



AGC Inc.

IR Day 2022 <Day 1> Architectural Glass Asia

June 13, 2022

Event Summary

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[Number of Speakers]	2	
	Shigeki Yoshiba	President of Architectural Glass, Asia Pacific Company
	Chikako Ogawa	General Manager of Corporate Communications & Investor Relations Division

Presentation

Ogawa: The next is the business strategy of AGC Architectural Glass Asia Company and the president, Yoshiba, will explain. Mr. Yoshiba, over to you.

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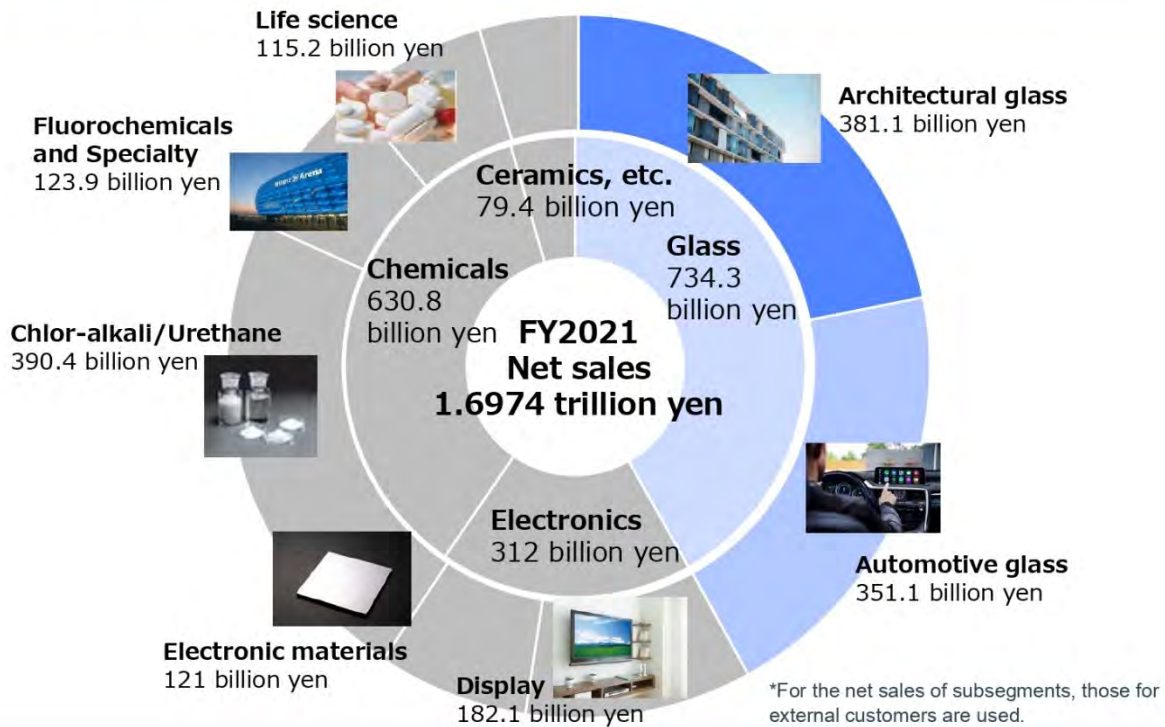


- Business overview
- Division policy
- Medium-term business strategy

Yoshiba: I am Yoshiba from Architectural Glass Asia Company. I'd like to follow the slides as I go along. Please turn to the next page. These are the contents. First, I will briefly explain about our business overview and division policy. And then lastly, I will discuss the current medium-term business strategy.

This is the sequence of the presentation. Next page, please.

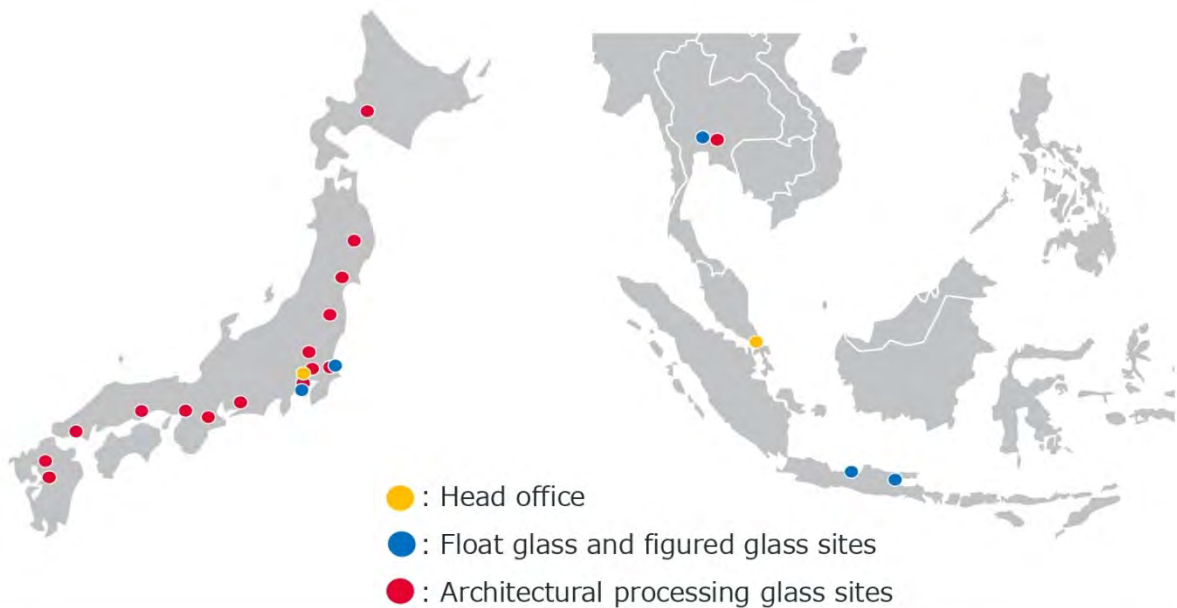
Position in the AGC Group



First, the business overview. So within AGC Group, the architectural glass position is shown here in this pie chart. As you can see, out of JPY1.7 trillion of the overall, the JPY700 billion or more is for glass. Of that, slightly more than JPY380 billion is architectural glass. As I explain more in detail later, of JPY381 billion, JPY130 billion is attributed to Asia and Japan.

Japan

Asia



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Next, in Japan and Asia. So those are the production sites for architectural glass and Japan is on the left, float glass and figured glass. There are two sites with the furnaces: in Kashima in Ibaraki, that is the first one; and the other is in Tsurumi, Yokohama, the figured glass furnace, is colored in blue. In red, the architectural processing glass site are shown, mainly the double-glazing glass is the main ones. There are 17 sites across Japan, so we can cover the whole demand from the country.

As for Asia, Indonesia and Thailand, we have production sites in Indonesia, the main market is Java Island, and there are two sites in the island. One is 70 kilometers from Jakarta, east of Jakarta, in a city called Cikampek, there is one plant. And then there is another one. On the right, in the east side, the second largest city in Indonesia, in the suburb of Surabaya, there's one as well.

As for Thailand, in the suburb of Bangkok, the float glass furnace and architectural processing glass site are in the same site. And in Singapore, there's a regional head office for Asia, and it is controlling the whole Asian business.

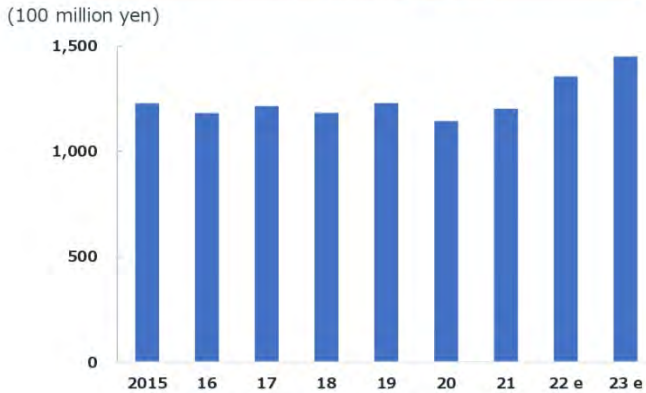


Last year, the Architectural Glass Asia Company has become more independent from the global organization. And back then, we came up with a mission that's called “glass for quality life,” as you see here. And the glass that we deal with is a material that is of high characteristic and function. As the technological development progresses, they are also evolving to show various functions and through the product of glass with excellent characteristics, we would like to enrich people's lives, the world and society for sustainable future.

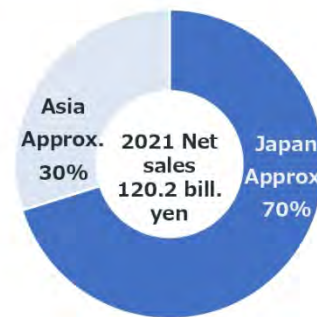
Sales trend

- The sales that once plunged in 2020 due to the coronavirus pandemic is expected to recover and grow toward 2023
- Japan and Asia account for about 70% and 30%, respectively, of the net sales

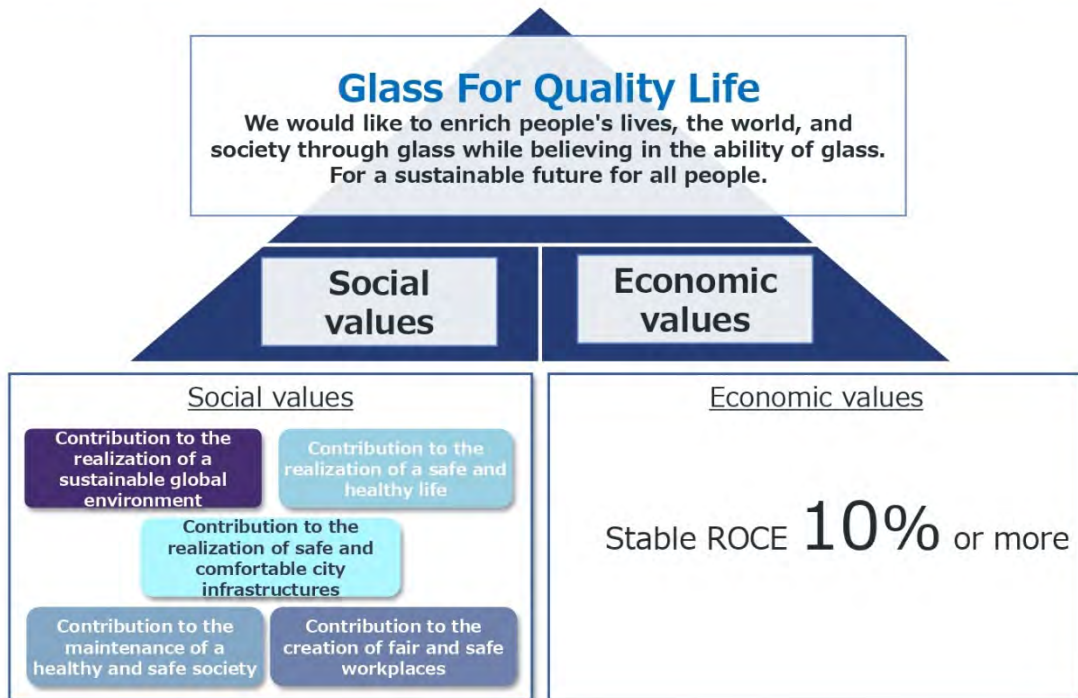
Net sales of architectural sheet glass
(Asia including Japan)



Percentage of net sales of each region in
the total net sales in 2021



Now these are the sales trend. As you can see on the bar chart on the left, in 2020, because of the pandemic, the demand dropped once. However, in this year, we are seeing signs of recovery. And from next year onward, we're expecting the trend going to a positive growth. And for Japan and Asia, we have about JPY120 billion in total turnover. And if you split between Asia and Japan, Japan represents about 70%, and Asia the remaining 30%.



This is the division policy. I'll be brief on this part. As I explained, there is mission for us, "glass for quality life." And through this mission, social values and economic values are both pursued to be created. As for social values, as was explained in the whole company business presentation, as you can see on the left bottom of the slide, there are five elements. So, from these perspectives, we are hoping to create social values to contribute to society. On the other hand, as for economic values, the stable ROCE of 10% or more, and we like to run sustainable business in order to achieve that. So, these are the division policies that we are seeking to achieve.

	<u>Operation</u>	<u>Main issue</u>
Core business	Architectural glass	<ul style="list-style-type: none"> • Creation of cash in the core business • Growth thanks to new business and high-value-added products • Activities for SDGs issues including the climate change problem

Break Down

Core business	Architectural glass Japan	<ul style="list-style-type: none"> • Establish a stable revenue structure in the gradually contracting market • Development and sales expansion of high-value-added products such as energy-saving products, BIPV, and 5G-related products • Acceleration of the development of GHG reduction technology
	Architectural glass Asia	<ul style="list-style-type: none"> • Capitalize on the growth of the emerging market • Promote the shift to high-value-added products and establish a stable growing revenue structure
	Common in Asia including Japan	<ul style="list-style-type: none"> • Further reinforce the supply chain that supports the growth of the core business, stable supply ability, and presence in the market • Improve the asset efficiency, productivity and reduction of costs

From now, I'll talk about the medium-term business strategies. Next page, please. First, on the top part of this slide, as you can see, the architectural glass is positioned as core business. And for the whole architectural glass, the main issue was referenced in the whole company presentation. We need to create cash in the core business. And in addition, the new business and high value-added products should be expanded to achieve growth. And in addition, climate change and other SDG issues are being addressed. So, these are the main issues for the whole architectural glass business. And if you break this down into Japan, Asia, you can see the main issues on the bottom.

As for Japan, in the Japanese market because of population decline, the market is not expected to grow or instead, it is expected to contract gradually. But based on this assumption, a stable revenue structure should be established in order to generate stable profit. That is one issue or challenge. And to achieve that, energy savings, contributing higher value-added products should be pursued. And what is called BIPV, in the window glass, the solar cells are inserted. Also 5G-related in-glass antenna. Those are the new businesses for us, and these are the products that have higher value added. These are the ones that we have to pursue.

In Japan, in manufacturing, CO₂ reduction technologies will be developed. And those technologies that are developed will be not just used in Japan, but in the rest of Asia, so that we can realize CO₂ emission reduction for the whole region. On the other hand, with regard to Asia, the market is basically expected to grow steadily, and we have to capture that growth steadily. Especially the higher value-added products will be the focus for us, and we need to establish a stable revenue structure in that context. That is the mission for Asia.

Then there are issues common in Asia, including Japan. And the supply chain that support the growth of the business is very important. And we have to reinforce the supply chain so that we can take leadership in the market. And also, we have to have a stable supply to provide products in the supply chain and reinforce the presence in the market. And ROCE has been mentioned, but we have to enhance asset efficiency further, and

you need to improve productivity and reduce costs continuously in order to achieve that. That is the mission or the issues.

Strengths of the architectural glass business in Japan & Asia



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 and process development ability of advanced glass represented by energy-saving glass product lines

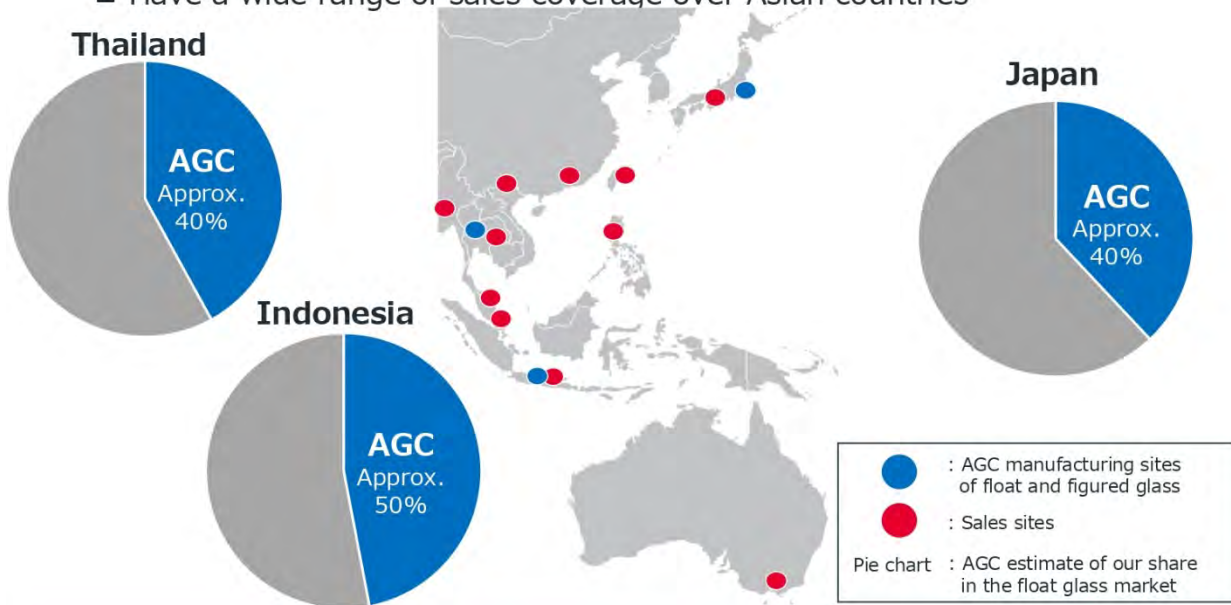
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As we figure out the strategies, what are the strengths of our business? There are mainly two.

The first, as we produce products and do business in certain countries, and we have long history in those countries, and we have established a robust supply chain in those countries. And in each of the markets, we take advantage of those robust supply chain to take the lead in the market. That is one of the strengths for us. And second is the top-level products and processes can be developed. And we do have the technologies to achieve that. And using those technologies, the high-function and higher value-added glass products that can be represented by energy saving products should be offered.

1. Diverse manufacturing base and robust supply chain

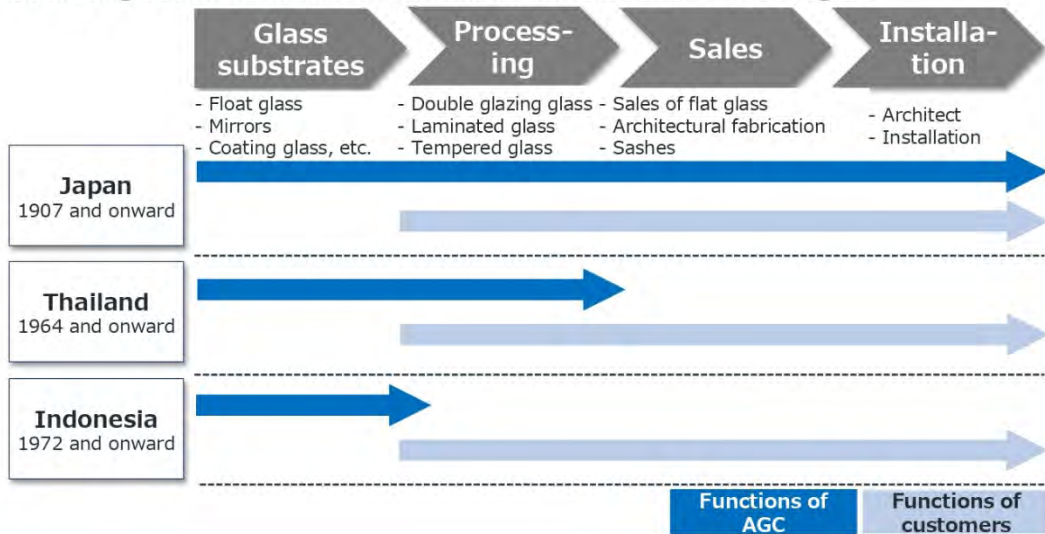
- Concentrate on regions where we can dominate the competition in growing market and keep our position as the market leader in such countries
- Have a wide range of sales coverage over Asian countries



Business strength about supply chain, I would like to elaborate on this point a little bit more. The pie charts on the slide show the broad class share indicated in blue in the markets that we operate. So, this is according to our estimation. And as you can see, our market share is higher than 40% in all of these different markets. We have a very solid supply chain. Also, we have market-leading position in each of these markets that is being sustained. In Southeast Asia, value-added products are exported to different countries and areas. And the red dots indicate sales sites, and they're distributed in various parts of Asian countries. Singapore is serving the headquarter function, and we have a sales network through which we can have an advantage in delivering the value-added products throughout Asia.

1. Diverse manufacturing ability and robust supply chain

- Manufacturing capabilities in Japan, Thailand and Indonesia
- Have diverse manufacturing ability and technologies for glass substrates, coated glass, and processed glass
- Possess a robust supply chain together with customers from supply of glass substrates to installation of glass in accordance with the circumstances in each region



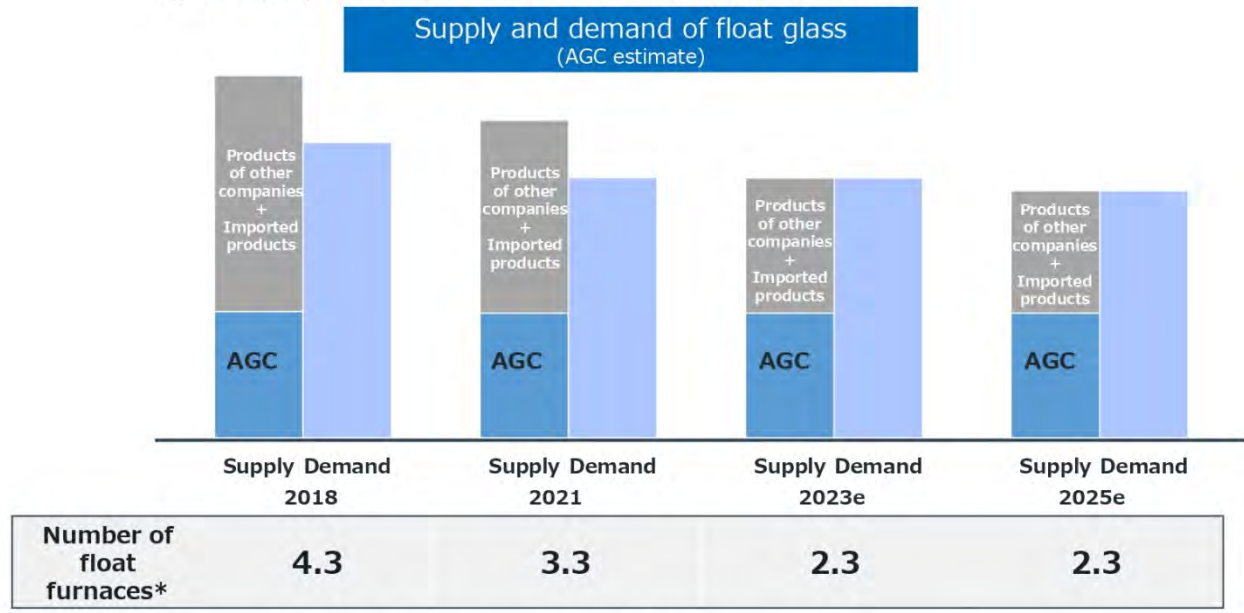
This is the detailed explanation about the supply chain in each of these different countries where we manufacture and sell. At the top in the middle, you can see a simple diagram of glass supply chain. So, the furnace will produce glass substrates. They can be produced and sold and then they can be processed and then sold. And also, they can be, for example, installed into a building. So, this is a typical supply chain for architectural glass.

Japan, Thailand, Indonesia, in each of these different countries where we operate, as you can see in dark blue arrow, this is where we have supply chain functionalities. And the blue light arrows indicate where our customers are functioning as a part of the supply chain.

In other words, in each of these different countries, we can leverage our strength and also our customers can play on their strength. And we play different roles. And as a whole for the market, we have a very strong supply chain which enables us to have a leadership position.

Japan: Market structure

- Competitors partially ceased furnace operations in 2020 and 2022
- From 2023, the supply and demand balance in Japan is expected to improve significantly compared to past over-supply situation



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

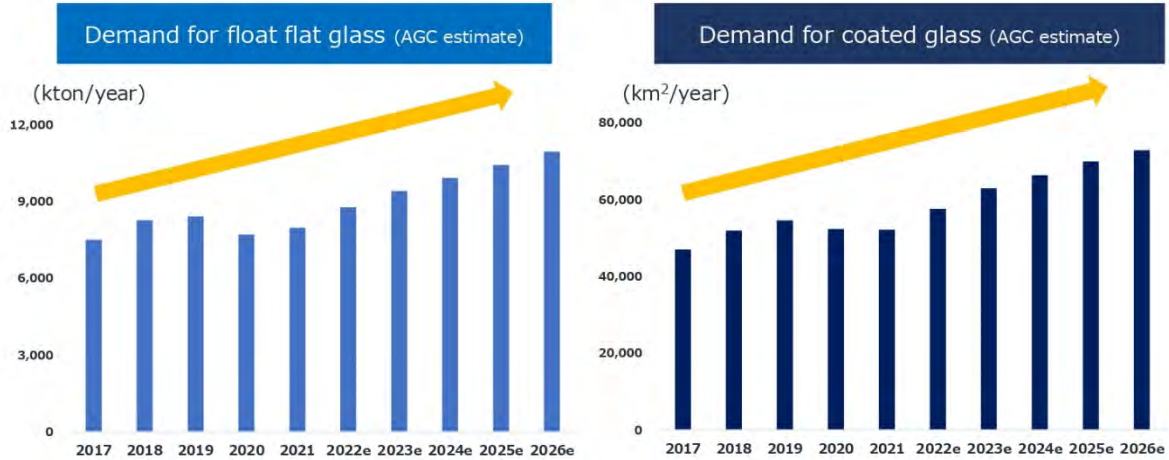
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This slide explains about the market structure of Japan. For a very long time, oversupply situation continued, which was a major problem. But the situation is actually dramatically improving according to our understanding. The bottom of the slide for the architectural glass number of a float or furnaces are shown. And as you can tell from these numbers, it is declining over time.

Specifically, one in 2020, and in 2022, another one actually declined. So as a whole for the market, we are seeing a better balance in terms of supply and demand now, which means that healthy profit can now be obtained in the Japanese market. The environment is ready for that.

Asia: Market structure

- Capture the commodity demand that is expanding in the Asia/Oceania region* as a base load
- Capture the expanding demand for high-value-added products and establish a stable growing revenue structure



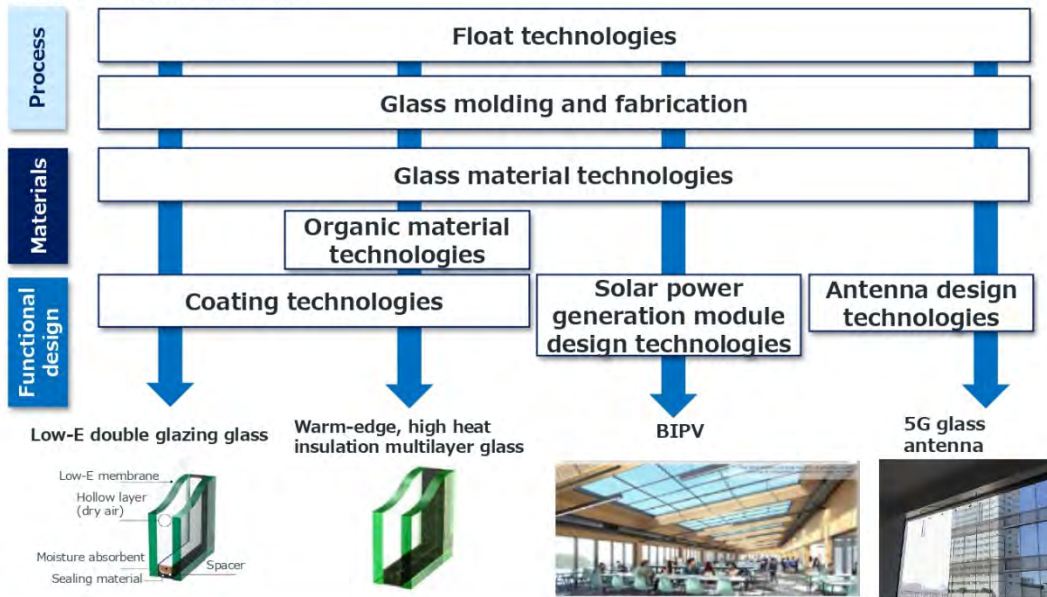
* Excluding Japan and China

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Turning our eyes to Asia. As I have explained, this is basically a growth market. And as you can see to the left, in the bar graph, high value-added coating glass. Its saved energy contributes to society in that sense as well. And the carbonization is a major trend. And based on that, demand for such product is growing in Asia and Oceania region. We believe that the structure will enable us to generate a stable revenue.

2. World leading product and process development ability (1)

- Develop advanced glass and new processes capitalizing on diverse human resources and development capability
- Develop new products differentiated from competitors with composite technologies of glass, electronics and chemicals



This is another strength in terms of development capabilities of products and processes. And we talk about development capabilities, and this slide is specific about process development capabilities. At the top of the slide, we have the substrate float glass technology, manufacturing technology that is a foundation of our technology. And starting with that, we also have a processing technology and lower down, we have AGC other businesses, technologies other than glass that can be combined in terms of taking advantage of various technologies. This is our strength.

And also, we can take this one step further. And course to the bottom of the slide you see functional design, for example, coating development technologies and also the solar panel development technology. For automotive business, we have been accumulating the technology for in-glass antenna, and we can apply that to architecture as well. And we have started new businesses and new products, as you can see at the very bottom of the slide.

2. World leading product and process development ability (2)

- Greatly contribute to resolution of social issues such as realization of a low-carbon society and arrangement of social infrastructure with world-class technology and development ability

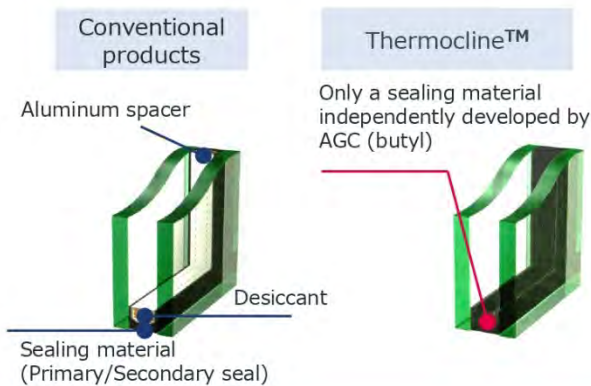


In new products and new businesses, we will be contributing to achieving these five social values. And I will talk about specific product and business explaining how they contribute to societal values. I'll start with Low-E double-glazing glass. This product contributes to saving energy. About half of the heat entering/leaving the housing passing through windows.

Low-E double glazing glass



- About half of the heat entering and leaving housing does so through windows
- In Asia, Low-E double glazing glass is expected to grow at CAGR of 7% up to 2030
- In Japan, double glazing is adopted in about 80% of new houses and apartments
- Expand the sales with newly developed resin spacers to increase the revenue



Thermocline™

- High-durability/long-life/high-heat-insulation double glazing using a material independently developed by AGC
- Integrated function of spacer, desiccant and seal materials with technologies of chemicals to make recycling easy
- Realized long-life products without sacrificing the performance of windows, contributing to longer product life

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So, improving the energy-saving capability of the windows can contribute greatly to decarbonization and energy saving, and Low-E double-glazing glass plays a big part in this aspect. So basically, two or sometimes three layers of glass are combined, and coating is applied, so only selective arrays can be transmitted. Through these layers of glass, we are trying to improve the performance even further by developing another product called thermocline. Double glazing traditionally used a spacer and desiccants and various materials had to be used to make such type of glazing glass. But our idea was to develop our own sealing material, which is used as a spacer and also the desiccant functionality is also integrated into this, which makes it a lot easier to recycle and also prolong the life of the product. So, in the double-glazing area, we will continue to expand the sales of thermocline, which is our own unique product.

BIPV

(Building Integrated Photovoltaics)



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



Global Zero Emission Research Center of AIST
Entrance canopy



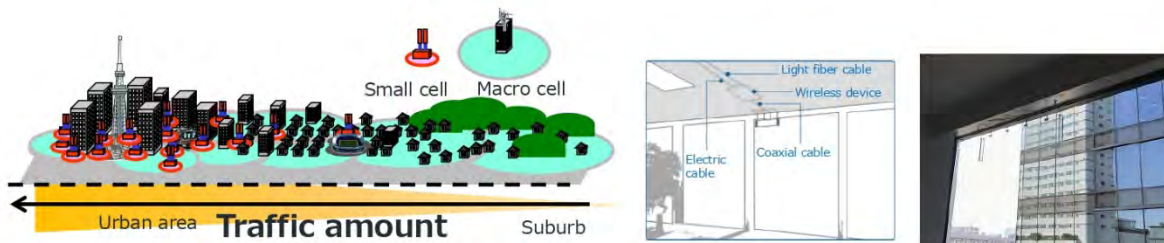
New Punggol Campus of Singapore
Institute of Technology

I have alluded to this slightly earlier, BIPV, building integrated photovoltaics. Simply speaking, Solar cells integrated into glass for windows, and it is highly flexible in terms of design, it can be part of the architecture. In the urban area, where there's not a lot of space, you can use the windows to generate energy from buildings. And this is not just energy saving, but energy-generating or energy-creating.

WAVEATTOCH™



- Following the spread of high-speed and large-capacity 5G communication, securing locations for small-cell antennas in urban areas has become an issue
- AGC developed glass antennas that can be attached from the indoor side of existing window glass
- It is so transparent that it does not interfere with interior design and street landscape
- Building windows in prime downtown locations will be converted to antennas.



This is 5G glass antenna. 5G is expected to grow in the future. But 5G is difficult to transmit. And as you can see at the bottom left of the slide, we need a lot of solar cells in order to transmit 5G waves. But there are limitations in terms of space, and they don't want to put too many antennas in one building. This is where the antenna-integrated glass can be very useful. As it can be attached to the glass, it doesn't interfere with the scenery. And also, you can take advantage of many windows in high-rise buildings in the urban area. This is a new business and a new product.

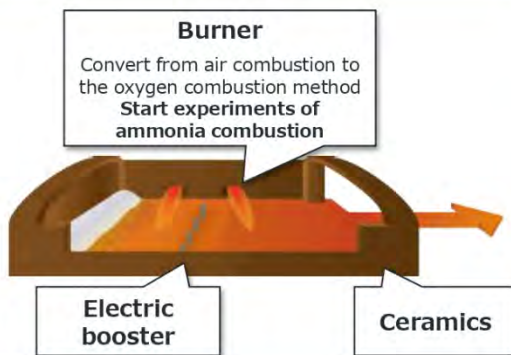
Energy-saving glass manufacturing technology



- Develop and introduce world-leading energy-saving glass manufacturing technologies as a leader in the industry
- Promote cutting-edge production technology development such as carbon-free ammonia combustion toward carbon net zero

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

*New Energy and Industrial Technology Development Organization

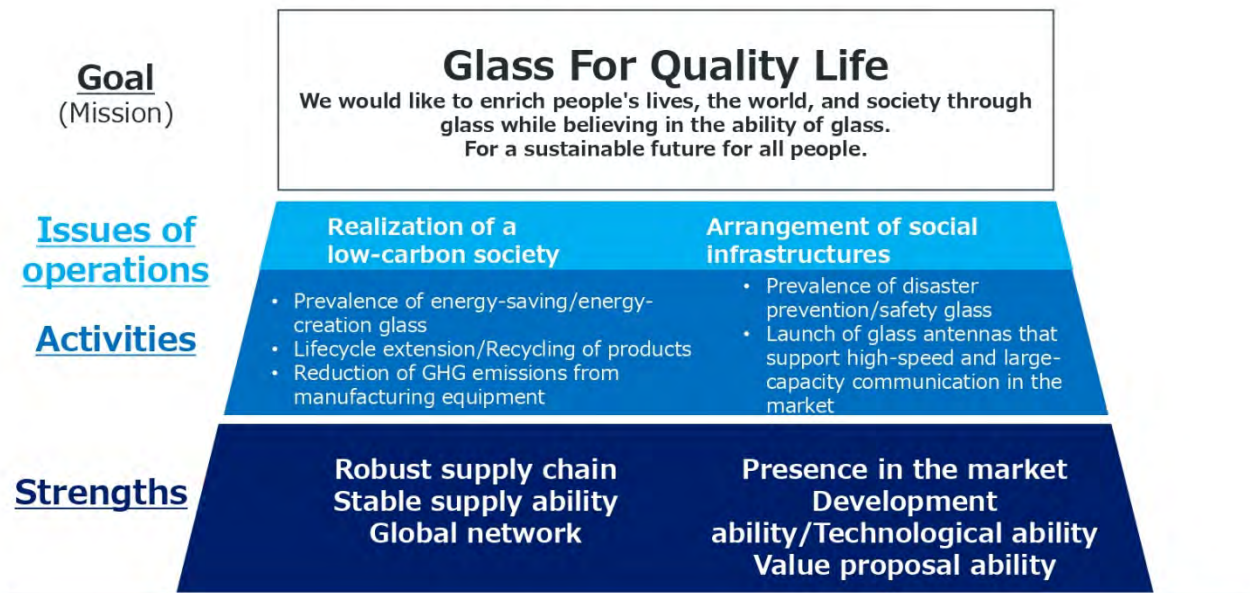
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Last but not least, energy-saving glass manufacturing technology. The left diagram shows that heavy oil and natural gas used to be burned with a burner generating CO₂ to manufacture glass. In Japan, we are trying to replace that with ammonia combustion. This is an approved concept, and this is a project that was commissioned by NEDO.

Some people talk about hydrogen, too, but Europe is actually making advances in terms of hydrogen infrastructure. So, hydrogen combustion is also within the plan for the European business. We have global business, which means that we can develop technology that is suited for each of the different geographies. We still don't know whether ammonia or hydrogen would be the mainstream in the future, and we'll be ready either way. And that also puts us in an advantage. And as you can see to the left, we also use electric booster. By using electricity, we can support the melting capabilities and therefore, contributing to the CO₂ reduction.

We aim to realize our mission, Glass For Quality Life, by making use of our strengths, recognizing social issues as business opportunities, and solving such issues through products and production/development activities.



And this is my last slide. We have a mission, a goal. Realization of look up on society and the social infrastructure preparation. Toward that end, we have many initiatives that I have explained today. And as you can see at the bottom of the slide, we are taking advantage of our strength in our businesses and different regions.

This is a summary slide, and that's all for me. Thank you very much.

[END]