

C0. Introduction

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C0.1

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**(C0.1) Give a general description and introduction to your organization.**

The NSG Group (Nippon Sheet Glass Co., Ltd. and its group companies) is the world's leading supplier of glass and glazing systems, operating in the business areas of Architectural, Automotive and Creative Technology. The Group has principal operations around the world and sales in over 100 countries, employing approximately 26,000 people.

The Architectural business manufactures and supplies architectural glass as well as glass for the solar energy and other sectors. The Automotive business serves the original equipment (OE) and aftermarket replacement (AGR) glazing markets. Creative Technology comprises several discrete businesses, including lenses and light guides for printers and scanners, and speciality glass fibre products such as glass cord for timing belts and glass flake.

The Group offers various solutions based on its proprietary online coating technology, such as glass for thin-film solar panels, building integrated photovoltaic (BIPV), electrochromic windows and thermochromic glass, as well as low emission (low e) and vacuum glass. These products support the increasing and evolving requirements of society for more energy efficient and smarter buildings including zero emission buildings and houses (ZEB and ZEH). In the automotive industry, heated windshield and low e glass is expected to enhance energy saving of vehicles. Glass cord used in car engine timing belts, which can replace metal chains, also contributes to vehicles' weight reduction and energy saving. Not only are the products used to reduce energy consumption, but also to generate energy.

The Group conducts its business in accordance with the NSG Group Sustainability policy. The NSG Group considers that glass has a unique role to play in society's attempt to reduce greenhouse gas emissions and mitigate the effects of climate change. The Group promotes more usage of glass to reduce the energy consumption of society, including that of buildings, vehicles, facilities and equipment, as well as to generate or conserve energy.

At the same time, glass production remains energy intensive and emits a significant amount of greenhouse gas. In order to maximise the net benefit to sustainable development, it is critical for the Group to minimise the emissions from its manufacturing processes, in addition to making environmental contributions through its products.

The Group's initiative to lower greenhouse gas emissions from its manufacturing processes includes a wide range of activities such as; development of low carbon fossil fuel technologies; converting the existing electricity supply contracts to certified renewable sources, and on-site self generation, including the installation of solar panels at Group sites. The Group is also conducting research to reduce greenhouse gas emission from glass furnaces such as the usage of waste heat recovery systems, the identification of alternative fuel technologies and process optimisation. As part of these initiatives the Group's initial SBT initiative targets were approved in October 2019. These targets were revised, and revalidated by the SBTi in May 2022. The new targets are based on a WB2D scenario with a 30% reduction in absolute emissions vs 2018 baseline year. The targets continue to cover Scope 1 and Scope 2 emissions and for the first time also include Scope 3 emissions across all categories.

Progress against these targets in 2022/23 includes the continued development of using Hydrogen gas to replace natural gas in the manufacture of flat glass following the worlds first application in August 2021 of using Hydrogen in this way on a production furnace<sup>01</sup>. In Feb 2022, the same production furnace utilised a bio-fuel derived from waste products to replace natural gas. Both of these trials were designed to prove the technical capability for utilisation of low / zero carbon fuels which is one of the key aspects of the decarbonisation roadmap for NSG operations. These trials give a greater level of confidence in the achievement of the Groups existing mid term 2030 SBTi targets as well as carbon neutrality by 2050.

Through these and numerous other decarbonisation and sustainability management activities, the Group aims to reduce its environmental impacts, balancing the need of all its stakeholders.

C0.2

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**(C0.2) State the start and end date of the year for which you are reporting data and indicate whether you will be providing emissions data for past reporting years.**

**Reporting year**

**Start date**

January 1 2022

**End date**

December 31 2022

**Indicate if you are providing emissions data for past reporting years**

No

**Select the number of past reporting years you will be providing Scope 1 emissions data for**

<Not Applicable>

**Select the number of past reporting years you will be providing Scope 2 emissions data for**

<Not Applicable>

**Select the number of past reporting years you will be providing Scope 3 emissions data for**

<Not Applicable>

C0.3

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**(C0.3) Select the countries/areas in which you operate.**

- Argentina
- Austria
- Belgium
- Brazil
- Canada
- Chile
- China
- Czechia
- Finland
- France
- Germany
- India
- Italy
- Japan
- Malaysia
- Mexico
- Netherlands
- Norway
- Poland
- Spain
- Sweden
- United Kingdom of Great Britain and Northern Ireland
- United States of America
- Viet Nam

**C0.4**

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**(C0.4) Select the currency used for all financial information disclosed throughout your response.**

JPY

**C0.5**

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**(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your chosen approach for consolidating your GHG inventory.**

Operational control

**C0.8**

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**(C0.8) Does your organization have an ISIN code or another unique identifier (e.g., Ticker, CUSIP, etc.)?**

Indicate whether you are able to provide a unique identifier for your organization	Provide your unique identifier
Yes, an ISIN code	JP3686800008

**C1. Governance**

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**C1.1**

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**(C1.1) Is there board-level oversight of climate-related issues within your organization?**

Yes

**C1.1a**

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**(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.**

Position of individual or committee	Responsibilities for climate-related issues
Chief Executive Officer (CEO)	<p>The CEO, who is also a member of the Board of Directors (BOD), is responsible for oversight of Sustainability issues including climate-related issues from determination of targets, aligning them with business strategies to reviewing the progress.</p> <p>Sustainability is embedded in the NSG Group from supporting initiatives to utilize glass in order to reduce the energy consumption or to generate or conserve energy, to minimizing GHG emission, ensuring that in obtaining the raw materials natural habitats and biodiversity are preserved or enhanced.</p> <p>The Board of directors establish the Group's basic policies and goals including climate-related policies and targets.</p> <p>Climate-related issues are mainly discussed at the Management Committee (MC) and Sustainability Committee (SC) based on these policies and targets.</p> <p>The CEO chairs both Committees. They discuss the strategies and action plans to fulfill the sustainability goals as well as risk and opportunities, review their progress and report/propose to the Board.</p> <p>The Board of Directors monitors and reviews the sustainability targets, strategies and action plans to connect them to business aspects as well as associated risks and opportunities, oversee progress and provide instructions. An expert in the ESG field continued as a director in 2022, with active guidance given at board meetings and many other opportunities.</p> <p>The Group risk management policies including climate-related risks are discussed at Strategic Risk Committee, which the CEO chairs and report to MC and the Board of Directors via the Audit Committee. Chief Risk Officer ("CRO") is also appointed from among the Executive Officers.</p> <p>In CY2022, in addition to the regular agenda, the BOD also monitored and decided to approve the increased ambition of NSG Group decarbonization targets, with verification by the SBTi.</p> <p>The commitment of NSG to TCFD was also approved with TCFD reporting becoming a key inclusion in the NSG Integrated report in 2022.</p> <p>At another CY22 board meeting, a new ESG strategy was proposed in line with the formulation of the next mid-term management plan. The MC discussed the strategies and actions to achieve both corporate growth and social contribution. The CEO approved the strategy outline and reported it to the board. The BOD reviewed the plan and will monitor its progress. The new MTP including the new ESG strategy identifies decarbonization as one of the key pillars for business strategy. The new MTP will commence in April 2024.</p>

**C1.1b**

**(C1.1b) Provide further details on the board's oversight of climate-related issues.**

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Scope of board-level oversight	Please explain
Scheduled – all meetings	<p>Reviewing and guiding annual budgets</p> <p>Overseeing major capital expenditures</p> <p>Reviewing innovation/R&amp;D priorities</p> <p>Overseeing and guiding employee incentives</p> <p>Reviewing and guiding strategy</p> <p>Overseeing and guiding the development of a transition plan</p> <p>Monitoring the implementation of a transition plan</p> <p>Overseeing and guiding scenario analysis</p> <p>Overseeing the setting of corporate targets</p> <p>Monitoring progress towards corporate targets</p> <p>Overseeing and guiding public policy engagement</p> <p>Overseeing value chain engagement</p>	<Not Applicable>	<p>Addressing climate-related issues is considered by the Group as a material matter. Especially; CO2 emission reduction, reduction of waste and expanding sales of environmental contribution products. These are regarded to be critical action items by the Group.</p> <p>The Board of directors establish the Group's basic policies and goals including climate-related policies and goals. The Management Committee (MC) and Sustainability Committee (SC) discuss the strategies and action plans to fulfill the policies and goals and the board monitors and reviews the progress.</p> <p>Examples from this reporting year include as below;</p> <p>1) Developing and setting the revised SBTi targets concerning climate-related issues and monitoring implementation of action plans.</p> <p>The Group first engaged with the SBTi in 2018 and decided on a CO2 emission reduction target. Based on this, the Global Sustainability Director provided a report and the Board of Directors conducted a review of the Group's GHG reduction trend and progress towards its compliance with SBT. This activity was repeated in 2022 with the establishment of revised targets for submission and subsequent approval by SBTi in May 2022.</p> <p>In addition, the Board of Directors reviews, monitors and supervises regularly the long-term GHG reduction target, measures to achieve this target including technology development plan, prospect of delivery and required investment including capex and human resources.</p> <p>2) Medium- to long-term strategy (inclusive of challenges associated with climate change). At the board meeting in the second half of CY22, the CEO raised and Chief Corporate Planning Officer (CCPO) explained the medium- to long-term strategy concerning the climate-related issues as a key part of the ESG strategy. The discussion covered both risks and opportunities for stakeholders. The main themes, targets and KPIs were determined. The current MTP (through to end FY24) continues to include ESG as a key component of the business strategy, which will be further enhanced within the next MTP (Apr-24 onwards). The progress of this strategy and KPIs are reviewed and overseen by the CEO (overall management) and COO (responsible for products, operation and other business areas), who are the members of the Board of Directors and monitored by the Board of Directors as regular agenda.</p> <p>3) Risk management policies</p> <p>The Group risk management policies including climate-related risks are discussed in the Enterprise Risk Management process at the Strategic Risk Committee, which the CEO chairs and report to MC and the Board of Directors via the Audit Committee. Chief Risk Officer (CRO) is also appointed from among the Executive Officers.</p> <p>Sustainability Committee takes specific responsibility to monitor and steer the Group's response to Environmental and Climate Change risks and opportunities and these activities are reported to the Board.</p>

**C1.1d**

**(C1.1d) Does your organization have at least one board member with competence on climate-related issues?**

	Board member(s) have competence on climate-related issues	Criteria used to assess competence of board member(s) on climate-related issues	Primary reason for no board-level competence on climate-related issues	Explain why your organization does not have at least one board member with competence on climate-related issues and any plans to address board-level competence in the future
Row 1	Yes	NSG uses an assessment of competence based on the relevant skills, expertise & experience of individual board members. For climate competence this would include aspects such as; Professional qualifications Membership of relevant organisations Authoring / recognised participation in technical or scientific papers published in the area of climate management At least one board member of NSG within 2022 has considerable expertise in the area of sustainability and specifically climate change activities based on this assessment criteria. This expertise was enhanced further during later 2022 / early 2023 with two additional board members with considerable sustainability experience joining the board.	<Not Applicable>	<Not Applicable>

**C1.2**

**(C1.2) Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.**

**Position or committee**

Chief Executive Officer (CEO)

**Climate-related responsibilities of this position**

Managing annual budgets for climate mitigation activities  
Managing major capital and/or operational expenditures related to low-carbon products or services (including R&D)  
Providing climate-related employee incentives  
Developing a climate transition plan  
Integrating climate-related issues into the strategy  
Setting climate-related corporate targets  
Monitoring progress against climate-related corporate targets  
Managing public policy engagement that may impact the climate  
Managing value chain engagement on climate-related issues

**Coverage of responsibilities**

<Not Applicable>

**Reporting line**

Reports to the board directly

**Frequency of reporting to the board on climate-related issues via this reporting line**

Quarterly

**Please explain**

In the Group, climate issues are monitored by the Management Committee (MC) and Sustainability Committee (SC).  
The MC is constituted and established in order to enable the CEO to efficiently and adequately fulfil the basic policies and goals established by the Board of Directors as the Executive Officer having ultimate and overall responsibilities. At the SC the concrete actions for the sustainability policies and goals are managed and discussed. The principal purposes of the SC are to act as advisory body for the CEO to review the strategy, to coordinate all sustainability activities in the NSG Group and to ensure effective communication of these matters with our stakeholders. Both Committees are chaired by the CEO and attended by C-suite members, Heads of the Strategic Business Units (SBU) and global leaders of the major support departments including Sustainability, Procurement, Ethics and Compliance, Legal, R&D, Engineering, Corporate Planning, HR and Finance. Specific activities in the reporting year included;

- 1) SBT initiatives  
In 2022 the SBTi CO2 reduction target was examined and subsequently revised with a more aggressive 30% reduction target. The CEO announced the revised target at the AGM in June 2022.
- 2) Definition of environmental contribution products  
For the purpose of raising awareness of environmental contribution products inside and outside of the Group, their definition is reviewed from the standpoint of the UN SDGs.
- 3) Revision of internal carbon pricing  
The revised ICP of €100/tonne was approved by the CEO to further support departments and to incorporate CO2 emission into the evaluation criteria of a large-scale project of the Group.
- 4) ESG strategy  
In the ESG strategy, risks and opportunities involved in various ESG items including challenges associated with climate change were evaluated. Both addressing environmental problems through GHG emission reduction and the sales expansion of environmental contribution products were taken up as one of major challenges for the Group. In the SC, under this ESG strategy, each SBU presented issues to be dealt with and a concrete action plan with appointed owners was approved by the CEO. Regarding budget policy and strategy, each SBU and function gives presentation and the CEO gives an approval.  
Activities in each SBU are managed by the CEO. In 2021, the Global Sustainability Director gave a monthly briefing on sustainability issues to the CEO.  
In addition, the CEO chairs a committee that oversees energy & carbon management activities across the Group operations. This committee also consists of representatives from each group function (major support departments) and SBU heads. The output from this committee feeds into the higher-level committees (e.g. SC).  
Among others, CO2 impact of large-scale CAPEX projects are proposed to MC and approved by the CEO.

**C1.3**

**(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?**

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	A small number of senior & junior managers have an incentive related to climate management directly included in their re-numeration program. This is based on various KPIs/targets and the performance against these targets. Depending on the level of accountability and responsibility of delivering these climate related targets determines the weighting of the incentive in the overall incentive program. For example, the Climate Change Director of NSG Group has >50% of their incentives linked to climate change management aspects. Other members of the global sustainability function have similar levels of incentive.

**C1.3a**

**(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).**

**Entitled to incentive**

Chief Procurement Officer (CPO)

**Type of incentive**

Monetary reward

**Incentive(s)**

Salary increase

**Performance indicator(s)**

Achievement of climate transition plan KPI  
 Progress towards a climate-related target  
 Achievement of a climate-related target  
 Implementation of an emissions reduction initiative  
 Reduction in absolute emissions  
 Reduction in emissions intensity  
 Energy efficiency improvement  
 Increased share of renewable energy in total energy consumption  
 Increased engagement with suppliers on climate-related issues

**Incentive plan(s) this incentive is linked to**

Both Short-Term and Long-Term Incentive Plan

**Further details of incentive(s)**

The incentive is one of the personal objectives of the CPO management incentive plan. Performance against these objectives will determine the performance rating of the individual in the reporting year. This performance rating is used to define salary increase for the next year.

**Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan**

CPO has a personal objective to continue to extend the energy management programme in line with the agreed plans. They lead the procurement activities within the global multifunctional team for energy & carbon management across NSG Group tasked with achieving targets in the area of all climate impact management activities

**Entitled to incentive**

Buyers/purchasers

**Type of incentive**

Monetary reward

**Incentive(s)**

Salary increase

**Performance indicator(s)**

Increased engagement with suppliers on climate-related issues  
 Increased supplier compliance with a climate-related requirement

**Incentive plan(s) this incentive is linked to**

Both Short-Term and Long-Term Incentive Plan

**Further details of incentive(s)**

The incentive is one of the personal objectives of senior procurement managers management incentive plan. Performance against these objectives will determine the performance rating of the individual in the reporting year. This performance rating is used to define salary increase for the next year.

**Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan**

Key members of the procurement team have a personal objective to continue to develop the relationship with supply chain partners in various aspects of sustainability including climate change impact, for example embodied CO2 emissions of products / goods and services.

**C2. Risks and opportunities**

**C2.1**

**(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?**

Yes

## C2.1a

### (C2.1a) How does your organization define short-, medium- and long-term time horizons?

	From (years)	To (years)	Comment
Short-term	0	2	The NSG Group considers short term to be the financial reporting year. Short term operational objectives and financial budgets are defined to deliver a published forecast. Risks and opportunities to the budgets are identified, assessed and appropriately treated.
Medium-term	2	4	The NSG Group considers medium term to be 2-4 years. This is the timescale for the published NSG Group Medium Term Revival Plan (RP24), which sets out the Group's short term business strategy, capital investment plans and key performance targets/indicators. The Group Strategic Risk Committee identifies and assesses the risks and opportunities in relation to both the RP24 period and the longer horizon beyond, in order to implement and monitor effective treatment. The process for defining the next medium term plan (FY25-FY27) commenced within the reporting year.
Long-term	4	15	The NSG Group considers long term to be 4 - 15 years. Financial investment business cases consider a maximum of 10-15 years. This timescale includes the average major asset lifetime (glass manufacturing furnaces) i.e. Furnace life of 15 years. The individual investment business cases and the overall strategic plan are based upon an identification and assessment of the risks and opportunities in the NSG Groups' operating environment.

## C2.1b

### (C2.1b) How does your organization define substantive financial or strategic impact on your business?

On a regular basis, the NSG Group Strategic Risk Committee formally defines its risk appetite and risk tolerance thresholds, based on the financial strength of the Group, and its strategic and operational objectives.

Quantitative impact measurement criteria are defined for each of five levels from very low to critical, across four vectors - Financial/Operational/Compliance/Reputation.

Compliance impact includes EHS measures.

- Financial impact criteria range from "very low" - less than 1.2 Oku (JPY 120,000,000) to "critical" - greater than 40 Oku (4,000,000,000)
- Operational impact criteria range from "very low" - less than two day outage or 1% of annual production to "critical" - outage greater than 6 months or 10% of annual production
- Compliance EHS impact criteria range from "very low" - slight injury or slight and temporary environmental effect to "critical" - catastrophic safety or environmental incident with multiple fatalities or long term environmental impact
- Reputation impact criteria range from "very low" - localised and short-lived to "critical" - international and long-term.

Likelihood measurement criteria are defined for each of five levels from highly likely (annual) to highly unlikely (one in a hundred years).

The various permutations of impact and likelihood are mapped within a 2 dimensional matrix which allows further analysis and definition of the thresholds for risks that are (a) within appetite; (b) beyond appetite but within tolerance; and (c) beyond tolerance. Effectively;

- Within appetite would cover those aspects with an overall 'very low' or 'low' measure across the four vectors, e.g. low financial risk with high unlikely of occurrence.

- Beyond appetite , but within tolerance would cover those aspects with a 'medium' measure across the four vectors, or it could include higher risk vectors with contingency planning in place for control.

- Beyond tolerance would cover those aspects with a 'high' to 'very high' impact across the four vectors and highly likely likelihood. These aspects are closely monitored and control plans implemented to endeavour to reduce the risk to a more acceptable level.

When a specific threat or opportunity event is assessed, it is measured against each of the impact and likelihood scales to plot its assessed position vs the appetite and tolerance thresholds. Events which are beyond appetite can be defined as having a substantive financial or strategic impact, and therefore require a treatment strategy/plan.

The minimum impact thresholds, beyond which events are outside the NSG Group appetite and tolerance, are currently defined as 1.2 Oku (JPY 120,000,000) and 10 Oku (JPY 1,000,000,000) respectively.

Overall strategic impact is assessed using the capital planning and investment appraisal process, which is overseen by the Investment and Capital Committee (ICC).

Following a formal stage and gate process, the financial impact of strategic investment opportunities is assessed against cash generation and return on capital employed minimum targets.

The NSG Groups' defined risk appetite is used to assess all identified risks and opportunities, including the climate-related risks and opportunities that are identified from both the overall enterprise risk management process, and the specific climate-related drill-down assessment that was completed during 2022 is the basis for SBU action plans.

Further information on the NSG Group risk management approach and framework can be found within the investor information section of the company website: <https://www.nsg.com/en/investors/management-policy-and-sustainability/risk-management>

**(C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.****Value chain stage(s) covered**

Direct operations  
Upstream  
Downstream

**Risk management process**

Integrated into multi-disciplinary company-wide risk management process

**Frequency of assessment**

More than once a year

**Time horizon(s) covered**

Short-term  
Medium-term  
Long-term

**Description of process**

NSG Group employs a two-tiered risk management framework comprising the Strategic Risk Committee (SRC) and the Enterprise Risk Management Team (ERMT), both of which are supervised by the Management Committee, and ultimately the Board. The framework is designed with reference to ISO31000.

The SRC's members include the executive officers. One executive officer is appointed Chief Risk Officer (CRO).

The SRC is chaired by the CRO and composed of the CEO, CFO and CRO, the Heads of each Group Function, and the Heads of each Strategic Business Unit. The Group Sustainability Director is a member of the SRC.

The SRC determines the company-wide risk management framework, and periodically reviews strategies, policies and procedures governing risk management throughout the Group. Based on this framework, the SRC classifies the high-level risks as either those assessed as having a substantive impact on the Group as whole, or those that should be ordinarily managed by SBUs or Group functions.

The SRC then monitors how those risks are being addressed and directs that additional treatment measures be taken if required. For high-level risks, the SRC appoints "risk owners" to manage the reporting of risk information and the progress of countermeasures.

The CRO is secretary for all SRC meetings and, as representative of the committee, periodically reports to and receives feedback from the Management Committee (MC) and the Audit Committee (AC) regarding the effectiveness of the Group's basic internal control system and risk management structure. Since FY2021, each financial year the SRC has convened three meetings and reported once each to the MC the AC.

The ERM Team is chaired by the CFO and its members include SBU general managers and heads of functions including accounting, finance, and operational risk. Every year this team identifies, assesses, and prioritizes risks pertaining to business execution and endeavours to improve the effectiveness of risk management by formulating necessary measures to mitigate risks.

As noted at question C2.1 above, the impact and likelihood of the risks and opportunities identified are assessed against a standard framework of risk appetite, including financial, reputational, compliance and operational continuity measures. This enables risks and opportunities to be numerically quantified and, where assessments are beyond the defined appetite, target assessments and remediation actions can be defined.

The approach adopted by the SRC includes activities to mitigate climate impact / risk and opportunities. NSG climate related risks and opportunities focus on 1) operational cost savings for our energy intensive industry (energy reduction and carbon legislation compliance), 2) increasing profitability through the sale of value added products that will allow customers to mitigate now /adapt in future to climate change and 3) resilience to physical damage/ production loss caused by climate-induced changes in weather patterns. All SBU business reviews address these climate related risks.

In addition to the SRC and ERMT, the Group has established a number of operational forums which also play key role in the integrated risk management process. These include the Risk Engineering Board (REB), the Sustainability Committee, the Investment and Capital Committee (ICC) and the Energy Committee. The REB reviews mitigation and adaptation programs, in association with the Group's insurers, in relation to existing and proposed operations. The insurer-provided independent risk engineering audit process assesses and scores each asset risk. The risk and recommendation database is reviewed quarterly at the REB and the highest scored risks are assigned priority action. The risk mitigation programs include business continuity planning in response to adverse or unusual weather conditions.

Strategic opportunities, including those related to Climate Change, are identified through the strategic planning processes operated by each SBU and by the Group as a whole. A formal capital and business case "stage/gate" approval process is then followed, overseen by the ICC, which includes detailed quantification, analysis and management of the opportunity. Following the formal stage and gate process, the financial impact of strategic investment opportunities is assessed against cash generation and return on capital employed minimum targets.

Energy risk is monitored and managed through processes overseen by the Energy Committee. These processes include the planning of energy consumption and the hedging of energy costs through the placement of forward contracts. The risk of increasing energy costs is also managed through SBU operational cost control projects.

The Sustainability Committee takes specific responsibility to monitor and steer the Group's response to Environmental and Climate Change risks and opportunities. Climate-related risks and opportunities are then managed and monitored at many levels within the Group e.g. Energy procurement category meetings; SBU Board meetings; Risk Engineering Board, Energy Committee. Significant risks are reported to the SRC and Management Committee as necessary. The process has allowed us to capitalize on opportunities and include the future development of innovation energy saving and generating products in our Medium Term Plan.

Transition case study - The Board have recognized the opportunities associated with manufacturing glass for PV panels and invested in new plants in USA and Vietnam with a min 15y life. Alternative furnace fuel sources are also being considered and a hydrogen firing trial (UK) was conducted as part of this initiative. This reduces the risk of losing this significant opportunity.

Physical case study – River flood defences have been built around Sandomierz, to prevent a repeat of the flood that occurred several years ago. Similarly, during the investment planning process, the location for the new solar glass plant in Luckey Ohio was assessed for flood risk, using FEMA Flood Zone Designations.

The ERMT manages a "bottom up" assessment of the risks and opportunities that relate to the achievement of the budget. The period of assessment for the FY2023 exercise was CFY +1, the process is operated through a network of risk champions. Each SBU Region identifies and assesses the key risks and opportunities including the cause, effect, the current impact, likelihood and the strength of mitigations and controls. For risks beyond appetite, target assessments and action plans are added. The resulting risk registers are approved by the SBU heads, and monitored through ongoing business management processes. The approved registers are reviewed and consolidated by the ERMT and, at least annually, a formal review is held with each SBU Head. The SBU risk registers include significant transition and physical climate related risks including emissions pricing, product substitution, flood and windstorm.

**Value chain stage(s) covered**

Direct operations  
Upstream  
Downstream

**Risk management process**

A specific climate-related risk management process

**Frequency of assessment**

Not defined

**Time horizon(s) covered**

Short-term

Medium-term

Long-term

**Description of process**

NSG Group conducted a specific climate-related risk and opportunity assessment to drill down from the overall ERM process described above and provide a specific analysis to enable the Sustainability Committee, the Strategic Risk Committee and the Management Committee/Board to further refine the Group's pathway towards net zero, and its response to external reporting requirements. The initial analysis was completed in 2022 and the risks and opportunities have been mapped onto the Groups risk appetite framework.

The exercise included a detailed examination of both the Physical impacts of climate change and the risks and opportunities arising from the Transition to a lower-carbon economy, using scenario analysis. Three scenarios were modelled - Below 2C low carbon world; Intermediate 2C-3C; and Hothouse above 4C. The Group plan to repeat the scenario analysis on a 3-to-5-year basis.

The exercise identified acute and chronic Physical risks to NSG assets and supply chains, from flood, windstorm and heat stress as well as key Transition risks and opportunities which were assessed for short, medium and long term impact.

The Groups STBi targets were approved by the Management Committee and Board of Directors May 2022 with the targets for all emissions to reduce by 30% by 2030 and aim to achieve carbon neutrality by 2050. Key Performance Indicators (KPI's) are in the process of being defined across the SBU and central functions to monitor progress towards targets

Decarbonization roadmaps continue to be developed and implemented, progress against the plans is monitored at SBU level governance meetings with a summarised view being presented to the SRC in line with the target timeframes.

**C2.2a****(C2.2a) Which risk types are considered in your organization's climate-related risk assessments?**

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	Regulatory environmental risks are included in the Strategic Risk Committee and all levels below. NSG Group EHS functions manage regional environmental legislation.  EU and UK carbon tax legislation poses a significant financial risk to the Group as Carbon prices have risen significantly and forecasts suggest this rising price trend will continue.  Energy Efficiency Directive and Energy Performance Building Directive provide an opportunity to sell more value added solar control products in renovated buildings and helping them to adapt to climate change risks.  Regulation risks have also been specifically assessed as part of the 2022 climate-related Transition risk drill-down and scenario analysis.
Emerging regulation	Relevant, always included	Emerging regulation is reviewed by the SBUs and EHS functions who attend Trade Associations, eg Glass For Europe and Glass Alliance Europe have been closely involved in consultations of future EUETS Phase 4 (2021-2030) Glass For Europe has also been active in consultation on the EPBD in Architectural, EUETS Phase 4 and other potential national carbon taxes  The recently introduced European Green Deal and Fit For 55 package to meet demanding EU CO2 reduction targets will make significant changes to multiple pieces of European energy and tax legislation.  There will be opportunities presented by the requirement to renovate, insulate and adapt buildings in the Energy Efficiency Directive as increased targets are made mandatory. The new EUETS for buildings will drive the need to renovate with value added solar control products. The new EUETS for vehicles will drive the need for low emitting vehicles. Both of these will help society to adapt to new climate change risks.  Changes to European (and UK) Emissions Trading System EUETS (UK ETS) will increase the cost of EU (UK) allowances and reduce the allocation of free allowances. Future changes to the Energy Tax Directive must be closely monitored.  Regulation risks have also been specifically assessed as part of the 2022 climate-related Transition risk drill-down and scenario analysis.
Technology	Relevant, always included	Our business strategy aims to adapt innovative products to meet future legislative requirements eg electric vehicles, low energy buildings, photovoltaic panels  Technology risks have also been specifically assessed as part of the 2022 climate-related Transition risk drill-down and scenario analysis.
Legal	Relevant, always included	Legal requirements are considered by SBUs and fed up the management chain according to the risk rating.  Legal risks have also been specifically assessed as part of the 2022 climate-related Transition risk drill-down and scenario analysis.
Market	Relevant, always included	Non regulatory customer requirements are reviewed by SBUs and gaps are discussed at the six monthly Sustainability Committee. eg requirements for LEED and BREEAM sustainable building certification, requests for carbon emission data and requirements for reductions, increased recycled content. Customers are interested in the CDP climate change questionnaire , recycled content and the setting of a SBT, helping to meet their scope 3 emission reduction targets. help with vehicle electrification strategy and decarbonisation of buildings.  Market risks have also been specifically assessed as part of the 2022 climate-related Transition risk drill-down and scenario analysis.
Reputation	Relevant, always included	Reputation is included in the Group risk severity calculation. This could be affected if our sites fail to meet regulatory requirements or we fail to meet our customer's voluntary requests.  Reputation risks have also been specifically assessed as part of the 2022 climate-related Transition risk drill-down and scenario analysis.
Acute physical	Relevant, always included	Acute physical risks, e.g. from flood and typhoon are assessed by NSG's insurers and are reported to the Risk Engineering Board. The strategic and bottom up risk assessments conducted by the SRC and ERMT also include these weather-related natural catastrophe risks. Acute physical risks to NSG operations and its supply chain have also been specifically assessed by scenario analysis as part of the 2022 climate-related risk drill-down.
Chronic physical	Relevant, always included	Major asset loss and plant location risk is assessed by the Group's insurers and are reported to the Risk Engineering Board. Increasing global temperatures is an opportunity for NSG to increase sales of glass that will keep automotive and architectural customers cool. Chronic physical risks to NSG operations and its supply chain have also been specifically assessed by scenario analysis as part of the 2022 climate-related risk drill-down.

**C2.3**



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(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.3a

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**(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.**

**Identifier**

Risk 1

**Where in the value chain does the risk driver occur?**

Direct operations

**Risk type & Primary climate-related risk driver**

Emerging regulation	Carbon pricing mechanisms
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**Primary potential financial impact**

Increased direct costs

**Climate risk type mapped to traditional financial services industry risk classification**

<Not Applicable>

**Company-specific description**

Regulatory risk considers the cost of environmental compliance. e.g. This includes the current European Emission Trading System (EUETS) carbon costs and the potential for other countries to introduce carbon taxes in order to meet their National Determined Contributions resulting from the Paris Agreement and COP26. The risk associated with higher cost of carbon was highlighted as one of the most substantive risks as part of the 2022 transitional risk scenario analysis to NSG Group. Estimations of the cost impact on an annual basis were rated on the SRC index in the highest cost category (>40 oku) and high likelihood for frequency.

**Time horizon**

Short-term

**Likelihood**

Virtually certain

**Magnitude of impact**

High

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

5000000000

**Potential financial impact figure – minimum (currency)**

<Not Applicable>

**Potential financial impact figure – maximum (currency)**

<Not Applicable>

**Explanation of financial impact figure**

Group environmental compliance risk management is classified as a strategic risk to NSG Group.

The transition risk scenario analysis activity completed in 2022 identified that the cost to NSG Group for future impact would match to the highest risk category according to the ERM framework, meaning a cost penalty to operations of >4Bn JPY. According to the various scenarios used within this analysis, the worst case assumption based on NZC 1.5degC 2050, assuming an orderly transition cost of carbon at \$155 - \$454 / tCO2 or a disorderly transition cost of carbon at \$225 - \$418 t / CO2. Based on NSG Group emissions of @3,0M tonnes (scope 1 emissions), the cost of CO2 based on the lowest price figure (\$155 / t) would equate to @50Bn JPY (assuming \$1 USD = 100 JPY)

**Cost of response to risk**

1000000000

**Description of response and explanation of cost calculation**

To mitigate this risk, we operate with a continuous programme of energy and carbon efficiency improvement projects to ensure that our businesses run as energy efficiently as possible. In 2021 @250 projects were completed to improve energy efficiency and reduce carbon emissions across NSG Group operations. Implemented projects included; waste heat recovery, low carbon electrical generation capacity and process sub-metering.

We have invested in energy saving technologies at multiple sites including working in partnership with 3rd party suppliers. The ISO50001 Energy Management Standard has been introduced across all UK and EUETS member operations in Germany and Italy. NSG is increasing recycled content where the level of contamination is acceptable. This reduces the amount of energy required to melt the glass and also minimises the emission of process CO2 due to decomposition of the carbonate raw materials. In the longer term, we will continue with these energy and carbon saving initiatives and UK and EUETS allowances will be purchased if these measures are insufficient.

The total capital expenditure across this project portfolio, in addition to the man years of effort within the R&D program of energy efficiency and decarbonisation activities equated to @ 1Bn JPY.

This is split by @ 40% on cost of effort and implementation of projects within the R&D portfolio for the development of short, mid and long term technology options for decarbonization, @ 60% on capital investment for implementation of decarbonization and energy saving activities within the manufacturing sites which includes continuous improvement project activities as well as transformation / significant technological change implementation such as redesign of furnaces at cold repair. This is where a furnace stops operating completely, allowing the opportunity for step changes in design of the process to be introduced.

A specific example of one project would be the increased use of externally sourced glass cullet at the float glass operation in Argentina. The project involved the purchase of glass cullet, processing of this cullet and transportation to the manufacturing site for use. Total cost for the processing and transportation of this glass cullet was @ 1500000 JPY, with savings of @ 1000000 JPY delivered and CO2 reduction of @250 tonnes.

**Comment**

Operational cost saving activities are reducing money spent on energy and carbon

**C2.4**

**(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?**

Yes

## C2.4a

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.

**Identifier**

Opp1

**Where in the value chain does the opportunity occur?**

Direct operations

**Opportunity type**

Products and services

**Primary climate-related opportunity driver**

Development and/or expansion of low emission goods and services

**Primary potential financial impact**

Increased revenues resulting from increased demand for products and services

**Company-specific description**

NSG Group produces high performance glazing solutions for customers worldwide. The specific opportunity identified is increasing demand for NSG Group value added, carbon saving advanced product ranges. Global awareness of climate change and customers' recent tendency to set climate change targets is fuelling an increasing demand for development and supply of the Group's low-carbon range of products. Our low emissivity and solar control ranges have grown to comprise @25 % of the NSG Group Architectural glass SBU annual revenue. Based on current growth trends and market data, we anticipate these global sales to increase further in the short, mid and long term to support global commitments to climate change targets.

For example, one of the Groups value added, high performance technical glass products is used to manufacture solar panels. This product is a Transparent Conductive Oxide (TCO) glass coating that utilises NSG Group proprietary technology to manufacture. The Group invested @40 billion Yen in 2 new furnaces in Vietnam and North America to supply glass for the increasing solar energy market in 2019, with start up of operations in 2020 and 2021. This investment in 2 float plants led to more than 30 billion Yen revenue in 2020/21.

In addition to these investments, a further investment of @20 billion Yen was made to expand operations in Argentina for supply of high performance glazing products to start production in 2022.

These costs are associated with either the construction of new green field manufacturing sites which requires such significant investments in planning, design and construction of the facility and/or investment in upgrading of existing facilities to allow the production of key Value added (VA) products such as TCO coated glass. Such facility upgrades typically require minimal investment in furnace technology but significant investment in the on-line coating process within the float bath to allow for the TCO coating to be deposited onto the hot glass during the glass forming process.

Further investments are planned to continue to expand the global capacity for manufacturing these key VA products and specifically additional capacity investment for the production of TCO products to support the increasing market volumes of solar PV glass.

**Time horizon**

Short-term

**Likelihood**

Virtually certain

**Magnitude of impact**

High

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

45000000000

**Potential financial impact figure – minimum (currency)**

<Not Applicable>

**Potential financial impact figure – maximum (currency)**

<Not Applicable>

**Explanation of financial impact figure**

The annual 45 billion Yen figure is based on a sales forecast of 30 billion Yen new sales revenue from two new float furnaces which started in Vietnam and NA in 2020/21. A further 15 billion Yen sales revenue is forecast for the new plant that started production of high performance glazing in Argentina in 2022. Further plans are in place for increased sales of high performance glazing products (solar panel glass) in future reporting years, the first of which will be the conversion of an existing standard product production line to a high performance glazing product line in 2023.

The continued expansion of the production of glazing solutions for positive environmental impact is one of the key business strategies of NSG Growth. NSG is uniquely positioned to benefit from further expansion of the TCO solar panel market which is anticipated to grow considerably alongside general growth of solar product production.

**Cost to realize opportunity**

60000000000

**Strategy to realize opportunity and explanation of cost calculation**

RP24 plan to increase revenue by increasing the manufacture and sale of value added products.

Investing 60 billion Yen in 3 new plants to manufacture glass for solar panels and other high performance glazing products

**Comment**

## C3. Business Strategy

### C3.1

**(C3.1) Does your organization's strategy include a climate transition plan that aligns with a 1.5°C world?**

Row 1

**Climate transition plan**

Yes, we have a climate transition plan which aligns with a 1.5°C world

**Publicly available climate transition plan**

Yes

**Mechanism by which feedback is collected from shareholders on your climate transition plan**

We do not have a feedback mechanism in place, but we plan to introduce one within the next two years

**Description of feedback mechanism**

<Not Applicable>

**Frequency of feedback collection**

<Not Applicable>

**Attach any relevant documents which detail your climate transition plan (optional)**

NSG Pilkington Sustainability presentation June 2023.pdf

**Explain why your organization does not have a climate transition plan that aligns with a 1.5°C world and any plans to develop one in the future**

<Not Applicable>

**Explain why climate-related risks and opportunities have not influenced your strategy**

<Not Applicable>

C3.2

**(C3.2) Does your organization use climate-related scenario analysis to inform its strategy?**

	Use of climate-related scenario analysis to inform strategy	Primary reason why your organization does not use climate-related scenario analysis to inform its strategy	Explain why your organization does not use climate-related scenario analysis to inform its strategy and any plans to use it in the future
Row 1	Yes, qualitative and quantitative	<Not Applicable>	<Not Applicable>

C3.2a

**(C3.2a) Provide details of your organization's use of climate-related scenario analysis.**

Climate-related scenario		Scenario analysis coverage	Temperature alignment of scenario	Parameters, assumptions, analytical choices
Transition scenarios	IEA NZE 2050	Company-wide	<Not Applicable>	<p>A structured approach was followed using 3rd party input to identify and evaluate risk exposures derived from transition risk based on scenario analysis according to guidance issued by TCFD. Potential transition risks were identified and articulated using discussions with senior executives within NSG organisation and experience gathered by the 3rd party consultancy undertaking the assessment. Time horizons utilised matched those within the NSG strategic risk management framework (short, mid &amp; long term). In addition assessments out to 2050 and 2100 were included.</p> <p>Financial impacts were estimated and likelihoods assessed and aligned to an adapted version of the NSG Group enterprise risk management criteria.</p> <p>Scenario indicators utilised for qualitative and quantitative analysis include;</p> <p>Technology indicators, e.g. change in technology use, share of global renewables, average annual efficiency improvement in iron, steel &amp; cement industries), % of EV's for global passenger cars.</p> <p>Economic &amp; social indicators, e.g. Carbon tax prices, energy price predictions, Net zero commitments, market &amp; production, growth in material consumption. Carbon price risk calculated based on Scope 1 and Scope 2 location based emissions.</p> <p>Carbon prices estimates used for quantitative analysis based on the mid range average of NGFS models (NGFS &lt;2°C, NGFS Net Zero 2050).</p> <p>Baseline emissions for the scenario assessments refer to 2018 emissions (as provided for SBTi target validation)</p> <p>30% reduction target achievement included according to latest NSG Group SBTi target proposals</p> <p>A mid term (2025) emissions reduction was assumed for short/mid term scenario assessments, based on a staggered achievement of 2030 targets - 50% of the difference between expected 2030 emissions and 2020 emissions according to CDP 2021 response.</p> <p>Regional groupings included Mexico within South/Latin America. For Asia Pacific, expected carbon risk for Japan is notably higher, therefore max Asia Pacific scenarios and Asia Pacific averages are heavily influenced by Japan.</p> <p>For EU28 carbon price risk estimates, free allowances received are not accounted for in order to illustrate the total possible risk. Japan carbon price risk is estimated at significant higher than current prices according to NGFS carbon price forecasts for Japan)</p> <p>Initial assessment at Company wide level was then further differentiated to a regional level approach and also a business division approach.</p>
Transition scenarios	IEA SDS	Company-wide	<Not Applicable>	<p>A structured approach was followed using 3rd party input to identify and evaluate risk exposures derived from transition risk based on scenario analysis according to guidance issued by TCFD. Potential transition risks were identified and articulated using discussions with senior executives within NSG organisation and experience gathered by the 3rd party consultancy undertaking the assessment. Time horizons utilised matched those within the NSG strategic risk management framework (short, mid &amp; long term). In addition assessments out to 2050 and 2100 were included.</p> <p>Financial impacts were estimated and likelihoods assessed and aligned to an adapted version of the NSG Group enterprise risk management criteria.</p> <p>Scenario indicators utilised for qualitative and quantitative analysis include;</p> <p>Technology indicators, e.g. change in technology use, share of global renewables, average annual efficiency improvement in iron, steel &amp; cement industries), % of EV's for global passenger cars.</p> <p>Economic &amp; social indicators, e.g. Carbon tax prices, energy price predictions, Net zero commitments, market &amp; production, growth in material consumption. Carbon price risk calculated based on Scope 1 and Scope 2 location based emissions.</p> <p>Carbon prices estimates used for quantitative analysis based on the mid range average of NGFS models (NGFS &lt;2°C, NGFS Net Zero 2050).</p> <p>Baseline emissions for the scenario assessments refer to 2018 emissions (as provided for SBTi target validation)</p> <p>30% reduction target achievement included according to latest NSG Group SBTi target proposals</p> <p>A mid term (2025) emissions reduction was assumed for short/mid term scenario assessments, based on a staggered achievement of 2030 targets - 50% of the difference between expected 2030 emissions and 2020 emissions according to CDP 2021 response.</p> <p>Regional groupings included Mexico within South/Latin America. For Asia Pacific, expected carbon risk for Japan is notably higher, therefore max Asia Pacific scenarios and Asia Pacific averages are heavily influenced by Japan.</p> <p>For EU28 carbon price risk estimates, free allowances received are not accounted for in order to illustrate the total possible risk. Japan carbon price risk is estimated at significant higher than current prices according to NGFS carbon price forecasts for Japan)</p> <p>Initial assessment at Company wide level was then further differentiated to a regional level approach and also a business division approach.</p>
Transition scenarios	IEA CPS	Company-wide	<Not Applicable>	<p>A structured approach was followed using 3rd party input to identify and evaluate risk exposures derived from transition risk based on scenario analysis according to guidance issued by TCFD. Potential transition risks were identified and articulated using discussions with senior executives within NSG organisation and experience gathered by the 3rd party consultancy undertaking the assessment. Time horizons utilised matched those within the NSG strategic risk management framework (short, mid &amp; long term). In addition assessments out to 2050 and 2100 were included.</p> <p>Financial impacts were estimated and likelihoods assessed and aligned to an adapted version of the NSG Group enterprise risk management criteria.</p> <p>Scenario indicators utilised for qualitative and quantitative analysis include;</p> <p>Technology indicators, e.g. change in technology use, share of global renewables, average annual efficiency improvement in iron, steel &amp; cement industries), % of EV's for global passenger cars.</p> <p>Economic &amp; social indicators, e.g. Carbon tax prices, energy price predictions, Net zero commitments, market &amp; production, growth in material consumption. Carbon price risk calculated based on Scope 1 and Scope 2 location based emissions.</p> <p>Carbon prices estimates used for quantitative analysis based on the mid range average of NGFS models (NGFS &lt;2°C, NGFS Net Zero 2050).</p> <p>Baseline emissions for the scenario assessments refer to 2018 emissions (as provided for SBTi target validation)</p> <p>30% reduction target achievement included according to latest NSG Group SBTi target proposals</p> <p>A mid term (2025) emissions reduction was assumed for short/mid term scenario assessments, based on a staggered achievement of 2030 targets - 50% of the difference between expected 2030 emissions and 2020 emissions according to CDP 2021 response.</p> <p>Regional groupings included Mexico within South/Latin America. For Asia Pacific, expected carbon risk for Japan is notably higher, therefore max Asia Pacific scenarios and Asia Pacific averages are heavily influenced by Japan.</p> <p>For EU28 carbon price risk estimates, free allowances received are not accounted for in order to illustrate the total possible risk. Japan carbon price risk is estimated at significant higher than current prices according to NGFS carbon price forecasts for Japan)</p> <p>Initial assessment at Company wide level was then further differentiated to a regional level approach and also a business division approach.</p>
Physical climate scenarios	RCP 8.5	Company-wide	<Not Applicable>	<p>Initial assessment at Company wide level was then further differentiated to a regional level approach and also a business division approach.</p> <p>For several aspects of physical risk, e.g. flood risk, sea level rise, heat stress, the impact assessment was carried out at individual entity level, e.g. manufacturing sites. Qualitative and quantitative analysis included key suppliers and key customers within the analysis activity to estimate impacts within the supply and value chain.</p> <p>Acute climate risks with significant impact include; river flood, flash flood or surface water run-off.</p> <p>Chronic climate risks with significant impact include; sea level rise, increase in heat and prolonged drought stress.</p>
Physical climate scenarios	RCP 4.5	Company-wide	<Not Applicable>	<p>Initial assessment at Company wide level was then further differentiated to a regional level approach and also a business division approach.</p> <p>For several aspects of physical risk, e.g. flood risk, sea level rise, heat stress, the impact assessment was carried out at individual entity level, e.g. manufacturing sites. Qualitative and quantitative analysis included key suppliers and key customers within the analysis activity to estimate impacts within the supply and value chain.</p> <p>Acute climate risks with significant impact include; river flood, flash flood or surface water run-off.</p> <p>Chronic climate risks with significant impact include; sea level rise, increase in heat and prolonged drought stress.</p>
Physical climate scenarios	RCP 1.9	Company-wide	<Not Applicable>	<p>Initial assessment at Company wide level was then further differentiated to a regional level approach and also a business division approach.</p> <p>For several aspects of physical risk, e.g. flood risk, sea level rise, heat stress, the impact assessment was carried out at individual entity level, e.g. manufacturing sites. Qualitative and quantitative analysis included key suppliers and key customers within the analysis activity to estimate impacts within the supply and value chain.</p> <p>Acute climate risks with significant impact include; river flood, flash flood or surface water run-off.</p> <p>Chronic climate risks with significant impact include; sea level rise, increase in heat and prolonged drought stress.</p>

**C3.2b**

**(C3.2b) Provide details of the focal questions your organization seeks to address by using climate-related scenario analysis, and summarize the results with respect to these questions.**

**Row 1**

**Focal questions**

NSG Group engaged with a 3rd party consultant to conduct scenario analysis assessments to support the Group in developing a greater understanding in numerous areas including;

Understanding climate risk exposure at a quantifiable level

Develop resiliency plans to manage threats and plans to exploit opportunities

Meet TCFD aligned disclosure requirements to support continuous improvements in reporting

Identify potential opportunities and challenges in achieving 2030 Science Based Targets and 2050 Carbon neutrality commitments

Specific aspects that were identified as focal questions to cover these broad objectives of the scenario analysis covered four key areas of risk and opportunity. These four areas and more focal questions developed are as follows;

Policy & Legal aspects: Impact of pricing of GHG emissions, enhanced emissions reporting obligations, emissions offset implications, mandates and regulation of products, climate change litigation, building code requirements.

Technology aspects: Cost to transition to lower emissions technology

Market aspects: Increased cost (and broader impact to supply chain, e.g. supplier interruptions) of raw materials, changing consumer preferences, cost of capital (to support decarbonisation target achievement)

Reputational aspects; Investment costs, employee aspects.

Each of these focal questions was assessed for risk and opportunity aspects with both quantitative and qualitative means to assess financial impact and likelihood of impact over the short, mid and long term.

Based on the assessment, a matrix of the impact and likelihood of these focal areas was developed to support the establishment and implementation of an action plan to mitigate impact of risk and maximise opportunity defined.

These action plans included;

Continued implementation and further enhancement of the decarbonization action plan across Group operations (top down and bottom up action list) to mitigate the impact of future carbon price / tax associated with legislation changes - timing up to 2030.

Review of the internal carbon price to be applied to capital investment projects for decarbonization to ensure the price reflected the anticipated market movement in carbon taxes in those countries already with such schemes in place as well as countries with plans/proposals for implementation of carbon taxation schemes. The carbon price should balance mid to long term carbon price expectations to support longer term investment opportunities. Review 6 monthly

Levelized cost of carbon analysis to develop a greater understanding of the relative value of decarbonization project activities per unit of carbon avoided (short to mid term action)

Development of a training program for all employees to ensure widest possible understanding of the key aspects of climate change mitigation associated with NSG activities and the role that each individual can take in their activities both within NSG and their personal life - short term (1 yr) action

**Results of the climate-related scenario analysis with respect to the focal questions**

At NSG Group level, the output of the scenario analysis has indicated a high residual transition risk that could be more severe without the decarbonisation efforts that are planned to be implemented. The Group risk exposure is primarily driven by the projected global pricing of GHG emissions. Consequently, decarbonisation presents an opportunity to reduce this transition risk exposure across all three time horizons. The residual risk exposure is moderate in the short to mid term, rising to significant in the longer term as projected costs of GHG emissions are very significant and may impact severely on the 2035 timescale given mitigation measures focus on 2030 targets (-30%) and achievement of carbon neutrality by 2050.

The transition to a low carbon economy presents a significant opportunity for NSG Group in the form of emerging consumer demands. This is driven by the outlook for building energy efficiency requirements as well as the need for energy saving components to improve aspects of electric vehicle utilisation, e.g. extending battery life.

NSG's position as a manufacturer of energy saving speciality glass and glazing products means it has the means to capitalise on this change in customer preferences.

The results of the analysis have identified a number of quick wins that NSG can choose to exploit, specifically in the focal areas of governance, communication, collaboration and cost management across various stakeholder levels of NSG's value chain.

The findings of this climate change impact assessment have been assessed by the senior executive management team of NSG Group and cascaded down to a regional, business unit and local level to support the development of a tailored action plan.

The results of the scenario analysis were used in combination with output from NSG's participation in the voluntary development and assessment of the glass manufacturing industry according to ACT methodology (2021-22) to support the development of the NSG Group strategy.

In the short term, the impact of other aspects of cost management not directly related to climate change are demonstrating the level of exposure of NSG Group to factors that will be influenced by climate change in the future. The results of the transition and physical risk assessments further clarify this exposure risk and provide further clarification of the requirement for development and implementation of a climate risk mitigation strategy. These actions are being integrated into the business strategy of NSG Group within the RP24 framework and longer term into the transformation of NSG Group via the 'shine' phase.

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**C3.3**

**(C3.3) Describe where and how climate-related risks and opportunities have influenced your strategy.**

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	NSG Group, following best practice defined within the TCFD framework, has continued to further refine during 2022 a KPI to measure the revenue associated with sales of climate impact related products over the mid and long term horizon. This has resulted in some key asset investment strategic decisions in this area. Specifically, the construction of two new float glass manufacturing operations dedicated to the production of products for the photovoltaic generation market. These new production facilities come on stream 2021. Conversions of existing operations to the production of high performance solar glazing are also planned to take place in 2023/24 An additional example of the commitment of all NSG employees to recognise the impact they can have on society via the products & services the company offers is the continued utilisation of the 'Our Vision, My Action' program during 2022. Launched in 2019, this program encouraged all employees to think about how our Mission, Aspiration and Core Values might guide our actions and asked everyone to write down the individual action they will take on a piece of paper and post it on a dedicated website that can be accessed by colleagues around the world. This included the need to reduce embodied carbon and increase recycled content. The NSG Management Committee members launched the activity by posting their individual actions on this site. In the spirit of one of the Core Values "Ensure efforts to serve society," NSG Group donated one US dollar against each employee submission of My Action to The Climate Group, an international non-profit organization active in climate and energy initiatives.
Supply chain and/or value chain	Yes	Increasing engagement during 2022 with several suppliers of key, high carbon impact raw materials. This greater collaboration with the supply chain is a conscious effort to establish win:win scenarios through sharing aspects such as; low carbon technologies, development of products to reduce emissions associated with our manufacturing processes, etc. Customers will receive products with lower embodied carbon. This will help to reduce their scope 3 emissions to achieve their own carbon targets and commitments and enhance our reputation. This scope 3 activity has focused on the highest impact raw materials within the NSG supply chain and has led to a greater understanding of the activities being undertaken within the supply chain for scope 1 & 2 reduction. This is a short term horizon action repeated biannually. A significant activity was also launched at the end of 2022 to revise the existing NSG Group supplier code of conduct and also the introduction of a sustainable supply chain charter. Moving forwards, all supply chain partners of NSG Group will be expected to achieve the minimum standards set out in this charter, which include defining the existing performance and future actions to improve performance of products and services provided from a broad range of sustainability aspects including embodied CO2 content.
Investment in R&D	Yes	Continuing development of energy generating and energy efficient products. Includes mid to long term strategic development product strategy with key partners in both the supply and customer chain to improve performance of products in use as well as reducing embodied carbon of products manufactured. One specific example includes the continuous development and new product launch during 2022 of a next generation product to improve photovoltaic generation efficiency and extend product lifetime and performance to achieve the highest industrial performance standard to date. Mid to long term development in furnace technology to identify potential pathways to significant step changes in embodied carbon content of the flat glass process. More than 8 discrete project activities have been undertaken with significant budget commitment in capex, opex and resource support to these activities. This investment is an essential aspect of the NSG decarbonisation pathway to meet the 2030 SBT target and lay the foundation for delivery of the 2050 net zero vision.
Operations	Yes	Continued focus on Carbon and energy efficiency activities during 2020 has supported the achievement of targets within the final year of the current mid term plan. Key points from this short to mid term activity will be extended, with the establishment of actions for the next mid term strategy of NSG Group (RP24). As carbon and energy cost contributes to ~10% of operational spend, energy savings will mitigate the risk of current increasing energy prices and future carbon costs. For example, the current impact of legislation within Europe (EU ETS) and Japan has increased the profile of CO2 cost within those regions. This CO2 cost contributed to the establishment of the Internal Carbon price which is used as an indication of the potential cost of CO2 taxes globally. Assuming a €100/tonne ICP and ~3Mt CO2 (scope 1), results in a indicative cost impact of €300M. Additional legislation impact is also resulting in a change in operational philosophy at certain sites across the Group. This activity focuses on the level of energy intensity by energy type, resulting in additional costs/savings depending on local energy mix. Monitoring of the impact of this local legislation, driven primarily by national government commitments to climate change protocols requires some dedicated resource effort to ensure a positive impact where possible. Other specific activities during 2022 included further development and application of a world class manufacturing framework to include carbon and energy management activities. Production sites self assess their status within this framework which supports the development and implementation of projects to improve This included establishing a dedicated management team to monitor impacts, develop actions to mitigate impact, disseminate these practices across all Group operations and review the impact of these measures (standard PDCA approach). The focus of this activity was to ensure any reduction in process utilization was matched by appropriate reductions in energy consumption and carbon emission. The management team reviewed the site performance on a monthly basis while encouraging sites to reach immediately to any unexpected deviation in performance. An employee awareness program was launched across UK operations utilising 3rd party software to guide more sustainable choices, including CO2 emission reductions.

**C3.4**

**(C3.4) Describe where and how climate-related risks and opportunities have influenced your financial planning.**

	Financial planning elements that have been influenced	Description of influence
Row 1	Revenues Direct costs Capital expenditures Capital allocation Access to capital	An enhanced adoption of the TCFD framework during 2022 has reinforced the clear link between future revenue opportunity from climate change related products manufactured by NSG. The increased sale of these climate related, Value Added (VA) products has positively contributed to the Medium Term Plan Phase 2 target achievement during the period 2021 - 2024. The recognition of the positive impact from these products has resulted in the mid to long term strategic decision of capital allocation and investment into two new float operation lines to specifically produce products dedicated to the Photovoltaic market. The plan includes investing a total of approximately 38 billion yen in the expansion of production capacity of online TCO (transparent conductive oxide) coated glass to support the growing solar market. The investment will fund the upgrade and restart of a currently dormant float line in Vietnam and the construction of a new glass production facility in the United States during 2019 - 2021 years. The expanded global production capacity for TCO glass is expected to accelerate a shift in the company's product portfolio towards VA (value-added) products while supporting a long-term supply agreement with First Solar, the world's leading provider of comprehensive photovoltaic (PV) solar systems. The latest expansion of production of these products includes investment to upgrade operations at two manufacturing facilities. These facilities located in the USA and Malaysia require an investment of @\$200M to produce this high positive impact product. Global solar demand is expected to see a double-digit increase every year in the next three years and First Solar is expanding its production capacity for Series 6, the latest thin film module system with higher efficiency and energy yield. Manufactured with the online coating technology, in which a conductive oxide on the glass surface is formed during its passage through the float line, NSG Group's TCO glass is very durable with a wide range of applications. With the expanded supply capability for VA products, such as solar glass and other products, NSG Group intends to drive its growth strategy while supporting the increased use of renewable energy.  The access to capital is reinforced by such investments in sustainable technology growth areas. As well as the significant investment into new production facilities, capital has continued to be spent in order to purchase energy efficient equipment. Much of this has been in conjunction with energy supplier partnerships.  Activity within TCFD framework adoption also highlights the impact of operational energy costs. This continues to emphasise the need to support the ongoing activities to improve energy & carbon impact as a result of the multiple energy efficiency initiatives. Numerous examples of project activities have been implemented during the year, which in some cases are reinforced by the application of the Group Internal Carbon Price. The application of the ICP is now established as a key component of the financial planning activity, managed by the Group finance teams, within any project business case that leads to a significant impact on carbon emission.

**C3.5**

**(C3.5) In your organization's financial accounting, do you identify spending/revenue that is aligned with your organization's climate transition?**

	Identification of spending/revenue that is aligned with your organization's climate transition	Indicate the level at which you identify the alignment of your spending/revenue with a sustainable finance taxonomy
Row 1	Yes, we identify alignment with our climate transition plan	<Not Applicable>

**C3.5a**

**(C3.5a) Quantify the percentage share of your spending/revenue that is aligned with your organization's climate transition.**

**Financial Metric**

CAPEX

**Type of alignment being reported for this financial metric**

Alignment with our climate transition plan

**Taxonomy under which information is being reported**

<Not Applicable>

**Objective under which alignment is being reported**

<Not Applicable>

**Amount of selected financial metric that is aligned in the reporting year (unit currency as selected in C0.4)**

300000000

**Percentage share of selected financial metric aligned in the reporting year (%)**

2

**Percentage share of selected financial metric planned to align in 2025 (%)**

10.2

**Percentage share of selected financial metric planned to align in 2030 (%)**

5.4

**Describe the methodology used to identify spending/revenue that is aligned**

The capex defined for investment in decarbonization activities is based on the bottom up roadmaps defined by each individual NSG manufacturing operation. These capex estimates are based on the current expectation of costs for each different technology by site. The estimate uses a standard approach to implementation cost that is defined within the core multifunctional team which has responsibility for the overall implementation of the decarbonization roadmap for NSG Group. The central engineering function of NSG contributes significantly to this roadmap capex estimation. Examples of project activities within the roadmap include; improving furnace design for repairs and new furnace builds to deliver a step change (minimum 5% vs previous design) in energy and carbon efficiency. Application of technology to allow the use of low or zero CO2 fuel combustion, e.g. Hydrogen firing capability. Application of increased electrical heating intensity within primary glass manufacturing furnaces. Adoption of glass recycling process technology to facilitate the increased utilization of recycled glass content. The capex plan is defined year by year, with the % spend in any given year to 2030 available, The % is calculated based on a fixed assumption for total capex spending within NSG Group primary operations of 35,000,000,000 JPY. In general the % of capex spend on decarbonization measures is expected to increase YoY, however in certain years this spend may be higher than others depending on the availability to apply such technology. For example, certain technologies can only be installed at a furnace repair, therefore this restricts the opportunity to invest in a given year. Overall expectation is to invest in the region of 20,000,000,000 JPY in decarbonization measures to achieve the 2030 decarbonization targets of NSG Group

**C4. Targets and performance**

**C4.1**

**(C4.1) Did you have an emissions target that was active in the reporting year?**

Absolute target

Intensity target

**C4.1a**

**(C4.1a) Provide details of your absolute emissions target(s) and progress made against those targets.**

**Target reference number**

Abs 1

**Is this a science-based target?**

Yes, and this target has been approved by the Science Based Targets initiative

**Target ambition**

Well-below 2°C aligned

**Year target was set**

2022

**Target coverage**

Company-wide



**Scope(s)**

Scope 1  
Scope 2  
Scope 3

**Scope 2 accounting method**

Market-based

**Scope 3 category(ies)**

Category 1: Purchased goods and services  
Category 2: Capital goods  
Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)  
Category 4: Upstream transportation and distribution  
Category 5: Waste generated in operations  
Category 6: Business travel  
Category 7: Employee commuting  
Category 8: Upstream leased assets  
Category 9: Downstream transportation and distribution  
Category 10: Processing of sold products  
Category 11: Use of sold products  
Category 12: End-of-life treatment of sold products  
Category 13: Downstream leased assets  
Category 14: Franchises  
Category 15: Investments

**Base year**

2018

**Base year Scope 1 emissions covered by target (metric tons CO2e)**

3102857

**Base year Scope 2 emissions covered by target (metric tons CO2e)**

890736

**Base year Scope 3, Category 1: Purchased goods and services emissions covered by target (metric tons CO2e)**

1054822

**Base year Scope 3, Category 2: Capital goods emissions covered by target (metric tons CO2e)**

4174

**Base year Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) emissions covered by target (metric tons CO2e)**

356271

**Base year Scope 3, Category 4: Upstream transportation and distribution emissions covered by target (metric tons CO2e)**

6120

**Base year Scope 3, Category 5: Waste generated in operations emissions covered by target (metric tons CO2e)**

11509

**Base year Scope 3, Category 6: Business travel emissions covered by target (metric tons CO2e)**

5566

**Base year Scope 3, Category 7: Employee commuting emissions covered by target (metric tons CO2e)**

9955

**Base year Scope 3, Category 8: Upstream leased assets emissions covered by target (metric tons CO2e)**

0

**Base year Scope 3, Category 9: Downstream transportation and distribution emissions covered by target (metric tons CO2e)**

172200

**Base year Scope 3, Category 10: Processing of sold products emissions covered by target (metric tons CO2e)**

735000

**Base year Scope 3, Category 11: Use of sold products emissions covered by target (metric tons CO2e)**

0

**Base year Scope 3, Category 12: End-of-life treatment of sold products emissions covered by target (metric tons CO2e)**

35141

**Base year Scope 3, Category 13: Downstream leased assets emissions covered by target (metric tons CO2e)**

0

**Base year Scope 3, Category 14: Franchises emissions covered by target (metric tons CO2e)**

0

**Base year Scope 3, Category 15: Investments emissions covered by target (metric tons CO2e)**

200000

**Base year Scope 3, Other (upstream) emissions covered by target (metric tons CO2e)**

<Not Applicable>

**Base year Scope 3, Other (downstream) emissions covered by target (metric tons CO2e)**

<Not Applicable>

**Base year total Scope 3 emissions covered by target (metric tons CO2e)**

2590758

**Total base year emissions covered by target in all selected Scopes (metric tons CO2e)**

6584351

Base year Scope 1 emissions covered by target as % of total base year emissions in Scope 1  
100

Base year Scope 2 emissions covered by target as % of total base year emissions in Scope 2  
100

Base year Scope 3, Category 1: Purchased goods and services emissions covered by target as % of total base year emissions in Scope 3, Category 1: Purchased goods and services (metric tons CO2e)  
100

Base year Scope 3, Category 2: Capital goods emissions covered by target as % of total base year emissions in Scope 3, Category 2: Capital goods (metric tons CO2e)  
50

Base year Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) emissions covered by target as % of total base year emissions in Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e)  
30

Base year Scope 3, Category 4: Upstream transportation and distribution covered by target as % of total base year emissions in Scope 3, Category 4: Upstream transportation and distribution (metric tons CO2e)  
50

Base year Scope 3, Category 5: Waste generated in operations emissions covered by target as % of total base year emissions in Scope 3, Category 5: Waste generated in operations (metric tons CO2e)  
100

Base year Scope 3, Category 6: Business travel emissions covered by target as % of total base year emissions in Scope 3, Category 6: Business travel (metric tons CO2e)  
50

Base year Scope 3, Category 7: Employee commuting covered by target as % of total base year emissions in Scope 3, Category 7: Employee commuting (metric tons CO2e)  
50

Base year Scope 3, Category 8: Upstream leased assets emissions covered by target as % of total base year emissions in Scope 3, Category 8: Upstream leased assets (metric tons CO2e)  
100

Base year Scope 3, Category 9: Downstream transportation and distribution emissions covered by target as % of total base year emissions in Scope 3, Category 9: Downstream transportation and distribution (metric tons CO2e)  
80

Base year Scope 3, Category 10: Processing of sold products emissions covered by target as % of total base year emissions in Scope 3, Category 10: Processing of sold products (metric tons CO2e)  
100

Base year Scope 3, Category 11: Use of sold products emissions covered by target as % of total base year emissions in Scope 3, Category 11: Use of sold products (metric tons CO2e)  
100

Base year Scope 3, Category 12: End-of-life treatment of sold products emissions covered by target as % of total base year emissions in Scope 3, Category 12: End-of-life treatment of sold products (metric tons CO2e)  
100

Base year Scope 3, Category 13: Downstream leased assets emissions covered by target as % of total base year emissions in Scope 3, Category 13: Downstream leased assets (metric tons CO2e)  
100

Base year Scope 3, Category 14: Franchises emissions covered by target as % of total base year emissions in Scope 3, Category 14: Franchises (metric tons CO2e)  
100

Base year Scope 3, Category 15: Investments emissions covered by target as % of total base year emissions in Scope 3, Category 15: Investments (metric tons CO2e)  
30

Base year Scope 3, Other (upstream) emissions covered by target as % of total base year emissions in Scope 3, Other (upstream) (metric tons CO2e)  
<Not Applicable>

Base year Scope 3, Other (downstream) emissions covered by target as % of total base year emissions in Scope 3, Other (downstream) (metric tons CO2e)  
<Not Applicable>

Base year total Scope 3 emissions covered by target as % of total base year emissions in Scope 3 (in all Scope 3 categories)  
83

Base year emissions covered by target in all selected Scopes as % of total base year emissions in all selected Scopes  
93.3

Target year  
2030

Targeted reduction from base year (%)  
30

Total emissions in target year covered by target in all selected Scopes (metric tons CO2e) [auto-calculated]  
4609045.7

Scope 1 emissions in reporting year covered by target (metric tons CO2e)  
2910499

**Scope 2 emissions in reporting year covered by target (metric tons CO2e)**

542415

**Scope 3, Category 1: Purchased goods and services emissions in reporting year covered by target (metric tons CO2e)**

1655954

**Scope 3, Category 2: Capital goods emissions in reporting year covered by target (metric tons CO2e)**

5000

**Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) emissions in reporting year covered by target (metric tons CO2e)**

534186

**Scope 3, Category 4: Upstream transportation and distribution emissions in reporting year covered by target (metric tons CO2e)**

60750

**Scope 3, Category 5: Waste generated in operations emissions in reporting year covered by target (metric tons CO2e)**

32742

**Scope 3, Category 6: Business travel emissions in reporting year covered by target (metric tons CO2e)**

5065

**Scope 3, Category 7: Employee commuting emissions in reporting year covered by target (metric tons CO2e)**

2000

**Scope 3, Category 8: Upstream leased assets emissions in reporting year covered by target (metric tons CO2e)**

0

**Scope 3, Category 9: Downstream transportation and distribution emissions in reporting year covered by target (metric tons CO2e)**

174842

**Scope 3, Category 10: Processing of sold products emissions in reporting year covered by target (metric tons CO2e)**

600000

**Scope 3, Category 11: Use of sold products emissions in reporting year covered by target (metric tons CO2e)**

0.1

**Scope 3, Category 12: End-of-life treatment of sold products emissions in reporting year covered by target (metric tons CO2e)**

35425

**Scope 3, Category 13: Downstream leased assets emissions in reporting year covered by target (metric tons CO2e)**

0

**Scope 3, Category 14: Franchises emissions in reporting year covered by target (metric tons CO2e)**

0

**Scope 3, Category 15: Investments emissions in reporting year covered by target (metric tons CO2e)**

170000

**Scope 3, Other (upstream) emissions in reporting year covered by target (metric tons CO2e)**

&lt;Not Applicable&gt;

**Scope 3, Other (downstream) emissions in reporting year covered by target (metric tons CO2e)**

&lt;Not Applicable&gt;

**Total Scope 3 emissions in reporting year covered by target (metric tons CO2e)**

3275965

**Total emissions in reporting year covered by target in all selected scopes (metric tons CO2e)**

6728879

**Does this target cover any land-related emissions?**

No, it does not cover any land-related emissions (e.g. non-FLAG SBT)

**% of target achieved relative to base year [auto-calculated]**

-7.31674237901351

**Target status in reporting year**

Underway

**Please explain target coverage and identify any exclusions**

The Science Based Target revision was submitted to the SBTi in March 2022 and confirmed as verified in June 2022. Nippon Sheet Glass Co., Ltd.'s target for scope 1, 2 and 3 emissions is a reduction of absolute emissions 30% by 2030 from a 2018 base year, which aligns with the well below 2°C pathway defined by the absolute contraction approach and is therefore considered ambitious.

NSG Group submitted this more ambitious SBTi target to demonstrate commitment to minimise the impact of operational GHG emissions across the full value chain. The revised target replaced the previous SBTi approved target that only covered scope 1 and 2 emissions with a 21% absolute reduction target for 2030 vs 2018 baseline year. This increased level of ambition in terms of both absolute reduction quantities and inclusion of scope 3 categories is further enhanced by the publicly announced commitment of NSG to achieve carbon neutrality by 2050.

**Plan for achieving target, and progress made to the end of the reporting year**

The NSG Group continued to implement a global energy & carbon efficiency program across all operations during the year. This included the continuation of over 250 energy & carbon efficiency projects. These projects align with the Groups transformation approach utilising a so called 3K project management categorisation = Kaizen, Kaikaku, Kakushin. All operating sites across the Group are encouraged to implement at least one project from one of these categories.

Our Scope 3 reporting procedures for purchased goods and services have dramatically improved since the target was set and has therefore led to a significant increase in Category 1 scope 3 reported emissions in 2022 compared to the target year. We have recently launched a scope 3 supply chain focused project, the first phase of which is progressing but has been one of the reasons for the improved data collection and numbers reported for 2022.

Moving into the mid-long term project actions. A top down and bottom up approach was taken to develop a detailed action plan for implementation to achieve both the 2030 and 2050 targets for the Group. This action plan is a combination of project categories and includes some transformative technology changes. The project plan includes initiatives developed via R&D programs as well as more localised initiatives from continuous improvement and investment in new equipment, etc. In general terms, the roadmap covers 5 key initiatives; Investment in energy efficiency, investment in renewable energy, technology changes (e.g. alternative fuel, alternative materials, increased rates of recycling, carbon capture & sequestration), supply and customer engagement and finally, to support carbon neutrality, carbon offsets. As one example, in

the reporting year NSG Group carried out the first use of Hydrogen to manufacture float glass. The trial successfully demonstrated the capability of Hydrogen usage as a substitute to fossil fuel (in this case natural gas). The result was a @80% reduction in the scope 1 emissions associated with the manufacture of float glass. The use of low / zero carbon fuels is one of the main project strands within the decarbonisation roadmap. This project and many others like it have contributed to the good progress made towards the 2030 SBTi target.

**List the emissions reduction initiatives which contributed most to achieving this target**

<Not Applicable>

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## C4.1b

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**(C4.1b) Provide details of your emissions intensity target(s) and progress made against those target(s).**

**Target reference number**

Int 1

**Is this a science-based target?**

No, but we are reporting another target that is science-based

**Target ambition**

<Not Applicable>

**Year target was set**

2021

**Target coverage**

Company-wide

**Scope(s)**

Scope 1

Scope 2

**Scope 2 accounting method**

Market-based

**Scope 3 category(ies)**

<Not Applicable>

**Intensity metric**

Metric tons CO2e per metric ton of product

**Base year**

2020

**Intensity figure in base year for Scope 1 (metric tons CO2e per unit of activity)**

0.67

**Intensity figure in base year for Scope 2 (metric tons CO2e per unit of activity)**

0.12

**Intensity figure in base year for Scope 3, Category 1: Purchased goods and services (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 2: Capital goods (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 4: Upstream transportation and distribution (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 5: Waste generated in operations (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 6: Business travel (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 7: Employee commuting (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 8: Upstream leased assets (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 9: Downstream transportation and distribution (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 10: Processing of sold products (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 11: Use of sold products (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 12: End-of-life treatment of sold products (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 13: Downstream leased assets (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 14: Franchises (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 15: Investments (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Other (upstream) (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Other (downstream) (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for total Scope 3 (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for all selected Scopes (metric tons CO2e per unit of activity)**

0.79

**% of total base year emissions in Scope 1 covered by this Scope 1 intensity figure**

70

**% of total base year emissions in Scope 2 covered by this Scope 2 intensity figure**

70

**% of total base year emissions in Scope 3, Category 1: Purchased goods and services covered by this Scope 3, Category 1: Purchased goods and services intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 2: Capital goods covered by this Scope 3, Category 2: Capital goods intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) covered by this Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 4: Upstream transportation and distribution covered by this Scope 3, Category 4: Upstream transportation and distribution intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 5: Waste generated in operations covered by this Scope 3, Category 5: Waste generated in operations intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 6: Business travel covered by this Scope 3, Category 6: Business travel intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 7: Employee commuting covered by this Scope 3, Category 7: Employee commuting intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 8: Upstream leased assets covered by this Scope 3, Category 8: Upstream leased assets intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 9: Downstream transportation and distribution covered by this Scope 3, Category 9: Downstream transportation and distribution intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 10: Processing of sold products covered by this Scope 3, Category 10: Processing of sold products intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 11: Use of sold products covered by this Scope 3, Category 11: Use of sold products intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 12: End-of-life treatment of sold products covered by this Scope 3, Category 12: End-of-life treatment of sold products intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 13: Downstream leased assets covered by this Scope 3, Category 13: Downstream leased assets intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 14: Franchises covered by this Scope 3, Category 14: Franchises intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 15: Investments covered by this Scope 3, Category 15: Investments intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Other (upstream) covered by this Scope 3, Other (upstream) intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Other (downstream) covered by this Scope 3, Other (downstream) intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3 (in all Scope 3 categories) covered by this total Scope 3 intensity figure**

<Not Applicable>

**% of total base year emissions in all selected Scopes covered by this intensity figure**

70

**Target year**

2024

**Targeted reduction from base year (%)**

8

**Intensity figure in target year for all selected Scopes (metric tons CO2e per unit of activity) [auto-calculated]**

0.7268

**% change anticipated in absolute Scope 1+2 emissions**

-8

**% change anticipated in absolute Scope 3 emissions**

-1

**Intensity figure in reporting year for Scope 1 (metric tons CO2e per unit of activity)**

0.63

**Intensity figure in reporting year for Scope 2 (metric tons CO2e per unit of activity)**

0.1

**Intensity figure in reporting year for Scope 3, Category 1: Purchased goods and services (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 2: Capital goods (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 4: Upstream transportation and distribution (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 5: Waste generated in operations (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 6: Business travel (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 7: Employee commuting (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 8: Upstream leased assets (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 9: Downstream transportation and distribution (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 10: Processing of sold products (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 11: Use of sold products (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 12: End-of-life treatment of sold products (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 13: Downstream leased assets (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 14: Franchises (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 15: Investments (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Other (upstream) (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Other (downstream) (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for total Scope 3 (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for all selected Scopes (metric tons CO2e per unit of activity)**

0.73

**Does this target cover any land-related emissions?**

No, it does not cover any land-related emissions (e.g. non-FLAG SBT)

**% of target achieved relative to base year [auto-calculated]**

94.9367088607596

**Target status in reporting year**

Underway

**Please explain target coverage and identify any exclusions**

NSG Group established an intensity target in 2016, performance against which was reported for several years as detailed below.

Baseline 2014 0.78 tonnes CO2e per tonne of equivalent product. Target 0.73

2015 0.77 1.5% improvement

2016 0.76 1.5% improvement

2017 0.75 1.4% improvement

2018 0.73 2.1% improvement  
2019 0.74 1.4% deterioration  
2020 0.78 4.6% deterioration  
2021 0.74 5.2% improvement

Overall performance of 6% target was achieved by end of 2018. Continued deterioration in performance during 2020 associated with the significant impact of deteriorating market conditions associated with Covid-19 pandemic and associated reduction in utilisation of the group operations. While an active program of carbon management was in place to minimise the impact of this reduced utilisation, a significant quantity of the carbon emission is independent of production utilisation, i.e. 'fixed' rather than variable. Subsequently absolute emissions decreased significantly while indexed emissions (associated with product output) deteriorated. Without the successful proactive management of energy & carbon during this low utilisation period, the indexed performance would have been significantly worse.

In 2021, as part of the revised Group strategy within the RP24 and Group transformation 'shape to shine' a revised, more aggressive 4 year intensity target was introduced. This target is equivalent to a 2% Year on Year improvement in performance over 4 years (previous target was @1.5% YoY) and aligns more closely to the revised SBTi for NSG Group.

These two targets (revised SBTi & revised intensity target) have become an integral part of the new revival strategic plan of NSG Group announced in May 2021.

#### **Plan for achieving target, and progress made to the end of the reporting year**

The NSG Group continued to implement a global energy & carbon efficiency program across all operations during the year. This included the continuation of over 270 energy & carbon efficiency projects. These projects align with the Groups transformation approach utilising a so called 3K project management categorisation = Kaizen, Kaikaku, Kakushin. All operating sites across the Group are encouraged to implement at least one project from one of these categories.

Moving into the mid-long term project actions. The focus for this target is more in the short to medium term project implementation, particularly; continuous improvement initiatives and investment in new equipment, Investment in energy efficiency, investment in renewable energy and increased rates of recycling.

There is also a continued focus on maximising process utilisation (and minimising energy consumption during periods of low process utilisation). This included the revision of established best practices to reduce energy consumption to the minimum level achievable during process downtime.

As one example, in early 2022, NSG Group carried out the first use of biofuel to manufacture float glass. The trial successfully demonstrated the capability of biofuel usage as a substitute to fossil fuel (in this case natural gas). The result was a @80% reduction in the scope 1 emissions associated with the manufacture of float glass. The use of low / zero carbon fuels is one of the main project strands within the decarbonisation roadmap.

#### **List the emissions reduction initiatives which contributed most to achieving this target**

<Not Applicable>

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## C4.2

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### **(C4.2) Did you have any other climate-related targets that were active in the reporting year?**

Target(s) to increase low-carbon energy consumption or production

Net-zero target(s)

Other climate-related target(s)

## C4.2a

---

**(C4.2a) Provide details of your target(s) to increase low-carbon energy consumption or production.**

**Target reference number**

Low 1

**Year target was set**

2018

**Target coverage**

Company-wide

**Target type: energy carrier**

Electricity

**Target type: activity**

Consumption

**Target type: energy source**

Renewable energy source(s) only

**Base year**

2018

**Consumption or production of selected energy carrier in base year (MWh)**

2076948.067

**% share of low-carbon or renewable energy in base year**

18

**Target year**

2024

**% share of low-carbon or renewable energy in target year**

50

**% share of low-carbon or renewable energy in reporting year**

32

**% of target achieved relative to base year [auto-calculated]**

43.75

**Target status in reporting year**

Underway

**Is this target part of an emissions target?**

This target is part of the verified SBTi and will support the absolute reduction in scope 2 CO2 emissions. The target has been integrated into the new medium term revival plan (RP24) of NSG Group strategic activity to support the development of renewable electrical generation capacity and responsible sourcing and consumption of energy aligned with SDG #12 and #13

**Is this target part of an overarching initiative?**

Science Based Targets initiative

**Please explain target coverage and identify any exclusions**

The target will cover all NSG Group activities Scope 2 market based purchases of electrical energy. The target is aligned with the NSG Group SBT originally verified in October 2019 and revised in March 2022

**Plan for achieving target, and progress made to the end of the reporting year**

NSG Group is working towards a 50% (by volume) share of electricity from renewable sources by 2024. During 2022 this figure reached 32%, up 1% on 2020. Progress towards this target is being achieved through a combination of unbundled Energy Attribute Certificates (EACs), bundled EACs, onsite solar generation and offsite Power Purchase Agreements (PPA).

During 2021 and starting contract supply in January 2022, NSG Group signed its first offsite virtual PPA for 100 GWh's per year of renewable electricity from EDP Renewables Korsze wind farm in Poland. This project will reduce the Group's scope 2 carbon emissions by approximately 80,000 tonnes per year. In addition to this virtual PPA, a number of direct PPA's have also been signed in other regions such as Argentina. Further direct and virtual PPA's are currently under evaluation as part of the broader strategy of NSG Group to move towards increasing proportion of PPA based contracting away from the use of EAC's.

The procurement of EACs has been a long-standing tactic for NSG Group. New contracts have been put in place in Brazil to complement existing contracts elsewhere.

A new onsite solar installation was constructed in 2021 at NSG Group's site in Rossford, Ohio, USA and is operational as of May 2022. The 1.4MWp installation will produce 2,500 MWh's of renewable electricity per year and will help to reduce scope 2 emissions.

Transitioning towards renewable electricity will be a key part of the wider NSG Group decarbonisation strategy in the future.

**List the actions which contributed most to achieving this target**

<Not Applicable>

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**C4.2b**



**(C4.2b) Provide details of any other climate-related targets, including methane reduction targets.**

**Target reference number**

Oth 1

**Year target was set**

2021

**Target coverage**

Company-wide

**Target type: absolute or intensity**

Absolute

**Target type: category & Metric (target numerator if reporting an intensity target)**

Waste management	metric tons of waste diverted from landfill
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**Target denominator (intensity targets only)**

<Not Applicable>

**Base year**

2020

**Figure or percentage in base year**

22100

**Target year**

2024

**Figure or percentage in target year**

17680

**Figure or percentage in reporting year**

21045

**% of target achieved relative to base year [auto-calculated]**

23.868778280543

**Target status in reporting year**

Underway

**Is this target part of an emissions target?**

The target is not specifically part of the NSG SBT for GHG emission reduction . However, it is directly related to the broader sustainability activities within NSG Group and is one of the Group sustainability targets within the medium term plan (MTP) of NSG Group.

The recognition of the impact landfill waste can have on GHG emissions was recognised by the Group at the establishment of this original target in 2015 which has subsequently been extended as a key part of the RP24. The original target was achieved ahead of the target year and consequently the target was revised prior to 2020. The target was reviewed and revised in 2021 based on 2020 performance, and set at a 20% absolute reduction by end of mid 2024.

**Is this target part of an overarching initiative?**

Science Based targets initiative - other

**Please explain target coverage and identify any exclusions**

The target covers 100% of NSG Group operations. It is aimed at reducing waste to landfill from NSG operational activities. It is closely aligned with the UN SDG #12 Responsible consumption and production and UN SDG #13 climate action. Reduction in the generation of waste and the redirection of waste previously destined for landfill are two of the key activities within this target scope. As a result of this activity, 40% of the waste previously destined for landfill (~12k tonnes) was avoided in 2019. The target was revised in 2021 to achieve a further 20% reduction in waste destined to landfill by 2024 vs 2020 baseline year. The benefit of this initiative is two fold; 1. It encourages improved segregation of waste generated at NSG manufacturing sites and specifically the improved segregation of waste glass that may have previously been destined for landfill. This glass cullet can then be re-melted at the glass operations contributing to reductions in CO2 emissions across all 3 scopes. 2. It reduces the quantity of waste destined for landfill which may lead to CH4 emissions from degradation of the material.

**Plan for achieving target, and progress made to the end of the reporting year**

An action plan has been defined following the good progress of activities during the period 2016 - 2020. This action plan includes further dissemination or well proven best practices in addition to introduction of solutions to issues that need to be resolved.

The focus of actions is primarily in three key areas.

1. Reductions in the quantity of waste generated across operations. There have been numerous examples of projects implemented during the year. For example, improving the utilisation of batching processes to reduce the quantity of raw material waste that cannot be re-utilised on site.
2. Reduction in the disposal of any glass produced at manufacturing sites that can be recovered for re-use in primary glass operations. Such glass is a combination of internal cullet and pre-consumer cullet. Good progress was made during the year across many operations, with levels of reduction of over 95% in mass of glass sent off site for disposal. Several sites achieved a recycling rate of 100%.
3. Identifying partners for waste streams produced on site,. This can be external partners that could utilise our waste products as feedstock for their own manufacturing processes - for example glass grinding 'muds'.

Good progress was made during 2021 resulting in continued improvement in the KPI exceeding the target for the year. Challenges remain going forwards, especially associated with waste generated during the commissioning of new plant and processes.

**List the actions which contributed most to achieving this target**

<Not Applicable>

C4.2c

**(C4.2c) Provide details of your net-zero target(s).**

**Target reference number**

NZ1

**Target coverage**

Company-wide

**Absolute/intensity emission target(s) linked to this net-zero target**

Abs1

Int1

**Target year for achieving net zero**

2050

**Is this a science-based target?**

No, but we are reporting another target that is science-based

**Please explain target coverage and identify any exclusions**

NSG Group announced a target commitment to achieve net zero by 2050 as part of the FY22 financial results presentation to the TSE (May 2022). This target is aligned to numerous stakeholder requests across NSG value chain.

The target covers all scopes of NSG GHG emissions and has no exclusions as it is a Group level target

This target replaces the original vision that NSG had published for net zero as part of the FY21 financial results presentation (May 2021)

**Do you intend to neutralize any unabated emissions with permanent carbon removals at the target year?**

Yes

**Planned milestones and/or near-term investments for neutralization at target year**

The first key milestone towards NZC1 will be the delivery of the NSG Group RP24 targets at end of FY24 (April 2024). The second key milestone will be the achievement of the verified SBT in 2030. We expect to publish further SBTi commitments over the coming years, to establish further milestones for absolute emission reductions. These absolute target reduction milestones will align to future NSG Group transformation project timescales, effectively a rolling 4 year plan of milestone targets.

NSG Group has identified a 5 stage decarbonisation roadmap at Group level. The 5 stages are;

1. Investment in energy efficiency - continued development of the Kaizen, Kaikaku and Kakushin project implementation program. Focused on delivering short, mid and long term improvements in energy efficiency across operations. Examples would include the upgrade of compressed air generation across OE SBU manufacturing sites.
2. Renewable energy strategy. A combination of on site electricity generation, Power purchase agreements and (short term) renewable energy certificates. The implementation of this stage is aligned directly to the Low 1 target. Examples include the vPPA for Poland based operations.
3. Technology Change. Developing a 'tool-box' of technologies that can be implemented case by case to delivery significant decarbonisation of operations. In the short to mid term, a key part of this stage is the investment in provision for these technologies to be implemented when the commercial or logistical conditions for implementation are viable. Examples would include the implementation of Hydrogen firing trials at a production float furnace in the UK and continued development of this solution at other float operations with associated investment in the supply infrastructure for fuel delivery to the furnace to facilitate use of Hydrogen.
4. Sustainable value chain. Focus on upstream and downstream decarbonisation to reduce scope 3 impacts. Near term investment includes the introduction of improved reporting systems to develop a greater understanding and transparency of scope 3 emissions across the full value chain of NSG. Specific examples in 2022 include the utilisation of software to undertake LCA and EPD activities.
5. Carbon offsets. Final stage is to use carbon offsets to neutralise any remaining carbon emissions in the value chain. In 2021 a small volume of offsets were purchased as a test case for the principle of utilising offsets

**Planned actions to mitigate emissions beyond your value chain (optional)**

A key focus of NSG Group is in the development of products that can significantly reduce the emissions associated with these products in use by the end customer / consumer. The development of these products is a key strategy for NSG Group within the Value Added strategy. Product development can be classified into 3 key sustainability streams including; Health, Safety and Environment. The opportunity associated with product development was identified as very significant within the climate change scenario analysis activity undertaken in 2021, with the potential benefit within the highest category of the NSG ERM framework. For climate change impact in use, high performance glazing products can be demonstrated to have a benefit of 8-10 times higher than the embodied carbon content to produce that product (over the life cycle of that product). Consequently, NSG uses a life cycle approach as a key aspect to support development of products for future applications. This product development directly supports the NSG Group vision of changing our surroundings, improving our world.

**C4.3**

**(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.**

Yes

**C4.3a**

**(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.**

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	18	4500
To be implemented*	85	46450
Implementation commenced*	138	91102
Implemented*	123	81200
Not to be implemented	12	5550

**C4.3b**

**(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.**

**Initiative category & Initiative type**

Energy efficiency in production processes	Process optimization
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**Estimated annual CO2e savings (metric tonnes CO2e)**

97558

**Scope(s) or Scope 3 category(ies) where emissions savings occur**

Scope 1

Scope 2 (location-based)

Scope 2 (market-based)

Scope 3 category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

**Voluntary/Mandatory**

Voluntary

**Annual monetary savings (unit currency – as specified in C0.4)**

2200000000

**Investment required (unit currency – as specified in C0.4)**

1500000000

**Payback period**

&lt;1 year

**Estimated lifetime of the initiative**

11-15 years

**Comment**

Aligned with SDG #12 responsible consumption and production and SDG #13 climate action, 2.2Bn Yen savings delivered by 135 furnace and other process operational efficiency projects. Specific project activities included improved efficiency of furnace design, implementation of productivity and process utilisation projects, including optimising energy consumption to the minimum level during periods of production downtime, compressed air management campaigns (leakage awareness & repair and setpoint level reduction).

**Initiative category & Initiative type**

Low-carbon energy consumption	Wind
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**Estimated annual CO2e savings (metric tonnes CO2e)**

22264

**Scope(s) or Scope 3 category(ies) where emissions savings occur**

Scope 2 (market-based)

Scope 3 category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

**Voluntary/Mandatory**

Voluntary

**Annual monetary savings (unit currency – as specified in C0.4)**

0

**Investment required (unit currency – as specified in C0.4)**

0

**Payback period**

No payback

**Estimated lifetime of the initiative**

21-30 years

**Comment**

Ongoing implementation of NSG Group Renewable Electricity Strategy. Specifically the increased purchases of Renewable guarantee of origin certificates (REGO) in Europe, South America and North America. In addition, the introduction of new onsite generation (PV) projects in North America, Asia and Europe. Finally the introduction of Power Purchase Agreements for electricity supply (vPPA) in Europe and South America.

No capital cost associated with these projects in the reporting year as they were all managed as 3rd party investment activities via long term vPPA contractual arrangements. Anticipate that in some cases in the future NAG may invest directly in on-site power generation (solar, wind) but given capex constraints upon NSG and the general acceptance of the 3rd party investment model such NSG owned facility investment will be limited.

**Initiative category & Initiative type**

Waste reduction and material circularity	Product/component/material reuse
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**Estimated annual CO2e savings (metric tonnes CO2e)**

45000

**Scope(s) or Scope 3 category(ies) where emissions savings occur**

Scope 1

Scope 3 category 1: Purchased goods &amp; services

Scope 3 category 2: Capital goods

Scope 3 category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Scope 3 category 5: Waste generated in operations

**Voluntary/Mandatory**

Voluntary

**Annual monetary savings (unit currency – as specified in C0.4)**

150000000

**Investment required (unit currency – as specified in C0.4)**

200000000

**Payback period**

1-3 years

**Estimated lifetime of the initiative**

11-15 years

**Comment**

Aligned with SDG #12 responsible consumption and production and SDG #13 climate action, 150M Yen savings delivered by 22 glass recycling projects across all regions of NSG float glass operations. Specifically, these projects included the recovery of waste glass from secondary processes adjacent / close to primary glass operations. This waste glass is a combination of process off-cuts (cutting shapes from rectangular plates) and process yield losses. Glass cullet recovered in these cases is classified as pre-consumer cullet. In addition, projects focused on increasing quantities cullet from later stages of the processing chain, including small quantities of end of life cullet (architectural).

**Initiative category & Initiative type**

Energy efficiency in production processes	Machine/equipment replacement
---	-------------------------------

**Estimated annual CO2e savings (metric tonnes CO2e)**

6500

**Scope(s) or Scope 3 category(ies) where emissions savings occur**

Scope 1

Scope 2 (location-based)

Scope 2 (market-based)

Scope 3 category 2: Capital goods

Scope 3 category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

**Voluntary/Mandatory**

Voluntary

**Annual monetary savings (unit currency – as specified in C0.4)**

90

**Investment required (unit currency – as specified in C0.4)**

2900000000

**Payback period**

1-3 years

**Estimated lifetime of the initiative**

11-15 years

**Comment**

Aligned with SDG #12 responsible consumption and production and SDG #13 climate action, 800M Yen savings delivered by 27 furnace and other process operational efficiency projects, including investment in efficient infrastructure projects e.g. LED's, inverters, high efficiency fan systems, etc

**Initiative category & Initiative type**

Low-carbon energy consumption	Liquid biofuels
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**Estimated annual CO2e savings (metric tonnes CO2e)**

980

**Scope(s) or Scope 3 category(ies) where emissions savings occur**

Scope 1

**Voluntary/Mandatory**

Voluntary

**Annual monetary savings (unit currency – as specified in C0.4)**

0

**Investment required (unit currency – as specified in C0.4)**

20000000

**Payback period**

No payback

**Estimated lifetime of the initiative**

11-15 years

**Comment**

Consumption of a liquid biofuels derived from water recycled oils as par, t of a production trial in Feb 2022to manufacture a lower carbon float glass. The trial was a success and demonstrated the viability of NSG Group strategy to utilize such fuels for float glass manufacture in the future.

### C4.3c

#### (C4.3c) What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Compliance with regulatory requirements/standards	Continued implementation of ISO50001 in Germany, Italy and Finland to minimise energy taxes. Need to reduce EUETS Carbon allowance purchases
Dedicated budget for energy efficiency	Pilot projects to demonstrate what is possible following capital expenditure. Dissemination of these key projects widely across the Group site as capex / payback criteria are met.
Dedicated budget for low-carbon product R&D	Revival Plan (RP24) includes a focus on value added products including energy saving glass. Development of these products continues to be a fundamental focus of R&D activities across all SBU's of NSG Group. A number of R&D projects were launched as individual activities with dedicated management resources to identify low carbon furnace technology options during the reporting year in support of delivery of longer terms SBT objectives. Investment decisions continued to be supported by dedicated ICP of €100/tonne CO2 to be applied to all capital projects >10000000 investment. This ICP was increased from \$50/tonne to ensure it reflects the anticipated mid-long term (5 years) view of CO2 price (ETS allowance costs, offset costs)
Dedicated budget for other emissions reduction activities	Funding to support the continued development and implementation of low carbon solutions that can be applied to the glass manufacturing process. Technology typically proven via energy pilot program or from experience of implementing similar technologies in other energy intensive industries. Often can involve collaboration with ESCO partners, but not in all cases.
Employee engagement	Employee energy awareness training has taken place each year from 2016. In the reporting year this included several remotely delivered and the restart of minimal levels (2 delegates) face to face training courses involving representatives from across the spectrum of Global operations. In addition, the continued development of existing energy champions across other Group operations progressed. Training and awareness also delivered to numerous representatives of key central functions such as engineering, R&D, procurement, IR, HR, etc.
Partnering with governments on technology development	Continued contribution to British Glass and Glass Alliance Europe Decarbonisation Roadmaps, working with UK and other EU governments in developing a route to low carbon glass making by 2050. The BG roadmap was published at the end of 2018 and has continued to be developed during the reporting year, with NSG employees chairing the working Group for decarbonisation. Glass for Europe published the initial draft for the EU flat glass industry decarbonisation pathway in 2019, which has been actively discussed during the reporting year and revised with a new net zero ambition pathway (published in July 2021) NSG also actively participating with national and local government authorities in several countries to support the development of national deployment of low carbon technologies. This includes participation as the industrial partner for application of several low carbon technologies in the glass industry, e.g. Hydrogen as an alternative fuel (Hynet project)

### C4.5

#### (C4.5) Do you classify any of your existing goods and/or services as low-carbon products?

Yes

### C4.5a

**(C4.5a) Provide details of your products and/or services that you classify as low-carbon products.**

**Level of aggregation**

Group of products or services

**Taxonomy used to classify product(s) or service(s) as low-carbon**

No taxonomy used to classify product(s) or service(s) as low carbon

**Type of product(s) or service(s)**

Buildings construction and renovation	Building orientation: Thermal performance
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**Description of product(s) or service(s)**

NSG Group manufactures both solar control and low emissivity architectural glazing.

In hotter climates, solar control coated glass minimises the amount of air-conditioning required in a building. In colder climates, a low E glass coating reflects heat back into the building, thereby reducing the heat loss through the window.

These products are classified as low carbon products because the operational building energy savings grow exponentially for the long life of the window and installation of this glass far outweighs the energy consumed in manufacturing the glass. With the adequate type of glazing energy savings are maximised in all building types and under all climatic conditions.

Between 2020 and 2030, a doubling of window renovation rates would avoid the release of above 240 million tonnes of CO2 over 10 years.

[https://glassforeurope.com/wp-content/uploads/2019/05/Glazing\\_potential\\_brochure\\_2019.pdf](https://glassforeurope.com/wp-content/uploads/2019/05/Glazing_potential_brochure_2019.pdf)

This Glass For Europe commissioned study by an independent Dutch research institute TNO, detailed below allows the quantification of CO2 avoided thanks to high-performance glazing. In 2030, the use of advanced glazing could save annually almost a third of the EU CO2 emissions in buildings. The study shows an energy saving potential in 2030 equivalent to a reduction of 30% in the energy consumption of buildings. due to the fact that today's buildings in Europe are mostly equipped with dated inefficient glazing

**Have you estimated the avoided emissions of this low-carbon product(s) or service(s)**

Yes

**Methodology used to calculate avoided emissions**

Other, please specify (Glass for Europe commissioned the independent Dutch research institute TNO to study energy savings and CO2 emission avoidance of high-performance glazing see [https://glassforeurope.com/wp-content/uploads/2019/05/Glazing\\_potential\\_brochure\\_2019.pdf](https://glassforeurope.com/wp-content/uploads/2019/05/Glazing_potential_brochure_2019.pdf))

**Life cycle stage(s) covered for the low-carbon product(s) or services(s)**

Use stage

**Functional unit used**

m2 of glazing installed in EU28 buildings

**Reference product/service or baseline scenario used**

Baseline scenario is today's poorly insulated EU28 average building stock with a window replacement rate of 2% per year. The average thermal transmittance value of 3.4 Uw is that of a mix of products from the late 1960s and 70s.

The 2030 scenario assumes that all older, non coated glazing is replaced with coated, high performance glazing (U value 0.9 Triple Glazing, 1.4 Double Glazing) and that the worst performing windows are prioritised for renovation.

**Life cycle stage(s) covered for the reference product/service or baseline scenario**

Use stage

**Estimated avoided emissions (metric tons CO2e per functional unit) compared to reference product/service or baseline scenario**

240000000

**Explain your calculation of avoided emissions, including any assumptions**

See methodology on page 8 /8 [https://glassforeurope.com/wp-content/uploads/2019/05/Glazing\\_potential\\_brochure\\_2019.pdf](https://glassforeurope.com/wp-content/uploads/2019/05/Glazing_potential_brochure_2019.pdf)

This study is a quantification of both energy and CO2 savings that can be achieved due to the replacement of high-performance glazing in buildings across the 28 EU Member States.

The study draws on recent scientific sources to define input parameters such as today's Europe building stock and performance, the evolution in the energy mix, the penetration of high-performance heating and cooling equipment, etc.

The energy performance characteristics of products computed in the study had to be defined by an ad-hoc expert group within Glass for Europe,. Windows installed are based on a mix of high-performance glazing products readily available on the EU market. Glazing has been selected to offer optimal energy performance to different building types, in seven climatic zones and taking into account facades' orientations., performances are based on five different types of Low-E glazing and five different types of solar-control glazing. For non-residential buildings with large glazing façades, different types of solar control glazing are applied on all buildings' façades across all climatic zones. For dwellings in the Southern regions of Europe, solar control glazing is applied on all buildings' orientations. For dwellings in the other regions of Europe, several different low-e glazing are used on the North, West and East façades, while solar control glazing is applied on the South orientation.

It was decided to adopt a conservative approach by considering an average EU window renovation rate of 2% in the baseline scenario.

If all windows were changed by 2030, 94 million tonnes of CO2 would be saved per year. The cumulative effect is 240 million tonnes between 2020 and 2030.

**Revenue generated from low-carbon product(s) or service(s) as % of total revenue in the reporting year**

10

**C5. Emissions methodology**

**C5.1**

**(C5.1) Is this your first year of reporting emissions data to CDP?**

No

## C5.1a

**(C5.1a) Has your organization undergone any structural changes in the reporting year, or are any previous structural changes being accounted for in this disclosure of emissions data?**

### Row 1

**Has there been a structural change?**

Yes, a divestment

**Name of organization(s) acquired, divested from, or merged with**

Guilin and Tianjin NSG Safety Glass sites in China

**Details of structural change(s), including completion dates**

Sold in September 22

## C5.1b

**(C5.1b) Has your emissions accounting methodology, boundary, and/or reporting year definition changed in the reporting year?**

	Change(s) in methodology, boundary, and/or reporting year definition?	Details of methodology, boundary, and/or reporting year definition change(s)
Row 1	Yes, a change in boundary	New furnace became operational in Argentina

## C5.1c

**(C5.1c) Have your organization's base year emissions and past years' emissions been recalculated as a result of any changes or errors reported in C5.1a and/or C5.1b?**

	Base year recalculation	Scope(s) recalculated	Base year emissions recalculation policy, including significance threshold	Past years' recalculation
Row 1	No, because the impact does not meet our significance threshold	<Not Applicable>	<p>NSG Group set an emissions baseline recalculation policy at +/- 5% tolerance. The divestment of this business and new furnace did not trigger this recalculation</p> <p>The criteria for +/- 5% was reviewed as part of the submission of revised SBTi targets in 2022.</p> <ul style="list-style-type: none"> <li>Material change is defined as any change associated with the asset footprint of NSG Group. These assets can be defined as; <ul style="list-style-type: none"> <li>NSG wholly owned companies, e.g. sale/transfer of businesses, purchase of business, construction of new operational assets, fundamental changes to existing assets, e.g. product mix changes</li> <li>NSG subsidiary companies, e.g. equity share reported emissions (scope 3 only)</li> </ul> </li> <li>Targets will be reviewed according to material changes of +/- 5% across Scope 1 &amp; 2 emissions within a reporting year.</li> <li>For scope 3 reporting, it was decided to increase significantly the reporting threshold for material change. This was in light of the expectation for expected changes in Scope 3 emissions associated with the sustainable supply chain project <ul style="list-style-type: none"> <li>The agreed threshold for initial scope 3 changes is +/- 50%.</li> <li>It is recognized that this is a very high tolerance level and NSG Group will review this tolerance on an annual basis once Scope 3 emissions are seen to stabilize in calculation/reporting.</li> </ul> </li> <li>Changes associated with implementation of NSG Group strategy, e.g. decarbonization action plans are excluded from the material change definition</li> </ul>	No

## C5.2

**(C5.2) Provide your base year and base year emissions.**

### Scope 1

**Base year start**

January 1 2010

**Base year end**

December 31 2010

**Base year emissions (metric tons CO2e)**

3716429

**Comment**

### Scope 2 (location-based)

**Base year start**

January 1 2010

**Base year end**

December 31 2010

**Base year emissions (metric tons CO2e)**

1097315

**Comment**

**Scope 2 (market-based)**

**Base year start**

January 1 2010

**Base year end**

December 31 2010

**Base year emissions (metric tons CO2e)**

0

**Comment**

This was not measured in 2010 and therefore our market based contribution to scope 2 was zero in the base year.

**Scope 3 category 1: Purchased goods and services**

**Base year start**

January 1 2010

**Base year end**

December 31 2010

**Base year emissions (metric tons CO2e)**

1140000

**Comment**

This was not measured in 2010 and was first calculated for SBTi in 2018. This figure has been prorata'd on the basis of glass melted in 2010 vs 2018.

**Scope 3 category 2: Capital goods**

**Base year start**

**Base year end**

**Base year emissions (metric tons CO2e)**

**Comment**

**Scope 3 category 3: Fuel-and-energy-related activities (not included in Scope 1 or 2)**

**Base year start**

**Base year end**

**Base year emissions (metric tons CO2e)**

**Comment**

**Scope 3 category 4: Upstream transportation and distribution**

**Base year start**

**Base year end**

**Base year emissions (metric tons CO2e)**

**Comment**

**Scope 3 category 5: Waste generated in operations**

**Base year start**

**Base year end**

**Base year emissions (metric tons CO2e)**

**Comment**

**Scope 3 category 6: Business travel**

**Base year start**

**Base year end**

**Base year emissions (metric tons CO2e)**

**Comment**

**Scope 3 category 7: Employee commuting**

**Base year start**

**Base year end**

**Base year emissions (metric tons CO2e)**

**Comment**

**Scope 3 category 8: Upstream leased assets**

**Base year start**

**Base year end**

**Base year emissions (metric tons CO2e)**

**Comment**



Scope 3 category 9: Downstream transportation and distribution

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 10: Processing of sold products

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 11: Use of sold products

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 12: End of life treatment of sold products

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 13: Downstream leased assets

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 14: Franchises

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 15: Investments

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3: Other (upstream)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3: Other (downstream)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

C5.3

---

**(C5.3) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.**

The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

## C6. Emissions data

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### C6.1

---

**(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?**

**Reporting year**

**Gross global Scope 1 emissions (metric tons CO2e)**

2910499

**Start date**

<Not Applicable>

**End date**

<Not Applicable>

**Comment**

### C6.2

---

**(C6.2) Describe your organization's approach to reporting Scope 2 emissions.**

**Row 1**

**Scope 2, location-based**

We are reporting a Scope 2, location-based figure

**Scope 2, market-based**

We are reporting a Scope 2, market-based figure

**Comment**

In 2021 we continued to use Sphera Cloud data collection software that calculates both location and market based emissions.

### C6.3

---

**(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO2e?**

**Reporting year**

**Scope 2, location-based**

718744

**Scope 2, market-based (if applicable)**

542415

**Start date**

<Not Applicable>

**End date**

<Not Applicable>

**Comment**

### C6.4

---

**(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1, Scope 2 or Scope 3 emissions that are within your selected reporting boundary which are not included in your disclosure?**

No

### C6.5

---

**(C6.5) Account for your organization's gross global Scope 3 emissions, disclosing and explaining any exclusions.**

## Purchased goods and services

### Evaluation status

Relevant, calculated

### Emissions in reporting year (metric tons CO2e)

1655954

### Emissions calculation methodology

Average data method

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

### Please explain

Scope 3 factors from Sphera environmental reporting software are used to calculate scope 3 emissions based on quantity of each material consumed that is entered into the global reporting software. These emission factors are updated on an annual basis by the software provider. The factors are taken from an internationally recognised provider of LCA analysis software, e.g. GABI. In addition, scope 3 emission associated with bought in glass utilises a factor based on EU28 float flat glass of 1.12 kg CO2(e) / kg glass purchased. Also added 10kt for bought in glazing

## Capital goods

### Evaluation status

Relevant, calculated

### Emissions in reporting year (metric tons CO2e)

5000

### Emissions calculation methodology

Average data method

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

### Please explain

Scope 3 factors from Sphera environmental reporting software are used to calculate scope 3 emissions based on quantity of each material consumed that is entered into the global reporting software. These emission factors are updated on an annual basis by the software provider. The factors are taken from an internationally recognised provider of LCA analysis software, e.g. GABI.

## Fuel-and-energy-related activities (not included in Scope 1 or 2)

### Evaluation status

Relevant, calculated

### Emissions in reporting year (metric tons CO2e)

534186

### Emissions calculation methodology

Average data method

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

### Please explain

Scope 3 factors from Sphera environmental reporting software are used to calculate scope 3 emissions based on quantity of each energy type consumed that is entered into the global reporting software. These emission factors are updated on an annual basis by the software provider. The factors are taken from an internationally recognised provider of LCA analysis software, e.g. GABI.

## Upstream transportation and distribution

### Evaluation status

Relevant, calculated

### Emissions in reporting year (metric tons CO2e)

60750

### Emissions calculation methodology

Average product method

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

### Please explain

External consultants carried out a life cycle analysis study on a flat glass for Glass For Europe. Upstream transportation data for the locally sourced materials was obtained but finally considered insignificant (<1%) for inclusion in the report when compared to the emissions from the glass melting process. So we have assumed that this is 1% of 1.3kgCO2 emitted to make 1 kg glass.  $0.013 \times 4,673,000$  tonnes glass melted in CY 22 = 60750 t CO2

## Waste generated in operations

### Evaluation status

Relevant, calculated

### Emissions in reporting year (metric tons CO2e)

32742

### Emissions calculation methodology

Average data method

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

### Please explain

Scope 3 factors from Sphera environmental reporting software are used to calculate scope 3 emissions based on quantity of each waste type generated that is entered into the global reporting software. These emission factors are updated on an annual basis by the software provider. The factors are taken from a internationally recognised provider of LCA analysis software, e.g. GABI.

## Business travel

### Evaluation status

Relevant, calculated

### Emissions in reporting year (metric tons CO2e)

5065

### Emissions calculation methodology

Distance-based method

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

### Please explain

UK Government GHG Conversion Factors for Company Reporting version 2.0 2022  
Business travel – air tab - Average passenger kgCO2e /km RF included  
Short haul European flights 0.15353 Long haul 0.19309 We will use this overestimate for all flights  
Well ToTank Air travel tab Average passenger class Average passenger emission kgCO2e / km  
Short 0.01681 Medium 0.02114 We will use the worst case scenario factor for all flights Long 0.02011  
Total factor to be applied = 0.19309 + 0.02114 = 0.21423 kgCO2e / km flown  
14 692 542 miles flown 23645354 km x 0.21423kgCO2e = 5065t CO2e

## Employee commuting

### Evaluation status

Relevant, calculated

### Emissions in reporting year (metric tons CO2e)

2000

### Emissions calculation methodology

Average data method

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

### Please explain

Assume 20% of 27,000 NSG employees travel 40km return journey 230 days / week in a medium sized car. This is an over-estimation but is not significant for total Group CO2 emissions. Direct impact 0.00019443 kgCO2 / m Indirect impact 0.00003923 kg CO2 / m Business commuting was significantly lower with the impact of Covid19 pandemic which resulted in reduced travel / increased working from home.

## Upstream leased assets

### Evaluation status

Not relevant, explanation provided

### Emissions in reporting year (metric tons CO2e)

<Not Applicable>

### Emissions calculation methodology

<Not Applicable>

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

### Please explain

No upstream leased assets within NSG Group

## Downstream transportation and distribution

### Evaluation status

Relevant, calculated

### Emissions in reporting year (metric tons CO2e)

174842

### Emissions calculation methodology

Average data method  
Spend-based method  
Distance-based method

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

42

### Please explain

Distance based methodology used by major US, Japanese and European suppliers  
Suppliers provided CO2e data to cover 42 % of Global road transport spend.  
64659 t CO2 calculated by suppliers = 42% emissions  
Europe 69% of transport spend emitted 54913 tonnes CO2e. Assume 100% emitted 79,584 tonnes.  
Japan 38% of transport spend emitted 5,275 tonnes CO2e Assume 100% emitted 13,882 tonnes  
NA 11% of transport spend emitted 4470 tonnes CO2 Assume 100% emitted 40,636 tonnes  
Total Europe + Japan + NA = 94% Group total spend = 134,102 tonnes CO2e +6% for missing South America and South East Asia (excluding Japan) = 142,148 t  
Assumed 2.71 kg CO2 / litre for Europe and Japan  
Add additional 23% of emissions are added for Indirect emissions (0.626 kg CO2(e)/litre )  
23% emissions added for previously non reported well to wheel emissions.  
 $142148 \times 1.23 = 174\ 842\ \text{t CO2e}$

## Processing of sold products

### Evaluation status

Relevant, calculated

### Emissions in reporting year (metric tons CO2e)

600000

### Emissions calculation methodology

Average data method

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

### Please explain

Based on sold glass volume to solar customers and applying a factor for heating glass to 600 C based on NSG data. Sold glass volume to non solar customers - applied a factor for NSG downstream processing

## Use of sold products

### Evaluation status

Not relevant, calculated

### Emissions in reporting year (metric tons CO2e)

0.1

### Emissions calculation methodology

Other, please specify ( GHG Protocol Standard)

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

### Please explain

Reported separately as customers avoided emissions. Products do not consume energy in use and many actively generate or save energy See question 4.5 (Entered 0.1% in case we are penalised in Management score for entering zero here.)

## End of life treatment of sold products

### Evaluation status

Relevant, calculated

### Emissions in reporting year (metric tons CO2e)

35425

### Emissions calculation methodology

Average data method

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

### Please explain

End of life glass will actually save ghg emissions Calculation based on the impact of open or closed loop recycling of glass product returned to NSG operations at a 10% rate (21 kg CO2e / t) and recycling of glass for road aggregate use at 90% (9kg CO2e /t). Using the total glass output in calendar year 2022, this equates to 35 425 t CO2e This also includes a small impact associated with recycling of packaging material  
We assume a scope 3 impact for recycling of packaging materials based on 2500 tonnes of packaging consumption, with a 100% reuse/recycling rate either as closed or open loop recycling. Based on the guidance of DEFRA GHG Company Reporting document v1.3, the conversion factor to consider for either closed or open loop recycling is 21 kg / tonne, therefore an emission impact of 53 tonnes / year for scope 3 associated with recycling packaging materials.

**Downstream leased assets****Evaluation status**

Not relevant, explanation provided

**Emissions in reporting year (metric tons CO2e)**

<Not Applicable>

**Emissions calculation methodology**

<Not Applicable>

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

<Not Applicable>

**Please explain**

No downstream leased assets in NSG Group

**Franchises****Evaluation status**

Not relevant, explanation provided

**Emissions in reporting year (metric tons CO2e)**

<Not Applicable>

**Emissions calculation methodology**

<Not Applicable>

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

<Not Applicable>

**Please explain**

Several small franchises in North and South America but their impact will be negligible

**Investments****Evaluation status**

Relevant, calculated

**Emissions in reporting year (metric tons CO2e)**

170000

**Emissions calculation methodology**

Average data method

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

0

**Please explain**

Management control joint ventures are included in our Group reporting.

50% ownership of 3 float lines in South America Assume 1 float line emits @100,000 tonnes CO2 / year. Three float lines = 150,000 tonnes CO2 e per year.

Plus 20,000t emissions prior to the divestment of the float line joint venture in Russia which is no longer part of the NSG Group.

Total = 170,000t

**Other (upstream)****Evaluation status****Emissions in reporting year (metric tons CO2e)**

<Not Applicable>

**Emissions calculation methodology**

<Not Applicable>

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

<Not Applicable>

**Please explain****Other (downstream)****Evaluation status****Emissions in reporting year (metric tons CO2e)**

<Not Applicable>

**Emissions calculation methodology**

<Not Applicable>

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

<Not Applicable>

**Please explain****C6.7****(C6.7) Are carbon dioxide emissions from biogenic carbon relevant to your organization?**

Yes

C6.7a

(C6.7a) Provide the emissions from biogenic carbon relevant to your organization in metric tons CO2.

	CO2 emissions from biogenic carbon (metric tons CO2)	Comment
Row 1	454	This emission is from a wood pellet fired boiler located in Finland

C6.10

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

**Intensity figure**

0.0000045

**Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)**

3452914

**Metric denominator**

unit total revenue

**Metric denominator: Unit total**

76400000000

**Scope 2 figure used**

Market-based

**% change from previous year**

25

**Direction of change**

Decreased

**Reason(s) for change**

Other emissions reduction activities  
Change in revenue

**Please explain**

Scope 1 and 2 emissions have reduced by 5% and revenue has increased by 27% compared to CY21. We continue to see a positive impact from the implementation of decarbonisation measures . Given the nature of the carbon intensity of glass manufacturing , the increased revenue generated in CY22 in combination with the efficiency measures implemented (see 4.3b for more details) have led to an improved intensity figure

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?

Yes

C7.1a

(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	2910499	IPCC Second Assessment Report (SAR - 100 year)
CH4	0	IPCC Second Assessment Report (SAR - 100 year)
N2O	0	IPCC Second Assessment Report (SAR - 100 year)

C7.2

**(C7.2) Break down your total gross global Scope 1 emissions by country/area/region.**

Country/area/region	Scope 1 emissions (metric tons CO2e)
EU28	1133049
Asia Pacific (or JAPA)	761144
North America	632665
South America	383641

**C7.3**

**(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.**

By business division

By activity

**C7.3a**

**(C7.3a) Break down your total gross global Scope 1 emissions by business division.**

Business division	Scope 1 emissions (metric ton CO2e)
Automotive Glass Replacement	10053
Architectural	2427845
Automotive	355841
Creative Technology & Fine Glass Division	106414
Central functions and Global R&D	1710

**C7.3c**

**(C7.3c) Break down your total gross global Scope 1 emissions by business activity.**

Activity	Scope 1 emissions (metric tons CO2e)
Glass melting	2765136
Glass processing	145363

**C7.5**

**(C7.5) Break down your total gross global Scope 2 emissions by country/area/region.**

Country/area/region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
EU28	240363	118113
Asia Pacific (or JAPA)	248440	225988
North America	185864	179006
South America	44036	19309

**C7.6**

**(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.**

By business division

By activity

**C7.6a**



**(C7.6a) Break down your total gross global Scope 2 emissions by business division.**

Business division	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Automotive Glass Replacement	3267	2790
Architectural	321328	216523
Automotive	306258	257939
Creative Technology & Fine Glass Division	38645	30650
Central functions and Global R&D	1913	829

**C7.6c**

**(C7.6c) Break down your total gross global Scope 2 emissions by business activity.**

Activity	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Glass melting	349096	259046
Glass Processing	369607	249685

**C7.7**

**(C7.7) Is your organization able to break down your emissions data for any of the subsidiaries included in your CDP response?**

Yes

**C7.7a**

**(C7.7a) Break down your gross Scope 1 and Scope 2 emissions by subsidiary.**

**Subsidiary name**

NSG UK Enterprises

**Primary activity**

Glass products

**Select the unique identifier(s) you are able to provide for this subsidiary**

Another unique identifier, please specify (company number)

**ISIN code – bond**

<Not Applicable>

**ISIN code – equity**

<Not Applicable>

**CUSIP number**

<Not Applicable>

**Ticker symbol**

<Not Applicable>

**SEDOL code**

<Not Applicable>

**LEI number**

<Not Applicable>

**Other unique identifier**

05584873

**Scope 1 emissions (metric tons CO2e)**

1883587

**Scope 2, location-based emissions (metric tons CO2e)**

453768

**Scope 2, market-based emissions (metric tons CO2e)**

300512

**Comment**

100% verified according to ISO14064-3 with limited assurance

**C7.9**

**(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?**

Decreased

## C7.9a

(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined), and for each of them specify how your emissions compare to the previous year.

	Change in emissions (metric tons CO2e)	Direction of change in emissions	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	22264	Decreased	9.9	Total Scope 1 + 2(mkt) emissions; 2021 = 3,678,417 tonnes 2022 = 3,452,914 tonnes Total difference = -225,503 tonnes. Total increase of 92GWh of electricity purchased from renewable sources in 2022 vs 2021 (595 GWh in 2022 vs 503 GWh in 2021) Assuming a CO2 emission saving of 0.242kgCO2 / kWh, (OECD European average from IEA version 4) we have saved 22,264t CO2. $(22264/225503)*100 = -9.9\%$ This change is scope 2 market emissions is a combination of the increased purchase of guarantee of origin electricity certificates, increased use of PPA contracting for supply and targeted purchases of lower CO2 emissions electricity from suppliers are renewal of contract supply. We have assumed that emissions value (percentage) means the percentage contribution from each measure to the difference in the scope 1 and 2 mkt reported emissions CY21 vs CY22
Other emissions reduction activities	150038	Decreased	66.5	2021 to 2022 difference in CO2 emissions = -225,503 tonnes. Other categories reported here account for -75,465 tonnes of CO2 impact. Difference to total emission reduction = -150,038 tonnes. $\% \text{ change} = 150,038/225,503 = 66.5\%$ We have assumed that emissions value (percentage) means the percentage contribution from each measure to the difference in the scope 1 and 2 mkt reported emissions CY20 vs CY21 See response to 4.3b for further details of emission reductions
Divestment	17544	Decreased	7.8	The Group divested direct emissions with the transfer of operations in Guilin & Tianjin (China OE SBU) from September 2022 and the transfer of a proportion of the operations in Tsu (Japan CT SBU) from April 2022. Total emissions from these operations in 2021 (S1 + S2 mkt) = 53,533 tonnes Total emissions from these operations in 2022 (S1 + S2 mkt) = 35,989 tonnes Total difference of -17,544 tonnes attributed as a reduction due to the transfer of the business in 2022. We have assumed that emissions value (percentage) means the percentage contribution from each measure to the difference in the scope 1 and 2 mkt reported emissions CY21 vs CY22. Therefore $\% \text{ attributed to divestments} = -17544/225503 = -7.8\%$
Acquisitions	0	No change		
Mergers	0	No change		
Change in output	35657	Decreased	15.8	Total Scope 1 + 2(mkt) emissions; 2021 = 3,678,417 tonnes 2022 = 3,452,914 tonnes Total difference = -225,503 tonnes. We have assumed that emissions value (percentage) means the percentage contribution from each measure to the difference in the scope 1 and 2 mkt reported emissions CY21 vs CY22 Raw Glass Production output in 2022 is 3.9% decrease in tonnes glass output compared to previous year. T output 2021 = 3,601,992 T output 2022 = 3,467,558 Assume 3.9% decrease in output matches a 3.9% decrease in Scope 1 + 2(mkt) emissions = $-3.9\% * 225,503 = 8,743 \text{ tonnes CO2}$ Processed Glass production output in 2022 is -11.9% compared to previous year. m2 output 2021 = 107.13Mt. m2 output 2022 = 95.71Mt. $\% \text{ difference} = -11.9\%$ Decrease in Scope 1 + Scope 2 (mkt) emissions = $11.9\% * 225503 = 26,915 \text{ tonnes CO2}$ . Total CO2 difference for production output change = $8,743 + 26,915 = -35,657 \text{ tonnes or } -15.8\%$
Change in methodology	0	No change		
Change in boundary	0	No change		
Change in physical operating conditions	0	No change		
Unidentified	0	No change		
Other	0	No change		

## C7.9b

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Market-based

## C8. Energy

### C8.1

(C8.1) What percentage of your total operational spend in the reporting year was on energy?

More than 15% but less than or equal to 20%

## C8.2

### (C8.2) Select which energy-related activities your organization has undertaken.

	Indicate whether your organization undertook this energy-related activity in the reporting year
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	Yes
Consumption of purchased or acquired steam	Yes
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	Yes

## C8.2a

### (C8.2a) Report your organization's energy consumption totals (excluding feedstocks) in MWh.

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	0	10466368	10466368
Consumption of purchased or acquired electricity	<Not Applicable>	594623	1248622	1843245
Consumption of purchased or acquired heat	<Not Applicable>	0	27935	27935
Consumption of purchased or acquired steam	<Not Applicable>	0	18498	18498
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	11	<Not Applicable>	11
Total energy consumption	<Not Applicable>	594634	11761423	12356057

## C8.2b

### (C8.2b) Select the applications of your organization's consumption of fuel.

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	Yes
Consumption of fuel for the generation of heat	Yes
Consumption of fuel for the generation of steam	Yes
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	Yes

## C8.2c

### (C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

#### Sustainable biomass

##### Heating value

LHV

##### Total fuel MWh consumed by the organization

1005

##### MWh fuel consumed for self-generation of electricity

0

##### MWh fuel consumed for self-generation of heat

1005

##### MWh fuel consumed for self-generation of steam

0

##### MWh fuel consumed for self-generation of cooling

<Not Applicable>

##### MWh fuel consumed for self- cogeneration or self-trigeneration

0

##### Comment

Biomass wood pellets used on a boiler in Finland.

**Other biomass**

**Heating value**

LHV

**Total fuel MWh consumed by the organization**

0

**MWh fuel consumed for self-generation of electricity**

0

**MWh fuel consumed for self-generation of heat**

0

**MWh fuel consumed for self-generation of steam**

0

**MWh fuel consumed for self-generation of cooling**

<Not Applicable>

**MWh fuel consumed for self- cogeneration or self-trigeneration**

0

**Comment**

Only consume sustainable wooden pellets in Finland

**Other renewable fuels (e.g. renewable hydrogen)**

**Heating value**

LHV

**Total fuel MWh consumed by the organization**

0

**MWh fuel consumed for self-generation of electricity**

0

**MWh fuel consumed for self-generation of heat**

0

**MWh fuel consumed for self-generation of steam**

0

**MWh fuel consumed for self-generation of cooling**

<Not Applicable>

**MWh fuel consumed for self- cogeneration or self-trigeneration**

0

**Comment**

not applicable

**Coal**

**Heating value**

LHV

**Total fuel MWh consumed by the organization**

0

**MWh fuel consumed for self-generation of electricity**

0

**MWh fuel consumed for self-generation of heat**

0

**MWh fuel consumed for self-generation of steam**

0

**MWh fuel consumed for self-generation of cooling**

<Not Applicable>

**MWh fuel consumed for self- cogeneration or self-trigeneration**

0

**Comment**

not applicable

**Oil**

**Heating value**

LHV

**Total fuel MWh consumed by the organization**

1319018

**MWh fuel consumed for self-generation of electricity**

0

**MWh fuel consumed for self-generation of heat**

0

**MWh fuel consumed for self-generation of steam**

0

**MWh fuel consumed for self-generation of cooling**

<Not Applicable>

**MWh fuel consumed for self- cogeneration or self-trigeneration**

0

**Comment**

waste oils, fuel oil 4,5,6

**Gas**

**Heating value**

LHV

**Total fuel MWh consumed by the organization**

9075903

**MWh fuel consumed for self-generation of electricity**

0

**MWh fuel consumed for self-generation of heat**

0

**MWh fuel consumed for self-generation of steam**

0

**MWh fuel consumed for self-generation of cooling**

<Not Applicable>

**MWh fuel consumed for self- cogeneration or self-trigeneration**

0

**Comment**

natural gas, LPG, LNG

**Other non-renewable fuels (e.g. non-renewable hydrogen)**

**Heating value**

LHV

**Total fuel MWh consumed by the organization**

70442

**MWh fuel consumed for self-generation of electricity**

0

**MWh fuel consumed for self-generation of heat**

0

**MWh fuel consumed for self-generation of steam**

0

**MWh fuel consumed for self-generation of cooling**

<Not Applicable>

**MWh fuel consumed for self- cogeneration or self-trigeneration**

0

**Comment**

Diesel, and gasoline for stationary and mobile operations. As instructed in the question, we have not included the diesel used as feedstock

**Total fuel****Heating value**

LHV

**Total fuel MWh consumed by the organization**

10466368

**MWh fuel consumed for self-generation of electricity**

5128

**MWh fuel consumed for self-generation of heat**

11105

**MWh fuel consumed for self-generation of steam**

29983

**MWh fuel consumed for self-generation of cooling**

&lt;Not Applicable&gt;

**MWh fuel consumed for self- cogeneration or self-trigeneration**

5118

**Comment****C8.2d****(C8.2d) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.**

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	5128	5118	10.6	0
Heat	11105	11105	1005	1005
Steam	29983	29983	0	0
Cooling	0	0	0	0

**C8.2e****(C8.2e) Provide details on the electricity, heat, steam, and/or cooling amounts that were accounted for at a zero or near-zero emission factor in the market-based Scope 2 figure reported in C6.3.****Country/area of low-carbon energy consumption**

United Kingdom of Great Britain and Northern Ireland

**Sourcing method**

Purchase from an on-site installation owned by a third party (on-site PPA)

**Energy carrier**

Electricity

**Low-carbon technology type**

Solar

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**

1353

**Tracking instrument used**

REGO

**Country/area of origin (generation) of the low-carbon energy or energy attribute**

United Kingdom of Great Britain and Northern Ireland

**Are you able to report the commissioning or re-powering year of the energy generation facility?**

Yes

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**

2019

**Comment**

This was generated by a third party solar plant on our R&amp;D facility in Lathom UK.

**Country/area of low-carbon energy consumption**

United Kingdom of Great Britain and Northern Ireland

**Sourcing method**

Retail supply contract with an electricity supplier (retail green electricity)

**Energy carrier**

Electricity

**Low-carbon technology type**

Wind

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**

76323

**Tracking instrument used**

REGO

**Country/area of origin (generation) of the low-carbon energy or energy attribute**

United Kingdom of Great Britain and Northern Ireland

**Are you able to report the commissioning or re-powering year of the energy generation facility?**

No

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**

<Not Applicable>

**Comment**

REGO contract covers UK electricity supply

---

**Country/area of low-carbon energy consumption**

Germany

**Sourcing method**

Retail supply contract with an electricity supplier (retail green electricity)

**Energy carrier**

Electricity

**Low-carbon technology type**

Hydropower (capacity unknown)

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**

207604

**Tracking instrument used**

GO

**Country/area of origin (generation) of the low-carbon energy or energy attribute**

Norway

**Are you able to report the commissioning or re-powering year of the energy generation facility?**

Yes

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**

1920

**Comment**

1920 to 2012 various commissioning dates . REGO contract covers German electricity supply

---

**Country/area of low-carbon energy consumption**

Poland

**Sourcing method**

Retail supply contract with an electricity supplier (retail green electricity)

**Energy carrier**

Electricity

**Low-carbon technology type**

Wind

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**

106535

**Tracking instrument used**

GO

**Country/area of origin (generation) of the low-carbon energy or energy attribute**

Poland

**Are you able to report the commissioning or re-powering year of the energy generation facility?**

Yes

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**

2011

**Comment**

PPA commissioning date was 1st Jan 2022

---

**Country/area of low-carbon energy consumption**

Italy

**Sourcing method**

Retail supply contract with an electricity supplier (retail green electricity)

**Energy carrier**

Electricity

**Low-carbon technology type**

Hydropower (capacity unknown)

---

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**

8594

**Tracking instrument used**

GO

**Country/area of origin (generation) of the low-carbon energy or energy attribute**

Italy

**Are you able to report the commissioning or re-powering year of the energy generation facility?**

Yes

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**

2019

**Comment**

commissioning date is estimated. REGO contract covers a proportion of Italian electricity supply

---

**Country/area of low-carbon energy consumption**

Italy

**Sourcing method**

Retail supply contract with an electricity supplier (retail green electricity)

**Energy carrier**

Electricity

**Low-carbon technology type**

Solar

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**

42120

**Tracking instrument used**

GO

**Country/area of origin (generation) of the low-carbon energy or energy attribute**

Italy

**Are you able to report the commissioning or re-powering year of the energy generation facility?**

Yes

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**

2019

**Comment**

commissioning date is estimated. REGO contract covers a proportion of Italian electricity supply

---

**Country/area of low-carbon energy consumption**

Austria

**Sourcing method**

Retail supply contract with an electricity supplier (retail green electricity)

**Energy carrier**

Electricity

**Low-carbon technology type**

Hydropower (capacity unknown)

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**

5854

**Tracking instrument used**

Contract

**Country/area of origin (generation) of the low-carbon energy or energy attribute**

Austria

**Are you able to report the commissioning or re-powering year of the energy generation facility?**

Yes

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**

2015

**Comment**

commissioning date is estimated REGO contract covers Austrian electricity supply

---

**Country/area of low-carbon energy consumption**

Spain

**Sourcing method**

Retail supply contract with an electricity supplier (retail green electricity)

**Energy carrier**

Electricity

**Low-carbon technology type**

Wind

---



**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**

7954

**Tracking instrument used**

GO

**Country/area of origin (generation) of the low-carbon energy or energy attribute**

Spain

**Are you able to report the commissioning or re-powering year of the energy generation facility?**

No

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**

<Not Applicable>

**Comment**

REGO contract covers Spanish electricity supply

---

**Country/area of low-carbon energy consumption**

Netherlands

**Sourcing method**

Retail supply contract with an electricity supplier (retail green electricity)

**Energy carrier**

Electricity

**Low-carbon technology type**

Wind

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**

946

**Tracking instrument used**

Contract

**Country/area of origin (generation) of the low-carbon energy or energy attribute**

Netherlands

**Are you able to report the commissioning or re-powering year of the energy generation facility?**

No

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**

<Not Applicable>

**Comment**

REGO contract covers Dutch electricity supply

---

**Country/area of low-carbon energy consumption**

Argentina

**Sourcing method**

Physical power purchase agreement (physical PPA) with a grid-connected generator

**Energy carrier**

Electricity

**Low-carbon technology type**

Wind

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**

32475

**Tracking instrument used**

I-REC

**Country/area of origin (generation) of the low-carbon energy or energy attribute**

Argentina

**Are you able to report the commissioning or re-powering year of the energy generation facility?**

Yes

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**

2017

**Comment**

commissioning date is estimated REGO contract covers the non PPA Argentinian electricity supply

---

**Country/area of low-carbon energy consumption**

Chile

**Sourcing method**

Retail supply contract with an electricity supplier (retail green electricity)

**Energy carrier**

Electricity

**Low-carbon technology type**

Wind

---

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**

26688

**Tracking instrument used**

Contract

**Country/area of origin (generation) of the low-carbon energy or energy attribute**

Chile

**Are you able to report the commissioning or re-powering year of the energy generation facility?**

No

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**

&lt;Not Applicable&gt;

**Comment**

REGO contract covers Chilean electricity supply

**Country/area of low-carbon energy consumption**

Brazil

**Sourcing method**

Retail supply contract with an electricity supplier (retail green electricity)

**Energy carrier**

Electricity

**Low-carbon technology type**

Large hydropower (&gt;25 MW)

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**

76655

**Tracking instrument used**

I-REC

**Country/area of origin (generation) of the low-carbon energy or energy attribute**

Brazil

**Are you able to report the commissioning or re-powering year of the energy generation facility?**

Yes

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**

1980

**Comment**

REGO contract covers Brazilian electricity supply

**Country/area of low-carbon energy consumption**

Italy

**Sourcing method**

Retail supply contract with an electricity supplier (retail green electricity)

**Energy carrier**

Electricity

**Low-carbon technology type**

Sustainable biomass

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**

713

**Tracking instrument used**

GO

**Country/area of origin (generation) of the low-carbon energy or energy attribute**

Italy

**Are you able to report the commissioning or re-powering year of the energy generation facility?**

No

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**

&lt;Not Applicable&gt;

**Comment**

renewable bio-liquid

**C8.2g****(C8.2g) Provide a breakdown by country/area of your non-fuel energy consumption in the reporting year.****Country/area**

United Kingdom of Great Britain and Northern Ireland

**Consumption of purchased electricity (MWh)**

77837

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

77837

---

Country/area

Germany

Consumption of purchased electricity (MWh)

207604

Consumption of self-generated electricity (MWh)

5118

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

11104

Total non-fuel energy consumption (MWh) [Auto-calculated]

223826

---

Country/area

Poland

Consumption of purchased electricity (MWh)

155043

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

155043

---

Country/area

Italy

Consumption of purchased electricity (MWh)

217655

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

46433

Consumption of self-generated heat, steam, and cooling (MWh)

29983

Total non-fuel energy consumption (MWh) [Auto-calculated]

294071

---

Country/area

Austria

Consumption of purchased electricity (MWh)

5854

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

**Consumption of purchased heat, steam, and cooling (MWh)**

0

**Consumption of self-generated heat, steam, and cooling (MWh)**

0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**

5854

---

**Country/area**

Spain

**Consumption of purchased electricity (MWh)**

7954

**Consumption of self-generated electricity (MWh)**

0

**Is this electricity consumption excluded from your RE100 commitment?**

<Not Applicable>

**Consumption of purchased heat, steam, and cooling (MWh)**

0

**Consumption of self-generated heat, steam, and cooling (MWh)**

0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**

7954

---

**Country/area**

Finland

**Consumption of purchased electricity (MWh)**

39194

**Consumption of self-generated electricity (MWh)**

0

**Is this electricity consumption excluded from your RE100 commitment?**

<Not Applicable>

**Consumption of purchased heat, steam, and cooling (MWh)**

0

**Consumption of self-generated heat, steam, and cooling (MWh)**

0.29

**Total non-fuel energy consumption (MWh) [Auto-calculated]**

39194.29

---

**Country/area**

Netherlands

**Consumption of purchased electricity (MWh)**

946

**Consumption of self-generated electricity (MWh)**

0

**Is this electricity consumption excluded from your RE100 commitment?**

<Not Applicable>

**Consumption of purchased heat, steam, and cooling (MWh)**

0

**Consumption of self-generated heat, steam, and cooling (MWh)**

0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**

946

---

**Country/area**

Norway

**Consumption of purchased electricity (MWh)**

1950

**Consumption of self-generated electricity (MWh)**

0

**Is this electricity consumption excluded from your RE100 commitment?**

<Not Applicable>

**Consumption of purchased heat, steam, and cooling (MWh)**

0

---

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

1950

---

Country/area

France

Consumption of purchased electricity (MWh)

172

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

172

---

Country/area

United States of America

Consumption of purchased electricity (MWh)

353610

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

353610

---

Country/area

Mexico

Consumption of purchased electricity (MWh)

43608

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

43608

---

Country/area

Canada

Consumption of purchased electricity (MWh)

35578

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

35578

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**Country/area**

Argentina

**Consumption of purchased electricity (MWh)**

71557

**Consumption of self-generated electricity (MWh)**

0

**Is this electricity consumption excluded from your RE100 commitment?**

&lt;Not Applicable&gt;

**Consumption of purchased heat, steam, and cooling (MWh)**

0

**Consumption of self-generated heat, steam, and cooling (MWh)**

0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**71557

---

**Country/area**

Chile

**Consumption of purchased electricity (MWh)**

26688

**Consumption of self-generated electricity (MWh)**

0

**Is this electricity consumption excluded from your RE100 commitment?**

&lt;Not Applicable&gt;

**Consumption of purchased heat, steam, and cooling (MWh)**

0

**Consumption of self-generated heat, steam, and cooling (MWh)**

0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**26688

---

**Country/area**

Brazil

**Consumption of purchased electricity (MWh)**

141061

**Consumption of self-generated electricity (MWh)**

10

**Is this electricity consumption excluded from your RE100 commitment?**

&lt;Not Applicable&gt;

**Consumption of purchased heat, steam, and cooling (MWh)**

0

**Consumption of self-generated heat, steam, and cooling (MWh)**

0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**141071

---

**Country/area**

Japan

**Consumption of purchased electricity (MWh)**

267568

**Consumption of self-generated electricity (MWh)**

0.63

**Is this electricity consumption excluded from your RE100 commitment?**

&lt;Not Applicable&gt;

**Consumption of purchased heat, steam, and cooling (MWh)**

0

**Consumption of self-generated heat, steam, and cooling (MWh)**

0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**267568.63

---

**Country/area**

China

**Consumption of purchased electricity (MWh)**

30475

**Consumption of self-generated electricity (MWh)**

0

**Is this electricity consumption excluded from your RE100 commitment?**

<Not Applicable>

**Consumption of purchased heat, steam, and cooling (MWh)**

0

**Consumption of self-generated heat, steam, and cooling (MWh)**

0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**

30475

---

**Country/area**

India

**Consumption of purchased electricity (MWh)**

10381

**Consumption of self-generated electricity (MWh)**

0

**Is this electricity consumption excluded from your RE100 commitment?**

<Not Applicable>

**Consumption of purchased heat, steam, and cooling (MWh)**

0

**Consumption of self-generated heat, steam, and cooling (MWh)**

0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**

10381

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**Country/area**

Malaysia

**Consumption of purchased electricity (MWh)**

76616

**Consumption of self-generated electricity (MWh)**

0

**Is this electricity consumption excluded from your RE100 commitment?**

<Not Applicable>

**Consumption of purchased heat, steam, and cooling (MWh)**

0

**Consumption of self-generated heat, steam, and cooling (MWh)**

0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**

76616

---

**Country/area**

Viet Nam

**Consumption of purchased electricity (MWh)**

70358

**Consumption of self-generated electricity (MWh)**

0

**Is this electricity consumption excluded from your RE100 commitment?**

<Not Applicable>

**Consumption of purchased heat, steam, and cooling (MWh)**

0

**Consumption of self-generated heat, steam, and cooling (MWh)**

0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**

70358

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## C9. Additional metrics

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### C9.1

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(C9.1) Provide any additional climate-related metrics relevant to your business.

C10. Verification

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C10.1

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(C10.1) Indicate the verification/assurance status that applies to your reported emissions.

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	No third-party verification or assurance

C10.1a

---

(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements.

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

UK.VS.0014.2022 NSG V2 110923.pdf

**Page/ section reference**

All information is on page 3/3

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

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C10.1b

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(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 2 emissions and attach the relevant statements.

**Scope 2 approach**

Scope 2 location-based

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

UK.VS.0014.2022 NSG V2 110923.pdf

**Page/ section reference**

Page 3 / 3

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

**Scope 2 approach**

Scope 2 market-based

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

UK.VS.0014.2022 NSG V2 110923.pdf

**Page/ section reference**

Page 3 / 3

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

C10.2

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?

Yes

C10.2a

(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C8. Energy	Energy consumption	ISO14064-3	Energy consumption data reported in CDP was provided to verifier in order to calculate the verified CO2 emissions.

C11. Carbon pricing

C11.1

(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?

Yes

C11.1a

**(C11.1a) Select the carbon pricing regulation(s) which impacts your operations.**

EU ETS  
Japan carbon tax  
UK ETS

**C11.1b**

---

**(C11.1b) Complete the following table for each of the emissions trading schemes you are regulated by.**

**EU ETS**

**% of Scope 1 emissions covered by the ETS**

30.4

**% of Scope 2 emissions covered by the ETS**

0

**Period start date**

January 1 2022

**Period end date**

December 31 2022

**Allowances allocated**

635858

**Allowances purchased**

248915

**Verified Scope 1 emissions in metric tons CO2e**

884773

**Verified Scope 2 emissions in metric tons CO2e**

0

**Details of ownership**

Facilities we own and operate

**Comment**

**UK ETS**

**% of Scope 1 emissions covered by the ETS**

6.3

**% of Scope 2 emissions covered by the ETS**

0

**Period start date**

January 1 2022

**Period end date**

December 31 2022

**Allowances allocated**

120318

**Allowances purchased**

61648

**Verified Scope 1 emissions in metric tons CO2e**

181966

**Verified Scope 2 emissions in metric tons CO2e**

0

**Details of ownership**

Facilities we own and operate

**Comment**

**C11.1c**

---

**(C11.1c) Complete the following table for each of the tax systems you are regulated by.**

**Japan carbon tax**

**Period start date**

January 1 2022

**Period end date**

December 31 2022

**% of total Scope 1 emissions covered by tax**

11.6

**Total cost of tax paid**

84973121

**Comment**

336261 t reported in scheme / 2910499 NSG Scope 1 = 11%

**C11.1d**

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**(C11.1d) What is your strategy for complying with the systems you are regulated by or anticipate being regulated by?**

NSG strategy for compliance with all emission regulation systems is effectively to maintain the current mixture of direct engagement with policy makers as well as trade organizations and other similar organizations. This engagement is managed within the Global sustainability team of NSG Group with close support from other relevant Group functions including representatives of R&D, manufacturing excellence, procurement, finance and across the business units (Architectural, Automotive and Creative Technology). The Sustainability Committee and Strategic risk committee include regulatory reviews as part of the agenda for each meeting to keep abreast of current and future activities. For example, the most recent case has been related to the introduction of carbon taxes within Chile and the effective management of this at local site level and Global level to support reporting as well as mitigation measures to be implemented. All NSG Group European glass melting facilities are covered by the EU Emissions Trading System and in the UK by the UK ETS. NSG Group have for many years operated with a continuous programme of energy efficiency improvement projects to ensure that our businesses run as energy efficiently as possible. This management program continued during the reporting year, with an ever increasing emphasis not just on energy efficiency but also Green House Gas emissions efficiency / reduction. Numerous projects have been installed over a number of years as well as during the reporting year, including; waste heat recovery, low carbon electrical generation capacity, process sub-metering, investment in efficient infrastructure, etc. As well as direct investment, NSG Group also works in partnership with solution providers to support energy and carbon saving technology projects. This included the approach of 'pilot' sites to test technology installations prior to broader dissemination across NSG global locations. The ISO50001 Energy Management Standard has been introduced across all EUETS member operations in Germany, Italy and Finland as well as some key central NSG Group functional teams, e.g. engineering. NSG Group continues to increase the proportion of recycled content where the level of contamination in such recycled materials is acceptable. This reduces the amount of energy required to melt the glass and also minimises the emission of process CO2 due to decomposition of the carbonate raw materials used on the glass manufacturing process. In the short, mid and longer term, NSG Group will continue with these energy and carbon saving initiatives aiming to reduce the impact from operational energy and carbon legislation and associated costs. This ambition is now baked into the energy and carbon reduction targets announced in May 2022, to achieve 30% reduction in absolute GHG emissions by 2030 and carbon neutrality by 2050. By delivering these targets utilising a defined roadmap of actions, NSG Group will continue to meet all legislation and regulation requirements moving forwards. The impact of future legislation during the climate transition was highlighted as one of the highest priority impacts to NSG Group based on the climate change scenario analysis started in 2021 and completed in 2022. This impact contributes and supports the requirements to utilise the management program for energy and carbon management. As well as this program, the NSG Group operations directly impacted GHG regulations (e.g EU ETS and UK ETS) will continue to purchase allowances to cover any shortfall in emissions according to the action plan implementation timescale.

**C11.2**

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**(C11.2) Has your organization canceled any project-based carbon credits within the reporting year?**

Yes

**C11.2a**

---

**(C11.2a) Provide details of the project-based carbon credits canceled by your organization in the reporting year.**

**Project type**

Landscape projects

**Type of mitigation activity**

Emissions reduction

**Project description**

Reducing Emissions from Deforestation and forest Degradation (REDD+)

Envira Amazonia Project: The project conserves over more than 39,000 hectares of carbon sequestering tropical forest in Brazil. Protecting biodiversity and mitigating deforestation pressures.

The Envira Amazonia Project preserves tropical forests by mitigating deforestation pressures along the Jurupari River in the state of Acre in Brazil.

The project is designed to strengthen biodiversity and enhance habitat for the diverse Amazonian flora and fauna.

Access to sanitary facilities and job provision have improved the well-being of local communities.

Without this project, the area would be threatened by deforestation and biodiversity would be under pressure.

**Credits canceled by your organization from this project in the reporting year (metric tons CO2e)**

600

**Purpose of cancellation**

Voluntary offsetting

**Are you able to report the vintage of the credits at cancellation?**

Yes

**Vintage of credits at cancellation**

2016

**Were these credits issued to or purchased by your organization?**

Purchased

**Credits issued by which carbon-crediting program**

VCS (Verified Carbon Standard)

**Method(s) the program uses to assess additionality for this project**

Consideration of legal requirements

Investment analysis

Other, please specify (identification of alternative land use scenarios to the proposed VCS AFOLU project activity, Common practice analysis)

**Approach(es) by which the selected program requires this project to address reversal risk**

Monitoring and compensation

Other, please specify ( Verra requires projects to conduct a Non-Permanence Risk Assessment Report and depending on the risks identified, to set aside a portion of credits into a buffer pool. The credits serve as a reserve to compensate for any potential reversals that may occur.)

**Potential sources of leakage the selected program requires this project to have assessed**

Activity-shifting

Market leakage

**Provide details of other issues the selected program requires projects to address**

Not relevant

**Comment**

Triple Gold Certification

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**C11.3**

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**(C11.3) Does your organization use an internal price on carbon?**

Yes

**C11.3a**

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**(C11.3a) Provide details of how your organization uses an internal price on carbon.**

**Type of internal carbon price**

Shadow price

**How the price is determined**

Alignment with the price of allowances under an Emissions Trading Scheme

Price with material impact on business decisions

**Objective(s) for implementing this internal carbon price**

Change internal behavior

Drive energy efficiency

Drive low-carbon investment

Identify and seize low-carbon opportunities

Navigate GHG regulations

Stakeholder expectations

**Scope(s) covered**

Scope 1

Scope 2

Scope 3 (upstream)

Scope 3 (downstream)

**Pricing approach used – spatial variance**

Uniform

**Pricing approach used – temporal variance**

Static

**Indicate how you expect the price to change over time**

<Not Applicable>

**Actual price(s) used – minimum (currency as specified in C0.4 per metric ton CO2e)**

14400

**Actual price(s) used – maximum (currency as specified in C0.4 per metric ton CO2e)**

14400

**Business decision-making processes this internal carbon price is applied to**

Capital expenditure

Operations

Procurement

Risk management

Opportunity management

Value chain engagement

**Mandatory enforcement of this internal carbon price within these business decision-making processes**

Yes, for some decision-making processes, please specify

**Explain how this internal carbon price has contributed to the implementation of your organization's climate commitments and/or climate transition plan**

NSG Group continued to utilise a global management system for energy and carbon efficiency projects undertaken to reduce the risk of future carbon taxes and quantify the potential carbon saving opportunities associated with a new plant design.

Numerous activities have taken place, including further workshops with several internal functions (R&D, engineering, Manufacturing Excellence, EHS, Procurement) identifying and assessing the viability of energy saving opportunities. These support the development of the Group's decarbonisation strategy, the future implementation of the Group's science based target setting and the production of low embodied carbon products that will help our customers to reduce their scope 3 emissions.

The ICP can be utilised across any of the 3 emission scopes.

Price based on 100 € / tonne CO2e. This price was increased from an original figure of \$50 USD / tonne CO2e in calendar year 2020. This increase was made to reflect the projected mid/long term changes in CO2 price according to legislation (e.g. EU ETS cost of CO2 allowances).

The energy saving opportunities were prioritised according to the combination of energy and carbon price impacts.

The output from the studies reveals energy saving projects that might previously not have been considered for investment to the ICC (Investment and Capital Committee). It is anticipated that continuing to use this and future studies will shift investment towards more low carbon measures.

This approach is further evidenced by the climate change scenario analysis transition impact that highlighted the cost of carbon as one of the highest levels of risk to NSG Group associated with climate change. As a result of the output of this transition analysis and the increased price of carbon allowances within the EU & UK ETS, the decision was taken to increase the ICP significantly to encourage investment into mid/long term decarbonisation solutions reflects the anticipate carbon price of the future. The ICP was reviewed twice in 2022 and seen to remain relevant based on the latest predictions of carbon price from various 3rd party analysts.

The NSG Group review the level of application of the internal carbon price as part of the sustainability committee activities to ensure it remains a viable method to support implementation of decarbonisation project investments, with governance of the ICP part of the sustainability committee responsibilities.

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**C12. Engagement**

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**C12.1**

**(C12.1) Do you engage with your value chain on climate-related issues?**

Yes, our suppliers

Yes, our customers/clients

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**C12.1a**

**(C12.1a) Provide details of your climate-related supplier engagement strategy.**

**Type of engagement**

Engagement & incentivization (changing supplier behavior)

**Details of engagement**

Offer financial incentives for suppliers who reduce your operational emissions (Scopes 1 & 2)

Offer financial incentives for suppliers who reduce your downstream emissions (Scopes 3)

**% of suppliers by number**

1

**% total procurement spend (direct and indirect)**

23

**% of supplier-related Scope 3 emissions as reported in C6.5**

**Rationale for the coverage of your engagement**

Energy represents one of the largest spend areas for NSG; In FY23 it was 23% of the total Procurement spend for the group. In addition, scope 1 and scope 2 energy consumption represents 51% of the CO2 emissions of NSG Group. The Energy and Carbon Management programme has continued with a number of new energy and water efficiency projects implemented.

**Impact of engagement, including measures of success**

Our measure of success will be to incentivise the market supply of renewable electricity and hit our target of 50% by 2024. In 2022 32% of Group electricity came from renewable sources an increase of 6% vs 2021. The Power Purchase Agreement (PPA) which began in January 2022 for electricity demand in Poland made a major contribution towards the target. The Poland PPA helped to reduce carbon emissions by 57,000 tonnes in 2022. Further offsite PPA's were implemented in Argentina to support the existing operations and the business expansion as part of a strategy to manage cost and carbon emissions simultaneously. Renewable electricity is already being used to support Scope 1 emission reductions through the use of an electric boost system in NSG Group's float line at the Gladbeck site in Germany and electric boost systems using RE is planned for future Float Furnaces. Here natural gas consumption is offset via electricity to support lower carbon product manufacturing. An onsite solar project began operation in Rosford, USA in 2022 and construction was underway for projects in Aken (Germany), Maizuru (Japan), Sungai Buloh (Malaysia) and Rosford Phase 2 (USA) with these projects expected to be commissioned during 2023 and 2024. Carbon emissions will be reduced by producing renewable electricity onsite which is then directly consumed by NSG Group's operations. These projects will utilise solar modules from NSG Group's customer First Solar therefore demonstrating products from within NSG Group.

Following on from the world first trials using hydrogen as a furnace fuel in the UK in August 2021, a similar trial was completed in February 2022 using biofuel. Here a liquid biofuel was supplied from Argent Energy, who are located close to the Greengate site in the UK, for a multi-day 100% furnace fuel conversion. The trial was supported by UK Government's Industrial Fuel Switching programme and helped to prove that this type of fuel is another option for future long-term decarbonisation.

To build on the successes in 2021 with hydrogen firing trials, a series of agreements have been signed with partners to identify and develop projects. One example of this would be the Memorandum of Understanding signed with Vertex Hydrogen Limited in UK in late 2022. This project will see the delivery of low-carbon hydrogen to the UK Greengate site in St Helens later in the decade.

**Comment**

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**Type of engagement**

Innovation & collaboration (changing markets)

**Details of engagement**

Run a campaign to encourage innovation to reduce climate impacts on products and services

**% of suppliers by number**

1

**% total procurement spend (direct and indirect)**

12

**% of supplier-related Scope 3 emissions as reported in C6.5**

**Rationale for the coverage of your engagement**

Transport and Warehousing activities account for 12% of the NSG Group's total procurement's spend across its global operations (3.5% warehousing : 8.5% transportation). Regional breakdown as follows: European road transport accounts for 45%, SEA & India 3%, Japan 16%, and the Americas 36%.

**Impact of engagement, including measures of success**

Our measure of success will be to reduce scope 3 emissions in line with NSG's overall SBTi target of 30% by 2030. Supplier engagement on CO2 reporting currently equates to ~80% coverage in Europe, 37% coverage in Japan and 39% in North America and we collate detailed distance travelled data. In 2022 we focused on continuous incremental efficiency gains through; reducing empty driven miles, modal shift from road to rail, ship or barge and increase of relative payload of product carried. All initiatives continue to reduce our environmental impact. In Europe, through selection of a consolidated strategic haulier base, enhanced reporting and visibility has led to efficiency gains through better haulier, lane management and flow triangulation improvements in our network. Through our Control Tower we optimize return load opportunities with other clients and through governance and checks we have standardized trailer types with direct and subcontracted hauliers across multiple NSG Business Units. Our North American automotive business has a return ratio approx 5:1. We have worked with our carriers to identify return shipments in order to reduce one-way shipments. Through investment in UK the payload for bulk Float Glass road carriage by reducing TARE weight of the tractor and trailer units on larger proportions of the dedicated fleets has continued to improve. In Europe we have been working to increase intermodal solutions for freight and raw materials, moving from truck to rail where possible & reducing GHG emissions up to 75%. Intermodal movements increased between our automotive operations, San Salvo (IT) to Poland and San Salvo (IT) to Witten (DE). A project is underway to explore the use of HVO as opposed to Diesel for Innenladers in the UK (ex St Helens). In North America, routes are continuously reviewed for qualification of intermodal conversions. Our North American Automotive Glass Replacement Division routes their shipments from Distribution Center to Service Centre for the most optimal routes and then publishes those to the respective 4PL providers to competitive bid against. A bespoke system ensures all service centre returns are managed properly with efficient backhauls and optimization of routes. Returns from our Florida/Georgia service centers to Mexicali also utilize intermodal

**Comment**

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**Type of engagement**

Innovation & collaboration (changing markets)

**Details of engagement**

Collaborate with suppliers on innovative business models to source renewable energy

**% of suppliers by number**

1

**% total procurement spend (direct and indirect)**

13

**% of supplier-related Scope 3 emissions as reported in C6.5**

**Rationale for the coverage of your engagement**

The manufacture and processing of glass making raw materials for use in NSG manufacturing lines makes up around 35% of scope 3 emissions or 15% of total NSG Group CO2 emissions. For an average float line approximately 17% of CO2 emissions result from the decomposition of carbonate raw materials. Therefore a focus on low carbon alternatives is a priority for NSG.

**Impact of engagement, including measures of success**

Our measure of success will be to reduce scope 3 emissions in line with NSG's overall SBTi target of 30% by 2030. NSG is working closely with key supply partners to understand in detail the current primary emission factors of the raw materials to ensure the most accurate result of Scope 3 impact, including calculation method and third party verification. In addition, NSG will evaluate supplier roadmaps to 2030 and 2050 carbon reduction targets to ensure alignment with NSG targets. This work will inform the NSG sourcing strategy and drive the transition to a fully sustainable supply chain that can meet the published Science Based Targets for 2030 and beyond. In early 2022 NSG completed a successful glass manufacturing trial using calcined dolomite. Handling and processing challenges were overcome to ensure a safe and controlled delivery of the material to the furnace and multiple KPI's were monitored to evaluate the impact. Results demonstrated that not only were emissions lower but the energy required to melt the batch also reduced. A second larger trial is now planned for second half of 2023 to further consolidate the knowledge gained and optimize the process. Other more speculative low carbon materials will also be trialed in 2023 to prove their technical suitability in the glassmaking process and expand the suite of potential solutions available to meet NSG emission targets. NSG is taking steps to increase the use of recycled glass (cullet) in the production process. This includes not just the cullet generated during glass manufacturing and tertiary processing, but also returns from Customers and end users to maximise the recycled content of the batch. This in turn reduces the amount of carbonate raw materials necessary, thus reducing CO2 emissions. Procurement's Supplier Development team are supporting the evaluation of new sources of supply to ensure compliance with minimum quality control standards and cleanliness requirements. We are also partnering with dedicated recycling companies who can clean and remove contamination of cullet sourced from other locations to make a product suitable for NSG, for example glass returns from the Automotive industry.

**Comment**

**C12.1b**

**(C12.1b) Give details of your climate-related engagement strategy with your customers.**

**Type of engagement & Details of engagement**

Education/information sharing	Run an engagement campaign to educate customers about the climate change impacts of (using) your products, goods, and/or services
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**% of customers by number**

80

**% of customer - related Scope 3 emissions as reported in C6.5**

90

**Please explain the rationale for selecting this group of customers and scope of engagement**

Our ambition is to strive to realize a sustainable society by offering new values and services with glass swiftly and appropriately to meet the growing needs of our customers and society.

Almost 50% of the NSG Group's £3.3 Billion 2022 sales are derived from the Architectural Glass Business. Our technologically advanced, high-performance glass and glazing products help to solve some of worlds environmental challenges. There is a huge potential for energy savings and CO2 emission reductions simply by using high performance glazing. By incorporating such facts into our training material and daily interactions with our customers we can start to inform and educate on how our products and services can be used to help ameliorate climate-related issues.

In addition to our regular customer educational/information communications with the wider glass industry, all of our customers/partners can attend a PK course, which are highly regarded within the Glass Industry. Attendance covers a wide cross section of the Construction sector from professional Architects, Specifiers, Installers as well Trade. The content of the training sessions has evolved to now include our Group sustainability targets as well as supporting attendees on the regulations and relevant certification schemes such as BREAM, LEED and informing them around our EPDs our Supply Chain Charter. These account for ~80% of our sales.

In addition to the regular customer training sessions, we also use our website as a source of information and knowledge hub. In 2022, the UK website [www.pilkington.co.uk](http://www.pilkington.co.uk) ~1M views with ~10% downloads. Our designated sustainability hub Pilkington UK Sustainability also allows access to information and short videos with information on our Corporate Strategy Sustainability ([nsg.com](http://nsg.com)).

**Impact of engagement, including measures of success**

Our construction sector specific areas allow Architects, Specifiers as well as Trade to access, Got a Question? Ask Pilkington to answer glazing related questions such as how to reduce the environmental impact of buildings or simply what is a g value? Support tools such as Pilkington Spectrum (glass performance model calculator) now includes a GWP figure and has an incremental 15,120 new users in 2022. NSG will continue to measure the usage of the tool as an indication of the customers' understanding in improving the energy saving impact of a building. The ultimate measure of success will be the embodied and operational carbon reduction of new buildings.

In terms of helping to promote and raise awareness of our climate related initiatives on our sustainability journey one example of a typical initiative we undertake throughout the Group is to host webinars with industry insiders. This particular webinar example <https://youtu.be/cbcpWLHT1t8> involved a panel of leading architects and industry experts exploring low carbon glass and net zero manufacturing. We have also developed a short sustainability video Towards a sustainable future - YouTube again to help inform our customers on how we are working to significantly reduce greenhouse gas emissions from the glass manufacturing process through innovative technologies. These short videos are a great way to engage and educate on how we can all make a difference on our sustainability pathway. In addition we are also a member of Glass Futures, who are a global research and technology membership that connects the glass industry with academia to demonstrate disruptive technologies to make glass and other materials zero carbon and sustainable.

Regarding PR we recently promoted our decarbonisation manufacturing trials in the UK via ~ 100 pieces of coverage and a reach of 5.4M to construction sector publications media other platforms.

**Type of engagement & Details of engagement**

Education/information sharing	Share information about your products and relevant certification schemes (i.e. Energy STAR)
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**% of customers by number**

40

**% of customer - related Scope 3 emissions as reported in C6.5**

0.01

**Please explain the rationale for selecting this group of customers and scope of engagement**

NSG continues to develop and extend its portfolio of lighter weight glazings as an enabler for vehicle manufactures to improve the range of the vehicle. A key directive also is to maintain the function of the glazing, so noise reduction interlayers, infra-reflective / absorbing materials and tolerances that allow a flush appearance are increasing being requested. These allow thinner materials, improved solar rejecting properties and improved aerodynamic profiles that all benefit the system efficiency of the battery in an electric vehicle, and hence the range.

These saved emissions are avoided emissions and are not scope 3 emissions in 6.5 so we have recorded 0.01% in the box above

**Impact of engagement, including measures of success**

The engagement resulted in increasing collaborations with customers and more awards of business, as vehicle manufacturers increasingly develop possibilities to improve the system energy efficiency and increase the vehicles driven range.

**Type of engagement & Details of engagement**

Education/information sharing	Share information about your products and relevant certification schemes (i.e. Energy STAR)
-------------------------------	---

**% of customers by number**

70

**% of customer - related Scope 3 emissions as reported in C6.5**

0.01

**Please explain the rationale for selecting this group of customers and scope of engagement**

NSG Group is utilising its in-house low emissivity coating technology for automotive applications. In-vehicle studies on the thermal performance of roof glazings have provided the conditions to enable the removal of the interior blind system, which saves weight and reduces the number of components. The unique properties of the coating provides significant climate control energy saving benefits in both summer and winter conditions. NSG has been promoting low emissivity technologies to multiple multinational customers as an enabler to extend the range of battery electric vehicles. Further enhancements include the incorporation of infra-red reflecting coatings on new product offerings.

These saved emissions are avoided emissions and are not scope 3 emissions in 6.5 so we have recorded 0.01% in the box above

**Impact of engagement, including measures of success**

The engagement resulted in the continued successful award of business to NSG and our low e glazing will be launched in multiple customers' vehicles in all regions, resulting in reduced global climate change impacts from the vehicles used by the end consumer.

**Type of engagement & Details of engagement**

Education/information sharing	Share information about your products and relevant certification schemes (i.e. Energy STAR)
-------------------------------	---

**% of customers by number**

60

**% of customer - related Scope 3 emissions as reported in C6.5**

0.01

**Please explain the rationale for selecting this group of customers and scope of engagement**

Heated glazings help improve the energy efficiency of battery electric vehicles by de-misting or de-icing the glazings whilst the vehicle is either stationary or moving. The portfolio of these types of products continues to evolve. Historically, wires or screen printing technologies have been used as the conductive source. With the implementation of high performance sputter coating technologies, infra-red reflective coatings can also be heated, which provides vehicle energy saving benefits in both hot and cold climates. With the increasing importance of technologies for advanced driver assist features, it is also possible to locally heat and de-mist the glazing in the critical transparency area of the camera field of vision.

These saved emissions are avoided emissions and are not scope 3 emissions in 6.5 so we have recorded 0.01% in the box above.

**Impact of engagement, including measures of success**

The engagement resulted in increasing collaborations with customers and more awards of business, as vehicle manufacturers increasingly develop possibilities to improve the system energy efficiency and increase the vehicles driven range.

**C12.2**

**(C12.2) Do your suppliers have to meet climate-related requirements as part of your organization's purchasing process?**

No, but we plan to introduce climate-related requirements within the next two years

**C12.3**



**(C12.3) Does your organization engage in activities that could either directly or indirectly influence policy, law, or regulation that may impact the climate?**

Row 1

**External engagement activities that could directly or indirectly influence policy, law, or regulation that may impact the climate**

Yes, our membership of/engagement with trade associations could influence policy, law, or regulation that may impact the climate

**Does your organization have a public commitment or position statement to conduct your engagement activities in line with the goals of the Paris Agreement?**

Yes

**Attach commitment or position statement(s)**

The NSG Group has published a Code of Ethics, a sustainability policy and an environmental policy that make clear commitments to align with the principles of the UN Global Compact. These policies are further enhanced by the public commitment of NSG Group to deliver a Science Based Target verified by the SBTi. Science-based targets provide a clearly-defined pathway for companies to reduce greenhouse gas (GHG) emissions, helping prevent the worst impacts of climate change and future-proof business growth. Targets are considered 'science-based' if they are in line with what the latest climate science deems necessary to meet the goals of the Paris Agreement – limiting global warming to well-below 2°C above pre-industrial levels and pursuing efforts to limit warming to 1.5°C. See page 34 NSG Code of Ethics For suppliers and other business partners we will: work with those whose ethics match our own and take action if their behavior conflicts with our Code.

NSG Group Environment Policy Poster.pdf

NSG Group Sustainability Policy Poster.pdf

NSG\_Group\_Ethics\_booklet\_E01.pdf

NSG\_Group\_Ethics\_booklet\_2023\_E01.pdf

NSG Group Sustainability Policy Poster\_EN\_202304 (3).pdf

NSG Group Environmental Policy Poster\_EN\_202304.pdf

**Describe the process(es) your organization has in place to ensure that your external engagement activities are consistent with your climate commitments and/or climate transition plan**

See page 35 NSG Code of Ethics Working with Customers, Suppliers and Partners. For suppliers and other business partners we will: Work with those whose ethics match our own, Never allow relationships to influence our business decisions and Take action if their behaviour conflicts with our Code Governance of the application and delivery of the NSG Group sustainability policy, environmental policy and SBTi target is undertaken at the highest possible level within the organisation via the Group executive management committee and sustainability committee. The adherence of these policies and targets, signed off by the NSG Group CEO, is a fundamental responsibility for all employees of NSG Group. The climate strategy of NSG Group aligns directly to the overall Group strategy and mission 'Changing our surroundings, improving our world'. The ongoing management of activities to achieve the targets established is reported on a regular basis to the governance committees of NSG Group, with the establishment and tracking of various key performance indicators demonstrating the delivery of defined actions. The sustainability committee and various sub committees, e.g. energy and carbon management committee ensures that the performance of these KPI's is on track to deliver and in cases where any deviation is seen, action plans established and implemented to ensure targets are back on track over appropriate timescales. The Sustainability committee also ensures that the KPI's of importance are reviewed to ensure they remain relevant as a measure of the engagement of the Group in achieving the business strategy.

**Primary reason for not engaging in activities that could directly or indirectly influence policy, law, or regulation that may impact the climate**

<Not Applicable>

**Explain why your organization does not engage in activities that could directly or indirectly influence policy, law, or regulation that may impact the climate**

<Not Applicable>

C12.3b

**(C12.3b) Provide details of the trade associations your organization is a member of, or engages with, which are likely to take a position on any policy, law or regulation that may impact the climate.**

**Trade association**

Other, please specify (Glass For Europe)

**Is your organization's position on climate change policy consistent with theirs?**

Consistent

**Has your organization attempted to influence their position in the reporting year?**

Yes, we publicly promoted their current position

**Describe how your organization's position is consistent with or differs from the trade association's position, and any actions taken to influence their position**

As forward-looking innovative providers of state-of-the-art products and technologies, Glass for Europe members believe that it is essential to achieve balanced solutions that are sustainable from an economic, environmental and social standpoint. In this context Glass for Europe is particularly interested in the following European policies: - Energy efficiency in light of glass' contribution to energy savings -EU initiatives aimed at lowering the environmental impact of manufacturing and strengthening innovation in sustainable production -Legislation that aims to enhance the quality of glass products and their distribution Besides, Glass for Europe is involved in the discussion on the development of standards for glass products and the subsequent CE marking. Globally, it calls on EU policies to ensure a level-playing field between EU and non-EU manufacturing industries and a reform of the EU climate and energy policies to ensure that Europe's low-carbon objective becomes a growth-driver for EU industries. NSG policy is replicated at trade association level and demonstrates public policy support for mitigating climate change. In the case of Glass for Europe lobbying position being different to NSG Group, we have the option to veto any public policy disclosure. This position is in line with members' climate change strategy to reduce energy consumption and carbon emissions in both manufacturing processes and in product use. -Lobbying to ensure that high performance solar control glass technologies are legally required in vehicles to reduce fuel consumption and CO2 associated with air conditioning. -We are helping to respond to consultations on The Green Deal and are calling for a binding energy savings target for buildings -EU Emissions Trading Scheme: maintaining carbon leakage status and post 2020 legislative improvement options. Currently promoting increased recycling of end of life glass products to reduce energy consumption and CO2 emissions from glass manufacturing. In 2020, Glass for Europe published "2050 Flat Glass in Climate-Neutral Europe" brochure. See <https://glassforeurope.com/wp-content/uploads/2020/01/flat-glass-climate-neutral-europe.pdf> It describes why GFE is lobbying for the following legislative policy changes: Industrial Strategy, Energy Positive Building Stock, Sustainable Transport, Achieving Climate Neutrality, Transition to a Circular Economy, Clean, Reliable and Affordable Energy and Financing the Transition

**Funding figure your organization provided to this trade association in the reporting year (currency as selected in C0.4)**

22000000

**Describe the aim of your organization's funding**

Membership fee for Board presence, Environment Committee, Standardisation Committee, External Relations Committee and Automotive Strategy Committee

**Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?**

Yes, we have evaluated, and it is aligned

**Trade association**

Other, please specify ((Flat Glass Manufacturing Association of Japan))

**Is your organization's position on climate change policy consistent with theirs?**

Consistent

**Has your organization attempted to influence their position in the reporting year?**

Yes, and they have changed their position

**Describe how your organization's position is consistent with or differs from the trade association's position, and any actions taken to influence their position**

We have already influenced them to change their position The GHG reduction target by 2030 of FGMAJ (about 22% reduction for 2013) which reported to METI have gaps with Japan's target by 2030 (about 46% reduction for 2013). It seems to be expected that the target of FGMAJ will be reviewed in the future and aligned with Member company targets. The three companies, NSG, AGC and CGC, discuss and decide on policies regarding initiatives with the METI and Keidanren etc.. The association has produced LCA reports to demonstrate and support the use of high spec insulating windows that reduce CO2 emissions from buildings. Flat Glass Manufacturing Association of Japan (FGMAJ) is participating in Keidanren's Commitment to a Low Carbon Society. In Commitment to a Low Carbon Society phase 2, FGMAJ has committed to reducing GHG emissions by 49% below 1990 levels by 2030. All 3 member companies have the same strategy, i.e. promoting construction and automotive legislation which requires the installation of highly insulating glasses. We are members of the environment committee and support their activities. We have lobbied Japanese government for many years to establish a new regulation for high spec insulating windows. Recently, the government finally decided to revise an energy saving law which requires that all new buildings should have higher insulating windows.

**Funding figure your organization provided to this trade association in the reporting year (currency as selected in C0.4)**

100000

**Describe the aim of your organization's funding**

Membership fee for Environmental Technology Committee of FGMAJ

**Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?**

Yes, we have evaluated, and it is aligned

**Trade association**

Other, please specify (National Glass Association (NGA) and the Fenestration and Glazing Industry Alliance (FGIA))

**Is your organization's position on climate change policy consistent with theirs?**

Consistent

**Has your organization attempted to influence their position in the reporting year?**

Yes, we publicly promoted their current position

**Describe how your organization's position is consistent with or differs from the trade association's position, and any actions taken to influence their position**

National Glass Association (NGA) and the Fenestration and Glazing Industry Alliance (FGIA) are actively involved with standards and codes bodies to promote sustainability initiatives relating to environmental friendliness and energy efficient glazing solutions in North America. We are actively involved in NGA and FGIA committee meetings and contribute to lobbying activities for the legislative drivers required to install more energy efficient glazing in buildings.

**Funding figure your organization provided to this trade association in the reporting year (currency as selected in C0.4)**

10118664

**Describe the aim of your organization's funding****Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?**

Yes, we have evaluated, and it is aligned

## C12.4

**(C12.4) Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).**

**Publication**

In mainstream reports, incorporating the TCFD recommendations

**Status**

Underway – previous year attached

**Attach the document**

IntegratedReport2022.pdf

**Page/Section reference**

Strategy for Energy saving products p9-14, Carbon Neutrality Goal by 2050 - Emission targets p22, Climate change and TCFD p33-38, GHG performance and CY21 CO2 emissions p37, Energy Initiatives to reduce energy use and CO2 emissions p39 – 43, Corporate governance p70, Risks and risk management p83

**Content elements**

Governance  
Strategy  
Risks & opportunities  
Emissions figures  
Emission targets  
Other metrics

**Comment**

## C12.5

**(C12.5) Indicate the collaborative frameworks, initiatives and/or commitments related to environmental issues for which you are a signatory/member.**

	Environmental collaborative framework, initiative and/or commitment	Describe your organization's role within each framework, initiative and/or commitment
Row 1	Science Based Targets Network (SBTN) Task Force on Climate-related Financial Disclosures (TCFD)	NSG has been utilising the TCFD framework for reporting since 2019 and continues to develop the TCFD response within the integrated report (annually) and regular updates of the NSG website content aligned with TCFD requirements & guidelines. (https://www.nsg.com/en/sustainability/climate-change/initiatives-for-tcfcd/strategy) In 2021, NSG demonstrated further commitment by becoming a member of the TCFD consortium in Japan. The forum was established in 2019 as a forum for companies and financial institutions that support the TCFD recommendations to work together to promote and discuss on effective and efficient corporate disclosure of climate-related information and their use by financial institutions. NSG first engaged with the SBTi in 2018 when the Group were first considering the establishment of a decarbonization reduction target. The Group went on to establish its first SBTi using 2018 as the baseline year, following a 2DS absolute contraction methodology. The target covered Scope 1 and Scope 2 emissions, with a reduction of 21% by 2030 vs 2018 baseline year. In 2021 NSG Group started to consider a revised target, working alongside the SBTi to develop this revision. The revised target was approved in May 2022, using the more ambitious scenario of WB2DS and also incorporating for the first time a scope 3 emission target (across all Scope 3 emission categories). The revised targets are a 30% reduction in absolute emissions across Scope 1, 2 & 3. The continued relationship with the SBTN since 2018 has resulted in NSG Group establishing science based absolute emission targets which are continually monitored and reported as part of the annual reporting of NSG activities. Representatives of NSG Group also participated in various activities relating to the introduction of the SBTi Net Zero targets during 2022.

**C15. Biodiversity**

**C15.1**

**(C15.1) Is there board-level oversight and/or executive management-level responsibility for biodiversity-related issues within your organization?**

	Board-level oversight and/or executive management-level responsibility for biodiversity-related issues	Description of oversight and objectives relating to biodiversity	Scope of board-level oversight
Row 1	No, but we plan to have both within the next two years	<Not Applicable>	<Not Applicable>

**C15.2**

**(C15.2) Has your organization made a public commitment and/or endorsed any initiatives related to biodiversity?**

	Indicate whether your organization made a public commitment or endorsed any initiatives related to biodiversity	Biodiversity-related public commitments	Initiatives endorsed
Row 1	No, but we plan to do so within the next 2 years	<Not Applicable>	<Not Applicable>

**C15.3**

**(C15.3) Does your organization assess the impacts and dependencies of its value chain on biodiversity?**

**Impacts on biodiversity**

**Indicate whether your organization undertakes this type of assessment**

No, but we plan to within the next two years

**Value chain stage(s) covered**

<Not Applicable>

**Portfolio activity**

<Not Applicable>

**Tools and methods to assess impacts and/or dependencies on biodiversity**

<Not Applicable>

**Please explain how the tools and methods are implemented and provide an indication of the associated outcome(s)**

<Not Applicable>

**Dependencies on biodiversity**

**Indicate whether your organization undertakes this type of assessment**

No, but we plan to within the next two years

**Value chain stage(s) covered**

<Not Applicable>

**Portfolio activity**

<Not Applicable>

**Tools and methods to assess impacts and/or dependencies on biodiversity**

<Not Applicable>

**Please explain how the tools and methods are implemented and provide an indication of the associated outcome(s)**

<Not Applicable>

C15.4

(C15.4) Does your organization have activities located in or near to biodiversity- sensitive areas in the reporting year?

No

C15.5

(C15.5) What actions has your organization taken in the reporting year to progress your biodiversity-related commitments?

	Have you taken any actions in the reporting period to progress your biodiversity-related commitments?	Type of action taken to progress biodiversity- related commitments
Row 1	Yes, we are taking actions to progress our biodiversity-related commitments	Land/water protection Law & policy

C15.6

(C15.6) Does your organization use biodiversity indicators to monitor performance across its activities?

	Does your organization use indicators to monitor biodiversity performance?	Indicators used to monitor biodiversity performance
Row 1	No, we do not use indicators, but plan to within the next two years	Please select

C15.7

(C15.7) Have you published information about your organization’s response to biodiversity-related issues for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Report type	Content elements	Attach the document and indicate where in the document the relevant biodiversity information is located
No publications	<Not Applicable>	<Not Applicable>

C16. Signoff

C-FI

(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

C16.1

(C16.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	Munehiro Hosonuma	Chief Executive Officer (CEO)