STMicroelectronics N.V., Q4 2022 Earnings Call, Jan 26, 2023 (EditedCopy)

TEXT version of Transcript

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* Didier Scemama

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* Francois-Xavier Bouvignies

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Presentation

Operator [1]

Ladies and gentlemen, welcome to the STMicroelectronics Fourth Quarter and Full Year 2022 Earnings Conference Call and Live Webcast. I'm Moira, the Chorus Call operator. [Operator Instructions] The conference is being recorded. The presentation will be followed by a Q&A session. [Operator Instructions] The conference must not be recorded for publication or broadcast.

At this time, it's my pleasure to hand over to Celine Berthier, Group Vice President, Investor Relations. Please go ahead, ma'am.

Celine Berthier, STMicroelectronics N.V. - Group Vice President of Investor Relations [2]

Good morning. Thank you, everyone, for joining our Fourth Quarter and Full Year 2022 Financial Results Conference Call. Hosting the call today is Jean-Marc Chery, ST's President and Chief Executive Officer. Joining Jean-Marc on the call today are Lorenzo Grandi, President of Finance, Purchasing, Enterprise Risk Management and Resilience and Chief Financial Officer; and Marco Cassis, President of Analog, MEMS and Sensors Group and Head of STMicroelectronics Strategy, System Research and Applications and also the Innovation Officer. This live webcast and presentation materials can be accessed on ST's Investor Relations website. The replay will be available shortly after the conclusion of this call.

This call will include forward-looking statements that involve risk factors that could cause ST's results to differ materially from management's expectations and plans. We encourage you to review the safe harbor statement contained in the press release that was issued with the results this morning and also in ST's most recent regulatory filings or a full description of these risk factors. Also to ensure all participants have an opportunity to ask questions during the Q&A session, please limit yourself to 1 question and a brief follow-up.

I'd now like to turn the call over to Jean-Marc, ST's President and CEO.

Jean-Marc Chery, STMicroelectronics N.V. - President, CEO & Member of Managing Board [3]

So thank you, Celine. Good morning, everyone, and thank you for joining ST for our Q4 and Full Year 2022 Earnings Conference Call. Let me begin with some opening comments, starting with Q4.

ST delivered net revenues and gross margin above the midpoint of our guidance. Net revenues of $4.42 billion increased 24.4% year-over-year and 2.4% sequentially. Gross margin was 47.5%. Operating margin was 29.1% and net income was $1.25 billion.

Looking at the full year 2022. Net revenues increased 26.4% to $16.13 billion, driven by strong demand in automotive and industrial and our engage customer programs. All 3 product groups contributed to the growth. Profitability improved on a year-over-year basis. Gross margin was 47.3% up from 41.7%. Operating margin was 27.5%, up from 19%. And net income was $3.96 billion, almost doubling from $2 billion. We generated stronger net cash from operating activities. We invested $3.52 billion in CapEx and delivered free cash flow of $1.59 billion. Our net financial position increased to $1.8 billion at December 31, 2022, from $977 million 1 year ago.

On Q1 2023. At the midpoint, our first quarter business outlook is for net revenues of $4.20 billion, increasing by 18.5% year-over-year and decreasing 5.1% sequentially. Gross margin is expected to be about 48%.

For the full year 2023, we will continue to execute our strategy with a strong focus on Automotive and Industrial as a broad range supplier and a selective approach in Personal Electronics and Communication Equipment and Computer Peripheral. We entered this year with a backlog higher than what we had entering 2022. We plan to invest about $4 billion in CapEx, mainly to increase our 300-millimeter wafer fabs and silicon carbide manufacturing capacity, including our substrate initiative.

Based on our strong customer demand and increased manufacturing capacity, we will drive the company based on a plan for full year 2023 net revenues in the range of $16.8 billion to $17.8 billion, representing a growth range of 4% to 10% compared to full year 2022.

Now let's move to a detailed review of the fourth quarter. Both revenue and gross margin came above the midpoint of our guidance by 60 and 20 basis points, respectively. On a sequential basis, Q4 net revenues increased 2.4%, driven mainly by ADG, which increased 8.5%. MDG revenues increased 0.7%, while AMS revenues decreased 3%.

On a year-over-year basis, Net revenues increased 24.4%, with ADG and MDG growing 38.4% and 29.1%, respectively, while AMS increased 7% year-over-year. Sales to OEMs increased 26.8% and 19.5% to distribution. Gross profit was $2.1 billion, increased 30.7% on a year-over-year basis. Gross margin was 47.5%, increasing 230 basis points year-over-year, mainly driven by favorable pricing, improved product mix and currency effect, net of hedging, partially offset by the inflation of manufacturing input costs.

Fourth quarter operating income increased 45.4% to $1.29 billion. Q4 operating margin was 29.1%, up from 24.9% in the year-ago period, with ADG at 27.7%, AMS at 25.8% and MDG at 35.8%.

Q4 net income was $1.25 billion, including onetime noncash income tax benefit of $141 million, compared to $750 million in the year ago quarter. Earnings per diluted share were $1.32 compared to $0.82.

Let's now discuss our full year results, starting with the business dynamics. 2022 was a year marked again by strong demand in Automotive and Industrial, still impacted by supply chain challenges due to continuing shortages and capacity constraints. In the second half, we started to see market softening in Personal Electronics and Computer Peripherals. In Automotive, we again saw unprecedented demand across all geographies, driven by increasing semiconductor pervasion structural transformation,and inventory replenishment.

We continue to execute our strategy for car electrification, in particular in our silicon carbide business. We added a wide range of wins in next-generation electrical vehicle design with our power discrete solutions. The latest one is with Hyundai Motor, who have chosen our Acepack drive silicon carbide MOSFET generation 3 based power module for traction inverter in its current generation electrical vehicle platform.

In silicon carbide for Automotive and Industrial, we achieved $700 million of revenues with silicon carbide in 2022, with a plan to be above $1 billion in 2023. We finished the year with 115 awarded projects, spread over 80 customers, adding 25 projects and 8 customers during 2022. About 60% of these projects are for Automotive customers.

We continue to lead in silicon carbide as we have moved to high volume production of our third-generation transistors for multiple Automotive customers, and we will ramp our fourth generation transistor in volume in the second half of this year.

In car digitalization, we are the range of wins with our MCUs and power solutions for new zonal car architectures. We won designs with our next-generation Stellar Automotive MCU and announced a cooperation model with Volkswagen Cariad, including the joint development of a System-on-Chip MPU. We also received awards with our partners Mobileye for ADAS and Autotalks for V2X.

In our Automotive sensors, we continue to increase the scale of our business in inertial sensor, growing by over 40% year-over-year. In global shutter imaging sensors, we received awards for 5 key programs during the year.

In Industrial, demand was also very strong throughout the year, especially in Power & Energy, Factory Automation and Robotics and in Industrial Infrastructure what we define the B2B part of the Industrial market. We continued to strengthen our embedded processing solutions leadership with our STM32 microcontroller and microprocessor families and ecosystem.

We continued to win many designs in a wide range of industrial applications and to achieve record volumes and sales of STM32 products. In power and energy management applications, such as electric vehicle charging stations, photovoltaic systems,and industrial power supplies, we have many important design wins with our power discrete portfolio of both silicon and wide bandgap-based devices, and we further extended our product offer during the year.

We progressed with sensors for industrial applications, with revenue growth of around 50% year-over-year. We introduced new industrial sensors, such as the first Intelligent Sensor Processing Unit, launched together with Generation 3 MEMS Sensor as well as Time-Of-Flight sensor for touchless sensing applications. These enabled design wins with customers in many areas, such as equipment condition monitoring, asset tracking and healthcare.

During 2022, we introduced 80 new Industrial analog products, with awards in applications for factory automation, motion control, metering, power tools and home appliances. In Personal Electronics and Computer Peripherals, we started to see a market softening in the second half of the year, while Communication Equipment demand remains solid through the year in the areas we are focused on.

In Personal Electronics, in 2022, we won many sockets in flagship smartphones, with motion and environmental sensors, time-of-flight ranging sensors, wireless charging products, touch display controllers and secure solutions. We also leveraged our broad portfolio to address high-volume personal electronics applications, such as smart watches, headsets and other wearables, as well as gaming accessories from leading player in each area.

In Communication Equipment, we progressed well with engage customer program for selected applications in cellular and satellite communication infrastructure, and received new awards based on our proprietary technologies. These were for satellite, optical and wireless infrastructure ICs based on our mixed singl signal processes and 28-nanometer FD-SOI.

Let me now share a summary of our main 2022 manufacturing initiatives. We are transforming our manufacturing base to enable our future growth and drive enhanced profitability with a significant expansion of our 300-millimeter capacity and a strong focus on the wide bandgap semiconductors. In silicone carbide, we are following our plans to increase 10-fold, the front-end capacity versus 2017 and to have 40% of our substrate need internally sourced by 2024.

We continue to ramp our silicon carbide front-end device production in our Singapore facility on top of the Catania one, and we increased back-end manufacturing capacity in our sites in Morocco and China. We are building an integrated silicon carbide substrate manufacturing facility in Catania as an important step in our silicon carbide vertical integration strategy.

Volume production is expected to start in the second half of this year. And just recently, we have produced, in Catania, the first 150-millimeter ingot out of this facility.

In terms of R&D activities, we have completed full MOSFET device processing using our internally produced 200-millimeter substrate. We also announced that we will cooperate with Soitec on silicon carbide substrate manufacturing technology, with an agreement to qualify Soitec's SmartSiC technology, for future 200-millimeter SiC substrate production. In our 300-millimeter strategy, in 2022, we have further expanded capacity in our Crolles, France site. We also signed a MoU with GlobalFoundries to create a new 300-millimeter semiconductor manufacturing facility adjacent to ST's existing facility in Crolles.

In Agrate, Italy, having completed in 2022 the first industrialization line and the qualification of the engineering sample, we are now ramping our new 300-millimeter wafer fab. We plan to have a capacity of about 1,000 wafers per week by the end of this year. These initiatives will be aligned with our sustainability strategy and our sustainable manufacturing commitment in terms of energy consumption and greenhouse gas emissions, air and water quality.

We are on track to achieve our carbon neutrality in 100% renewable energy goals by 2027 as announced in December 2020. One important contributor to our plan was the adoption in 2022 of a district cooling system in Singapore ST's single largest wafer fabrication site. We expect to eliminate 30% of the site carbon emission on completion. We also continue to work closely with external bodies and were well ranked by the Carbon Disclosure project and included in the Dow Jones Sustainability World and Europe indices.

Looking now at full year 2022 financial performance in greater detail. Net revenues increased 26.4% to $16.13 million. On a year-over-year basis, Automotive volume grew 51%, industrial was up 34%, Communication Equipment and Computer Peripherals increased 19% and personal electronics grew 2%. This performance was consistent with both end market dynamics and our strategy. We have a strong focus on Automotive and Industrial as a broad range supplier of application specific and general purpose products targeting leadership position.

Automotive represents about 33% and Industrial about 29% of our total revenues in 2022. We selectively address the Personal Electronics and Communication Equipment and Computer Peripherals market, targeting some leadership positions with a few differentiated products or custom solutions, complemented by our general purpose product portfolio. In 2022, Personal Electronics represented about 27% of our total revenues, and Communication Equipment, Computer Peripherals 11%.

By customer channel, sales to OEMs and distribution represented 67% and 33%, respectively, of total revenues in 2022. Similar to the split in 2021. By region of origin, 41% of our revenue 2022 were from

Americas, 30% from Asia Pacific and 29% from EMEA. Looking at the sales performance by product group. ADG revenues grew 37.2% on strong growth in Automotive and in Power Discrete. AMS revenues were higher by 7.1% with an increase in Imaging and MEMS, partially offset by a decrease in Analog. MDG revenues increased 37.5%, with strong growth in both microcontrollers and radio frequency communication.

Gross margin increased to 47.3% for 2022 compared to 41.7% for 2021, specifically driven by favorable pricing, improved product mix, currency effect net of hedging, partially offset by deflation of manufacturing input costs. We delivered a strong increase in operating margin to 27.5% for 2022 compared to 19% in 2021. All product groups demonstrated year-over-year growth, with ADG operating margin up to 24.6% from 11.8%, AMS operating margin up to 25.2% from 22.3% and MDG operating margin up to 35% from 23.9%.

Net cash from operating activities increased 70% in 2022, totaling $5.2 billion. After investing $3.52 billion in CapEx in 2022 compared to $1.83 billion in 2021, our free cash flow increased 42.1% to $1.59 billion. Cash dividends paid to stockholders in 2022 totaled $212 million. In addition, during 2022, ST executed share buybacks totaling $346 million under our current share repurchase program. ST net financial position of $1.8 billion at December 31, 2022, reflected total liquidity of $4.52 billion and total financial debt of $2.72 billion.

Now let's move to our first quarter 2023 financial outlook and our plan for the full year 2023. For the first quarter, we expect net revenues to be about $4.2 billion at the midpoint, representing year-over-year growth of about 18.5% and a sequential decrease of about 5.1%. Gross margin is expected to be about 48% at the midpoint. For 2023, based on our strong customer demand and increased manufacturing capacity, we will drive the company based on this plan for full year 2023 revenues in the range of $16.8 billion to $17.8 billion, representing growth over 2022 of about 4% to 10%.

Automotive and Industrial will be the key growth drivers of our revenues in 2023. We plan to invest about $4 billion in CapEx, about 80% of this amount is mainly related to the increase of our 300-millimeter wafer fabs and silicon carbide manufacturing capacity, including our silicon carbide substrate initiative. The remaining 20% is for R&D, laboratories, manufacturing maintenance and efficiency, and our corporate sustainability initiative.

To conclude, last May at our Capital Markets Day, we shared our value proposition. This is based on sustainable and profitable growth with our '25 to '27 $20 billion-plus revenue ambition and the related financial model. Our end market focus on Automotive and Industrial as a broad range supplier of application-specific and general purpose products, targeting leadership positions. On Personal Electronics and Communication Equipment and Computer Peripherals, with a selective approach, targeting some leadership position with a few differentiated products or custom solutions, complemented by our general purpose products portfolio, providing customers with differentiating enablers, and a reliable and secure supply chain.

And last but not the least, a strong commitment to sustainability. In 2022, we made important progress in all these areas and we will continue along the same pace in 2023.

Thank you, and we are ready to take your questions and to answer.

Question And Answer

Operator [1]

[Operator Instructions] The first question comes from Aleksander Peterc from Societe General.

Aleksander Peterc, Societe Generale Cross Asset Research - Equity Analyst [2]

Congratulations for strong results and a very solid guidance. Now I'd just like to understand, given your first quarter gross margin outlook at 48%, are there any specific positive mix effects here at play that will shape out differently in the remainder of the year? I remember, Lorenzo, you said previously that we should probably look at the gross margin flat to maybe slightly up for the current year, is that still valid? And how should we think about the shape of gross margin over the year?

Jean-Marc Chery, STMicroelectronics N.V. - President, CEO & Member of Managing Board [3]

Lorenzo will take the question. Thank you.

Lorenzo Grandi, STMicroelectronics N.V. - President of Finance, Purchasing, ERM & Resilience and CFO [4]

Okay. Good morning, everybody. Thank you for the question. For the gross margin of Q1, when I look at sequentially this improvement, this is mainly driven by 2 factors, I would say. The first one is related to a positive product mix that is continuing impacting positively our revenues and our gross margin. And actually, I would say that in this first quarter, we have still some positive effect on price increase. This was mainly on some specific customer and some specific area, I would say, mainly in Automotive and partially also for some customers in the Industrial. Of course, it's not the same magnitude that we experienced last year, but still there are some positive negotiations that are improving our gross margin.

On the other side, of course, our gross margin is impacted by some increase also in our input cost in the manufacturing. All in all, anyway, we see this improvement in respect to the previous quarter, with respect to Q4 of around 50 basis points. Moving forward, the gross margin at the midpoint of our revenue indication for the year is expected similar to the one that we had in 2022. So we are substantially confirming what I was saying also in -- during Q4. On one side, we have a positive product mix. In the manufacturing productivity, we expect some improvement.

In terms of pricing, we expect a substantial stability in terms of prices. So with the price, we do not expect in the course of the year play significantly high positive or negative, as said, but to stay substantially stable. This -- all these will be offset for sure by increased input cost in our manufacturing. And then we have not to forget that we start our 300-millimeter in Agrate, that is suboptimal in terms of, let's say, volume and production this year, and this will impact for some extent, our gross margin, especially in the second part of the year. So at the end, starting from the 48%, we see as average in the year, something more similar to 47% for the total year.

Aleksander Peterc, Societe Generale Cross Asset Research - Equity Analyst [5]

Excellent. And just a quick follow-up, if I may. Can you tell us how far out your current and planned capacity is currently fully booked? And is the top end of your guidance range aligned with the hypothesis that you remain sold out into year-end? How does this work out?

Jean-Marc Chery, STMicroelectronics N.V. - President, CEO & Member of Managing Board [6]

So about capacity, there is different dynamics. It is clear that we have to look now by technology and packaging clusters. It is clear that all technology which are related to Automotive and, let's say, B2B industrial. And here, I have spoken about power, technology. So SiC, MOSFET, IGBT, vertical integrated power, high-voltage, low-voltage MOSFET, but as well, okay, some advanced power driver like BCD and high-performance microcontroller on 40-nanometer, our capacity are fully booked for the year, definitively.

Well, for the other one, which are more addressing Personal Electronics, consumer market, we are going back, okay, something we classify normal, okay? So entering the year, the capacity is well utilized but not fully booked for the year. And that's the reason why for such, let's say, market, now our lead times are improving, okay, moving forward.

Operator [7]

Next question is from Didier Scemama from Bank of America.

Didier Scemama, BofA Securities, Research Division - Director in EMEA Equity Research & Head of European IT Hardware [8]

Congratulations on the spectacular guidance for Q1 and '23. Jean-Marc, I'd like to understand one thing on your silicon carbide business. So number one, is it clear or is it -- or did I understand correctly that you slightly raised that guidance to -- from $1 billion to $1 billion plus?

And then secondly, in that number, can you tell us a little bit about the mix between discretes versus modules? Because it seems like some of your competitors are shipping mostly modules, whereas you're shipping mostly discrete. And obviously, the value-added of modules is substantially greater than the value added of discretes. In other words, that's comparing apples to apples, if that makes any sense. And I've got a follow-up.

Jean-Marc Chery, STMicroelectronics N.V. - President, CEO & Member of Managing Board [9]

Thank you. Yes, I confirm that our plan for 2023 is above $1 billion. And clearly, the mix, okay, we have is mainly modules, okay? First of all, okay, with one of our main customers. And the main part of the program, okay, we have been awarded are significantly based on the ACEPACK, okay, module we have for our main business is module-related. However, as this is not a KPI, okay, we communicate in detail. But qualitatively, I can confirm to you that it is mainly on module.

Didier Scemama, BofA Securities, Research Division - Director in EMEA Equity Research & Head of European IT Hardware [10]

Okay. Excellent. And on the second half gross margin comment that you made, Lorenzo, can you quantify the sort of start-up costs in Agrate, Catania in the gross margins? That would be helpful.

Lorenzo Grandi, STMicroelectronics N.V. - President of Finance, Purchasing, ERM & Resilience and CFO [11]

Yes, in terms of startup cost, we have 2 components, I would say. One is what is qualified startup. So it means that this cost will not hit our gross margin, but will be reflected in other incoming expenses. This from an accounting standpoint, let's say, are the pure startup cost. When your fab is not yet, let's say, at a minimal capacity, this will be visible in the line other income and expenses, that actually this year will be somehow lower in respect to what we have seen in 2022 for this reason, but not impacting the gross margin.

What I'm referring is in -- once the fab will be out of the startup and will start to produce, we'll be still in suboptimal situation in terms of efficiency because the volume is not yet enough to really to have wafer cost that is comparable with a full buildout of fab 300-millimeter. This will impact the second part of the year of our gross margin. But what I'm saying is that starting with 48%, the average of the year will be in the range of 47%. So it means that will not give us an opportunity to improve in respect to the first quarter, but will not be even a big detractor because at the end, the average will stay in this range.

Didier Scemama, BofA Securities, Research Division - Director in EMEA Equity Research & Head of European IT Hardware [12]

All right. And maybe just one quick one for Jean-Marc. Is there anything you want to call out for the second half for Personal Electronics? Is it a win or a loss or anything that we should be aware of when we model the business, please?

Jean-Marc Chery, STMicroelectronics N.V. - President, CEO & Member of Managing Board [13]

Okay. So yes, maybe I will comment, okay, the full year plan, okay, we have indicated at the midpoint. Well, clearly, at the midpoint of the plan, we indicated, so $17.3 billion, it is clear that we will grow every quarter sequentially, and we will grow every quarter year-on-year basis. But moving forward, okay at a, let's say, softer pace. And why, because we have to look dynamics, by product group and dynamics, by verticals.

So by product group, as we said, okay, clearly, ADG and MDG will grow at double digit, okay; while IMS, okay, will, let's say, slightly decrease. By end market, it is clear that on Automotive and Industrial, the company will grow and will perform better than the market we address with double-digit, driven by the high-growing application we are focusing on and by the increasing capacity, okay, we built in H2 2022 and we are building in H1 2023.

On communication equipment and computer peripheral, we will grow slightly in line with the market. And clearly, it is driven mainly by the engage customer program we have, offset by, let's say, the computer personal. Well, now in Personal Electronics, it's another dynamic year. We will have a decrease. We will, let's

say, decrease our revenue, so lower definitively than the market. Why? Because we will have a change in important engage customer program, which will be accretive on our gross margin, but with less revenue. So this is the dynamic we will have on the -- moving forward in 2022.

Operator [14]

The next question is from Matt Ramsay from Cowen and Company.

Joshua Louis Buchalter, Cowen and Company, LLC, Research Division - Vice President [15]

This is Josh Buchalter, on behalf of Matt. Congrats on the awesome results. I guess I wanted to follow-up on a previous question and double-click on Industrial and Auto in particular. I mean there's widespread, I guess, concerns of macro softening. And one of your large peers earlier this week called out some weakness in digestion in industrial. I guess can you walk us through and provide a little more granularity on what gives you confidence in Industrial? And I guess also Auto, is that still benefiting from replenishment inventory like it was last quarter?

Jean-Marc Chery, STMicroelectronics N.V. - President, CEO & Member of Managing Board [16]

Yes, I think it's important to split the industrial market in two. I repeat, this is what we classify the B2B. In B2B, first of all, there is power and energy. And when I have spoken about power and energy, I have spoken about the generation of energy, conversion of synergy and storage. And with the whole initiative you have worldwide on renewable energy, okay, and in all geographies, the demand for power electronics and, let's say, board controllers, encompassing microcontroller, gate driver and sensor is huge. There is absolutely no investment softening in the field of power energy.

Then the second point about power energy is the main consumption of electricity in the world is related to motion, okay, but engine, water or electrical. Everywhere in the world, there is an initiative to make more efficient all the engines which are connected to industry and factories. And here, the demand for power electronics, again, in terms of industrials, in terms of board controllers, MCU, power electronics is huge. This is exactly the same for factory automation and robotics, okay?

So because of the shortage of talent in the world, because of the lesson learned for the post-pandemic, there is many, many industries which are making them more automated and asking for more robotics. Here is the same. It's also the same in the logistics. The robots you need in the massive, let's say, storage infrastructure are completely with the robot, okay, asking for many microcontroller and so on and so forth. And last but not the least, you see the heavy infrastructure that you have in countries and in cities. This market is growing at the same pace in automotive, asking for power, MCUs and BCD technology for driver.

Then the second part of the industrial market is more what we call the consumer one, which are battery-operated tool, okay? Because since 2, 3 years, there is an acceleration of all, let's say, professional and consumer small tools to move from thermal combustion engine base or plug-in on the grid to battery operators. Yes, here, there is a softening of the market, but the expectation of customer is a restart in Q2.

And then there is health care, where the volumes are less, but is in the, let's say, similar path. So yes, I would like to insist that on industrial market, you have 2 different dynamics. You have really a dynamic which is strong, the B2B, and here is driven by a transformation, so decarbonization and automation of the industry, so pervasion of semiconductor. And there is a second dynamic, which is going back to normal, softening, which is battery-operated tool, all appliances is basically the same and health care. So I don't know what the main competitor you refer or say. But I can confirm to you, this is what we see. This is a backlog we have and this is what the customer are demanding.

Celine Berthier, STMicroelectronics N.V. - Group Vice President of Investor Relations [17]

Did that answer your question?

Joshua Louis Buchalter, Cowen and Company, LLC, Research Division - Vice President [18]

Thank you for all the color there. I guess for my follow-up I wanted to ask about silicon carbide substrates. You've seen a player -- the leading player in substrates sort of have yield issues over the last quarter or 2. It was great to hear you reiterate the confidence in 40% internal substrates over the next year. Could you just walk me through what gives you -- how can you be so confident, I guess, in your ability to, both medium term and longer term, get access to substrates, and particularly given some of your peers are going full vertical, others are going the other end and placing bets all over the place with multiple suppliers? Would just be great to hear an update on the silicon -- your view of silicon carbide substrate supply.

Jean-Marc Chery, STMicroelectronics N.V. - President, CEO & Member of Managing Board [19]

No, I would like to comment, let's say, the planning horizon of 3 to 5 years, and to confirm what is our strategy. Again, on substrate initiative, our intention was to, let's say, build an internal source in order to warranty to any customer with whom we have a strategic agreement, let's say some security of the supply chain, okay? We have seen during the past few years that some issues could occur. And one of the lessons learned we have taken, this silicon carbide is so key enabling technology for the electrification of the MOSFET and the decarbonization of the industry that we consider that, for a while, to offer strategic independence to our key customer was, let's say, a key initiative of us.

But then the second objective to acquire internal capability on this substrate initiative is R&D and efficiency. We want to be, let's say, not dependent on anybody to move our production to 200-millimeter. And we do not want to be dependent on anybody to insert strong innovation in our substrate initiatives. As an example, the SmartSiC technology from Soitec. So now ST will be equipped -- is equipped very soon with all this internal capability to offer strategic independence to our customers and to drive in the safe management mode, our efficiency and innovation. So this is what we want during now and the next 5 years.

So beyond this horizon, we will see which complementary partnership or open partnership we can do. No, ST is not a company close to partnership. I would like to recall GlobalFoundries partnership, ThELMA partnership. So ST is perfectly open to any manufacturing cooperation and agreement. But it's too early to speak about that.

Operator [20]

The next question is from Francois Bouvignies from UBS.

Francois-Xavier Bouvignies, UBS Investment Bank, Research Division - Technology Analyst [21]

I have 2 quick ones. The first one is on maybe microcontroller has been a big driver in 2022 and seems to be still in Q1. Can you give some color around the dynamic in microcontroller, specifically that has been constrained for the last few quarters? I mean it looks like inventories are going up significantly. So what do you see in terms of supply demand and pricing dynamic inventories for microcontrollers specifically? Even though you assume pricing to be flat on average, but it would be very interesting to have your microcontroller view specifically.

And the second question I had is on silicon carbide. Actually, to confirm the 40%, 4-0, subset in-house for, I think it was 2024, Jean-Marc, I was not sure I understood your answer. I mean do you still to have 40% next year? Or it's maybe more like a 3, 5 years aspiration? I just wanted to clarify that point.

Jean-Marc Chery, STMicroelectronics N.V. - President, CEO & Member of Managing Board [22]

By 2024, it means, by Q4 2024, we would like to have 40% internal production.

Francois-Xavier Bouvignies, UBS Investment Bank, Research Division - Technology Analyst [23]

Okay. And is it 200-millimeter or 150 that you...

Jean-Marc Chery, STMicroelectronics N.V. - President, CEO & Member of Managing Board [24]

I think It will be 150 at the early stage, and step after step, we'll move to 200.

Francois-Xavier Bouvignies, UBS Investment Bank, Research Division - Technology Analyst [25]

Good clarification.

Jean-Marc Chery, STMicroelectronics N.V. - President, CEO & Member of Managing Board [26]

On MCU, the market remains strong overall. We have spoken about STM32, I guess, general purpose. So remain -- the market remains very strong. But overall, I have spoken then -- okay, I will give maybe some specific color. Yes, the demand, the capacity and the inventories have started to be more balanced, clearly. And the lead time are starting to reduce step after step in certain product families and the pricing is stable. But where we are still, let's say, capacity constrained, it's on some ultra-performing microcontroller for industrial applications, for B2B application, because this ultra-performing microcontroller sometimes including let's say, connectivity, security and AI are in competition with microcontroller for automotive.

Basically, they are sharing the same 14-nanometer technology capacity. And here, clearly, we are still on the, let's say, important capacity saturation. Lead time, which are, let's say, quite above a normal situation and in a certain extent, due to is some allocation. For the mainstream microcontroller STM32, for the ultra-low power microcontroller STM32, we are moving step by step to a more normal situation. But I repeat with still a strong demand and in a pricing environment, which is stable whatever is, let's say, go-to-market channel we use.

Celine Berthier, STMicroelectronics N.V. - Group Vice President of Investor Relations [27]

Next question, please. I think we have time for 1 or 2 questions depending on the length of the question and answer. So next question and then we will adjourn.

Operator [28]

The next question is from Sandeep Deshpande from JPMorgan.

Sandeep Sudhir Deshpande, JPMorgan Chase & Co, Research Division - Research Analyst [29]

Two or 3 questions, if I may, quickly. Jean-Marc, you've had a great guidance for the full year. And you are highlighting that in the second half that there is some mix shift with your main consumer electronics customer. So essentially, it looks like all your growth for the year is coming from the automotive industrial space. Is that correct? And I would like to understand what is exactly happening in terms -- because you mentioned in an earlier question that there is some shift happening in terms of the consumer electronics customer, in terms of the part, I'd like to understand that. And I have one quick follow-up.

Jean-Marc Chery, STMicroelectronics N.V. - President, CEO & Member of Managing Board [30]

Yes. What I would like to confirm that in 2023, completing the plan we disclosed to you at the midpoint. Our company will have about 70% of our revenue generated by automotive and industrial markets, and about slightly above 30% from personal electronics and communication equipment and computer peripheral. But it is perfectly aligned with the $20 billion ambition that we shared with you at the Capital Market Day. This is exactly what we want to do.

So this, yes, I confirm, in 2023, we will finish the year in the mix in terms of vertical exposure, which is a strategic target we set up at the management team during the Capital Market Day. Now where we are, I repeat, on the personal electronics overall, moving forward along the year, we have a mix change in the important engage customer program. Again, this mix change will translate in less revenue year-over-year, but better gross margin generation. So this is what I can confirm to you, and this will happen smoothly moving forward across the year.

Sandeep Sudhir Deshpande, JPMorgan Chase & Co, Research Division - Research Analyst [31]

Understood. And just a quick follow-up on manufacturing. I have -- I mean, how much of your production in '22 was 300 millimeters? And going forward, with your ramping up of Agrate, how should we look at that 300-millimeter as a percentage of your production in '23 and then in '24?

Jean-Marc Chery, STMicroelectronics N.V. - President, CEO & Member of Managing Board [32]

It was, let's say, slightly above 25%.

Lorenzo Grandi, STMicroelectronics N.V. - President of Finance, Purchasing, ERM & Resilience and CFO [33]

Internal, we're talking about internal only.

Sandeep Sudhir Deshpande, JPMorgan Chase & Co, Research Division - Research Analyst [34]

And Jean-Marc, is it -- because there was some conversation earlier on the margin mix because of the ramp-up of the Agrate fab that there will be some negative impact on gross margin in the second half of this year, but will it be accretive in '24?

Lorenzo Grandi, STMicroelectronics N.V. - President of Finance, Purchasing, ERM & Resilience and CFO [35]

Yes, definitely. Of course, in the course of this year, in 2023, we will not be in scale for our 300-millimeter in Agrate, such as that it will be accretive at the level of our gross margin. Because at the end, as we said that we will end the year with the 1,000 wafer per week. Still it's too low, and you know that our priority is to grow as fast as we can in this.

In 2024, our expectation is that we will start to be neutral to our gross margin, and then in the second part of next year to be accretive as we target to increase this capacity along 2024. This year, no, it will not be, let's say, accretive to our gross margin. This is one of the reasons that you see that, in respect to the starting point of our gross margin in the first quarter, we have no opportunity to improve over the year. And we -- and our average for the full 2023 will be close to 47%, similar to the one that we had in 2022.

Celine Berthier, STMicroelectronics N.V. - Group Vice President of Investor Relations [36]

Thank you very much, Sandeep. And we have time for our last question.

Operator [37]

This last question is from Andrew Gardiner from Citi.

Andrew Michael Gardiner, Citigroup Inc., Research Division - Research Analyst [38]

Lorenzo, perhaps one for you. You normally give us an update in terms of your operating expense outlook, if you could help both in terms of first quarter as well as how you see things trending through the year. And then a quick follow-up after that, if you don't mind.

Lorenzo Grandi, STMicroelectronics N.V. - President of Finance, Purchasing, ERM & Resilience and CFO [39]

In terms of expenses, net operating expenses actually in the first quarter are expected to increase in respect to our Q4 operating expenses. And this is mainly due to negative impact of the calendar because during Q4, we had, let's say, a vacation at the end of the year, as you know very well, with the Christmas period. We have an increase of activity. We have also some unfavorable currency effect during -- in this quarter in respect to the previous quarter. We have also to consider that we will have a negative impact in the line other income and expenses. So there are 2 reasons for that. One, I was explaining before, is due to the start-up cost that we account in this line.

And the second reason is that we do expect in Q1, a lower level of R&D income and grants, let's say, due to the fact that for administrative reasons, we are not in the position to recognize, let's say, all the amount of R&D grants in Q1, most likely there will be a catch-up of these R&D grants due to the renewal of the various convention with the various authorities. So at the end, when we look at Q1, our net operating expenses, including other income expenses, should fall in the range of $900 million to $950 million (sic) [$915 million].

Andrew Michael Gardiner, Citigroup Inc., Research Division - Research Analyst [40]

And then in terms of how you think that trends through 2023.

Lorenzo Grandi, STMicroelectronics N.V. - President of Finance, Purchasing, ERM & Resilience and CFO [41]

For the year 2023, let's say, I would say that this year will be a year of quite significant, let's say, investment in terms of R&D, in terms of activity, in terms of digitalization of our company. So we have many programs running. I would say that at midpoint, while in 2022, we enjoyed a significant leverage on our expenses, my expectation is that in 2023, we will not enjoy a significant leverage on our expenses at the midpoint of our revenues indication.

Andrew Michael Gardiner, Citigroup Inc., Research Division - Research Analyst [42]

Okay. So steady as a percent of sales on '22?

Lorenzo Grandi, STMicroelectronics N.V. - President of Finance, Purchasing, ERM & Resilience and CFO [43]

Yes.

Andrew Michael Gardiner, Citigroup Inc., Research Division - Research Analyst [44]

Okay. And if I could just squeeze a quick follow-up in back to the personal electronics question. If I go back to how you guys framed the outlook for '23 back at the third quarter, you've given us an initial indication of growth, and you said at that time that you thought you could grow across all 3 divisions in 2023. As we start the year here in January, you're now saying no, AMS is going to be down, driven by this reframing of the personal electronics relationship. Has something materially changed in the last few months with that, that's driving this mix towards lower revenue but higher gross margin? It feels like it's more socket change than any pricing dynamic because if it was pricing on a similar part, gross margin largely wouldn't move up. So is there anything more you can add to that?

Jean-Marc Chery, STMicroelectronics N.V. - President, CEO & Member of Managing Board [45]

Here, there is 2 points. Point number one is the usual seasonality of Q1 of the personal electronic overall. But this is not a surprise. And again, what I commented on the mix change with an important engage customer program is absolutely not a soft point.

Andrew Michael Gardiner, Citigroup Inc., Research Division - Research Analyst [46]

Okay. That's all you can say. I understand.

Celine Berthier, STMicroelectronics N.V. - Group Vice President of Investor Relations [47]

And just to clarify because we had a question from the expense book, the amount of net OpEx for Q1 is $900 million to...

Lorenzo Grandi, STMicroelectronics N.V. - President of Finance, Purchasing, ERM & Resilience and CFO [48]

$915 million or something.

Celine Berthier, STMicroelectronics N.V. - Group Vice President of Investor Relations [49]

$915 million.

Lorenzo Grandi, STMicroelectronics N.V. - President of Finance, Purchasing, ERM & Resilience and CFO [50]

Not, $950 million, $915 million.

Celine Berthier, STMicroelectronics N.V. - Group Vice President of Investor Relations [51]

Yes, exactly. Just to be clear.

Lorenzo Grandi, STMicroelectronics N.V. - President of Finance, Purchasing, ERM & Resilience and CFO [52]

I take some time some cushion and there is hesitation. But this time, I am a little bit too mature.

Celine Berthier, STMicroelectronics N.V. - Group Vice President of Investor Relations [53]

So with this, thank you very much to all of you. I think you can end our call for this time.

Jean-Marc Chery, STMicroelectronics N.V. - President, CEO & Member of Managing Board [54]

Thank you, everybody, and Happy New Year for everybody.

Lorenzo Grandi, STMicroelectronics N.V. - President of Finance, Purchasing, ERM & Resilience and CFO [55]

Thank you.

Operator [56]

Ladies and gentlemen, the conference is now over. Thank you for choosing Chorus Call, and thank you for participating in the conference. You may now disconnect your lines. Goodbye.