

ESG Briefing

AGC Group Sustainability Management



AGC Inc.

September 11, 2024

Your Dreams, Our Challenge



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1 Long-Term Management Strategy “Vision 2030”

2 Creation of Three Social Values

3 Blue planet: Realization of a sustainable global environment

- Addressing climate change
 - Effective use of resources
-

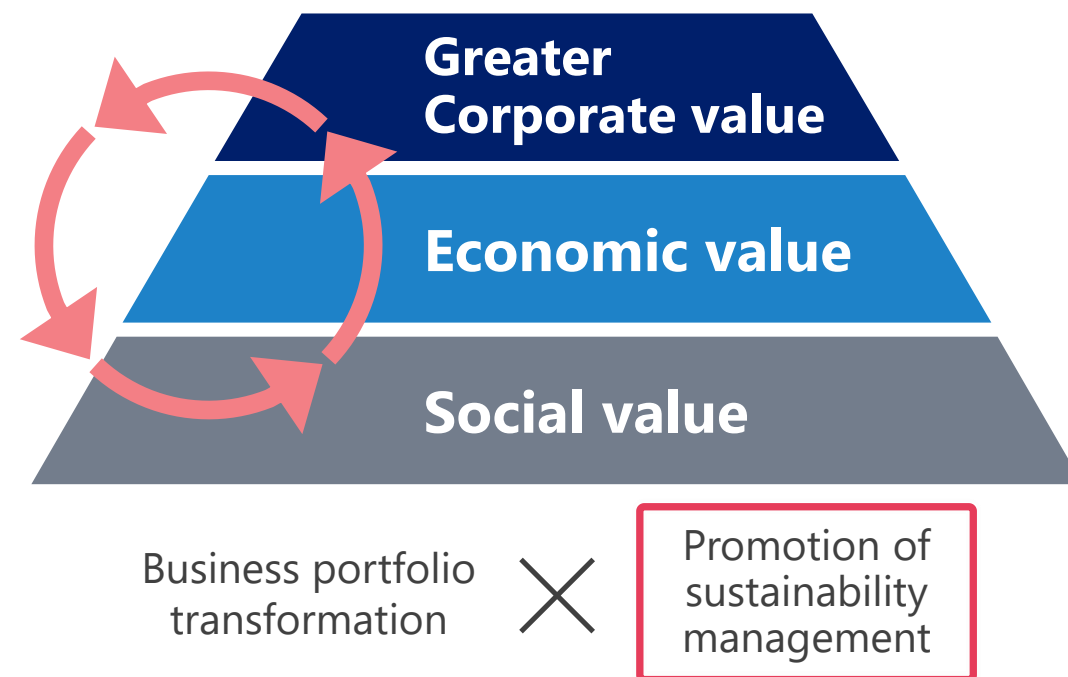
4 Efforts to enhance the effectiveness of "Creation of Three Social Values"

- The AGC Group will enhance corporate value by creating economic value through the creation of social value.

Long-Term Management Strategy

Vision 2030

By providing **differentiated materials and solutions**, AGC strives to help realize a **sustainable society and become an excellent company** that grows and evolves continuously.



1 Long-Term Management Strategy "Vision 2030"

2 **Creation of Three Social Values**

3 Blue planet: Realization of a sustainable global environment

- Addressing climate change
 - Effective use of resources
-

4 Efforts to enhance the effectiveness of "Creation of Three Social Values"

Creation of Three Social Values

- In line with the launch of the new medium-term management plan **AGC plus-2026**, the AGC Group has redefined the social values it provides into the three categories of “Blue planet,” “Innovation,” and “Well-being.”

Creation of three social values



Blue planet

Realization of a sustainable global environment

Key opportunities

- Addressing climate change
- Effective use of resources

We contribute to the sustainability of the planet on which all life depends by reducing the environmental impact of our products from raw material procurement to use by customers.



Innovation

Creation of an innovative future society

Key opportunities

- Building an info-intensive and IoT society
- Achieving safe and comfortable mobility

We contribute to the creation of innovative future society by providing materials and solutions that support the world's most advanced technologies.



Well-being

Contribution to safe and secure living

Key opportunities

- Developing social infrastructure
- Facilitating better health and longevity
- Addressing food crises

We contribute to safe, secure, comfortable, and healthy lives by providing products necessary for daily life, infrastructure, and healthcare in a more stable manner.

1 Long-Term Management Strategy "Vision 2030"

2 Creation of Three Social Values

3 **Blue planet: Realization of a sustainable global environment**

- **Addressing climate change**
 - Effective use of resources
-

4 Efforts to enhance the effectiveness of "Creation of Three Social Values"

- Mid- to long-term GHG emissions reduction targets was set in 2021, making steady progress



**FY2030
milestone**
(from the 2019 figure)

Scope 1

GHG emissions
(Scope 1+2 emissions)

30% reduction

Scope 2

GHG emissions per unit of sales
(Scope 1+2emissions/sales)

50% reduction

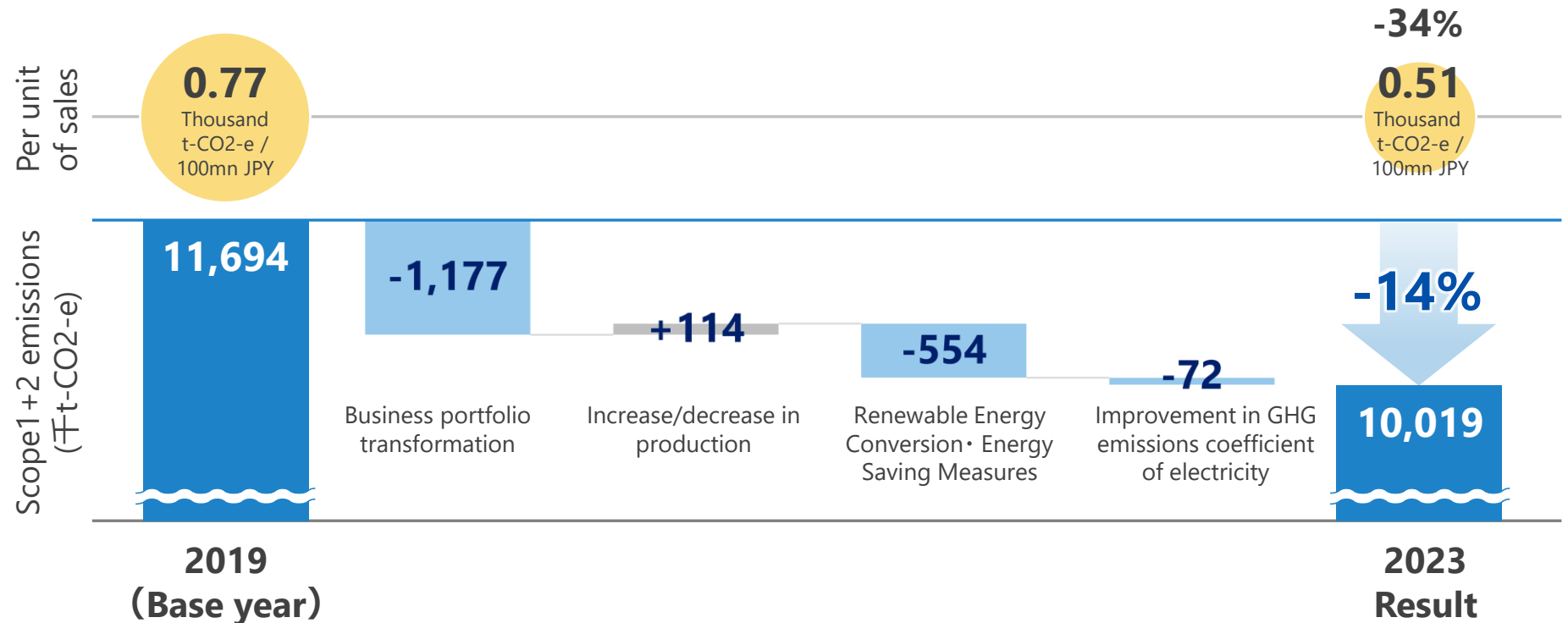
Scope 3

GHG emissions
(Total of Scope 3 emissions in categories 1, 10, 11, and 12)

30% reduction

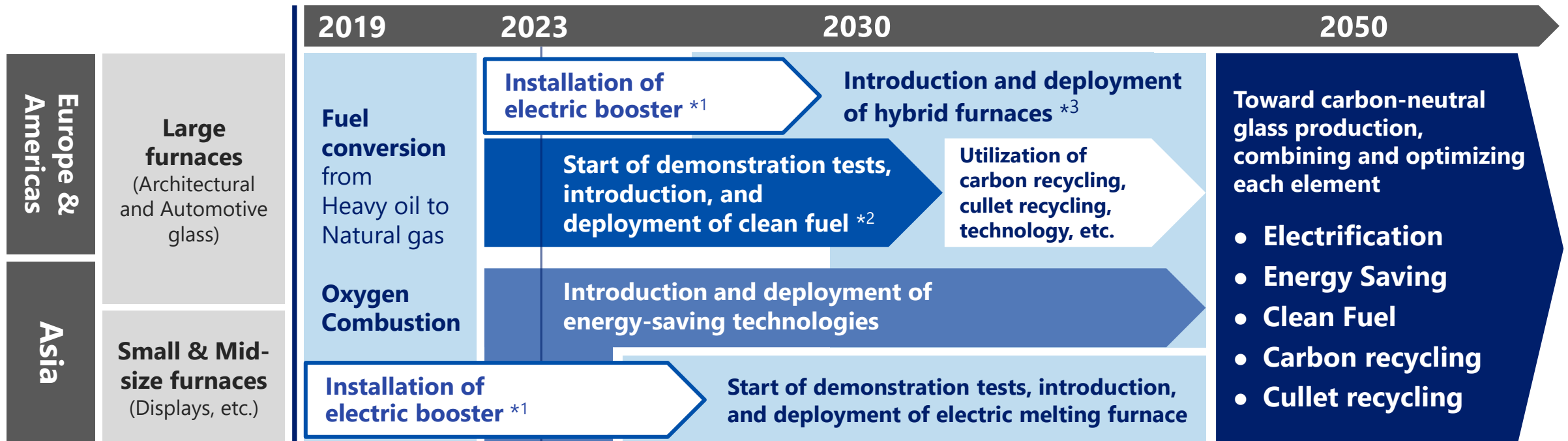
- Results in 2023 were 14% lower than in 2019, mostly in line with the plan for the 2030 milestone.
- To achieve the milestone, we will work on technological innovation of the glass melting process, conversion to renewable energy as a source of electricity for the chlor-alkali business, and use of biomass fuel for in-house power generation, etc.

Scope 1+2 emissions and per unit of sales reductions (2019-2023)



Technology Roadmap for Reducing GHG Emissions in Float Glass Melting Process

- **By 2023** : Progress in fuel conversion, electric booster installation, clean fuel demonstration, carbon recycling, and cullet recycling development
- **By 2030** : Implement priority measures in line with regional characteristics (Europe & Americas: electrification, Asia: energy saving)
- **By 2050** : Combining multiple technologies focusing on electrification



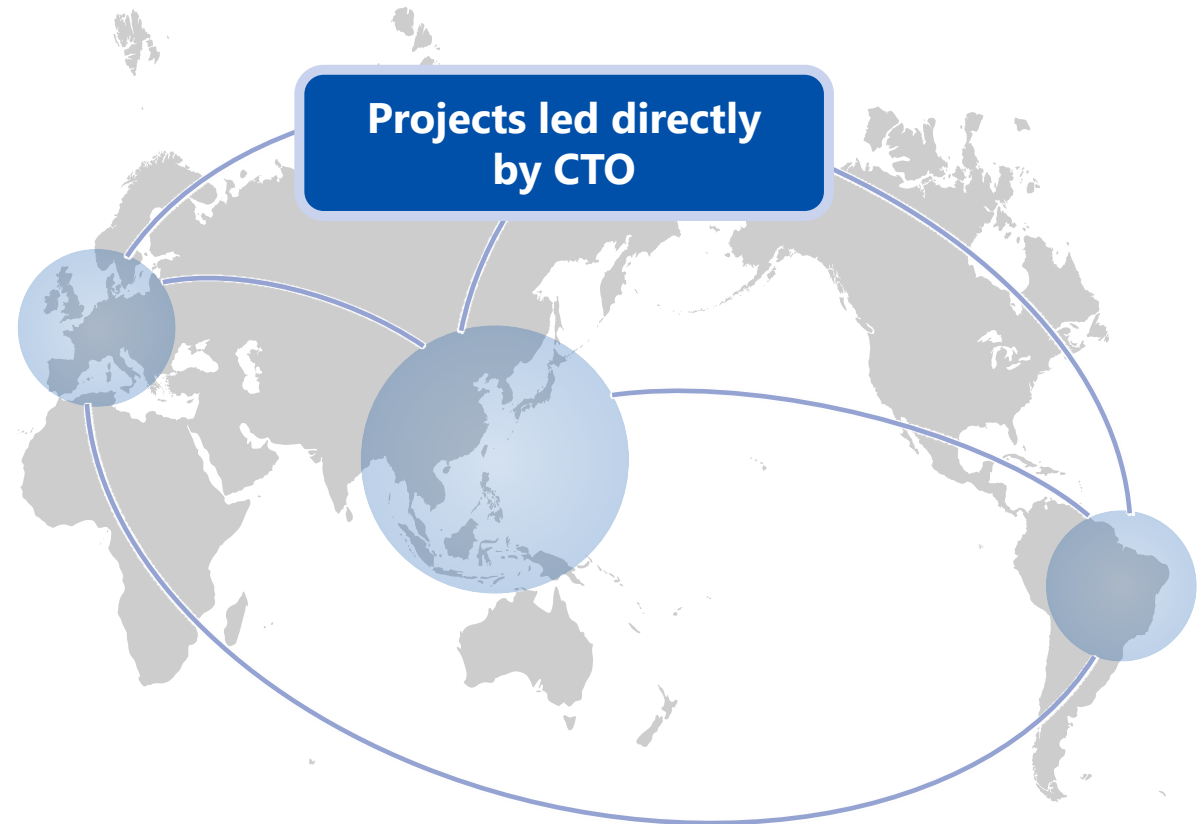
- Developing “Implementation Strategy for Technology to Reduce GHG Emissions from Float Glass Melting Furnaces” as a cross-business project under the leadership of CTO.

Initiatives and Considerations

Future cost simulation of energy prices, carbon costs, etc. in each country up to 2050

Verification of economic rationale and prioritization of mass production for elemental technologies

Formulate optimal technology implementation strategies for the Group, including global technology deployment and resource allocation



Progress examples: Conversion to Clean Fuels in Float Glass Melting Furnaces

- Successful demonstration test of clean fuels (ammonia and hydrogen)

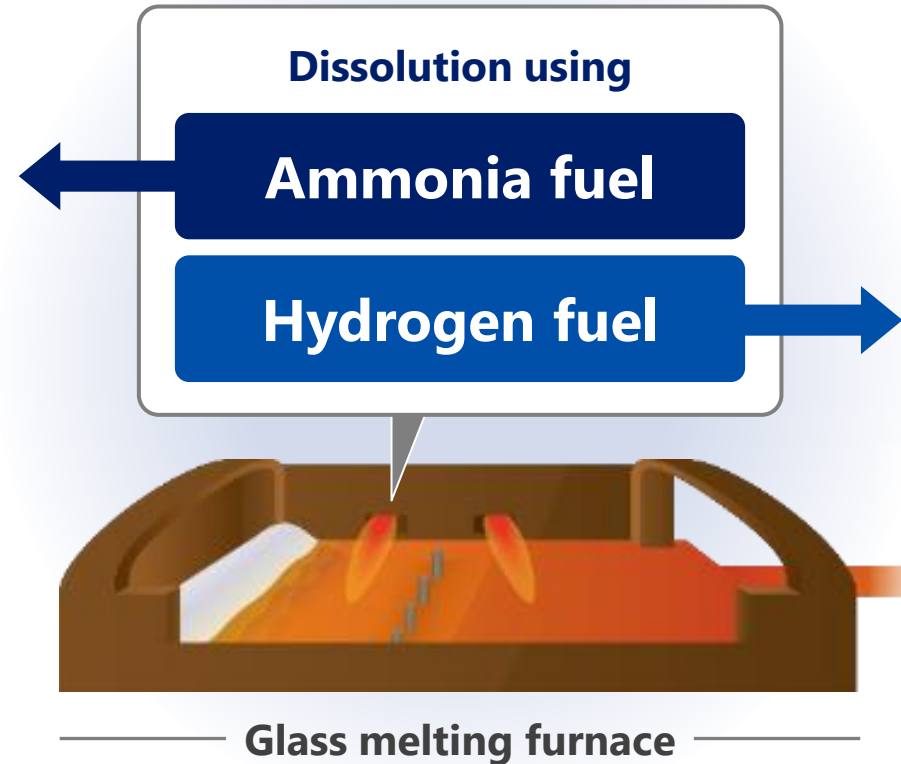
2023

World's first successful demonstration test in an actual production furnace

We will also consider expanding its application beyond glass to other materials, such as steel and aluminum, **to widely help reduce GHG emissions in the production process of the materials industry.**



Storage tank for ammonia fuel



2023

Successful demonstration test in an actual production furnace

We will conduct scaled-up tests of combustion capacity and consider demonstration tests at global sites, with the aim for full-scale deployment.



Glass melting furnace where the demonstration experiment was conducted

- Joint development with Saint-Gobain (France), a major glass company, to reduce GHG emissions in the manufacturing process
 - Demonstration testing to begin in the second half of 2024
 - Funded by the European Union's Innovation Fund

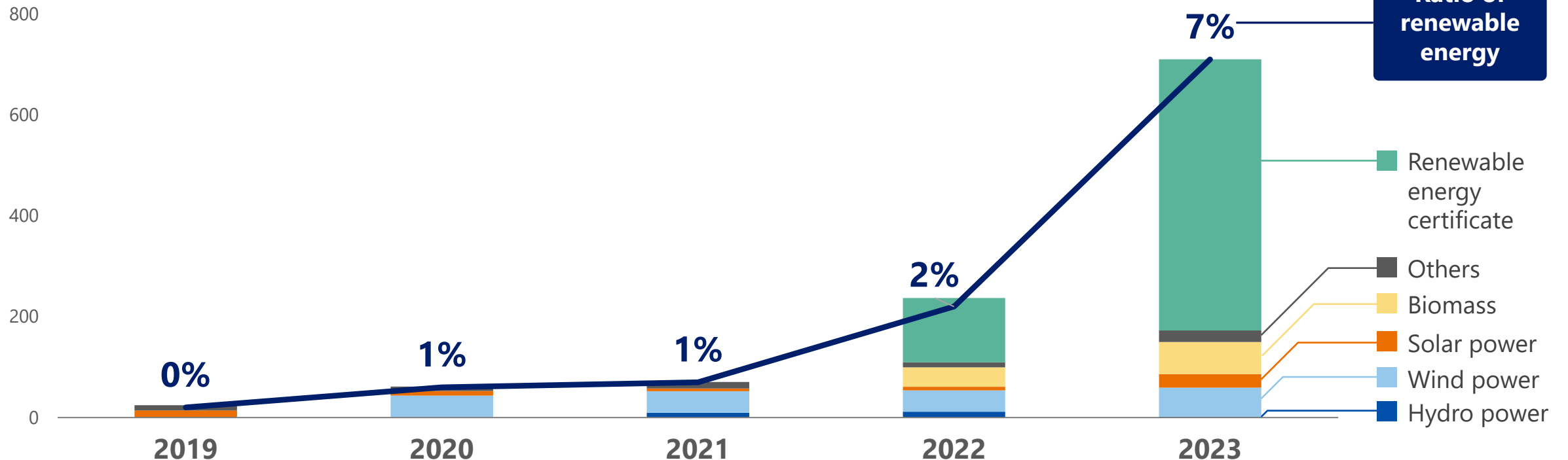


Details of the Demonstration Test

- Natural gas air combustion \Rightarrow electric melting **50%** + oxy-gas combustion **50%**
 - Recycled cullet* ratio \Rightarrow maximum up to **100%**
- \Rightarrow Compared to a conventional furnace, Scope 1 and 3 emissions are reduced by 75% each**

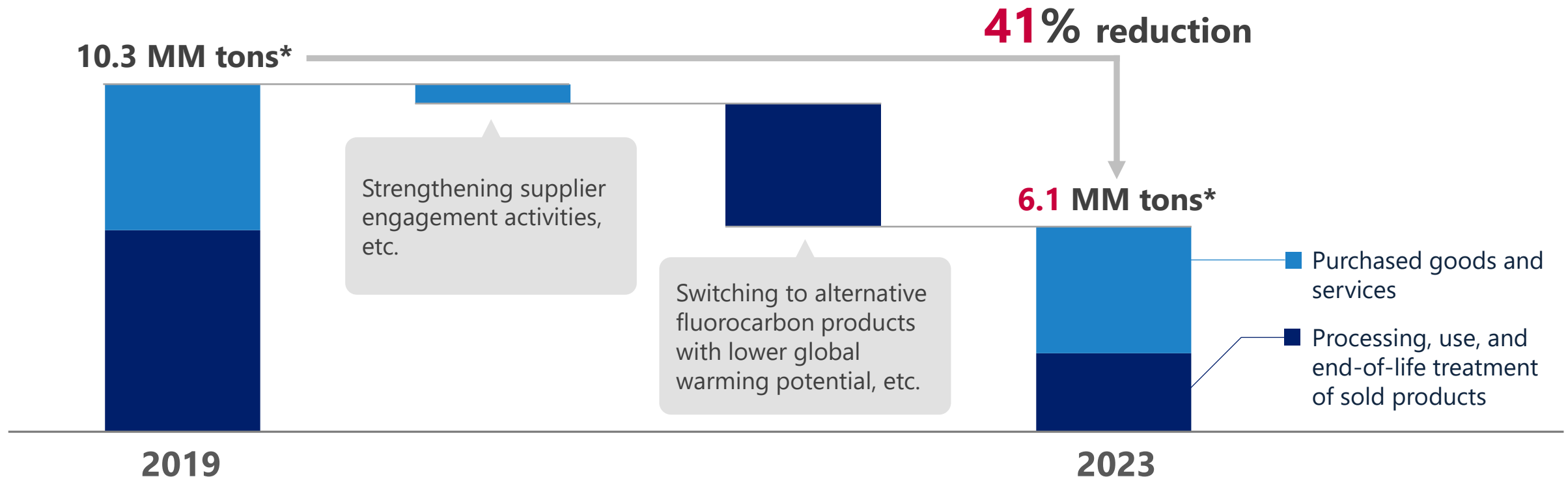
- Progress made in Indonesia (Asahimas Chemicals) due to the expansion of renewable energy certificates purchase.
- Further expansion planned through introduction of PPA and purchase of certificates at other sites.

Status of introduction of electricity derived from renewable energy (GWh)

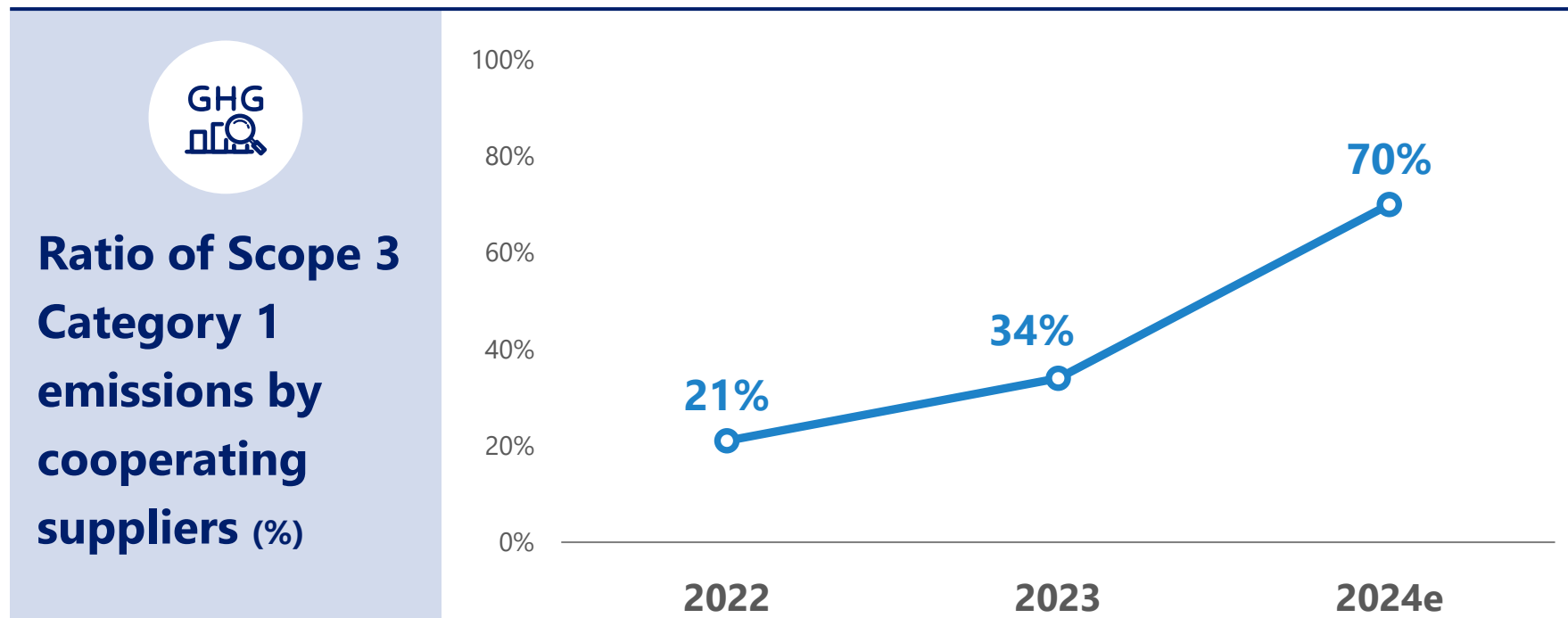


- GHG emissions reduction by strengthening supplier engagement activities and switching to alternative fluorocarbon products with lower global warming potential

GHG emissions reduction (Scope3)

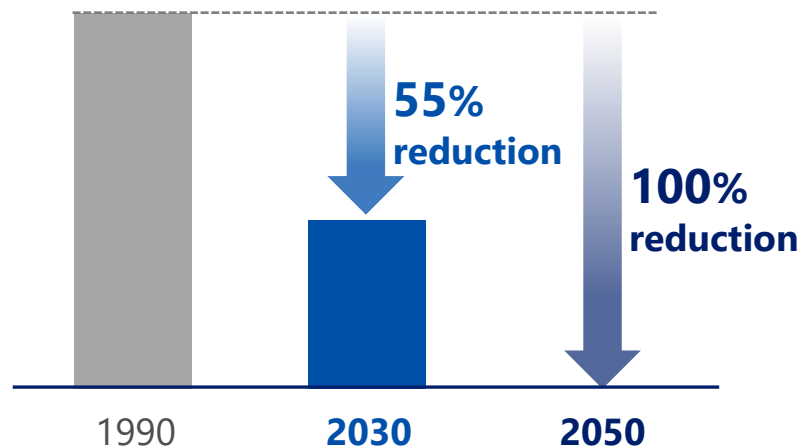


- In collaboration with our major suppliers, we have established a reduction plan by 2030 in Europe, also developing similar strategies in Japan and Asia.
- Instead of using industry averages, we are planning to calculate emissions intensity of raw materials based on each supplier's situations.

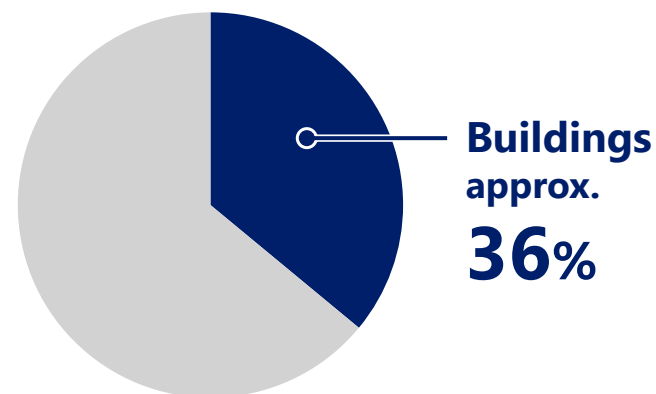


- The European Commission targets a 55% reduction in GHG emissions in Europe by 2030*¹. (32% reduction as of 2022)
- Buildings account for about 36% of GHG emissions*².
- It is important to improve energy consumption efficiency and insulation of buildings.

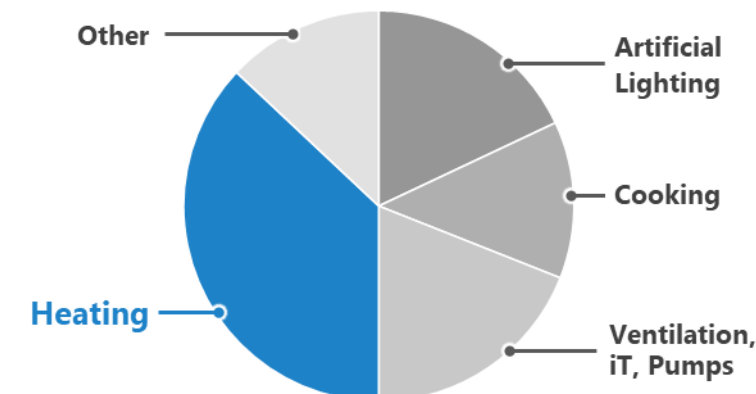
Europe GHG emissions reduction targets*¹



Proportion of GHG emissions*²



Building energy consumption breakdown*³



*¹: Renovation Wave Strategy and Green Deal by the European Commission

*²: EC, EU Energy Figures – “Statistical Pocket Book 2021” and Glazing Potential – Energy Savings & CO₂ Emissions Reduction, Glass for Europe

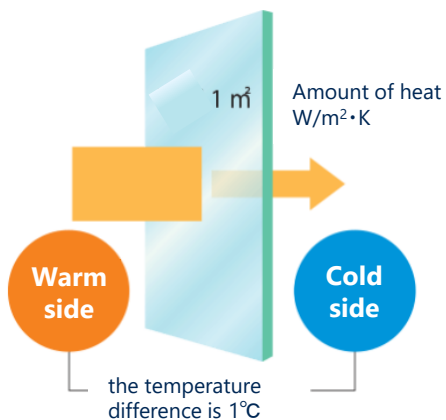
*³: Based on section “2.5.3 Final Energy Consumption BY SECTOR” in file ‘EU energy in figures - Statistical pocketbook 2021’

- AGC high-performance window glass products help reduce GHG emissions from buildings.

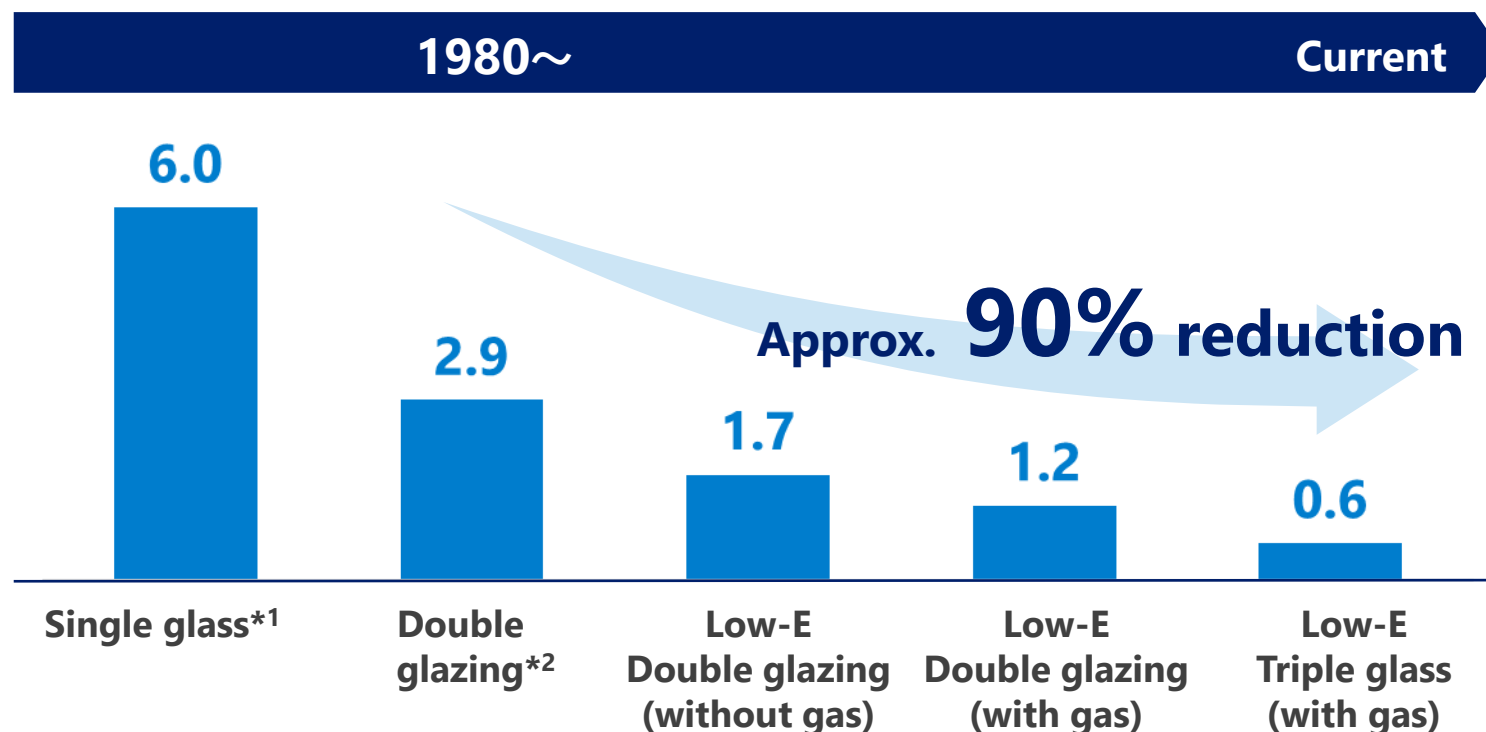
Progress of window glass insulation performance

Thermal transmission rate

Amount of heat passing per 1 m² for 1 hour at a 1 °C temperature difference between inside and outside.



Thermal transmittance ratio [W//m2·K]



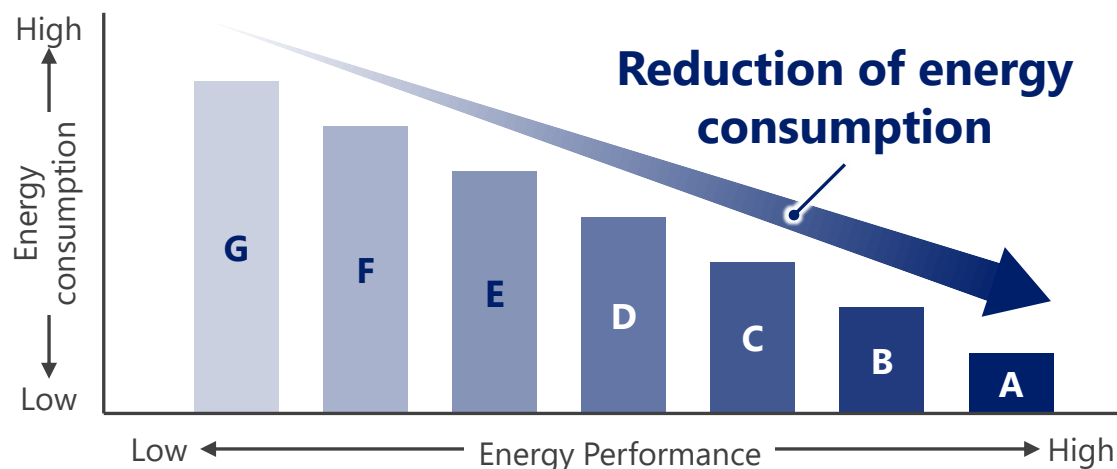
*1 3mm float glass *2 transparent double glazing with a 12mm hollow layer

Europe

Mandatory retrofitting is enforced for some low-performance buildings under the Energy Performance Rating System for Buildings*¹. Subsidies and preferential interest rates are implemented for renovations.



Building energy performance evaluation



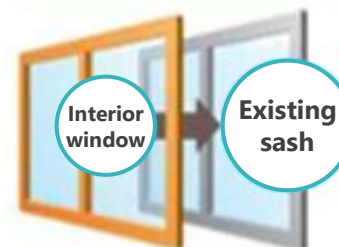
Japan

All suppliers are required to make their best efforts to label their products to display energy efficiency performance*². "Advanced Window Renovation Subsidy" will continue in 2024 with an expanded budget.

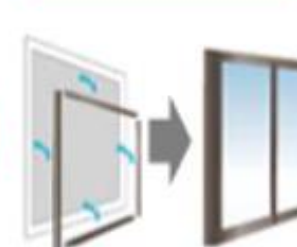
Subjects

Window renovation

Interior window installation



Exterior window replacement



Glass Replacement

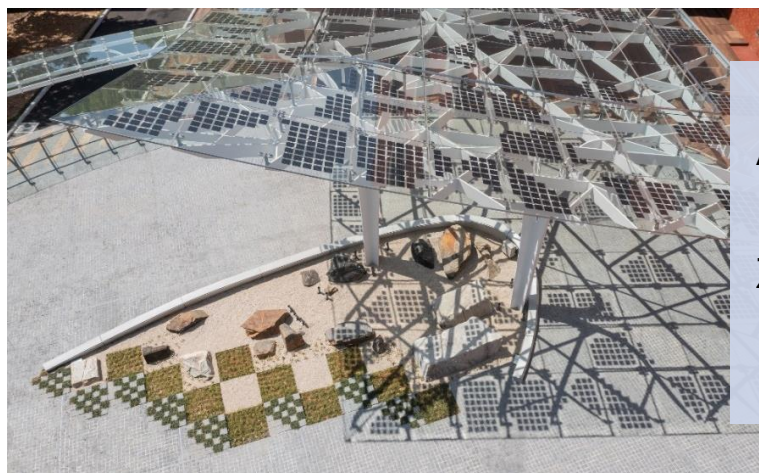


Supplementary budget

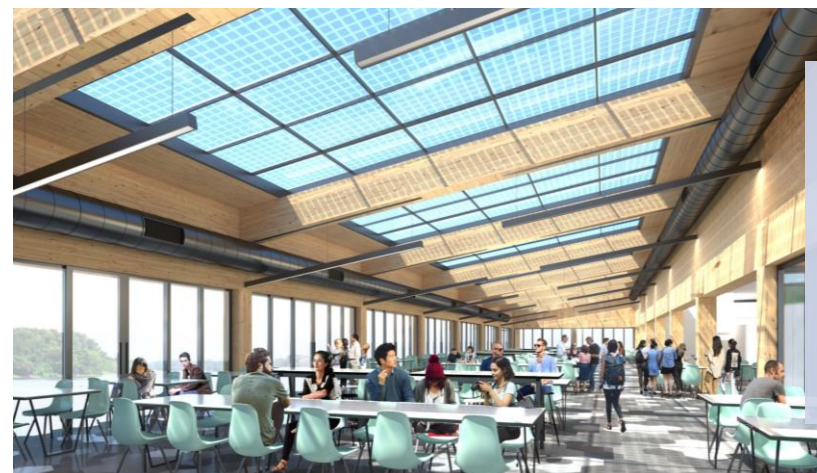
2023: 1,000 、 2024: 1,350 (100million JPY)

- Securing locations for solar panel installation in urban areas is a key issue.
- **Building Integrated Photovoltaics** enable energy generation through windows and reduce installation site constraints.
- It realizes both energy generation performance and design flexibility and contribute to the realization of a carbon-neutral society.

Building Integrated Photovoltaics (BIPV)



AIST International
Research Center for
Zero Emissions
Entrance Canopy

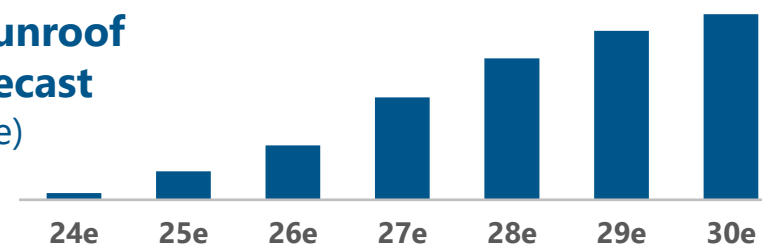


New Punggol
Campus of
Singapore Institute
of Technology

- **Demand for high value-added automotive glass will increase** along with the expansion of the EV/FCV market toward a carbon-net-zero society.

Panorama Sunroof Demand forecast

(AGC's estimate)



Low-emissivity glass



High solar control and insulation properties reduce air conditioner load and improve fuel efficiency

In addition to improving comfort, contributes to extending the cruising range of EVs and reducing CO₂ emissions

Light control glass



Providing new value for panoramic sunroofs, which are enjoying growing demand due to the introduction of EVs

Further improved comfort and openness and an advanced cabin

Sound insulation glass



In addition to the windshield glass, the side window glass is laminated to further improve sound insulation

A quiet and comfortable cabin space is created in EVs, which are free of engine noise

- As products become more functional with the expansion of the hydrogen market, the specifications required for materials are becoming more sophisticated.
- Developing new products and technologies with fluorine technology cultivated over many years to respond to customer requirements.

Fluorinated Ion Exchange Membrane for Water Electrolysis

Integrating electrolyte technologies for fuel cells and ion exchange membrane technologies for chlor-alkali electrolysis

⇒ **Supplying electrolyte membranes for water electrolysis with the world's highest efficiency and safety performance**

FORBLUE™
S-SERIES



Fluorinated Electrolyte Polymers for Fuel Cells

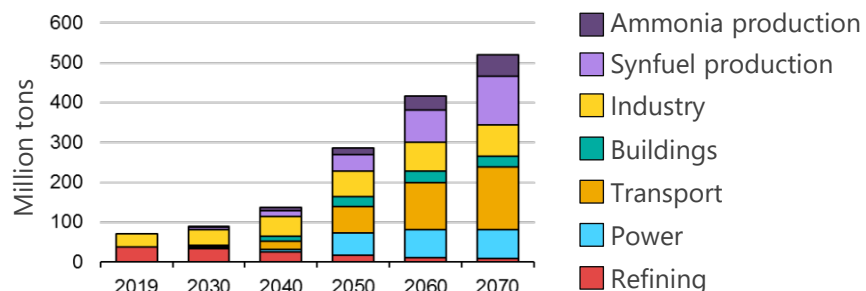
High power generation performance and durability achieved by differentiated technology

⇒ **Established an overwhelming No. 1 position**

FORBLUE™
i-SERIES

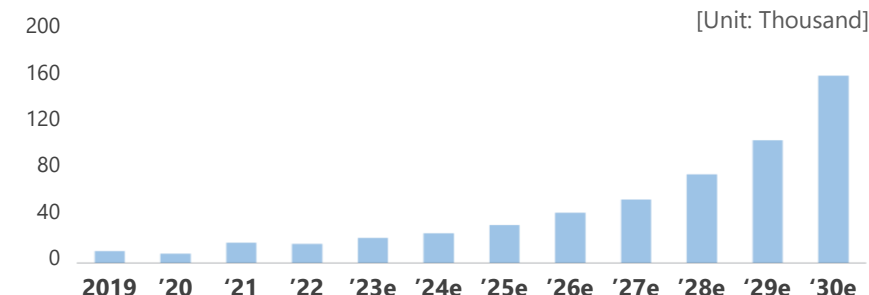


Hydrogen Demand Trends*1

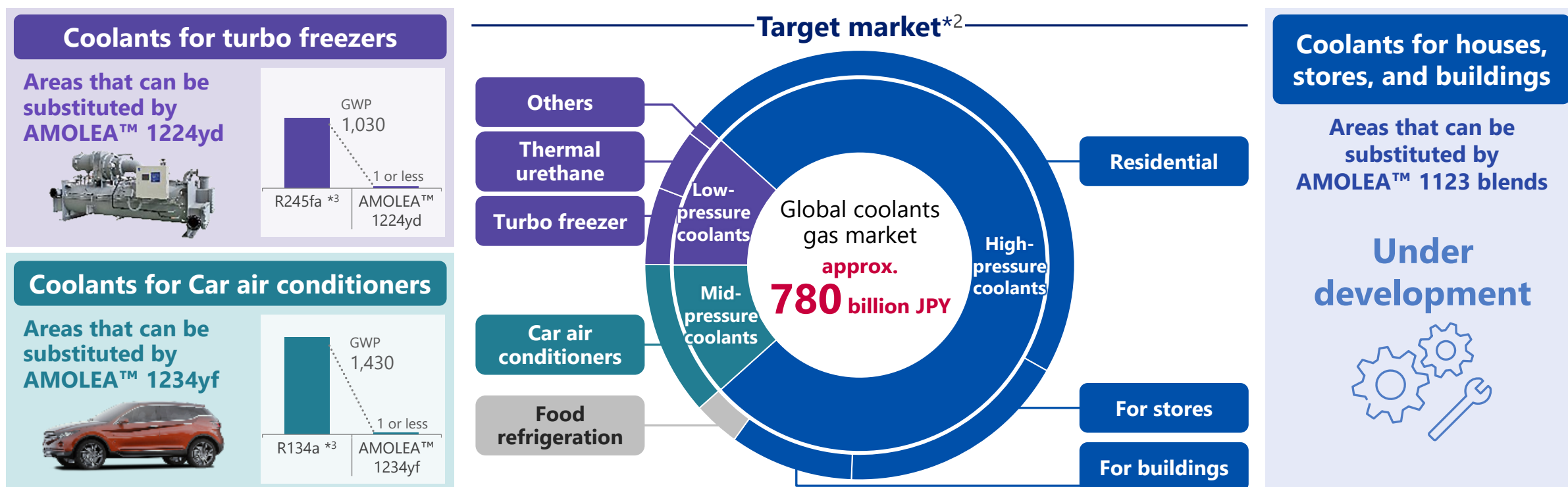


Hydrogen-related: including ammonia and synthetic fuels derived from methanation processes

Fuel Cell Vehicle Production Trends*2



- Accelerated conversion from existing coolants to **new eco-friendly, next-generation coolants and solvents** with low global warming potential (GWP*) from 2025 onward toward a net-zero carbon society.
- Low-GWP coolants market will expand to about 2.2 times its 2022 level by around 2030*4.



*1 : GWP (Global Warming Potential) is a coefficient that expresses the greenhouse effect as a multiple of that of CO₂.

*2 : 2020 AGC estimates *3 : Existing products *4 Based on TCFD scenario analysis

Future Investment Plans for Addressing Overall Climate Change

- Investing more than 80 billion yen over three years from 2024 to 2026 to address climate change

Cumulative investments plan related to climate change response

Investment to expand sales of products that contribute to reducing GHG emissions

30.0 billion yen or more



Energy saving



Next-generation energy



Low GHG emissions

etc.

Investments aimed at reducing AGC Group GHG emissions

50.0 billion yen or more



GHG emissions reduction in float glass furnaces



Conversion of power sources to renewable energy

etc.

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 - **Effective use of resources**
-

4 Efforts to enhance the effectiveness of "Creation of Three Social Values"

- Promote the use of recycled resources and reduce the use of raw materials derived from natural resources.
- Aiming to establish resource recycling in all phases of business

Targets

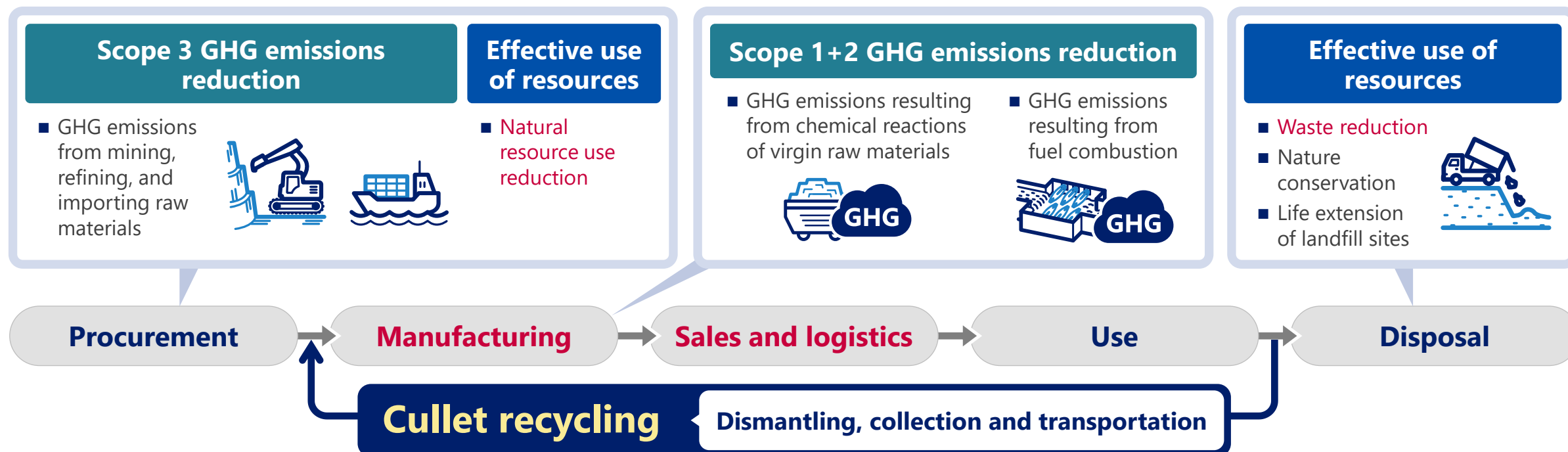
- **Landfill ratio: less than 1%**
- **Effective Utilization of Resources**
- **Improved resource reuse rate**
- **Introduction of non-fossil-derived materials**



Cullet (Glass Waste) Recycling

- Recycle waste glass that would otherwise be sent to landfill as raw materials.
- Cullet recycling contributes to **both reducing the use of natural resources and reducing GHG emissions in Scope 1 to 3**

1 ton of cullet recycled = approx. 1.2 tons of virgin material saved, GHG emissions reduced by 0.5 to 0.7 tons (CO₂ equivalent)



Progress examples: Cullet Recycling (Construction Glass)

- In partnership with major general contractors and various business partners, we're promoting the recycling of waste glass from building demolition - a feat that was previously considered challenging
- Successful recycling of glass for convenience stores

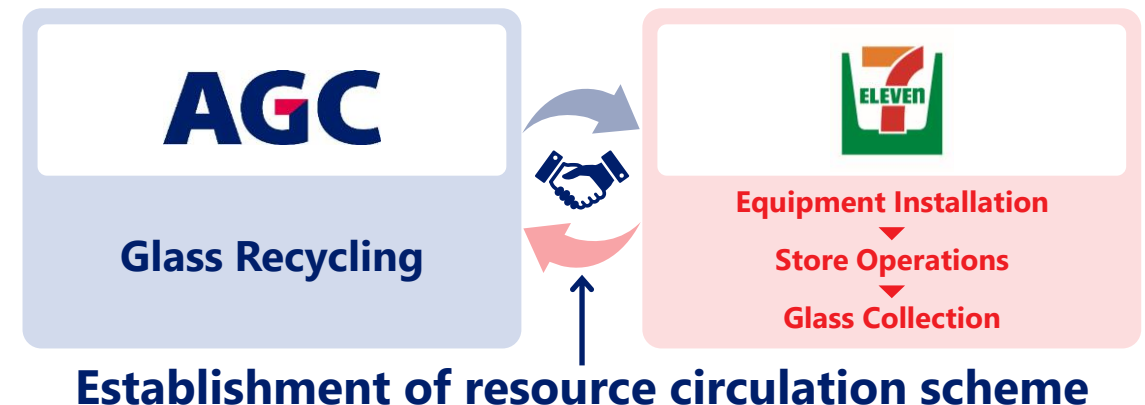
Europe

- We've managed to collect 130 tons of waste glass from a large building in Brussels. This will then be recycled at AGC and is planned to be repurposed as Low-Carbon glass.



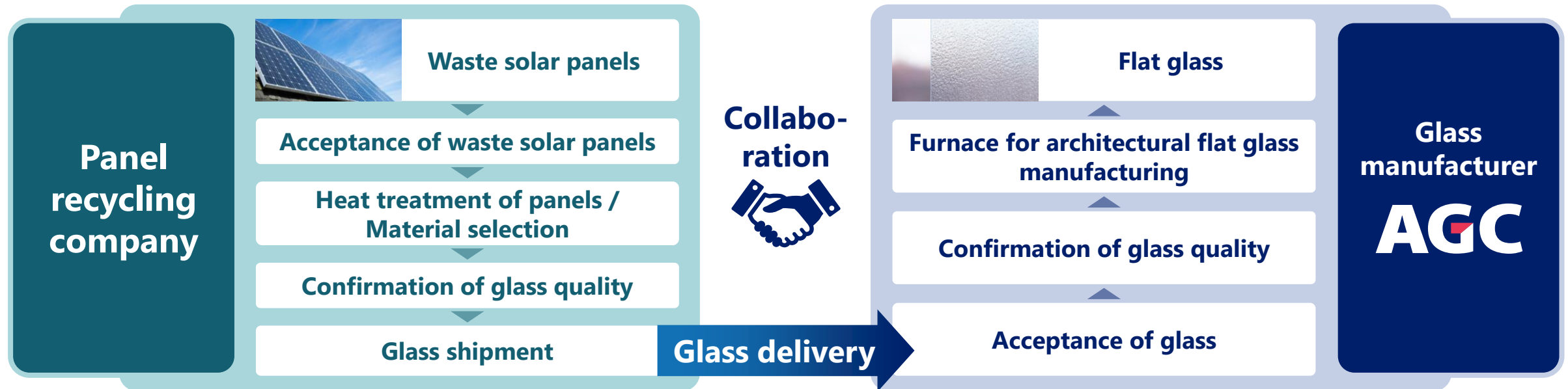
Japan

- Collaborated with 7-Eleven to collect 4 tons of shelf glass and succeeded in recycling into raw material cullet (Japan's first in 2024)
- Plans to expand recycling to store glass in the future



Progress examples: Cullet Recycling (Cover Glass for Solar Panels)

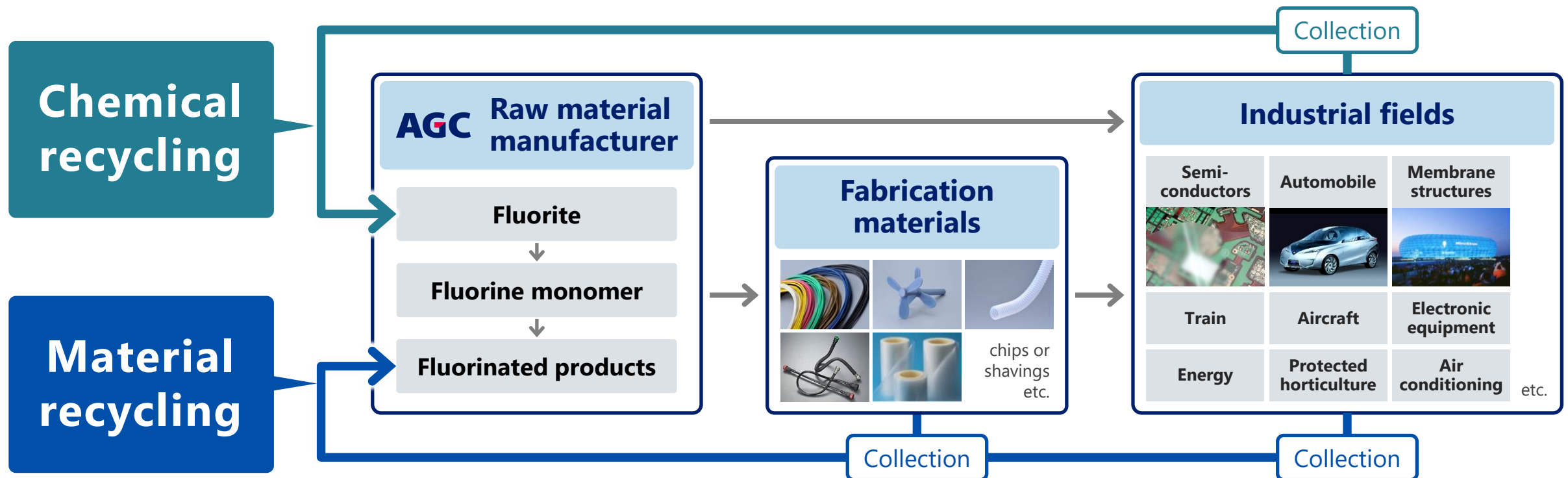
- Hundreds of thousands of tons of solar panels are expected to be disposed of annually in the late 2030s*, and recycling of cover glass is an important issue.
- Successful demonstration test of float glass production using collected cover glass as raw material (first in Japan in 2023). Scheduled to begin use as a raw material for the manufacture of figured glass (planned from the end of 2024 onwards).



Recycling process for solar panel cover glass (an example)

Progress examples: Fluorinated Products Recycling

- Promoting recycling of fluorocarbons since 1997. Used products are collected and reused as raw materials.
- The company aims to further expand the fields of recycling, such as fluoropolymers used in the manufacture of semiconductors.



Examples of Products Contributing to Effective Use of Resources

Long Life

Fluoropolymer film for greenhouse that lasts for over 30 years without being replaced

- Longer life than ordinary products that has a life span of between 3 and 5 years
- Waste plastic emissions are also reduced

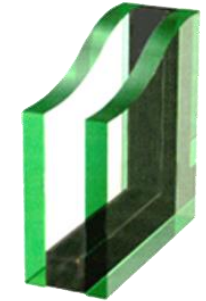


Easy to Recycle

**Easily recyclable
Double-Glazing Glass**

- Easily disassembled for horizontal recycling
- Contributes to CO₂ reduction throughout the product life cycle by extending service life

Thermocline



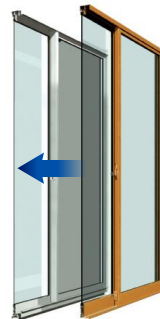
Waste Reduction

Glass for renovations that can be retrofitted

- Enables high-performance windows without disposal of existing glass and sashes

Mado2™

**Double-glazing
window for a
comfortable
environments**



Insulation

Heat shielding

Anti-condensation

Soundproof

Bio-Based

**100% bio-based
epichlorohydrin**

- In addition to reducing new resource extraction, GHG emissions are up to 67% less than conventional petroleum-derived ECH

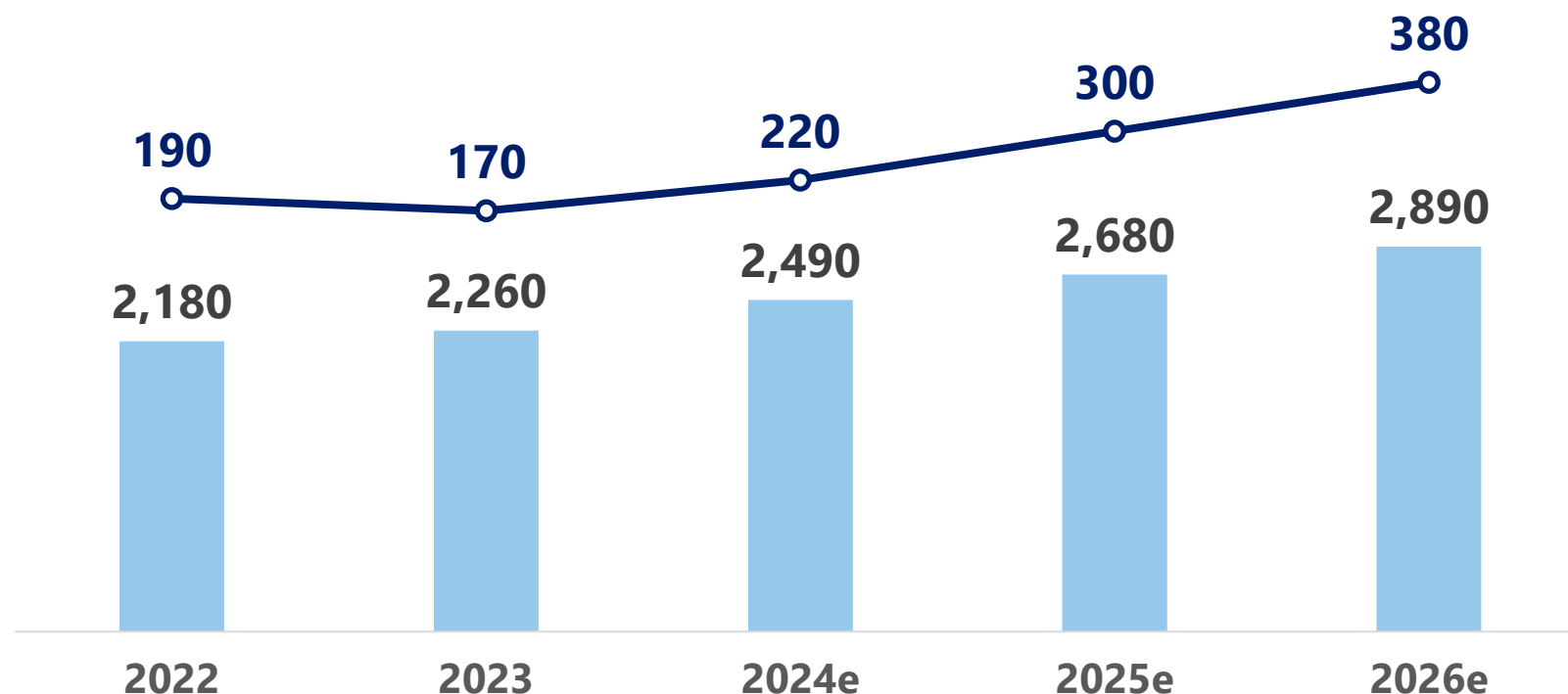


Net Sales and Operating Profit of Products Contributing to the Environment and Energy Field

- Net sales of products contributing to the environment and energy fields account for about 10% of the Group's total sales.
- While seizing opportunities for market expansion, AGC Group will continue to leverage its technological capabilities to contribute to further GHG emissions reductions and business growth.

Overview of Business Performance Contribution of Products Benefiting the Environment and Energy Fields (Unit: 100 million yen)

■ Net Sales ● Operating Profit



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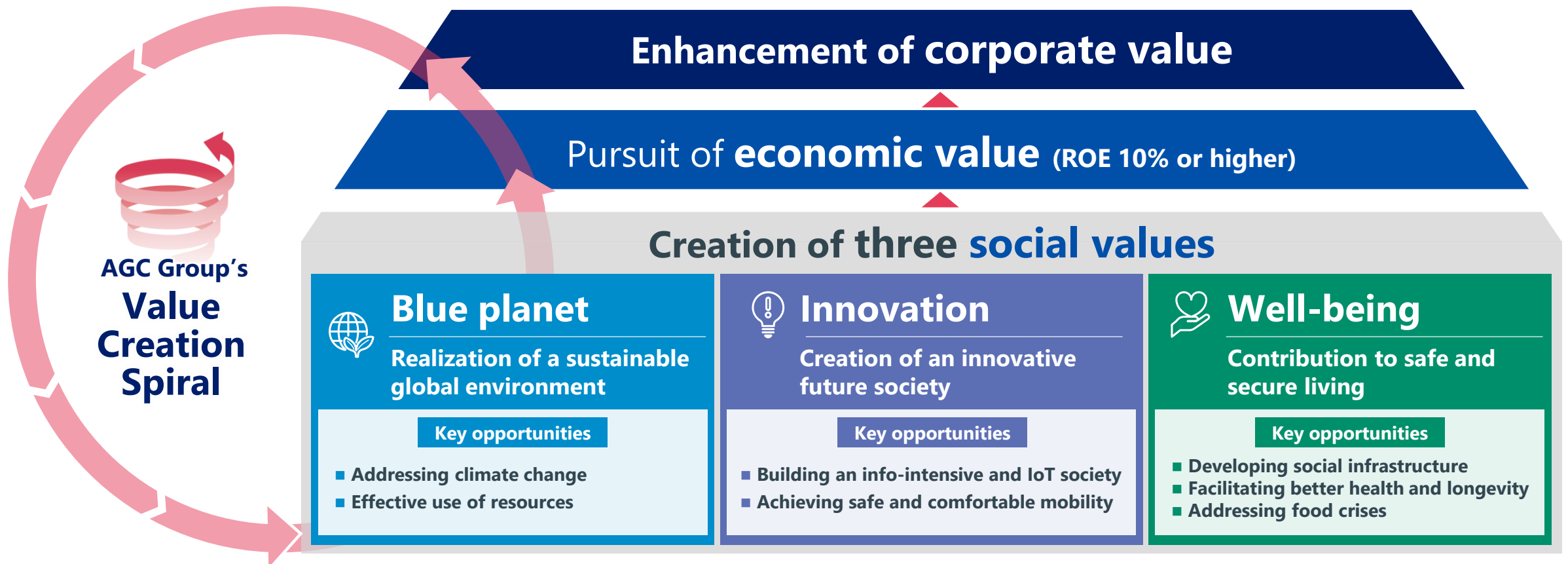
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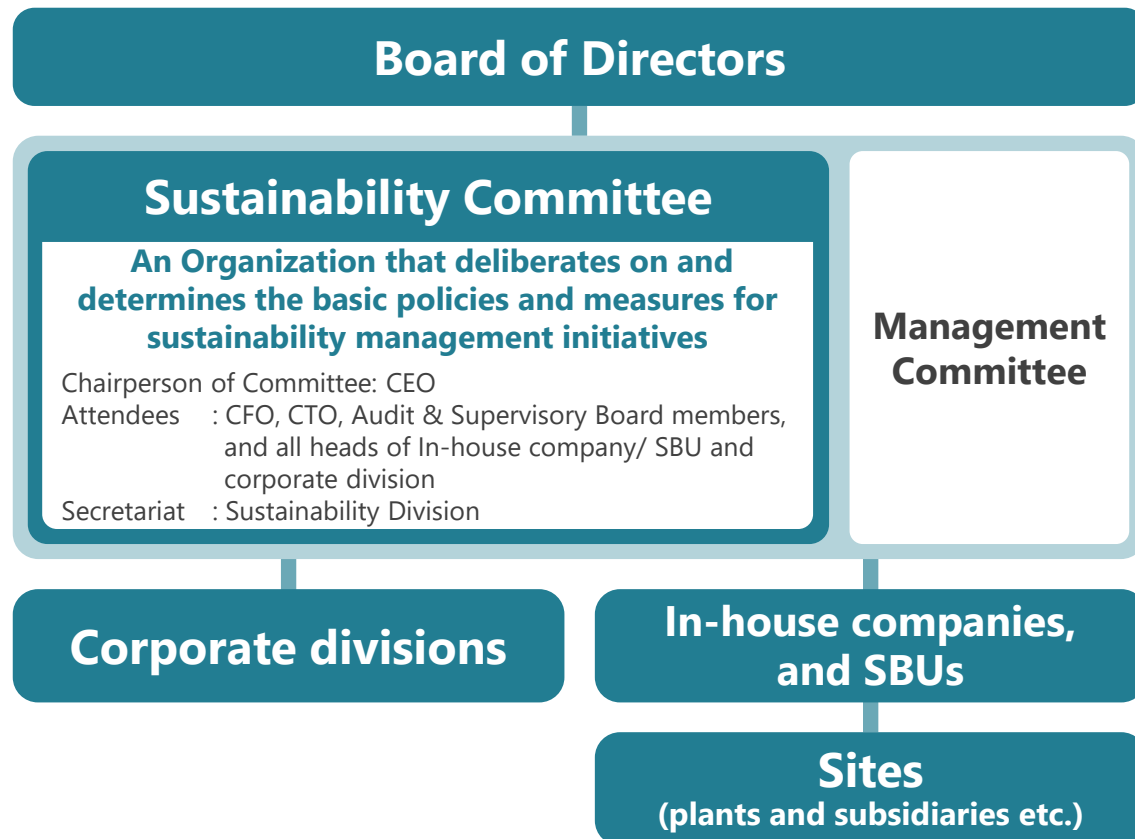
4 **Efforts to enhance the effectiveness of "Creation of Three Social Values"**

AGC Group's Value Creation Spiral

- The AGC Group will create economic value through the creation of social value to achieve a spiral of enhanced corporate value.



- Positioned equivalent with the Management Committee
- Held four times a year, reporting to the Board of Directors twice a year



Agenda for the 2023 Sustainability Committee meeting

Examples

- **Internal carbon pricing system operational Review**
- **GHG emissions reduction**
Scope 1, 2, 3 reduction roadmap
Emissions reduction results
- **Initiatives to address human rights issues**
Identification of salient human rights issues and establishment of human rights policies
Supply chain human rights due diligence
- **Matters related to worker safety**
- **Employee engagement surveys and improvement**

Environmental Response Meeting

- Renewed the structure in 2024 to discuss not only GHG emissions reduction but also the environment in general.
- Establish global and cross-business thematic projects in order to address issues

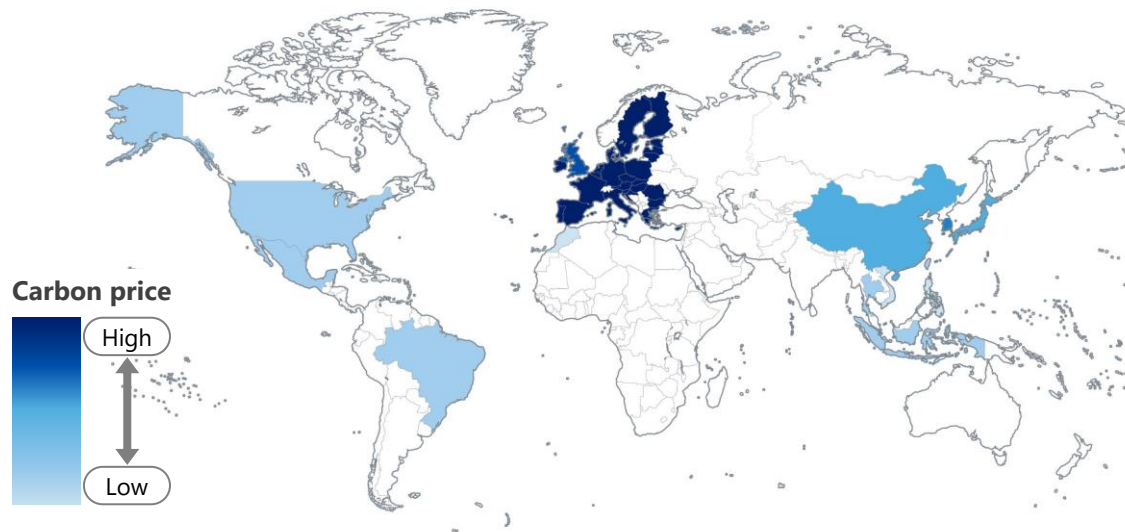


GHG Emissions Reduction Strategies that Take into Account Carbon Cost

- Reviewed the Internal Carbon Pricing System*.
 - Reflecting the policy landscape of each country and region in the carbon cost for climate change, future carbon costs are calculated based on both regional and time Axis.
 - Consider social and economic value and apply them to investment decisions

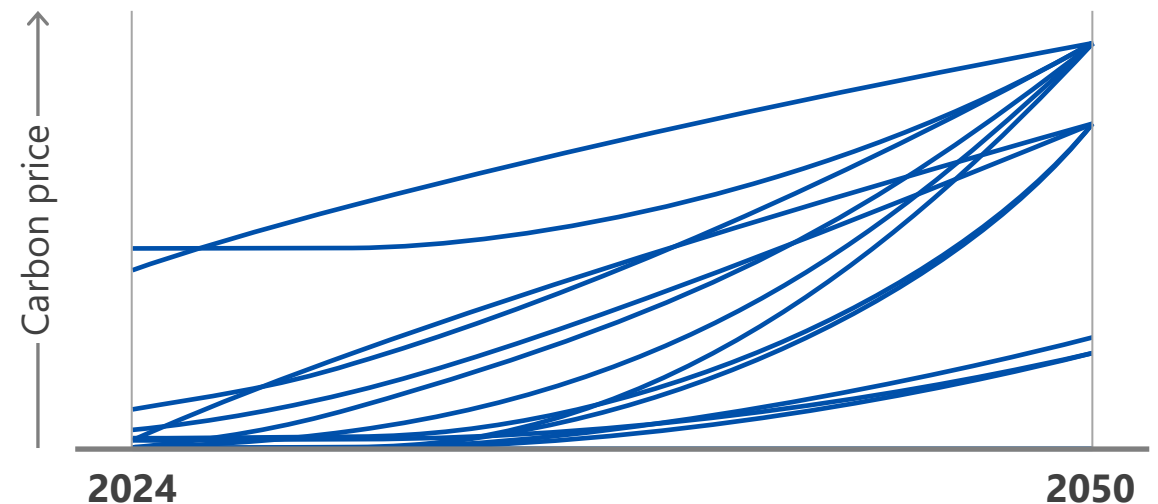
Regional axis

Projected carbon prices by region in 2030



Time axis

Projected carbon price trends by region

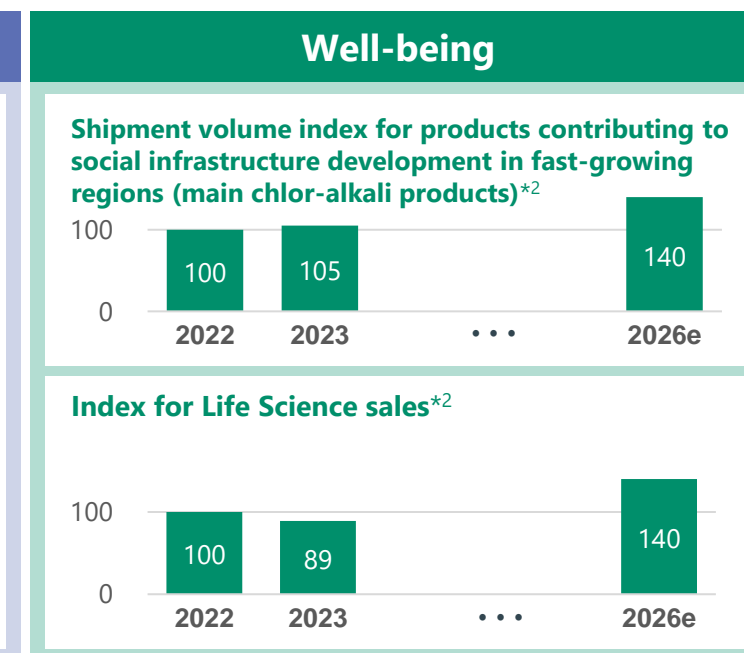
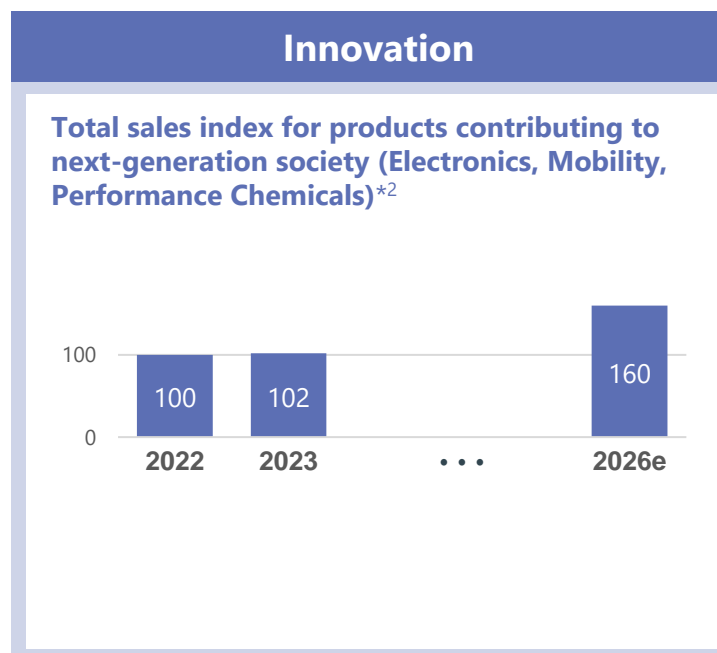
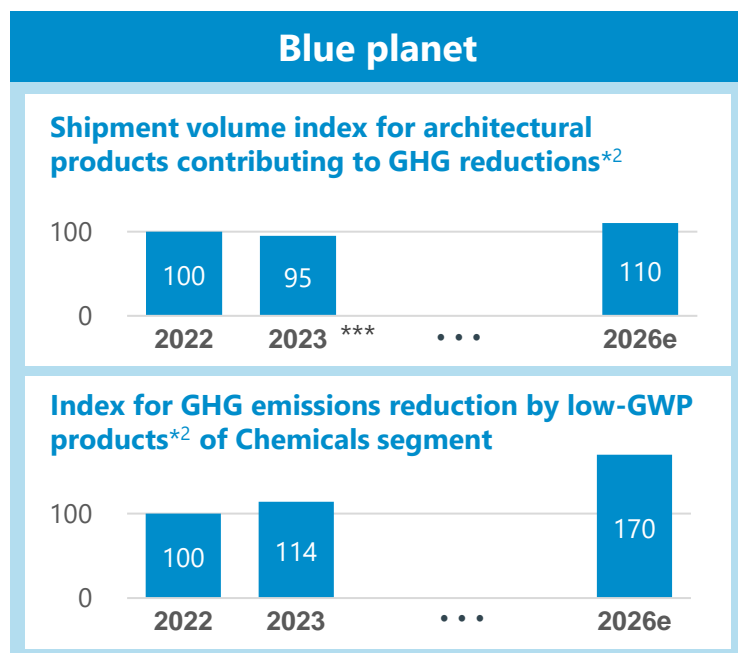
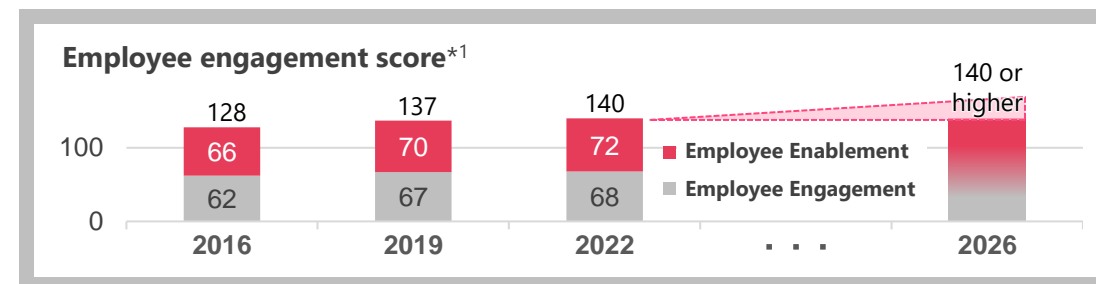
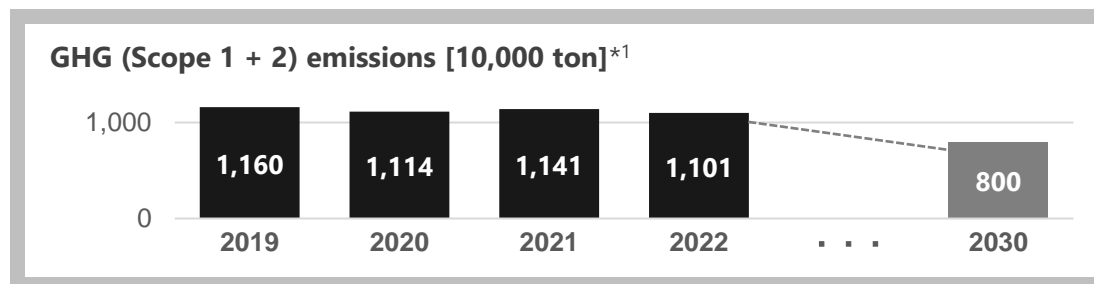


Sustainability KPIs

■ Establish sustainability KPIs and monitor sustainable growth

(As of February 8, 2024)

Sustainability KPIs



*¹: Items reflected in executive remuneration. However, for GHG emissions, GHG emissions per unit of GHG emissions sales are used in the calculation of executive remuneration.

*²: Indexes: Figures converted from 2023 on using 2022 as a base of 100.

Reflection in executive compensation system

- Sustainability KPI adopted as a non-financial indicator for executive stock compensation for the period covered by the new medium-term management plan **AGC plus-2026**.

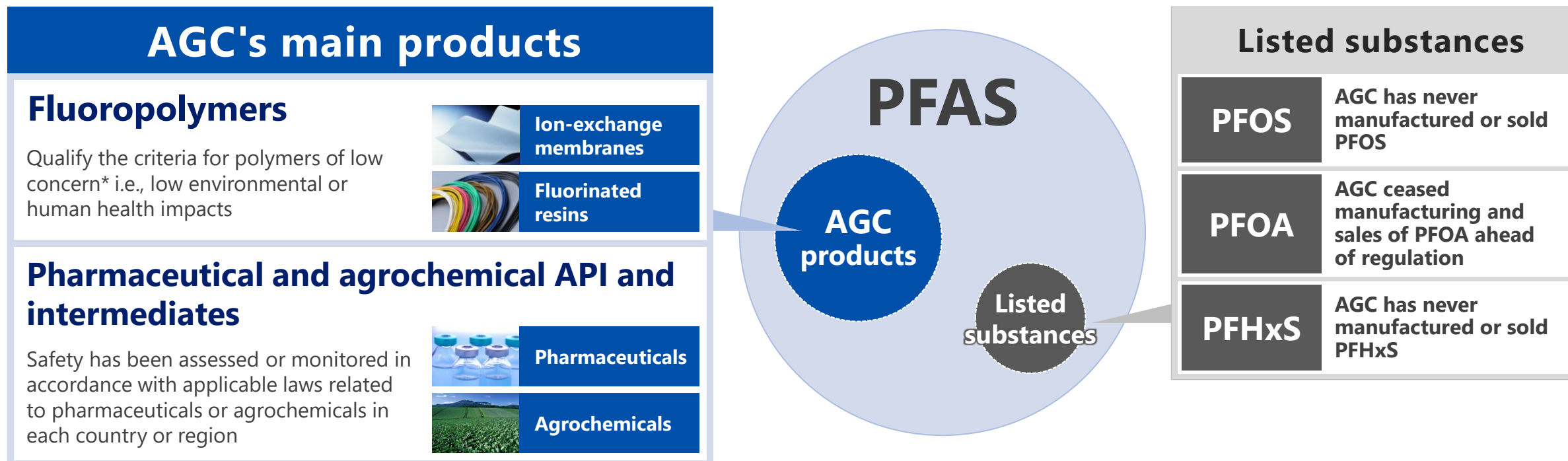
Category	Performance Indicators	Reason for Selection	Weight
Financial Indicators	ROE	Important Performance Objectives for Long-term and Medium-term Plan Periods	30%
	EBITDA	To improve cash generation capacity and profitability	30%
Stock Price Indicator	Relative TSR (vs TOPIX)	More profit sharing with shareholders	20%
Non-Financial Indicators	GHG Emissions per unit of sales	Aiming to contribute to the realization of a sustainable global environment	10%
	Employee Engagement	Aiming for the growth of the company through the growth of each employee and the exercise of his or her abilities.	10%

Note 1: Relative TSR (vs. TOPIX): TSR stands for Total Shareholder Return and refers to the total investment yield (total shareholder return) for shareholders, including capital gains and dividends. Relative TSR (vs. TOPIX) compares the Company's TSR for the subject period to the average TSR of TOPIX component stocks.

Note 2 GHG emissions per unit of sales: GHG emissions per unit of sales is an index of the amount of GHG (greenhouse gases) emitted by AGC group divided by net sales, and indicates the carbon efficiency of our business activities.

Appendix

- Of the PFAS (umbrella term for approximately 12,000 types of fluorine compounds), three substances are listed as Persistent Organic Pollutants under the Stockholm Convention, and AGC does not currently handle any of these listed substances.
- To fulfill its corporate social responsibility, AGC Group is working to minimize environmental impacts resulting from our business activities and contribute to resolving global environmental issues through our products, based on scientific evidence.

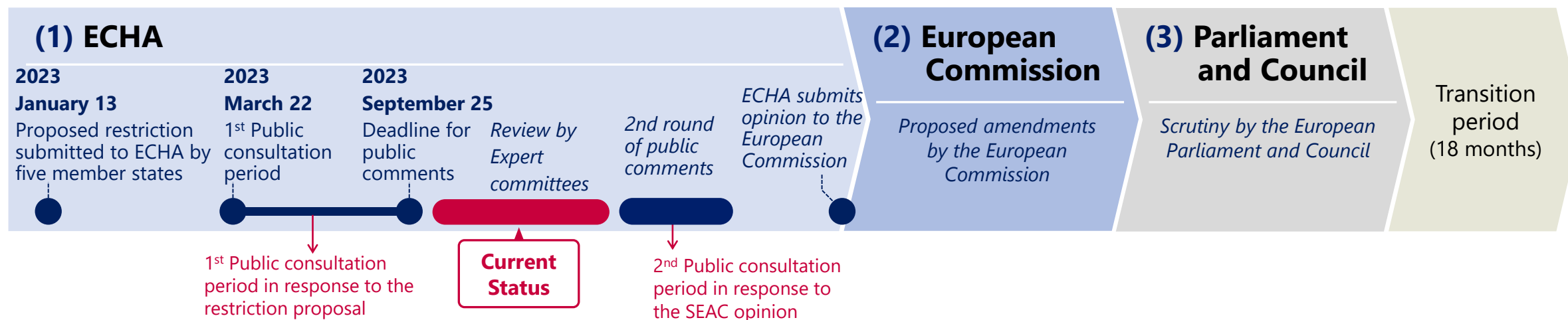


Regulatory trends in Europe

- The expert committees of the European Chemicals Agency (ECHA) is currently reviewing the proposal of the universal PFAS restriction.
- The ECHA's review process is taking time due to the significant number of public comments received, and the timing of the second public consultation and the time frame for the subsequent regulatory process is currently unclear.
- AGC Group has submitted our public comments for the 1st public consultation.

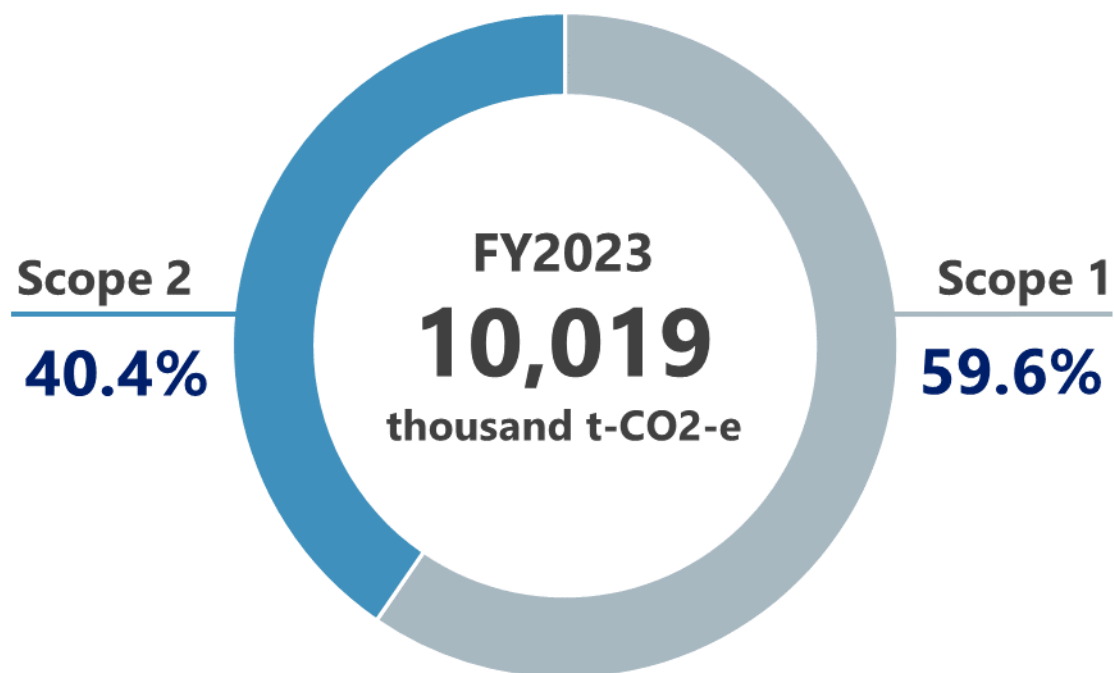
Review process of the proposal of the universal PFAS regulation in Europe

- (1) After two rounds of public consultation by ECHA, the expert committee submits their final opinion
- (2) The European Commission prepares a draft regulation referring the final opinion submitted, and the REACH Committee, consisting of member states, deliberates on and adopts the draft.
- (3) The adopted legislation enters into force after being scrutinized by the European Parliament and Council

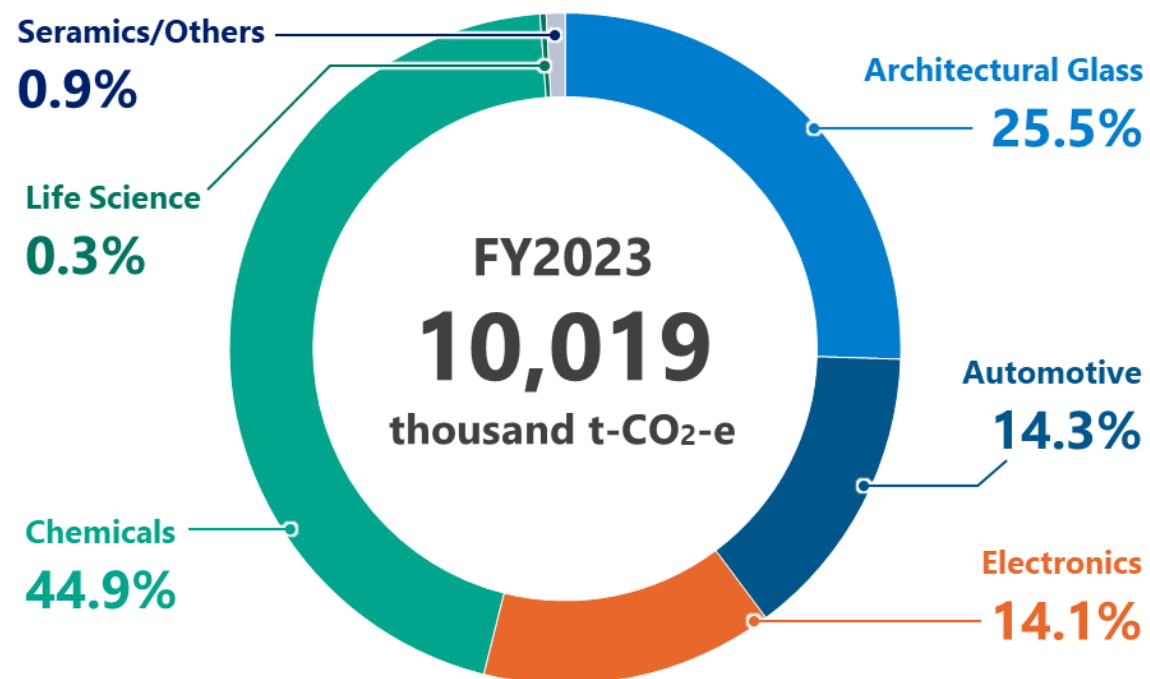


GHG Emissions Breakdown (Scope1+2)

Emissions Breakdown by Scope

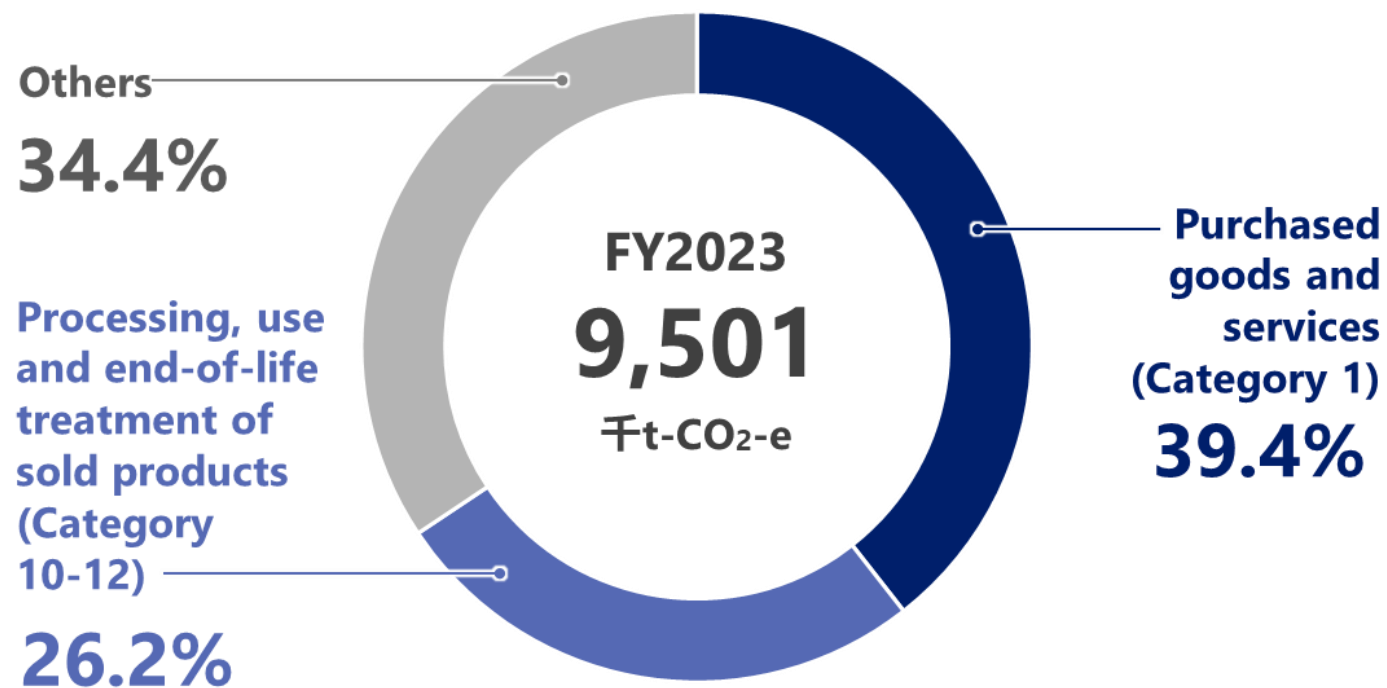


Emissions Breakdown by Business Segment



GHG Emissions Breakdown (Scope3)

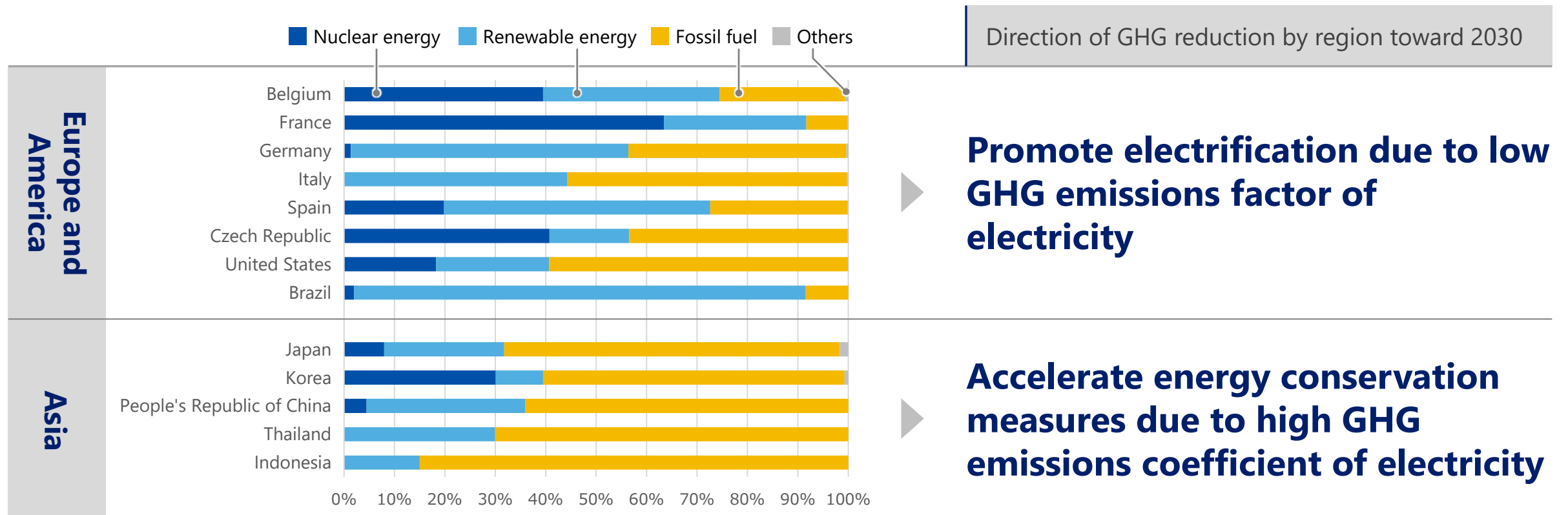
Emissions Breakdown by category (Scope 3)



GHG emissions reduction based on regional characteristics

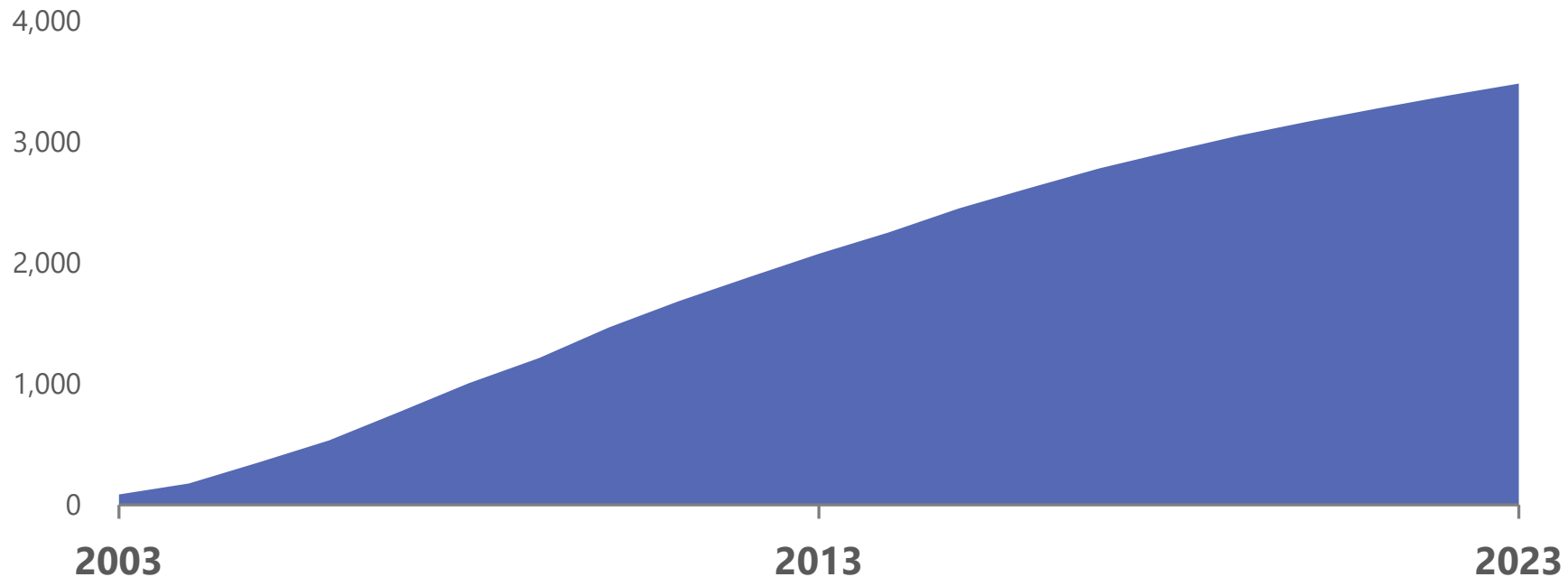
- Promote optimal GHG reduction measures in accordance with the trend toward decarbonization of electricity sources in each country

Composition of electricity generated by source*



- Began recycling fluorocarbons in 1997.
- Collect fluorocarbons and reuse the calcium fluoride obtained through the destruction process as a raw material.

Fluorocarbons Collection Cumulative Results (Unit: 10,000 tons, CO₂ equivalent)

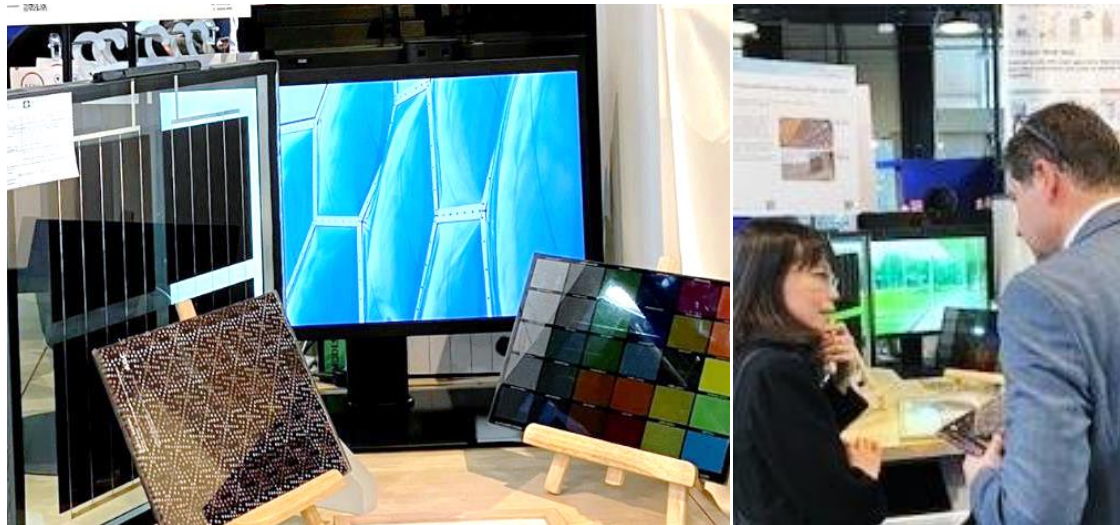


AGC's products and technologies attract worldwide attention

- Exhibit at the 28th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP28)

Glass-integrated solar cells

Exhibited SunEwat, photovoltaic glass integrated into building materials, at the Japan Pavilion (sponsored by the Ministry of the Environment).



Ion Exchange Membrane

Introduction of a project to introduce an electrodialysis water purification system using ion-exchange membranes in a drought rural areas in India.



- Established the AGC Group Human Rights Policy* in December 2023. Identified salient human rights issues in the AGC Group.
- Deepening our efforts to address human rights issues, including the implementation of human rights due diligence.

Human rights issues for AGC Group to consider (14 items)

Salient human rights issues (5 items)

- Worker's health and safety
- Rights of local people
- Conflict minerals (Responsible mineral procurement)
- Procurement of raw materials
- Discrimination and harassment in the workplace and employment

- Consumers' health and safety
- Forced labor
- Child labor
- Freedom of association and collective bargaining
- Adequate working hours
- Decent wages
- Rights of foreign and migrant workers
- Rights to privacy
- Corruption

Initiatives Related to Human Rights Due Diligence in the Supply Chain

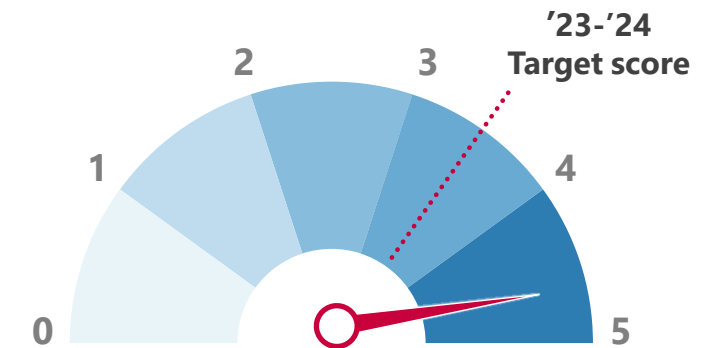
- Implementing procurement activities under the AGC Group Purchasing Policy, which aims for a socially and environmentally responsible supply chain, including responsible mineral procurement
- In 2024, the survey on sustainable procurement will be expanded to more than 400 companies. If there are issues, conduct hearings and work on improvement.

Scope of questionnaire

	Major AGC parent suppliers	Top global suppliers	High risk mineral suppliers	Major suppliers at sites of each Company
'20-'21	✓	✓		
'22-'23	✓	✓	✓	
'23-'24	✓	✓	✓	✓

Expanded scope of the questionnaire

Average questionnaire score



'23-'24
Achieved target score

Strengthening the Management Foundation: Promoting Human Capital Management

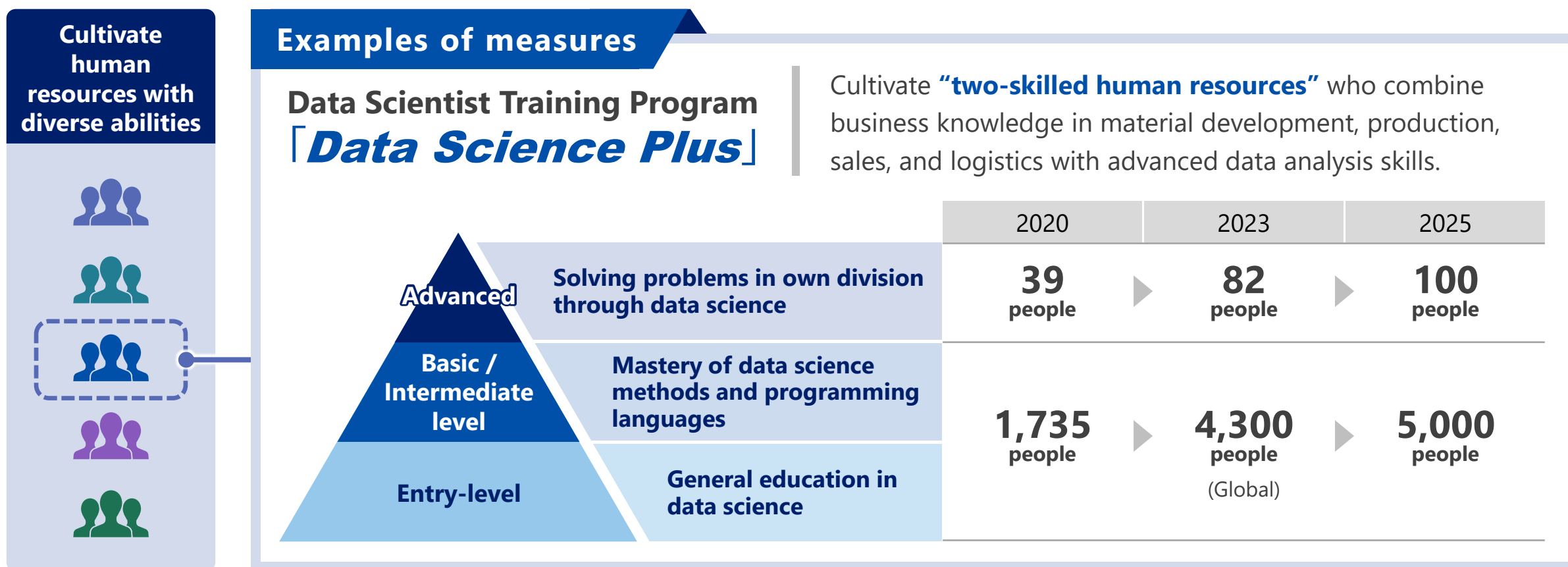
- At AGC, we will unlock the unique strengths and abilities of each individual. We foster a culture of continuous learning, professional development and support embracing new challenges. The collective growth of each individual creates a highly engaged and resilient organization, which enhances our corporate value, enabling us to fulfill our mission.

**"AGC People:
Driving our
Growth!"**



Human Resource Development Strategy

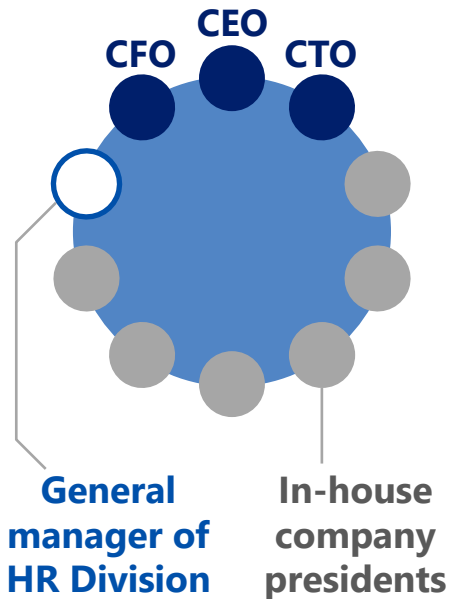
- Focus on developing human resources with diverse abilities as a strategy to develop human resources that will contribute to business portfolio expansion and higher profitability.



Promotion of Diversity Policies

- The Diversity Council was established in 2022 to build an environment where diverse people can make the most of their individual abilities. Accelerate diversity promotion measures by sharing information across divisions.

Diversity Council



Chairperson	CEO
Participants	CFO, CTO, General manager of HR Division, In-house company presidents
Frequency	2 times/year
Agenda	Diversity & Inclusion promotion
Established	2022

Diversity promotion measures

Fostering organizational culture

Increased opportunities for communication by top management and executives to spread the significance of diversity promotion throughout the organization

Recruitment

Increase ratio of women in new graduates and mid-career hires*

Talent development

Strengthening the development of key talent in the mid-tier and young-career groups who will become candidates for executive positions

Improvement of working environment

Continue to promote the concept of "Smart working" as a way work style that AGC aspires to and continue to improve the environment that leads to enhanced corporate value *

Employee Engagement Improvement

- Conduct an annual* engagement survey of all Group employees
- Reflect monitoring results in action plans to continuously improve engagement
- **Link engagement scores to executive compensation** to increase effectiveness

Engagement Survey Results



*Large-scale survey every 3 years, simplified survey in other years

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Your Dreams, Our Challenge