

EBARA IR 2023 | Day 1 | Q&A Highlights

<Overview of the Q&A session from Day 1 of EBARA IR Day 2023 held on December 4, 2023>

[Ebara representatives]

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Participant 1: As my first point, please tell me about the component business. In your explanation, you introduced multiple factors related to responding to technological advancement. Please provide a little more detail about the possibility of changes in market share with your largest competitors. I would like you to address the possibility of share increasing by exerting Ebara's technological advantages or through changes in generation technology. Also, please summarize areas where you think you can win and areas where there are issues compared to the largest competitors.

Tsuyuki: Customers praise our products for their superior energy saving properties, enabling us to differentiate ourselves from the competition. We will also advance by offering solutions based on a combination of products. Specifically, production efficiency and speed are critical factors in the customer decision-making process. We will further pursue optimization through automation like we have achieved at the V7 plant and work to further address customer needs.

During the period of E-Vision 2030, we will aim to become the No. 1 share. We will continue engaging in product development based on a mission to catch up to and surpass the competition.

The market for exhaust systems for EUV lithography systems is split between Ebara and our major competitor. We will continue to pursue growth and aim to increase our market share by promoting the development of new differentiating factors.

Participant 1: It is my understanding that the market for exhaust systems for EUV lithography systems only consists of Ebara and your major competitor, with no new manufacturers entering this market. When you say that the market is split, is it correct to assume that you are confident in the ability to secure a 50% share of the market, which would be higher than your market share for dry vacuum pumps?

Tsuyuki: Yes. Currently, there are not a lot of device manufacturers adopting exhaust systems for EUV lithography systems. We want to ensure our ability to capture market share as customers increase moving forward. At present, only a few device manufacturers have adopted this equipment, so our view is that, based on recent deliveries, the market share is roughly evenly split.

Participant 1: As my second point, can you please discuss the section on memory under the “Strategy for Major CMP Processes” on Page 9 of the materials? On the subject of hybrid bonding, in your explanation you indicate that future increases in metal layers will create business opportunities for Ebara. Can you provide some hints or additional explanation on the timing and impact of such opportunities?

For wafer bonding, in what year do you expect to begin shipping products regularly? The increase in metal layers means that Ebara’s share will increase but, for example, will changes in product generation lead to an increase in profit margin? I understand this is a vague question, but I would like to gain a grasp of Ebara’s outlook on the timing of growth.

Nambu: Growth opportunities for memory will increase the number of CMP processes for bonding, which we view as incredibly opportune for us. We are currently working with customers on development line evaluations. It is difficult to speak on timing as this depends on market conditions. At present, memory customers are holding off on investments and when these activities will resume will depend on market conditions. A major factor is the fact that we are unable to forecast these investment decisions.

Another factor is the technical challenge. With the movement toward increased density, there are great expectations on bonding technology. However, we recognize that the memory market is incredibly sensitive to costs. Even though the technology may be sound, the timing based on which customers look to adopt will depend on customer development progress and cost reductions. As such, it is difficult to say. Broadly speaking, we think that mass production for bonding processes such as hybrid bonding and fusion bonding could be established in 2025 at the earliest, or sometime between 2025 and 2030.

Participant 1: Please indicate your view on the increase in the number of processes. How much do you project the number of processes will increase as a result of conventional memory manufacturers adopting new technology relative to the number of processes that require CMP? I understand that it may be difficult to make an apples-to-apples comparison.

Nambu: As I mentioned earlier, processes for simple bonding involve polishing the bonding surfaces of each wafer so, compared to conventional devices, the number of layers will increase proportionately. On the other hand, bonding means that the number of processes on the side being bonded will also increase so we think this will mean an increase of 10-20% compared to existing memory processes. However, required specs, such as polishing volume and the level of precision required of the final finish will depend significantly on the process so whether or not this will reflect market volume is a separate discussion. That is a point of caution that needs to be considered.

Participant 2: I want to ask two questions regarding CMP. The first is about the CMP growth rate over the past 10 years or so, which is on par with or just slightly above the growth rate for the semiconductor manufacturing equipment industry. Looking forward over the next 10 years, do you think this rate will increase as bonding equipment increases?

Or, is it your view that, compared to other equipment such as etchers and steppers, for example, the CMP growth rate is not necessarily outperforming the competition on the semiconductor manufacturing equipment market?

Please comment on the weight of CMP processes relative to the overall semiconductor manufacturing equipment market.

Nambu: Comparing the growth rate for CMP systems to the growth rate for the overall semiconductor manufacturing equipment market, it is also my view that it is slowing.

This is because CMP systems didn't exist previously, so CMP has gradually been adopted as the newest process among new semiconductor manufacturing processes. Looking at the overall semiconductor market, we recognize that the rate of adoption is still at a low level.

Your understanding is correct. Moving forward, the rate of adoption will increase dramatically. Although not mentioned thus far, in addition to bonding, increase will also be driven by the ongoing shift towards higher integration. In terms of logic devices, with advancements in miniaturization, the number of copper lines will also increase. With memory as well, as the density of memory elements increases, the number of layers will also increase and other processes will increase as well. It is not the case that bonding alone will drive growth rate but expectations for CMP and its role in the future shift to higher integration boards, which includes bonding processes, are extremely high. As for the growth rate for CMP CAGR relative to semiconductors overall, our view is that growth will be on par or slightly above the industry.

Participant 2: Only slightly? I would love to hear something like 20 percent, but I suppose it is not as simple as that.

Nambu: CMP is originally a polishing process. Prior to CMP, there will always be processes involving film formation and etching, so they are related. We do not see it being the case that CMP alone would increase by 20 percent.

Participant 2: Looking beyond bonding, it is correct to assume the possibility that CMP would not be required very much in the subsequent stepper process because it is not a very difficult process technologically.

Nambu: Miniaturization is not progressing as quickly in subsequent processes so, as you suggest, CMP would not be used as frequently as in front-end devices.

On the other hand, looking at the CMP market, with the rise of the advanced packaging domain, so-called chip-to-wafer segment, we are beginning to see applications other than miniaturization. CMP is being used in flattening, the process of shaving down very thick film layers. So, in terms of new domains, we are seeing new needs for CMP in the advanced packaging domain.

Participant 2: To another point, we are seeing CMP systems with washers and dryers to enable a dry-in, dry-out manufacturing process. Does Ebara make the washers being used in CMP?

Nambu: We make the washers as well.

Participant 2: It is my admittedly unfounded assumption that CMP washers are very technically challenging. Is it an accurate view that, even compared to the washers of other washer manufacturers, this is technically difficult?

Nambu: The level of difficulty is different. The level of cleaning conducted by washer manufacturers involves taking something that is relatively clean and making it cleaner. Our CMP washers have the difficulty of cleaning components that are incredibly dirty. The type of cleaning we achieve is on a different level.

Participant 2: It seems that, with the level of technology your company possesses, you would come out on top if you were to target the markets serviced by other washers.

Nambu: While we truly appreciate the high expectations, entering a market with established manufacturers is not easy. Different companies excel at different things.

Participant 3: There are three things I want to ask about. The first is regarding Page 6 of the materials for the first presentation, the section on transforming into an organization that responds to the needs of each target market and the adoption of a CxO system. If you are already seeing the benefits of these changes in your business, can you please provide some examples? From a medium and long-term perspective, what contributions to performance are you anticipating? Looking at orders received for the Energy segment, from the outside looking in it appears that you may already be seeing results. Could you discuss this in detail?

Hosoda: With the Energy segment fiscal year in particular, orders received on the LNG market have been favorable. This is in part due to the fact that we have adopted a combined approach marketing pumps and compressors to customers. This has led to orders received in the LNG market for total systems including compressors and pumps where previously the Pumps Business and the Compressors & Turbines Business functioned as separate entities targeting the same petroleum and gas markets. In that respect, we are already seeing specific synergies being created.

I think we will see synergy generated in various ways moving forward. This includes synergy between custom pumps and compressors in the Energy segment and we also can look forward to synergy in the Building Service and Industrial segment. The chillers business and the Standard Pumps business previously operated separately, but they now move as a single business unit.

Participant 3: Please comment on the adoption of the CxO system if you are seeing benefits in terms of SG&A reduction or revenue gains, or if you have expectations of such benefits.

I imagine the CxO system includes the adoption of group human resource management, ERP adoption, and business management optimization. Please comment on ways, if any, that the CxO system has helped optimize operations or improve the profitability of each business.

Hosoda: That is our goal. We want to deftly use common resources to reduce the burden on each business and contribute to optimization. With that in mind, we are in the process of adopting ERP as well. We will not see benefits immediately during this adoption period. Instead, there will be instances where this process will lead to temporary cost increases. While adopting the CxO system will not lead to immediate contributions to business, what we are aiming for is as you described, and so our hope is for an understanding that we are steadily taking action towards achieving that goal.

Participant 3: As my second question, I want to ask about increasing your CMP systems share. I have heard before that the goal for the Precision Machinery segment you outline in your E-Plan 2025, a sales CAGR of 15% or more, is based on the assumption of increased CMP market share. In today's Q&A, you discussed increased market share for memory, but can you elaborate to the extent possible on your view of market share increases in other areas?

Nambu: If you separate logic and memory by device type, our strength lies largely in logic. As I mentioned earlier, the trend with devices towards higher integration will lead to increases in copper layers. In other words, the number of metal layers will steadily increase. We have an incredibly strong position with metal, and we view the outlook for future growth as incredibly bright.

With logic as well, as bonding increases so too will the number of metal layers in the bonded side, re-wired layers, and power source layers. As a company with a strong foundation in metal, we believe this creates a very bright outlook for us.

Participant 3: When do you expect to see an increase in demand for logic?

Nambu: Timing is difficult to project. Although once vigorous, investments are now stagnant and right now it is very difficult to forecast when that activity will return. Once there is a resumption of investments, those types of devices representing a new age of technology will be produced. Compared to devices from the previous generation, those new devices are likely to have a larger number of metal layers. That is generally a factual assessment so we have expectations in that sense, and we do not think this advancement will require waiting until 2030.

However, next year looks to be extremely difficult, so our expectation for the next two or three years is to see investments from logic customers. We also want to make contributions in this area.

Participant 3: As my third question, I want to ask about the growth potential of dry vacuum pumps and the components business. Page 18 of the materials touches on demand and mentions the increased use of gas in the semiconductor manufacturing process as a way to shorten manufacturing times. Also, Page 20 discusses the shift to dry processes in areas other than semiconductors. What are Ebara's current assumptions about the growth rate in demand or sales for dry vacuum pumps. Also, please comment on whether you have increased your growth projections compared to past assumptions.

Tsuyuki: Opportunities for the use of dry vacuum pumps will increase further in the future. With semiconductors in particular, the number of processes will increase. Regarding etching machines, a large number are already being used in semiconductor manufacturing processes, and as the number of chambers increase, we expect to see growth that exceeds past performance. Currently, Ebara products such as dry vacuum pumps and gas abatement systems are beginning to see growth rates that are on par with the scope of growth for semiconductor facility investments. There are projections that by 2030 the semiconductor market will double in size compared to 2021. We are assuming that our business scope will also double and, including assumptions for market share, we are also expecting performance to grow by at least double. As such, we are considering strengthening development and production capacity.

As for applications outside of semiconductors, this is a product line that has universal applicability, so we expect the focus to be on models that we can supply rapidly and in large volumes. In that sense as well, we will make appropriate preparations for production and sales capacity. Although I cannot provide specific numbers, I can say that we are planning to develop a comprehensive structure.

Participant 4: I have two questions. The first is regarding the diagram of the component product line on Page 13 of the materials. I realize the component sales are made up of unit sales and service and support (S&S), and wonder if you would share the ratio. Exhaust systems for EUV lithography systems and precision chillers are just getting started as businesses so their scope is still small, but what image do you have for the future?

Also, I want to ask about the newer products such as ozonized water generators and precision chillers. What is the competitive advantage of these products? How much potential do you think there is for equipment other than dry vacuum pumps by around 2030 and is it safe to assume that

you will be able to achieve sales growth? I understand it may be difficult, but please explain your views on these areas.

Tsuyuki: The ratio of products to S&S is 70 percent products and 30 percent S&S. Currently, this is between 6:4 and 7:3. For S&S, I explained the overhaul (OH) business as something that is impacted by customer operating rates. Currently, beyond new facility investments, customer operating rates are also slightly sluggish. Customers are looking at now as the time to consider upgrading to energy-saving products, so we are making proposals to replace or conduct maintenance for products already installed. Roughly, the current product ratio would be about, dry vacuum pumps at roughly 70 percent, gas abatement systems at 20 percent, and ozonized water generators for 10 percent.

There are a large number of competitors involved in gas abatement systems, so we are all taking our piece of the pie. However, as was explained earlier, we are promoting product development that will enable integration. We want to pursue integration as we look to increase the ratio for gas abatement systems.

As for ozonized water generators, the majority are supplied to washer manufacturers, and sales to China are also increasing. Outside of washers for semiconductor manufacturing processes, we are also seeing the emergence of new applications such as wafer cleaning. We view ourselves as No. 2 or No. 3 in the market, but believe we are positioned to aim for the top spot, so we will focus on achieving that.

Participant 4: Does this mean including exhaust systems for EUV lithography systems in dry vacuum pumps?

Tsuyuki: Exhaust systems for EUV lithography systems are hybrid systems that use both dry vacuum pumps and gas abatement systems. For exhaust systems for EUV lithography systems, the ratio is roughly 70 percent dry vacuum pumps and 30 percent gas abatement systems.

Participant 4: My second question is regarding CMP systems. I have heard before that expectations are for the market to double in size by 2030. This time, there were no comments on region-specific market conditions, but I do believe China is currently seeing demand growth. It is also my impression that, amid friction, there is a growing possibility that demand could increase in other regions. Please discuss current trends in China and how you view the sustainability of those trends. Also, as a result of current conditions, is there a possibility that demand for CMP systems could more than double in size by 2030? Even from a qualitative perspective, I would appreciate your view on these topics.

Nambu: The market in China differs somewhat from other markets. Currently, as a technology node, the market is leaning significantly towards the low-tech node, but demand is vigorous. US-China relations have led to intensifying restrictions but within that environment we plan to do everything we can. Looking at the market overall, investments are currently somewhat sluggish, but we are not seeing that in China. It appears that the market is mostly maintaining the demand from 2022.

As for how this will look as we head towards 2030, it is extremely difficult to make projections as future trends will be affected by geopolitical developments as well as by the emergence of markets in other regions.

Regarding the view that the CMP market will double in size compared to 2020, China is energetic so we are not taking the approach of projecting beyond that.

Participant 5: I want to ask some basic questions. You discussed future business opportunities for CMP. As my first question, I would like to confirm whether there is any risk that the number of layers in the wiring process will decrease and the number of processes will decrease during the early stages of adopting backside PDN. Also, with the subsequent shift to 1.4 nano and 1 nano, the total number of reverse side wiring will increase, so can we assume that business opportunities for Ebara will increase? I would like to confirm this point.

Nambu: The question was regarding whether the number of layers for CMP processes would reduce with the adoption of backside PDN. That is not our understanding. The reason behind the adoption of backside PDN is that it is difficult to achieve higher integration on the front side, so achieving even higher integration requires adding more power source lines on the back side. We have no particular view that the number of layers on the front side would be reduced.

Participant 5: I have another question regarding CMP and HBM (high bandwidth memory). This may have been discussed at the beginning, but I would like to confirm how much the demand for CMP will change with the transition from the current TSV (Through-Silicon Via) bump connection to hybrid bonding. Also, the timing was explained as around 2025-2026, but does this mean that Ebara also expects to change from HBM4 to hybrid bonding? I would like to confirm this point as well.

Nambu: There is a trend to change from TSV to hybrid bonding, but the direction of integration also changes, such as whether it is back-to-back or back-to-front, so it is difficult to say at the moment which is the biggest trend. Either way, CMP processes will certainly increase. We believe that hybrid bonding is more promising for the CMP market. The significant point is that there is metal in the shaved layer.

It is difficult to predict from which node bonding and pasting will be applied in the future, so I will refrain from making any specific comments.

Participant 5: Lastly, I would like to ask you about the component business. Among future business opportunities, you mentioned products other than semiconductors and LCDs. You also mentioned LC-MS (Liquid Chromatograph Mass Spectrometer), will those completely replace oil rotary pumps in the future, or are there any other issues regarding this area? I would also like to know how much market potential there is.

Tsuyuki: This is still a developing market. One is miniaturization, and I've heard about LC-MS being used for a variety of purposes due to its handy utility. I think demand will increase in the future, but there are currently a large number of research centers and other institutions still using rotary pumps, so we are still in the evaluation stage, including working with a wide range of market participants such as equipment manufacturers. In terms of growth, we can use product groups with similar specifications in the medical field, so we can increase the total mass benefit or sales method by increasing numbers and speed, rather than going up on our own like semiconductors. We are currently assessing the growth potential of this product development, including where we can supply those products. We are currently working on applying our products to this area.

Our main strength lies in semiconductors, where processes are constantly changing. While gaining the trust of our semiconductor customers and responding to their technological needs, we are currently evaluating whether we can shift our core technology and successfully apply it to the market. I think there are many possibilities, but overall, our mainstream is semiconductors, and we plan to base our efforts on semiconductors.

Participant 5: Just to confirm, I think the footprint is important because equipment in analytical and medical systems is becoming smaller. In that respect, are there still any issues compared to existing systems?

Tsuyuki: As you said, customers are very concerned about footprints, noise, and vibration. We will commercialize products with such specifications. In particular, we will develop and release products based on current customer needs, such as air-cooled pumps with no utilities or water connections while still promoting dry systems.