# Nippon Sheet Glass Company, Ltd - Climate Change 2022

## C0. Introduction

### C0.1

**(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 SBT initiative targets were approved in October 2019. These targets are being revised, as announced at the Group FY22 results presentation in May 2022 and SBTi re-verification will be sought at that time. For the first time, these targets will also include Scope 3 aspects covering all categories of scope 3 emission.

Progress against these targets in 2021/22 includes the world's first utilisation of Hydrogen gas to replace natural gas in the manufacture of flat glass. This very successful full scale production trial took place over a 4 week period in August 2021. 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

**(C0.2) State the start and end date of the year for which you are reporting data.**

| | Start date | End date | Indicate if you are providing emissions data for past reporting years | Select the number of past reporting years you will be providing emissions data for |
|---|---|---|---|---|
| Reporting year | January 1 2021 | December 31 2021 | No | <Not Applicable> |

### C0.3

**(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

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

JPY

## C0.5

**(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

**(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

## C1.1

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

Yes

## C1.1a

**(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(s) | Please explain |
|---|---|
| Chief Executive Officer (CEO) | 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. 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. The Board of directors establish the Group's basic policies and goals including climate-related policies and targets. Climate-related issues are mainly discussed at the Management Committee (MC) and Sustainability Committee (SC) based on these policies and targets. 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. 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 2021, with active guidance given at board meetings and many other opportunities. 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. In CY2021, in addition to the regular agenda, the BOD also monitored and decided the following climate actions for mid-term ESG and climate strategy; At a CY21 board meeting, a new ESG strategy was proposed in line with the formulation of the next mid-term management plan. 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 MTP including new ESG strategy was suspended and revised due to COVID-19. Discussions progressed from the second half of CY20 and into CY21. The new medium term management plan, Revival plan 24, was formulated and announced in May 21. |

## 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 | Reviewing and guiding strategy<br>Reviewing and guiding major plans of action<br>Reviewing and guiding risk management policies<br>Reviewing and guiding business plans<br>Monitoring implementation and performance of objectives<br>Overseeing major capital expenditures, acquisitions and divestitures<br>Monitoring and overseeing progress against goals and targets for addressing climate-related issues | <Not Applicable> | 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. 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 fulfil the policies and goals and the board monitors and reviews the progress. Examples from this reporting year include as below; 1) Setting the targets concerning climate-related issues and monitoring implementation of action plans. The Group 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. In 2019, the CO2 reduction target and the acquisition of certification by the SBT initiative was deliberated in the SC, decided by the CEO and subsequently approved by the Board of Directors in August 2019. 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. 2) Medium- to long-term strategy (inclusive of challenges associated with climate change). At the board meeting in the first half of CY20, 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. Next MTP including new ESG strategy was suspended and revised due to COVID-19. Discussions progressed from the second half of CY2020 to the first half of CY2021, and the new medium-term management plan, Revival Plan 24, was formulated and announced in May 2021. The progress of them 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. 3) Risk management policies 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. 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. |

## 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 has considerable expertise in the area of sustainability and specifically climate change activities based on this assessment criteria. | <Not Applicable> | <Not Applicable> |

## C1.2

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

| Name of the position(s) and/or committee(s) | Reporting line | Responsibility | Coverage of responsibility | Frequency of reporting to the board on climate-related issues |
|---|---|---|---|---|
| Chief Executive Officer (CEO) | <Not Applicable> | Both assessing and managing climate-related risks and opportunities | <Not Applicable> | Quarterly |

## C1.2a

**(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored (do not include the names of individuals).**

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 the COO & Vice-president, the CFO & Vice-president, 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.

In the reporting period, the global leaders of each functions reported the updates on sustainability targets and the CEO approved the material items described as follows.

1 ) SBT initiatives

The Group participated in SBT in 2018. In the reporting period, the CO2 reduction target was examined, and the CEO approved the target. The Group's target was certificated by SBT initiative in October 2019.

Considering mitigation of the risks associated with climate change brings business opportunities compatible with environmental contribution, the Group set forth a CO2 emission reduction target and at the same time, the CEO externally announced that the Group would pursue the following initiatives:

- Converting the energy source in the glass manufacturing process from heavy oil to natural gas

- Implementation of CO2 reduction measures in the glass manufacturing process

- Supplying energy saving/generating glass, e.g. solar energy glass, vacuum glass, etc. to reduce CO2 emission

Subsequently, a roadmap for reducing CO2 emission was laid out and action plans were discussed to deliver these initiatives. These activities are carried out under guidance from the COO in R&D, Engineering, Procurement and other corresponding departments respectively and their progress is monitored and reviewed by SC.

2) Definition of environmental contribution products

For the purpose of raising awareness of environmental contribution products inside of the Group, their definition is reviewed from the standpoint of the UN SDGs. The medium-term numerical targets were presented to each SBU to expand the sales of environmental contribution products. The progress of this activity is to be monitored. This target is currently suspended due to the impact of COVID-19 and to be revised when its impact on our business is identified.

3) Installation of internal carbon pricing

A proposal was made and approved by the CEO to introduce the internal carbon pricing system to enhance awareness of carbon pricing across SBUs and support departments and to incorporate CO2 emission into the evaluation criteria of a large-scale project of the Group. Based on this decision, the environmental impact of all large investments will be managed. In addition, the implementation of these is carried out with the confirmation of all MC members and the approval of the CEO.

4) ESG strategy

The new ESG strategy integrated within the new medium-term management plan, Revival Plan 24, was formulated and announced in May 2021. In this 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 COO. In 2021, the Global Sustainability Director gave a monthly briefing on sustainability issues to the COO while reporting annual schedule update and additional discussion on specific agenda in MC. Such agenda included an update concerning SBT research and the related action plan, feedback on internal carbon pricing discussion, and the need for additional resources to address climate change issues including CO2 emission reduction projects.

In addition, the COO 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 | Type of incentive | Activity incentivized | Comment |
|---|---|---|---|
| Chief Procurement Officer (CPO) | Monetary reward | Energy reduction project<br>Energy reduction target<br>Environmental criteria included in purchases<br>Supply chain engagement<br>Company performance against a climate-related sustainability index | CPO has a personal objective to continue to extend the energy management programme in line with the agreed plans. This objective is linked to performance related pay. |
| Buyers/purchasers | Monetary reward | Environmental criteria included in purchases<br>Company performance against a climate-related sustainability index | Members of the procurement function that are directly engaged in the sustainability / climate change activities have a limited scope incentive linked to these activities |

# 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. |
| 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 to define the thresholds for risks that are (a) within appetite; (b) beyond appetite but within tolerance; and (c) beyond tolerance.

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 commenced in late 2021 and completed during 2022.

## C2.2

**(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 and the Audit Committee regarding the effectiveness of the Group's basic internal control system and risk management structure. In each of FY2021 and FY2022, the SRC convened three meetings and reported once each to the Management Committee and the Audit Committee. The ERM Team is chaired by the CFO and its members 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 is the financial year and the process is operated through a network of risk champions. Each SBU Region identifies and assesses the key risks and opportunities including the cause and effect, the current impact and 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 help 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**
Launched in 2021 and completed In early 2022 the 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 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 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 risks and opportunities have been mapped onto the Groups risk appetite framework for ongoing monitoring purposes but the exercise will be continued throughout 2022 to review the detailed findings and define appropriate response plans as part of both the ERM and Strategic Planning processes.

## 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 in the last year. 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 2021/22 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 2021/22 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 2021/22 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 2021/22 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 2021/22 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 2021/22 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 2021/22 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 2021/22 climate-related risk drill-down. |

## C2.3

**(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

**(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 |

**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 2021/22 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)**
50000000000

**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 2021/22 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, 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. 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 was made to expand operations in Argentina for supply of high performance glazing products to start production in 2022. 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 amnd NA in 2020/21. A further 15 billion Yen sales revenue is forecast for the new plant that will start production of high performance glazing in Argentina in 2022.

**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 transition plan that aligns with a 1.5°C world?**

**Row 1**

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

**Publicly available transition plan**
Yes

**Mechanism by which feedback is collected from shareholders on your 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 transition plan (optional)**
NSG Decarbonisation_short Jun 2022.pptx

**Explain why your organization does not have a 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> | 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 & long term). In addition assessments out to 2050 and 2100 were included. Financial impacts were estimated and likelihoods assessed and aligned to an adapted version of the NSG Group enterprise risk management criteria. Scenario indicators utilised for qualitative and quantitative analysis include; Technology indicators, e.g. change in technology use, share of global renewables, average annual efficiency improvement in iron, steel & cement industries), % of EV's for global passenger cars. Economic & social indicators, e.g. Carbon tax prices, energy price predictions, Net zero commitments, market & production, growth in material consumption. Carbon price risk calculated based on Scope 1 and Scope 2 location based emissions. Carbon prices estimates used for quantitative analysis based on the mid range average of NGFS models (NGFS <2°C, NGFS Net Zero 2050). Baseline emissions for the scenario assessments refer to 2018 emissions (as provided for SBTi target validation) 30% reduction target achievement included according to latest NSG Group SBTi target proposals 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. 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. 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) Initial assessment at Company wide level was then further differentiated to a regional level approach and also a business division approach. |
| Transition scenarios: IEA SDS | Company-wide | <Not Applicable> | 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 & long term). In addition assessments out to 2050 and 2100 were included. Financial impacts were estimated and likelihoods assessed and aligned to an adapted version of the NSG Group enterprise risk management criteria. Scenario indicators utilised for qualitative and quantitative analysis include; Technology indicators, e.g. change in technology use, share of global renewables, average annual efficiency improvement in iron, steel & cement industries), % of EV's for global passenger cars. Economic & social indicators, e.g. Carbon tax prices, energy price predictions, Net zero commitments, market & production, growth in material consumption. Carbon price risk calculated based on Scope 1 and Scope 2 location based emissions. Carbon prices estimates used for quantitative analysis based on the mid range average of NGFS models (NGFS <2°C, NGFS Net Zero 2050). Baseline emissions for the scenario assessments refer to 2018 emissions (as provided for SBTi target validation) 30% reduction target achievement included according to latest NSG Group SBTi target proposals 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. 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. 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) Initial assessment at Company wide level was then further differentiated to a regional level approach and also a business division approach. |
| Transition scenarios: IEA CPS | Company-wide | <Not Applicable> | 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 & long term). In addition assessments out to 2050 and 2100 were included. Financial impacts were estimated and likelihoods assessed and aligned to an adapted version of the NSG Group enterprise risk management criteria. Scenario indicators utilised for qualitative and quantitative analysis include; Technology indicators, e.g. change in technology use, share of global renewables, average annual efficiency improvement in iron, steel & cement industries), % of EV's for global passenger cars. Economic & social indicators, e.g. Carbon tax prices, energy price predictions, Net zero commitments, market & production, growth in material consumption. Carbon price risk calculated based on Scope 1 and Scope 2 location based emissions. Carbon prices estimates used for quantitative analysis based on the mid range average of NGFS models (NGFS <2°C, NGFS Net Zero 2050). Baseline emissions for the scenario assessments refer to 2018 emissions (as provided for SBTi target validation) 30% reduction target achievement included according to latest NSG Group SBTi target proposals 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. 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. 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) Initial assessment at Company wide level was then further differentiated to a regional level approach and also a business division approach. |
| Physical climate scenarios: RCP 8.5 | Company-wide | <Not Applicable> | Initial assessment at Company wide level was then further differentiated to a regional level approach and also a business division approach. 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. Acute climate risks with significant impact include; river flood, flash flood or surface water run-off. Chronic climate risks with significant impact include; sea level rise, increase in heat and prolonged drought stress. |
| Physical climate scenarios: RCP 4.5 | Company-wide | <Not Applicable> | Initial assessment at Company wide level was then further differentiated to a regional level approach and also a business division approach. 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. Acute climate risks with significant impact include; river flood, flash flood or surface water run-off. Chronic climate risks with significant impact include; sea level rise, increase in heat and prolonged drought stress. |
| Physical climate scenarios: RCP 1.9 | Company-wide | <Not Applicable> | nitial assessment at Company wide level was then further differentiated to a regional level approach and also a business division approach. 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. Acute climate risks with significant impact include; river flood, flash flood or surface water run-off. Chronic climate risks with significant impact include; sea level rise, increase in heat and prolonged drought stress. |

## 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.

**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 an 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.

## 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 2020 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 in 2020 and 2021. 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 2020. 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 2020 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. |
| 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 2019/20 of a 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 5 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 $50/tonne ICP and ~3Mt CO2 (scope 1), results in a indicative cost impact of $150M. 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 2020 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 efficiency to a best in class level. The impact of Covid19 during 2020 was also closely monitored at operational level in terms of energy and carbon management. 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 facility utilisation 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. |

## 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<br>Direct costs<br>Capital expenditures<br>Capital allocation<br>Access to capital | Further adoption of the TCFD framework during 2020 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 2015 - 2020. 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. 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 transition to a 1.5°C world?**

No, but we plan to in the next two years

# 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

**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 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 emissions covered by target as % of total base year emissions in Scope 3 (in all Scope 3 categories)**
100

**Base year emissions covered by target in all selected Scopes as % of total base year emissions in all selected Scopes**
100

**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)**
3028390

**Scope 2 emissions in reporting year covered by target (metric tons CO2e)**
621869

**Scope 3 emissions in reporting year covered by target (metric tons CO2e)**
3556368

**Total emissions in reporting year covered by target in all selected scopes (metric tons CO2e)**
7206627

**% of target achieved relative to base year [auto-calculated]**
-31.5027757987588

**Target status in reporting year**
Revised

**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

**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 impact of the Covid19 pandemic and global economic downturn continued to impact NSG Group value chain emissions during 2021, although to a lesser extent compared to previous years. 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 2021 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 2021. 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>

## C4.1b

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

**Target reference number**
Int 1

**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 (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 (in all Scope 3 categories) covered by this 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)**
0.11

**Intensity figure in reporting year for 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)**
0.74

**% of target achieved relative to base year [auto-calculated]**
79.113924050633

**Target status in reporting year**
Underway

**Is this a science-based target?**
No, but we are reporting another target that is science-based

**Target ambition**

<Not Applicable>

**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 Overall performance of 6% target was achieved by end of 2018. Continued deterioration in performance during 20120 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 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. 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>

## C4.2

**(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**
26

**% of target achieved relative to base year [auto-calculated]**
25

**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 2021 this figure reached 26%, 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 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 from January 2022 onwards. 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. 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>

## 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 |

**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**
19500

**% of target achieved relative to base year [auto-calculated]**
58.8235294117647

**Target status in reporting year**
New

**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 remelted 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 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 would include the vPPA recently signed for Poland based operations. 3. Technology Change. Developing a 'tool-box' of technologies that can be 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 2021 include the utilisation of software to undertake LCA 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 2020/21, 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 | 13 | 4200 |
| To be implemented* | 61 | 14500 |
| Implementation commenced* | 129 | 21100 |
| Implemented* | 169 | 89350 |
| Not to be implemented | 14 | 5260 |

## 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 |

**Estimated annual CO2e savings (metric tonnes CO2e)**
49650

**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)**
1800000000

**Investment required (unit currency – as specified in C0.4)**
1000000000

**Payback period**
<1 year

**Estimated lifetime of the initiative**
11-15 years

**Comment**
Aligned with SDG #12 responsible consumption and production and SDG #13 climate action, 1.8Bn Yen savings delivered by 125 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 |

**Estimated annual CO2e savings (metric tonnes CO2e)**
8200

**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 and Asia. Finally the introduction of Power Purchase Agreements for electricity supply (vPPA) in Europe and South America

**Initiative category & Initiative type**

| | |
|---|---|
| Waste reduction and material circularity | Product/component/material recycling |

**Estimated annual CO2e savings (metric tonnes CO2e)**
27000

**Scope(s) or Scope 3 category(ies) where emissions savings occur**
Scope 1
Scope 3 category 1: Purchased goods & services
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)**
100000000

**Investment required (unit currency – as specified in C0.4)**
150000000

**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, 100M Yen savings delivered by 14 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)**
4500

**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)**
800000000

**Investment required (unit currency – as specified in C0.4)**
2200000000

**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 30 furnace and other process operational efficiency projects, including investment in efficient infrastructure projects e.g. LED's, inverters, high efficiency fan systems, etc.

## 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 $50/tonne CO2 to be applied to all capital projects >100000000 investment. |
| 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 (as a consequence of the Covid19 pandemic) 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 |

**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 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)

**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 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**
battery separator division, part of the creative technology SBU

**Details of structural change(s), including completion dates**
Sale of manufacturing sites within the battery separator division within the creative technology SBU. Divestment took place in August 2021.

## 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 | No | <Not Applicable> |

## C5.1c

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

| | Base year recalculation | Base year emissions recalculation policy, including significance threshold |
|---|---|---|
| Row 1 | No, because the impact does not meet our significance threshold | NSG Group set an emissions baseline recalculation policy at +/- 5% tolerance. The divestment of this business did not trigger this recalculation. Total emissions across all 3 scopes for the sites involved was @20k tonnes vs total Group emissions of @6M tonnes = 0.3%. |

## 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

## 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)**
3028390

**Start date**
<Not Applicable>

**End date**
<Not Applicable>

**Comment**
Total scope 1 emissions for NSG Group

## 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**
748696

**Scope 2, market-based (if applicable)**
621869

**Start date**
<Not Applicable>

**End date**
<Not Applicable>

**Comment**
Scope 2 location and market based emissions for NSG Group

## C6.4

**(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 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)**
1938669

**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 a 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 15kt for bought in automotove glazing.

### Capital goods

**Evaluation status**
Relevant, calculated

**Emissions in reporting year (metric tons CO2e)**
4000

**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 a 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)**
587759

**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 a 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)**
6143

**Emissions calculation methodology**
Average data 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. 0.0013 x 4, 725,000 tonnes glass melted in CY 21 = 6143 t CO2

### Waste generated in operations

**Evaluation status**
Relevant, calculated

**Emissions in reporting year (metric tons CO2e)**
12055

**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)**
443

**Emissions calculation methodology**
Distance-based method

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**
0

**Please explain**
Calculation method. NSG's global travel agency records total kms travelled by air. 776378 km Short Distance Flights (< 1500km) 1304962 km Medium Distance Flights (Between 1501 to 4100km ) 4165 Long Distance Flights (>4100 km ) Business Air Travel We have used emissions factors from aviation have both direct (CO2 , CH4 and N2O) and indirect (non-CO2 emissions e.g. water vapour, contrails, NOx) climate change effects Average passenger kgCO2e /km Short and medium haul 0.19309 Long haul 0.18362 Well ToTank Air travel Average passenger class Average passenger emission kgCO2e / km Short 0.01681 Medium 0.02114 Long 0.02011

### 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)**
168300

**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**
41

**Please explain**
Distance based methodology used by major US suppliers (31% of US transport spend) to calculate US emissions using SmartWay platform of the US EPA website. (1.04 kg CO2e / km) 2.71 kg CO2e / litre fuel based methodology applied to fuel data supplied by Japanese and European suppliers (36% of Japanese transport spend and 51% of European transport spend). Factors taken from www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2021 Suppliers provided fuel and distance data to cover 40 % of Global road transport spend. 56,388 tonnes CO2 calculated by suppliers = 41% emissions Europe 51% of transport spend emitted 38,907 tonnes CO2e. Assume 100% emitted 76,288 tonnes. Japan 36% of transport spend emitted 5,277 tonnes CO2e Assume 100% emitted 14,658 tonnes NA 32% of transport spend emitted 12,204 tonnes CO2 Assume 100% emitted 38,138 tonnes Total Europe + Japan + NA = 94% Group transport spend = 129,084 tonnes CO2e +6% for missing South America and South East Asia (excluding Japan) = 136,829 t CO2e for Group road transport This year, we are adding previously non reported Well to Wheel emissions. 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. 136829 x 1.23 = 168 300t 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)**
37053

**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 2021, this equates to 37 053 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)**
200000

**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 a furnace in Russia, , 50% ownership of 3 float lines in South America Assume 1 float line emits @100,000 tonnes CO2 / year. Four float lines = 200,000 tonnes CO2 e per year

**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 | 444 | 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**
0.00000608

**Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)**
3650259

**Metric denominator**
unit total revenue

**Metric denominator: Unit total**
600600000000

**Scope 2 figure used**
Market-based

**% change from previous year**
9

**Direction of change**
Decreased

**Reason for change**
In past years, we have reported the denominator in Million Yen but thought that CDP would require us to report in Yen this year, so it is consistent will all other currency entries. CY20 3346565/499 200 000 000 Yen = 0.00000670 CY21 3650259 /600 600 000 000 Yen = 0.00000608 Scope 1 and 2 emissions have increased by 8% and revenue has increased by 20% compared to CY20. 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 CY21 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 | 3028390 | 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/region.**

| Country/Region | Scope 1 emissions (metric tons CO2e) |
|---|---|
| EU28 | 1167915 |
| Asia Pacific (or JAPA) | 821444 |
| North America | 594182 |
| South America | 444849 |

## 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 | 9319 |
| Architectural | 2484436 |
| Automotive | 410777 |
| Creative Technology & Fine Glass Division | 121784 |
| Central functions and Global R&D | 2074 |

## 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 | 2815254 |
| Glass processing | 213136 |

## C7.5

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

| Country/Region | Scope 2, location-based (metric tons CO2e) | Scope 2, market-based (metric tons CO2e) |
|---|---|---|
| EU28 | 262760 | 180647 |
| Asia Pacific (or JAPA) | 269406 | 238787 |
| North America | 167093 | 141320 |
| South America | 49436 | 61115 |

## 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 | 1450 | 1047 |
| Architectural | 328534 | 268587 |
| Automotive | 370911 | 315537 |
| Creative Technology & Fine Glass Division | 45854 | 35915 |
| Central functions and Global R&D | 1945 | 772 |

## 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 | 330015 | 301442 |
| Glass Processing | 418681 | 320427 |

## 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?**

Increased

## 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 | Emissions value (percentage) | Please explain calculation |
|---|---|---|---|---|
| Change in renewable energy consumption | 8200 | Decreased | 2.7 | CY20 3346565 t scope 1 and 2mkt CY21 3650259 t Difference = 303 694t CO2 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 In CY21 we purchased an additional 34GWh of green electricity. Assuming a CO2 emission saving of 0.242kgCO2 / kWh, (OECD European average from IEA version 4) we have saved 8,200t CO2. (8200/303694)*100= 2.7% |
| Other emissions reduction activities | 81150 | Decreased | 26.7 | CY20 3346565 t scope 1 and 2mkt CY21 3650259 t Difference = 303 694t CO2 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 details Total savings from emission reduction activities ar e 81150t. 81150/303694t (scope 1 and 2 change) *100 = 26.7% improvement |
| Divestment | 0 | No change | 0 | |
| Acquisitions | 0 | No change | 0 | |
| Mergers | 0 | No change | 0 | |
| Change in output | 393044 | Increased | 129 | CY20 3346565 t scope 1 and 2mkt CY21 3650259 t Difference = 303 694t CO2 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 7% increase in tonnes glass melted compared to previous year. T melted 2021 = 4 724 523 T melted CY20 = 4 406 258 14.5% increase in m2 processed compared toprevious year. CY20 91593 km2 CY21 107134 km2 This increase in output was due to an increased demand. (393044/303694)*100 = 129% |
| Change in methodology | 0 | No change | 0 | |
| Change in boundary | 0 | No change | 0 | |
| Change in physical operating conditions | 0 | No change | 0 | |
| Unidentified | 0 | No change | 0 | |
| Other | 0 | No change | 0 | |

## 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 | 11000537 | 11000537 |
| Consumption of purchased or acquired electricity | <Not Applicable> | 497092 | 1369855 | 1866947 |
| Consumption of purchased or acquired heat | <Not Applicable> | 0 | 34776 | 34776 |
| Consumption of purchased or acquired steam | <Not Applicable> | 0 | 21287 | 21287 |
| Consumption of purchased or acquired cooling | <Not Applicable> | <Not Applicable> | <Not Applicable> | <Not Applicable> |
| Consumption of self-generated non-fuel renewable energy | <Not Applicable> | 78 | <Not Applicable> | 78 |
| Total energy consumption | <Not Applicable> | 497170 | 12426455 | 12923625 |

## 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**
1022

**MWh fuel consumed for self-generation of electricity**
0

**MWh fuel consumed for self-generation of heat**
1022

**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 applicabke

**Oil**

**Heating value**
LHV

**Total fuel MWh consumed by the organization**
1317715

**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 oils no4 , 5 and 6.

**Gas**

**Heating value**
LHV

**Total fuel MWh consumed by the organization**
9560163

**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 and LNG

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

**Heating value**
LHV

**Total fuel MWh consumed by the organization**
117037

**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**
10995937

**MWh fuel consumed for self-generation of electricity**
10816

**MWh fuel consumed for self-generation of heat**
19821

**MWh fuel consumed for self-generation of steam**
30757

**MWh fuel consumed for self-generation of cooling**
<Not Applicable>

**MWh fuel consumed for self- cogeneration or self-trigeneration**
4623

**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 | 10816 | 10816 | 0 | 0 |
| Heat | 19821 | 19821 | 1022 | 1022 |
| Steam | 30757 | 30757 | 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.**

**Sourcing method**
Purchase from an on-site installation owned by a third party

**Energy carrier**
Electricity

**Low-carbon technology type**
Solar

**Country/area of low-carbon energy consumption**
United Kingdom of Great Britain and Northern Ireland

**Tracking instrument used**
REGO

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**
1279

**Country/area of origin (generation) of the low-carbon energy or energy attribute**
United Kingdom of Great Britain and Northern Ireland

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**
2019

**Comment**
Lathom solar plant

---

**Sourcing method**
Green electricity products from an energy supplier (e.g. green tariffs)

**Energy carrier**
Electricity

**Low-carbon technology type**
Wind

**Country/area of low-carbon energy consumption**
United Kingdom of Great Britain and Northern Ireland

**Tracking instrument used**
REGO

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**
78665

**Country/area of origin (generation) of the low-carbon energy or energy attribute**
United Kingdom of Great Britain and Northern Ireland

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**
2015

**Comment**
Date of commissioning is estimated

---

**Sourcing method**
Green electricity products from an energy supplier (e.g. green tariffs)

**Energy carrier**
Electricity

**Low-carbon technology type**
Hydropower (capacity unknown)

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

**Tracking instrument used**
GO

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**
204669

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

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**
1920

**Comment**
Various commissioning dates 1920 to 2012

---

**Sourcing method**
Green electricity products from an energy supplier (e.g. green tariffs)

**Energy carrier**
Electricity

**Low-carbon technology type**
Wind

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

**Tracking instrument used**
GO

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**
5052

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

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**
2000

**Comment**
Commissioning date is estimated

---

**Sourcing method**
Green electricity products from an energy supplier (e.g. green tariffs)

**Energy carrier**
Electricity

**Low-carbon technology type**
Hydropower (capacity unknown)

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

**Tracking instrument used**
GO

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**
59244

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

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**
2019

**Comment**
Commissioning date estimated

---

**Sourcing method**
Green electricity products from an energy supplier (e.g. green tariffs)

**Energy carrier**
Electricity

**Low-carbon technology type**
Wind

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

**Tracking instrument used**
GO

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**
5757

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

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**
2019

**Comment**
Commissioning date is estimated

---

**Sourcing method**
Green electricity products from an energy supplier (e.g. green tariffs)

**Energy carrier**
Electricity

**Low-carbon technology type**
Solar

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

**Tracking instrument used**
GO

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**
3667

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

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**
2019

**Comment**
Commissioning date is estimated

---

**Sourcing method**
Green electricity products from an energy supplier (e.g. green tariffs)

**Energy carrier**
Electricity

**Low-carbon technology type**
Hydropower (capacity unknown)

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

**Tracking instrument used**
GO

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**
6363

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

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**
2015

**Comment**
Commissioning date estimated.

---

**Sourcing method**
Green electricity products from an energy supplier (e.g. green tariffs)

**Energy carrier**
Electricity

**Low-carbon technology type**
Other biomass

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

**Tracking instrument used**
GO

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**
8339

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

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

**Comment**

---

**Sourcing method**
Green electricity products from an energy supplier (e.g. green tariffs)

**Energy carrier**
Electricity

**Low-carbon technology type**
Wind

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

**Tracking instrument used**
GO

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**
887

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

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

**Comment**

---

**Sourcing method**
Direct procurement from an off-site grid- connected generator e.g. Power purchase agreement (PPA)

**Energy carrier**
Electricity

**Low-carbon technology type**
Wind

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

**Tracking instrument used**
Contract

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**
21556

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

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

2017

**Comment**

---

**Sourcing method**
Green electricity products from an energy supplier (e.g. green tariffs)

**Energy carrier**
Electricity

**Low-carbon technology type**
Wind

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

**Tracking instrument used**
Contract

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**
14695

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

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

**Comment**

---

**Sourcing method**
Green electricity products from an energy supplier (e.g. green tariffs)

**Energy carrier**
Electricity

**Low-carbon technology type**
Large hydropower (>25 MW)

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

**Tracking instrument used**
I-REC

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**
77790

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

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**
1980

**Comment**

---

**Sourcing method**
Green electricity products from an energy supplier (e.g. green tariffs)

**Energy carrier**
Electricity

**Low-carbon technology type**
Sustainable biomass

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

**Tracking instrument used**
GO

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**
3006

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

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**
2020

**Comment**
Estimted commissioning year

---

**Sourcing method**
Green electricity products from an energy supplier (e.g. green tariffs)

**Energy carrier**
Electricity

**Low-carbon technology type**
Solar

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

**Tracking instrument used**
Contract

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**
5163

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

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

**Comment**

## C8.2g

**(C8.2g) Provide a breakdown of your non-fuel energy consumption by country.**

**Country/area**
United Kingdom of Great Britain and Northern Ireland

**Consumption of electricity (MWh)**
81236

**Consumption of heat, steam, and cooling (MWh)**
0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**
81236

**Is this consumption excluded from your RE100 commitment?**
<Not Applicable>

**Country/area**
Germany

**Consumption of electricity (MWh)**
215407

**Consumption of heat, steam, and cooling (MWh)**
18816

**Total non-fuel energy consumption (MWh) [Auto-calculated]**
234223

**Is this consumption excluded from your RE100 commitment?**
<Not Applicable>

**Country/area**
Poland

**Consumption of electricity (MWh)**
158254

**Consumption of heat, steam, and cooling (MWh)**
0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**
158254

**Is this consumption excluded from your RE100 commitment?**
<Not Applicable>

**Country/area**
Italy

**Consumption of electricity (MWh)**
220094

**Consumption of heat, steam, and cooling (MWh)**
30757

**Total non-fuel energy consumption (MWh) [Auto-calculated]**
250851

**Is this consumption excluded from your RE100 commitment?**
<Not Applicable>

**Country/area**
Austria

**Consumption of electricity (MWh)**

6363

**Consumption of heat, steam, and cooling (MWh)**
0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**
6363

**Is this consumption excluded from your RE100 commitment?**
<Not Applicable>

---

**Country/area**
Spain

**Consumption of electricity (MWh)**
8339

**Consumption of heat, steam, and cooling (MWh)**
0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**
8339

**Is this consumption excluded from your RE100 commitment?**
<Not Applicable>

---

**Country/area**
Finland

**Consumption of electricity (MWh)**
34938

**Consumption of heat, steam, and cooling (MWh)**
1002

**Total non-fuel energy consumption (MWh) [Auto-calculated]**
35940

**Is this consumption excluded from your RE100 commitment?**
<Not Applicable>

---

**Country/area**
Netherlands

**Consumption of electricity (MWh)**
887

**Consumption of heat, steam, and cooling (MWh)**
0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**
887

**Is this consumption excluded from your RE100 commitment?**
<Not Applicable>

---

**Country/area**
Norway

**Consumption of electricity (MWh)**
1144

**Consumption of heat, steam, and cooling (MWh)**
0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**
1144

**Is this consumption excluded from your RE100 commitment?**
<Not Applicable>

---

**Country/area**
France

**Consumption of electricity (MWh)**
181

**Consumption of heat, steam, and cooling (MWh)**
0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**
181

**Is this consumption excluded from your RE100 commitment?**
<Not Applicable>

---

**Country/area**

United States of America

**Consumption of electricity (MWh)**
325529

**Consumption of heat, steam, and cooling (MWh)**
0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**
325529

**Is this consumption excluded from your RE100 commitment?**
<Not Applicable>

---

**Country/area**
Mexico

**Consumption of electricity (MWh)**
45252

**Consumption of heat, steam, and cooling (MWh)**
0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**
45252

**Is this consumption excluded from your RE100 commitment?**
<Not Applicable>

---

**Country/area**
Canada

**Consumption of electricity (MWh)**
35204

**Consumption of heat, steam, and cooling (MWh)**
0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**
35204

**Is this consumption excluded from your RE100 commitment?**
<Not Applicable>

---

**Country/area**
Argentina

**Consumption of electricity (MWh)**
85025

**Consumption of heat, steam, and cooling (MWh)**
0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**
85025

**Is this consumption excluded from your RE100 commitment?**
<Not Applicable>

---

**Country/area**
Chile

**Consumption of electricity (MWh)**
19858

**Consumption of heat, steam, and cooling (MWh)**
0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**
19858

**Is this consumption excluded from your RE100 commitment?**
<Not Applicable>

---

**Country/area**
Brazil

**Consumption of electricity (MWh)**
154595

**Consumption of heat, steam, and cooling (MWh)**
0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**
154595

**Is this consumption excluded from your RE100 commitment?**
<Not Applicable>

**Country/area**
Japan

**Consumption of electricity (MWh)**
289721

**Consumption of heat, steam, and cooling (MWh)**
0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**
289721

**Is this consumption excluded from your RE100 commitment?**
<Not Applicable>

**Country/area**
China

**Consumption of electricity (MWh)**
50903

**Consumption of heat, steam, and cooling (MWh)**
0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**
50903

**Is this consumption excluded from your RE100 commitment?**
<Not Applicable>

**Country/area**
India

**Consumption of electricity (MWh)**
10164

**Consumption of heat, steam, and cooling (MWh)**
0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**
10164

**Is this consumption excluded from your RE100 commitment?**
<Not Applicable>

**Country/area**
Malaysia

**Consumption of electricity (MWh)**
61411

**Consumption of heat, steam, and cooling (MWh)**
0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**
61411

**Is this consumption excluded from your RE100 commitment?**
<Not Applicable>

**Country/area**
Viet Nam

**Consumption of electricity (MWh)**
73180

**Consumption of heat, steam, and cooling (MWh)**
0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**
73180

**Is this consumption excluded from your RE100 commitment?**
<Not Applicable>

## C9. Additional metrics

### C9.1

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

## C10. Verification

### C10.1

**(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) | No third-party verification or assurance |
| 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**
Reasonable assurance

**Attach the statement**
Pilkington Poland.pdf
SGS UK EU ETS Summary Statement for CDP 2021 v2.pdf

**Page/ section reference**
SGS UK and EUETS summary v2 Page 2 Section 2 states tCO2 from scope 1 combustion and process sources., P2 section 3 states the completion timescale P3 section 4 containst he standards used and section 5 contains the opinion statement . Pilkington Poland doc has verified EUETS data for one site in Poland . p1 section 2 contains verified scope 1 CO2 data section 3 states the time period p2 section 4 contains stds used p2 sec 5 opion No UKETS relevant standard to select in CDP

**Relevant standard**
European Union Emissions Trading System (EU ETS)

**Proportion of reported emissions verified (%)**
36

### 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?**
No, but we are actively considering verifying within the next two years

## 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

**% of Scope 2 emissions covered by the ETS**
0

**Period start date**
January 1 2021

**Period end date**
December 31 2021

**Allowances allocated**
618555

**Allowances purchased**
286587

**Verified Scope 1 emissions in metric tons CO2e**
905142

**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

**% of Scope 2 emissions covered by the ETS**
0

**Period start date**
January 1 2021

**Period end date**
December 31 2021

**Allowances allocated**
120162

**Allowances purchased**
55452

**Verified Scope 1 emissions in metric tons CO2e**
175614

**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 2021

**Period end date**
December 31 2021

**% of total Scope 1 emissions covered by tax**
13

**Total cost of tax paid**
100948832

**Comment**
392 549 t scope 1 CO2 e total for Japan.

## C11.1d

**(C11.1d) What is your strategy for complying with the systems you are regulated by or anticipate being regulated by?**

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

**(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?**
Yes

## C11.2a

**(C11.2a) Provide details of the project-based carbon credits originated or purchased by your organization in the reporting period.**

**Credit origination or credit purchase**
Credit purchase

**Project type**
Forests

**Project identification**
Forest plantations on degraded grasslands under extensive grazing. Located in Uruguay, Cerro Chato/Valentis and Regis / Garao regions

**Verified to which standard**
VCS (Verified Carbon Standard)

**Number of credits (metric tonnes CO2e)**
600

**Number of credits (metric tonnes CO2e): Risk adjusted volume**
0

**Credits cancelled**
Yes

**Purpose, e.g. compliance**
Voluntary Offsetting

## C11.3

**(C11.3) Does your organization use an internal price on carbon?**
Yes

## C11.3a

**(C11.3a) Provide details of how your organization uses an internal price on carbon.**

**Objective for implementing an internal carbon price**
Navigate GHG regulations
Stakeholder expectations
Change internal behavior
Drive energy efficiency
Drive low-carbon investment
Identify and seize low-carbon opportunities

**GHG Scope**
Scope 1
Scope 2
Scope 3

**Application**
NSG Group continued to utilise a global management system for energy and carbon efficiency projects during the reporting year. This included the utilisation of pilot 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 to support the utilisation of any carbon reduction project activity across any of the 3 emission scopes.

**Actual price(s) used (Currency /metric ton)**
13858

**Variance of price(s) used**
Price based on 100 euro / 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 price is reviewed on a six monthly basis to ensure it remains relevant and supportive of the objective for utilising an Internal Carbon Price

**Type of internal carbon price**
Shadow price

**Impact & implication**
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 will be reviewed on a six monthly basis to ensure it's relevance is maintained and we fully expect to increase the price during 2022 to reflect 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.

## C12. Engagement

### C12.1

**(C12.1) Do you engage with your value chain on climate-related issues?**
Yes, our suppliers
Yes, our customers/clients

### 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)**
20

**% 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 FY21 it was 20% 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**

26% of Group electricity came from renewable sources in 2021, an increase of 1% vs 2020. Our measure of success will be to incentivise the market supply of renewable electricity and hit our target of 50% by 2024. In 2021 NSG Group implemented its first offsite Power Purchase Agreement (PPA) covering 25% of electricity demand in Argentina and RECs were purchased in Brazil, incentivising the renewable electricity supply markets in South America. Renewable electricity is 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. Here natural gas consumption is offset via electricity to support lower carbon product manufacturing. Examples of supplier engagements in 2021 flowing from our strategy : 1) A major lighting system upgrade at NSG Group EU HQ in UK was undertaken based upon cutting edge LED technology. Delivering greater control, reliability, energy savings & significantly lower environmental footprint. Custom-made fittings manufactured using innovative 3D-printed technology are fully recyclable, reduce waste & contribute to a circular economy. The manufacturing process also uses less energy & materials, resulting in 70% lower CO2 footprint vs standard Al die-cast process. 2) Construction underway on a PV on-site solar project at NSG Rossford, USA. This 1.4MWp installation that will provide zero CO2 electricity for site & utilise solar modules from NSG Group customer First Solar therefore demonstrating products from within NSG Group. The project will be operational in May 2022. 3) A 5MW / 10 MWh battery energy storage system was fully commissioned at NSG 's automotive site in Collingwood, Canada in September . This project will support CO2 and cost objectives by adjusting the sites consumption profile throughout each day. 4) In a world 1st successful trials were undertaken at NSG UK to replace natural gas energy for Float Glass manufacture. 1st trial in August 2021 used hydrogen followed in February 2022 by biofuel . From these trials we learnt how alternative fuels can be used in future de-carbonisation plans. Trials were supported by UK government's Industrial Fuel Switching programme. Major projects and , a number of case studies have been created & shared widely including with suppliers to increase awareness and understanding

**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)**
13

**% of supplier-related Scope 3 emissions as reported in C6.5**

**Rationale for the coverage of your engagement**
Transport and Warehousing activities account for 13% of the NSG Group's total procurement's spend across its global operations. (4% warehousing : 9% transportation). Regional breakdown as follows: European road transport account for 47%, SEA & India 2%, Japan 15%, and the Americas 36%. The supplier engagement on CO2 reporting currently equates to 71% coverage in Europe (primarility through innenlader and spend under 3PL control tower), 37% coverage in Japan and 39% in North America. From these engagements we now collate detailed distance travelled data. Project emphasis is on improving efficiency, reducing empty driven miles and driven miles, making modal shift from road to rail, ship or barge, and increasing the relative payload of product carried. All of these initiatives will reduce our environmental impact.

**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 71% coverage in Europe, 37% in Japan and 39% in North America. From these engagements we collate detailed mileage data. Our focus is on improving efficiency, reducing empty driven miles and making modal shift from road to rail, ship or barge, and increasing the relative payload of product carried to reduce environmental impact. Some examples of supplier engagement: 1) In Europe selection of a strategic haulier base under management of an external control tower gives us haulier and lane management oversight, better governance of empties return and triangulation of flow. Collaboration between NSG operations, control tower and forwarders with standardised trailer types and automated freight management solutions allows us to drive synergies across our distribution profile. 2) In North America we have worked with our carriers to identify return loads in order to reduce one-way shipments. 3) Innenlader glass stillage supply has seen a continuous improvement on payload by reducing the TARE weight of the tractor and trailer units, increasing potential carrying weights and number of packs of glass. Maximum payloads increased to approximately 92% vs 90.5% YOY. In Central Europe re-routing of supply has reduced average distance travelled by ~60km per trip. Moving freight and raw materials by train instead of truck can reduce GHG emissions by up to 75%. 4) Europe - we have increased intermodal traffic between our Italian , German & Polish automotive plants. The shift from road to rail is being expanded by exploiting hub & spoke intermodal network opportunities proximate to customers from key distributing plants. 5) North America - converted all routes qualifying for intermodal traffic from "Over The Road" to Intermodal. 6) In North America - Automotive Glass Replacement Division introduced a bespoke system to optimise routes and set up efficient backhauls. We also utilise intermodal returns from our Florida/Georgia service centres to Mexicali.

**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)**
10

**% of supplier-related Scope 3 emissions as reported in C6.5**

**Rationale for the coverage of your engagement**
Batch Materials used in the manufacture of 'Float Glass' represent around 10% of total Procurement spend. The manufacture and processing of raw materials contribute 1161 thousand metric tonnes of scope 3 emissions or 16% of total NSG Group CO2 emissions. Of the total CO2 emissions from any given float line, on average, around 17% comes purely from the decomposition of carbonate raw materials, with the remainder coming mainly from the melting of these and other raw materials, including cullet, to make glass, and a smaller amount from the forming and annealing processes. Evaluating alternatives to carbonate raw materials has, therefore, been a key focus in NSG's efforts to reduce the CO2 emissions from glass making and achieve our Science Based Targets (SBT).

**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. Our Procurement team work directly with our R&D Team & suppliers to identify low CO2 materials that minimise emissions & reduce energy required for melting. In 2022 we completed a successful large scale trial of calcined dolomite in South America. Collaborating with an existing dolomite supplier & a company, specialising in high quality calcination, we were able to approve a material with the correct characteristics for float glass m/f. Additional benefits are reduced fuel and raw material volumes resulting in lower transport demand and reduction of total CO2 emissions. Future trials are now planned at other NSG sites to fully validate process and safety before implementing as a mainstream solution. We are developing new analytical methods to quantify melting energy requirements of new materials. Results will lead to proposals for an optimised suite of raw materials minimising CO2 emissions. One such material is processed blast furnace slag which has potential to reduce CO2 input and also energy consumption. Samples have been

analysed and evaluated as suitable to progress. A large scale trial is being prepared for the second half of 2022. A project is running to increase the proportion of cullet (scrap glass) used in the batch. Cullet is scrap glass that is generated during glass manufacture but also from Customer processing or return of end of life units. Use of cullet as part of the batch can lower the melting temperature and reduce the carbonate containing material requirements. Trials are underway to use more returned cullet, particularly from NSG Automotive tertiary glass production that was previously unfeasible due to contamination risk. but with improved sorting and cleaning technology this is now a realistic solution for reducing energy and CO2. Through strategic partnerships, we expect continued progress towards minimising CO2 in our supply chain. One of our key supply partners of Soda Ash, a high CO2 emitter, has committed to similar CO2 reduction targets as NSG and moved several manufacturing process to alternate fuels, significantly reducing the CO2 emissions. We are also investigating options for onsite hydrogen generation with carbon capture technology to reduce the CO2 impact from externally purchased gases.

**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 | Share information about your products and relevant certification schemes (i.e. Energy STAR) |

**% of customers by number**
35

**% 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**
Since 2016, NSG Group has been promoting low E glazing technologies to multiple multinational customers to help them to achieve their vehicle CO2 reduction targets as well as their vehicle electrification strategies. The adoption of low e glazing reduces the heat loading on a vehicle interior and reduces fuel energy consumption and hence reduces CO2 emissions or extends the electric vehicle 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 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.

## 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**

**Direct or indirect engagement that could influence policy, law, or regulation that may impact the climate**
Yes, we engage indirectly through trade associations

**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 and 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

**Describe the process(es) your organization has in place to ensure that your engagement activities are consistent with your overall climate change strategy**
See page 34 NSG Code of Ethics Working with sCustomers, 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 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 consistent with theirs?**
Consistent

**Has your organization influenced, or is your organization attempting to influence their position?**
We publicly promote their current position

**State the trade association's position on climate change, explain where your organization's position differs, and how you are attempting to influence their position (if applicable)**
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, if applicable (currency as selected in C0.4) (optional)**
22561203

**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

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**Trade association**
Other, please specify (Flat Glass Manufacturing Association of Japan)

**Is your organization's position on climate change consistent with theirs?**
Consistent

**Has your organization influenced, or is your organization attempting to influence their position?**
We have already influenced them to change their position

**State the trade association's position on climate change, explain where your organization's position differs, and how you are attempting to influence their position (if applicable)**
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, if applicable (currency as selected in C0.4) (optional)**
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

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**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 consistent with theirs?**
Consistent

**Has your organization influenced, or is your organization attempting to influence their position?**
We publicly promote their current position

**State the trade association's position on climate change, explain where your organization's position differs, and how you are attempting to influence their position (if applicable)**
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, if applicable (currency as selected in C0.4) (optional)**

**Describe the aim of your organization's funding**
<Not Applicable>

**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

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## 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**
IntegratedReport2021_E02.pdf

**Page/Section reference**
Outline of corporate governance p33 Strategy for sustainability p22 Risks and opportunities p40 Emissions figures and other metrics pp74-75 Climate change and GHG performance Climate change and targets pp43-49 Energy reduction initiatives pp55-60 Energy saving products pp50-53

**Content elements**
Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

**Comment**

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## 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 impact of its value chain on biodiversity?**

| | Does your organization assess the impact of its value chain on biodiversity? | Portfolio |
|---|---|---|
| Row 1 | Yes, we assess impacts on biodiversity in our upstream value chain only | <Not Applicable> |

## C15.4

**(C15.4) 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 management<br>Law & policy |

## C15.5

**(C15.5) 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 |

## C15.6

**(C15.6) 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 |
|---|---|---|
| In mainstream financial reports | Governance<br>Impacts on biodiversity | See Materials section of Integrated Report . Printed pages 66-67<br>IntegratedReport2021_E02.pdf |

# 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 | Chief Executive Officer Nippon Sheet Glass Group Company Ltd | Chief Executive Officer (CEO) |

## SC. Supply chain module

## SC0.0

**(SC0.0) If you would like to do so, please provide a separate introduction to this module.**

NSG is a global flat glass manufacturer supplying the Construction, Energy, Automotive and Information Technology industries. NSG Group is the owner of Pilkington which is now used as a brand name. NSG manufacture float and rolled glass and convert it by toughening, laminating and coating. Our Technical Glass business manufactures glass filament and cord as well as special ultra thin float. We have principle operations in 27 countries organised into three strategic business units, Architectural, Automotive and Technical Glass. In particular, we manufacture products that help customers to mitigate and adapt to climate change eg insulating and solar control glazing for buildings and automotive, low iron and other coated glass for photovoltaic modules energy generation , low weight glazing systems for vehicles, glass cord for vehicular timing applications.

## SC0.1

**(SC0.1) What is your company's annual revenue for the stated reporting period?**

| | Annual Revenue |
|---|---|
| Row 1 | 600600000000 |

## SC1.1

**(SC1.1) Allocate your emissions to your customers listed below according to the goods or services you have sold them in this reporting period.**

**Requesting member**
BMW AG

**Scope of emissions**
Scope 1

**Allocation level**
Commodity

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
22890

**Uncertainty (±%)**
15

**Major sources of emissions**
Glass manufacturing float furnaces are major emitters of carbon dioxide from combustion fuel and from carbonate raw materials. Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
4540000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

**Requesting member**
Daimler Truck AG

**Scope of emissions**

Scope 1

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
454

**Uncertainty (±%)**
15

**Major sources of emissions**
Glass manufacturing float furnaces are major emitters of carbon dioxide from combustion fuel and from carbonate raw materials. Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
90000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

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**Requesting member**
Electrolux

**Scope of emissions**
Scope 1

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
2458

**Uncertainty (±%)**
15

**Major sources of emissions**
Glass manufacturing float furnaces are major emitters of carbon dioxide from combustion fuel and from carbonate raw materials. Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
487000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions. WE ARE SORRY TO REPORT THAT THE INCORRECT ELECTROLUX REVENUE WAS USED TO CALCULATE LAST YEAR'S SCOPE 1 EMISSIONS . CY21 was 1986t (not 35434t)

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**Requesting member**
Ford Motor Company

**Scope of emissions**
Scope 1

**Allocation level**
Company wide

**Allocation level detail**

<Not Applicable>

**Emissions in metric tonnes of CO2e**
24633

**Uncertainty (±%)**
15

**Major sources of emissions**
Glass manufacturing float furnaces are major emitters of carbon dioxide from combustion fuel and from carbonate raw materials. Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
4885000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

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**Requesting member**
General Motors Company

**Scope of emissions**
Scope 1

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
45243

**Uncertainty (±%)**
15

**Major sources of emissions**
Glass manufacturing float furnaces are major emitters of carbon dioxide from combustion fuel and from carbonate raw materials. Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
8973000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

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**Requesting member**
Honda Motor Co., Ltd.

**Scope of emissions**
Scope 1

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
14824

**Uncertainty (±%)**
15

**Major sources of emissions**
Glass manufacturing float furnaces are major emitters of carbon dioxide from combustion fuel and from carbonate raw materials. Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
2940000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

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**Requesting member**
HP Inc

**Scope of emissions**
Scope 1

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
8279

**Uncertainty (±%)**
15

**Major sources of emissions**
Glass manufacturing float furnaces are major emitters of carbon dioxide from combustion fuel and from carbonate raw materials. Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
1642000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

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**Requesting member**
Jaguar Land Rover Automotive plc

**Scope of emissions**
Scope 1

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
40659

**Uncertainty (±%)**
15

**Major sources of emissions**
Glass manufacturing float furnaces are major emitters of carbon dioxide from combustion fuel and from carbonate raw materials. Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
8064000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

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**Requesting member**
KAO Corporation

**Scope of emissions**
Scope 1

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
777

**Uncertainty (±%)**
15

**Major sources of emissions**
Glass manufacturing float furnaces are major emitters of carbon dioxide from combustion fuel and from carbonate raw materials. Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
154000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

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**Requesting member**
Magna International Inc.

**Scope of emissions**
Scope 1

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
10261

**Uncertainty (±%)**
15

**Major sources of emissions**
Glass manufacturing float furnaces are major emitters of carbon dioxide from combustion fuel and from carbonate raw materials. Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
2035000000

**Unit for market value or quantity of goods/services supplied**

Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

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**Requesting member**
Mercedes-Benz Group AG

**Scope of emissions**
Scope 1

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
59055

**Uncertainty (±%)**
15

**Major sources of emissions**
Glass manufacturing float furnaces are major emitters of carbon dioxide from combustion fuel and from carbonate raw materials. Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
11712000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

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**Requesting member**
Mitsubishi Motors Corporation

**Scope of emissions**
Scope 1

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
1023

**Uncertainty (±%)**
15

**Major sources of emissions**
Glass manufacturing float furnaces are major emitters of carbon dioxide from combustion fuel and from carbonate raw materials. Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
203000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and

therefore contain large assumptions.

**Requesting member**
Nissan Motor Co., Ltd.

**Scope of emissions**
Scope 1

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
20925

**Uncertainty (±%)**
15

**Major sources of emissions**
Glass manufacturing float furnaces are major emitters of carbon dioxide from combustion fuel and from carbonate raw materials. Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
4150000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

**Requesting member**
Renault Group

**Scope of emissions**
Scope 1

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
17844

**Uncertainty (±%)**
15

**Major sources of emissions**
Glass manufacturing float furnaces are major emitters of carbon dioxide from combustion fuel and from carbonate raw materials. Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
3539000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

**Requesting member**
Stellantis N.V.

**Scope of emissions**

Scope 1

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
71953

**Uncertainty (±%)**
15

**Major sources of emissions**
Glass manufacturing float furnaces are major emitters of carbon dioxide from combustion fuel and from carbonate raw materials. Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
14270000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

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**Requesting member**
Toyota Motor Corporation

**Scope of emissions**
Scope 1

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
215577

**Uncertainty (±%)**
15

**Major sources of emissions**
Glass manufacturing float furnaces are major emitters of carbon dioxide from combustion fuel and from carbonate raw materials. Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
42754000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

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**Requesting member**
Velux A/S

**Scope of emissions**
Scope 1

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
1177

**Uncertainty (±%)**
15

**Major sources of emissions**
Glass manufacturing float furnaces are major emitters of carbon dioxide from combustion fuel and from carbonate raw materials. Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

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**Requesting member**
BMW AG

**Scope of emissions**
Scope 2

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
4700

**Uncertainty (±%)**
15

**Major sources of emissions**
Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
4540000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

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**Requesting member**
Daimler Truck AG

**Scope of emissions**
Scope 2

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
93

**Uncertainty (±%)**
15

**Major sources of emissions**
Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
90000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

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**Requesting member**
Electrolux

**Scope of emissions**
Scope 2

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
505

**Uncertainty (±%)**
15

**Major sources of emissions**
Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
487000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions. WE ARE SORRY TO REPORT THAT THE INCORRECT ELECTROLUX REVENUE WAS USED TO CALCULATE LAST YEAR'S SCOPE 2 EMISSIONS . CY21 was 374 t (not 6667 t)

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**Requesting member**
Ford Motor Company

**Scope of emissions**
Scope 2

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
5058

**Uncertainty (±%)**
15

**Major sources of emissions**
Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
4885000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

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**Requesting member**
General Motors Company

**Scope of emissions**
Scope 2

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
9290

**Uncertainty (±%)**
15

**Major sources of emissions**
Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
8973000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

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**Requesting member**
Honda Motor Co., Ltd.

**Scope of emissions**
Scope 2

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
3044

**Uncertainty (±%)**
15

**Major sources of emissions**
Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
2940000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

**Requesting member**
HP Inc

**Scope of emissions**
Scope 2

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
1700

**Uncertainty (±%)**
15

**Major sources of emissions**
Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
1642000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

**Requesting member**
Jaguar Land Rover Automotive plc

**Scope of emissions**
Scope 2

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
8349

**Uncertainty (±%)**
15

**Major sources of emissions**
Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
8064000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

**Requesting member**
KAO Corporation

**Scope of emissions**
Scope 2

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
159

**Uncertainty (±%)**
15

**Major sources of emissions**
Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
154000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

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**Requesting member**
Magna International Inc.

**Scope of emissions**
Scope 2

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
2107

**Uncertainty (±%)**
15

**Major sources of emissions**
Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
2035000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

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**Requesting member**
Mercedes-Benz Group AG

**Scope of emissions**
Scope 2

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
12127

**Uncertainty (±%)**
15

**Major sources of emissions**
Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
11712000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

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**Requesting member**
Mitsubishi Motors Corporation

**Scope of emissions**
Scope 2

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**

**Uncertainty (±%)**
15

**Major sources of emissions**
Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
203000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

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**Requesting member**
Nissan Motor Co., Ltd.

**Scope of emissions**
Scope 2

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
4297

**Uncertainty (±%)**
15

**Major sources of emissions**
Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
4150000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

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**Requesting member**
Renault Group

**Scope of emissions**
Scope 2

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
3664

**Uncertainty (±%)**
15

**Major sources of emissions**
Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
3539000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumptions.

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**Requesting member**
Stellantis N.V.

**Scope of emissions**
Scope 2

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
14775

**Uncertainty (±%)**
15

**Major sources of emissions**
Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
14270

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and

therefore contain large assumptions.

**Requesting member**
Toyota Motor Corporation

**Scope of emissions**
Scope 2

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
44268

**Uncertainty (±%)**
15

**Major sources of emissions**
Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**
42750000000

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumption

**Requesting member**
Velux A/S

**Scope of emissions**
Scope 2

**Allocation level**
Company wide

**Allocation level detail**
<Not Applicable>

**Emissions in metric tonnes of CO2e**
242

**Uncertainty (±%)**
15

**Major sources of emissions**
Bending and toughening furnaces are carbon dioxide sources from both combustion and electricity consumption.

**Verified**
No

**Allocation method**
Allocation based on the market value of products purchased

**Market value or quantity of goods/services supplied to the requesting member**

**Unit for market value or quantity of goods/services supplied**
Currency

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**
Plants have been extensively surveyed for energy usage and for process raw materials. Float and rolled glass furnaces are subject to monitoring and reporting plans (externally verified in the EU) and lessons from these are implemented elsewhere in the world. Sites are certified ISO 14001 and this includes energy management. All sites report annually on a global intranet database. Life Cycle Analysis has been applied to the float glass process. Carbon dioxide is the only significant GHG released in the manufacturing process. Its source is limited to fuel use and a single process raw material. Customer emissions have been assigned as a percentage of Group revenue and therefore contain large assumption

## SC1.2

**(SC1.2) Where published information has been used in completing SC1.1, please provide a reference(s).**

not applicable

## SC1.3

**(SC1.3) What are the challenges in allocating emissions to different customers, and what would help you to overcome these challenges?**

| Allocation challenges | Please explain what would help you overcome these challenges |
|---|---|
| Diversity of product lines makes accurately accounting for each product/product line cost ineffective | Introducing more sub-metering and increasing resources to analyse the meter information. |
| Customer base is too large and diverse to accurately track emissions to the customer level | NSG Group does not only manufacture a wide range of products for the automotive industry. Flat glass is also used to manufacture a wide range of building products. Introducing more sub-metering and increasing resources to analyse the information. |

## SC1.4

**(SC1.4) Do you plan to develop your capabilities to allocate emissions to your customers in the future?**
Yes

## SC1.4a

**(SC1.4a) Describe how you plan to develop your capabilities.**

Sub metering projects are currently ongoing.

## SC2.1

**(SC2.1) Please propose any mutually beneficial climate-related projects you could collaborate on with specific CDP Supply Chain members.**

## SC2.2

**(SC2.2) Have requests or initiatives by CDP Supply Chain members prompted your organization to take organizational-level emissions reduction initiatives?**
No

## SC4.1

**(SC4.1) Are you providing product level data for your organization's goods or services?**
Yes, I will provide data

## SC4.1a

**(SC4.1a) Give the overall percentage of total emissions, for all Scopes, that are covered by these products.**
75.99

## SC4.2a

**(SC4.2a) Complete the following table for the goods/services for which you want to provide data.**

**Name of good/ service**
Glass For Europe compiled LCA data for float glass

**Description of good/ service**
Glass For Europe compiled LCA data for float glass

**Type of product**
Intermediate

**SKU (Stock Keeping Unit)**
Unit = 1kg (non processed) flat glass.

**Total emissions in kg CO2e per unit**
1.27

**±% change from previous figure supplied**
0

**Date of previous figure supplied**
July 30 2015

**Explanation of change**
Project has not been repeated by trade association.

**Methods used to estimate lifecycle emissions**
ISO 14040 & 14044

## SC4.2b

**(SC4.2b) Complete the following table with data for lifecycle stages of your goods and/or services.**

**Name of good/ service**
Float glass manufacture - raw material extraction to raw glass packing. (Excludes laminating and toughening)

**Please select the scope**
Scope 1, 2 & 3

**Please select the lifecycle stage**
Cradle to gate

**Emissions at the lifecycle stage in kg CO2e per unit**
1.27

**Is this stage under your ownership or control?**
Yes

**Type of data used**
Primary and secondary

**Data quality**
Primary manufacturing data provided from 25 glass furnaces across Europe. Secondary data used for some scope 3 data.

**If you are verifying/assuring this product emission data, please tell us how**
Glass For Europe data was verified by an external LCA consultant

## SC4.2c

**(SC4.2c) Please detail emissions reduction initiatives completed or planned for this product.**

| Name of good/ service | Initiative ID | Description of initiative | Completed or planned | Emission reductions in kg CO2e per unit |
|---|---|---|---|---|
| Float glass | Initiative 1 | 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. | Please select | 0.1 |

## SC4.2d

**(SC4.2d) Have any of the initiatives described in SC4.2c been driven by requesting CDP Supply Chain members?**

No

## Submit your response

**In which language are you submitting your response?**

English

**Please confirm how your response should be handled by CDP**

| | I understand that my response will be shared with all requesting stakeholders | Response permission |
|---|---|---|
| Please select your submission options | Yes | Public |

**Please confirm below**

I have read and accept the applicable Terms