareholders as well as reflecting the commitment and achievements of the individuals concerned</li> </ul>		
<b>Decision-making Body</b>	Compensation Committee		
<b>Composition and Details</b>	Basic salary		<ul style="list-style-type: none"> <li>Set at market competitive levels</li> </ul>
	Performance-related compensations	Management Incentive Plan (Annual bonus)	<ul style="list-style-type: none"> <li>Aligned to NSG Group's Medium-Term Plan</li> <li>Performance measures (FY2019, FY2020):                             <ul style="list-style-type: none"> <li>Group Management Operating Profit</li> <li>Group Free Cash Flow</li> <li>Global SBU* Management Operating Profit</li> <li>Global SBU* Cash from Operations</li> </ul> </li> <li>* SBU means each "Strategic Business Unit" of NSG Group</li> <li>Payment: In cash</li> <li>Potential payment levels: Ranging between 0% and 125% against each individual's basic salary depending upon the management grade</li> </ul>
		Long-Term Incentive Plan	<ul style="list-style-type: none"> <li>Long-term incentive scheme over a three business-year period</li> <li>Performance measure (FY2017, FY2018): Aggregate Earnings per Share</li> <li>Performance measure (FY2019): Aggregate Earnings per Share and Return on Sales</li> <li>Payments are factored up or down according to the share price movement during each three-year plan period.</li> <li>Payment (nature of share-based payment): In cash, and the plan rules require the participants to invest 50% of cash LTIP proceeds (if any) to purchase ordinary NSG Group shares. Further, shareholding targets are set for each Executive Officer and are expressed as a percentage of basic salary—ranging between 50% and 100% against basic salary dependent upon the management grade.</li> <li>Potential payment levels: Ranging between 0% and 150% against each individual's basic salary depending upon the management grade</li> <li>Malus (ability for the value of the award to be reduced after it has been granted but before it has vested) and Clawback clauses (ability for the Group to require the participant to repay the value they receive after the award has vested)</li> </ul>

Note 1: Executive Officers with regard to the above table include the ones concurrently serving as Directors.

Note 2: Apart from the above-mentioned compensation, Stock Compensation-type Stock Options are issued annually to certain Executive Officers, which were introduced as a retirement saving plan in accordance with the abolishment of director's retirement allowance scheme in 2007 under Japanese employment terms.

Performance measures for the FY2019 and FY2020 annual incentive plan for Executive Officers are mainly based on the following:

Element	Weight (%)		
	CEO, COO and CFO	Executive Officers other than CEO, COO and CFO, who are mainly responsible for specific Global SBUs	Executive Officers other than CEO, COO and CFO, who are mainly responsible for specific Group functions
Group Management Operating Profit	50%	25%	25%
Group Free Cash Flow	50%	25%	25%
Global SBU Management Operating Profit	–	In relation to the results of specific SBUs they are responsible for, constituting 25% in total	In relation to the results for each of the Group's SBUs constituting 25% in total
Global SBU Cash Flow from Operations	–	In relation to the results of specific SBUs they are responsible for, constituting 25% in total	In relation to the results for each of the Group's SBUs constituting 25% in total

\*Note: SBU means each "Strategic Business Unit" of the Group

#### A case of compensation composition ratio for Executive Officer (CEO)



Note 1: This estimation is created based on a hypothesis that performance-related compensation (annual bonus and LTIP) are fully paid for CEO.  
(For calculation, this estimate excludes "other" compensations than any of above compensations).

Note 2: LTIP requires the participants to invest 50% of net LTIP net proceeds (if any) to purchase NSG Group ordinary shares.(unless impracticable in specific cases)

Note 3: Compensation composition ratio is determined according to the management grade.

#### Amount of Compensation for Directors and Executive Officers for FY2019

(Million Yen)

Category	Headcount	Basic Salary	Performance-linked compensation		Other Benefits
			Annual Bonus	Long-Term Incentive Pay	
External Directors	5	69			–
Executive Officers	12	429	95	190	135

Notes

1: Five of the Executive Officers include compensation for the Executive Officers paid by the Company's subsidiary.

2: Amounts shown relate to the periods for which the office of Director and Executive Officer was held.

3: The data for Executive Officers includes those who assumed office during the Group's Financial Year from April 1<sup>st</sup> 2018 to March 31<sup>st</sup> 2019.

4: The amount shown as Performance-linked compensation in the table are the payments associated with the Annual Bonus for the year from April 2018 to March 2019 and with the Long-Term Incentive Plan covering the three financial years from April 2016 to March 2019. The amount will be paid to the Executives in the financial year commencing April 2019.

5: Other Benefits for Executive Officers include an amount of 79 Million Yen for Stock Options awarded to six Executive Officers, which are the Stock Compensation-type Stock Options introduced as a retirement saving plan in accordance with the abolition of the Director's retirement allowance scheme in 2007 under Japanese employment terms.

6: Other Benefits include pension fund contributions, healthcare provision and accommodation costs and so forth.

#### Compensation System for Independent External Directors

<b>Objectives</b>	<ul style="list-style-type: none"> <li>To enable Independent External Directors to fulfill their supervisory role adequately and effectively</li> <li>To retain individuals with the capacity and experience required for that role</li> </ul>
<b>Composition and Details</b>	<ul style="list-style-type: none"> <li>Appropriate compensation level set based on comparisons with other companies using benchmark provided by external professionals</li> <li>Compensations for their performance on their duties</li> <li>No performance-related compensations such as Management Incentive Plan and Long Term Incentive Plan</li> </ul>
<b>Decision-making Body</b>	Compensation Committee

Note: According to resolutions of the Compensation Committee, a Non-Independent External Director also receives the level of compensation adequate for his/her duties and is not eligible for the performance-related compensations such as Management Incentive Plan and Long Term Incentive Plan.

Please refer to our securities report (Yukashoken Hokokusyo or Yu-Ho) for the Policy for Directors and Executive Officers' Compensation and the past compensation actually paid.

# RISK MANAGEMENT



## Basic policy

Consistent with the “Our Vision” management principles, NSG Group aims to enhance corporate value by way of sustained growth in line with MTP Phase 2. That said, the business environment enveloping the Group is becoming increasingly complex and showing signs of a dynamic transformation. We see risks in the uncertainties that stem from internal and external factors and affect the Group’s ability to achieve its business targets. We therefore position risk management, which is tasked with identifying, assessing, and properly managing major risks, as an important part of our management foundation in order to minimize the negative effects and maximize positive results. And by

systematically and methodically implementing appropriate risk management across the entire Group, we can not only achieve our business targets, but also reliably execute business strategies.

NSG Group’s risk management is carried out in accordance with our Basic Policy on Internal Control Systems, which was resolved by the Board of Directors pursuant to the provisions of the Companies Act. Specific measures for addressing risks that arise in connection with our corporate activities are prescribed in our NSG Group Risk Management Policy and are consistent with ISO 31000 (principles and guidelines on risk management).

## Framework

NSG Group employs a two-tiered risk management framework comprising the Strategic Risk Committee (SRC) and the Enterprise Risk Management (ERM) Team, both of which are under the supervision of the Management Committee.

The SRC’s members are mostly executive officers, while the CEO serves as Chairman. One of the executive officers is appointed Chief Risk Officer (CRO).

The SRC determines the companywide risk management framework, based on which it classifies high-level risks thought to have a serious impact on the Group and risks that ought to be managed by SBUs or Group functions. It then monitors how those risks are being addressed and requests that measures be taken if required. For high-level risks, the SRC appoints “risk owners” to manage the collection of risk information and the progress of countermeasures.

The CRO presides over all SRC meetings and as representative of the committee, periodically reports to and receives feedback from the Management Committee and the Audit Committee mainly regarding the effectiveness of the Group’s basic internal control system and risk management structure. In FY2019, the SRC convened three meetings and reported once each to the Management Committee and the Audit Committee.

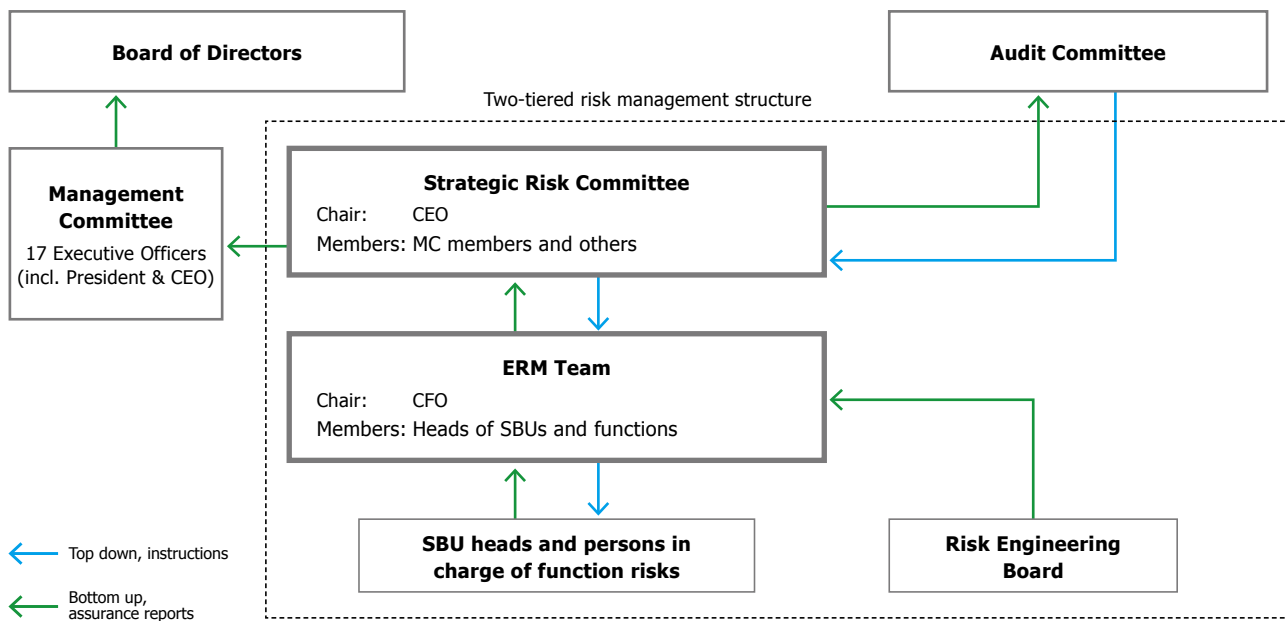
The ERM Team is chaired by the CFO and its members comprise SBU general managers and heads of functions such as accounting, finance, and human resources. Every year this team identifies, assesses, and prioritizes risks pertaining to business execution and endeavors to improve the effectiveness of risk management by formulating necessary measures to mitigate risks. The ERM Team periodically, or

whenever requested, reports on its activities to the SRC.

The Internal Audit Department's role is to provide assurance from an independent standpoint regarding companywide efficiency of risk management.

As for the sharing of risks, we established the NSG Group Insurance Policy. We identify risks such as losses caused by natural disasters. Every year under the supervision of the SRC, we implement, or review, the Group's comprehensive insurance coverage under our global insurance program.

### Risk management structure



## Major risks for NSG Group

The SRC identified, assessed, and listed in order of priority the following risks from among the major risks it monitored in FY2019. Risk owners for each type of risk are appointed from among the executive officers to take responsibility for appropriately dealing with risks.

Risk
1 Business continuity risk
2 Non-performance of shipping contract by supplier
3 Cyber risk
4 Loss of competitiveness to key customers

Risk
5 Economic risk
6 Financial risk
7 Labor shortage
8 Compliance risk
9 Ascertaining and responding to technological innovation
10 Business strategy risk
11 Product quality risk
12 Risk pertaining to new or amended laws and regulations
13 Intellectual property risk
14 Organizational culture capable of swiftly responding to changes

## Business continuity risk

In preparation for the occurrence of a serious accident or large-scale disaster and as part of its business continuity management, NSG Group has organized teams and formulated plans at each business site so serious accidents can be managed in accordance with NSG Group Business

Continuity Policy and Serious Accident Management Guidelines. Since 2013, we have prioritized our main business sites in drafting and rehearsing comprehensive business continuity plans.

# ETHICS AND COMPLIANCE

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## Code of ethics and education

The NSG Group Code of Ethics broadly covers the ethical behavior expected of our employees in the work place, including compliance with all laws and all major Group policies, procedures and guidelines. The Code is available in all 19 Group languages.

The Group decided to expand new employee education to cover not only the Code of Ethics, but also conflict of interest, fraud, social media and Ethics and Compliance

reporting. Key Roles for competition law compliance and anti-bribery and anti-corruption (ABAC) are also required to complete the relevant online education. The education modules will be assigned to the Group employees accordingly through the NSG Group Ethics and Compliance Education Center. This new education structure began in April 2019. We will continuously monitor its effectiveness as well as the completion rate of the modules.

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## Ethics network

A Global Ethics Network is aimed at enhancing the ethical culture and monitor compliance risks throughout the Group. The Ethics Network consists of senior managers who have been appointed Regional Ethics Ambassadors and Ethics Champions. Both roles will play a vital part in the

communication and promotion of the Code of Ethics by leading and championing ethics and compliance in their local region or function which in turn will help embed ethics into the business.

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## Group Ethics & Compliance and communication

Group Ethics and Compliance has a direct reporting line to the Audit Committee. Its responsibilities include the development, implementation and maintenance of an integrated internal ethics and compliance management and control system, as well as the creation and review of relevant Group policies and procedures.

In FY2019, the Group E&C function adopted a regional structure by appointing E&C regional managers in Europe, North America, South America and Asia to embed E&C culture into the whole organization as well as cover risks in each region. In this regard, Group E&C started regional visits to reach out to local business/function people, liaising with the relevant Ethics Ambassadors and Champions.

Group E&C periodically issues Group Ethics and Compliance Briefings to employees. The Group's communications team translates the briefing into multiple languages and distributes to all NSG Group locations that is also made available on the Group's Intranet. In addition, each regional E&C manager issues a regional E&C newsletter to the relevant local employees.

Group E&C has begun sharing with the heads of Strategic Business Units and HR the case details reported via the E&C Hotline system to help improve the workplace environment as well as business performance. Group E&C regularly reports to the Audit Committee.

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## Conflict of interest disclosure

Under our Code of Ethics, all employees are responsible for acting in the best interests of the Group. Employees are required to complete an educational module and at the end they are asked to disclose any outside interests, activity or investments, which actually or potentially, could cause conflict against that of the Group, or otherwise certify they

do not have any such conflict of interest. Group E&C reviews all reported disclosures and discusses certain matters with the relevant business or function head if necessary. Feedback is provided to all reporters and in some cases, possible plans to mitigate exposure are also provided.



## Compliance system

To ensure transparency of employees' actions related to our core compliance programs, NSG Group requires the reporting of certain high risk areas such as competition law compliance and ABAC. Group E&C centrally manages an online reporting system where employees are required to document or obtain prior permission from Group E&C whenever they contact our competitors, join a trade association, make charitable contributions, give or receive a certain amount of gifts and

entertainment, do businesses with third parties, and interact with public officials. The specific requests and notifications are reviewed and approved by the relevant E&C regional managers.

NSG Group is monitoring around 500 third parties such as agents, consultants and joint venture partners that meet certain risk criteria of ABAC. This process includes due diligence, assessment and reputational screening.

## Reporting of concerns — Ethics & Compliance Hotline

NSG Group is committed to maintaining an environment in which employees can report, without fear of retaliation, any conduct they know of or suspect to be in violation of law, Group regulations or guidelines.

For this purpose, the Ethics and Compliance Hotline system has been established to provide an easy and simple way to report concerns, while employees are encouraged to speak to HR or line management first.

- Hotline
- Can be used by third parties
  - Reports can be made anonymously (except as prohibited legally)
  - Available 24 hours a day, 365 days a year in multiple languages
  - Toll-free number
  - Anybody can raise questions
  - Operated by a third party (to guarantee confidentiality)

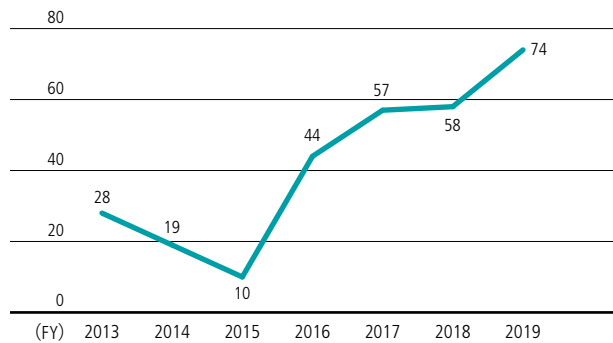
Managers who received the report from their colleagues must file the designated reporting form (Manager's Report Form) if he/she believes that it has a potentially adverse or negative legal, financial or reputational impact on NSG Group.



Any form of retaliation against an individual who has reported a concern or incident in good faith shall not be tolerated.

NSG Group constantly measures the effectiveness of the system by using the metrics against the industry benchmark region by region.

### Number of reported concerns



# SUSTAINABILITY



**Shiro Kobayashi**

Executive Officer  
Head of Group Sustainability

Mitigating risks associated with climate change are an opportunity for NSG group to make a positive contribution to our environment

Glass is playing an important role in society's efforts to reduce greenhouse gas emissions and to mitigate the effects of climate change. We aim to be the global leader in innovative high-performance glass and glazing solutions, contributing to energy conservation and generation, while working safely and ethically. Glass markets are extremely competitive around the world and it is imperative that we can meet the ever-increasing demands of customers.

Our sustainability agenda is integral to decreasing our costs and increasing our market opportunities. Over the past year, we have continued our efficiency programs in areas such as energy reduction, greenhouse gas emissions and waste recycling, which can have a significant and swift impact on the business performance of the Group.

Mitigating risks associated with climate change are an opportunity for NSG Group to make a positive contribution to our environment. With our planned commitment to Science-Based Targets we will aggressively reduce absolute CO<sub>2</sub> emissions generated in our glass manufacturing processes. In combination with increasing the development of environmentally beneficial products, this will become the basis for the NSG Group climate change strategy.

We train and develop our people while respecting their human rights, improving Inclusion & Diversity and keeping them safe from workplace injuries or occupational illness. We encourage our contractors and supply chain to take similar steps through the ongoing evaluation of our key suppliers' sustainability practices. We continue to keep good relationships with local communities.

## Materiality

For the purposes of this Report, we consider material information to be of greatest interest to, and which has the potential to affect the perception of, those stakeholders who wish to make informed decisions and judgments about the Company's commitment to environmental, social and economic progress.

The NSG Group Sustainability Committee agreed on material issues based on the Group's key impacts and stakeholder feedback throughout the year. These material issues have influenced our Sustainability Targets.

Financial issues are of the highest importance to

stakeholders. Financial health remains a critical issue to NSG Group and cost reductions are vital to our strategy and everyday activities.

People are NSG Group's most important asset. Inclusion & Diversity is a key issue for our global organization, being widely recognized as enhancing both corporate value and the working lives of employees. We provide leadership and development programs for our employees to develop their capability. Feedback from an employee engagement survey has led to improved learning and development plans and a healthy and motivated workforce. The minimization of safety

risks is important to all stakeholders and our management program is aimed at protecting the workforce. Our reputation is integral to the success of NSG Group. We are committed to demonstrating good corporate governance and ethical business practice to satisfy increasing shareholder and customer requirements.

We will execute the MTP Phase 2 in line with the Long-Term Strategic Vision within our Corporate Governance Guidelines. Group policies on compliance and reporting of concerns have been updated to align with these guidelines. Our Code of Ethics reflects our dedication to doing business the right way whilst minimizing regulatory and reputational risk.

Operational energy use and associated CO<sub>2</sub> emissions have a significant environmental impact combined with cost, security and regulatory risks. Operational efficiency has always been a key business concern but is now of particular interest to government, investors and customers. Requirements from regulators and customers are providing opportunities for sustainable and innovative product design in a shift to Value-Added products.

Supply chain risks and impacts, especially those related to the sustainability of raw materials and the environmental and human rights performance of suppliers, are important for NSG Group and our customers. We assess key suppliers' sustainability practices to satisfy these concerns.

## Our Management Approach

We work with local communities and governments to ensure compliance and forward thinking. We do this directly and through our membership of trade associations, standards bodies and other organizations. We also work to influence legislation, particularly in energy conservation and emission regulation.

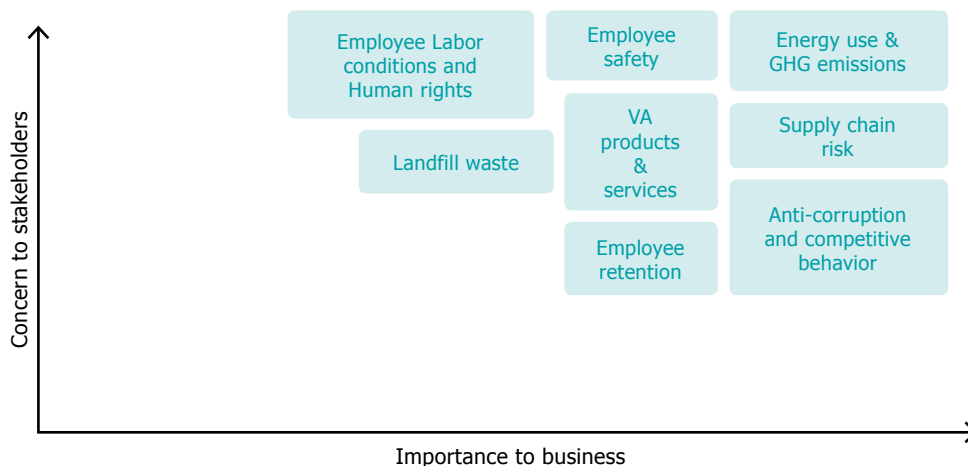
We have communicated our Supplier Code of Conduct to our suppliers and have conducted evaluations to verify the declarations we have received. Our products require raw materials that must be extracted from the earth. We take our responsibility to protect the natural habitats of the affected regions seriously.

NSG Group's Code of Ethics ensures that these activities are conducted in a safe, professional, legal and ethical manner, demonstrating corporate social responsibility and promoting sustainability.

Wherever possible, the Code defines a fair and common sense approach to doing business, with some elements dictated by strict legal requirements.

Our Group policies and procedures detail the procedures everyone in the Group must follow to achieve sound governance, tight controls, risk management and adherence to legal, ethical and sustainable principles.

### Outcome of materiality assessment



# TARGETS

Target	FY2020 targets	Progress in FY2019
<b>Safety</b>	<ul style="list-style-type: none"> <li>Reduce Significant Injury Rate by 10 percent per year with no fatalities</li> </ul>	<ul style="list-style-type: none"> <li>FY2019 was 3 percent worse than FY2018, but the average of three years was 2 percent improvement. There were no fatalities.</li> </ul>
<b>Waste</b>	<ul style="list-style-type: none"> <li>Reduce waste to landfill by 12kt (40 percent reduction vs. FY2014)</li> </ul>	<ul style="list-style-type: none"> <li>11.3kt reduction in FY2019 (37 percent reduction vs. FY2014)</li> </ul>
<b>Energy and CO<sub>2</sub> reduction</b>	<ul style="list-style-type: none"> <li>One percent year on year reduction in CO<sub>2</sub> intensity across glass manufacturing operations</li> </ul>	<ul style="list-style-type: none"> <li>NSG Group has achieved this one percent reduction target each year to FY2019.</li> </ul>
<b>Sustainable Value-Added products</b>	<ul style="list-style-type: none"> <li>Increase proportion of Value-Added products in total sales to 50 percent or more in FY2020</li> <li>Demonstrate the added environmental or social benefit of products</li> </ul>	<ul style="list-style-type: none"> <li>There has been a steady increase in the VA ratio and it was 46 percent in FY2019.</li> </ul>
<b>Responsible sourcing and transportation</b>	<ul style="list-style-type: none"> <li>10 percent year on year increase in Supplier Code of Conduct acceptance by our key suppliers</li> <li>Extend sustainability assessments for key suppliers and continue to monitor suppliers that use materials with a potentially high environmental impact</li> </ul>	<ul style="list-style-type: none"> <li>75 percent of Key suppliers have now agreed to SCoC or can demonstrate their own equivalent code. The Supplier Code of Conduct was last revised in 2017 to incorporate legislation, including modern slavery and human trafficking.</li> <li>We continued to improve our supplier sustainability evaluation.</li> <li>NSG Group continues to make good progress and has improved monitoring of suppliers with a potentially high environmental impact.</li> </ul>

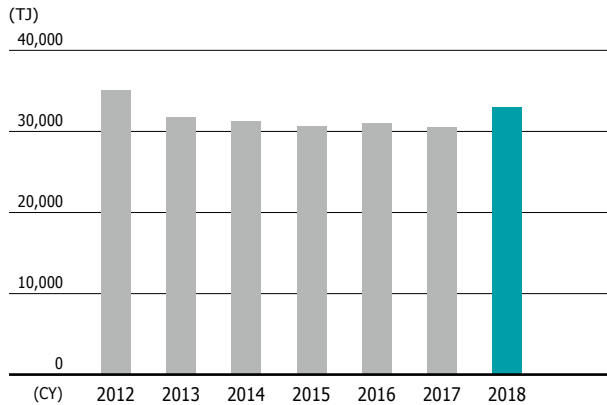
Target	FY2020 targets	Progress in FY2019
<b>Employees</b>	<ul style="list-style-type: none"> <li>• Improve the engagement score by 5 points by the end of FY2020</li> <li>• Train all managers in the new Appraisal Model and Talent System by the end of FY2019</li> <li>• Increase the skills of our newly appointed or prospective plant managers by 50 percent of the target population attending the Plant Leadership Program by the end of FY2020</li> <li>• Increase Inclusion &amp; Diversity awareness by training all managers with designated modules by the end of FY2020</li> </ul>	<ul style="list-style-type: none"> <li>• FY2019 engagement score was lower than previous year. This is mainly due to the expansion of the survey area in Asia. We are considering their feedback and working on further improvement.</li> <li>• Performance management training using SABA was completed by the end of March. SABA is the software supplier we have partnered with to introduce the global cloud-based talent management system.</li> <li>• Among the newly assigned plant managers and their candidates, 45 percent has completed SABA training. Additional workshops are scheduled for FY2020.</li> <li>• Selected managers completed training to 100 percent by FY2019. Awareness training continues to be issued to additional managers. All Strategy Business Units and Group Functions take specific actions in FY2020.</li> </ul>
<b>Ethics and Compliance</b>	<ul style="list-style-type: none"> <li>• Reissue Governance and Culture Leadership Assessment</li> <li>• Standardized New Employee Compliance Training Package</li> <li>• Ethics and Compliance Interview in the new appraisal system, SABA</li> <li>• Begin review of Code of Ethics</li> </ul>	<ul style="list-style-type: none"> <li>• Adopted regional E&amp;C structure</li> <li>• Preparing test out option for efficiency and effectiveness of annual online training campaign (Ongoing)</li> <li>• Conducted due diligence on third parties and sanction screen all business partners (Ongoing)</li> <li>• Conducted an annual Conflict of Interest assessment. Moving this to SharePoint site in line with other internal reporting systems regarding CC and ABAC, for consistency and usability (Ongoing).</li> </ul>

# ENERGY USAGE

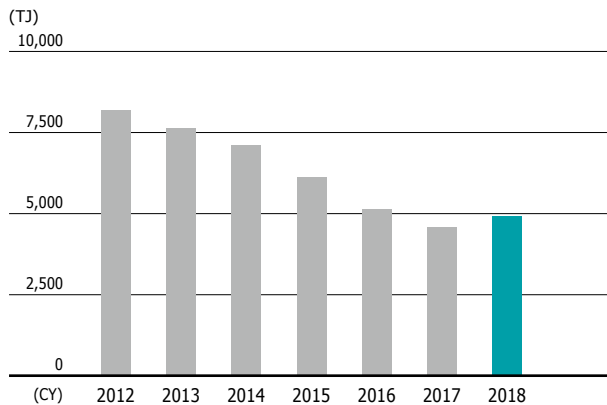
We work continuously to minimize energy input into all our processes, so that the usage of glass contributes net benefit to sustainability.

## NSG Group Energy Usage

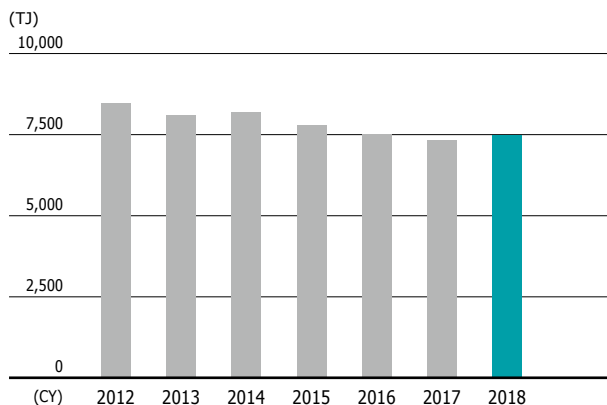
### Natural Gas



### Heavy Fuel Oil



### Electricity



## Our energy usage

For both environmental and financial reasons, we continue to use natural gas as the fuel of choice for glass melting. Furnaces continue to be converted from heavy fuel oil to gas. Small quantities of diesel and LPG are used for space heating and back up generators. See the graphs for consumption details.

## Initiatives to reduce energy usage

### Energy Committee

All initiatives are monitored by the Heads of SBUs and Group functions at six-monthly Energy Committee meetings, chaired by the Chief Operating Officer.

### Energy Core Team

A senior management team representing key functions including; manufacturing, engineering, procurement and R&D coordinate all energy project activities to ensure maximum engagement in the Group energy management program.

## Energy management pilot plants

The concept of the energy pilot plants is to make a step change reduction in energy consumption by using energy more efficiently and effectively. This initiative continues to expand across the Group with more than 25 sites engaged in the program. These sites represent in excess of 85 percent of NSG Group's energy spend.

Cross-functional pilot site teams are led locally by the plant manager, with proactive support from other Group functions, and extensive use is made of third-party suppliers. Over 500 projects have been implemented or continue to be evaluated.

## Operational energy-efficiency projects

The Operational Cost Saving program aims to reduce all operational costs in the areas of prime and overhead costs. One of the largest prime costs for the Group is energy.

To support the cost saving activities across sites, a deep analysis of all energy projects within the OCS database is regularly completed. Multiple projects were identified for rapid dissemination in FY2019 to deliver energy consumption and cost savings. Each manufacturing site within the Group had at least one active OCS energy project in FY2019.

Led by Manufacturing Excellence and assisted by other Group functions, NSG Group sites identified more than 200 energy-optimization opportunities, resulting in annual CO<sub>2</sub> savings in excess of 20kt.

Major projects include furnace fuel combustion optimization, reducing electrical requirements of motors optimizing compressed air systems, energy sub metering,



energy efficient lighting, fuel switching, cogeneration processes, waste heat and energy recovery.

An initiative to engage in Industry 4.0 or Internet of Things (IoT) for energy management was launched. This includes analytics of process data including energy metering with the goal of optimization of energy consumption. The analytics also support the identification and development of new projects, such as identifying energy waste & management of tariffs.

A directory of potential novel technologies available across the glass industry continues to be developed, including recommendations for appropriate application at Group sites.

### R&D activity

Reducing CO<sub>2</sub> emissions and maintaining the security of energy supply for our furnaces will remain fundamental to our continued business. Implementation of incremental technology changes will be required in the short term to minimize capital expenditure.

Project Carbon 2050 was launched in 2018 to support development and implementation of a decarbonization roadmap that identifies the technologies, barriers and financial investments required to achieve significant carbon emission reductions in float manufacturing by 2050.

### Management systems

We have maintained ISO 50001 certification across all operations in Germany, Italy, Finland and the Automotive engineering function. Investment in sub-metering hardware and software installations allows a high level of transparency in energy consumption and enables a sophisticated energy-planning process with improvement activities, target setting and frequent reviews to be established.

### Energy Savings Opportunity Scheme (ESOS)

All UK manufacturing sites are continuing to participate in the UK government Energy Savings Opportunity Scheme (ESOS). Currently in phase 2, the scheme is linked to the UK government commitment to the EU Energy Directive article 8. Sites are assessed by certified external auditors with the aim of identifying viable energy saving project activities. The assessment includes verification of energy consumption data and site energy audits which result in a set of published recommendations signed off by a UK senior management representative. A number of initiatives identified within the scheme have been implemented and disseminated across other regions. Similar schemes exist in several EU and other countries either at a mandatory or voluntary level with many sites participating.

### Renewable on-site energy generation and alternative fuels

We have installed an on-site photovoltaic generation facility

at our technical center in Lathom, UK. This facility will provide 30 percent of the site's annual electricity demand.

Our Rossford technical center in North America produces about 7 percent of its own electricity with on-site photovoltaic generation. We also have photovoltaic panels on the roof and former car parking areas of our German Weiherhammer plant.

We continue to evaluate and utilize alternative low carbon / renewable fuel sources across the Group operations. This includes use of waste derived biofuel oil which cuts CO<sub>2</sub> emissions on a furnace by 8kt / year.

### Partnership with suppliers

We continue to partner with key suppliers to develop projects to reduce energy consumption in our manufacturing sites.

Close collaboration with leaders in specific technologies is enabling us to implement optimum solutions to specific energy management challenges. Collaborative projects undertaken include, addressing compressor inefficiency, to make better use of waste heat generated in our glass-making processes and to reduce peaks in electricity demand.

### Innovation in cullet recycling

Our Watson Street plant continues to invest in plastic boxes to travel on float liners with customer glass deliveries. The collected downstream processed cullet is diverted from landfill and, when re-melted, reduces energy consumption and raw material decomposition, saving 3,000 tonnes CO<sub>2</sub> emissions per year.

Our VASA automotive glass plant in Argentina has invested in technology to allow the re-use of laminated glass back into the furnace. The process involved allows a previously unsuitable source of material to now be reused resulting in significant energy efficiency gains and CO<sub>2</sub> savings.



Laminated glass cullet



### Employee energy efficiency awareness

An energy management training program, designed to help the Group deliver cost savings and reduced CO<sub>2</sub> emissions, has been rolled out through Japan & SE Asia.

The program is the next stage of the initiative launched in 2016, and already delivered across European and South American operations.

Japan, Vietnam and Malaysia site energy champions were involved in a 'back to school' initiative that will increase levels of energy awareness and support the on-going generation of energy management project activities.

The key aspect of the training was to help the delegates understand the approach to energy management, how they can identify and implement activities at their sites and encourage others to do so.

To date, the training has directly involved more than 60 delegates, with identification and implementation of over 150 projects.

Energy savings have exceeded ¥64.5 million, and reduced CO<sub>2</sub> emissions by more than 1,500 tonnes.

The initiative comprises three levels of training, with level 1 involving 50 hours in all aspects of energy management. The course was organized with the support of local functional teams and was led by David Cast, Climate Change Director, NSG Group.

It was designed to support site energy management activities and give formal qualifications to the delegates with the cost of the course being recovered by the delegates identifying and delivering energy cost-saving projects.

Following successful completion of level 1, delegates were encouraged, where appropriate to their role, to continue energy management training with external organizations leading to level 2 and level 3 qualifications.

### Project examples that have been implemented so far include:

- LED lighting replacement and controls
- Staff awareness campaigns including 'shut-off' activity and inappropriate energy use
- Replacement of motors & drives with variable speed devices
- Optimizing combustion set up in furnaces and boilers
- Introducing energy 'mini audits' in daily routines (part of 5S activities)



European Team (2016)



South American Teams (2017)



Japan & SE Asia Training (2018)

## Lathom Solar Project

NSG Group and Lightsource BP have installed and connected a 2.3MW solar installation at the European Technical Centre in Lathom, Lancashire, UK. The site is anticipated to provide 30 percent of the facility's annual electricity demand.

This project was developed and funded entirely by Lightsource BP, with no capital investment required from NSG Group and no disruption to their daily operations during construction. NSG Group buys the clean, renewable electricity via a Power Purchase Agreement (PPA) with Lightsource BP, which provides a fixed, index-linked rate designed to hedge against future price fluctuations and deliver operational savings over the 25-year contract period.

This project is especially significant for both Lightsource BP and NSG Group as the installation showcases one of the glass manufacturer's own products. The solar modules selected were sourced from First Solar, one of NSG Group's largest global customers. Research and development for the glass contained within the solar modules was conducted at the European Technical Centre itself, where operations will now be powered by their own hard work.

As well as reducing electricity costs, the solar installation is a crucial part of NSG Group's drive to improve our sustainability credentials, and this project will help us meet carbon reduction targets by saving an estimated 848 tonnes in emissions each year – the equivalent of taking 180 family cars off the road.



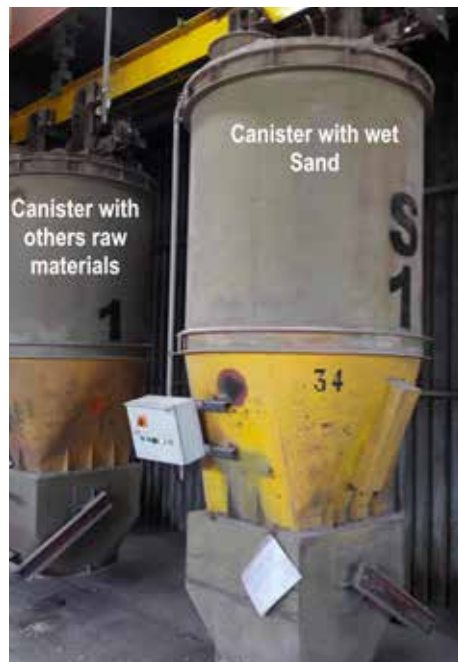
Lathom

## Wet Sand Project in San Salvo

A project was delivered at the San Salvo site, Italy to eliminate the sand drying process on the unique canister batch plant to improve both employee health & safety and reduce site energy consumption.

By modifying the process to allow the use of wet sand, the amount of sand dust has been significantly reduced and the consumption of natural gas for drying the sand has been eliminated. Benefits of the project include a reduction of 900kSm<sup>3</sup> Natural Gas consumption and 1900t CO<sub>2</sub> saved annually.

The project was an excellent collaboration between local site teams and the R&D function.



New Canister

# AIR EMISSIONS

The main emissions from a flat glass furnace come from the combustion of fuel and the decomposition of the carbonate and sulphate raw materials. The raw materials are melted at a very high temperature so the process is extremely energy-intensive.

## Emissions to air

The most significant pollutants from a glass furnace are: nitrogen oxides formed from the nitrogen and oxygen in the air at high temperature; sulfur oxides from the refining agent (and from oil fuel if that is used); and particulate matter derived from compounds volatilized from the molten glass. Carbon dioxide comes from both the decomposition of carbonates and from combusted fuels.

We are tackling pollutant air emissions with a range of primary and secondary abatement techniques. Primary methods, such as special burners or carefully-chosen raw materials, including more cullet (recycled glass), reduce pollutant formation and can also improve the thermal performance of the furnaces.

Secondary abatement removes the pollutants from the furnace waste gases before they are emitted through the chimney.

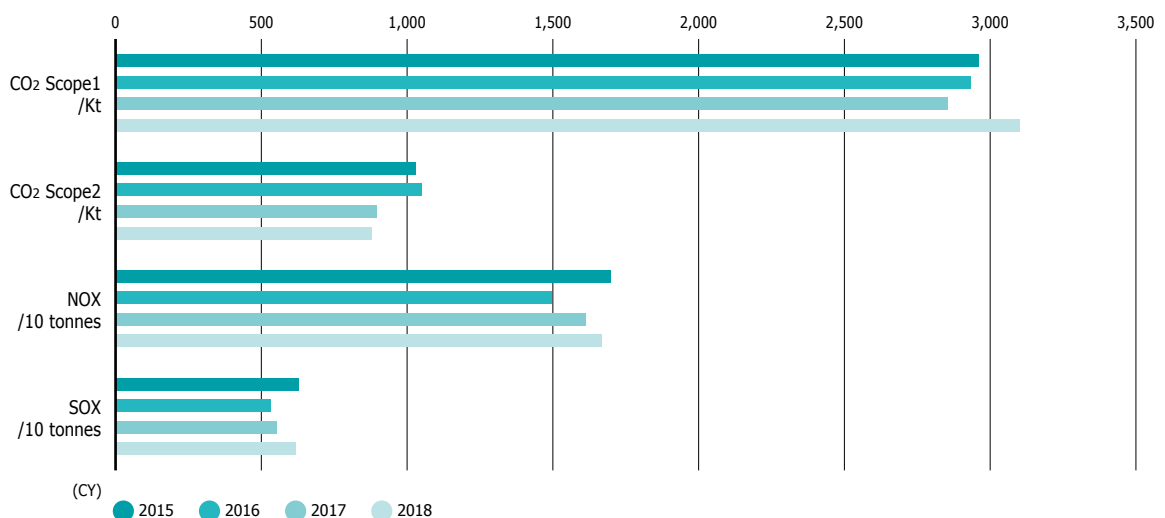
Until recently, the furnace emission pollution control plants in operation around NSG Group have all been based on standard technology. This removes the pollutants from the waste gases in three stages: alkali is injected into a scrubber to remove acid gases, the resultant reaction products and particulate emissions are then collected in an electrostatic precipitator, and finally nitrogen oxide is removed using ammonia injected into a selective catalytic reduction unit. However, the latest pollution control plant built by NSG Group uses a novel technique called a catalytic ceramic filter, or CCF.

## Novel pollution control plant installed at Ottawa

The abatement plant just installed on NSG Group's OT1 furnace in Ottawa, USA, is a CCF unit purchased from McGill AirClean. The system is based on thousands of ceramic filters, or "candles", in a single unit. Alkali, in this case lime, is added to the waste gas and the resultant reaction products and primary particles are collected by the filter. The novelty of the process is that the fibers of the filters are coated with a metal catalyst so when the gases pass through the structure nitrogen oxides are also removed. It is expected that CCF technology will become the standard for new furnace pollution control plant throughout NSG group.



## Air Emissions





## Monitoring and reducing carbon emissions

In 2018, NSG Group was responsible for the emission of 4.0 million tonnes of CO<sub>2</sub>e. This is a six percent increase on the previous year due to the recommissioning of furnaces balanced against increased renewable electricity and many proactive operational cost saving initiatives described in the energy use section.

Our Scope 1 emissions were 3.1 million tonnes. These direct emissions occur from our furnaces and from fuel used in bending and toughening furnaces. In 2018, our measured Scope 2 indirect emissions were 0.9 million tonnes of CO<sub>2</sub> and our estimated Scope 3 emissions were 2.3 million tonnes CO<sub>2</sub>e. In the operation of our float plants, heavy oil to natural gas conversion has helped to reduce carbon emissions by around 50 percent over the past 40 years and a combination of design and operational innovations has made further progress. We aim to reduce CO<sub>2</sub> emissions per tonne of equivalent product by one percent per year until 2020. This target has been achieved year on year for the last five years.

	Tonnes CO <sub>2</sub> e / tonne equivalent product	Percentage improvement
FY2019	<b>0.73</b>	2.1
FY2018	<b>0.75</b>	1.4
FY2017	<b>0.76</b>	1.5
FY2016	<b>0.77</b>	1.5
FY2015	<b>0.78</b>	1.2

## Recycled glass to improve efficiency and reduce emissions

Glass for recycling is a valuable resource. Wherever quality allows, we recycle any glass off-cuts or cullet within our own glass melting lines. Glass from our downstream operations and from our customers represents a potentially useful resource to us. We gain a double benefit from the use of such cullet: its use to make glass reduces the requirement for raw materials and avoids disposing of what would otherwise be a waste material and closes the recycling loop.

Ten percent cullet use saves three percent furnace energy and leads to reductions in CO<sub>2</sub> emissions. One of our sites has manufactured glass using only cullet.

Cullet return projects are ongoing to try to minimize the need for virgin raw materials.

Landfill is the least favored disposal option.

If glass is produced that cannot be remelted on-site, it is sent, where practicable, for external recycling.

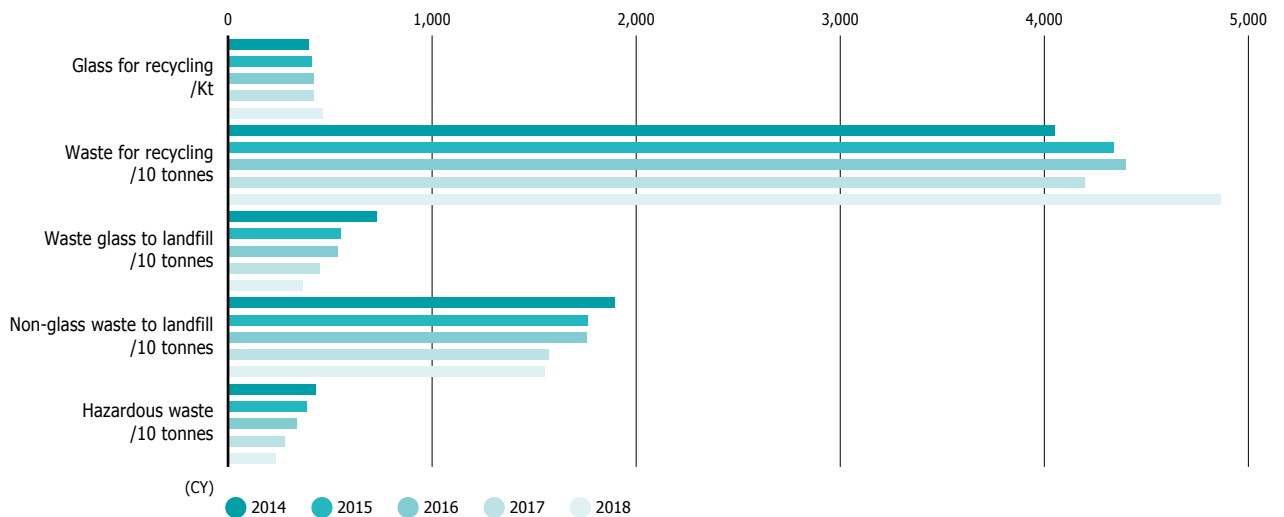
## Reduction of CO<sub>2</sub> emission at NGFE

The drive belt reinforcement cords manufactured by NSG Glass Fiber Europe (NGFE) in St Helens are made from glass fibers with two layers of special organic materials applied in coating ovens. The fumes from these primary and secondary coating processes are emitted through pollution abatement processes that are now undergoing refurbishment. The original primary coating treatment process sent the emissions through a recuperative incinerator and the energy was recovered to heat the ovens. It was realized that the concentration of the pollutants in the unabated emissions from the primary coaters was actually lower than the regulated limit and incineration was not only unnecessary but generating carbon dioxide and adding to climate change. However, improvement was not simply a case of emitting the unabated fumes through the existing chimney because there was the possibility of an odour problem affecting the local area. Using meteorological and topographical data for St Helens, R&D experts at NSG Group's Technology Centre at nearby Lathom were able to predict the required height of the new chimney to ensure ground level concentrations were never above the odour threshold. With support from Group Engineering, NGFE has now installed a new primary coater fume abatement process that directly heats the ovens, while lowering operational costs by reducing fuel, and at the same time reducing the emission of carbon dioxide by more than three thousand tonnes per year. This is a great example of the efforts of R&D, Group Engineering and site management combining to deliver a sustainable improvement to NSG Group businesses.



# RESOURCES AND RECYCLING

NSG Group promotes the efficient use, reuse, recovery and recycling of glass and other materials involved in glass manufacture, processing, packaging, and delivery.



## Waste sent to Landfill

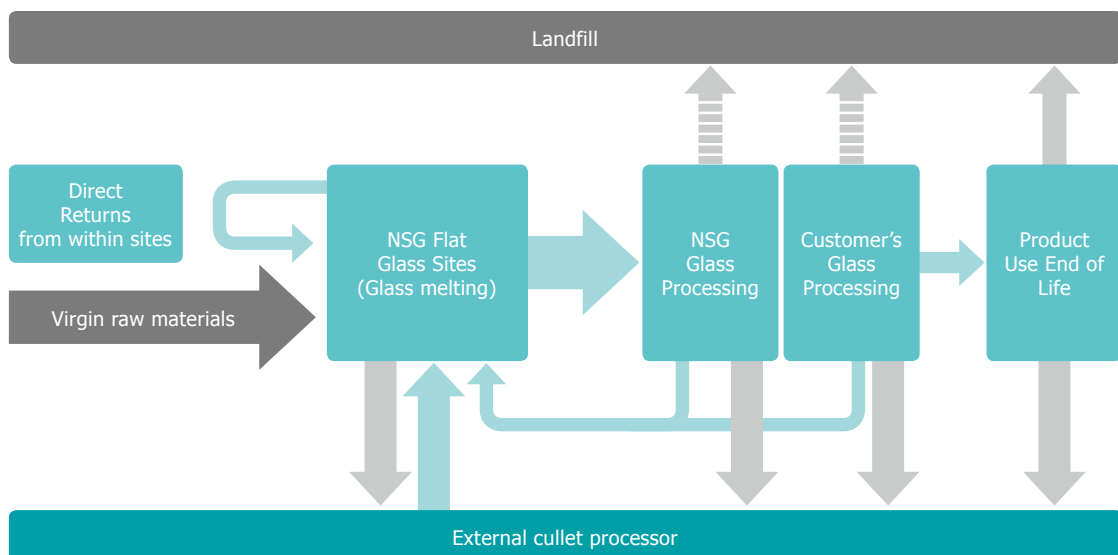
NSG Group reduced the waste sent to landfill by 50 percent up to 2013 versus the selected baseline year 2007. NSG Group set a new Sustainability target to reduce this environmental impact by an additional 40 percent (12 kt) on FY2014 by the end of FY2020. The result of FY2019 (37% reduction) is already close to that target and showing a 5% improvement versus FY2018, however with an inconsistent improvement performance of the individual sites. Additional actions are being taken at sites which are not yet showing the expected reduction of waste to landfill.

## Recycling of Glass

The glass manufacturing process itself produces very little waste material. All trimmed glass from the manufacturing processes of raw float glass plates is recycled back into the melting process. Cullet and rejected parts from further glass processing for Automotive or Architectural Glazing parts is recycled at the NSG Group glass melting process or given to external glass recycling partners.

Little glass cullet from Glass processing (3.4 kt in 2018) is sent to landfill – which is included in our related Sustainability improvement target and activities.

### ■ Cullet flow





## Grinding sludge

The waste stream from grinding of automotive glass edges and glass drilling cannot be prevented, but we have been actively seeking recycling partners to divert this waste from landfill and provide a raw material for concrete products and other aggregate manufacturers.

## Float rejected raw material

In 2018, we continued to seek recycling opportunities for glass dust and rejected batch – occasional off-specification raw material that often cannot be blended and dust collected by the pollution abatement equipment. Automated process monitoring and control systems are being implemented to proactively reduce the number of reject batches at our Rossford plant; while our Ottawa plant installed a new equipment to reduce batch spillage.

## General waste

Focus and support have been given to the highest volume producers to further improve general waste segregation, and procurement has been actively involved in finding local recycling partners.

## Automotive glazing components

In Automotive, all supplied glazing parts and their materials are registered in the global IMDS (International Material Data System) to ensure we have complete visibility of components confirm material compliance and to identify opportunities for recycling.

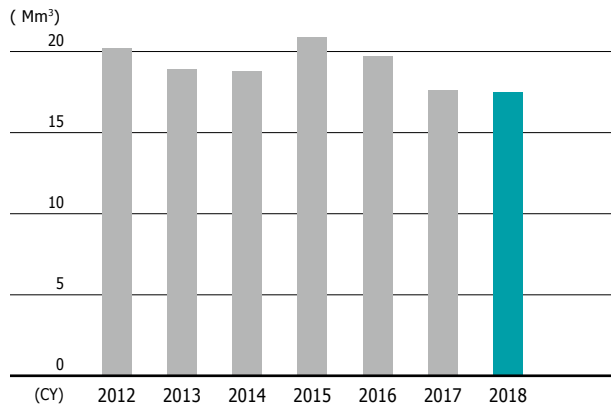
This data is shared with our Automotive customers to support their own material compliance and recycling efforts.

## Water management

In glass-making, water is used for cooling, and most of our plants operate with closed loop systems and so only require top up. Water is also used for washing glass in plants but there the need is for very high purity, so water is treated and then reused. We seek to minimize our water consumption by working with suppliers to recycle water and to install advanced water treatment facilities. This not only reduces the consumption of water itself but also the chemicals used in the treatment of the water. Across the Group, water consumption can vary considerably according to process and product demands as well as water quality. Approximately 2m<sup>3</sup> are required to manufacture one tonne of float glass and approximately 0.09 cubic meters are required to process each square meter of automotive product. We drew a total of 17.5 million cubic meters of water in 2018. Our Group risk assessment shows that our largest water consuming sites are located in countries that do not have water supply issues.

## NSG Group water usage

### ■ Total water use



## Handover of the award trophy to the team at Versailles

Amongst other good water saving projects, the water project at the Automotive downstream site Versailles, Kentucky won the internal Environmental Award 2018. The project recovers and re-uses water from numerous glass washing machines, resulting in significant savings of >200,000 m<sup>3</sup> water per year.



## Timber

In Europe, much of our glass is transported on steel stillages - in cycles with the customers - without packaging and utilizing specialist 'Floatliner' vehicles for the large raw glass plates. We use a significant quantity of wooden packaging in our operations and work with our suppliers to design reusable units. Due diligence is carried out to ensure it comes from legal and sustainable sources.

# SUPPLIERS

We purchase materials, goods and services from more than 20,000 suppliers worldwide. In support of Group Environmental Social Governance (ESG) goals, we are focused on ensuring our supply base is sustainable. Through our policies and procedures, as well as using reports by partners such as Ecovadis, we are working to mitigate risk in our supply base. The following key areas are included within our drive for sustainability.

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## Our Supplier Code of Conduct

As part of our Sustainable Procurement Program, we operate a Supplier Code of Conduct. It outlines behaviors, processes and procedures — in short, the standards we expect from our suppliers. Our manufacturing processes use materials, products and services procured from a wide range of regional and global suppliers. Our suppliers are therefore crucial to the achievement of our sustainability objectives. To manufacture and supply superior quality glass products to our customers, we aim to build strong relationships with suppliers that are based on a framework of trust, cooperation and sustainability.

The wide range of issues addressed in the Code reflect the many and diverse activities in which our suppliers are involved. Wherever possible, the Code defines a fair and common sense approach to doing business, while incorporating all relevant legal requirements.

The content of the Code also takes into account our values and principles, particularly the emphasis on safety, taking personal ownership for our actions and communicating with openness and involvement. It is the responsibility of all our suppliers to follow the principles of this Code to ensure compliance with our requirements.

Insisting that our suppliers agree to adhere to our Code has influenced who we develop longer-term relationships with as part of our category strategies and who we do not. It has also prioritized which suppliers we need to develop and help to ensure full compliance.

The Code is updated periodically to accommodate changes in legislation. The most recent updates include money laundering, modern slavery, human trafficking and Conflict Minerals.

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## Modern Slavery and Trafficking - Due Diligence Processes for Suppliers

Our Supplier Code of Conduct specifically covers this area. It is communicated to all current and new suppliers and we have already obtained agreement to its provisions from the majority of our key contracted suppliers. We operate a supplier sustainability program, which has detailed questions on compliance with labor laws.

Our supplier audits include coverage of this area.

We have a hotline available to all NSG Group employees and third parties that can be used to report suspected violations of human rights. Reporters may be anonymous in most countries and all reporters are protected from retaliation in any form.

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## Conflict Minerals

NSG Group supports the goals and objectives of the Dodd-Frank Wall Street Reform and Consumer Protection Act's Section 1502, which aims to prevent the use of conflict minerals that directly or indirectly finance or benefit armed groups in The Democratic Republic of the Congo (DRC) or an adjoining country as defined in the Act.

Identifying suppliers who provide materials that could potentially include these minerals is now a very important part of our procedures and due diligence continues to be completed via an online questionnaire. During FY2019 we once again updated data from these suppliers.

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## Anti-Bribery Anti-Corruption (ABAC)

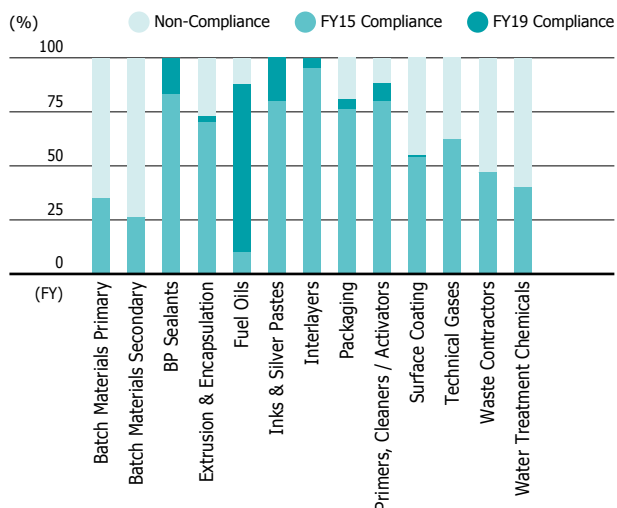
NSG Group and its subsidiaries do business with a range of persons and entities in the private sector including, but not limited to, agents, consultants, distributors, service providers, freight forwarders and customs clearance agents (collectively, "Third-Parties"). NSG Group sometimes engages Third-Parties to represent its interests or to interact on its behalf with Public Officials such as customs brokers, lawyers, lobbyists, standards committees, or other intermediary activities. Acting on behalf of NSG Group is not limited to those situations where the third party represents the Group as an attorney-in-fact. It also applies to those situations where they represent the Group's interests whether or not they are interacting with public officials or other entities in the private sector.

We continually review our suppliers in order to identify those considered to be a high ABAC risk. The NSG Group Ethics and Compliance function carries out due diligence that includes a questionnaire and screening process. The Third-Party may be screened against various lists including sanctions lists, watch lists, PEP (politically exposed persons' lists) and checked for exposure in adverse media.

## Communication and co-operation

In line with our Sustainability Policy, we communicate and work constructively with our suppliers and governments, regulatory agencies, the scientific community and other relevant stakeholders to develop and encourage business and community practices that make progress towards the common aim of sustainable development.

### Ranking supplier risk on the environment HEI Compliance FY2015-FY2019



In recent years we have implemented a program of identifying suppliers that have a potentially high impact on the environment (categorized as HEI). Our aim is to ensure that our suppliers minimize their potentially negative impacts and work positively on environmental initiatives. The scope covers 13 of our material categories, which we now categorize as being of 'High Environmental Impact', including wooden packaging, batch materials, waste-management contractors and chemicals. We expect that all suppliers in these categories have a recognized environmental certification such as ISO14001 or equivalent. In the case of wooden packaging, paper and cardboard, we look for a recognized chain of custody (e.g. FSC or PEFC) in regard to the raw material supply.

## Energy Efficiency and CO<sub>2</sub> reduction

For more than seven years, NSG Group has been implementing a globally co-ordinated and supported energy-efficiency program across its operations. The program combines central resources from Research and Development, Procurement and Manufacturing Excellence function together with local teams in a cross-functional effort focused on reducing our energy consumption and costs across the entire Group.

Each major site in the Group has undergone a structured process involving several days at the site working on all aspects of its consumption of natural gas, oil, electricity, diesel, water and other utilities. No stone is left unturned in the search for opportunities to reduce consumption and cost. The initial workshops to identify the areas of opportunity are only the beginning. The projects identified at the workshop are scoped in detail and evaluated and prioritized for implementation. Some ideas are quick to put in place and require little or no investment. Other projects require much longer to implement, and in some cases they require many thousands or even millions of dollars to realize.

## Working with suppliers to save energy

We continue to work with key suppliers to develop projects to reduce energy and water consumption in our manufacturing sites, utilizing their expertise in various technologies to develop solutions to specific energy management challenges.

## Renewable electricity

We are working to ensure that the electricity we consume comes from more sustainable sources. Since 2017, we have been implementing renewable energy guarantee of origin (REGO) contracts across the majority of our European electricity consumption reducing our CO<sub>2</sub> emissions by almost 200,000 tonnes. In 2020, we will be seeking to extend this concept across Europe and into other regions.

In April 2019, we also turned on a major on-site solar installation at the Lathom site in the UK. The solar installation, which has been implemented in partnership with Lightsource-BP, has a maximum capacity of 2.3MW in electrical output to supply 30 percent of the site's overall electricity demand. The installation has utilized First Solar's series 4 modules which contain the glass produced by NSG Group. A number of other on-site and near-site solar installations are currently under evaluation across the Group's operations.

# EMPLOYEES

Our management philosophy values the health and safety of our employees above all other considerations and we aim to ensure that we provide a working environment that allows our people to reach their full potential and meet our customers' expectations.

Safety, Quality, Customer Focus, Sustainability and Ethical Leadership underpin everything we do, with the principles of trust, mutual respect and open communication being central to our Employment Policies.

## ■ Focus on NSG Group

	Group
Permanent Male FTEs	22,482
Permanent Female FTEs (15%)	4,089
<b>Total Permanent FTEs</b>	<b>26,571</b>
Temporary Male FTEs	2,186
Temporary Female FTEs (23%)	643
<b>Total Temporary FTEs</b>	<b>2,829</b>
<b>Total Male FTEs</b>	<b>24,668</b>
<b>Total Female FTEs</b>	<b>4,732</b>
<b>Total FTEs</b>	<b>29,400</b>
Full-time Male employees	24,485
Full-time Female employees (16%)	4,606
Part-time Male employees	123
Part-time Female employees (2%)	115
<b>Total</b>	<b>29,329</b>
Male Managers	2,258
Female Managers (12%)	330
<b>Total Managers</b>	<b>2,588</b>

Data collected end December 2018

## Ethics and Inclusion & Diversity

Our Code of Ethics reflects our Integrity, as articulated in our Core Values, and forms part of the newly-introduced "Our Vision". It defines what is expected of all our employees. It particularly emphasises safety, respecting human rights, taking personal ownership for actions and communicating with openness and involvement.

The overriding basis of the Code is that we will carry out our business activities in a safe, professional, legal and ethical manner, and in a way that demonstrates corporate social responsibility and sustainability.

The Code acknowledges internationally proclaimed human rights and these are also reflected in our overall employment policies and standards, providing our employees with reassurance on how they will be treated. Our Equal Opportunity and Diversity policy aims to prohibit discrimination based on race, color, creed, religion and beliefs, age, gender, sexual orientation, national origin, disability, union membership, political affiliation, or any other status protected by law.

Global Inclusion and Diversity (I&D) is a key issue for many companies, being widely recognized as enhancing both corporate value and the working lives of employees. NSG Group is firmly committed to further improve its own I&D,

embracing the internally and externally declared Statement of Intent and one of our Core Values, "Respect Others and Unleash their Potential".

At our Group Conference in November 2018, our senior executive leaders had their first I&D-focused session. They discussed and agreed on I&D commitments by SBUs and Functions. Each SBU and Function has now set their own actions following these initial commitments. NSG Group will be reviewing the progress of these actions quarterly throughout the coming year to ensure that we are making continuous progress on I&D with support from our Global I&D Steering Group.

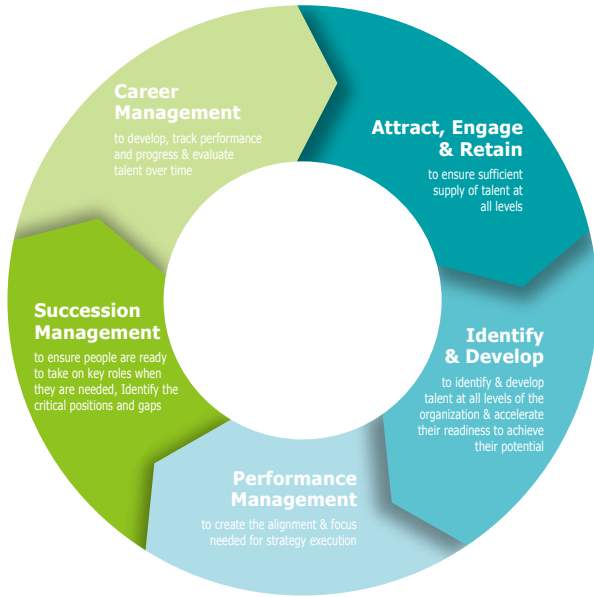
To raise I&D awareness internally, I&D posters were distributed across the organization. An I&D Newsletter is issued regularly, and globally acknowledges International Women's Day every March. Unconscious Bias Training was provided initially to senior leaders in the firm belief that they can help make our corporate culture more diverse and inclusive by demonstrating their own inclusive leadership behaviors to their teams. This training will be rolled out to a wider management population during FY2020. Women's networks have been launched in North America and Japan, and the Group is now developing an Employee Resource Group Guideline to encourage grassroots I&D activities on a wider basis.

## NSG Group Talent Management

During 2018, as part of our wider Talent Strategy supporting the Group's Vision and Values, we implemented the new Talent Management system, which involved transferring global employee records and data to our new software, along with providing comprehensive training for all our managers in the new people management and talent development processes.

During the Management Training, we revised our company approach to Performance Management discussions; from 2019 the discussions identify and place emphasis on the Impact and Value individuals are having in their role. These discussions include using our NSG Group Competency Model as a tool which helps Managers link the Impact and Value model to the required behaviors that drive performance. Integrating our Competency Model globally across our core people processes, and providing greater access and visibility for Managers of Talent Management practices, continues to support and drive culture change. During 2019, our goal is to create and share Talent Pools and Succession Plans that Managers have co-ownership of and access to throughout

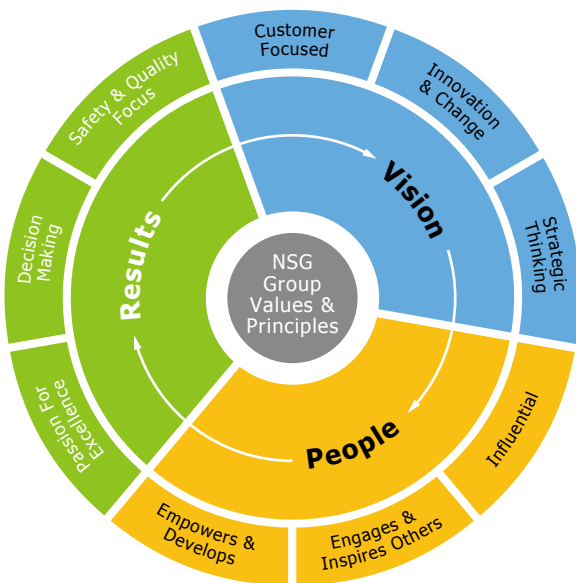
**Talent Management –Strategy**



the year, continuing to deliver a more transparent, dynamic approach to Talent Management.

During 2018, we enhanced our Leadership development portfolio and partnered with the University of Lancaster to design and deliver our first Plant Management Leadership Program. Through this global program, we have developed 24 individuals who are either new to the role or have been nominated into succession plans that support the recruitment of people as Plant Managers.

**NSG Group Competency Model**



“ Leaders are those who are able to engage and motivate our employees (People) and through them achieve short-term performance (Results) and long-term success (Vision) ”

**Employee Engagement**

We continue to use our Employee Survey to measure sustainable engagement within the Group. In 2018, the survey covered three regions (Europe, Asia, North America), 11 countries and involved 8,557 employees and achieved a response rate of 85 percent (7,254 employees).

The survey was open for completion for three weeks. The survey generated more than 2,658 comments, which were viewed by local Country Managers and Supervisors and action plans were put in place.

We continue to refine our question bank and keep a focus on encouraging Managers to implement their agreed action plans.

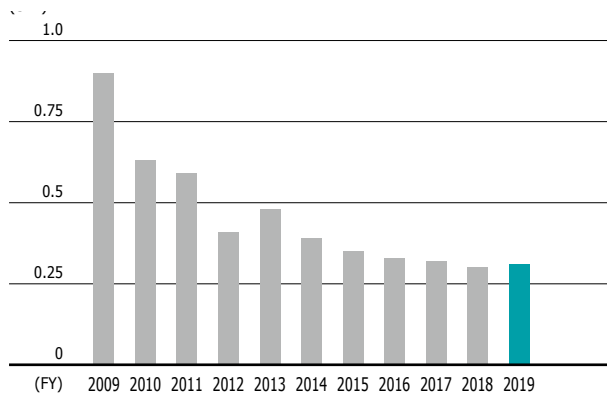
**Pulse Survey 2018**

-  The 2018 Pulse Employee Survey was accessible to 8,557 employees in 11 countries across 3 regions and available in 10 languages.
-  The questionnaire consisted of 25 'core' questions and in some areas, tailored 'supplementary' questions
-  The survey was open to completion for 3 weeks between September 24 - October 12, 2018.
-  135 online results reports generated
-  The question 'What one thing would make NSG Group a better place to work' generated more than 2,500 comments
-  Overall response rate remains high at 85%, with 7,254 people taking part in the survey

# HEALTH AND SAFETY

Our safety programs emphasize the importance of our vision and values, that people are our most important asset and the safety of our employees and the communities in which we operate is a core part of our ethical business philosophy.

## ■ Significant Injury Rate (SIR)



Percentage Significant Injuries	FY2015	FY2016	FY2017	FY2018	FY2019
Glass handling	30	30	38	45	<b>29</b>
Manual work	23	19	21	24	<b>35</b>
Slips/trips/falls	11	22	14	10	<b>16</b>
Engineering	14	0	0	0	<b>0</b>
Machinery	5	16	13	6	<b>6</b>
Blade	7	5	5	2	<b>6</b>
Fall from height	0	3	4	8	<b>2</b>
Others	10	5	5	5	<b>6</b>

## Safety organization and strategy

The NSG Group Sustainability Director reports to the Chief Operating Officer.

Monthly safety updates are provided to the COO while more in-depth management reviews are completed every six months with the senior operations team comprising the heads of the four SBUs and the heads of the Group functions. These reviews were held by round table in March 2018, Lathom in September 2018 and round table in March 2019.

All injuries at work are regarded as avoidable. We require full reporting of all incidents, no matter how minor, and appropriate investigation to ensure we learn from all such events.

The Group has a focused site approach that provides additional support and more regular reviews for sites that have more than a defined number of significant injuries.

## Safety performance

Safety improvement has been developed to focus on three main areas: leadership, specifically our first line leaders; managing our high risk activities and understanding the behaviors that lead to injuries. NSG Group drives proactive

safety through a measure called NABIS (NSG Anzen Bunka Improvement Strategy) this process has three main areas reflecting our focus points.

## Leadership

Asking our leaders at all levels of the business to show visible and demonstrated leadership, through discussion and spending more time in our production areas talking to leaders and teams about improvements using systems such as GEMBA walks.

Ensuring all our leaders assess themselves against our 10 key leadership behaviors, asking them to lead by example and to review their teams against a set of principles, such as never walking past an unsafe act without talking to the individual.

Responsibility and accountability of the leaders are to ensure that people follow the procedures and safety rules for the tasks we ask them to complete. This area also looks at how we consistently review the ability of their colleagues to competently complete the tasks.

Improving the way in which we communicate safety through regular opportunities for two-way briefings and more formal safety meetings with employees and their representatives is an important way of providing clear information on both reactive and proactive safety initiatives. Leadership teams are required to ensure this communication process is effective.

Training our colleagues is a fundamental part of delivering our services to our customers. Ensuring our employees have the tools and ability to deliver our commitments in a safe and ethical manner requires a continual review and update on training needs and competences. Leaders are required through NABIS to ensure that, from a safety point of view, people have the correct knowledge to complete this task.

Asking people to become proactively involved in safety in our plants is part of the leader's responsibility and in NABIS we ask our leadership teams to look for opportunities to involve teams and individuals in safety projects, with the implementation of suggestion schemes and participation in Kaizen processes across many of our larger manufacturing plant being a part of this process.

The second part of NABIS is measuring Safety 4 Ways, which includes:

- Safety Improvement Plans (SIP) – reducing hazards and risks through planned improvements of conditions and behaviors that lead to incidents.
- Incidents of High Potential Severity (IHPS) – reviewing all incidents with a critical eye, asking what could have happened and could the incident have led to a serious injury or fatality; then taking preventative actions.



- Key Safety Behaviors (KSB) – focus on how our employees complete tasks, working to reduce at-risk behaviors through frequent feedback.
- Significant Incident Rate (SIR) – The Significant Injury Rate (SIR) is our primary reactive indicator.  
The SIR records injuries requiring medical treatment or the reallocation of duties to allow an individual to continue working, expressed as a rate per 200,000 hours worked. The Significant Injury Rate for the year to March 31 2019 of 0.31 represents an 18 percent improvement in safety performance compared to FY2014 on a like-for-like basis. Finally, NABIS requires our leadership teams to manage our high-risk activities.

We are committed to our high-risk reduction program and the safety tools we have in place. We continue to focus on the following areas:

- Working where there is a risk of falling
- Vehicle and pedestrian safety
- Machinery safety: guarding, frequent access and complete isolation
- Contractor control, including permits
- Materials handling: moving glass, load security, grabs, trolleys and pallets
- Driving

### Next steps for NABIS

Our commitment to NABIS for larger sites has been completed with the introduction to all major manufacturing plants around the globe.

The next step for NABIS is for everyone working in NSG Group to be involved in some way in NABIS. To achieve this, the Sustainability Group has developed two new tools for implementation in FY20/21.

**NABIS for smaller sites:** NABIS continues to utilize the headings of the main NABIS tool. However, in the case for NABIS for smaller sites it takes into account the different operational and management requirement of smaller businesses within the group.

**NABIS for Offices:** This NABIS is for the functional and operational parts of our organization that do not have a standard manufacturing format and focuses on the risks identified by these functional groups and asks leaders to involve their teams in performance improvement relevant to their activities.

The combination of the three NABIS areas will eventually have all the employees of NSG Group involved in a NABIS activity.

After finding out that “manual work” was involved in 66 percent of the significant injuries, a program to address this issue was started in FY2020.

The Group is currently reviewing opportunities to improve the following areas to address the amount of manual work significant injuries it has by:

- Reviewing root causes and action identification from plant reactive measures such as incident and accident reporting.
- Completing an update of the Group’s PPE specifications for each SBU to further improve current standards, this will include more benchmarking between regional SBUs on suppliers and specifications.
- Leadership teams will need to look at training and the Group will review training techniques and support material specifically related to manual work.
- Development of new tools and applications (apps) to assist first-line leaders in training and observing manual work behaviors.

### Moving safety to the next level

The safety strategy remains the same, with a focus on improving the effectiveness of our safety tools and programs. We believe that our employees and leaders will make the difference in moving safety to the next level through the following initiatives:

- Independent audits of our safety tools to drive a more consistent approach, develop our safety skills and improve our shared learning. These audits were across regions and across sites within a region for maximum impact.
- Further improve our level of proactive employee involvement as a means of continuing to change our safety culture.
- Further develop our first-line supervisors to improve our overall level of safety leadership.

### NSG Group Annual Safety Day

The NSG Group Annual Safety Day took place on October 11, 2018 and continued to be a successful global event. All sites organized health-related activities and employees were given the opportunity to improve their first aid, firefighting and emergency response skills.

Senior managers attended sites to demonstrate their personal commitment and the opportunity was taken to celebrate safety success.

The focus in 2019 will be on mental health and well-being. In addition to the conventional safety activities, we are now asking the plants to consider the mental health and wellbeing of the employees.



# COMMUNITIES

We aim to be a good neighbor, wherever we operate. We have around 27,000 permanent employees, with principal operations in approximately 30 countries throughout Europe, Japan, North and South America, China and South and South East Asia.

The local communities throughout the world in which NSG Group operates are the foundation of our business and the lives of employees. Without a relationship of mutual benefit with these communities, the Group as a whole could not sustain its operation.

The effects of necessary investments on our communities are generally beneficial, bringing additional employment and economic benefits. For every investment we make, an impact assessment is conducted to ensure we understand and manage the likely effects on the community, the environment and the local economy.

As a responsible and often prominent member of the communities in which we operate, we believe it is important to be involved actively by leveraging our core business and management resources to help to address local issues.

## Aims and objectives

We want our operations to function in healthy, thriving communities and to be seen as a good neighbor to those communities.

We know that if we want to operate effectively and to be able to expand or change when the time is right, we need the goodwill that comes from being an active supporter of the community.

In addition to our business investments helping to sustain local operations, we also invest in the communities in which we operate.

We aim to help – through direct cash donations to charities and other projects or through in-kind resources – to improve the health of the community or tackle specific social issues. We operate programs that assess and manage the impacts of our operations on communities, including entering, operating and exiting.

We also involve our staff in providing a lead in developing our relationships with the communities in which we operate. This can take the form of matching contributions raised by staff or allowing staff time to make personal contributions of time and effort in local projects.

## Glass run in Poland

During the 1<sup>st</sup> Glass Run, which took place on September 16, 2018, the attendance was pretty high. The event was attended by 130 participants from Poland and other countries. Participants raced the 25-kilometer route between our two automotive plants: Pilkington Automotive Poland - in Chmielów and in Sandomierz. The entry fee was donated to the local orphanage in Skopanie. The residents of the Children's Home helped during the event as volunteers. The event turned out to be a great success, and the next run is planned for September, 2019.



### 1,000 Trees for 100<sup>th</sup> Anniversary of NSG Group

In recognition of the 100<sup>th</sup> anniversary of NSG Group, an initiative was launched to plant commemorative trees across the Group operations. In the UK, this included working with local schoolchildren to present the activities of NSG Group to reduce CO<sub>2</sub> impact and then plant over 200 trees across the NSG Technical Centre site.



### School improvements in Argentina

Every year since 2001, we hold a Community Day when we work with the families of our community. On this occasion, we collaborated with the kindergarten N°909, where around 200 people (adults and children) performed gardening tasks, painting walls, fences and blackboards. We also involved our permanent contractors, who provided electrical installations, masonry work and other jobs. Such activities allow us to strengthen links between our employees' families, work colleagues and members of the communities. Over the years we have collaborated with many schools and the very positive outcomes continually encourage and motivate.



### Support for research on inorganic materials in Japan

Nippon Sheet Glass Foundation for Materials Science and Engineering (NSG Group Foundation) was established by Nippon Sheet Glass Co., Ltd. in 1979 to commemorate the 60<sup>th</sup> anniversary of NSG Group. The NSG Group Foundation offers grants for research on inorganic materials used in various industries including IT and communication, biotechnology, energy, and environmental protection. Since its foundation, it has received 5,238 applications and disbursed a total of ¥1,664 million to 1,287 selected applicants. The NSG Group Foundation also offers grants for research themes on inorganic materials, carried out in overseas universities and institutes. Since 1992, it has received 547 applications and has disbursed a total of 912 thousand dollars to 144 selected applicants.



# NSG GROUP – CORPORATE HISTORY

In 2018, NSG Group marked its 100th anniversary. Since its foundation in 1918, NSG Group has continued to evolve. While sharing the 400-year-old Sumitomo Spirit, we are operating in markets around the world where our products have established a major presence in the architectural, automotive and technical glass sectors.



Futajima Plant in Fukuoka, Japan

**1920**

Flat glass production begun in Fukuoka, Japan.

**1920s-1940s**

Capacity expanded in line with domestic glass demand growth.

- New capacity added at the Futajima plant in 1920s.
- A new plant was built in Yokkaichi, Mie, in 1936.

**1950s-1960s**

The Company increased production capacity and expanded into the Automotive business.

- A new plant was built in Maizuru, Kyoto, in 1952.



Maizuru Plant in Kyoto, Japan

- A new plant was built in Chiba in 1964.

**1918**

America Japan Sheet Glass Co., Ltd. was established in Osaka, Japan.

**1931**

The Company name was changed to Nippon Sheet Glass Co., Ltd.

**1950**

The Company listed its shares on the Tokyo and other stock exchanges in Japan.

**1965**

The Company started the first float glass production in Asia, with the technology licensed from Pilkington. (Inventor of the float process)



First piece of float glass ever made in Asia

## 1970s-1980s

The automotive glass business grew and, in parallel, the Company began globalizing its architectural and automotive glass businesses.

- Manufacturing footprints were expanded in Kanagawa and Kyoto in 1970.
- The first overseas investment was made in Malaysia in 1971.
- Two automotive glass joint ventures were established, one in Mexico in 1975 and another in the USA in 1986.

## 1990s-2000s

Business expansion in Asia continued.

- An automotive glass joint venture was established in China in 1995.
- Two architectural glass joint ventures were established in Vietnam, one in 1995, another in 2007.



Vietnam Float Glass Co., Ltd.

## 2006~

With the acquisition of Pilkington plc, the Company fully globalized its architectural and automotive glass businesses. NSG Group has principal operations around the world and sales in 100 countries.

(As of March 31, 2019)

## 1970s-2000s

The Company focused on developing new products and technology. While setting up manufacturing sites in Japan, the Company also invested overseas, building the foundation for the Technical Glass business.

- SELFOC® was developed in 1968.



The SELFOC® is still core technology in NSG Group.

- The production of thin glass, UFF™, started in 1978.
- The glass fiber business was launched in 1979.
- The battery separator business was expanded through an acquisition in 2001.

## 1990s-2000s

The Company built a closer relationship with Pilkington.

- In 1990, the Company acquired a 20% stake in LOF, then a subsidiary of Pilkington.
- The Company acquired a share in Pilkington while divesting its stake in LOF in 2000.
- In 2001, with the increase in shareholding to 20%, Pilkington became an affiliate of the Company.



Lathom site, UK.

## 2008-2010s

The Company adopted the governance structure with "Three Committees" in 2008.

- The NSG Group Corporate Governance Guidelines were issued in 2015.

### 2009

The Company revealed the NSG Group Sustainability Policy and established the NSG Group Sustainability Committee.

### 2012

The Company participated in the UN Global Compact.

### 2014

In May 2014, the Company announced the Long-Term Strategic Vision and launched the Medium-Term Plan (MTP).

### 2015

The Company revised the NSG Group Code of Ethics.

### 2017

After a thorough review, the Company redefined the MTP and began MTP Phase 2 covering the three-year period from FY2018 to FY2020.

### 2018

The Company celebrated the Group's 100th anniversary and announced the new management principles, "Our Vision".

## 1979

The NSG Foundation was established to commemorate the 60th anniversary of the Company.

# SHAREHOLDER INFORMATION

(as of March 31, 2019)

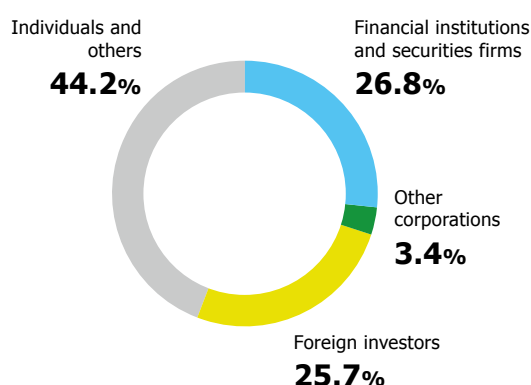
<b>Common shares</b>	Authorized Shares: 177,500,000 Issued Shares: 90,593,399	<b>Stock listing</b>	Tokyo (Code: 5202)
<b>Class A shares (as of June 30, 2019)</b>	Authorized Shares: 40,000 Issued Shares: 30,000	<b>Independent auditors</b>	Ernst & Young ShinNihon LLC
<b>Number of shareholders</b>	Common shares: 55,359 Class A shares: 3	<b>Transfer agent</b>	Sumitomo Mitsui Trust Bank, Limited 4-1, Marunouchi 1-chome, Chiyoda-ku, Tokyo, Japan

## Major Shareholders

Name	Number of shares (Common Shares)	Percentage of shares (%)
The Master Trust Bank of Japan, Ltd. (Trust Account)	6,218,200	6.86
Japan Trustee Services Bank, Ltd. (Trust Account)	4,284,200	4.72
JUNIPER	2,233,000	2.46
Japan Trustee Services Bank, Ltd. (Trust Account 5)	1,881,100	2.07
STATE STREET LONDON CARE OF STATE STREET BANK AND TRUST, BOSTON SSBTC A/C UK LONDON BRANCH CLIENTS – UNITED KINGDOM	1,834,400	2.02
THE BANK OF NEW YORK MELLON 140042	1,558,853	1.72
JP MORGAN CHASE BANK 385151	1,416,203	1.56
Japan Trustee Services Bank, Ltd. (Trust Account 1)	1,263,800	1.39
Japan Trustee Services Bank, Ltd. (Trust Account 2)	1,170,200	1.29
Client stock ownership of Nippon Sheet Glass	1,059,678	1.16

(Note) The shareholding ratio stated above is calculated by excluding the treasury stock from the total number of shares issued and rounded down to second decimal places.

## Share ratio in status of shareholders



	2015 March	2016 March	2017 March	2018 March	2019 March
Financial institutions and securities firms	23.2%	23.3%	22.5%	25.2%	26.8%
Other corporations	4.5%	5.0%	4.8%	4.4%	3.4%
Foreign investors	20.3%	15.3%	16.9%	22.0%	25.7%
Individuals and others	51.9%	56.4%	55.8%	48.4%	44.2%



# CORPORATE DATA

(as of March 31, 2019)

<b>Company name</b>	Nippon Sheet Glass Company, Limited
<b>Head office</b>	5-27, Mita 3-chome, Minato-ku, Tokyo 108-6321, Japan Telephone: +81-3-5443-9500
<b>Established</b>	November 22, 1918
<b>Number of permanent employees (consolidated)</b>	26,741
<b>Paid-in capital</b>	¥116,588 million

## Website

### About Us



<https://www.nsg.com/en/about-nsg>

### Investor Relations



<https://www.nsg.com/en/investors>

### Sustainability



<https://www.nsg.com/en/sustainability>

## Editing Policy

This is the second edition of the Integrated Report by NSG Group. The 2019 Integrated Report combines the separately published Sustainability Data Book, expands on non-financial data, and develops through a storyline the Company's value creation based on our unique strengths and technologies. The Group utilizes the Integrated Report as an important tool for communicating with investors. In the 2019 version however, we have worked to improve the content by referring also to the Guidance for Collaborative Value Creation. We will endeavor to further develop the Integrated Report by taking on board readers' feedback.

## Forward-Looking Statements

The projections contained in this document are based on information currently available to us and certain assumptions that we consider to be reasonable. Hence the actual results may differ. The major factors that may affect the results (but not limited to) are the economic and competitive environment in major markets, product supply and demand shifts, currency exchange and interest rate fluctuations, changes in supply of raw materials and fuel, and changes to laws and regulations.

## Further Information

In addition to this report, we provide other publications to keep investors informed about the Group's activities. For more information, visit [www.nsg.com](http://www.nsg.com)



