Automotive Business Briefing

AGC Inc.

November 30, 2023

Your Dreams, Our Challenge

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1. Automotive Business Overview

AGC Group's Ambidextrous Management

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Overall Strategy

Leveraging the core businesses and the strategic businesses as two wheels, we will shift to an optimal business portfolio and continuously create economic and social value.

Core Businesses

Establishing long-term, stable sources of earnings by increasing competitiveness of each business

- Architectural Glass
- Automotive (existing)
- Display
- Essential Chemicals
- Performance Chemicals
- Ceramics

Strategic Businesses

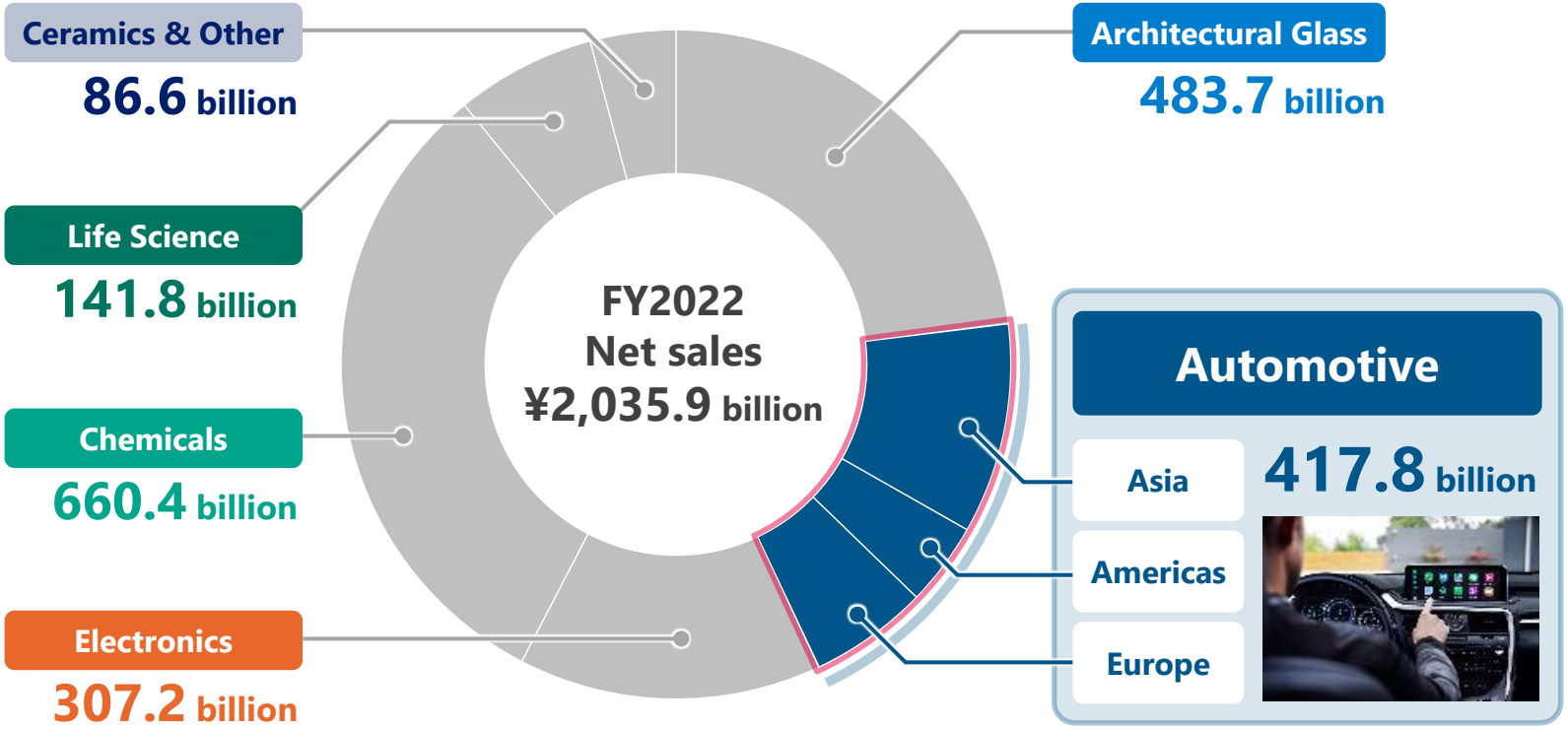
Create and expand highly profitable businesses that will become future pillars by using AGC's strengths in high-growth fields

Electronics

Mobility

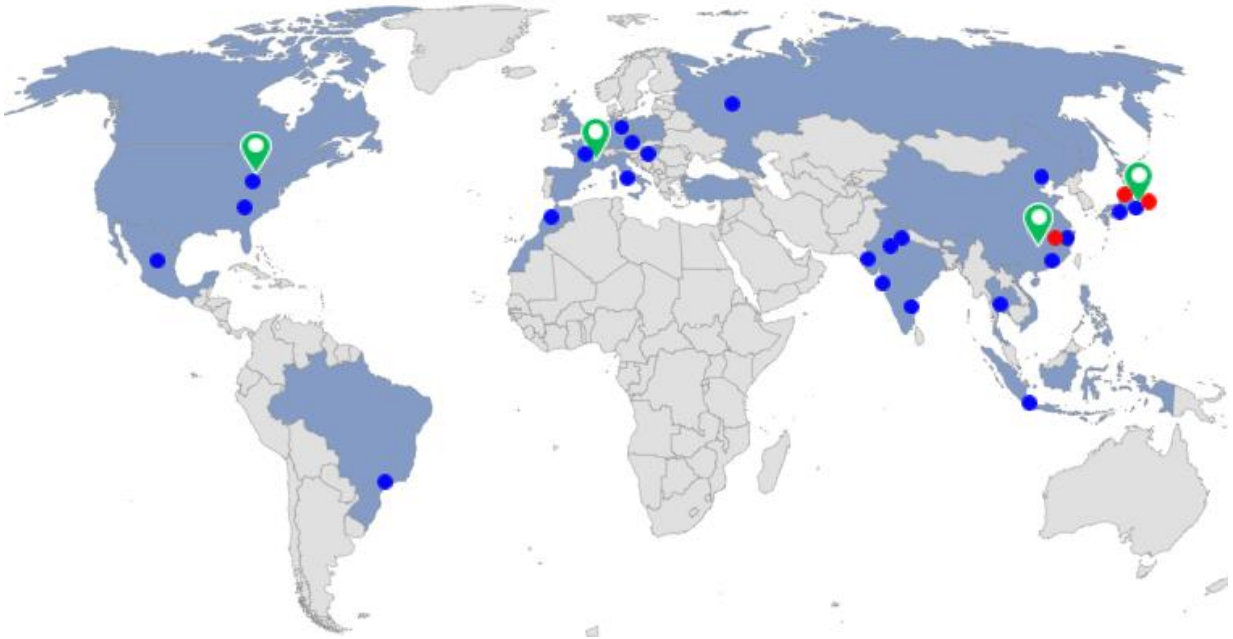
Life Science

Automotive business in AGC Group



Group site expansion

- Global network with three hubs in Asia, Europe, and the Americas
- R&D sites in China in addition to Japan, the US, and Europe to pursue market trends



● : **Automobile window glass manufacturing site**

Core business

● : **Cover glass for car-mounted displays manufacturing site**

Mobility

: **Development site**

(Note) **India site**: Equity-method affiliates
Colored countries: Countries where assembly sites are located

Vision and Mission

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Vision

We will earn the trust of society by enabling a safe, comfortable and connected mobile community

Mission

Continue to create new business (products, technologies and services) on the global scale for advancement of mobility community

COLLABORATIVE | **INTELLIGENT** | **ENABLER**

Diverse people in different organizations, interacting and influencing each other,
pooling their wisdom to create problem-solving methods and effective business solutions

Vision 2030

Continue to evolve and lead the way in realizing a sustainable mobility society (CASE) through differentiated components and solutions

Strengths of the Automotive business

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Market-leading customer base	**Relationships built on trust with global OEMs leading the EV and mobility market**
Global production, sales, and development system	**Global network capable of providing high quality products and services**
AGC Group's total technological ability	**Business development utilizing “materials technology,” “functional design,” and “production technology”**
Synergies generated by automotive window glass + mobility	**Increase added value by combining mobility products and technologies**

2. Initiatives for 2030

Market trends

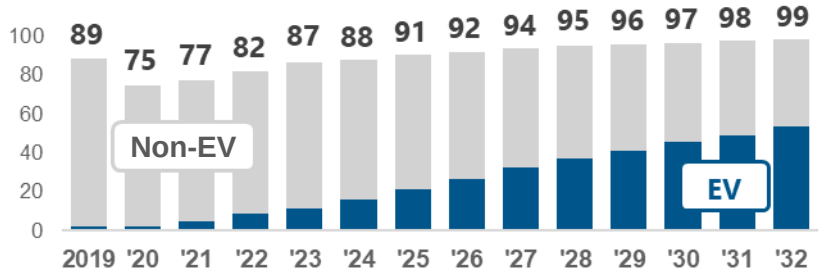
Transformation in the automotive industry, as exemplified by CASE, is steadily under way

Connectivity	Assumes market ramp up around 2030
Autonomous	Market takeoff at Level 4-5 is expected mainly for MaaS vehicles
Electric and **E**nvironment	Accelerating requirements from society from the perspective of SDGs

EV ratio rising to 50% in 2030

- Global car production is not expected to increase going forward.
- Yet the shift to EVs is further accelerating, especially in advanced EV regions (Europe, China, and North America).

Global production volume of cars (million units)



Background to initiatives to improve earnings

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- Decline in auto production volume due to the pandemic and semiconductor supply shortages affected the Automotive business, resulting in impairment losses and restructuring measures.

	Business environment	Recording of impairment losses	Implementation of structural reforms
2018			
2019	■ Slowdown in Europe & US auto sales	■ North American automotive glass	
2020			
2021	■ Decline in auto production volume due to pandemic	■ European automotive glass ■ Automotive glass in Russia ■ European automotive glass (Excluding Russia) Total 52.1 billion yen	■ Reduction of headcount in Europe and US headquarters and Czech plant, etc. ■ Start of production consolidation by introducing high-efficiency facilities ■ Consolidation of assembly sites and reduction of old lines ■ Reduction of Belgian plant and German assembly site
2022	■ Shortage of semiconductor supply		
2023	■ Prolonged Russia-Ukraine situation		

Medium- and long-term measures: Toward 10% ROCE by 2025

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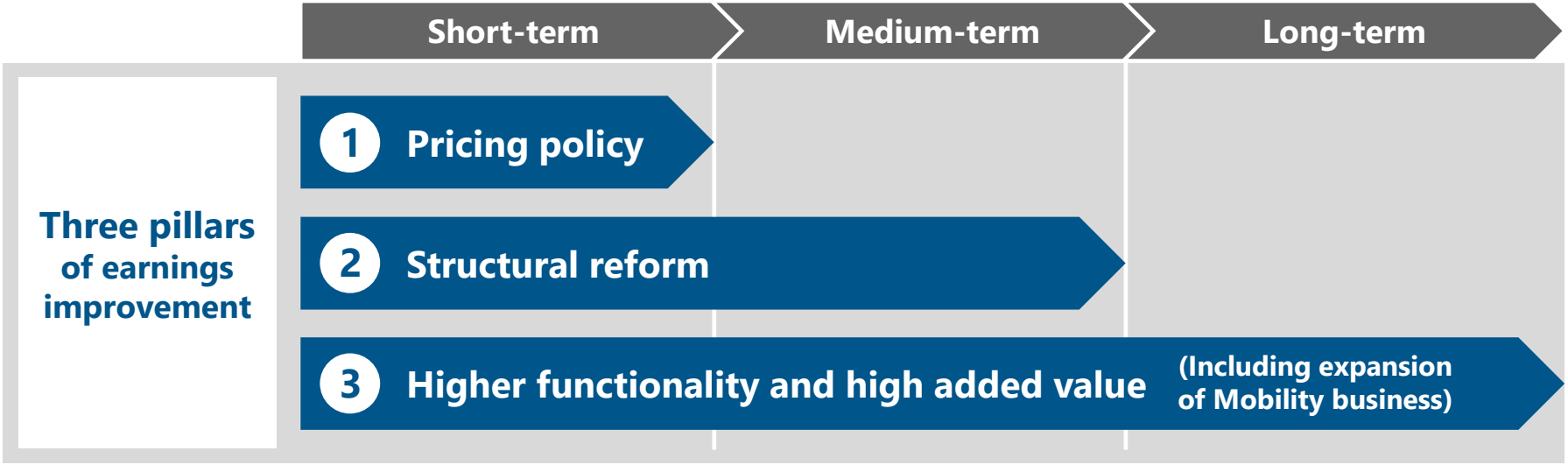
- Implementing review of pricing policy for automotive glass business
- Formulating and implementing measures to improve profitability, including structural reforms
- Focus on high-functional, high-value-added products (Volume to Value) rather than expanding sales volume



(1) Pricing policy

Price increases in response to higher costs due to **soaring raw material and fuel prices**	Price increases in response to higher costs due to **semiconductor shortages**, etc.	Review of price levels in consideration of **model profitability**

Continued pursuit of appropriate price levels

(2) Structural reform

	Implemented	To come
Europe	■ Reduction of Belgian plant and German assembly site ■ Reduction of old lines and cuts to headquarters headcount	■ Reduction of old lines and response to Mobility
North America	■ Reduction of old lines and streamlining of assembly sites	■ Reduction of old lines and streamlining of assembly sites
Global	■ Global deployment and standardization of high-efficiency facility installation ■ Consolidation and closure of low-utilization and low-productivity lines ■ Review of production and supply systems in response to regional market trends	

(3) Shift to higher functionality: Expansion of high value-added products through EV

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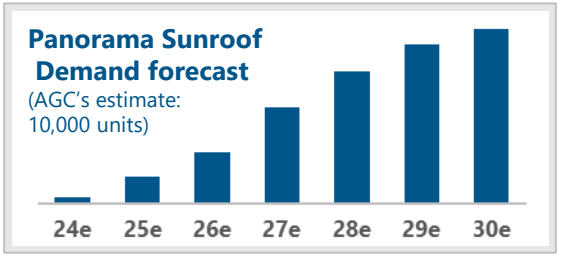
- With the expansion of EVs, demand for **sunroofs utilizing heat-insulating and light control glass and sound-insulation glass** is expected to grow in addition to existing high-value-added products*.
- Demand for sunroofs is expected to grow, particularly in Europe and China



Low-emissivity glass

Apply special metal coating to glass to block solar radiation heat in summer and keep heat in winter. Also contribute to extending the travel distance of EV and reducing CO_2 emissions.

Light control glass

Insert a special film between two sheets of glass to control transmission of light so that the optimal amount of light falls into the car.

Sound insulation glass

Insert a special sound insulation membrane between two sheets of glass to reduce noise from outside vehicles. Realize a comfortable in-vehicle environment without increasing the weight (thickness) of glass.

* Products with added functions and value such as IR cut and HUD

(3) Shift to higher functionality: Expansion of high value-added products through EV

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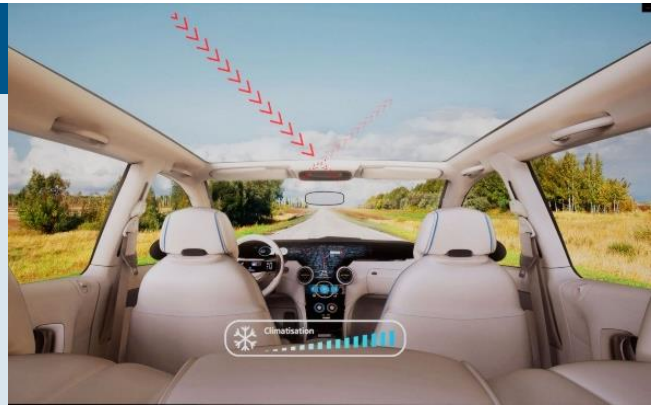
Low-E (Heat insulating glass)

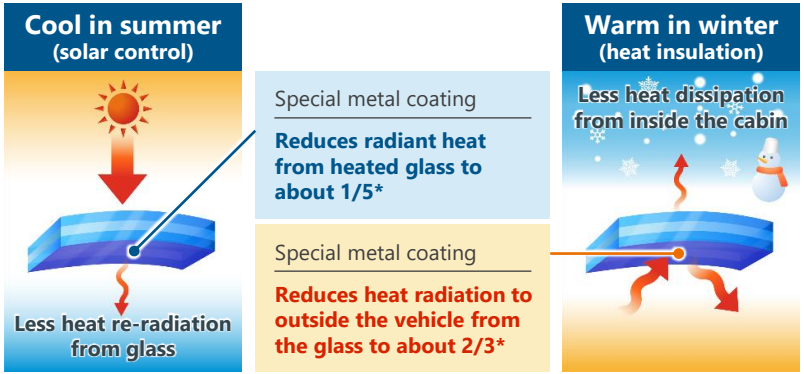
High solar control and insulation properties reduce air conditioner load and improve fuel efficiency

In addition to improving comfort, contributes to extending the cruising range of EVs and reducing CO_2 emissions



- Special Low-E coatings for in-vehicle applications developed **by leveraging AGC's materials, functional design, and production technologies**
- **In summer, it blocks the sun's heat to keep the cabin** cool and comfortable, **and in winter, it makes it difficult for heat inside the vehicle to escape to the outside to keep the cabin** warm and comfortable.
- **Use in roof glass allows for a shade-less configuration also contributes to vehicle weight reduction and head clearance**

Use case	Light control panoramic roof with Low-E coating adopted in the LEXUS RZ, Toyota's **LEXUS' first dedicated BEV model**



*AGC research

Reference: AGC News Release https://www.agc.com/en/news/detail/1202896_2814.html

(3) Shift to higher functionality: Expansion of high value-added products through EV

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Light control glass Digital Curtain®

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

- A special film is inserted between two sheets of glass and controlled by voltage to **instantly switch between "dimmed mode" and "transparent mode"**.
- **The** "dimmed mode" **eases the heat and glare of sunlight, while the** "transparent mode" **allows occupants to enjoy a sense of openness**.

Use case

Toyota's new model Harrier

- World's fastest **instantaneous control of flight transmission for automotive exterior glass**
- Adopted for the first time worldwide **in mass production vehicles**

Dimmed mode
(opaque state, when switched off)

Transmissive mode
(clear state, when switched on)

*AGC research

Reference: AGC News Release https://www.agc.com/en/news/detail/1200904_2814.html

(3) Shift to higher functionality: Expansion of high value-added products through EV

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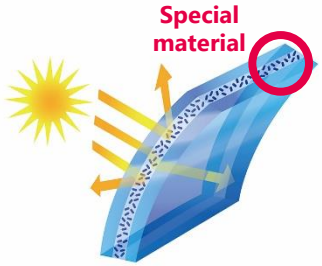
September 2023 News Release

Light control glass Digital Curtain®
Adopted for Toyota's new model Century

- World's first adoption for rear door sections
- Eliminates the need for shades and provides a larger, more advanced and comfortable rear seating space, as well as increased privacy

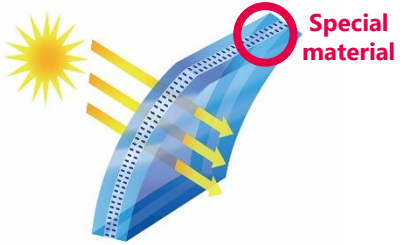
Dimmed mode
(opaque state, when switched off)

As the special material is arranged in a random pattern, it diffuses light from the outside to turn opaque.



Transmissive mode
(clear state, when switched on)

When voltage is applied to the film, the special material aligns in the same direction, and the glass becomes transparent allowing light from the outside to pass through.



*AGC research

Reference: AGC News Release https://www.agc.com/en/news/detail/1204655_2814.html

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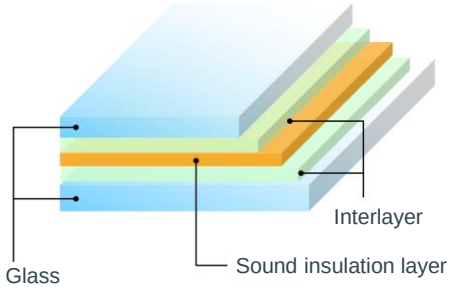
Sound insulation glass

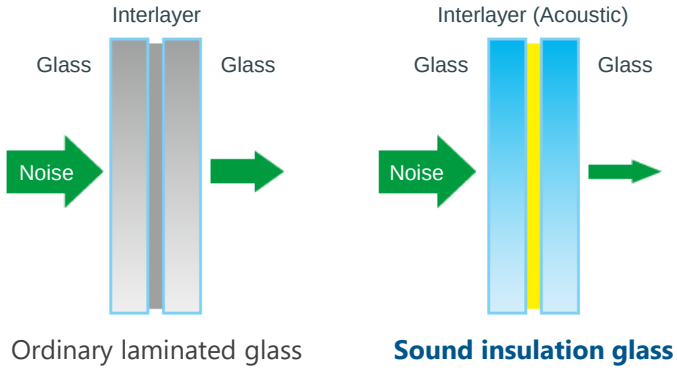
**In addition to the windshield glass,
the side window glass is laminated to further improve sound insulation.**

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

Structure

- Laminated glass with special sound insulation membrane inserted between two sheets of glass





Ordinary laminated glass

Sound insulation glass

Basic strategy for Mobility products

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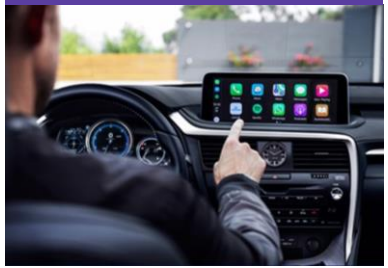
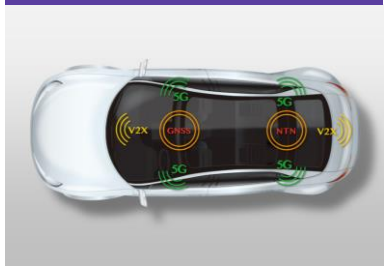
- **"Displays"** are further expanded to include cover glass for car-mounted displays.
- **"Sensors"** are moving to the mass production phase. Growing toward becoming the second pillar in 2030.
- Strengthen the discovery and commercialization of **"next-generation strategic businesses"** (antennas, etc.)

Displays

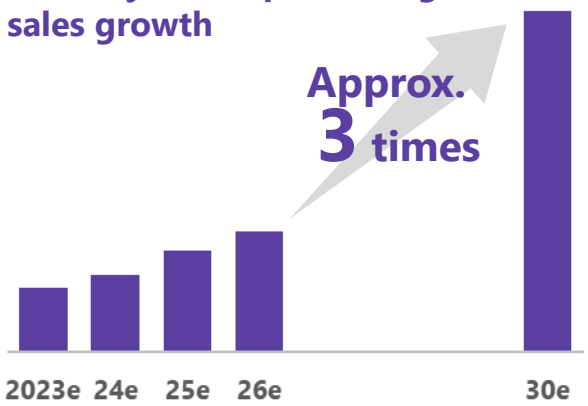


Sensors

Antennas



Mobility: Conceptual image of sales growth



(3) Shift to higher functionality: Displays

Mobility products

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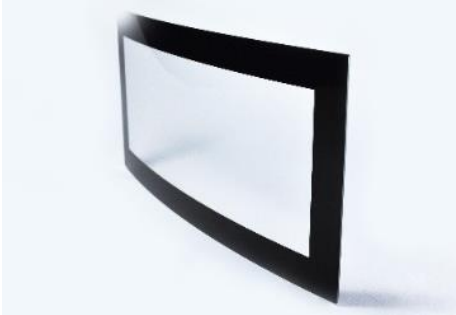
Cover glass for car-mounted displays

Support for next-generation mobility with "mobile living spaces"
"Large" displays to realize fun and comfort

Development of 3D cover glass for pillar-to-pillar displays

- Adopts AGC's specialty glass for chemical strengthening "Dragontrail®" Achieves **high strength and "high safety" required for interior materials**
- **"High visibility" and "touch panel performance"** of the displays are ensured by utilizing anti-reflective film and anti-fingerprint film deposition technologies.
- **"Outstanding design"** that enhances the sense of unity between the display and dashboard
- **Top global share**

3D curved cover glass



Structure of ordinary cover glass

Anti-fingerprint film
Anti-reflection film
Anti-glare film
Chemically tempered glass
Printing / Printing

*AGC research

(3) Shift to higher functionality: Sensors

Mobility products

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In-vehicle glass for LiDAR Wideye™

Product lineup compatible with various types of LiDAR

Body trim parts

(Ex glass + housing case) Seamless glass parts that match the car body design

- AGC's glass composition design technology, glass processing technology, etc. are utilized to design new glass materials. **Maintaining high near-infrared transmittance for long-distance sensing.**
- By installing the cover on the front of the LiDAR, it will **prevent damage due to scratches and shocks as well as degradation in detection accuracy due to raindrops and dirtying.**
- **The addition of AGC's water repellent coating, AR coating, and a heating function** maximizes excellent optical performance in a variety of environments.
- **Suitable for all automotive glass applications, including windshields**, with the ability to handle large areas and can be processed into exterior modules.
- AGC can provide one-stop proposals **from design to process development, manufacturing, and quality assurance.**

Other product lineup

LiDAR module cover

Cover glass for in-vehicle LiDAR module

Glazing-integrated LiDAR

LiDAR protection with integrated-glazing such as windshields

(3) Shift to higher functionality: Sensors

Mobility products

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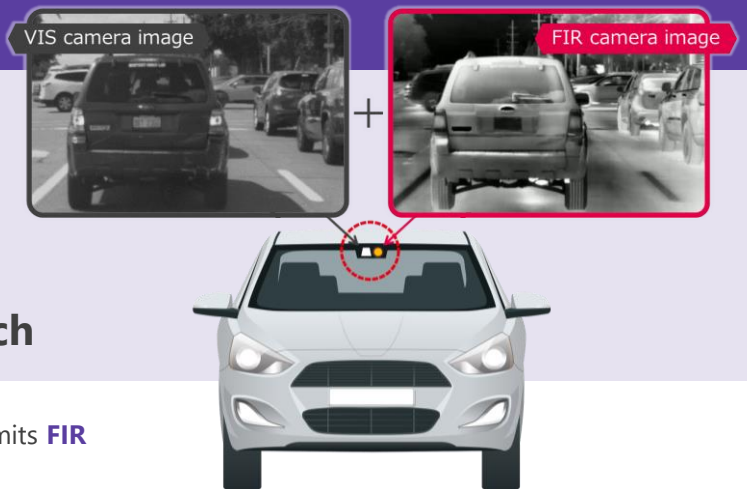
Windshield glass compatible with FIR cameras



Allows integrated installation of visible light cameras and FIR cameras inside the windshield

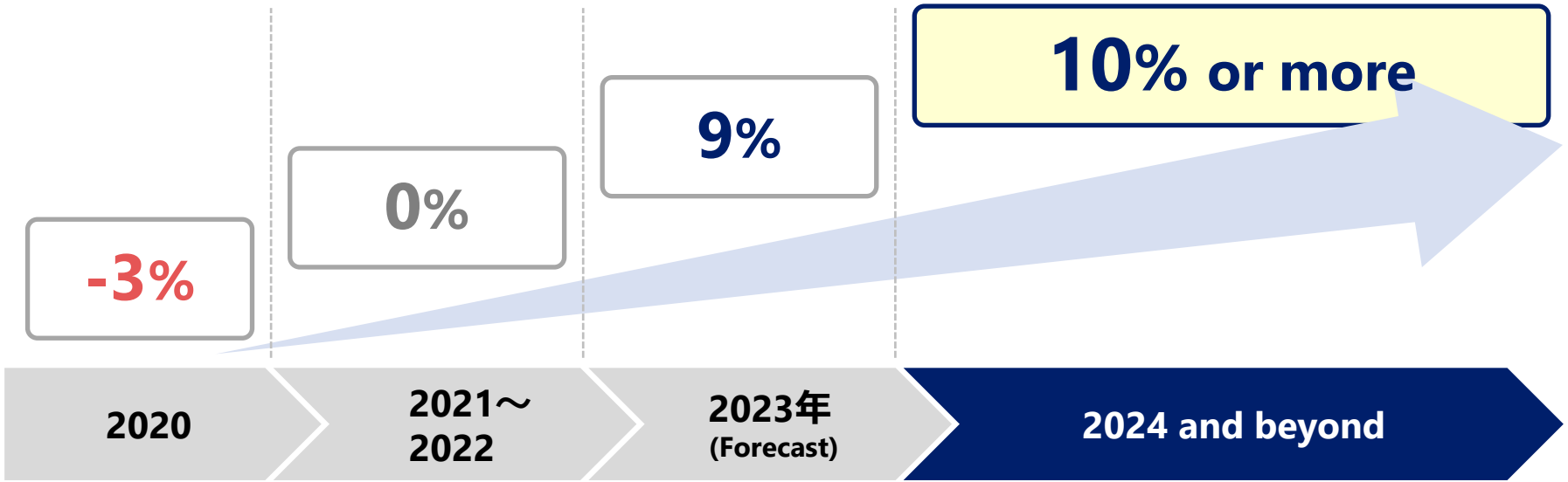
Accelerating development for 2027 market launch

- A portion of the windshield is specially processed and a special material that transmits **FIR (far-infrared ray) light is integrated into it.**
- FIR cameras, which have been installed outside the vehicle, can now be installed high inside the windshield, reducing the parallax between the visible light and FIR cameras, **which is advantageous for sensor fusion. The wide field of view, early recognition of objects in the distance, and sensor protection significantly boost the effectiveness of ADAS at night, which has become an issue, and prevent pedestrian traffic accidents.**
- This is also an effective solution to the new rule proposed by **the US National Highway Traffic Safety Administration (NHTSA) in May 2023, which will require** all new passenger vehicles to have nighttime pedestrian detection and collision avoidance capabilities.

Structure of FIR camera-compatible windshields

Progress in improving ROCE

- ROCE is improving rapidly, **partly due to the effects of measures taken**
- Aiming to achieve over 10% in 2025
- **Focus on** stable earnings and ROCE



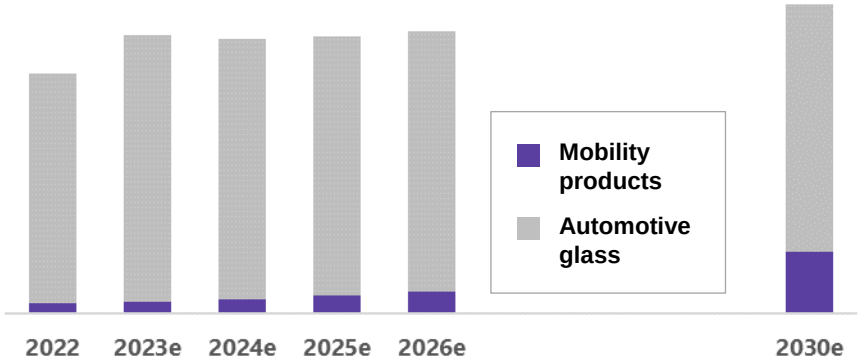
ROCE : Operating profit is prior to common expense allocation

Medium- and long-term earnings outlook

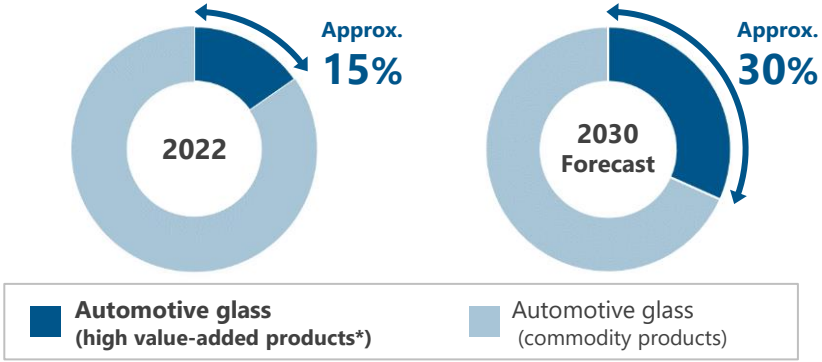
- Mobility products will capture market demand and expand in scale
- In automotive glass, pursue value, not volume (sales)

Achieve a stable earnings structure through the effects of various improvement measures and a better product mix

Automotive business Sales trend



Trend in OEM high value-added product ratio (Excluding Mobility products)



*Products with added functions and values such as Low-E, light control, sound insulation and HUD

3. Sustainability Initiatives

Sustainability: Creating social value

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Contributing to the realization of a sustainable global environment

Toward reducing GHG emissions

- **Initiatives to reduce and eliminate CO_2 generated by float processes**
- **Reduction of electricity consumption in processing, greening and promotion of recycling**
- **Development and deployment of products that contribute to reducing CO_2 emissions during automobile use**

Scope 1+2
(30% reduction vs 2019)

- Introduction of high-efficiency technology to float furnaces
- Replacement with high-productivity machining production process

Scope 3

- Expanding sales of products that contribute to reducing CO_2 emissions in automobiles and improving electric power costs in EV vehicles (Examples: High-insulation/Low-E glass, thin sheet glass (lightweight), antifogging glass, etc.)
- Recycling of repair-use glass and end-of-life vehicle glass

Contributing to the realization of safe and comfortable urban infrastructure

Expanding sales of products that contribute to comfortable cabin spaces and improved safety

Examples : Light control glass, in-vehicle sensing and radar components, antennas for next-generation communications, improved pedestrian safety performance, etc.

DX-related initiatives

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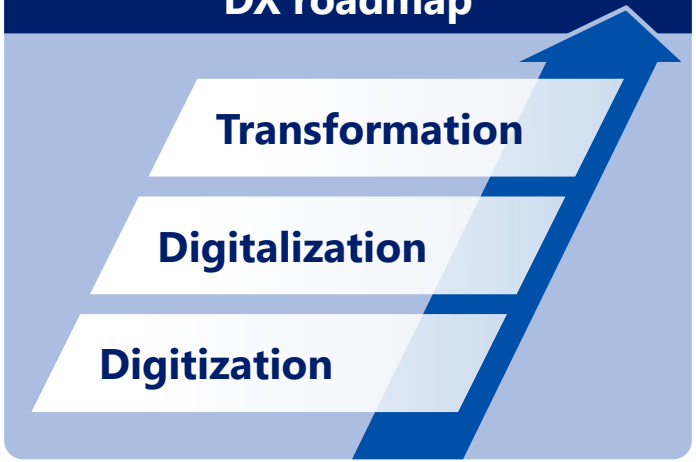
Using digital technology to transform businesses in response to epochal market changes such as CASE, GHG reduction, and the shift to EVs.

➡ Simultaneously transform speed, cost, and performance/quality to enhance competitiveness

DX roadmap



Transformed state

Factory of the Future

Transformation challenges

Design and production preparation	■ Rapid design and prototyping ■ Smooth production ramp-up ■ Quality tracking in the market
Cost	■ Flexible and lean production system ■ Maximize utilization of high-productivity equipment ■ Reduction of total cost of added functions
Supply chain	■ Digitalization of production networks ■ Total inventory in the supply chain Optimization and minimization

Appendix

Automotive glass Introduction of main products

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	General name		Description of the product
Basic glass	Laminated glass		Glass with high safety and crime-prevention functions whose fragments do not scatter when it is broken and unlikely to penetrate thanks to adhesion of two sheets of glass that sandwich a film
	Tempered glass		Glass with improved strength and high safety by heating and rapidly cooling glass. When it is broken, fragments are grained.
High-function glass	Comfort	99% UV cut glass	Glass with a function to cut ultraviolet rays by about 99% to reduce long-term damage to the skin such as burns
		IR cut glass	Solar control glass that greatly cuts the wavelength range that we feel is the hottest among solar rays and has radio wave transmissiveness by inserting a special film between two sheets of glass.
			Solar control glass that has a function to reflect mainly infrared rays by coating the inner surface of laminated glass with a special film.
		Privacy glass	Glass that secures privacy as well as has high solar control performance thanks to the addition of colored components.
		Sound insulation glass	Glass that contributes to greater silence during driving by improving the sound insulation performance of laminated glass.
		Laminated side window	Glass that improves theft-prevention performance and sound insulation performance by using laminated glass for side glass.
	Eyesight improvement	Water repellent door glass	Door glass that improves visibility in the rain with high water repellency and durability thanks to highly reactive fluorine and silicone coating.
		Snow-melting/ Ice-melting front glass	Glass that melts snow and ice through energization by printing conductive ink (heating element) on the front glass.
		Electro-thermal defogging glass	Glass that defogs through energization by printing conductive ink (heating element) on the rear glass.
	Information communication	Printed glass antenna	Automotive antenna with excellent design and durability by casting conductive ink with glass by printing.
		Embedded DTV glass antenna	Digital TV (DTV) glass with excellent design and durability with a seal-type antenna sealed in the front glass.
		Glass for head-up display	Front glass with a function to display the speedometer, etc. on glass.
	Design	Module assy window	Glass with resin parts cast around glass.

END

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