

AIXTRON SE

Analyst Earnings Conference Call

Q4/2022 & FY/2022 Results

February 28, 2023

Edited Transcript

Executive Board

Dr. Felix Grawert, CEO & President

Dr. Christian Danninger, CFO

The spoken word applies

Slide 1 – Operator & Forward-Looking Statements

Operator

Ladies and gentlemen, welcome to AIXTRON's fourth quarter and full year 2022 results conference call. Please note that today's call is being recorded. Let me now hand you over to Mr. Guido Pickert, VP of IR & Corporate Communications at AIXTRON, for opening remarks and introductions.

Guido Pickert

Investor Relations & Corporate Communications

Thank you, operator. Welcome to AIXTRON's presentation of our Q4 and FY/2022 results. I'd like to welcome our **CEO, Dr. Felix Grawert** and our **CFO, Dr. Christian Danninger**.

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This call is not being immediately presented via webcast or any other medium. However, we will place an audio file of the recording or a transcript on our website at some point after the call.

I would now like to hand you over to our CEO for opening remarks. Felix?

Slide 2 – FY/2022 Highlights & Operational Performance

Dr. Felix Grawert

Executive Board

Thank you, Guido! Let me also welcome you all to our Full Year 2022 results presentation. I will start with an overview of the highlights of the year and then hand over to Christian for more details on our financial figures. Finally, I will give you an update on the development of our business and our guidance.

Let me start by giving you an overview of the key business developments in the year on **slide 2**.

Demand for our equipment was very strong, resulting in an **order intake** of EUR 586 million, up 18% year-on-year, driven by the strength of the growth of the end markets our customers are serving. In fact, the 2022 order intake was the second best order intake in the 40-year history of AIXTRON.

I am very pleased that the area of **SiC and GaN Power Electronics** has been the strongest demand driver, representing the majority of our equipment order intake for the year. Orders for our SiC power solutions have more than tripled year-on-year. This strong development is a result of major capacity expansion activities of our customers, but also a great success of our new **G10-SiC multiwafer system**. This product is being adopted by our customers in an amazing speed since the launch in Q3/2022 due to its excellent cost per wafer proposition. This is a huge team success, and now we have a highly competitive tool in the market. With this, we very much look forward to the wafer size transition from 6 inch to 8 inch as this is a trigger point for many customers to look into their tool base anew. I think we can say that for SiC at AIXTRON, we have also reached the tipping point of a broad market adoption, similar to what we have seen for GaN some years ago.

While we have seen an acceleration of demand for SiC, orders for **GaN Power Electronics** also continued to grow year-on-year, reflecting our customers' aspiration to replace the incumbent material Silicon with gallium nitride based solutions in more and more applications.

In summary, the biggest demand drivers for the quarter are our systems for **SiC and GaN Power Electronics**.

Demand for laser tools in the area of **Optoelectronics** also remains strong. Demand for tools to produce LEDs is mainly driven by Micro LED production orders, more than offsetting lower demand for traditional ROY LED tools.

As a result of all that and of the delayed export licenses last year, due to which we were not able to ship all tools we had produced in 2022, we can report a strong **order backlog** of EUR 352 million, up 64% year-on-year.

Overall, we could grow our annual revenues by 8% year-on-year to EUR 463 million. Our gross margin ended up at 42% and our EBIT margin at 22%. With this, we have successfully mastered the global supply chain issues of the year 2022 and also maneuvered around some of the delays in export licenses that required us to shift some production slots back and forth within the year 2022.

In this place, I also would like express a strong gratitude to the entire AIXTRON team, that has made all these achievements possible in a difficult year 2022, namely that we fully delivered on our **upgraded 2022 growth guidance** in all aspects.

Now, I will hand over to our CFO Christian Danninger. He will take you through the Full year 2022 financials. Christian?

Slides 3-5 – FY/2022 Income Statement, Balance Sheet, Cash Flow Statement

Dr. Christian Danninger

Executive Board

Thanks, Felix, and hello to everyone.

Let me start with the financial highlights of our **income statement** on **slide 3**.

As Felix mentioned, **orders** in the quarter and the year continued to be strong and our **backlog** was up, fueled by the mentioned strength in demand.

Revenues in 2022 were at EUR 463 million, **gross profit** at EUR 195 million, both up 8% year-on-year. **EBIT** at EUR 105 million and **net profit** at EUR 100 million for the year were both up 6% year-on-year. **Quarterly Revenues** at EUR 183 million in Q4 even beat the very strong level of EUR 181 million in the same quarter of last year.

Both, Gross Margin and EBIT Margin in 2022 were on the same levels as the corresponding margins in 2021, which were 42% and 23% respectively.

OPEX in the year went up to EUR 91 million, predominantly driven by higher variable compensation elements and higher personnel cost due to more staff combined with slightly higher **R&D** spending. In fiscal year 2022, AIXTRON has primarily driven the completion of new product generations. In 2022, we also completed a major publicly funded development project which is why we recorded less **other operating income** from grants at EUR 5 million compared to a year ago at EUR 9 million.

In 2022, we again utilized tax loss carry forwards and capitalized some additional deferred tax assets in the amount of EUR 9 million due to expected future profits.

Now to our balance sheet on **slide 4**

Partially due to the shifted shipments as mentioned by Felix and mainly due to the preparation for higher deliveries in subsequent quarters, **inventory** levels at the end of 2022 went up to EUR 224 million compared to EUR 121 million at the end of 2021.

The **advance payments received from customers** were significantly up year-on-year at EUR 141 million from EUR 77 million also indicating higher levels of shipments to be expected. The down payments represented about 40% of order backlog.

All this led to a **total cash** balance including other financial assets of EUR 325 million which was below the EUR 352 million we had on the books last year.

Just a quick word on our Free cash flow on the **next slide** before I turn back to Felix.

Free cash flow in the fourth quarter was EUR 8 million compared to EUR 49 million in 2021. The difference compared to the previous year is mainly related to temporary working capital effects like the mentioned increase in inventories and high accounts receivables due to the very late shipments in December 2022. We have also increased our investments in property, plant and equipment, especially into R&D related lab equipment and extensions.

With that, let me hand you back over to Felix.

Felix?

Slide 6 – 2023 Full Year Guidance

Dr. Felix Grawert

Executive Board

Thank you, Christian.

Before giving you our updated view on the outlook for this year, I would like to share some highlights on our market development.

The Momentum remains strong in all areas. We see capacity build-up or expansion activities in most of our addressed end-markets. In particular the area of Wide-Band-Gap Power Electronics based on Gallium Nitride and Silicon Carbide has developed very strongly, **now representing the biggest contributor to orders and revenues** in addition to the contributions from Optoelectronics and Micro LEDs.

Let's now take a deeper look at the area of **SiC based Power Electronics**. Here we see the demand **accelerating** especially since we launched our new **G10-SiC** technology solution. Since its launch in Q3/2022, this tool was received so well by customers, that it now already represents the **vast majority of all orders** for our SiC manufacturing solutions — suggesting a similar development in revenues going forward.

With the G10-SiC, we have again made great steps forward in the tool performance. In combination with our multiwafer output, this enables our customers to produce SiC devices at a highly competitive cost position. And we strongly believe that cost will be one of the major decision criteria in this market. Beyond the current volume ramp of the industry driven by the fast adoption of battery electric vehicles, we see further demand down the line driven by governmental policies pushing towards electric vehicles, similar to what we have seen from EU lawmakers having banned the sale of new CO₂ emitting cars from 2035. Furthermore, we see the widespread promotion of renewable energies as very positive for the broad adoption of SiC Power electronics.

Therefore, we believe that demand for our SiC manufacturing solutions will be the strongest growth driver for AIXTRON in 2023 and possibly even beyond.

We observe a similar trend for our equipment in the area of **GaN based Power Electronics**, which continues to be in high demand by our customers. We see large industry players expanding their capacities at scale while we continue to see new players entering the arena of GaN Power. The adoption of GaN replacing the incumbent material Silicon is going full steam ahead. The GaN market volumes are growing steadily driven by our customers tapping into more and more sub-segments of the vast power electronics space, such as — most recently — the efficient conversion of residential solar power.

Today's market participants have to increasingly make an active choice between fab investments into incumbent Silicon based device manufacturing or the novel wide-band-gap materials such as GaN or SiC. In addition to the much higher energy efficiency, this is the main driver for the acceleration in GaN power.

For the **GaAs / InP** material systems, we have just launched our new high volume manufacturing platform **G10-AsP**. It marks a major step forward both in the area of **Micro LEDs**, and also in the segment of high-performance **Lasers** and **VCSELs**. To all these three segments, the new G10-AsP offers the value of much lower particles, uniformities improved by a factor of 2x - 3x and a significantly reduced consumption of process gases, which translates to a reduction of cost per wafer.

In the second half of 2022, we have seen a remarkable slowdown in all consumer electronics related investments of our customers, while fab expansions in telecom / datacom did continue. Also, we observe that the development work towards Micro LED solutions continues at the vast majority of our large customers, despite spending cuts in other areas of these companies. At this stage, it seems that not all technological challenges for mass production, in particular in downstream processes such as mass transfer of pixels, have yet been solved. But given the focus

and dedication of our customers, we are convinced that Micro LED displays will become the next generation display technology.

With that, let me now present our full year guidance for 2023 to you on **slide 6**.

First of all, it is important to note that we have adjusted our USD/EUR budget exchange rate, at which we record US Dollar denominated orders and backlog for 2023, to 1.15 USD/EUR from 1.20 USD/EUR the year before. This has just a minor effect on orders and backlog, as only less than one third of those are recorded in US Dollars.

Secondly, please note that that we expect to have a positive extraordinary revenue effect from the shift of some units that have been produced in 2022 and will be shipped and recognized as revenue in 2023.

Based on strong customer demand, we expect **orders** for 2023 in the range of **600 and 680 million Euros**. In 2023, we expect **total revenues** in a range of **580 to 640 million Euros**. This includes the above-mentioned shift of units that had been assembled already in 2022 and will ship in 2023. We expect a 2023 **gross margin** of **around 45 percent** and an **EBIT margin** **between 25 and 27 percent**.

In summary, we expect a **double-digit growth** of the AIXTRON business in 2023, driven by the strong demand from Power Electronics, and in particular for our new G10-SiC tool.

With that, I'll pass it back to Guido before we take questions.

Guido Pickert

Investor Relations & Corporate Communications

Thank you very much, Felix and Christian. Operator, we will now take questions, please.

Martin Marandon-Carlhian. Analyst, ODDO BHF Corporate & Markets

Congrats for the strong results. My first question then: Can you give us a bit more color on your assumption in terms of orders and sales for Micro LEDs for 2023? And it also looks like the first smartwatch using Micro LED maybe delayed by a few months. Has this impacted your clients' road map in terms of ramping up their capabilities? That's my first one, and I have a follow-up.

Dr. Felix Grawert CEO & President, AIXTRON SE

Thank you for your question relating to Micro LEDs. We expect in 2023 to get a decent amount of orders and a decent amount of shipments driven by demand from Micro LEDs, because we see that our customers are continuing their R&D efforts, but also continue or start to build smaller scale pilot lines to really gain first experiences with the full production tool set, including the mass transfer and all adjacent process steps to epitaxy within the value chain. And with that, we believe that Micro LED related demand might be around 10% of orders and revenues in 2023. This is not yet a volume ramp that could have been expected previously. This might be shifted a bit into the future. Reason could be technical challenges in some of the complementary process steps which have nothing to do with the epitaxial process we are involved in. This includes for example the mass transfer of the fully completed wafer with the Micro LEDs on it onto the display. We hear that for this downstream process step there are still some topics to be solved. That's our current understanding.

Martin Marandon-Carlhian. Analyst, ODDO BHF Corporate & Markets

And you also talked about very strong orders in silicon carbide with your new G10-SiC tool starting Q3 last year. I was wondering, was it more driven by 1 or 2 specific customers or also by newly won customers?

Dr. Felix Grawert CEO & President, AIXTRON SE

Very much both. We have sizeable repeat orders from existing customers. In addition, we are very successful in winning new customers. Some of these new customers ordering 1 or 2 tools. But we also have a new customer, which is ordering relatively large quantity of tools at once. With all of this, we are building up a very, very strong pipeline for our G10-SiC.

Michael Kuhn, Analyst, Deutsche Bank AG

Firstly, on the sales guidance, looking at the midpoint, you would add around EUR 150 million year-on-year. Is that purely driven by power semis? Or do you expect growth in other areas as well?

Dr. Felix Grawert CEO & President, AIXTRON SE

Let me give you a qualitative answer without having the detailed numbers in front of me. I would say the strongest contribution by far comes from the power semis as we highlighted in our introductory remarks. One element is gallium nitride, which really continues to accelerate the ramp. Another element is silicon carbide, which is really adding an additional revenue layer. This is by far the biggest growth driver.

On the remaining optoelectronics business, as indicated before, we see a continuation of the Micro LED business. It is not yet in an accelerating mode which might come a year later than 2023, but we see that continuing on a good and a stable level.

At the moment, we see no or just minor business in the area of red-orange-yellow LEDs. This formerly stronger contributor to our revenues dragged our margins down a bit. You may have seen and remarked the 45% gross margin target for this year which is to a large degree supported by the lower dilutional effect from this part of the business which falls out in this year because of the weakness of the consumer electronics market.

And we do see continued momentum in the other part of the optoelectronics business, namely, the optical datacom business which continues on a very steady, a very solid growth path. And we expect that to continue further because we all know that the transmission volume of data and data traffic is exponentially continuing and expanding. And here, we have a very strong market position. We continue to benefit of that market which keeps on growing.

However, in absolute terms, the number of tools here are smaller than what we expect to see in the silicon carbide power electronics market. Just bear in mind that one silicon carbide wafer can just serve a small number of electric vehicles, while a laser wafer in optoelectronics can serve a couple of thousand optical transmitters. This gives you an idea why the demand for silicon carbide wafers drives demand for so many production tools and units.

Michael Kuhn, Analyst, Deutsche Bank AG

And one quick follow-up on sales mix. In the fourth quarter, the LED/Micro LED sales, was that Micro LED only? Or did you still ship, let's say, traditional LED tools in the fourth quarter?

Dr. Felix Grawert CEO & President, AIXTRON SE

The equipment to produce Micro LEDs represented the largest share within the LED segment, having accelerated in the second half of last year. We only had some final shipments in the first half of the year for red-orange-yellow LEDs.

Michael Kuhn, Analyst, Deutsche Bank AG

Okay. Fantastic. And then a few more on P&L and also CapEx. CapEx went up quite a bit to around about EUR 30 million last year. Is that kind of a new run rate? Or do you rather expect a moderation here this year?

Dr. Christian Danninger CFO, AIXTRON SE

As mentioned in our annual report, CapEx is primarily related to R&D activities, in particular for lab expansions and tools for our labs. These investments are aligned with our R&D efforts and will continue at those levels or could go up slightly.

Dr. Felix Grawert CEO & President, AIXTRON SE

Yes, I agree, we require metrology solutions to measure particle defects. Some of these tools are quite expensive, sometimes with price tags of a couple of millions. The run rate could therefore rather go up.

Dr. Christian Danninger CFO, AIXTRON SE

Yes. And we continue to pursue our asset-light operating model where CapEx is primarily R&D driven and less driven by operational requirements. Therefore, our CapEx requirements continue to be mainly driven by our R&D activities rather than by our volume growth.

Michael Kuhn, Analyst, Deutsche Bank AG

Okay. That's good. In your full year 2022 figures, you showed about EUR 17 million of overdue receivables, which was quite an increase year-over-year. However, you still regard them as recoverable. Can you add a few more details on that position?

Dr. Felix Grawert CEO & President, AIXTRON SE

There's no concern on unrecoverable accounts receivables. This might only be timing effect, and there is no concern at all.

Michael Kuhn, Analyst, Deutsche Bank AG

All right. And then very last one. Does the dividend payout ratio of 35% this year and last year stand for a new permanent number we should look for? And how do you more generally think about shareholder participation, both in terms of dividend and also potentially buybacks?

Dr. Christian Danninger CFO, AIXTRON SE

To your first question, we continue to not formalize a dividend policy. However, we wanted our shareholders to participate in our strong results of this year which is why we did not want to go down with the payout ratio from the prior year. However, this does not represent a future policy. Regarding our cash allocation, we are intending to continue paying dividends. And we are also considering a share buyback program.

You have seen our cash flow of last year, which was primarily driven by working capital effects. Once we turn our receivables and part of our inventories into cash, we will most likely realize a strong cash flow in the course of the year. Based on our financial strength, we will consider how we will let our shareholders participate in that.

Adam Angelov, Analyst, BofA Securities

So firstly, I just wanted to touch on gallium nitride. The penetration you're seeing there in different markets, it feels like demand from data center applications is just really starting. But I think in the consumer market, people are a bit unsure. Is that already highly saturated, i.e. are all smartphones coming with fast chargers? So your view on that would be good. And then also the future growth drivers for GaN beyond data center perhaps?

Dr. Felix Grawert CEO & President, AIXTRON SE

Gallium nitride tends to be associated with the consumer end markets. That really should be taken out of the perception because consumer electronics have been a fantastic starter because here reliability of the devices is not a decisive requirement. Recall, if your smartphone charger doesn't work anymore, you throw it away and buy a new one, right? However, if you have a telecom base station sitting somewhere in a remote location which suddenly doesn't work anymore because its power supply failed, you need to fly over with the helicopter just to replace that part, and that's a bit more effort. The same applies to data centers. If the data center goes down, you hit your service level agreement in terms of uptime and that's really painful for you and your customers.

Due to these drivers, the adoption of this brand new technology starts first in the consumer market. But this market is in the end not the most relevant in terms of size, especially due to the small die sizes in consumer electronics. From an eight inch wafer, you can produce a couple of thousand smartphones while data centers requiring much larger chips, you may only be able to serve a couple of dozens or a few hundred of servers from one wafer.

That being said, we believe the most interesting part of adoption for gallium nitride just started with data centers and telecom base stations, which are traditional high-voltage, high-power applications. Those were also the historical key market drivers within the silicon business. Now, they are converting from silicon to gallium nitride step-by-step. The reason is that these devices are operating essentially 24/7, the entire year around and a server never gets switched off. Here the effect from higher energy efficiency of GaN is particularly pronounced. In parallel, we see that additional areas of Power Electronics are getting penetrated by GaN. One of the largest areas that's currently taking off is the area of inverters for residential PV applications. Also, a solar inverter is essentially running half of the year always when the sun is shining, right? Solar inverters need fairly

big chips which also come with a benefit in efficiency, which you see in the individual P&L. So overall, the dynamics for gallium nitride are very favorable.

Overall, we can say that new market segments are being developed. On the one hand they are addressed by the 3-4 established large players in gallium nitride which are all well known. These players continue to accelerate the capacity expansion. On the other hand, we see new entrants coming into this market having a very narrow focus on one of these segments with a unique application benefit, now looking into building out their own fab capacities. All of this together results in an acceleration of the demand in this market.

Adam Angelov, Analyst, BofA Securities

That's very helpful. Just wondering on the Power Electronics business, if you could roughly quantify the size of gallium nitride versus silicon carbide for maybe '22 revenue and then moving forward into '23, either in terms of orders or revenue, where you think it lands?

Dr. Felix Grawert CEO & President, AIXTRON SE

In 2022 Power Electronics revenue for AIXTRON consisted of around 40% silicon carbide and around 60% gallium nitride as a relative split. In 2023, this could reverse to a relative split of around 40% gallium nitride and around 60% silicon carbide, just as a rough indication. And you see gallium nitride is continuing to grow and the acceleration of silicon carbide adoption is clearly adding on top being the single biggest individual growth driver for the year.

Adam Angelov, Analyst, BofA Securities

Yes. That's very helpful. And one more, if I could just leave it in. I think you talked about potentially getting to 50% market share in silicon carbide in the past. Is that still the number you're looking at? That's all for me.

Dr. Felix Grawert CEO & President, AIXTRON SE

I think that's a decent number to look at.

Malte Schaumann, Analyst, Warburg Research

First question is a follow-up on the Micro LED side. Could you share a number of how many customers or potential or active customers you're currently discussing on projects besides your large commercial customer?

Dr. Felix Grawert CEO & President, AIXTRON SE

I think we talked clearly about a double-digit number of customers. As mentioned before, the research and pilot line activities for Micro LEDs continue to be very strong. We work with all the display and LED makers, and we also work with large consumer electronics companies. Partially due to the weakness in the consumer electronics market, some of the large giants are significantly cutting jobs. However, we are happy to say that none of the Micro LED programs have been affected by the job cuts that we saw in the consumer electronics area. And so those activities are ongoing.

In addition to the mentioned display makers and consumer electronic players, there is also a number of technology-driven startups who will drive and develop new technology. They have a clear aspiration and idea that when it comes to the ramp, they either sell or license their technology or they get bought up by one of the giants of the industry.

Malte Schaumann, Analyst, Warburg Research

And if these customers build a pilot line – will they order equipment for all colors from you or could they mix and match, i.e. pick equipment for one color from you and for other colors from other vendors? Or will they rather go with one supplier here?

Dr. Felix Grawert CEO & President, AIXTRON SE

So those players who pursue the full color RGB approach, will be ordering tools for all colors from us. Nevertheless, we also know that there are some players who experiment with color filters. They would use blue LEDs only and green and red are being created through color filters or other conversion methods. This is a different approach but also these players would be ordering the respective tools from us.

Malte Schaumann, Analyst, Warburg Research

With respect to the technical delays we currently see in the industry, do you think that will be sorted out in the next, let's say, 6 to 12 months? Or are there some more serious issues that could lead to a larger push out of the technology adoption?

Dr. Felix Grawert CEO & President, AIXTRON SE

To be honest, we are not very close to this step you are referring to because it's not directly linked to what we do. On everything around the EPI-step and the steps directly before or after the EPI, we typically know about due to our close collaboration with customers. But this step, as mentioned before, is clearly many, many process steps after ours. This is why we do not have such market insight and I therefore cannot give you a qualified opinion on that.

Malte Schaumann, Analyst, Warburg Research

Then on after sales business, you're guiding for an increase to EUR 100 million this year, which is quite substantial. Nevertheless, you're still growing revenue quite substantial as well. So could we expect another strong rise then in the future years, 2024, 2025? Or do you expect that level to be more or less sustained in the EUR 100 million you're expecting?

Dr. Felix Grawert CEO & President, AIXTRON SE

No, I expect further growth in this area.

Malte Schaumann, Analyst, Warburg Research

More or less in line with top line growth? Or is there a different function?

Dr. Felix Grawert CEO & President, AIXTRON SE

There's multiple factors involved. It grows with the rising installed base of our current series of tools, which is growing step-by-step as we grow the revenues. Therefore it's not directly connected to the revenues.

Malte Schaumann, Analyst, Warburg Research

Then a question on the tax losses. I saw in your annual report that the tax losses have increased quite substantially. I was wondering if you could give me an explanation for that? I think they've gone up from EUR 150/160 million to almost EUR 160 million. So what's the reason?

Dr. Christian Danninger CFO, AIXTRON SE

Christian here, I take that quite detailed question. Good catch. There has been no change in the tax loss carryforwards. It's a pure disclosure topic. This year, we are now disclosing the absolute amount of tax loss carryforwards in Note 14, which amount to EUR 283 million. In prior years, we disclosed the actual recorded deferred tax assets on these losses. It's a technical difference which is due to the IFRS standard requiring this disclosure. So therefore it is a pure disclosure change.

Malte Schaumann, Analyst, Warburg Research

And quickly, a last one on your R&D budget, maybe you can share a number. Obviously, R&D spending is expected to go up quite strongly this year. So will it exceed EUR 70 million in 2023 or come close to that number?

Dr. Christian Danninger CFO, AIXTRON SE

It will exceed the number.

Olivia Honychurch, Analyst, Jefferies LLC

You stated that a new silicon carbide customer was ordering relatively large quantities. Is that a China customer or perhaps a European-based one?

Dr. Felix Grawert CEO & President, AIXTRON SE

The majority of our silicon carbide customers is based in Europe and the U.S. This is where we currently see the strongest momentum. We know that Europe is traditionally very strong on power electronics in terms of the device makers. Here, we serve the leading players in the market. The U.S. is also very strong in power electronics, and we see further momentum now, of course, from the US Chips Act with U.S. customers also expanding their facilities.

Olivia Honychurch, Analyst, Jefferies LLC

So on the overall order outlook, you've said that power semis are the predominant driver of orders rather than Micro LEDs. For Micro LEDs, you're seeing a lot of revenue from your first major customer, but it sounds like that may tail off slightly in 2024 without there being another big order yet. The question is, do you see enough demand in GaN and silicon carbide into 2024 and 2025 being able to keep driving good strength in the business even if there was a bit of an air pocket in Micro LED?

Dr. Felix Grawert CEO & President, AIXTRON SE

I understand the question relates to the years 2024 and '25. I would expect that we continue our growth path also beyond 2023 because we will see the strong demand on the GaN and the silicon carbide side. And yes, in fact, the Micro LED topic has shifted somewhat in terms of the big wave

coming, but we see the demand from Micro LED continuing on the base level of 2022. So it's not going down. It's rather staying on a stable level, potentially even accelerating. But sometime in '24 or sometime in '25, further Micro LED adoption could kick in, generating the respective growth in demand. However, the exact timing remains difficult to foresee.

Olivia Honychurch, Analyst, Jefferies LLC

Okay. And one more question on the gross margin. You previously said that the 45% was a midterm aspiration, but now you're guiding to it in 2023 already. Does that mean we can now assume that the medium-term guidance should be higher? Or is that about the level we should expect going forward?

Dr. Felix Grawert CEO & President, AIXTRON SE

It's a very difficult question to exactly answer. On the one hand, we had achieved the 45% much faster than we had expected mainly due to the fact that the diluting red-orange-yellow business has now been replaced with more profitable business.

On the other hand, along with the growing volumes that we see in our markets, our customers are pushing for further cost reductions. We address this by driving up productivity of our tools. Yes, for an outcome, we have to see how that develops. So 45% is currently set and there might be an uptick in the years to come, let's see.

Jeff Bernstein, Cowen

I believe that you guys have an investment in an Australian company called BluGlass that was developing an RP CVD capability on your tools. And I guess they've gone commercial with high-power blue and green lasers. Can you just talk about what you see as the importance and the opportunity there?

Dr. Felix Grawert CEO & President, AIXTRON SE

Just to clarify, we do not have an investment in this company. BluGlass in Australia is a customer. They have purchased tools. They work on a specific technology. I don't want to comment on any details because I don't know what they have revealed themselves. And we serve them as a normal customer as we serve other customers. The details of our collaboration with them are under an NDA, as we have it with most of our customers. Therefore, I cannot reveal any details about what they specifically do. I think you would need to directly approach their management team for more details.

Adam Angelov, Analyst, BofA Securities

Just a very quick one on the status of the delayed export licenses. Have you fully received everything that was delayed from the second half of 2022?

Dr. Felix Grawert CEO & President, AIXTRON SE

We see that the missing licenses are now coming in one by one and also now the units that we spoke about are shipping step-by-step. Not all of them are there yet, but we see that the situation starts to be relaxing.

Elisabeth Weisenhorn, Portikus Investment

I would follow up on the question of these export licenses because here in Germany, the ministry of economics seem to have changed in their policy towards China. And I think maybe the slow process in getting out the export licenses is not only because of bureaucratic issues, but it is more of a systematic thing.

And second, your part of turnover in China was always very high. Does that now change? And how do you look at this from a risk standpoint?

Dr. Felix Grawert CEO & President, AIXTRON SE

Yes. So I see 2 questions. The first, whether there is a systematic change on this policy, we cannot confirm that. We rather see that licenses are coming. Some are coming a bit faster than expected. Others are coming a bit slower than expected, but they are coming. So we cannot confirm a systematic change here to your first question.

To the second part of your question about the China share of revenue, that's a very good observation. That's related mostly to the end markets and the end applications and the regional strength of different applications. For the last 10 years, AIXTRON had a very strong China exposure, driven largely by the traditional LED market and the LED industry, which is mostly located in China, while we all know that the highly innovative Micro LED technology topic is strongly driven out of Europe and the U.S. and in addition to that, as mentioned before, we currently see the biggest growth momentum coming from gallium nitride and silicon carbide power electronics. These are further applications where the majority of customers are located in Europe and in the U.S.

And with that, we do see the share of China revenue as a percent of overall revenue going down quite strongly. It used to be somewhere 50%, 60%. I think we are now talking 25%, 30%, something on that order, the reduction being due to the shift of end markets. However, also to be very clear, we have a very strong relationship to our in some segments also very innovative customers in China. We want to continue to serve these customers. And I think it's only a question of time when China will also focus stronger on the new applications that are currently driving our growth.

Johannes Ries Apus Capital

Coming back on Micro LEDs to get a better feeling about the size of the opportunity. I think it is the largest market opportunity despite the shorter term technology problems. Is this still the case,

despite silicon carbide and gallium nitride having grown stronger than expected maybe 1 or 2 years back? So what in the longer term period is your largest market opportunity?

Dr. Felix Grawert CEO & President, AIXTRON SE

I would see that the market opportunity is really quite balanced across all the 3 material systems that AIXTRON is offering in its portfolio. And again, there may be certain shifts. But to a very rough order, you can say 1/3 silicon carbide, 1/3 gallium nitride, both power but also including the LED side of GaN and 1/3 gallium arsenide and indium phosphide, both for lasers, and on the gallium arsenide side also including red Micro LEDs. These ratios can deviate in individual years from this 1/3, 1/3, 1/3 split. So in a specific year, one of those may be around 40% or even a little higher than 40%, but I would say we have a quite stable basis of all 3 material systems.

Johannes Ries Apus Capital

And Micro LED, it's the largest opportunity for you all, isn't it?

Dr. Felix Grawert CEO & President, AIXTRON SE

I wouldn't want to quantify it like that. I think it's nicely competing with silicon carbide. Just look at all the plans for the electrification of everything and the replacement of all combustion engines and technologies still burning fossil fuels with electric solutions. Furthermore, looking at the big growth drivers stemming from everything that needs to be replaced in the development of a fossil economy to an electric economy. You will eventually need wide-band-gap power electronics; silicon carbide for the very high power applications, gallium nitride for the lower power applications. I just read in a study that according to which by 2050, more than 50% of the world's energy will be produced by solar cells, not only here in Europe, where we are pushing this a little faster than others, but also in developing countries.

And all these new solar cells on the roofs or on the fields need power converters that should be based either on gallium nitride or silicon carbide, let's see. I think the future is uncertain, but for sure, growing.

Guido Pickert, VP Investor Relations & Corporate Communications, AIXTRON SE

Thank you for all the questions. This ends today's call. Our next earnings call will be our Q1 earnings call on April 27, followed by our Annual General Meeting on May 17. We ask you to participate and ideally support us. And until then, I'd say goodbye, and see some of you in between. Thank you very much.