AGC Inc.

IR DAY 2022 <DAY 2> Chemicals

June 16, 2022

Event Summary

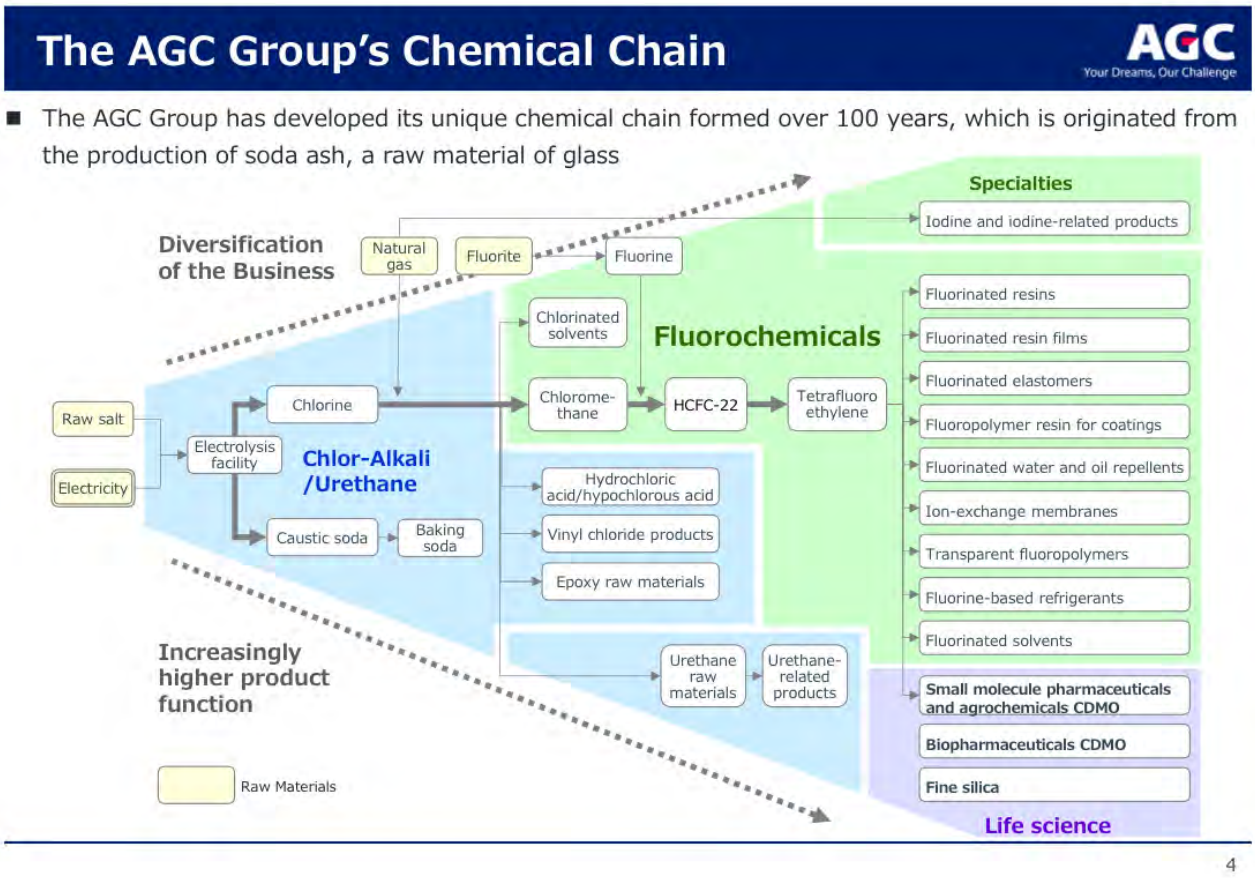
[Company Name]	AGC Inc.
[Company ID]	5201-QCODE
[Event Language]	JPN
[Event Type]	Analyst Meeting
[Event Name]	IR DAY 2022 <DAY 2>
[Fiscal Period]	
[Date]	June 16, 2022
[Number of Pages]	25
[Time]	17:20 – 18:50
[Venue]	Webcast
[Venue Size]	
[Participants]	
[Number of Speakers]	2
	Masao Nemoto — President of Chemicals Company
	Chikako Ogawa — General Manager of Corporate Communications and Investor Relations Division

Presentation

Moderator: We're going to start the presentation on the strategy of Chemicals by the President, Masao Nemoto.

Nemoto: Yes, this is Nemoto. Thank you. We have 1.5 hours. It's a long session.

I would like to show you the product flow for the chemicals to introduce the Chemicals business to you.



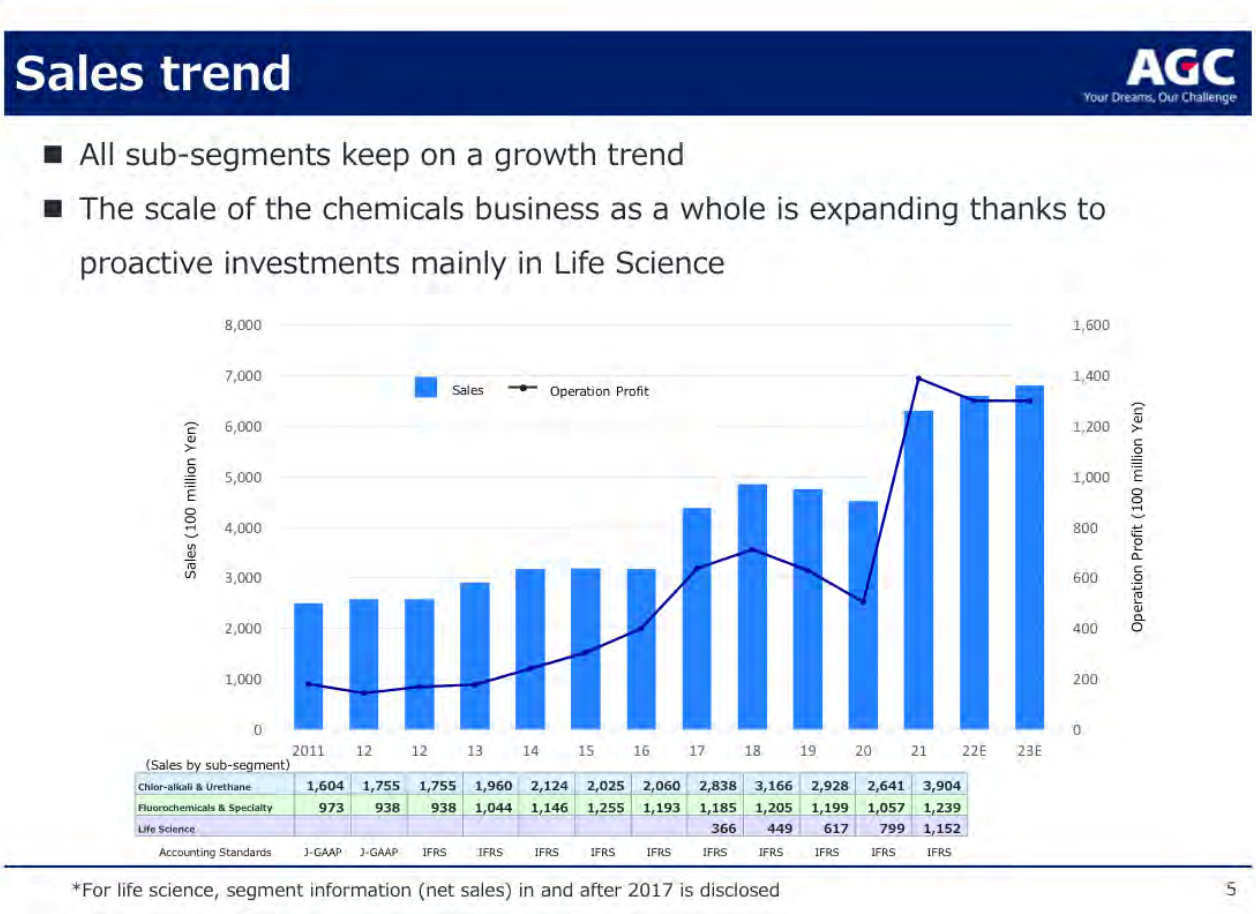
Soda ash is the main material for glass. From Asahi Glass, what AGC used to be, started the operation in 1907. Ten years later, soda ash production was started, so we started our own production of soda ash. In 1917, the Chemicals business started, so we have a history of 105 years. In this product flow, the chemical chain, you can see to the left, the raw salt. This is basically NaCL. This is the starting material. Soda ash starts with raw salt and the NaCL alkali side is made into soda ash. We have been working on this for many years.

From the 1930s, petrochemical technology and chemical technology increased or improved, and many chloride derivatives were developed and commercialized in different parts of the world, so we started the electrolysis business. The alkaline business was shifted to electrolysis business, and the soda ash business was basically discontinued in the beginning of the 2000s by AGC.

This is the chemical chain in the AGC Group.

The blue highlights chlor-alkali and the green highlights fluorochemicals. The bottom line is life science. These are the three different segments that I would like to touch upon today, but please understand that we are all starting from raw salt and 105 years ago. We started this whole business from soda ash and this is the origin of our business.

Looking at this chemical chain, you can explain AGC's Chemicals business. We have a lot of different types of chlorine-related products. In the chlor-alkali manufacturer, we believe that maybe AGC is the only one that has such a diverse portfolio based on chlorine. There were some other players in the past in Europe and the US, but the companies were split into smaller companies. We believe that our product flow and portfolio is very unique because we are doing things very comprehensively. I just wanted to explain the historical background of this product to you.



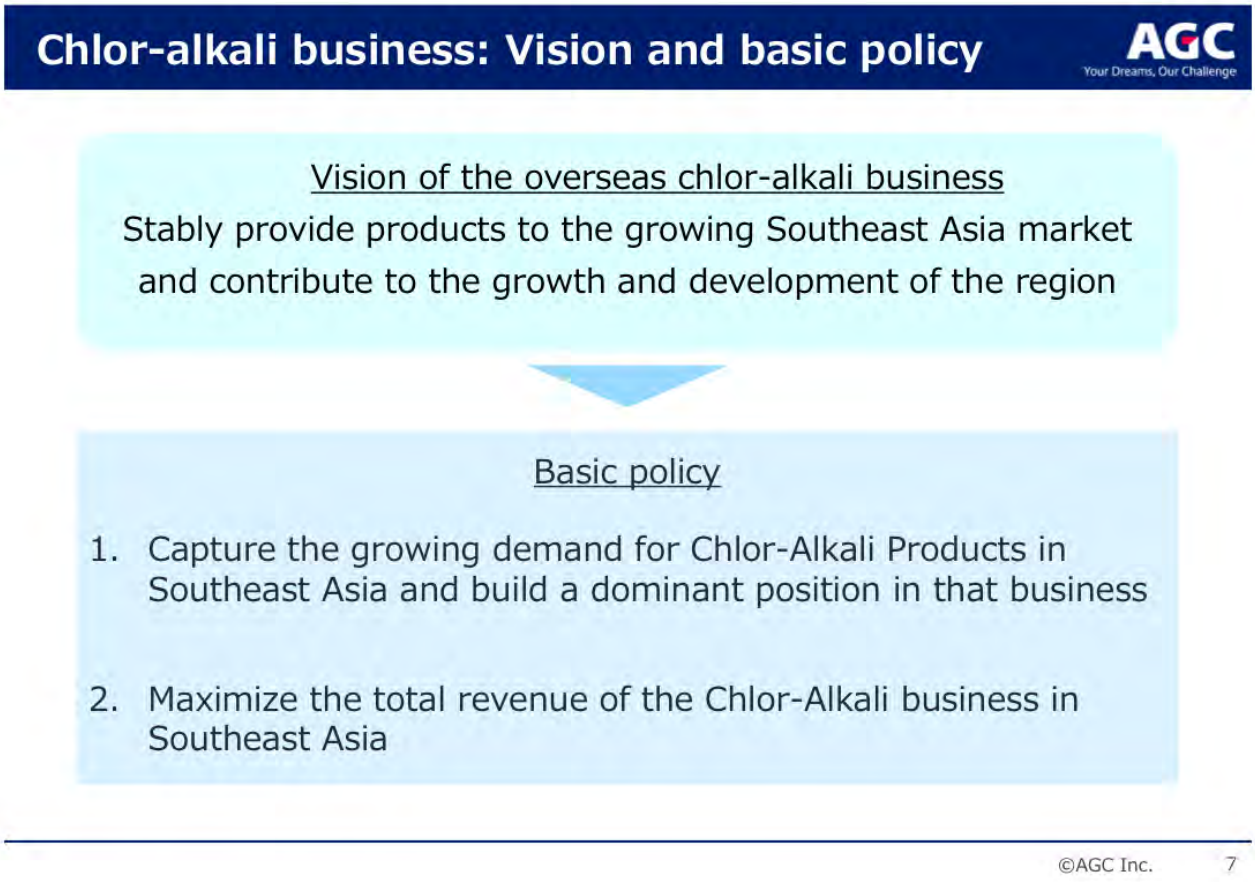
Next, I'd like to talk about the sales trend.

Starting from 2011, in the three segments that I have mentioned, sales trend and also the OP total trend is shown on this slide. Historically speaking, up until 2012, the chemicals products for implementing structural reform.

In terms of sales size, through restructuring, we were basically increasing and decreasing in different parts. Anyway, the sales level was trending around JPY250 billion for many years. In 2012, we did a major structural reform for chlor-alkali and it was completed that year, and all the shrinking measures were basically completed and finished. Since then, we have been able to focus on investment into growth.

AGC Group, being a part of this group, made it possible for us to continue to invest into structural reform up until 2012. Then we became a lean organization. Since then, we have been proactively making investments into growth areas.

I've been serving as the President of the Chemicals business from 2013. Before that, I was working on the structural reform with my boss. In the last 10 years or so, we have really been able to actively invest into growth. I'm a little bit old, but I'm basically working out of my frustration from the past, so to speak.



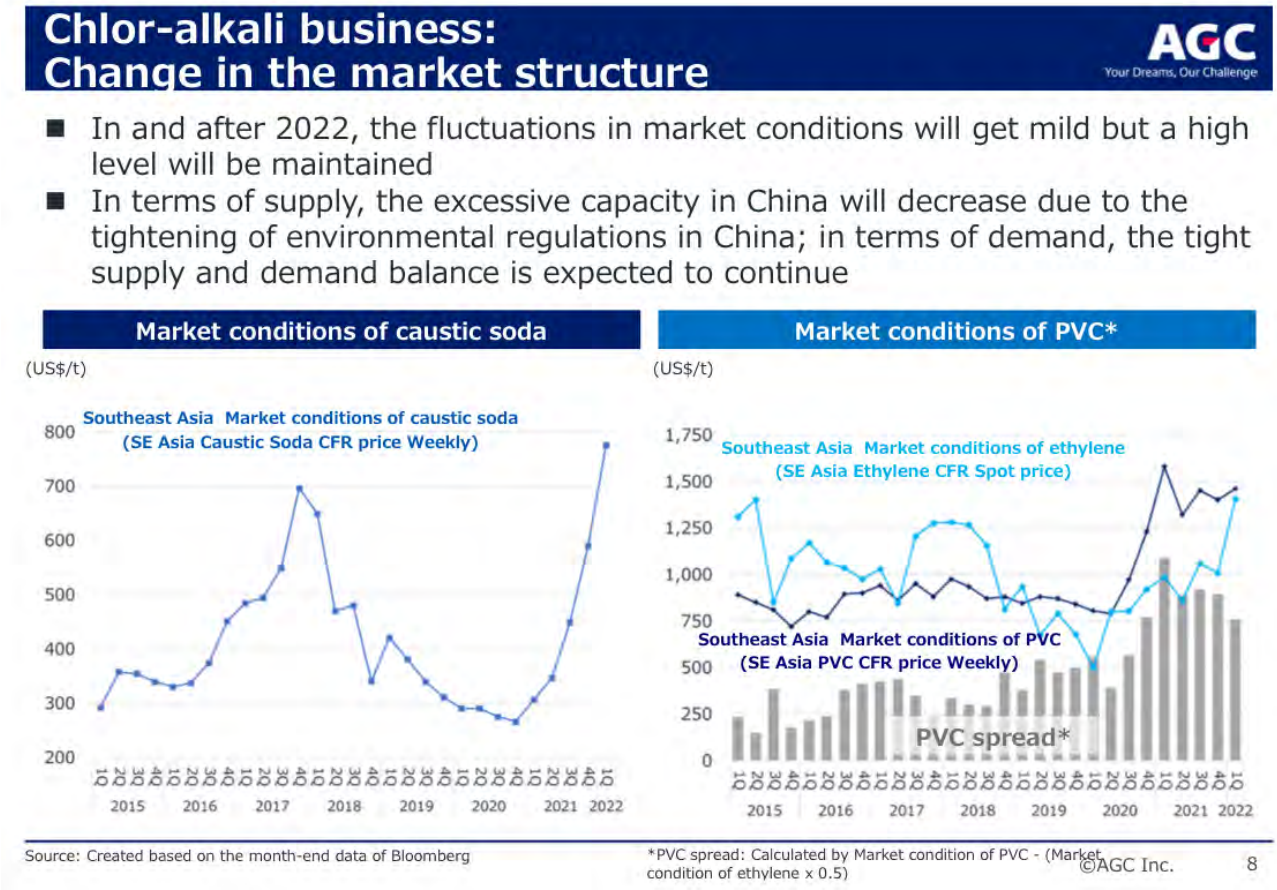
Now with regard to the three growth investments, I would like to provide some more explanation.

Starting with our chlor-alkali business, you can see the explanation on the slide but, basically, the keyword is region, geographical region.

NaCL is electrolyzed into NaOH, and this is within the water, so NaOH, Na, and CO2. This is an electrolysis process. An ion exchange membrane is used to separate these components. That is the electrolysis.

For the chlor-alkali business, in terms of strategy, we have a mutual strategy. We believe that the regional focus is the most appropriate strategy for this type of business because NaOH, caustic soda, has to be mixed with water. Otherwise, it would be just thick and it would harden and would not be able to be transported, so it has been mixed with water, half and half. We can already charge our customers for water, but transportation cost is very key and it's not that expensive. That means that transportation cost is quite high, which means that we should produce, manufacture, close to where it's consumed. That can be an advantage.

NaOH, caustic soda, is not a main ingredient, but it is actually used for most industries and the social infrastructure. This material is absolutely essential. Main use is neutralization of alkali and acid. For example, water supply or sewage systems and also power generation, caustic soda is absolutely necessary in these different types of industries. Although it's not the main material, without this material, various types of manufacturing, production, and social activities would cease and stop.



Price is an important motive, but also stable supply is the biggest motive for deciding who to purchase from, from the consumers' perspective. In other words, local production and local consumption would have the highest level of operative advantage. That is why we believe that regional or local strategy is the most appropriate for this business. Based on this thinking, in the past, we were selling, supplying all over Japan, but now we are only focusing on East Japan. In Chiba and Ibaraki, we have our plants; that is the reason. We have more than 50% of the market share already in these regions.

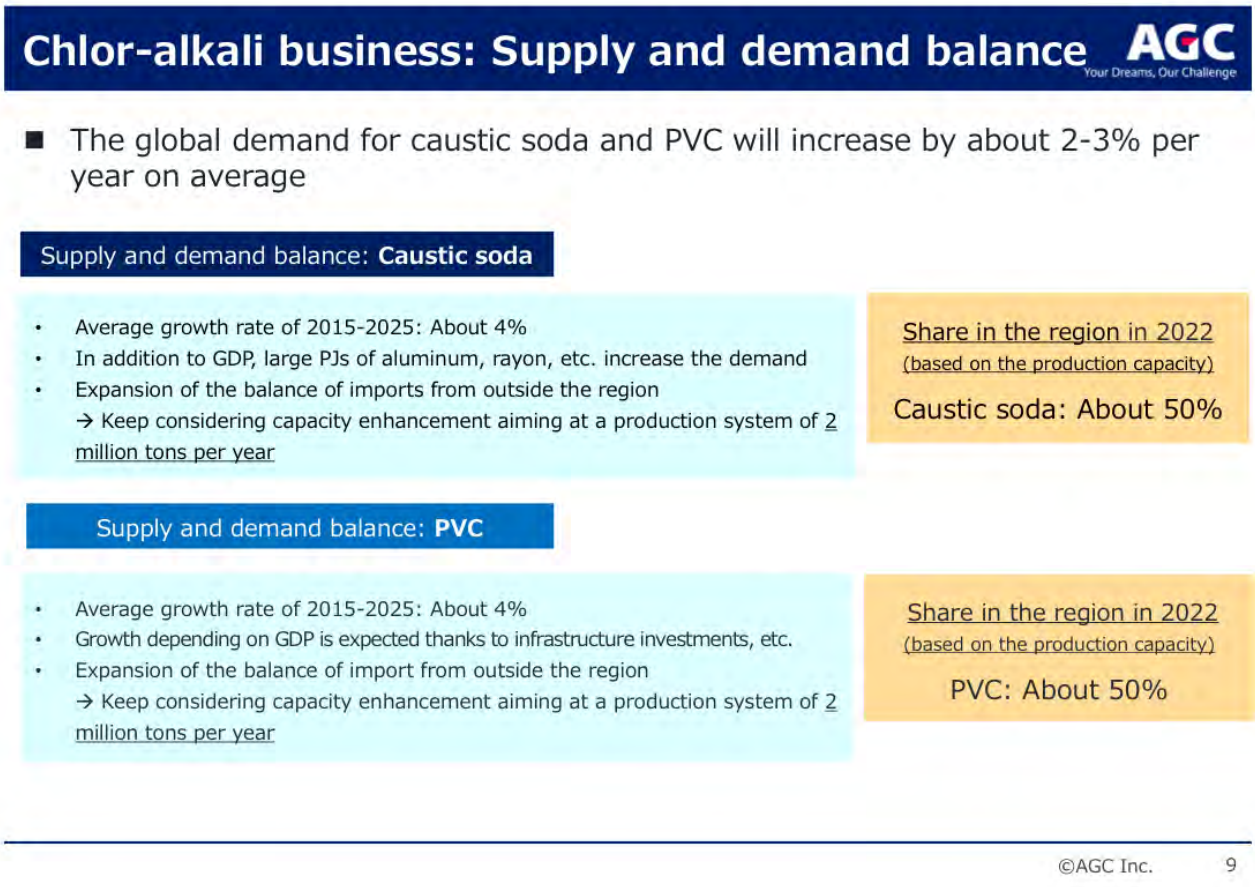
Demand is not growing very much in Japan, but as a region, we are targeting Southeast Asia and we are expanding our business in the Southeast Asian market. As you can see on this slide, we want to capture the demand of growing Southeast Asia to build an overwhelming position. This is the basic policy of our chlor-alkali business.

Moving on to the market situation of chlor-alkali, we have seen the market trending at a very high level for a while and we have received many questions about how long this level would continue or be sustained. So I would like to address this question first.

On the left, you can see the market conditions of caustic soda, and on the right, market conditions of PVC and ethylene. The bar graph shows the difference between PVC price minus ethylene. In other words, the PVC spread.

From 2015, chlorine has been appreciating over time. In terms of caustic soda, in 2017, there was a peak and then it went down and back up again. So, the international market has been fluctuating quite a lot. Basically, chloride and caustic soda, if you add these two valuations, since 2015, we can see the price level being very stable. This is our assessment. The reason for this is there was a period of imbalance between supply and demand in the past because in 2000, 2010, there was a massive increase in capacity in China as a carbide process, which was very unique. It's a little bit obsolete and of lower productivity level. It's an old technology in Japan, but China opened up its market to the rest of the world. Because of its economic policy, the capacity was increased and it basically mushroomed everywhere. But in the last few years, environmental issues were highlighted in China and the ethylene carbide process environmental regulation has been strengthened.

For new installation, the regulation is very tight as well. This is not limited to chlor-alkali or electrolytes, but the capacity increase in China had a massive negative impact on the market. The situation improved, leading to a more stable market.



In terms of demand for caustic soda, this is basically industry and economic development. In other words, in Southeast Asia, we are seeing growth of GDP and that's what we expect into the future as well.

With regard to PVC, the US is the biggest consumer and the infrastructure is aging, so there is a strong demand. In Southeast Asia, for water supply and wastewater as well as electric wires, social infrastructure investments are being made very actively, which means that the demand is strong.

Excess capacity was resolved in terms of supply and it basically disappeared. So demand-supply balance, assuming that China would not come back with ethylene production very quickly, we believe that there will

be a stable demand. But caustic soda is above JPY800 and, for chloride as well, the level is quite high at this point in time, but we believe that it will go down or go back gradually, slowly.

Last year, in North America, around the Gulf area, the production was damaged due to a cold wave, cold front. And in summer, there was a massive hurricane that caused a lot of damage. So, demand and supply balance was unusually tight, pushing up the prices.

Since then, you may remember that, from autumn last year, electricity was regulated and controlled in China, and we are still seeing some residual impact. We believe that the market will stabilize to some extent, but the fundamental demand and supply structure is as I have just explained. In other words, we would not expect a big dip in these price levels. So, the market structure, market status, has changed somewhat.

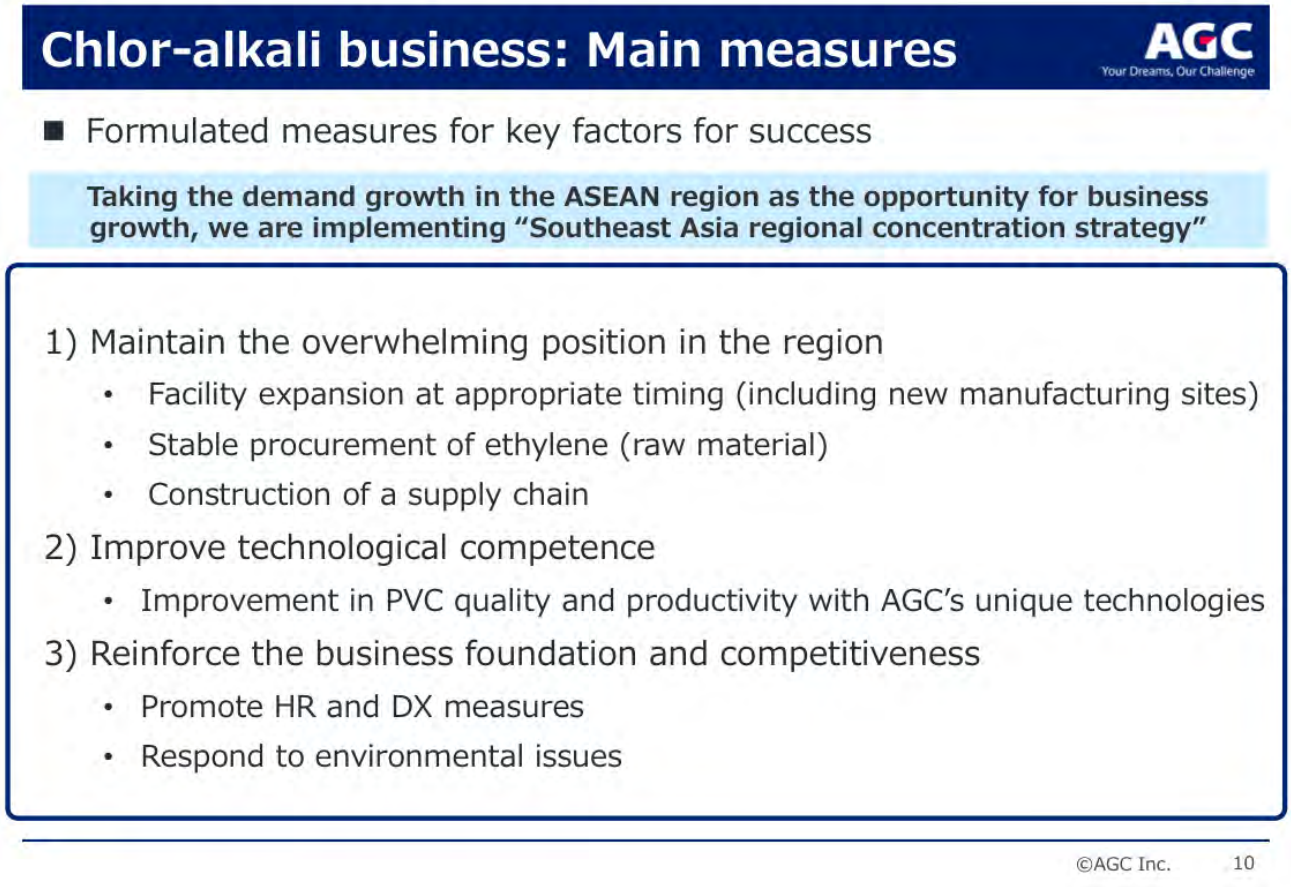
On this slide, you can see the growth in the world for the caustic soda and PVC. We believe that the growth will follow the growth level of GDP because it's a very essential basic material.

In Southeast Asia, we would definitely see growth according to our forecast, and looking at Southeast Asia alone, this is the supply and demand balance. From 2015, the bar graph shows demand within the ASEAN region. The yellow dotted line curve shows the production level within the ASEAN region. The blue dotted line shows production capacity of AGC Group, Indonesia, Thailand, and Vietnam, three countries included. This is the production capacity of AGC Group as a whole. As you can see, demand is showing approximately 4% growth, which is quite solid.

My point here is that Southeast Asia and ASEAN is dependent on imports from outside of the ASEAN region and the AGC Group, at this point in time, has a 50% share based on the product capacity.

As I have mentioned before, judging by the characteristics of caustic soda, local production, local consumption, is an advantage. We have this much share and also advantage, which means that we already have built ourselves an overwhelmingly strong position. In 2017, Vinythai from Thailand was acquired by Solvay and that pushed down our regional market share by a large extent. As you have seen in the newspaper articles, we have decided to double the capacity in Thailand, which will come online in 2025. Demand within the region will continue to increase, and our business will also continue to increase. We will be focusing on protecting our overwhelmingly strong position in order to further promote the growth within this region. This is not just limited to the volume. As a supplier that is close to the customer in terms of technology, logistics, we will be increasing our competitiveness.

Next, looking at PVC, the situation is very similar. For PVC, transportation cost rate is not as high as caustic soda, but the caustic soda advantage can be leveraged for PVC. We can provide PVC to users who are close to our manufacturing sites. This is where we can have an advantage in this region. Again, this vision is relying on imports, so we will continue to capture the opportunities, and we believe that there is much more room to increase capacity in the future.

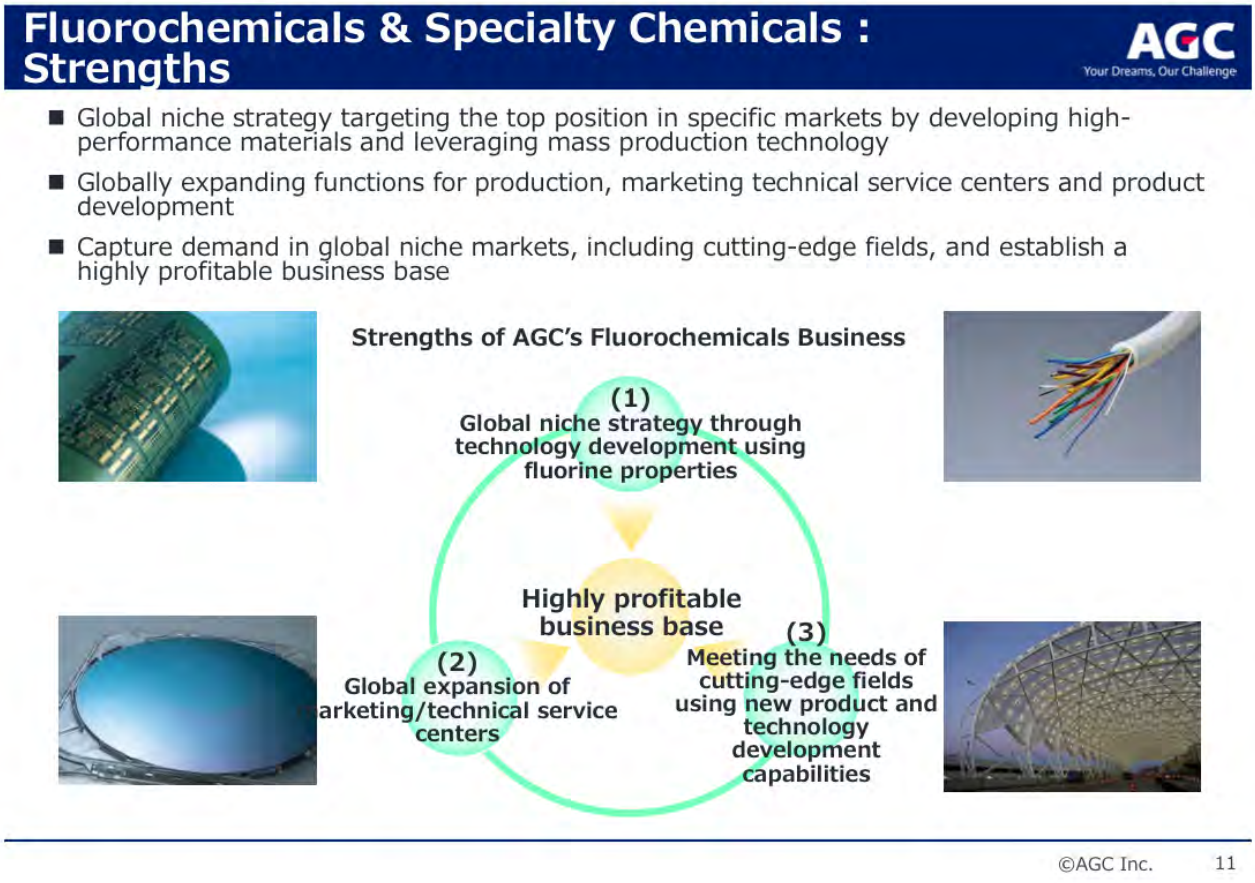


For chlor-alkali, this is the last slide, our key success factors for this business and what we are thinking in this business is explained on this slide.

We want to maintain our really strong position within the region and we took some time to bring ourselves to this position. We want to maintain this position based on the economic and demand situation and we will continue to increase the capacity according to the situation. We will continue to improve technological competence and enhance our competitiveness on many fronts.

Although this is not mentioned on the slide, I would like to mention another strength of ours. When salt is electrolyzed, 0.9 tons of chloride is produced from one ton of salt. Alkali and chlorine demand-supply balance differs from one country to another, so multiple manufacturing sites and multiple markets, if we have access to multiples of both, we can actually strike the right balance. For the ASEAN region as a whole, we want to have multiple manufacturing sites so that the chloride and alkali balance can be sustained. That would help us achieve the right balance for the whole business.

Although we are focused on Southeast Asia, we have multiple locations. That's why we have a strength in this business.



Next, I would like to move on to fluorochemicals.

For fluorochemicals within our Chemicals business, this product has a very long history. Selling volume products or generic products has not been our strategy.

DuPont was really great. They were the top manufacturer, although they withdrew from various segments by now. Anyway, there were some giant companies in the West doing business globally and they were employing those technologies. But we wanted to go into a niche market and also hone our own technologies. That has been a focus, so this business has very high asset efficiency.

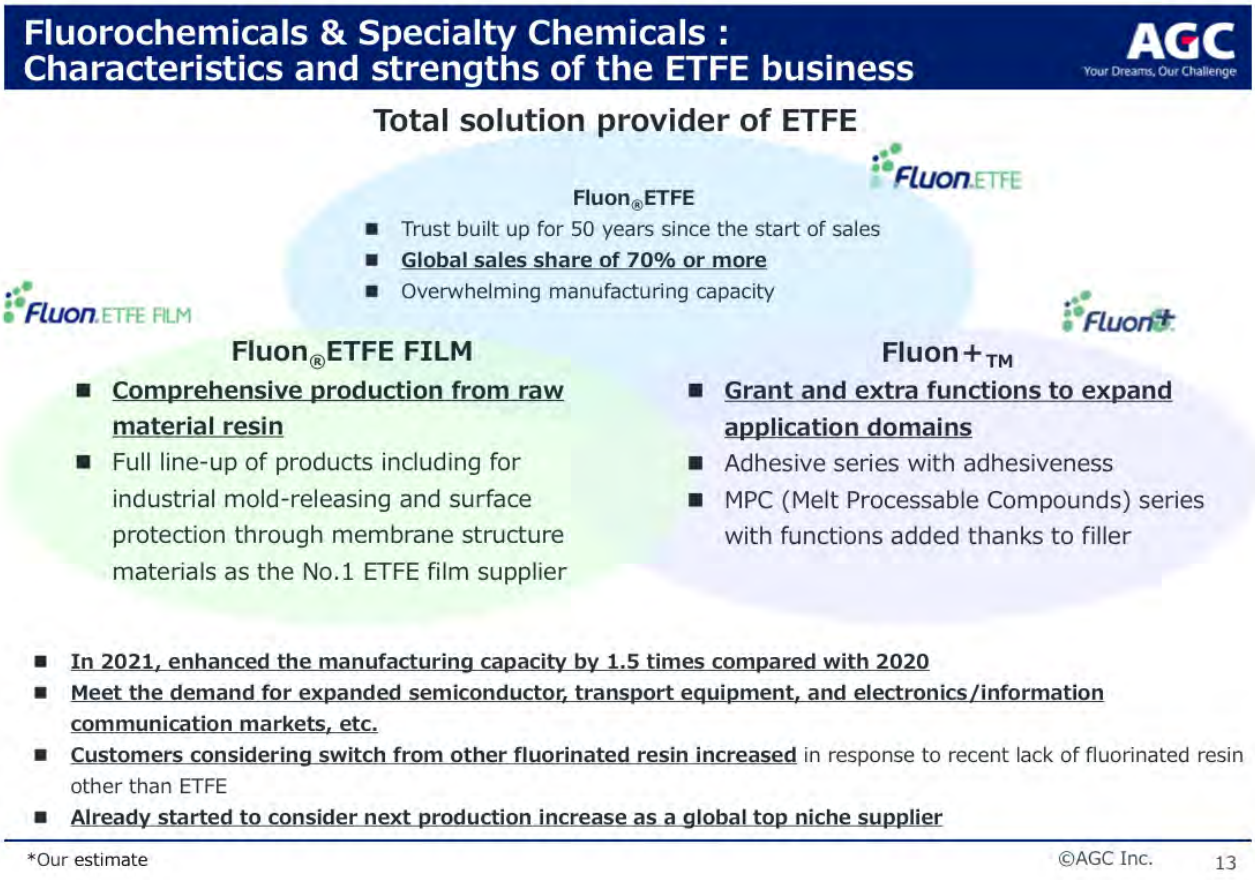
Development capability is enhanced constantly. The reason I'm explaining this to you today is because, if you look at the Western manufacturers, they are getting weaker in the synthetic chemicals these days. DuPont, for example, has decided to exclude fluorochemicals from their core business.

Now, as you see, we want to become a global niche player in specific markets in the world, so we have changed the strategy recently. We don't go after volume or mass-produced products, necessarily. We have a technology as AGC. We have manufacturing expertise know-how and we can provide very special products. Now, we're able to do that because the environment has changed the competitive conditions and the market structure has changed dramatically, which enables us to become a global top-niche player.

I would like to show you some typical examples of what we are doing in this area.

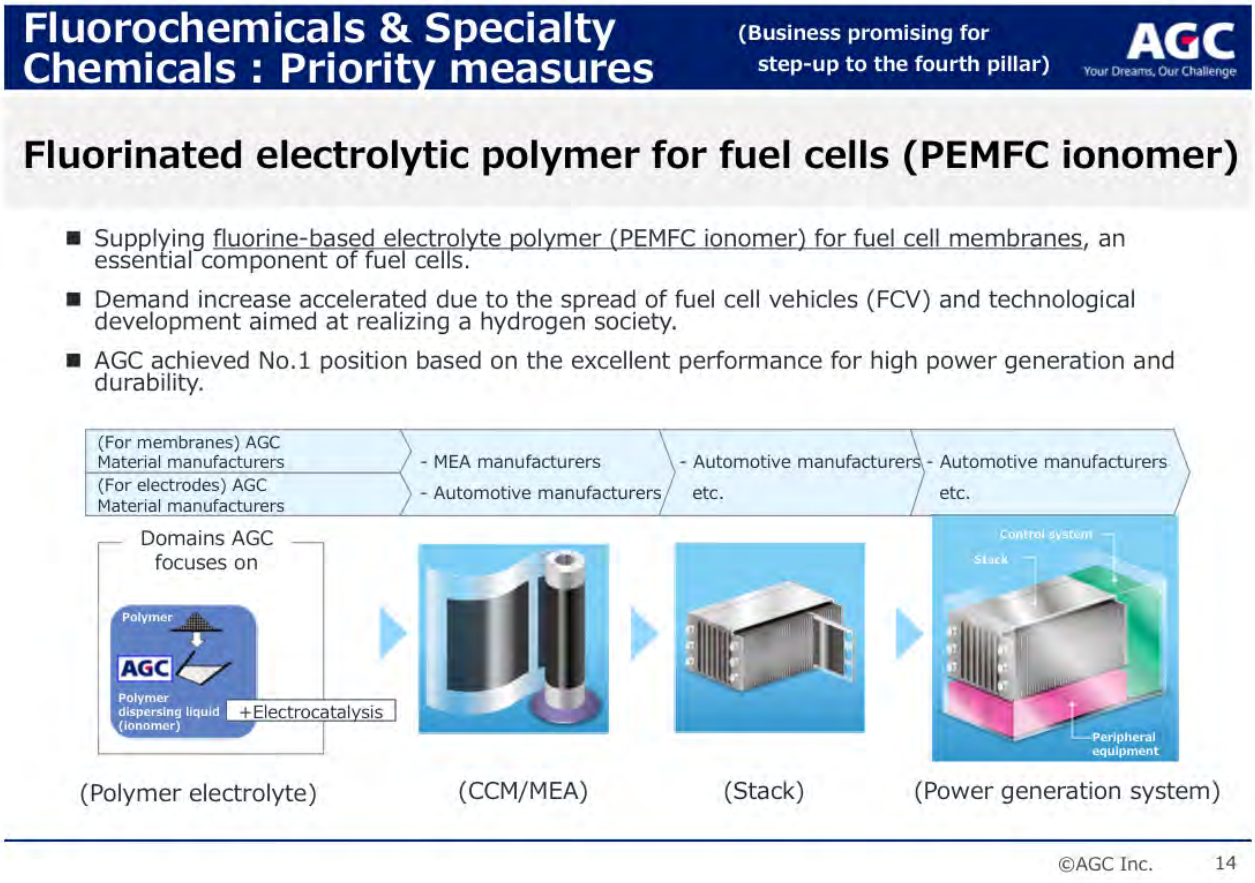
This is one of the fluoropolymers, ETFE, characteristics are taken advantage of and AGC has been building various applications over many years, which are now applicable. This is a polymer with specific characteristics. The price is quite high as well, used in semiconductors, aircraft and also membrane structures.

In terms of durability and also transparency, we are supplying more products where it's needed. This is not a multi-purpose, general-purpose polymer at all.



Moving on to the next slide, 70% or higher global sales share has been achieved. We have been working on this for many years, adding more functionalities over time.

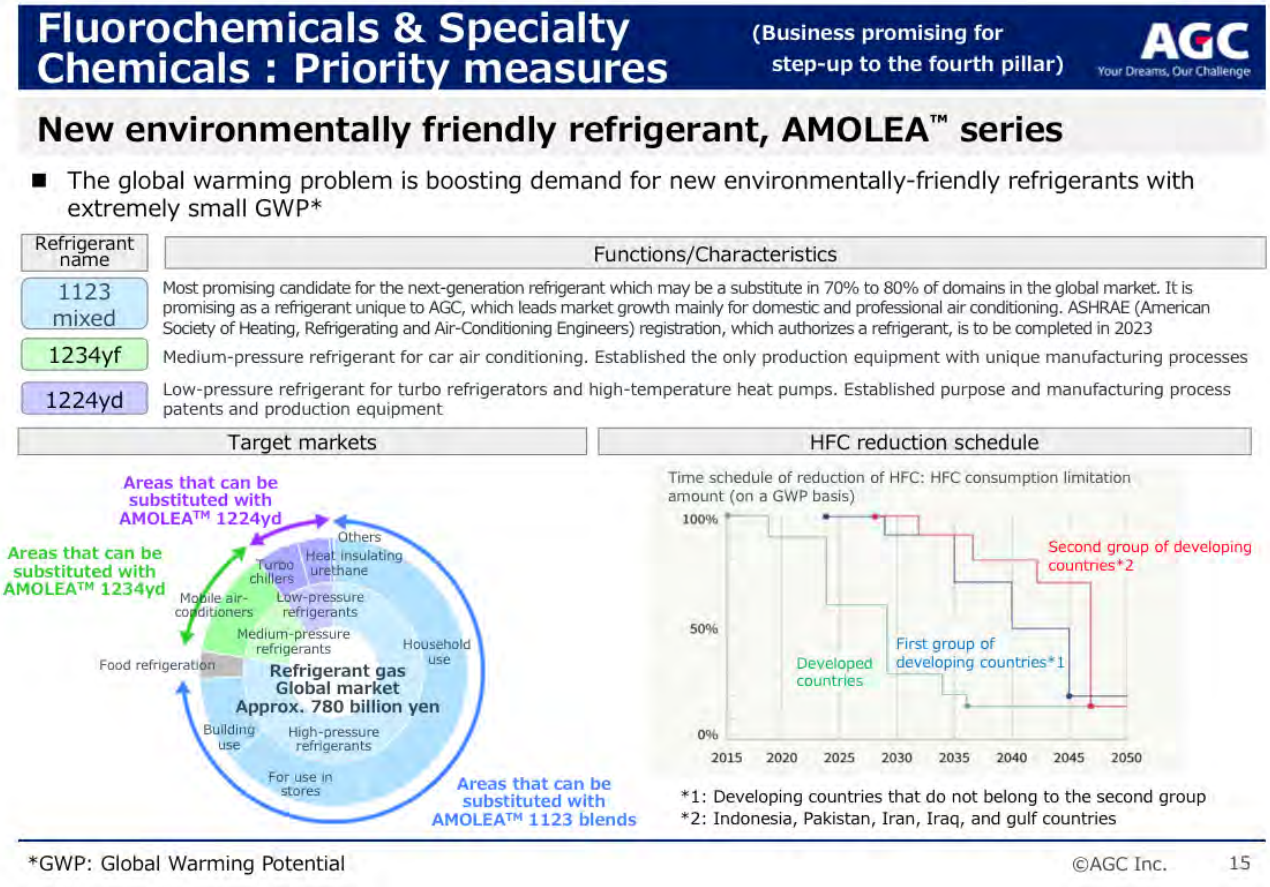
There is something called Fluon+. The material is a water repellent. It's very difficult to give it adhesiveness, but we have ETFE with adhesiveness, so we are actively promoting this product globally. In 2021, last year, the manufacturing capacity was increased by 1.5 times to respond to growing demands.



Moving on to the next product, this is a specialty business.

For fuel cells and hydrogen cells, we have monomer and polymer products. I cannot really cite the name of the customer because of the contract. I hope that you understand my situation. But if you think about hydrogen fuel cell vehicles running around the world, all of them, each one of them, every one of them is using a polymer. Based on this, we want to contribute to hydrogen society. So, the hydrogen generation process, hydrolysis, electrolytic polymer can be provided for this purpose. The project has been formed and we are actively working on this.

The membrane using fluoropolymer in this segment, we already have established an overwhelming number one position. There are only very few hydrogen cell vehicles, but they have a huge potential. Outside of Japan, in countries where they are really heavily promoting a hydrogen society, we can expect rapid growth.



Moving on to the third item, this is gas refrigerant used in air conditioning and refrigerators.

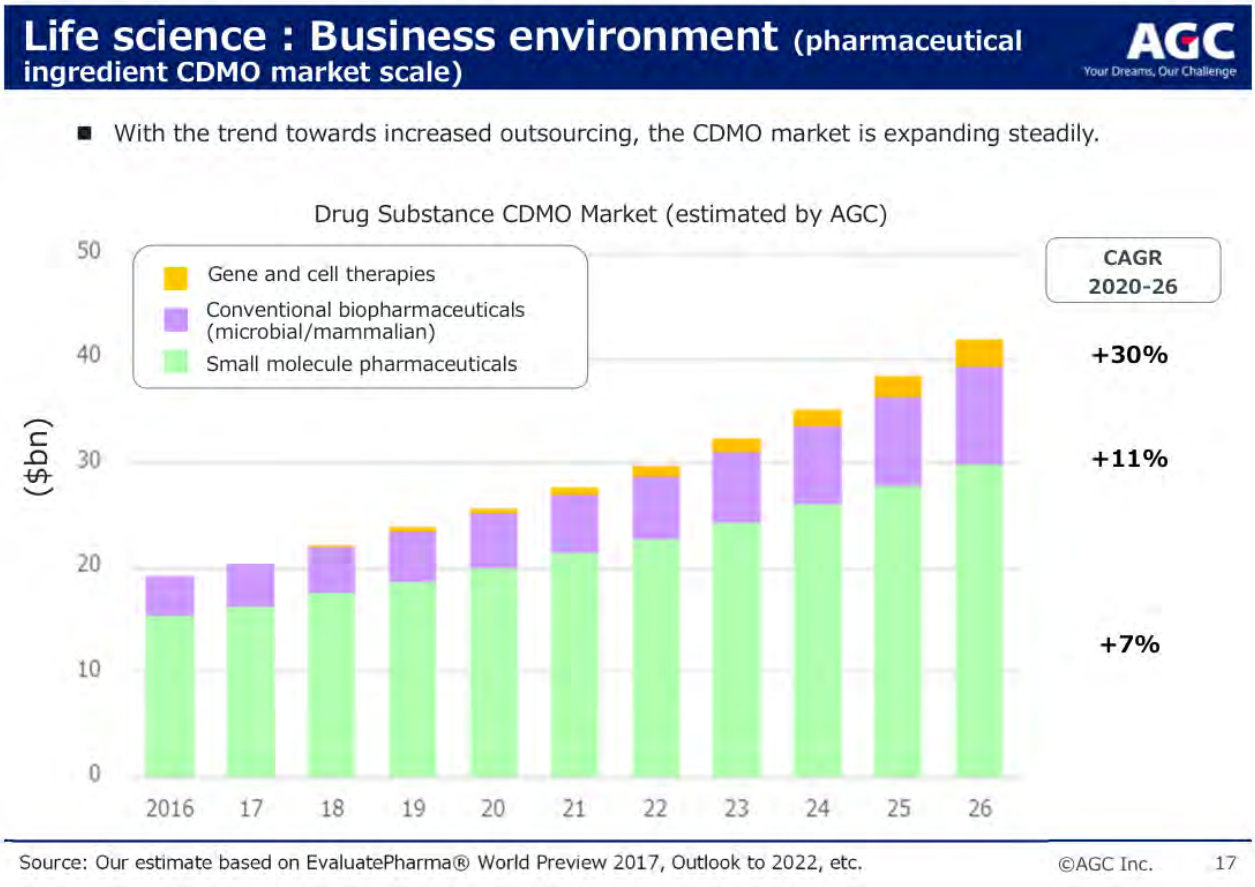
In 1995, because of a destruction problem, GHGs were removed. The gases used right now have high GWP, Global Warming Potential. Our imminent task is to reduce this. 1123, 1234yf, this is a chemist's perspective, chemist's name, based on the chemical formula. But if you look at the refrigerant gas global market, it's approximately JPY780 billion. This turbo refrigerator is being switched to 1234yf very quickly. Because of many restrictions, I cannot say many things about this, but what I can say is that, 1234yf, AGC is the first company who successfully commercialized this and we're still supplying this. And 1234yf will be the mainstay in automotive air conditioning systems.

For the rest of the segments, there is a competition for alternatives. On the right-hand side, you can see another graph that shows you the HFC reduction schedule. Developed countries need to reduce first, followed by developing nations. But once the alternative is developed and becomes available, GHG reduction and GWP reduction are big requirements. So, if there is a good alternative, this replacement switch may be front-loaded.

1123 based gas development, well, 1123 itself has been developed, but also it's mixed with another type of gas. This is something that we have been working on at AGC.

Finally, we have seen good results in terms of safety, and registration will complete in 2023. ASHRAE is the American Society of Heating, Refrigerating, and Air-Conditioning Engineers. Once this is registered there, it will be accepted as a refrigerant by the whole society. So, air-conditioning development manufacturers are part of the co-development team. We are also working with NEDO.

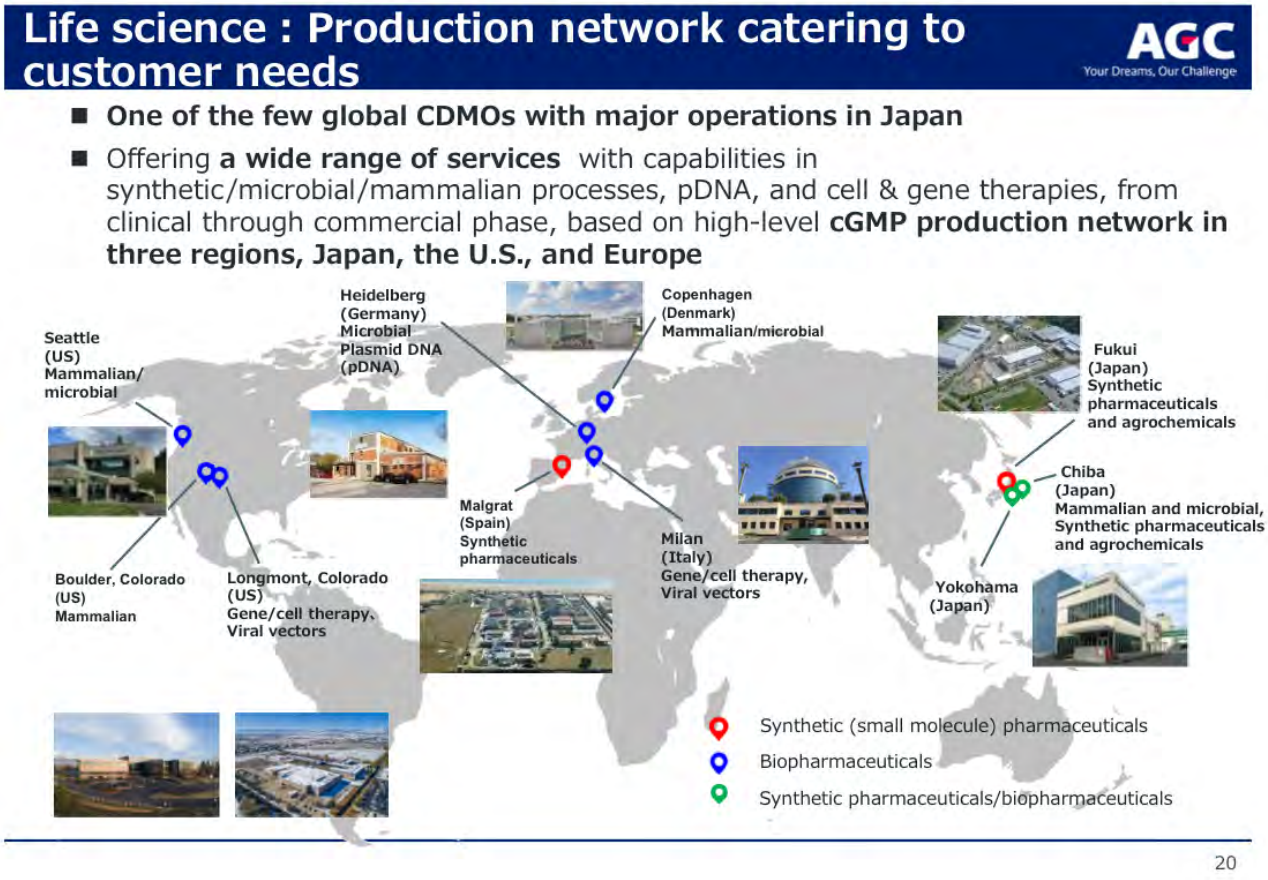
1123 targets the blue section, the whole blue section of the pie chart on the left-hand side, which means that AGC will be able to access a huge market using 1123. Once 1123 becomes available, we know that, performance-wise, it's much better than others. So, we believe that there's a very high probability that 1123 will be used once it's out there in the market.



Lastly, I would like to move on to life science.

I'm talking about three different businesses and this is the last one. I will start with the market situation, but I think this is already common knowledge.

Small molecule, biologics, and gene and cell therapy are different types of technologies. Also, you can see the trend of demand in the past. Gene and cell therapy have been growing recently quite tremendously. The small-molecule pharmaceuticals are still growing, in green, but bio is also growing very strongly. It's not just about the technology. Large pharmaceutical companies tend to outsource their manufacturing these days. Development and obtaining new IP is a focus of the management resource allocation by large pharma and the manufacturing production itself is getting outsourced. And in line with that trend, there is a big growth in the CDMO market. I'm sure that you're already fully aware of this.

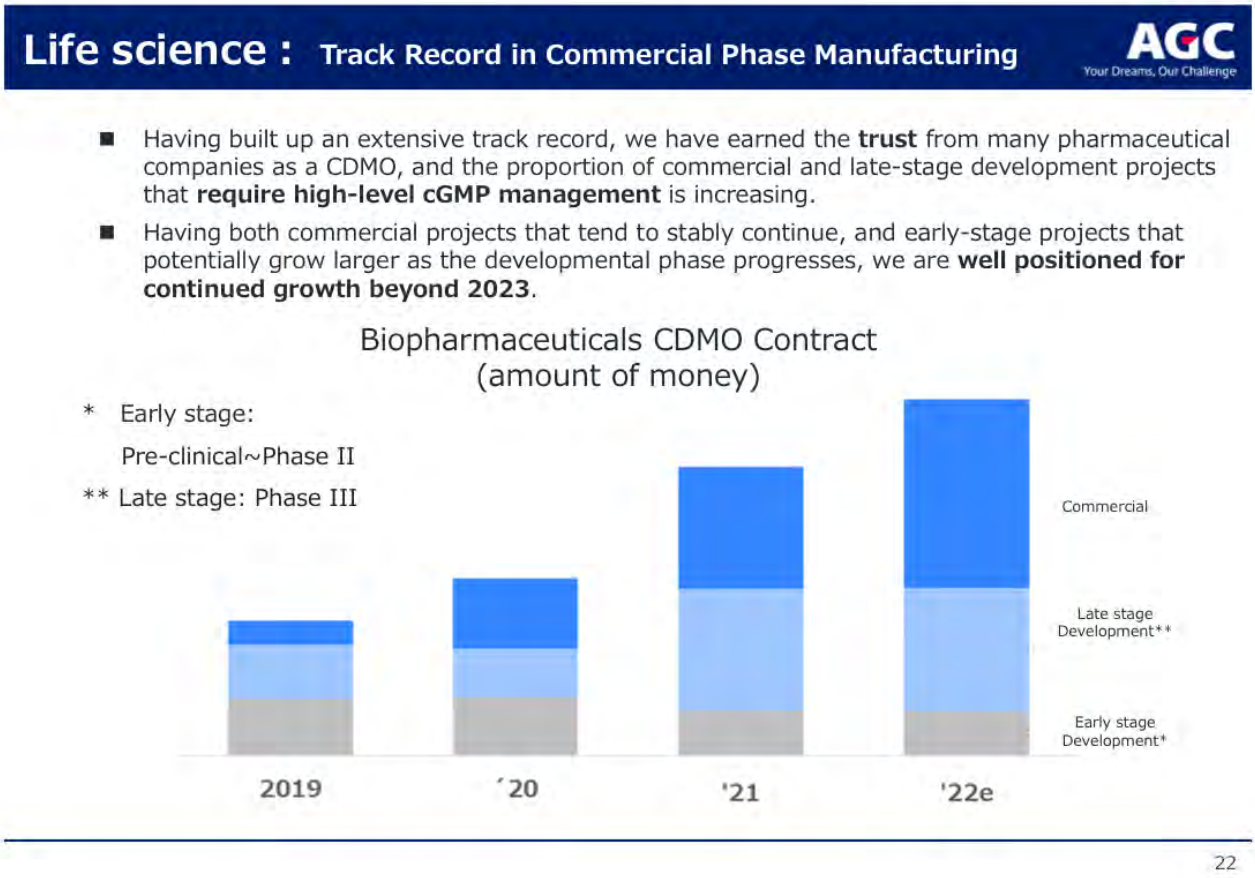


So AGC life science business, I would like to talk about its strengths first.

First, the production network catering to customers' needs. As you can see here, since 2016, we've been doing business overseas. It's been more than five years and we have this many overseas locations now. In the US, Europe, and Japan, in those three regions, we have established our locations and we are continuing with that effort. In those three regions, the standardized production, our product quality, and service quality are being provided. Everywhere, you can get the same quality. That's what we are aiming for. Of course, a high level of GMP production is what we are providing in supplying our products.

Starting from the clinical trials over to commercialization, this refers to the flexibility of our production system. From the smaller scale for clinical trials over to the large scale of commercialization, we can respond to those requirements.

Also, you can see the synthetic microbial and others, but all the technologies that have been demonstrated have been already gained by us. We have been demonstrating that, and we are providing those technologies to our customers. We can provide a very wide range of services and that is one of our strengths that I would like to highlight.



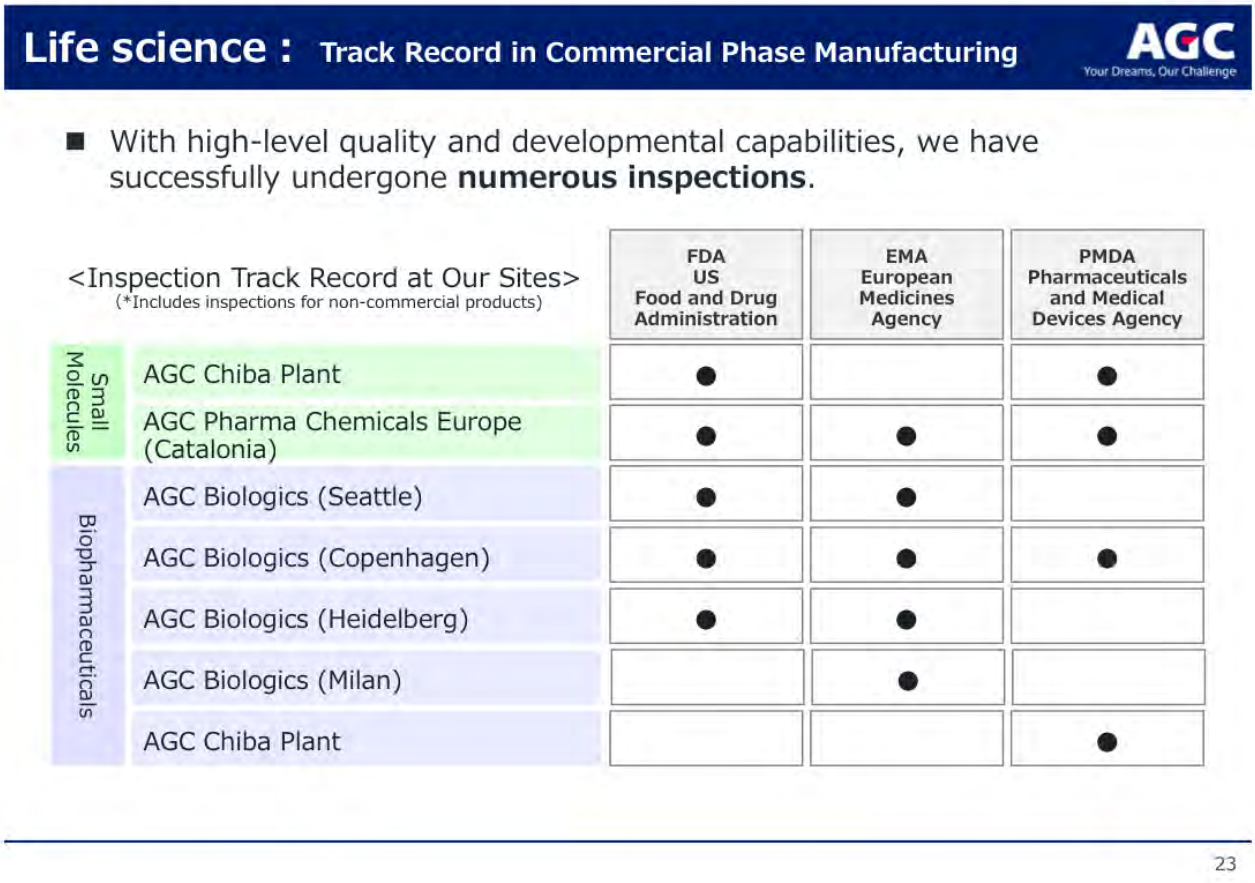
The second is the track record in commercial-phase manufacturing.

For commercial-phase pharmaceutical products, obviously, to pharmaceutical manufacturing, if they fail, that will be big trouble for them. You have to have a track record, a CDMO with a track record, and you have to have a trusting relationship with the CDMO. Otherwise, they wouldn't trust their production to CDMO. So, there's a higher level of control that is required. But once you get this commercialized product view, basically, until the product is discontinued, we will be able to have business.

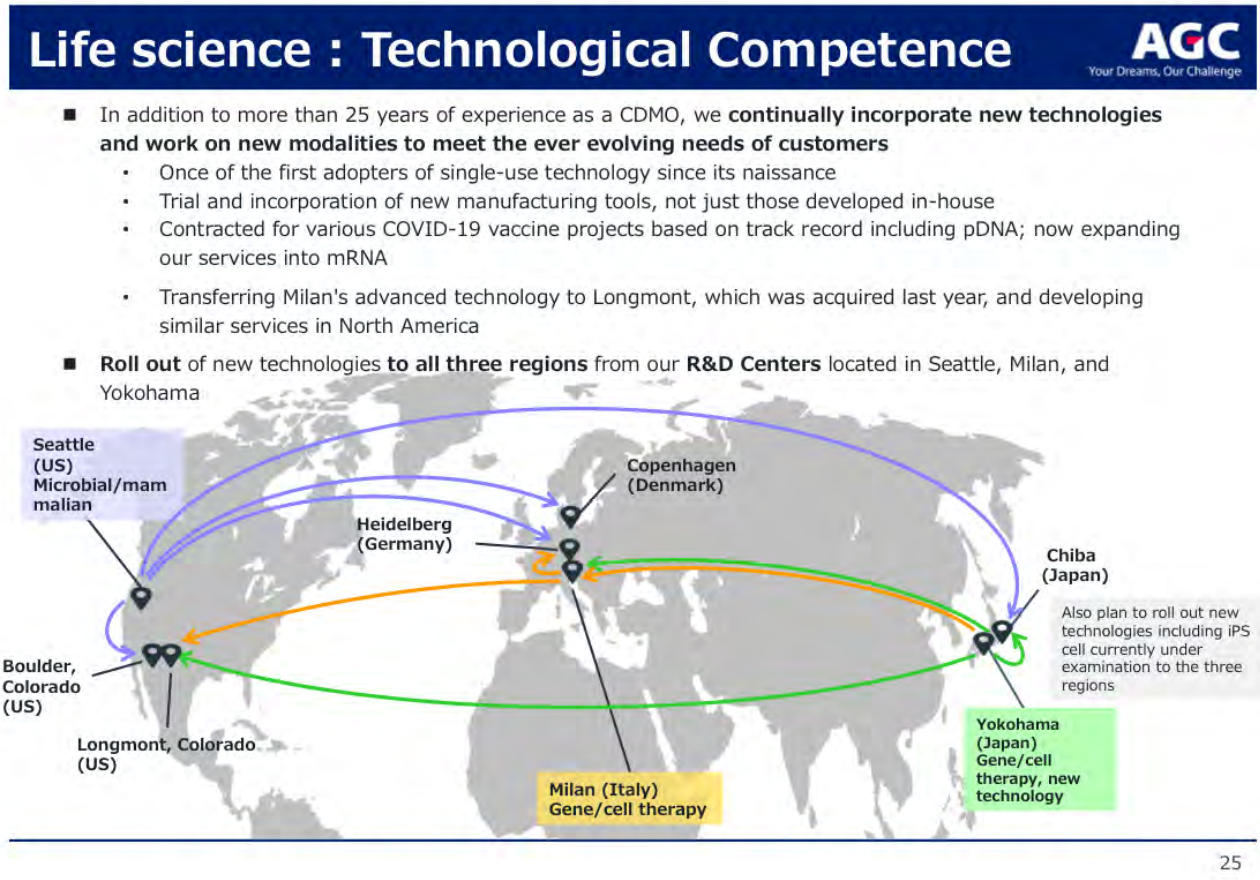
At the time of the development stage, depending on which of the stages of development you talk about, that could fail along the way. But once you are in the commercialization phase, the business is more stable. So, in commercialized phase, at the time of 2019, the portion of our mix was smaller, but this has been now increasing. A certain level of production has to be provided by the commercialized products and that is what we're aiming for. In that context, initially, what I said about the production system is relevant. We can address the various sizes from smaller to larger sizes. In that sense, what characterizes our business is that we can provide a single-use pack or disposable pack. 2,000 liters can be provided in single-use pack, up to 2,000 liters to 12,000 liters. There is flexibility in this whole range of spectrum and we can receive orders for any size of this spectrum. That is the flexibility. Once you get into the commercialized phase, of course, this depends on the negotiation with the customer, but if you're talking about a much larger and more stable commercialized product, then you need to have larger tank that could more appropriately suit the needs of the customers.

In some cases, in North America, we have 20,000-liter production equipment that has been acquired, so we are trying to increase the share of commercialized products for our services. But in terms of our business model, the early stage and late stage of the development and commercialized phase, we are providing

services throughout this whole process. Our production system is quite flexible to address any of those stages' needs.

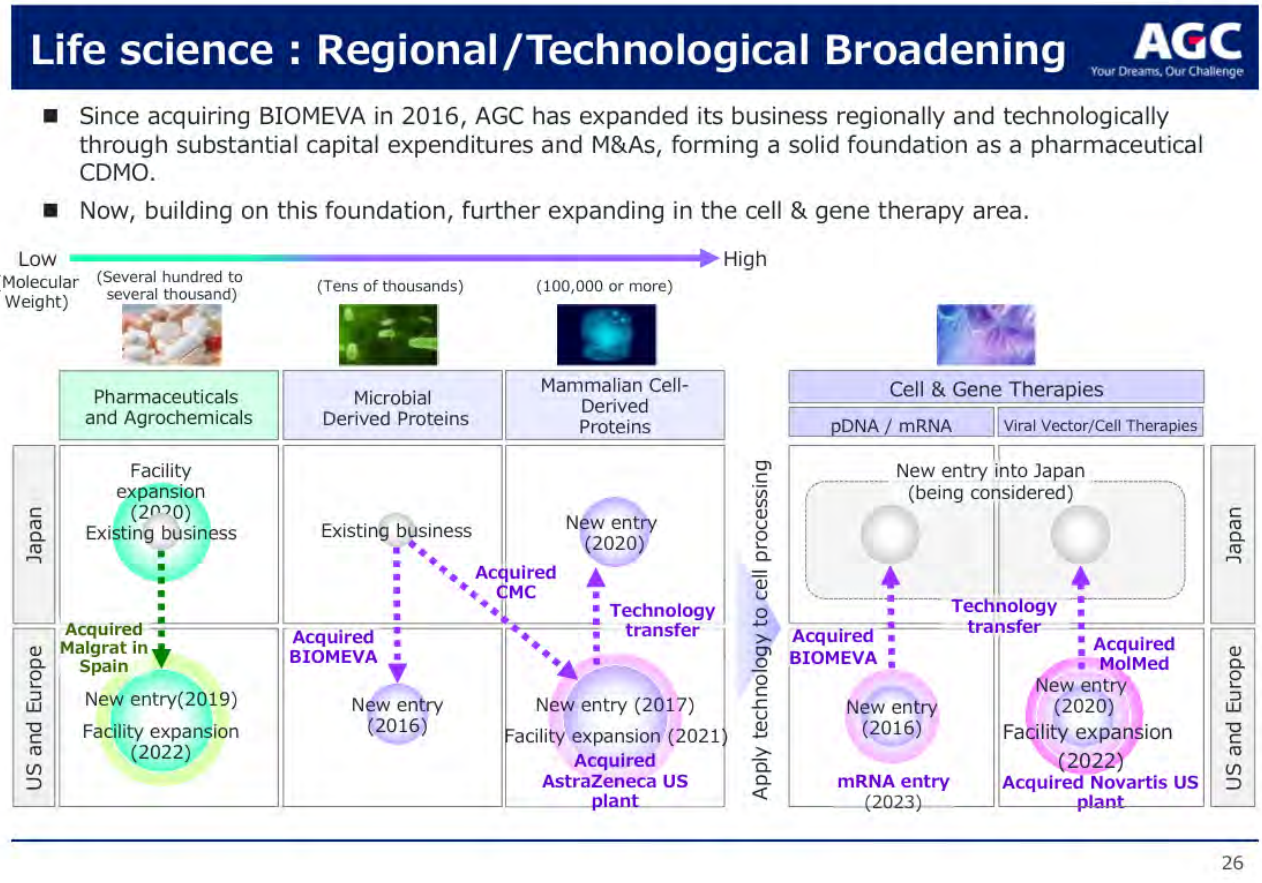


As for the track record of manufacturing, on the left, you can see our locations. FDA an EMA are quite strict in their inspections and audits. Of course, we have rich records of audits. In other words, we have been certified by those agencies and that is the most important point.



Then the technological competence, as I said at the outset, all of the demonstrated technologies are acquired by AGC Group, and we can actually respond to the needs for these technologies.

In terms of technology, single-use technology has been acquired as one of the first players to do so for biopharmaceuticals. For the coronavirus vaccine, messenger RNA can be also addressed and taken care of. Also, last year, we acquired a gene cell production facility acquired for Milan, and we were convinced that we can go for pDNA. Then there is Longmont in the US, and we have acquired this business from the US manufacturer. This is now being ramped up as a North American manufacturing site. We're in the process of that. So, in this gene and cell therapy, last year, we made acquisition and we did a demonstration in Italy. That is being deployed in North America already. So, as the current plan in Japan, there could be the deployment of this technology and that is what we are considering.



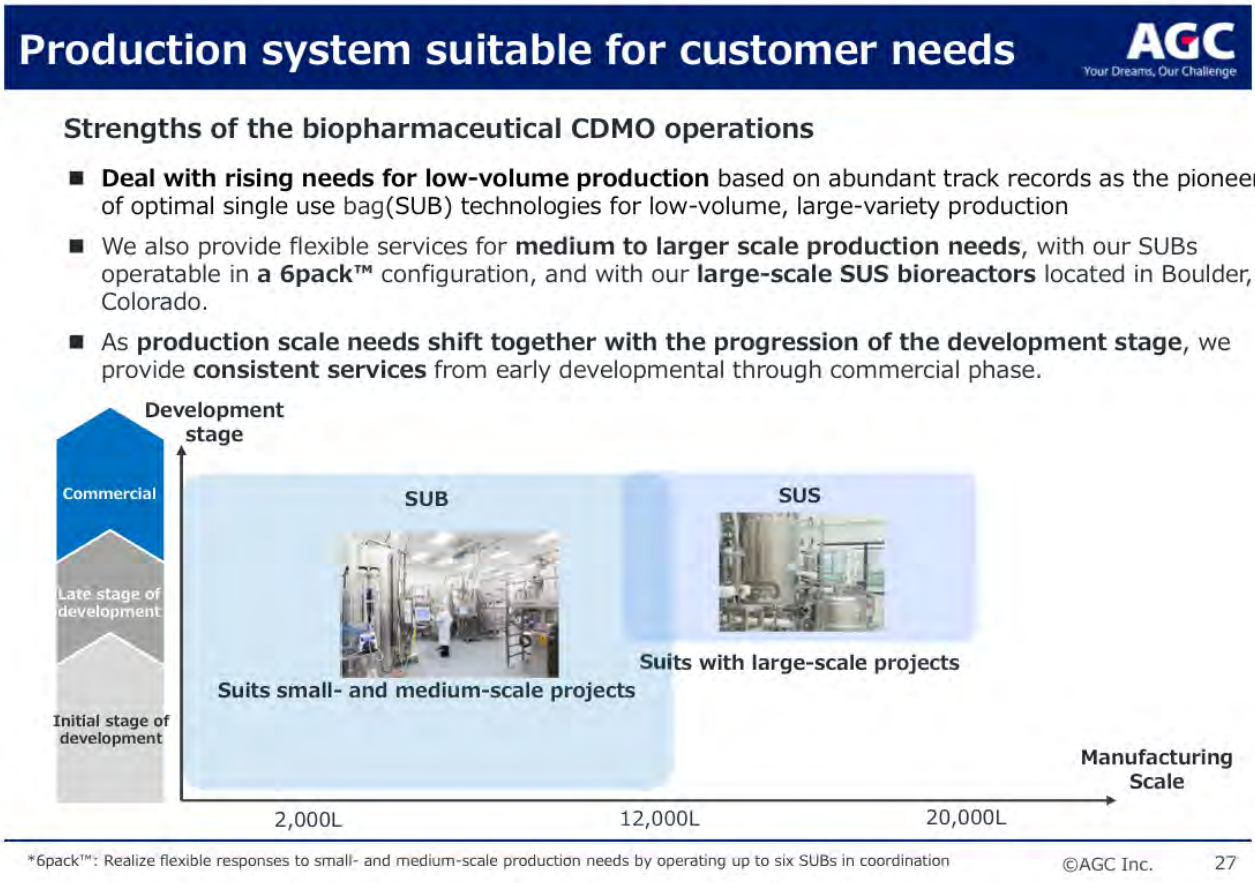
As for the technological broadening, if you can take a look at the schematic on the top, you see the technology access.

You see pharmaceutical and agrochemicals, microbial, and mammal cell-derived proteins. Then the vertical axis shows regions, Japan, US, and Europe. Up until 2016, the synthetic agrochemicals in Japan and microbial-derived proteins in Japan are the only two that we were doing. Then in the US and Europe, we deployed microbial-derived proteins, and then CMC was acquired.

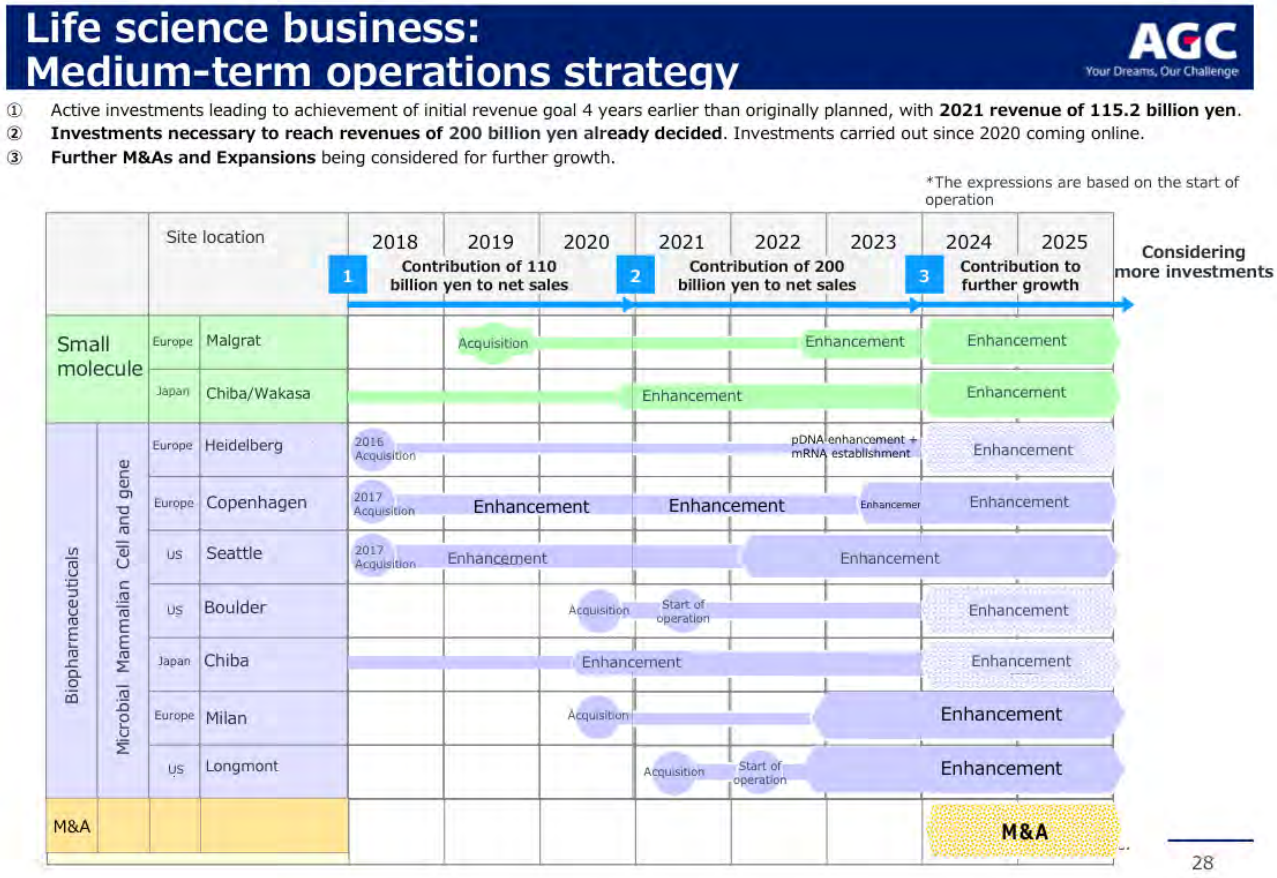
Mammalian cell-derived proteins is something that we entered as a newcomer. In the US and Europe, we secured a location and already technological transfer has been done in Japan, and the commercialization is now being done in Japan.

As for cells and gene therapies, in Italy, the US, and Europe, we made an acquisition last year and this has already been transferred to North America. Also, technological transfer is now under plan for Japan as well.

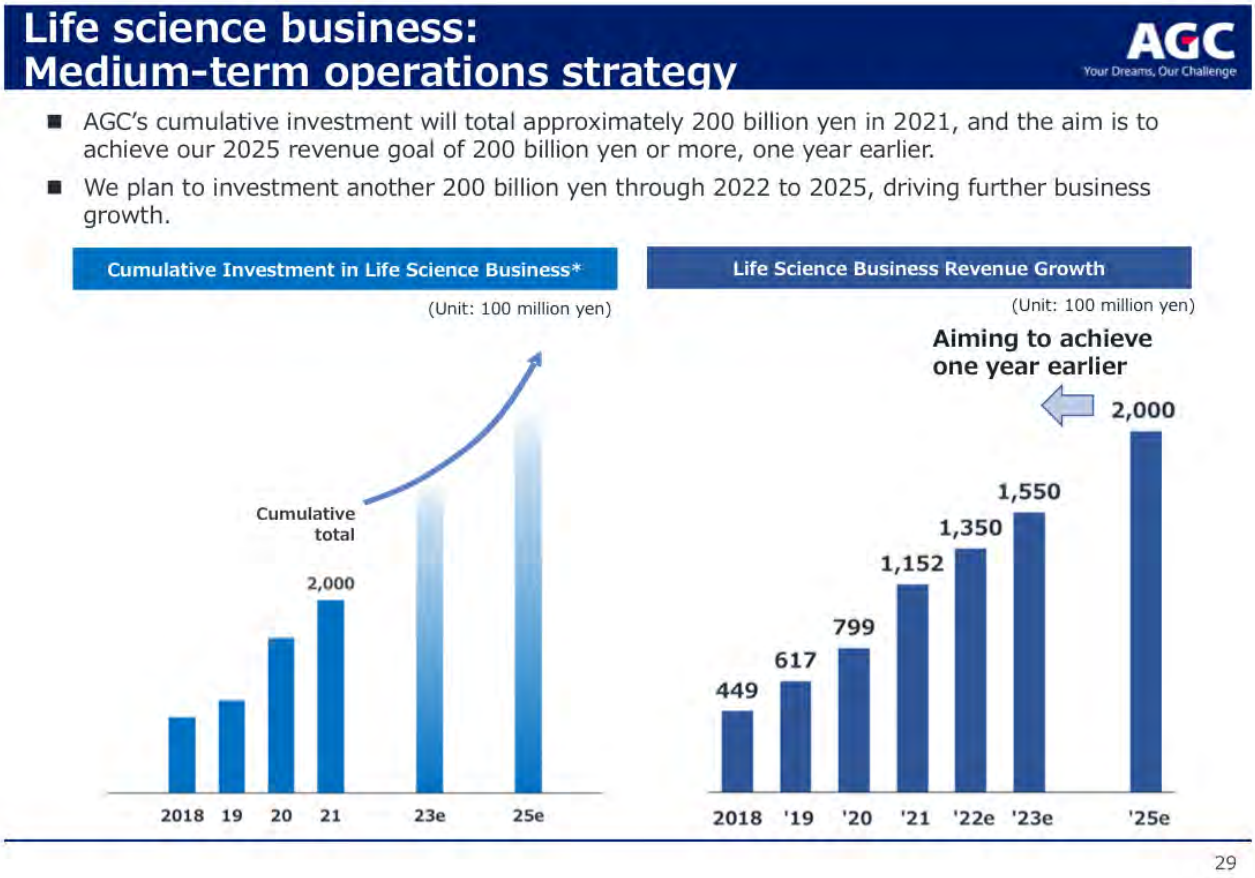
We are quite ready on the new technologies that can be demonstrated. We are deploying those technologies in each of those three regions so that we can provide standardized quality and provide them in the same manner. That is a system that we are now establishing.



On the left, the initial stage, late stage of development, and commercial stage, the development stage is shown on the vertical axis so we can provide services in an integrated manner. Also, in terms of size, single-use pack can be provided. We have a very flexible production system and that is used as a basis. Then there's stainless steel, a large-scale tank can be also used. There is a wide variety and spectrum of flexibility in terms of our production system that we can take advantage of.

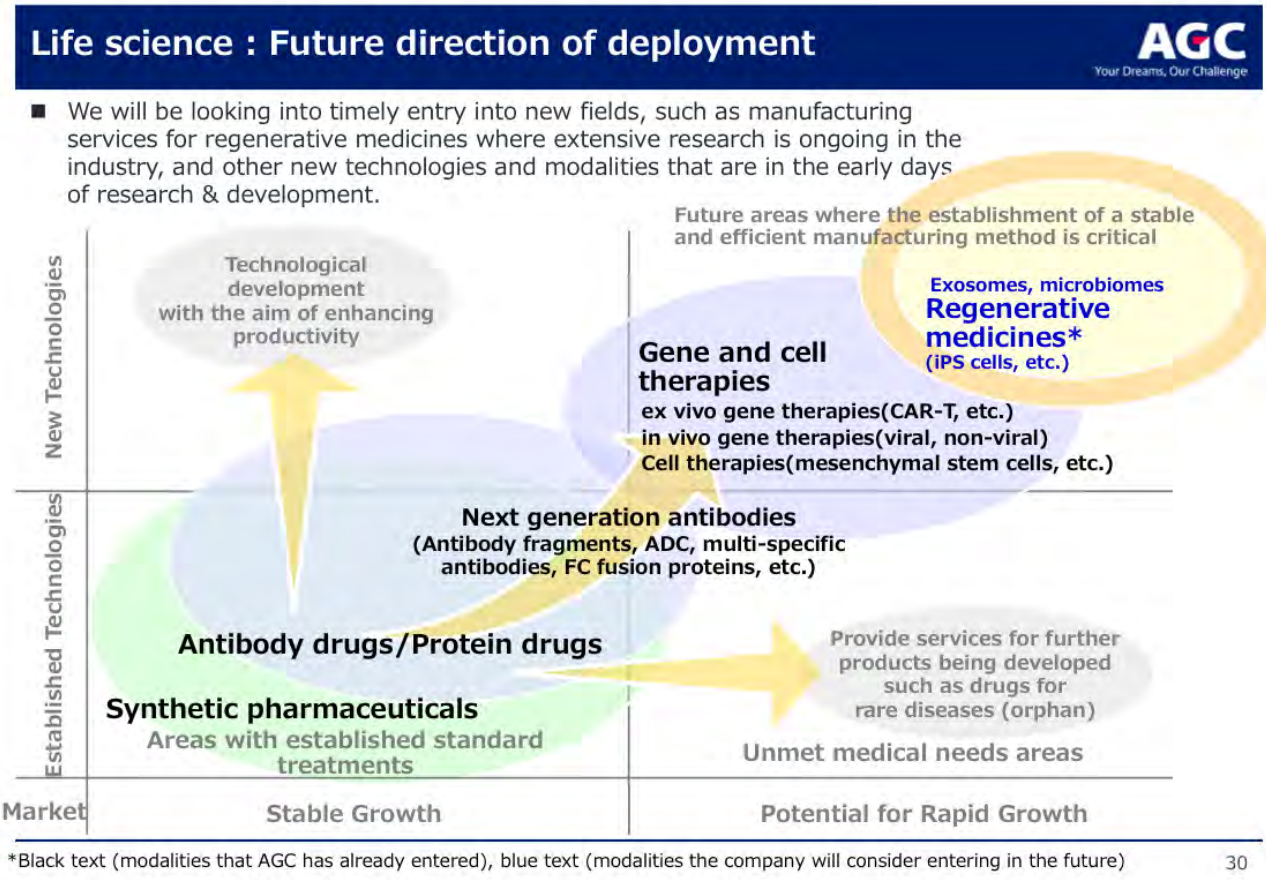


Starting from the left, in 2016 and 2017, six or seven years ago, maybe you think that we started around there, but actually, for the past 40 years, AGC has been making investments in development for bio products. But doing business overseas and also focusing resources in CDMO was started in 2016. For these growth markets, we are focusing our investments and that is being continued.



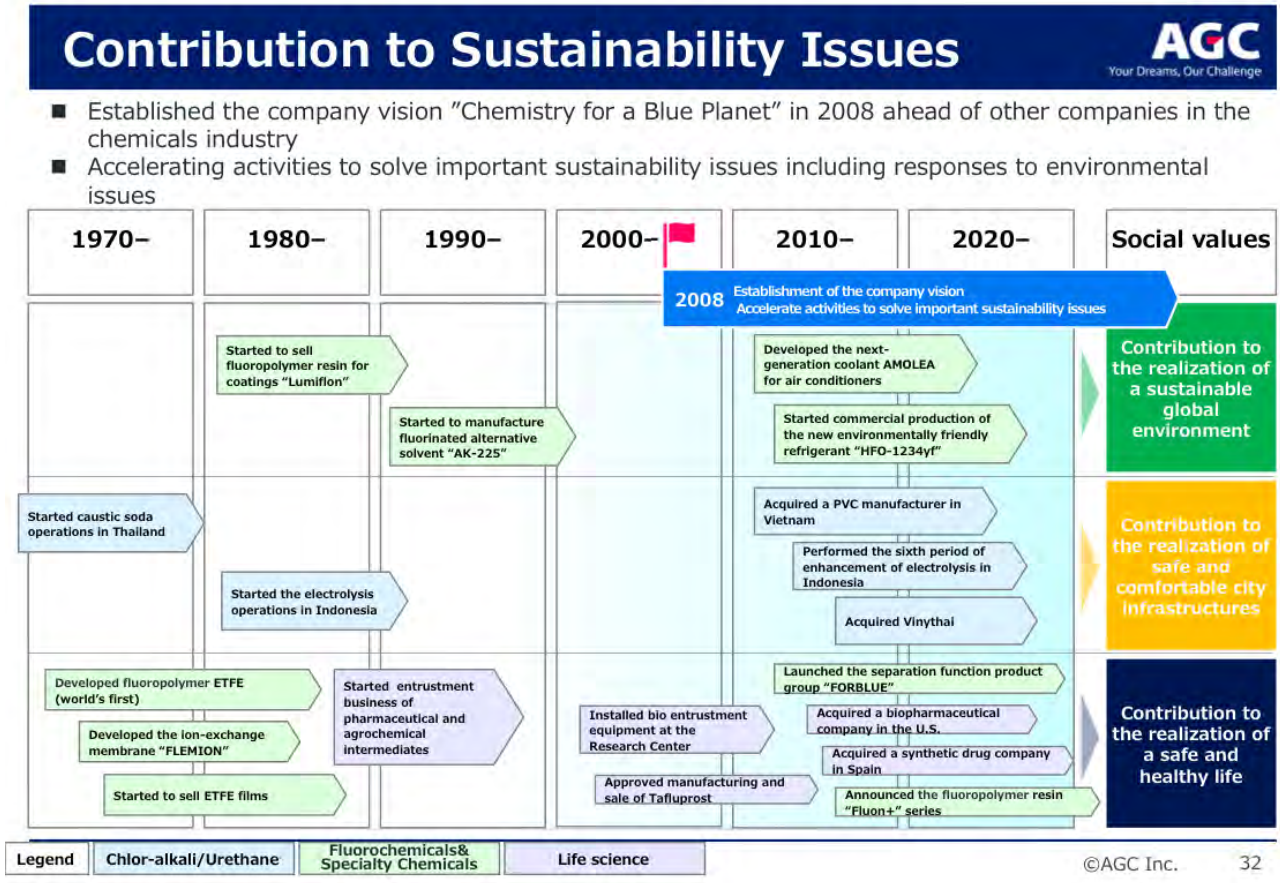
This is the plan.

Already in 2021, in Life Science, we have achieved the target four years earlier. We have achieved JPY115 billion and have already made an investment that can provide JPY200 billion in sales. Maybe in 2024, we can achieve the plan of JPY200 billion in sales one year earlier. That was expected originally for 2025. So we would continue to do optimal investments in a rapid manner. That is what we're planning. This is the modality of the technologies.

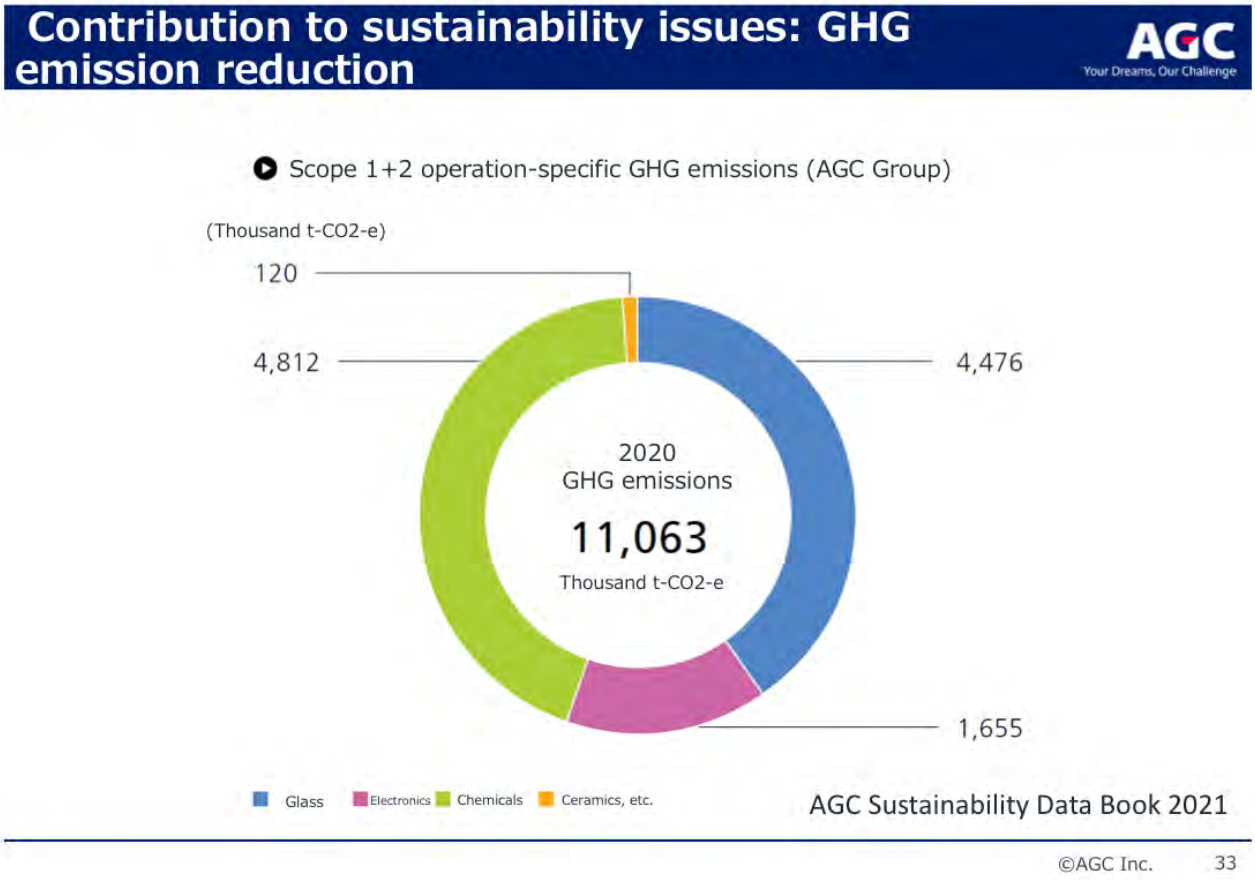


Next, in the next phase for regenerative medicine, we are now studying the possibility.

This is the flow that we're going to follow. Q technological favorable growth period and large-scale growth period for all products and antibody drugs are in the rapid growth stage. Also, gene and cell are at the initial stage and we are going to work each of these.



With regard to sustainability, at AGC Group, it's extremely important management issues. As a chemicals products company for more than a decade, Company vision of Chemistry for Blue Planet has been determined. I think we were ahead of others, in my view, when we established this, and various initiatives are being pursued.



Especially with regard to GHG, what are the initiatives that we are working on? This is the last item for my presentation.

Obviously, this is the Group target against 2019. In terms of absolute amount, we are going to reduce the emission by 30% as AGC Group. Compared to 2019, for a chemicals company, the scale would be several times larger, but the absolute amount should be reduced by 30%. However, for this, of course, on our part, this is one of the conditions for continuing the business. We have to achieve this target and we have to make a promise that we are going to achieve this. There are various initiatives that are being studied and some are already being implemented, so we're going to achieve this. However, as I said, the caustic soda and the PVC, those are quite essential for social society and people's lives, but electrolysis is used to produce them. For us, we should not stop supplying these products because that is also another form of contributing to society, in our view. So the 30% reduction by 2030, in absolute amount, we are going to achieve this.

For the Chemicals company as a whole, the CO2 intensity or the CO2 amount per unit of sales is going to be also a very important index for us. For the Chemicals company, this is just an internal model, but at the moment or as of 2019, the CO2 intensity in 2030 should be reduced to less than 30%. So, that is what we're going to aim for. But in terms of business structure, the flow of Chemicals and Life Science, they should be aiming for carbon neutral. And the carbon, or GHG, is quite low and favorable for carbon-neutral. Chlor-alkali should be contribute and we will achieve the 30% reduction. And the CO2 density will be reduced. And 30% against 2019 is something that we would like to achieve internally even though this is not official yet. So that's all for myself. Thank you very much.

[END]