

IR DAY 2024

Architectural Glass
[Asia Pacific]

AGC Inc.
June 3, 2024



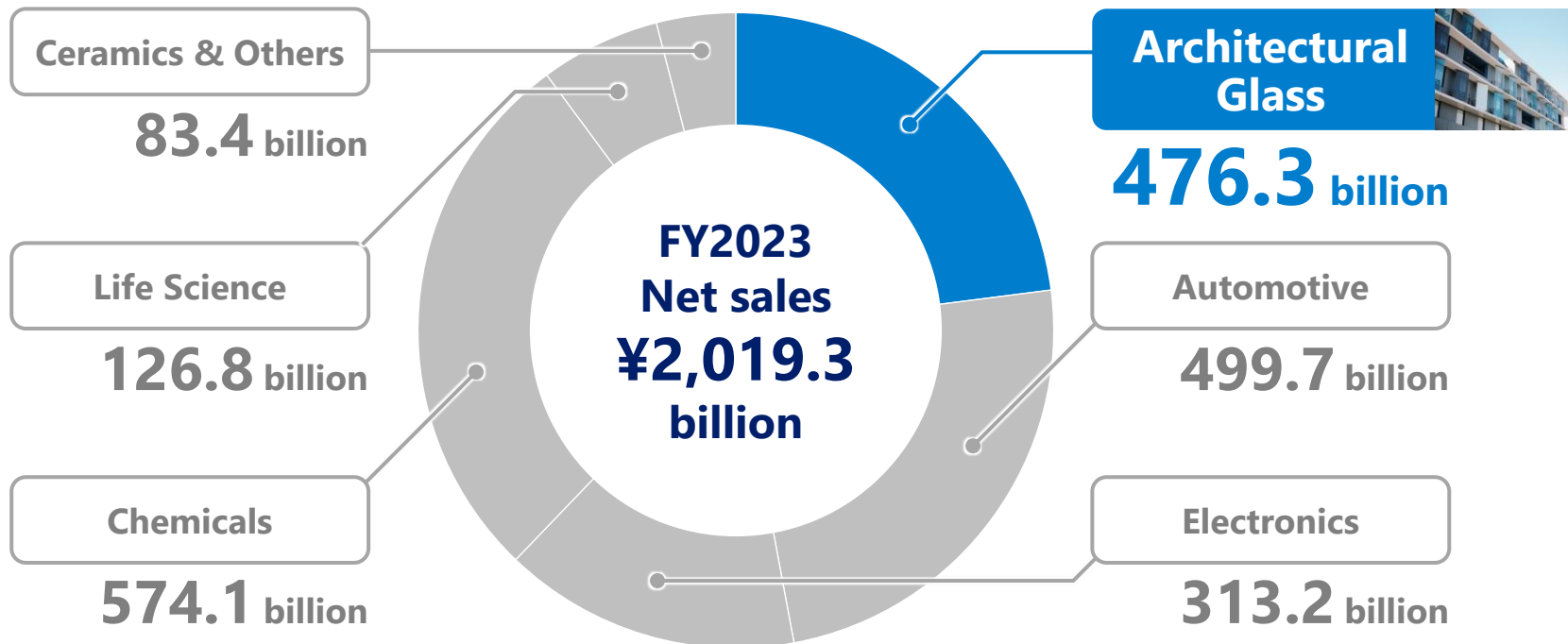


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Business Overview of Architectural Glass



Architectural Glass business in the AGC Group



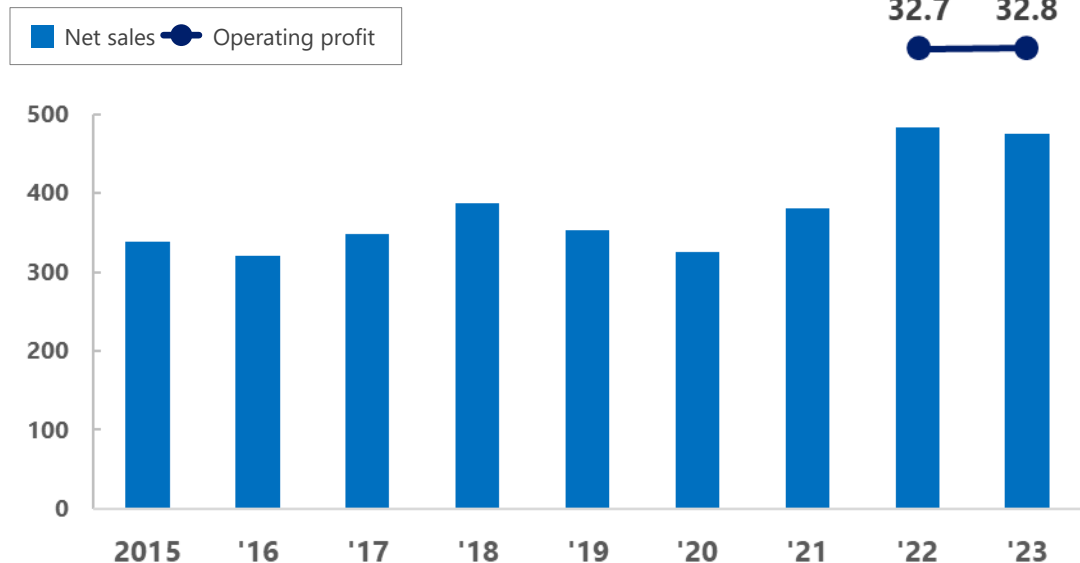
※ As net sales by business are figures before eliminations of intersegment sales, the sum of net sales by business does not equal Companywide net sales.

Architectural Glass earnings and asset efficiency trend

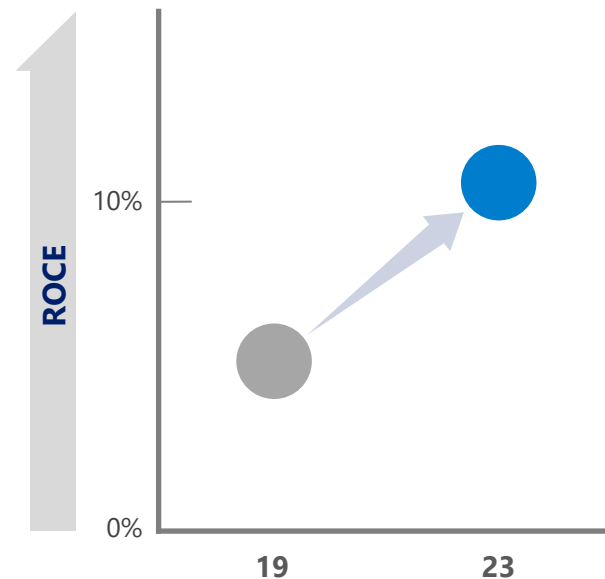
- Architectural Glass made progress in structural reforms, improving profitability and asset efficiency.

Architectural Glass net sales and operating profit trend

(billion JPY)



Change in ROCE

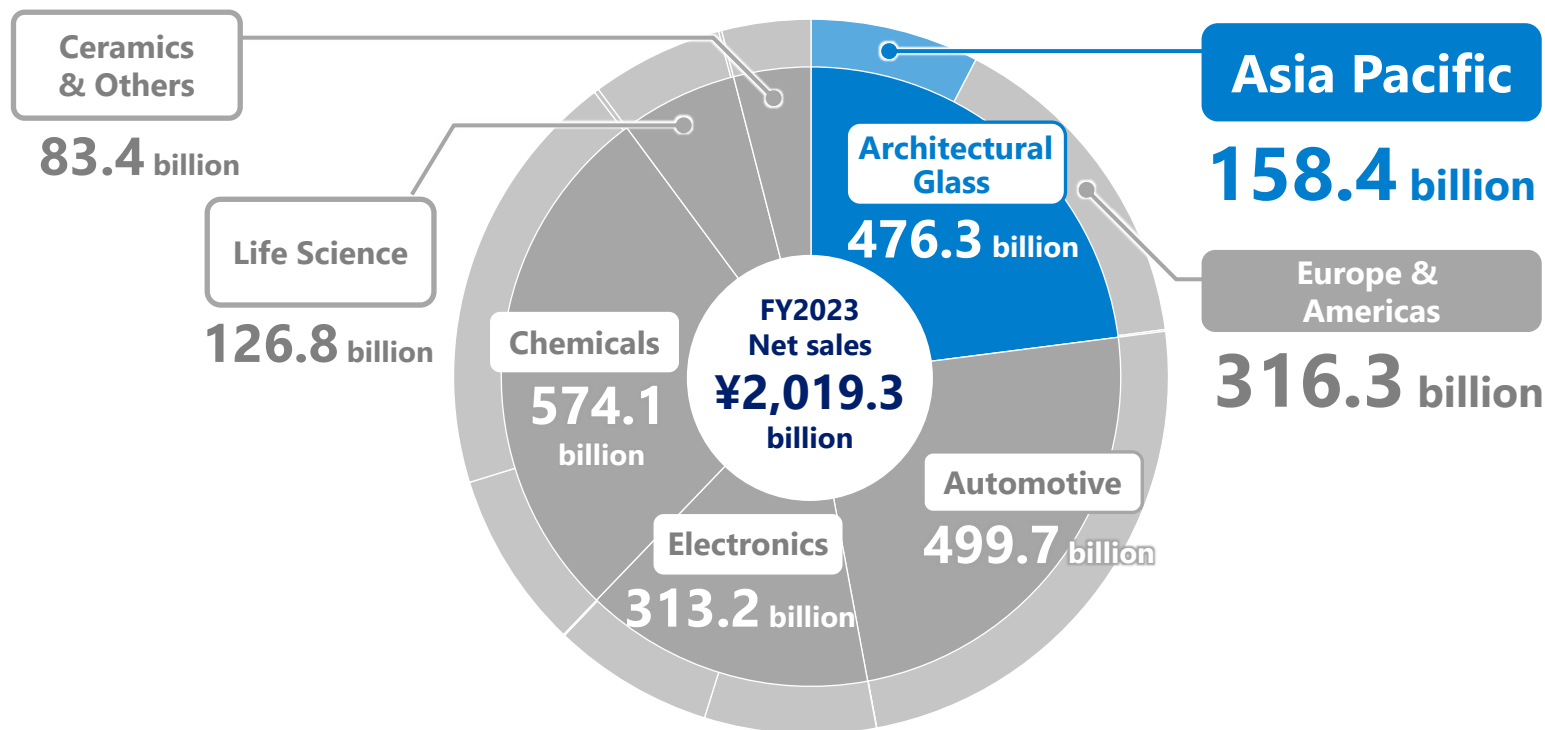


※ Diameter of each circle : the size of EBITDA

Business Overview of Architectural Glass Asia Pacific



Architectural glass Asia Pacific business in the AGC Group

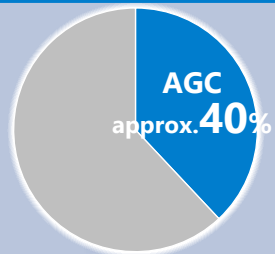


※ As net sales by business are figures before eliminations of intersegment sales, the sum of net sales by business does not equal Companywide net sales.
Sub-segment sales figures are based on sales to external customers.

Global footprint

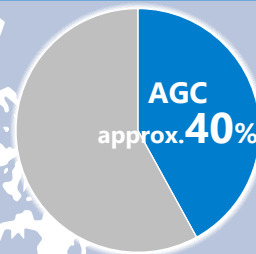
Japan

Market share
in Japan*

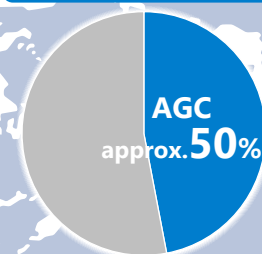


Asia

Market share
in Thailand*



Market share
in Indonesia*



● : Head office ● : Float glass and figured glass sites ● : Architectural processing glass sites

*AGC estimate

Functions of the main products



**Thermal insulation/
Condensation**



Energy-generating



Energy-saving



**Solar shading
(Heat shielding)**



**Disaster prevention/
Crime prevention**



Safety



Soundproof



Large opening



**Space production
(light control)**



Connectivity



Gaze control



Design

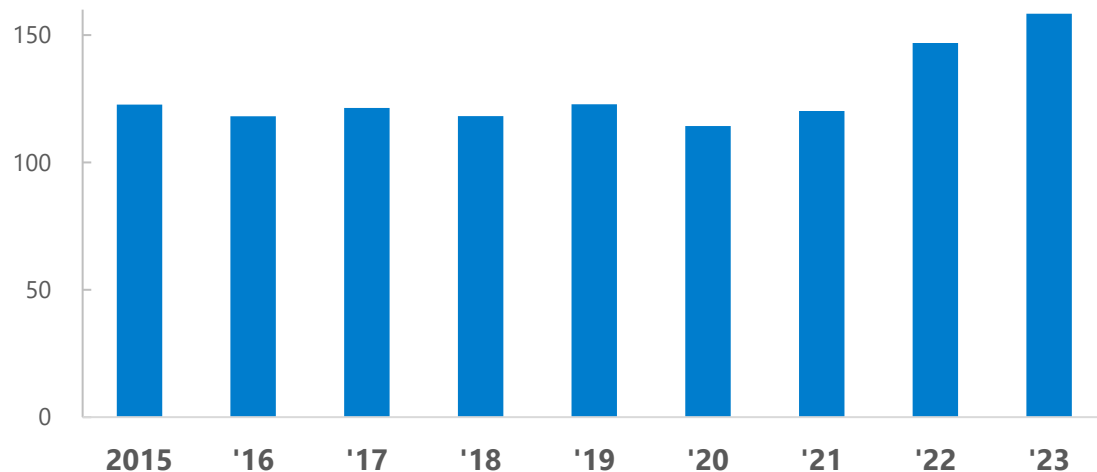


Fire prevention

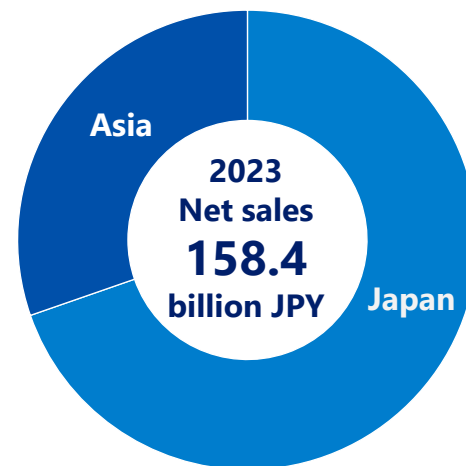


- In Japan, we established a stable revenue structure through structural changes in the industry as well as price revisions in response to soaring raw material and fuel prices.
- In Asia, we steadily captured market growth and achieved profitability in line with the plan.

Net sales of Architectural Glass Asia Pacific (billion JPY)



Ratio of net sales by region



Strategy





Mission

Glass for Quality Life

We would like to enrich people's lives, the world and society through glass while believing in the ability of glass. For a sustainable future for all people.



AGC's Strengths

1. Robust supply chain based on trust established over a long period of time

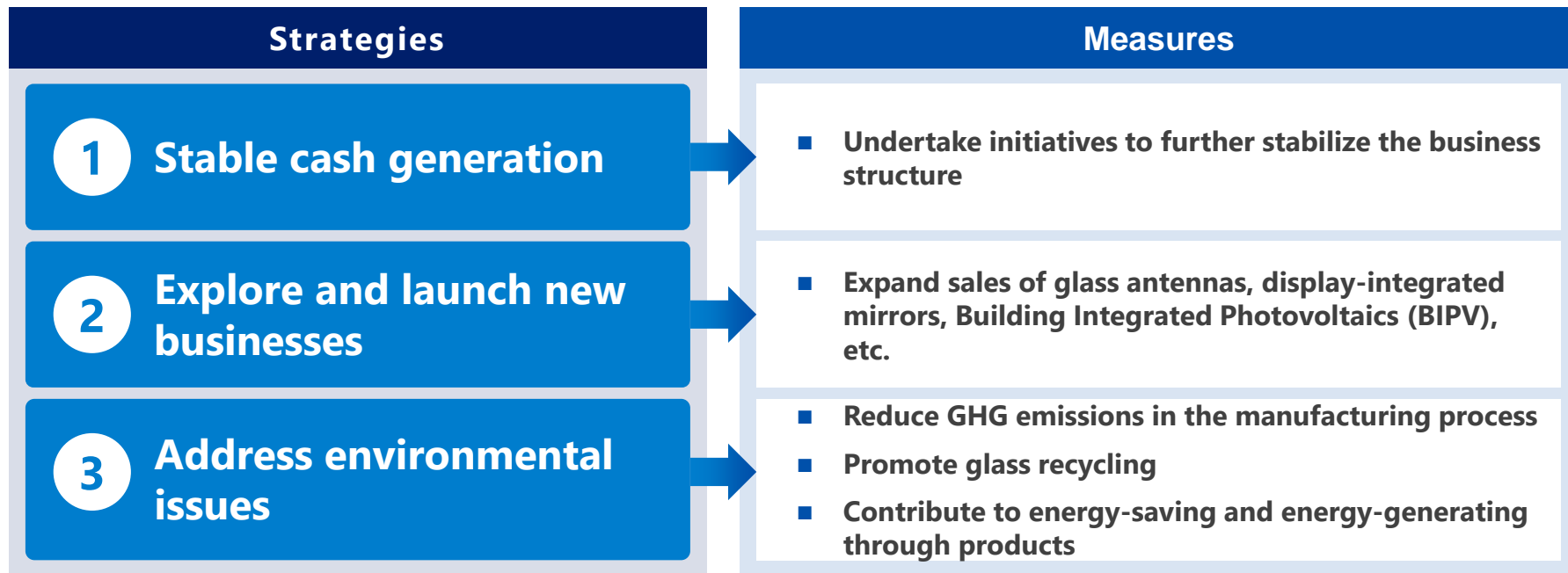
Covering the functions of the supply chain, including manufacturing, processing, sales, and installation

2. Leadership position in the product and process development ability in the world


Product development ability of advanced glass represented by energy-saving glass product lines, and process development ability for GHG emissions reduction technologies, etc.

Strategies and Measures

- Contribute to the growth of the AGC Group and the creation of social value by generating stable earnings and cash regardless of changes in the business environment.



- Strengthen business foundation, fortify resilience to economic volatility, and generate stable cash.

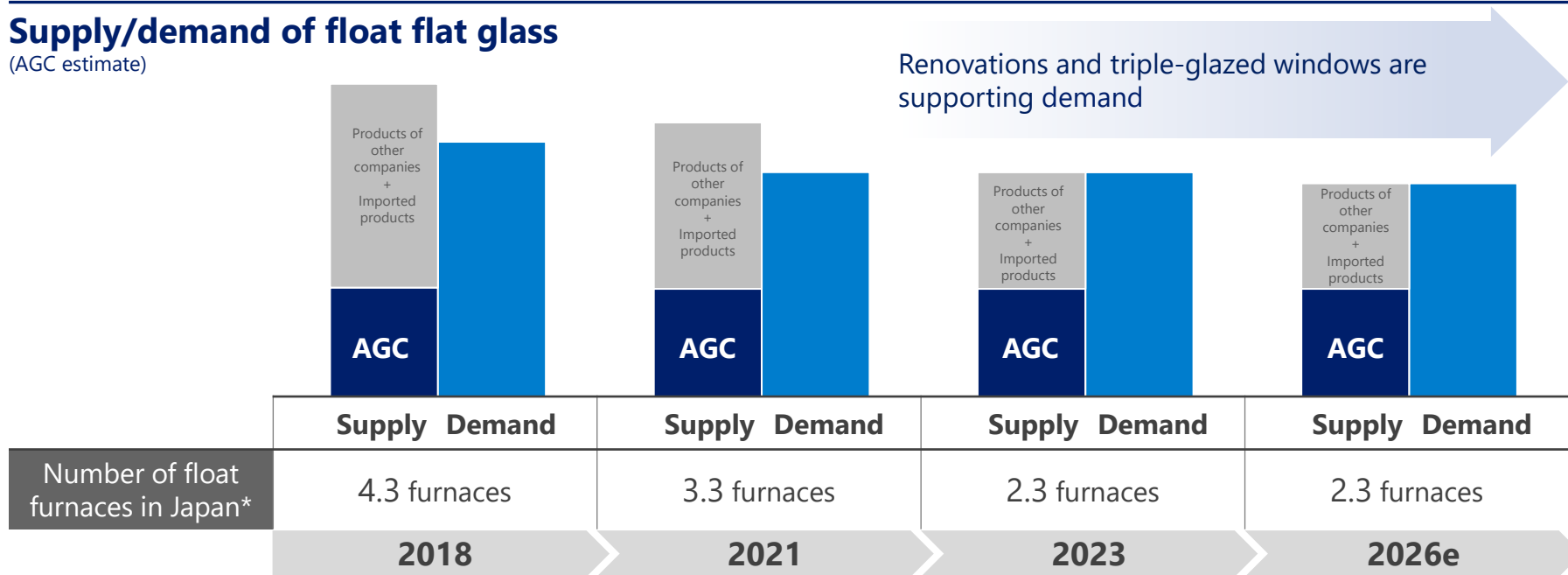
	Japan		Asia	
Main products	<div>Low-E double-glazing glass</div> <div><div>Gas-filled</div><div>Triple glazing</div><div>Warm edge</div></div>		Float glass	Heat reflective glass
			Heat absorbing glass	Low-E coating glass
Measures	Respond to demand (thermal insulation/heat shielding) in each region		Increase high-value-added products	
	Maintain fair prices			
	Reinforce logistics system			
	Talent development and recruitment			
	DX promotion			

Japan: Market Structure

- Competitors ceased furnace operations in 2020 and 2022.
- Supply/demand balance in Japan has improved significantly since the competitors shut down their furnaces.

Supply/demand of float flat glass

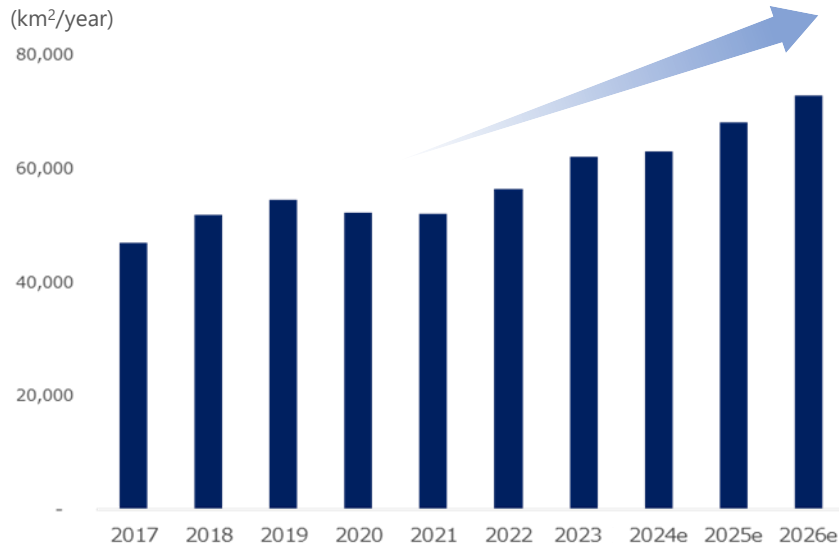
(AGC estimate)



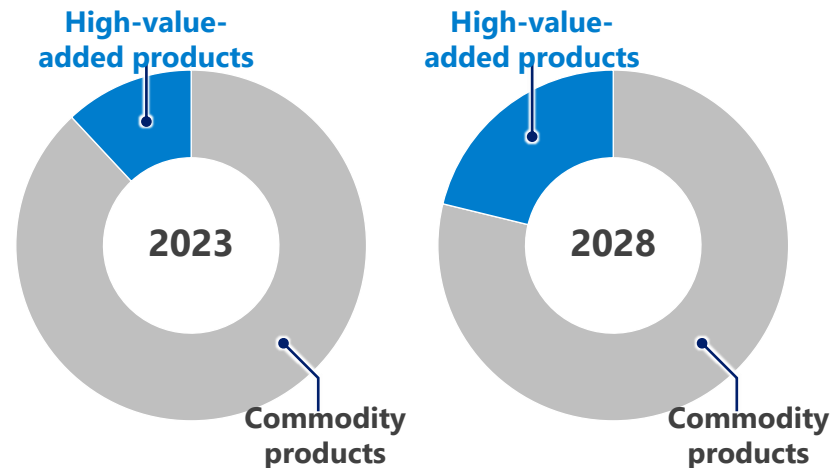
* Number of float furnaces in Japan including other companies (AGC estimate)

- Demands for energy-saving and energy-generating products are growing.
- Increasing the ratio of high-value-added products such as energy-saving glass and BIPV.

Demand for coated glass (AGC estimate)



Ratio of high-value-added products sales



Explore and Launch New Businesses

- Development and expansion of new products using AGC's world-class product and process development ability.
- Addressing the needs of the next generation and solving social issues integrating internal and external knowledge and technologies.

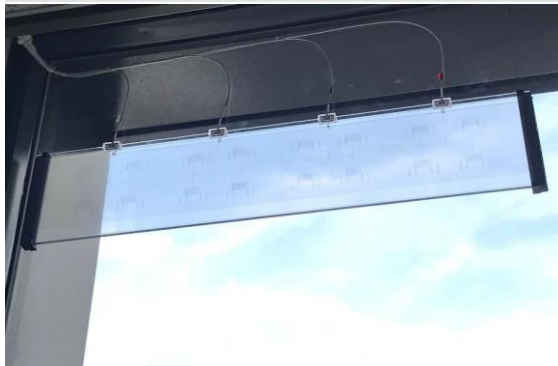
BIPV



AIST International Research Center for Zero Emissions Entrance Canopy

Glass products capable of generating solar power with power generating cells sealed between the glasses.

WAVEATTOCH™ (Glass antennas)



Development of glass antennas that can be affixed from the interior of existing windows to accommodate 5G expansion that supports high-speed, high-capacity communications.

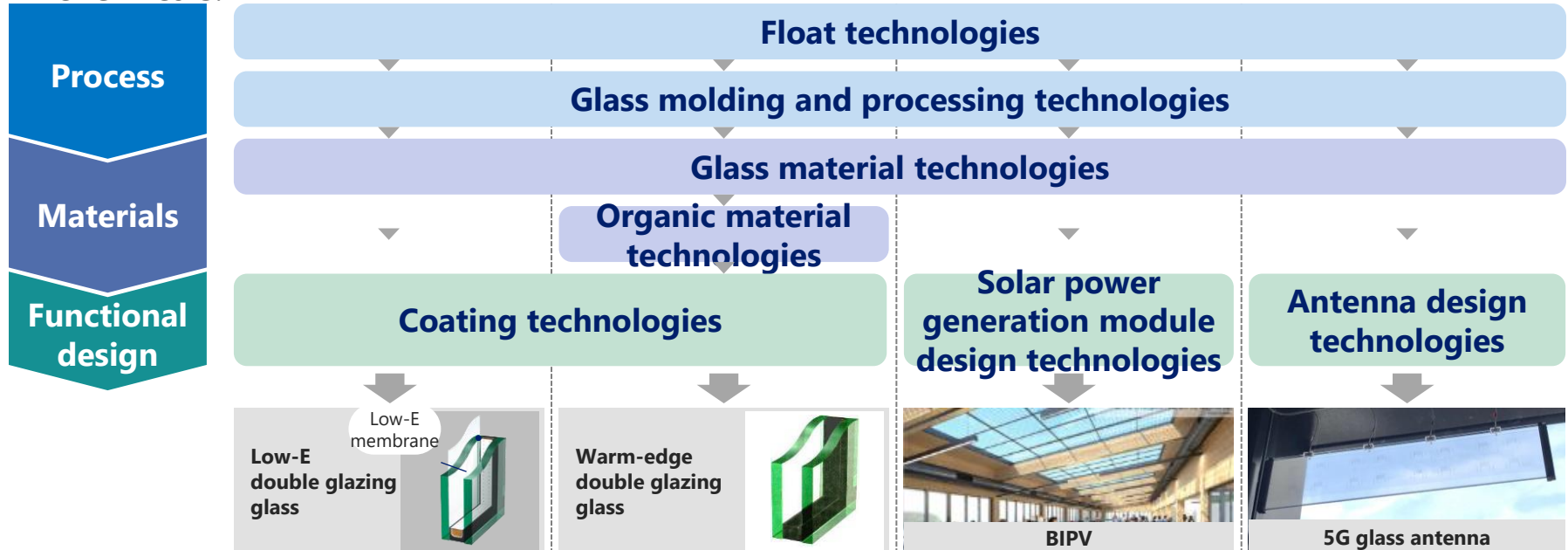
Mirroria™ (Display-integrated mirrors)



Products that simultaneously fulfill the functions of both mirrors and displays.

(Reference) Leadership position in the product and process development ability in the world

- Developing high-performance glass and new processes using the development abilities of our diverse human resources base.
- Developing new competitive products through combined technologies of glass, electronics, and chemicals.



- Promote GHG emission reduction and glass recycling in the manufacturing process as an industry leader.

Reduce GHG emissions in manufacturing processes



Reduction of GHG emissions in float glass melting furnaces

Initiatives

- Fuel conversion
- Introduction and deployment of clean fuels
- Introduction and deployment of energy-saving technologies
- Improvement of glass cullet utilization



Promote glass recycling



Contribute to realize a circular society by promoting glass recycling in collaboration with other companies and by reducing GHG emissions and landfill disposal

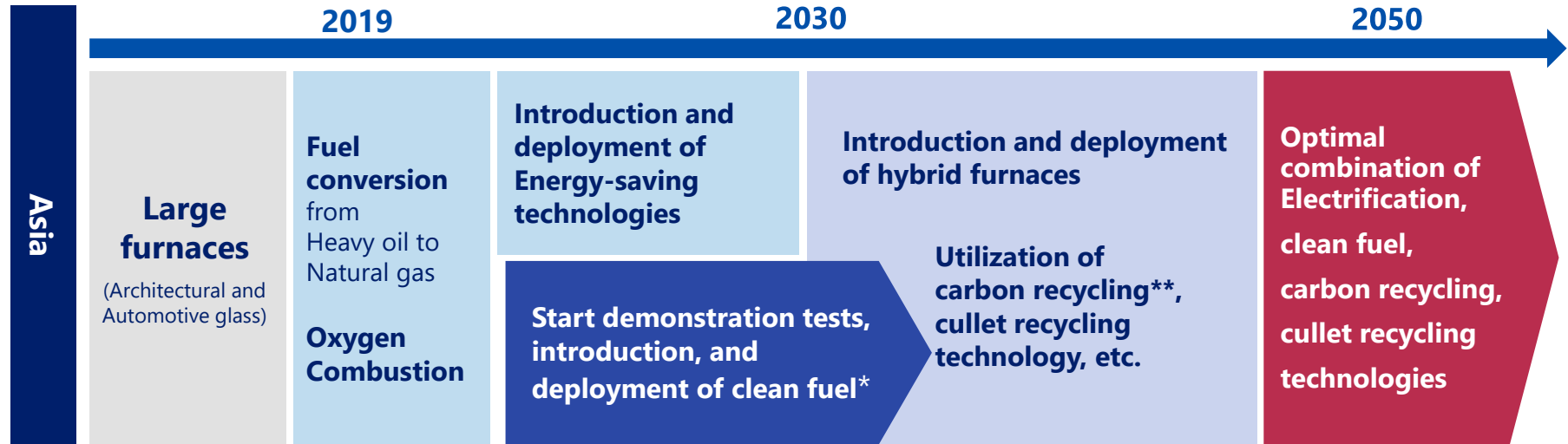
Initiatives

- Recycling solar panel cover glass
- Recycling waste flat glass generated at construction sites



Technology Roadmap for Reducing GHG Emissions in Float Glass Melting Furnaces

- Promoting introduction of energy-saving technologies (waste heat power generation, etc.), clean fuels (ammonia, hydrogen, etc.), CCUs, etc.



* As for ammonia combustion, one of the clean fuels, the NEDO project in which AGC participates succeeded in the world's first demonstration test of glass production using ammonia as a fuel in an actual production furnace in 2023. Further demonstration tests are planned, with the aim of full-scale introduction after determining the scope of utilization.

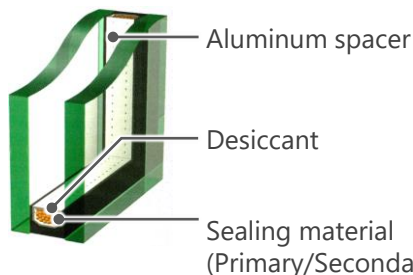
** As a specific initiative, Mitsubishi Gas Chemical Company is studying to produce methanol from the CO₂ generated during our production of architectural glass using CCU (Carbon dioxide Capture and Utilization) technology. We are targeting commercialization by around 2030 at AGC's Kashima Plant.

- Contribute to energy-saving and energy-generating through products.

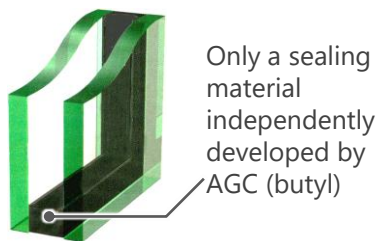
Low-E double glazing glass

- **About half** of the heat enters and leaves the housing through windows
- In Japan, **double glazing is adopted in about 80%** of new houses and apartments
- In Asia, **governmental policies to promote energy-efficient buildings** in various countries are driving their adoption.

Conventional products



Thermocline™



BIPV

- Glass products that can **generate electricity from sunlight with power generation cells** sealed between glass panels
- By **enabling energy-generating through windows**, it helps to **solve constraints of installation locations** for solar panels
- It realizes **both energy generation performance and design flexibility** and contribute to the realization of a carbon-neutral society



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Research Center for
Zero Emissions
Entrance Canopy

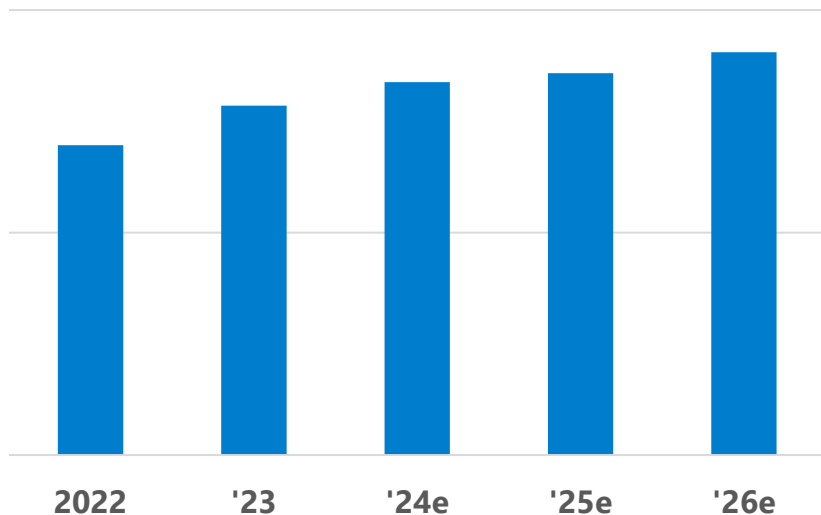
Target



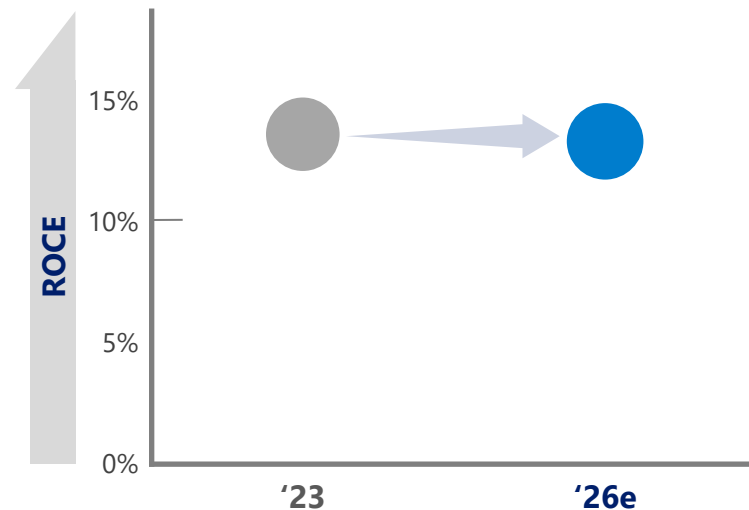
Performance Target

- Stably generate cash by strengthening the business foundation through optimization of the supply-demand balance and maintenance of appropriate prices in the region and sales expansion of high value-added products.

Net sales Image



ROCE and EBITDA* Image

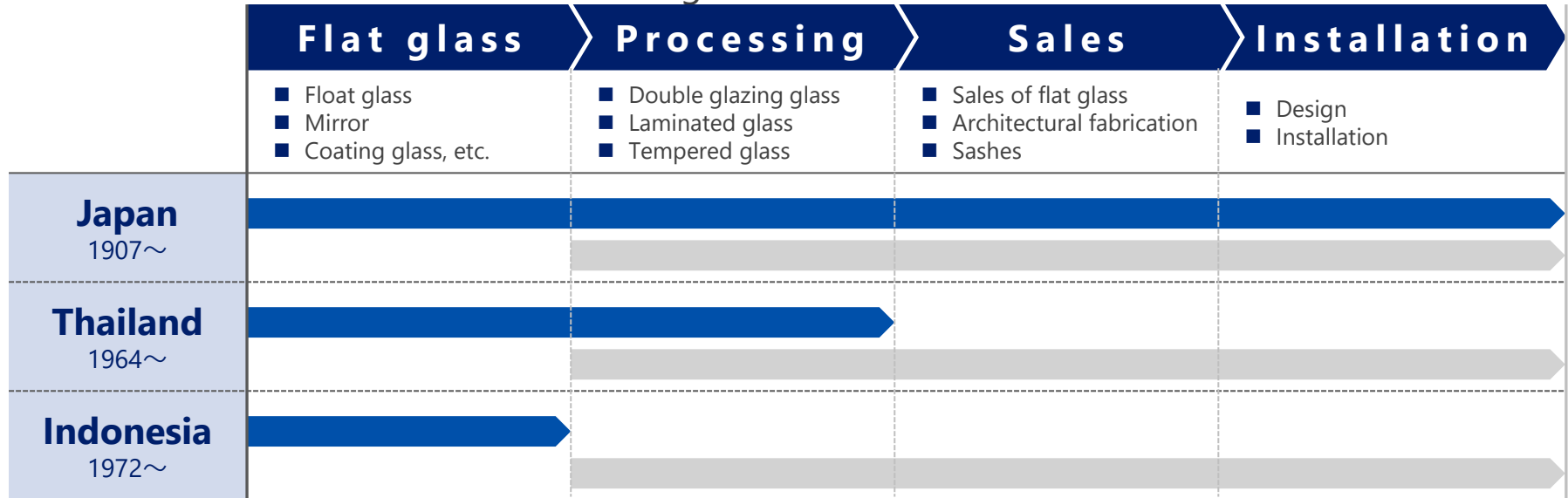



*Diameter of each circle : the size of EBITDA

Appendix

Robust supply chain based on trust established over a long period of time

- Wide range of manufacturing ability, including flat glass, coatings, and processing technologies.
- Build a strong supply chain together with customers, from flat glass to installation, in accordance with the situation in the region.



 : Functions of AGC  : Functions of customers

- Toward carbon neutrality, an unprecedentedly large-scale funding program called the "Advanced Window Renovation Subsidy"* started in 2023 to strongly promote residential energy conservation. Sales volume of Low-E double-glazing glass has grown due to a surge in demand for interior window renovations.
- Brisk demand is anticipated in 2024 as the project will continue with an expanded budget.
- We expect a certain level of demand for renovations to continue even after the subsidy ends.

Interior window installation

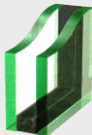

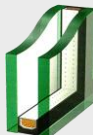






Another interior window is installed inside the existing window to create a double-paned window.

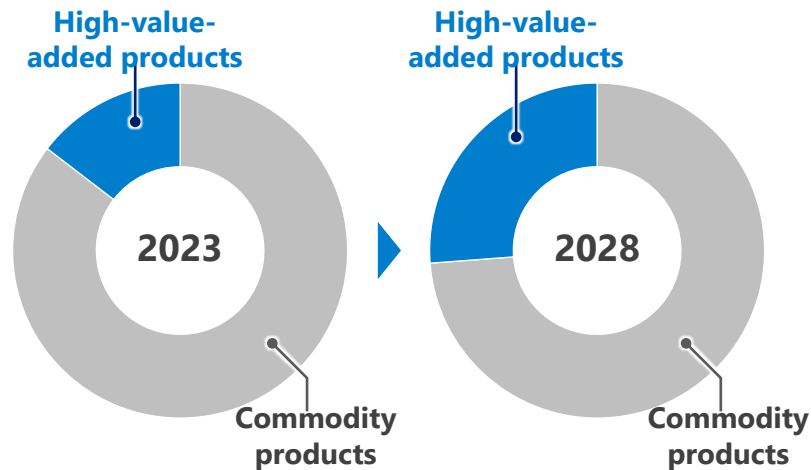
Increase ratio of high-value-added products in Japan and Asia

- Developing and expanding high-performance Low-E double-glazing glass and new businesses (5G glass antennas, etc.).
- In Asia, expand sales of high-value-added products by taking advantage of opportunities to promote energy-saving measures in each country in order not to compete on price basis.

Main high value-added products

Japan		Asia	
High-performance low-E double-glazing glass 	BIPV 	Low-E coating glass 	Heat reflective 
5G glass antenna 	Display integrated mirror 	BIPV 	

Ratio of high-value-added products sales



Development and expansion of energy-saving & energy-generating products (1)

Low-E double glazing glass

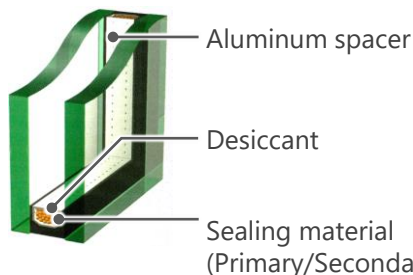
Blue planet

Innovation

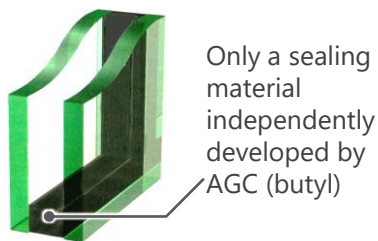
Well-being

- About half of the heat in and out of a house occurs through windows.
- In Japan, double glazing is used in approx. 80% of newly built detached houses and apartment buildings.
- Expand sales of newly developed resin spacer type to increase earnings.
- In Asia, policies to promote energy-efficient buildings in various countries are driving their adoption.

Conventional products



Thermocline™



- **Highly durable, long-lasting, and highly insulating** double glazing glass using AGC's proprietary materials.
- Chemicals technology **integrates the functions of spacer, desiccant, and sealant in a single unit, making it easy to recycle.**
- Contributes to **extending the life cycle** of the product by achieving a longer service life while maintaining window performance.

Development and expansion of energy-saving & energy-generating products (2)

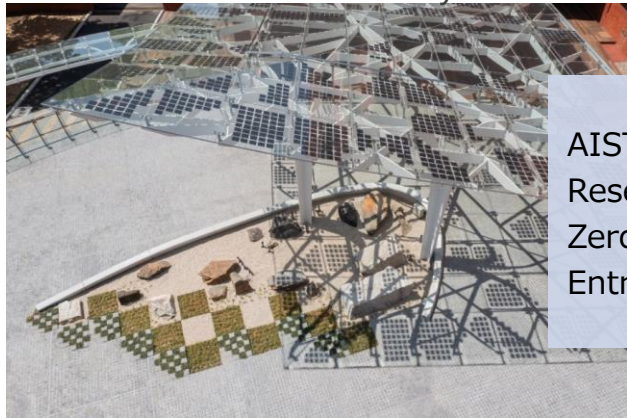
BIPV

Blue planet

Innovation

Well-being

- Glass products that can generate electricity from sunlight with power generation cells sealed between glass panels.
- By enabling energy-generating through windows, it helps to solve constraints of installation locations for solar panels.
- It realizes both energy generation performance and design flexibility and contribute to the realization of a carbon-neutral society.



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New Punggol
Campus of
Singapore
Institute of
Technology

Development and expansion of energy-saving & energy-generating products (3)

ATTOCH™ (Retrofit Low-E glass installed on site)

Blue planet

Innovation

Well-being

- Retrofit method to make single-glazing to Low-E double-glazing by attaching Low-E glass to the existing glass from inside a room.

For Fix Window

Prevention of
heat
in summer

Electricity saving in summer,
heat prevention!

Energy-
saving

Eco-friendly and
energy-saving
throughout
the year

Conden-
sation
reduction

Significant
reduction of
condensation

Prevention of
cold
in winter

Excellent winter
insulation!

Maintain-
ability

Easy cleaning

No
scaffolding
required

Shortened construction period and
lower cost with interior installation

No need for periodic
replacement

Easy to clean due to glass



New business/products (5G glass antenna)

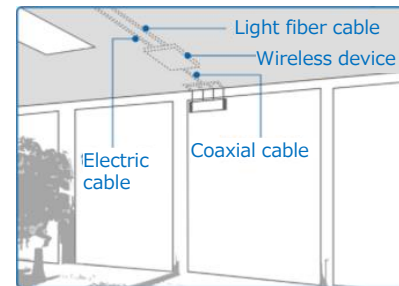
WAVEATTOCH™

Blue planet

Innovation

Well-being

- With the expansion of 5G, which supports high-speed, high-capacity communications, securing locations for small cell antennas in urban areas is an issue.
- Development of a glass antenna that can be affixed from the interior side of existing window glass.
- High transparency and no loss of interior design or cityscape
- Flexible antenna placement, turning a building window into an antenna in a prime downtown location.



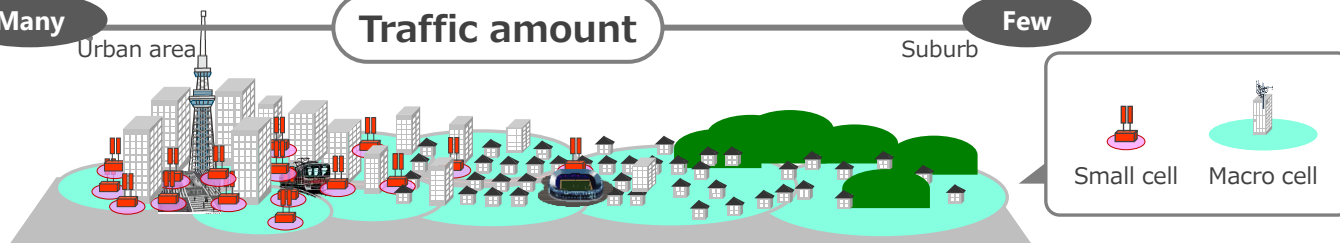
Many

Urban area

Traffic amount

Suburb

Few



New business/products (Display-integrated mirror)

Mirroria™

Blue planet

Innovation

Well-being

- Mirroria simultaneously fulfills the functions of both a mirror and a display.
- The balance of light reflected and transmitted by the mirror is adjusted using proprietary technology to allow images on the display installed on the back of the mirror to be seen.
- Mirroria has been selected for use in Takara Belmont's ECILA next-generation smart device mirror, and sales began in 2023.



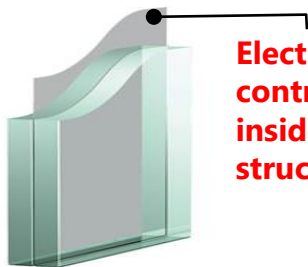
WAVETRAP™

Blue planet

Innovation

Well-being

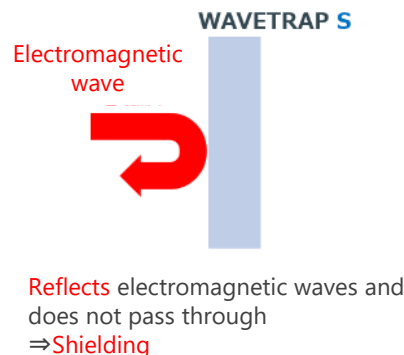
- The WAVETRAP series is a panel that can precisely control electromagnetic waves in wireless communications, IoT, and other networked environments.
- Applications include microwave ovens, RFID* gates, local 5G for factories, etc.



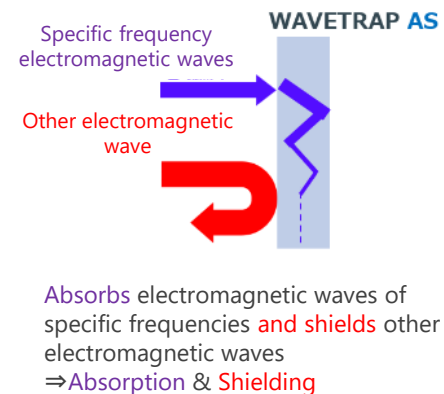
Electromagnetic wave control layer sealed inside laminated glass structure

Example of product variation (for reference)

WAVETRAP S



WAVETRAP AS



* Radio Frequency Identification: Technology that uses radio waves to wirelessly read IC tag data to identify and manage objects

Energy-saving manufacturing technology

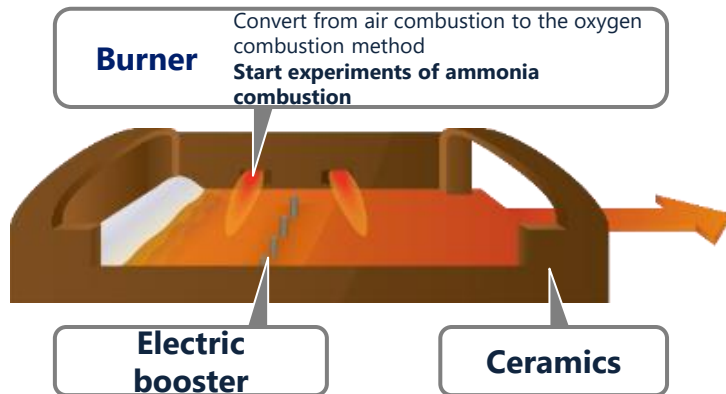
Blue planet

Innovation

Well-being

- Developed and introduced world-class energy-saving glass manufacturing technology as an industry leader.
- Promoting development of cutting-edge production technologies, such as carbon-free ammonia combustion, to achieve net-zero carbon emissions.

Energy-saving glass manufacturing technology



Ammonia combustion technology development

Combustion with natural gas and heavy oil ⇒ Ammonia combustion

Ammonia

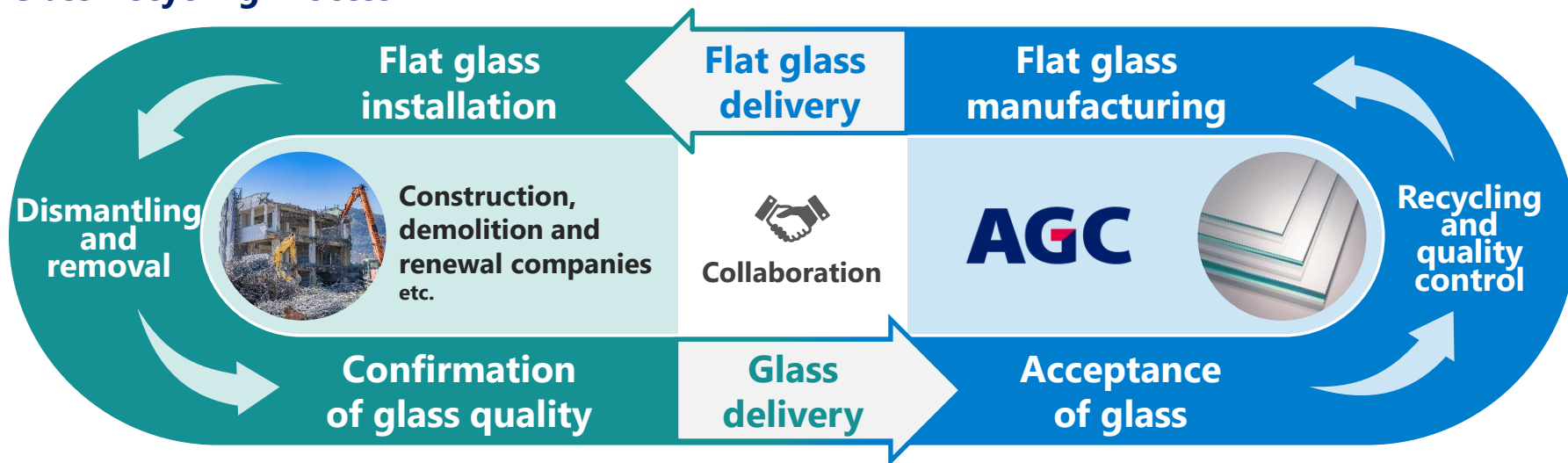
- Generates no CO₂ during combustion
- Ease of storage and transport
- Widely distributed

- Adopted as a NEDO commissioned project
- Aim at full-scale introduction in glass melting furnaces

Promote glass recycling

- Increasing the proportion of glass cullet recycling creates social value by reducing GHG emissions and landfill disposal.
- Collaborating with other companies to promote demonstration tests of glass recycling technology.

Glass Recycling Process



Examples of Social Value provided by Architectural Glass Business Asia Pacific

Blue planet



Float flat glass

(Products using recycled materials)

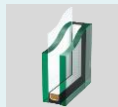


BIPV



Display- integrated mirror

EM wave
shielding glass



Energy-saving glass

(Low-E double-glazing
glass)



Heat reflective glass

Energy-saving,
thermal insulation
and soundproofing
interior windows
for renovation

Retrofit Low-E
glass installed
on site



5G glass antenna



Low reflective glass

Fireproof and
fire-resistant
glass

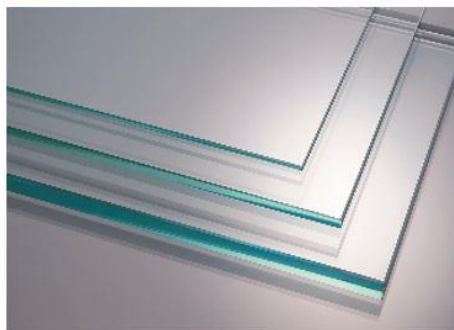
Tempered
glass

Laminated
glass for crime
and disaster
prevention

Innovation

Well-being

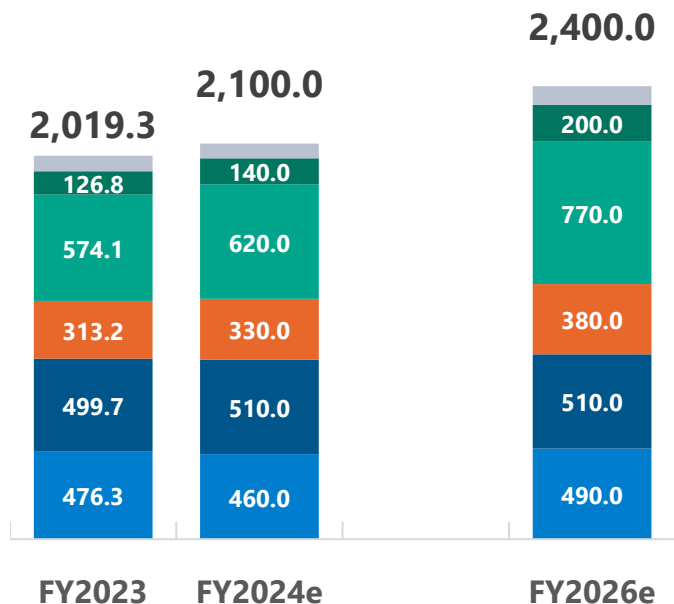
- Following the two sites in Asia, our Kashima Plant has obtained an Environmental Product Declaration (EPD) for architectural float glass.
- The newly acquired EPD quantitatively discloses environmental impacts from raw material procurement to production, verified and certified by the SuMPO*.
- Based on the disclosed data, customers can objectively evaluate the environmental impact of the products they use.



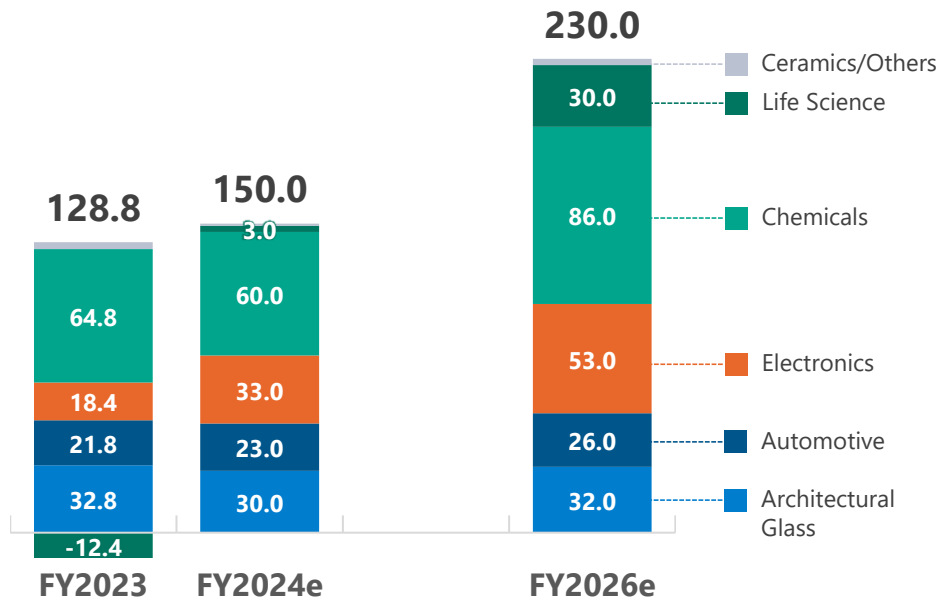
Architectural float glass

Image of Performance by Segment

Net sales (Billion yen)

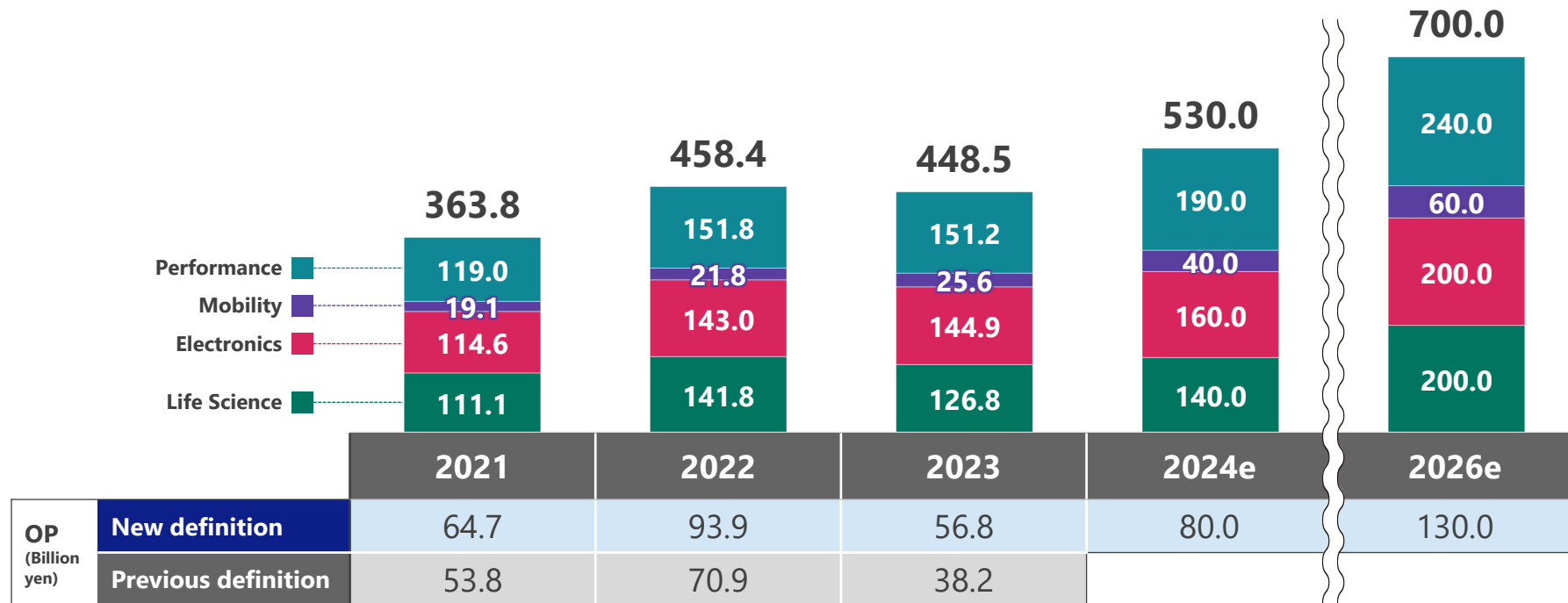


OP (Billion yen)



Strategic Business Performance Image

Strategic business net sales (Billion yen)

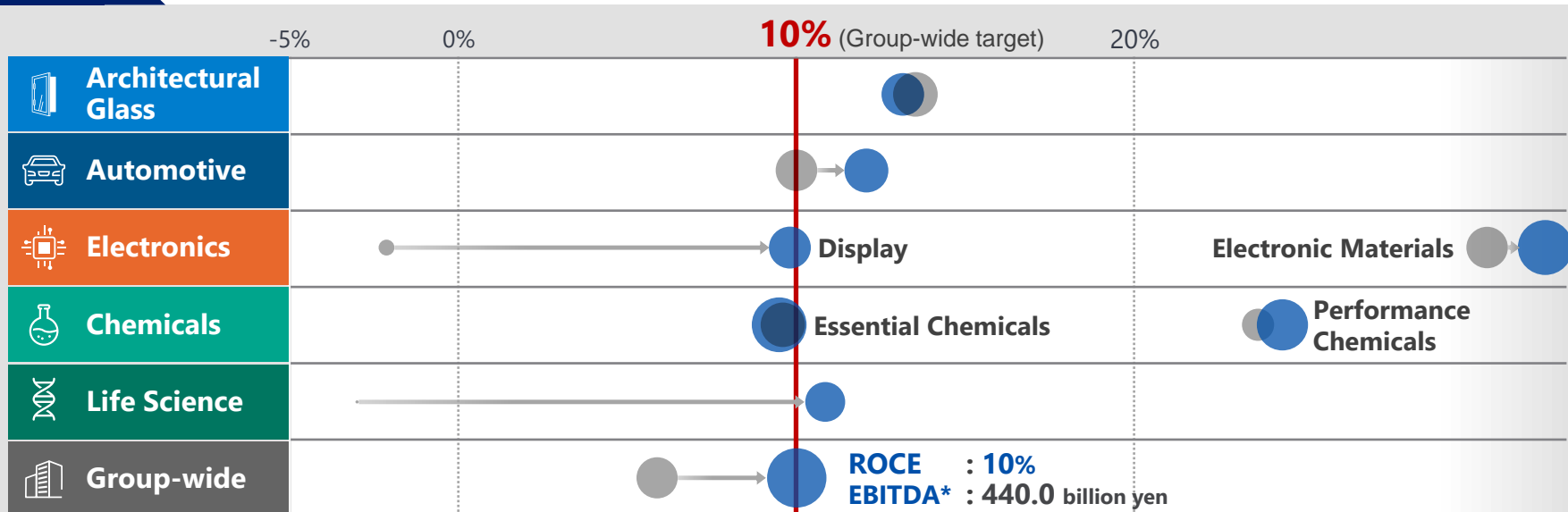


ROCE of Each Business

- We will continue to aim for a Group-wide ROCE of **10% or higher**

ROCE

● 2023 Actual vs ● FY2026 Projection



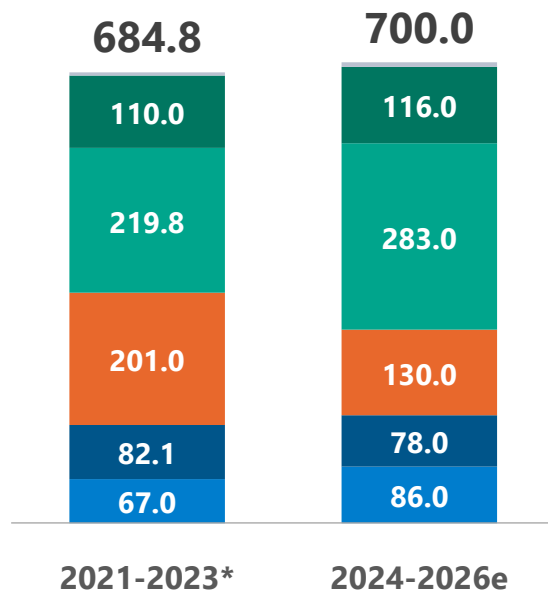
ROCE : (OP forecast of the year) ÷ (Operating asset forecast at the year-end),

Group-wide OP by business is after allocation of common expenses; OP for each business is before allocation of common expenses

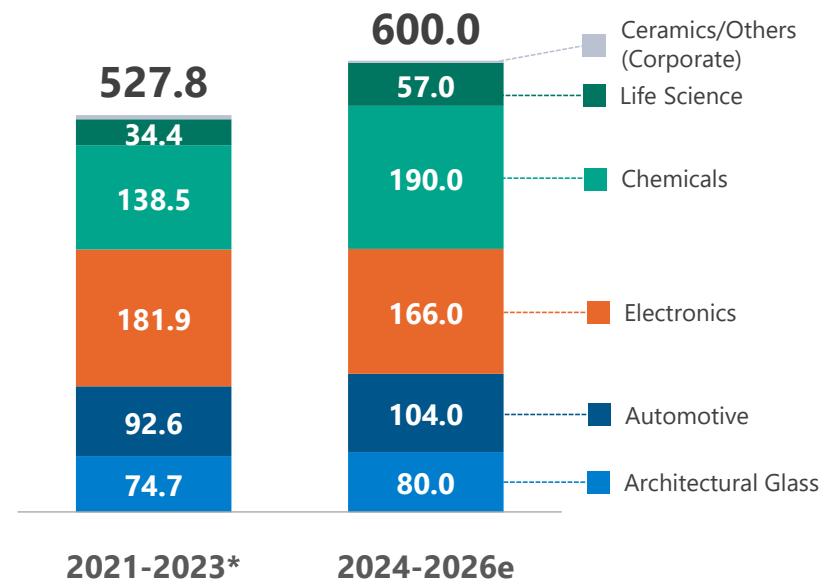
Diameter of each circle (excluding those of the group-wide section) : the size of EBITDA * **EBITDA** = Operating profit + Depreciation

AGC plus-2026 CAPEX and Depreciation & Amortization

CAPEX (Billion yen)



Depreciation & amortization (Billion yen)



* Breakdowns of each segment in 2021 are shown as calculated for reference only.

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Your Dreams, Our Challenge