AGC Inc.

Life Science Business Briefing Session

November 29, 2021

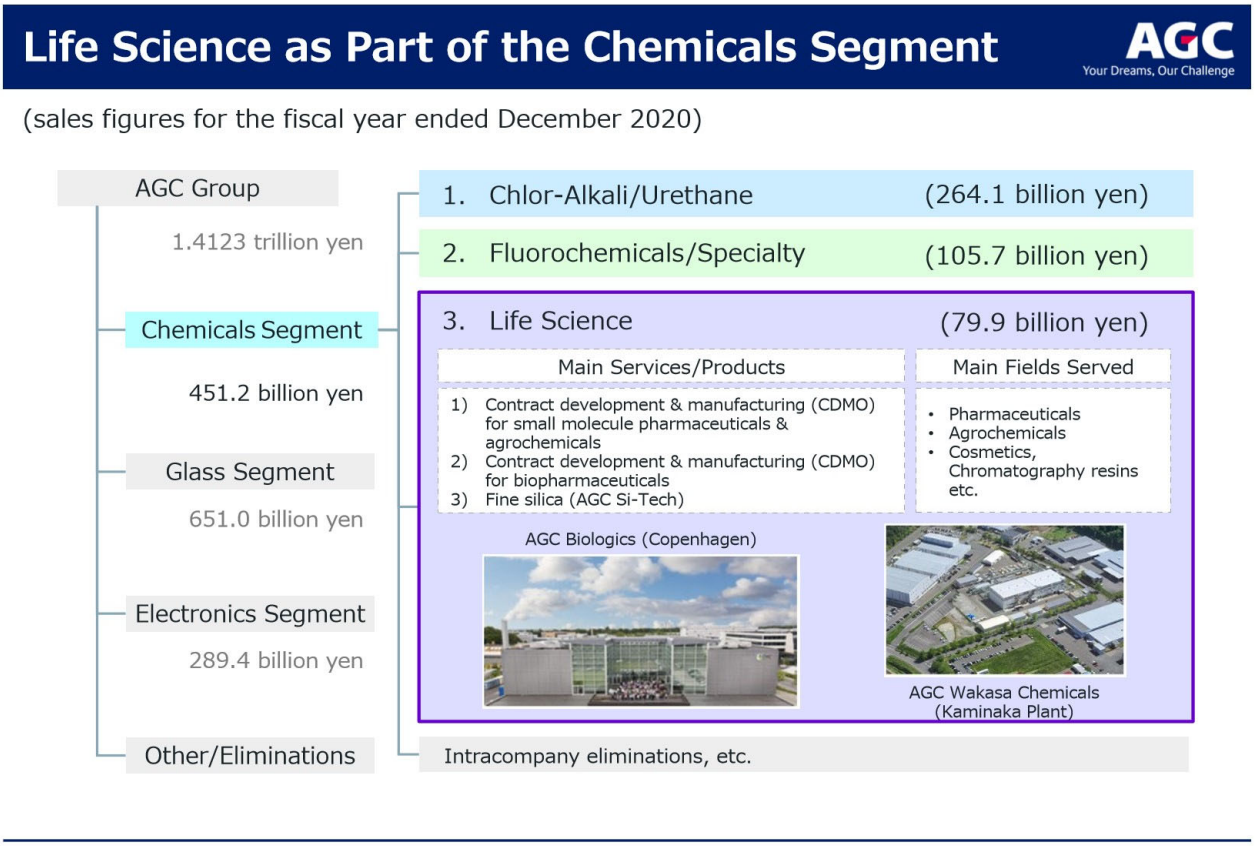
Event Summary

[Company Name]	AGC Inc.
[Company ID]	5201-QCODE
[Event Language]	JPN
[Event Type]	Investor Conference
[Event Name]	Life Science Business Briefing Session
[Fiscal Period]	
[Date]	November 29, 2021
[Number of Pages]	21
[Time]	17:00 – 18:17 (Total: 77 minutes, Presentation: 38 minutes, Q&A: 39 minutes)
[Venue]	Webcast
[Venue Size]	
[Participants]	
[Number of Speakers]	2

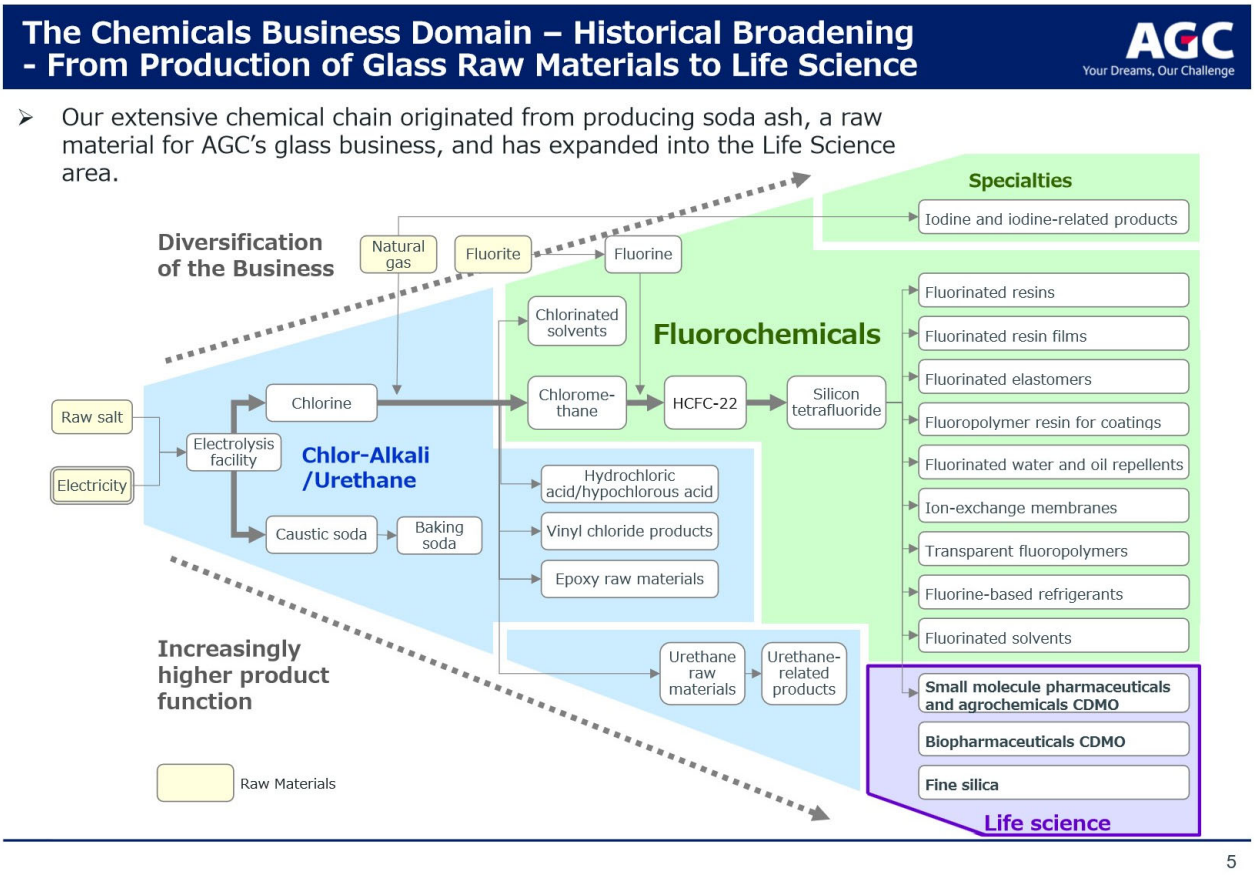
Noriyuki Komuro	General Manager of Life Science General Division, AGC Chemicals Company
Kazumi Tamaki	General Manager of Corporate Communications and Investor Relations Division

Presentation

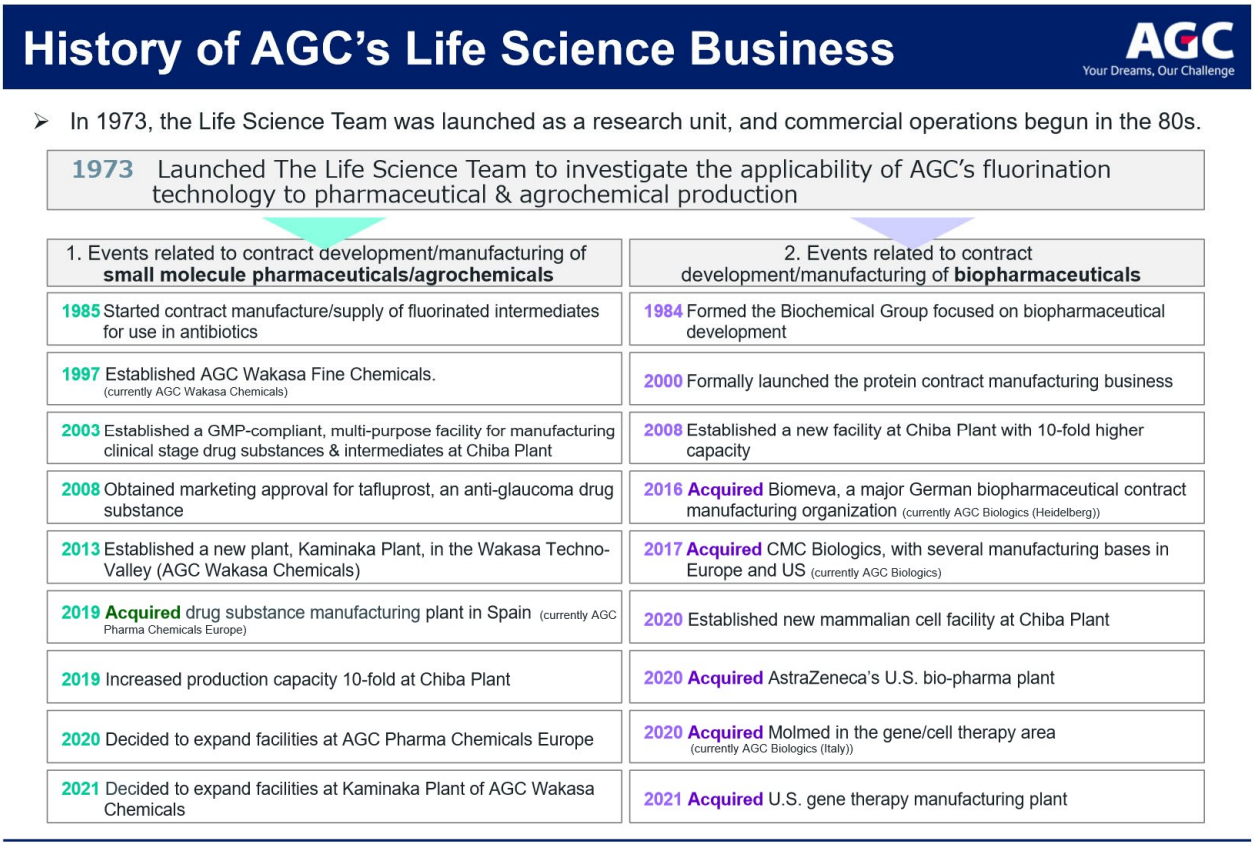
Komuro: Thank you very much for joining us despite your busy schedule today for our Life Science Business Briefing. Now, without further ado, I would like to discuss our Life Sciences business. This is the agenda today. There are 4 items to discuss about our business. I would like to make myself understood as well as possible. First, the positioning of our Life Science business in our company.



This is the Chemicals segment of our company. You can see the business scale from last fiscal year. On the left top, in AGC Group, JPY1.4 trillion plus in sales, and in the blue part, Chemicals segment, JPY450 billion in sales. Of that, Life Science is about JPY80 billion approximately in revenue. That was the actual result from last year. As you can see in Life Science, there is small molecule pharmaceuticals and biopharmaceuticals and fine silica. Those are the 3 major businesses that we have in Life Science.



Here, you can see the value chain of our chemical products. Over to the left, you see the electrolysis of raw salt to have chlorine and caustic soda. After that, decomposition using chlorine, you have chloromethane and fluorinated chemicals. You replace chlorine with fluorine to have various fluorinated resins, as you can see indicated in green. For chemicals business, at the right bottom corner, there is the purple part, which represents Life Science and small molecule pharmaceuticals and agrochemicals, contract development and manufacturing, or CDMO.

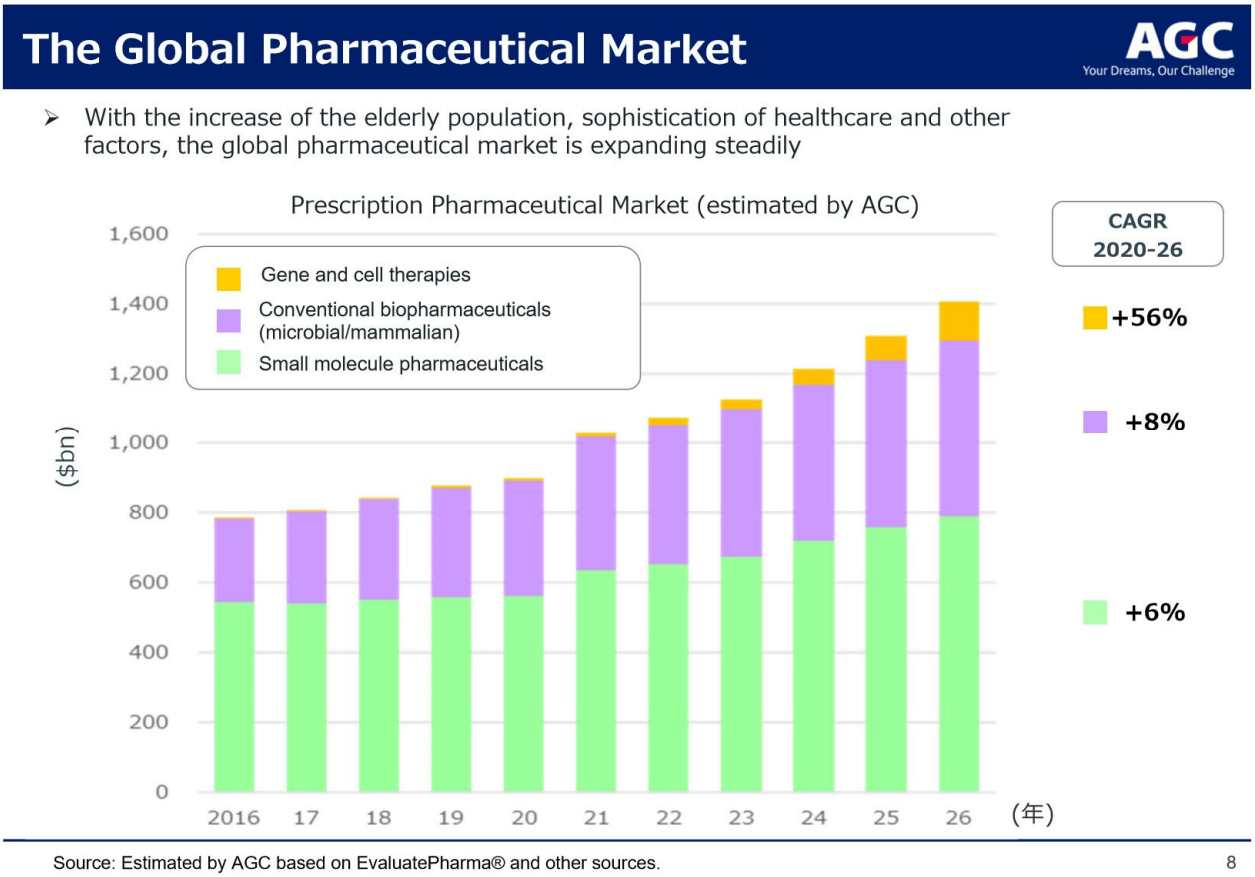


In the Chemicals businesses, we have originally expanded our business to Life Science. In the small molecule contract development and manufacturing organization, we have also developed our business in biopharmaceuticals and fine silica using our expertise in the small molecule business. This is what I explained earlier. This shows the history of AGC's Life Science business. As you can see at the top, in 1973, the Life Science team was launched.

you see the small molecule business and, on the right, biopharmaceuticals. On the left, the small molecule business. Back in 1985, fluorinated intermediate contract manufacturing was started. So, the business was started in 1985 for small molecule business or synthetic business, and then Wakasa Fine Chemicals was acquired. In 2008, the tafluprost anti-glaucoma drug was approved, and we have shifted our focus on the small molecule pharmaceuticals; this was the trigger.

The biggest development was made in 2013. We established a new plant – Kaminaka Plant in Wakasa Techno-Valley. From Boehringer Ingelheim, we have acquired plant in Spain 2019. In the same year, we have increased the production capacity 10-fold at Chiba Plant. The small molecule business was significantly expanded around these years. The facility that was acquired in Spain was expanded as well. Just last month, we spent JPY10 billion to expand facilities at Kaminaka Plant.

On the right, you see the biopharmaceuticals business. In 1973, the Life Science team was established, and 10 years later, in 1984, Bio Group was launched. But the business was started on a full-scale basis in 2000. At the moment, the Chiba factory is doing this business in Japan, and the biopharmaceutical facility was established in 2008. In 2016, BIOMEVA was acquired. It was a German company. Since then, almost every year, we did major acquisitions or production capacity expansions. And so, quite rapidly, we are expanding this business.



Likewise, in summer of this year, we made this press release from Novartis, the factory that was engaged in the gene therapy or AV in Longmont was acquired. We have been also focusing on gene therapy as well. Now, looking at the industry or market overall, just briefly, as you can see in this chart, you can see the pharmaceutical global market chronological changes, and the green portion is small molecule pharmaceuticals at the bottom, and the purple one in the middle is the microbial and mammalian derived from biopharmaceuticals or conventional biopharmaceuticals, as we call it. The orange portion is gene and cell therapies, which is at the forefront in this therapeutic area.

At the right most hand, you see the CAGR between 2020 and 2026. This is what we have been working on at those 3 areas. Small molecule was 6%, conventional biopharmaceuticals was 8%, and gene and cell therapies were 56%. Those are the growth rates. All 3 are growing steadily, especially gene and cell therapy, which is quite promising.

Global CDMO Market

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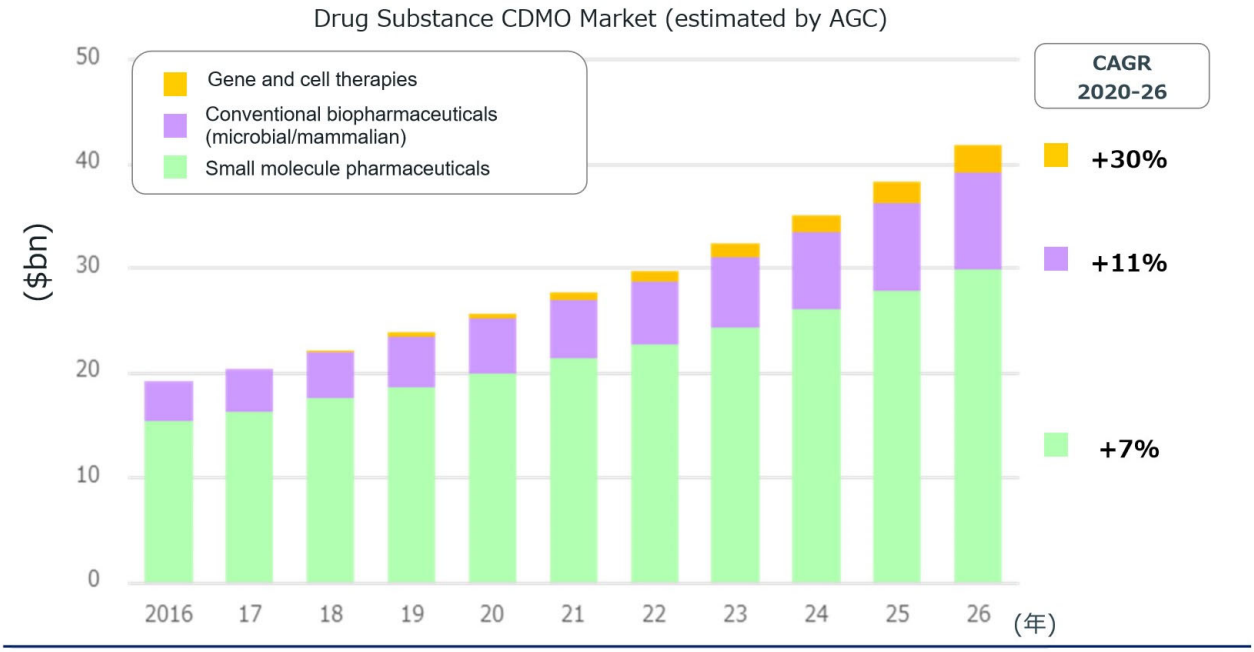
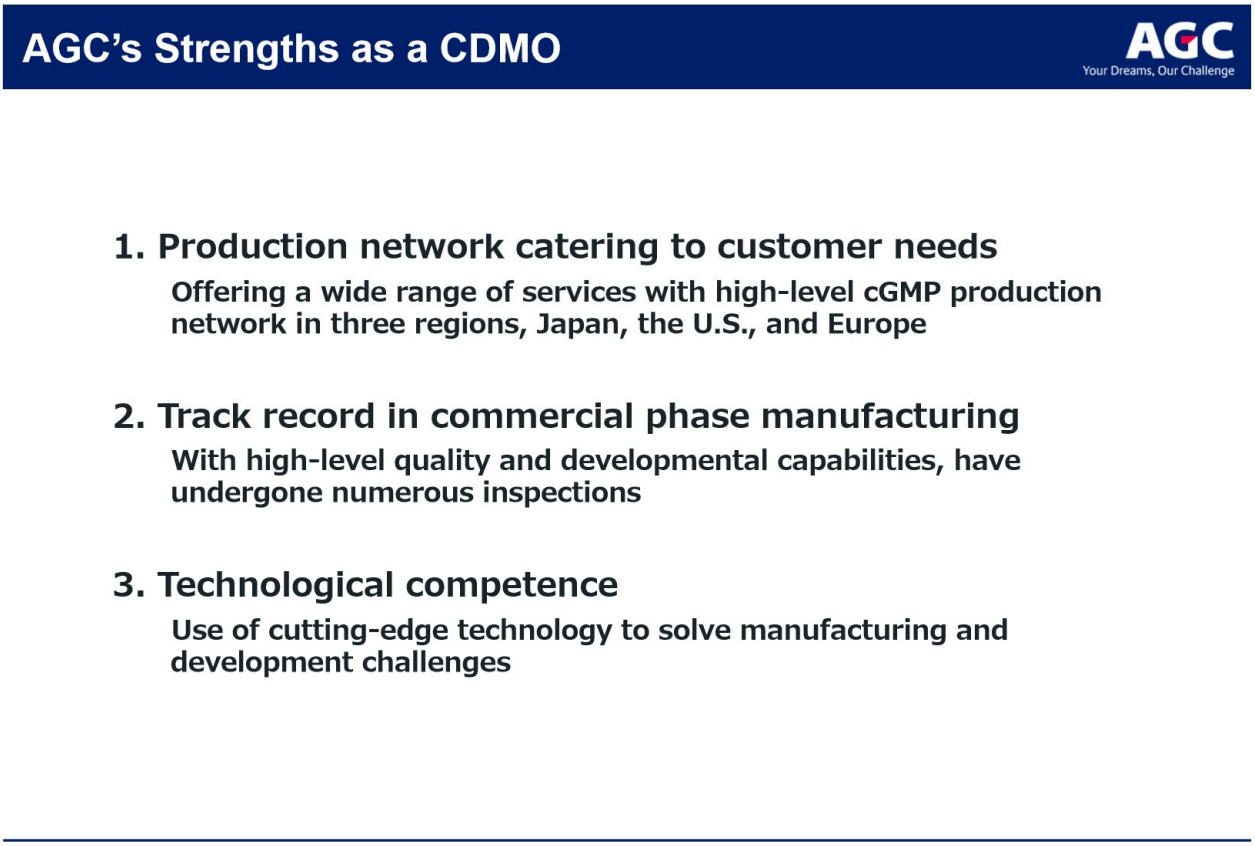
Your Dreams, Our Challenge

➢ With the trend towards increased outsourcing, the CDMO market is also expanding steadily.



Source: Estimated by AGC based on EvaluatePharma®, World Preview 2017, Outlook to 2022 and other sources. 9

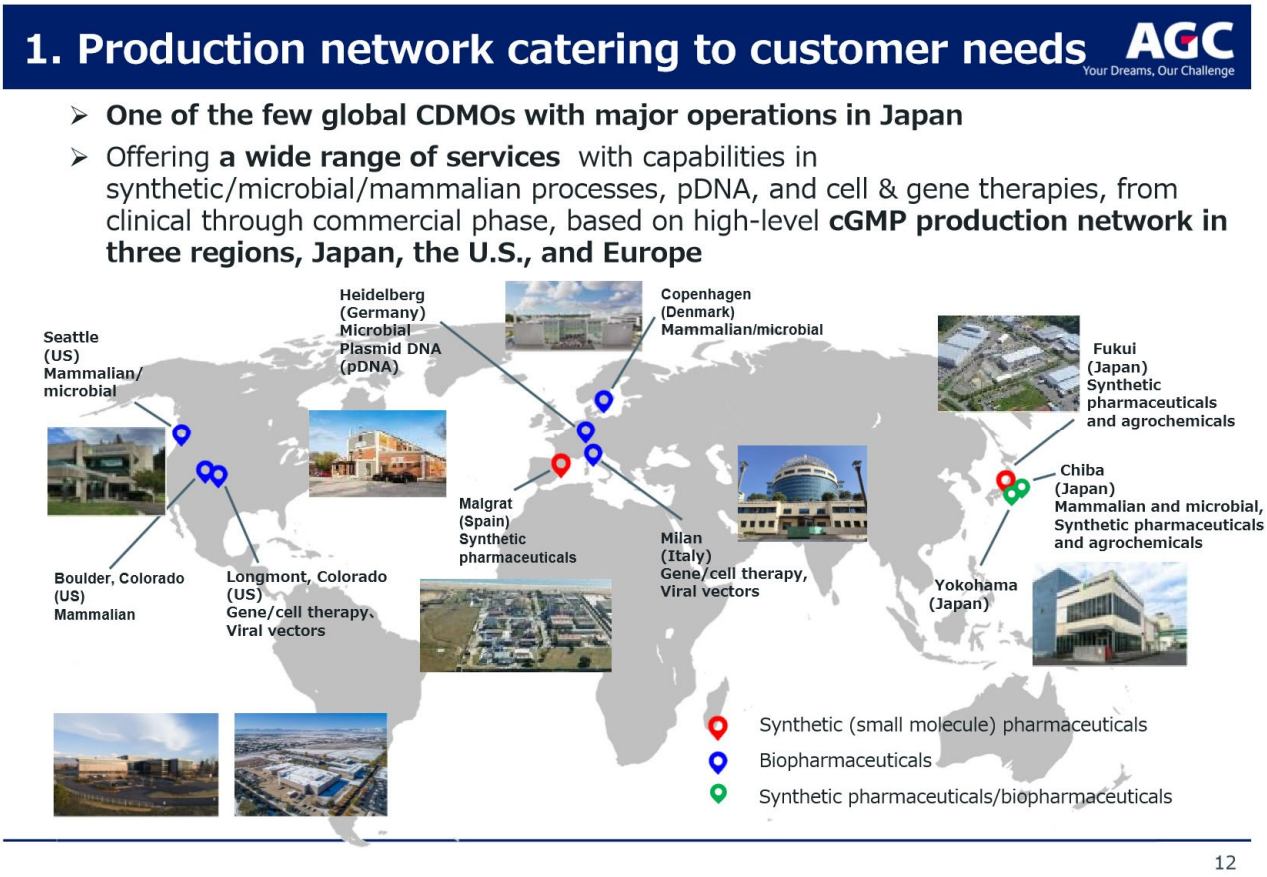
A similar chart is here as well. We are just looking at CDMO market alone. As you can see at the right, you see a CAGR between 2020 and 2026. Small molecules, 7%; biopharmaceuticals, 11%, and gene and cell therapies, 30%. Those are the growth rates. Every year, steady high growth is expected going forward for all 3 areas. So high growth rate is expected. So, investments have been also proactively made by various companies in this space.



Next, let me explain about our strengths. There are 3 major strengths, as you can see here. The first one is the production network catering to customer needs. We have 3 regions in Japan, the US, and Europe, and we have high-level cGMP production offering a wide range of services. Basically, the CDMO business is especially advanced in the US and Europe. Especially for biopharmaceuticals, the US and Europe are taking a large share in the market. There are very few players in Japan doing this business. This is the biggest differentiating point for us because we have businesses in all 3 regions: Japan, the US, and Europe.

The second one is the track record in commercial phase manufacturing. In pharmaceutical manufacturing, clinical trials will need to be done. You develop drugs, and you have to test the drugs. During this testing phase, the quality requirement for the manufacturing of those that are tested and also those drugs that are approved and produced are for the benefit of patients. If you are producing these for patients in the clinical setting, the quality level required is 1 level or 2 levels higher. If you have an actual track record in commercial phase manufacturing, there is a big difference between those that have the record and those that do not.

The third is technological competence. You have cutting-edge technology to solve manufacturing and development challenges. As I explained later, we have single-use bags. We were one of the first that has adopted this in the CDMO globally. In terms of single-use bags, we have the largest share in the world.



Now, this is what I was talking about when I said we do business in all 3 regions: Japan, the US, and Europe. Starting from the biopharmaceuticals, the blue dots represent biopharmaceutical manufacturing locations. On the left, you see the Americas and Seattle is the leftmost one. Mammalian and microbial business are done here. Then in the middle, there are 2 plants in Colorado. The left is in Boulder, and mammalian sells 20,000-liter capacity SUS bioreactor. There are 2 bioreactors in this plant.

The other one in Colorado is in Longmont. This is the gene therapy and cell therapy viral vector production facility. Then in Europe, Copenhagen microbial and mammalian. In the middle, Heidelberg microbial business. The other day, we made a press release plasmid DNA and the messenger RNA, which is quite well-known because of COVID-19 vaccine. The plasmid DNA is the raw material for messenger RNA. So, CDMO for this is what we also do.

Then the bottom, Milan business. Last year, we acquired gene therapy and cell therapy business here. On the left, the red one is Malgrat. There is a synthetic pharmaceuticals business plant. In 2019, we acquired this plant. Then, over to the right, Japan. Basically, the Chiba Plant represented in green points with microbial, mammalian, and small molecule pharmaceutical and agrochemicals, so all these are done. In Fukui, synthetic pharmaceuticals and agrochemicals. And as I explained, in Yokohama, there's development work being done.

1. Production network catering to customer needs

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Customer Centric Culture

- AGC builds **close, long-term relationships** with customers, with management level members taking a hands-on approach.
- AGC **provides seamless services**, including tech-transfer between sites, made possible through our integrated operations among the three regions.
  - Optimal proposals including manufacturing location and timing according to needs
  - Reduction in communication hurdles, such as language and time differences

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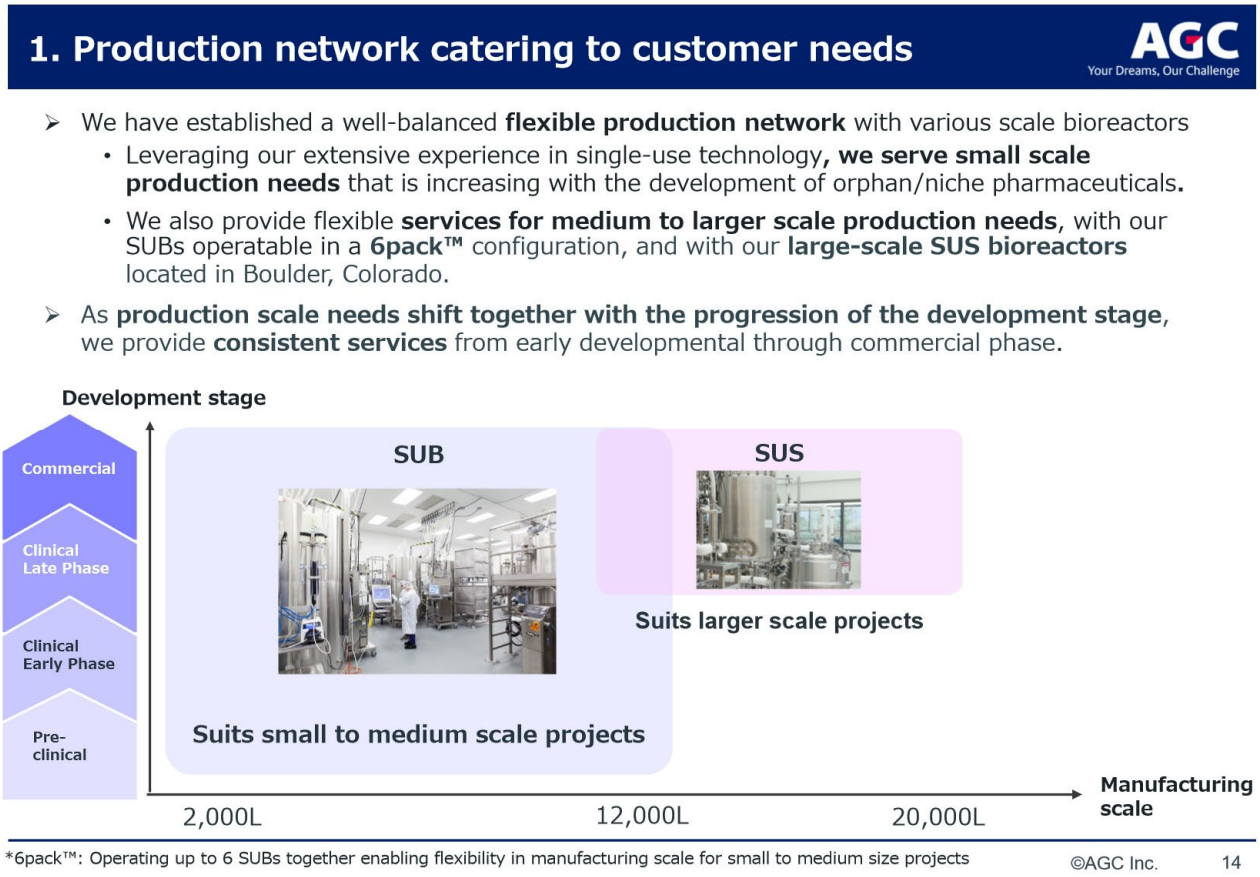
Next is the production network catering to customer needs. As I explained earlier, a lot of manufacturing locations around the world and also another strength of ours is that as AGC Biologics at all production locations, the same level GMP service is being offered. Especially when you look at the foreign competitors, even if they buy other companies, they leave the company name as they are, and independently, those businesses still run even after acquisition. But in our case, for example, MolMed was acquired last year, but company name is immediately changed to AGC Biologics, and business management was also integrated into AGC Group. In any locations, you can enjoy the same level of service, at the same price, with services being offered.

So, depending on the customers, when they would like to get their services, sometimes they are not able to access our services, but we can use the global site so that we are able to meet the customers' needs using a different site, which locate globally in a different vision.



We have single-use bags, and that is SUB, which is in the purple. The bag is discarded after the single use. Normally, if the tank is SUS tank, after SUS is being used, it is cleaned, then disinfected, then the tank is being used again. So, large manufacturing is done after the next manufacturing is going to be done. Before that is done, there is a downtime. However, because it is SUB, we can just discard, and we can have small lots of variable products. Manufacturing can be done because of less downtime between each production.

On the right-hand side, there's a SUS. We do have a 2,000-liter or 3,000-liter SUS, but we have gotten 20,000-liter SUS. Compared to 2,000, it's 20,000. Of course, that is 10-fold. So, this is suited for the large-scale projects. If the project becomes larger, then SUS 20,000-liter tank is used. At the same time, if the project site is not so large, then we have a 6-pack configuration that means we connect six 2,000-liter bags, and that comes up to 12,000 liters altogether.

If the volume is little bit short for SUS, then we can connect the single-use bag, and then we can meet the customers' needs for that scale. Basically, we have 2,000-liter single-use bags as the core of the business. However, we can support, of course, 20,000-liter SUS. We purchased it last year, and that is in full operation from this year. Therefore, we will be able to provide these services for large scale projects from now on.

2. Track Record in Commercial Phase Manufacturing

AGC Your Dreams, Our Challenge

- With high-level quality and developmental capabilities, we have successfully undergone numerous inspections.

<Inspection Track Record at Our Sites>
(*Includes inspections for non-commercial products)

		FDA US Food and Drug Administration	EMA European Medicines Agency	PMDA Pharmaceuticals and Medical Devices Agency
Small Molecules	AGC Chiba Plant	●		●
	AGC Pharma Chemicals Europe (Catalonia)	●	●	●
Biopharmaceuticals	AGC Biologics (Seattle)	●	●	
	AGC Biologics (Copenhagen)	●	●	●
	AGC Biologics (Heidelberg)	●	●	
	AGC Biologics (Milan)		●	
	AGC Chiba Plant			●

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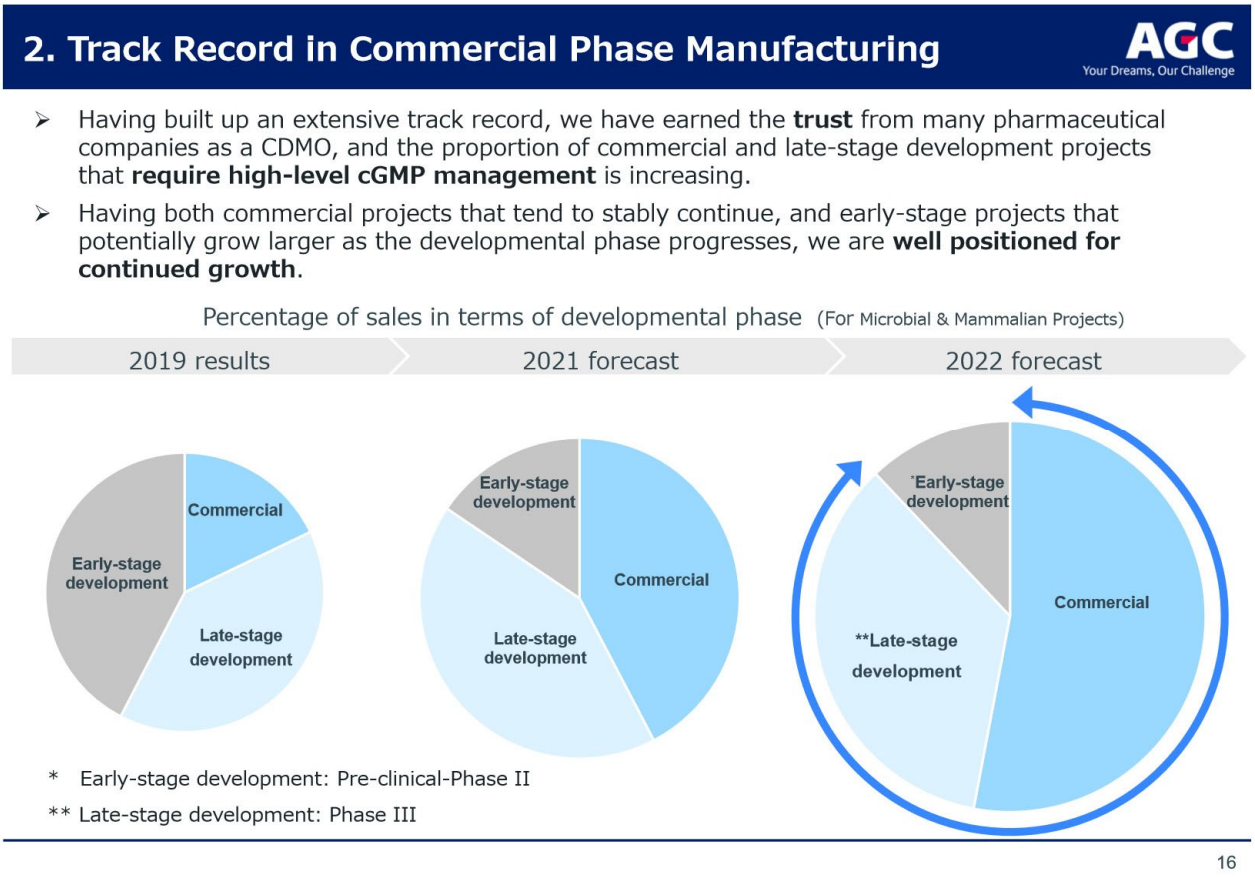
This talks about our commercial phase manufacturing track record. Before the commercial manufacturing started, of course, there is FDA or EMA, and in Japan, PMDA's approval. Inspection is done, that is, the pre-manufacturing inspection by each agent. This inspection is very, very stringent, but we received the inspection from these 3 – the FDA, EMA, and PMDA, and passed the inspection.



Now, I would like to talk about track record in commercial phase manufacturing from the year 2019 results to the 2021 forecast, and the right-hand side is the next year's forecast. Commercial manufacturing is increasing, particularly when it comes to the 2022 forecast after commercial and late-stage development; altogether, this will become 90% of sales. The development stage project has a very low success probability when it comes to pharmaceutical product, but when it is commercial, the commercial sales will be very stable because it's already approved, and we are able to provide the commercial product to the patients who need this product every year. So, in the future, if we have a commercial sales ratio increase, that means that our business will be more and more stable.

Late-stage development also is important. I would like to add to that: for early-stage development in terms of CDMOs, the approval level, of course, we have to comply with GMP, but a small- to medium-sized CDMO can support early-stage development. However, when it comes to late-stage development, particularly for Phase III, the late-stage development data is going to be submitted as a dossier for the NDA.

Therefore, the late-stage development means that once that drug is being approved, then we will get the commercial order. We will have more late-stage development, meaning we will have the future business. The Phase III success ratio is about 60% or 70%, I think. So, 60% to 70% of late-stage development will become commercial projects in the future. I am talking of the biopharmaceutical. The commercial sales ratio is going to increase in the future to give us more stable business.

3. Technological Competence

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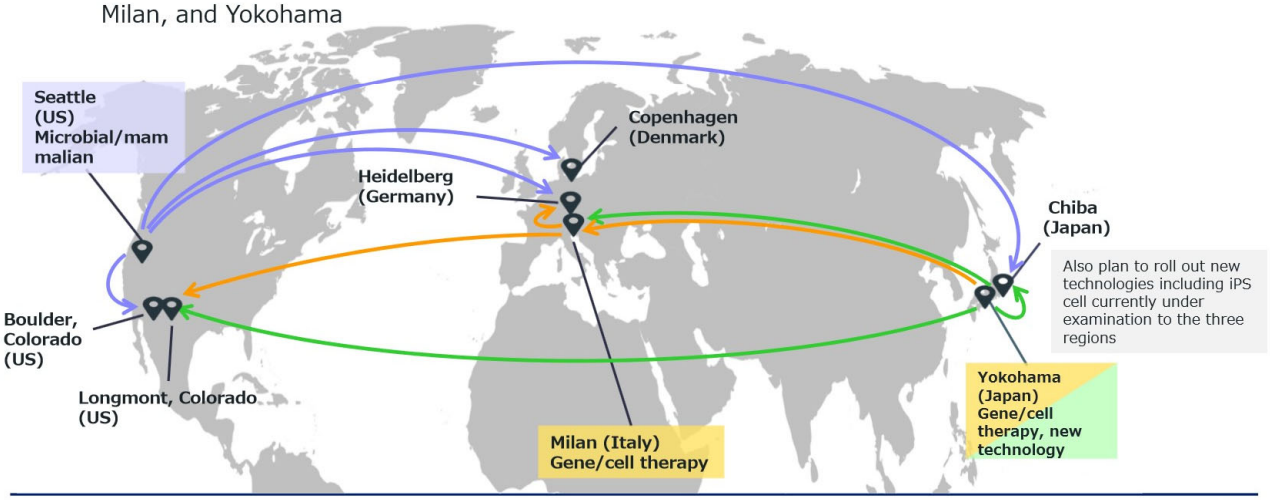
- In addition to more than 25 years of experience as a CDMO, we **continually incorporate new technologies and work on new modalities to meet the ever evolving needs of customers**
  - Once of the first adopters of single-use technology since its naissance
  - Trial and incorporation of new manufacturing tools, not just those developed in-house
  - Contracted for various COVID-19 vaccine projects based on track record including pDNA; now expanding our services into mRNA
- **Roll out** of new technologies **to all three regions** from our **R&D Centers** located in Seattle, Milan, and Yokohama



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Now, I would like to talk about technological competence. We have acquired more technologies. However, having said that, in this biopharmaceutical world, technology is evolving day-by-day. Therefore, we have to always try to get new technologies, always. For single-use technology as a CDMO, we are the first one to use that in the world, much earlier than other competitors and as plasmid DNA, that is, the technology that we started to use compared to other competitors. I can talk about this later. There is Pfizer. Actually, BioNTech.

Pfizer-BioNTech is our customer to manufacture plasmid DNA for vaccines. We expect to launch new technologies earlier than competitors in the future. There is a Seattle microbial/mammalian R&D center on the left-hand side. In middle center, there is a Milan R&D center for gene and cell therapy. So, technology is going to be transferred to Colorado and Longmont, and from Milan to Longmont. Also in Japan, we are thinking of developing Japan's side also for businesses. In Yokohama, there are new technologies applications, such as IPS cells. This is the new technology that we are thinking of using, developing in Yokohama.

COVID-19-Related Projects

AGC Your Dreams, Our Challenge

- We have been contracted for many COVID-19-related projects based on our high level of competence and track record.

(As of November, 2021)

Announced Date	Contractor company	Announcement
05/14/20	AdaptVac (Denmark)	Manufacture of a vaccine candidate
05/14/20	CytoDyn (US)	Leronlimab, a candidate for therapeutic drug, clinical trials underway in the US
05/21/20	Takara Bio (Japan)	Manufacture of an intermediate for a DNA vaccine candidate
06/04/20	Novavax (US)	Manufacture of an adjuvant of vaccine candidate NVX-CoV2373
07/20/20	Molecular Partners AG (Switzerland)	Manufacture of MP0420, a therapeutic drug candidate
08/18/20	Novavax (US)	Expanded the contract for the adjuvant of the vaccine candidate NVX-CoV2373 app. 1.5-fold
06/08/21	BioNTech (Germany)	Manufacture of plasmid DNA, a raw material of the Pfizer-BioNTech COVID-19 vaccine

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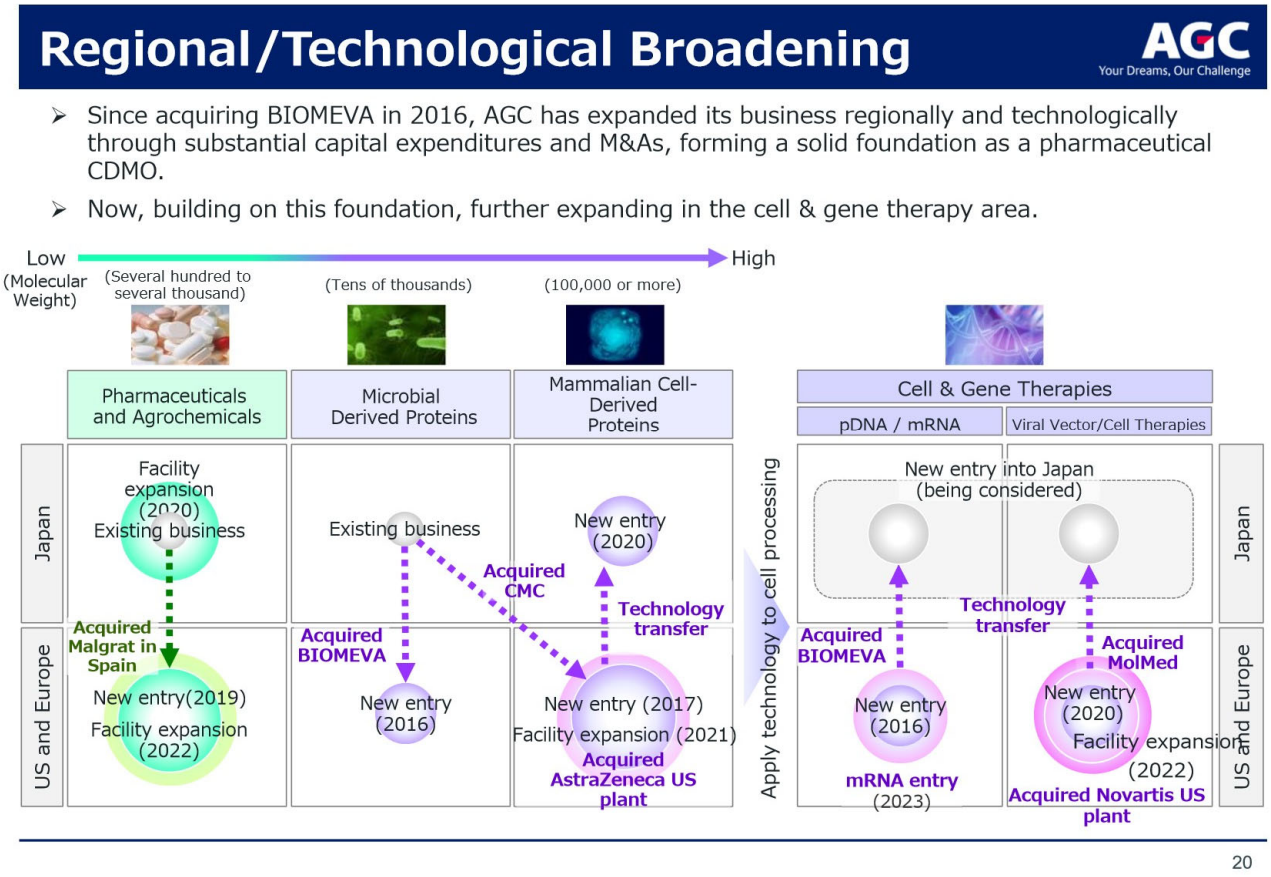
This chart talks about COVID-19 related projects. These are the ones that we are allowed to disclose to the public using newspapers, or there are other projects, which we are not able to talk about. There are 7 COVID-19 related projects, which we contracted. BioNTech, which is on the bottom of this slide, and also Novavax, which is the second from the bottom.



I would like to talk about the current situation and also the future station. This slide talks about what I have talked about using animation. As I said earlier, in Japan, pharmaceuticals and microbial CDMO was our original business. And we acquired BIOMEVA in 2016, so we entered the microbial business in Europe.

BIOMEVA's plasmid DNA was already our business at that time. In the year 2017, we acquired CMC to acquire the mammalian cell technology, and we acquired 2 sites, Seattle and Copenhagen. After that, in the year 2019, Synthetic Pharmaceutical, the plant in Spain, was acquired so that we entered European market. Then after that, using CMC technology from last year, in the Chiba Plant of Japan, we started providing services of mammalian cell in Japan.

MolMed was acquired last year. The virus vector for gene and cell therapy has become our new area last year. After that, we acquired AstraZeneca US Plant. A 20,000-liter stainless tank was acquired after that. Also, the same for synthetic pharmaceutical was expanded. Also, on the right-hand side, MolMed acquisition was done. After that, we expanded the facility. In summer of this year, we acquired a Colorado Plant from Novartis, so we were able to do our businesses in the US. That is already decided. Also, messenger RNA will be entered, and business entry is going to be done in Heidelberg in 2023. So, messenger RNA gene and cell therapy are going to be used, and we are thinking of using this technology to do some businesses in Japan.

Initiatives in the Cell & Gene Therapy Area (Acquisitions and Expansions)

AGC Your Dreams, Our Challenge

Milan, Italy

- 2020: Acquired (formerly MolMed)
- 2022: Adding suspension culture line for the manufacture of viral vectors, expanding analysis and development facilities

- Track record in commercial phase manufacturing while there are still not many commercial cell & gene therapy drugs in the world => **Outstanding track record and cutting edge technology**
- Over 250 experienced personnel. Reduced time to release product to customer, with in-house analytical capabilities for more than 160 tests.
- **Expanding production capacity** with suspension culture facility to respond to rapid market growth

Longmont, Colorado, US

- 2021: Acquired (formerly a plant of Novartis Gene Therapies Inc.)
- 2022: Adding manufacturing facilities to cater to full-scale contract projects

- **Establishing production capacity in the US**, the world's biggest market
- Incorporating knowledge from Milan site to provide **high-level cGMP quality and services** for viral vectors and cell therapy drugs
- Vast floor area in excess of 60,000 ㎡, plenty of **potential for further expansion**

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These are the initiatives. We only talked about Milan, Italy. Currently, for gene and cell therapy, there is very limited number of commercial projects. About 3 of them have the track record of this company, which we acquired, and we are trying to do that business in US also. Particularly for gene and cell therapy, plasmid DNA is used. So, there is Heidelberg Plant manufacturing plasmid DNA, and that will be sent to Milan, Italy or sent to Longmont, US. In the future, we would like to receive that in Japan, so that we can have end-to-end manufacturing for plasmid DNA to virus.

Initiatives in the Cell & Gene Therapy Area

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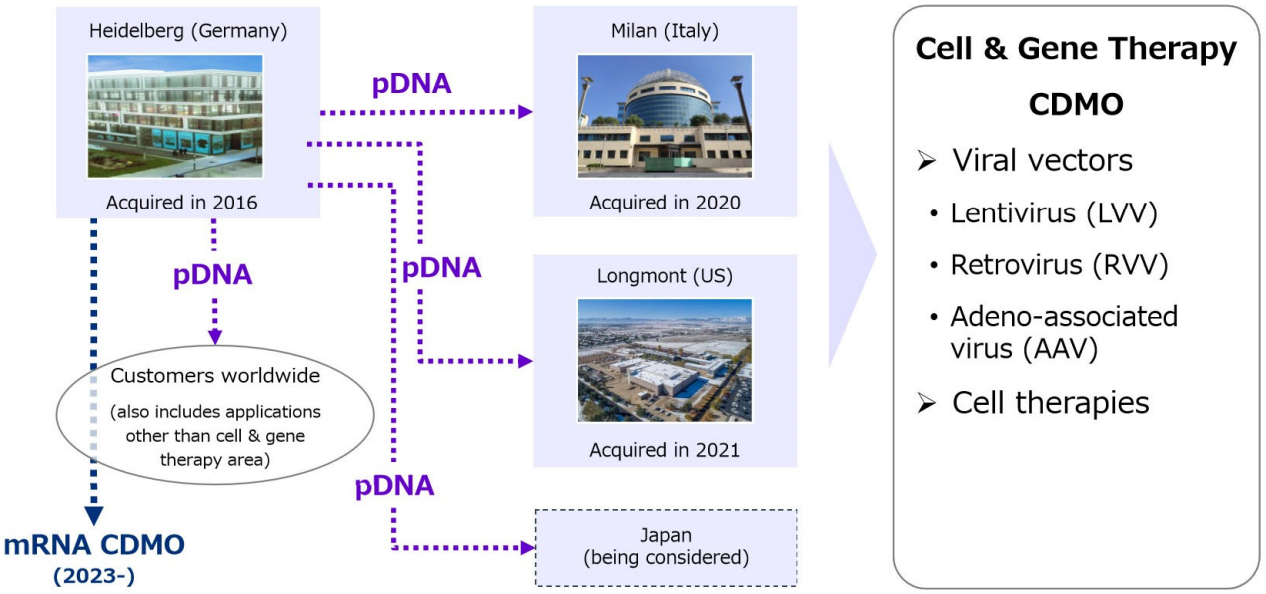
- AGC has expanded into a wide range of areas from the manufacture of plasmid DNA (pDNA), which is a raw material, to viral vectors (LVV/RVV/AAV) and cell therapies.



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This plasmid DNA, as I said earlier, is messenger RNA's raw material, which is on the bottom of left-hand side. So, not only plasmid DNA, but we would also like to expand our services to cover messenger RNA in the future.

Initiatives in the Small Molecule Pharmaceuticals and Agrochemicals Area

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2020	2022	2024
AGC Chiba Plant (Chiba, Japan)	AGC Pharma Chemicals Europe (Malgrat, Spain)	AGC Wakasa Chemicals (Fukui, Japan)

Expansion: approx. 10-fold
(from AGC GMP-compliant synthetic pharmaceutical manufacturing capacity)

Expansion: approx. 1.3-fold
Establishing a new R&D facility

Announced in November 2021

Expansion: approx. 1.5-fold

- Enhancing our one-stop service from raw material manufacture at Chiba Plant to pharmaceutical and agrochemical intermediates & active ingredients at AGC Wakasa Chemicals
- Catering to the needs of a wide range of Japanese and overseas pharmaceutical and agrochemical manufacturers

Based on the diverse and **advanced technical competence and quality systems**, which AGC has developed in fluorine synthesis and other areas, we are catering to customer needs by establishing a **wider range of services globally,** including capabilities to serve the needs for next-generation agrochemicals and high potency drugs. In general, such new areas demand even greater safety, and environmental considerations.

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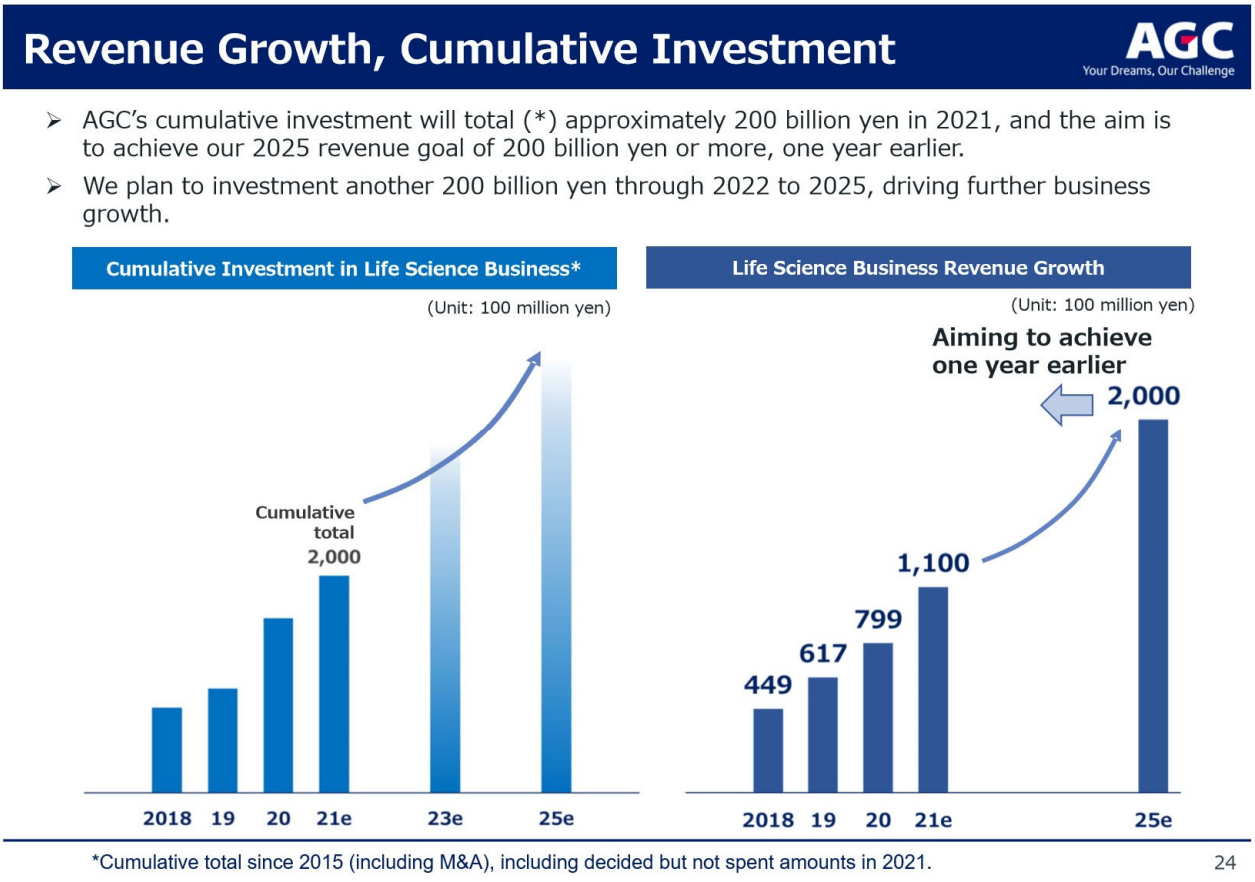
This slide talks about the small molecule pharmaceuticals and agrochemical area, which is synthetic pharmaceuticals. I am repeating myself. The left-hand side is the Chiba Plant. We expanded the capacity by 10-fold. Also, the Spanish the capacity will be 1.3 times more. In 2024, the Wakasa Plant expansion is going to be done, which is 1.5 times more than current capacity. Demand is growing 6% to 7% YoY. So, the demand growth is steady, and we would like to catch up with that demand by expanding our businesses.



Here, you can see the cumulative investment amount and sales changes. On the left, you see that for Life Science investment in cumulative amount from 2016 to this year, a total of JPY200 billion was spent. From next year through 2025, another JPY200 billion or more will be invested to expand the business. Then, we are looking at JPY200 billion in sales in 2025, but if we can expand in the pace that we are growing now, it could be moved up by 1 year so that we can reach JPY200 billion in 2024.

In 2016, the Life Science business division was established, and the JPY100 billion in 2025 in sales was the original target back then. But since then, compared to where we were, the assumption or plan that we originally had has been outpaced in our business expansion. Of course, we are spending more rapidly, and sales have been increasing much more rapidly.

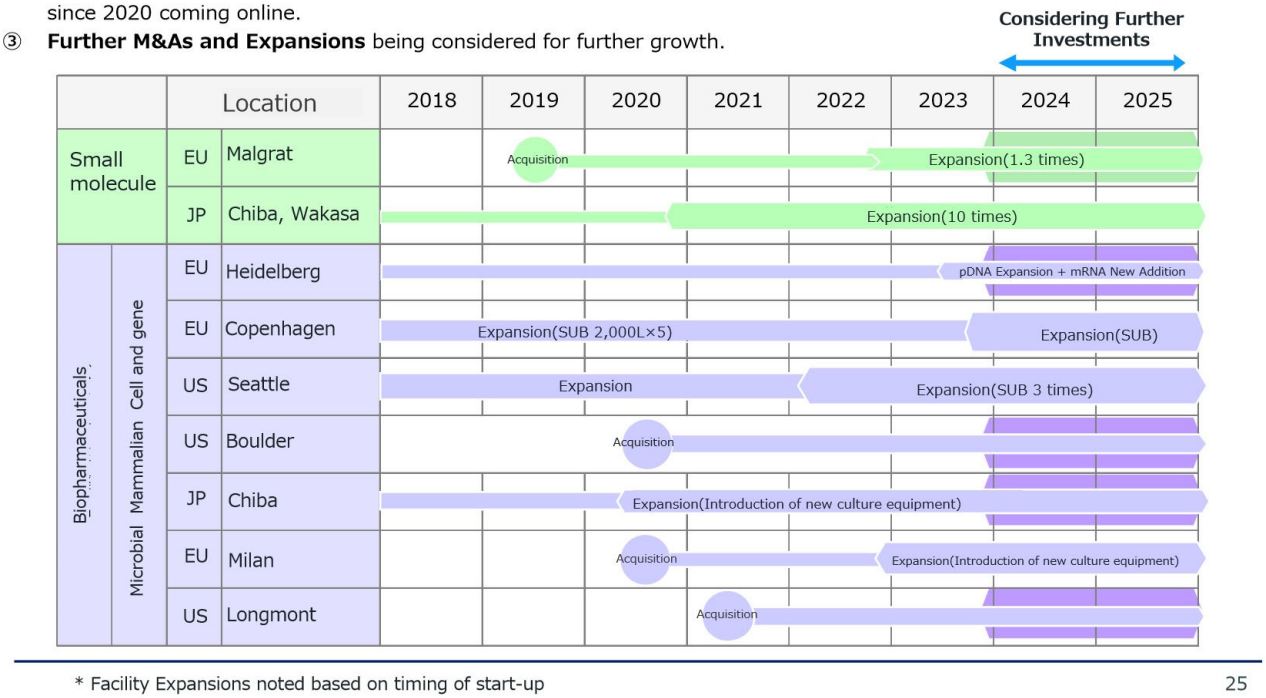
Capacity Expansion (Acquisitions and Facility Expansions)

AGC Your Dreams, Our Challenge

① Active investments leading to achievement of initial revenue goal 4 years earlier than originally planned, with **2021 revenue estimate at 1,100 hundred million yen**.

② **Investments necessary to reach revenues of 2,000 hundred million yen already decided**. Investments carried out since 2020 coming online.

③ **Further M&As and Expansions** being considered for further growth.



* Facility Expansions noted based on timing of start-up

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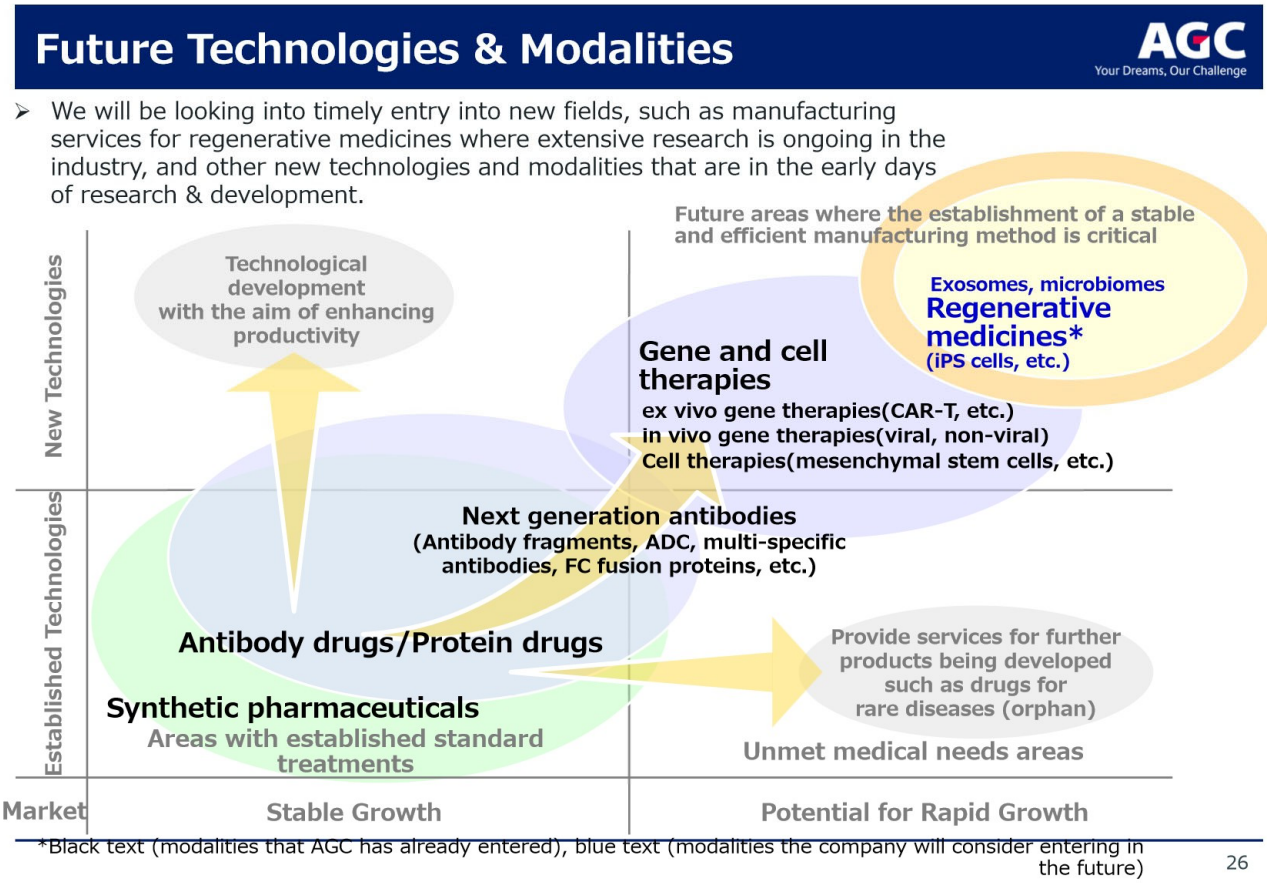
Here, you can see what I have already explained in 1 chart. First of all, the small molecule and biopharmaceuticals top and bottom, JPY110 billion for this year's forecast has been asked. The JPY110 billion can be covered by the investment that we have already made upward in 2020. Going forward, in 2023, as we already released all the things that I have explained have been already announced after the Company's decision was made to make the investments, and in 2024 and 2025, we can reach JPY200 billion in sales with all investments that we have already announced externally. That’s enough to cover that.

Then, JPY200 billion is just an interim point. We are looking at further growth beyond that. Obviously, small molecule pharmaceuticals and microbial and mammalian cells conventional business, and also M&As at the bottom will come after gene and cell therapy, the IPS cell therapy or whatever. What we don't have right now is something that we are also considering including in order to make further growth.



This is my last slide. This is future technological development and modalities.

What's written in bold black letters, gothic letters, are the ones that we have already worked on. Of the existing portion, the productivity improvement and technological development is now being done, except for synthetic biology and AI and DX. All these technologies are also introduced in biopharmaceuticals as well so that productivity improvement can be achieved. So, various technologies are there to capture. Then, on the right bottom side, taking advantage of these technologies scores, there are diseases that can be cured that used to be impossible to cure. Then, the right top corner, we see iPS cells, and new modalities are shown.

In the previous chart, we were just showing years up until 2025. So, by 2025, we will need to have come up with something new, as new businesses. So, by 2025, we will probably go through other new M&As to enter into new business areas. That is all for me. Thank you very much for your attention.