

Amprius Technologies, Inc.
Fourth Quarter and Full Year 2023 Earnings Conference Call
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Presenters

Kang Sun, CEO

Sandra Wallach, CFO

Q&A Participants

Lydia Senatore - Oppenheimer & Company

Mark Schutter (ph) - William Blair

Christopher Souther - B. Riley Securities

Chip Moore - Roth MKM

Jeffrey Grampp - Alliance Global Partners

Donovan Schafer - Northland Capital Markets

Amit Dayal - HC Wainwright

Operator

Good afternoon. Welcome to Amprius Technologies' Fourth Quarter and Full Year 2023 Earnings Conference Call. Joining us for today's presentation are the company's CEO, Dr. Kang Sun, and CFO, Sandra Wallach. At this time, all participants are in listen-only mode. Following managements' remarks, we will open the call for questions.

Please note that this presentation contains forward-looking statements, including, but not limited to, statements regarding future product commercialization, new customer adoption, the timing and ability of Amprius to build its large scale manufacturing facility, expand its manufacturing capacity, scale its business and achieve a sustainable cost structure, and Amprius' financial and business performance.

These statements involve known and unknown risks, uncertainties, and other important factors that may cause Amprius' results, performance, or achievements to be materially different from any future results, performance, or achievements expressed or implied in such forward-looking statements. For a more complete discussion of these risks and uncertainties, please refer to Amprius' filings with the Securities and Exchange Commission.

Finally, I would like to remind everyone that this conference call is being webcast and a recording will be made available for replay on the company's Investor Relations website at ir.amprius.com. In addition to the webcast, the company has posted a shareholder letter that accompanies these results, which can also be found on the Investor Relations website.

I will now turn the call over to Amprius Technologies CEO, Dr. Kang Sun, for his comments. Sir, please proceed.

Kang Sun

Welcome, everyone, and thank you for joining us this afternoon. On today's call, I will report our progress and accomplishments for the fourth quarter while also highlighting some of the milestones we achieved in 2023. Our CFO, Sandra Wallach, will then discuss our financial results for the period. After that, I will share some closing remarks before opening the call for questions.

The fourth quarter was a strong end of a great year for Amprius. Before I give a recap of the year, I would like to briefly introduce Amprius to those who may be new to the company. Amprius develops, manufactures, and markets high energy density and high-power density batteries with applications across all segments of electrical mobility, including the aviation and the EV industries.

As a pioneer of silicon anode battery technologies, Amprius has spent the last decade developing various silicon anode structures and cell chemistries, as well as manufacturing processes. The company has a strong patent portfolio of over 80 issued patents and pending applications. When it comes to the battery performance, Amprius silicon anode batteries command a firm leading position in the industry.

Amprius batteries deliver 450 watt-hour per kilo specific energy density and the 1,150 watt-hour per liter volumetric density and have been available commercially since early 2022. In 2023, we developed a 500 watt-hour per kilo, 1,300 watt-hour per liter battery platform, which will be ready for commercial shipments soon. Also, Amprius' silicon anode structures and cell chemistries enable us to 10C power capability and balance the high energy and high power battery designs.

Our silicon anode batteries have the extreme fast charge rates of 0% to 80% state of charge in approximately six minutes and operate in a wide temperature range of minus 30 degree Celsius up to 55 degree Celsius, and have safety design features that enable us to pass the United States' military benchmark nail penetration tests. Each of these performance parameters is critically important to electrical mobility applications. Not only do our battery enable certain aircrafts and vehicles to function, but in doing so, they also enable our customers to achieve their economic targets as well.

Amprius has been in commercial battery production since 2018. So the company has many years of experience manufacturing high energy density and high-power density lithium-ion batteries.

It's our belief that there are no other commercial batteries on the market that can perform at these levels today.

Between our two battery families, SiMaxx and SiCore, Amprius' high performance batteries have attracted significant market attention and customer demand. Company's priority today is to build additional manufacturing capacity as quickly as we can to meet the significant customer demand for our products.

2023 was a transformational year for Amprius. We came into the year with three major goals. First, we set out to further advance our silicon anode battery technology to deliver breakthrough performance. Second, we sought new customer wins as we continue to grow our product shipment volume. And third, we strove to expand our production capacity to meet the increasing demand of our batteries. We made a significant progress across each of these areas and are confident that our effort has positioned Amprius to continue executing on its growth strategy in 2024 and beyond.

Specifically, we had several noteworthy accomplishments in 2023. Last year turned out to be a banner year for our technology development. Back in March, we unveiled our 500 watt-hour per kilo battery platform, a first for our industry. To the best of our knowledge, once our cells begin shipping to customers this year, Amprius will be the first company to achieve 500 watt-hour per kilo energy density in a commercially available battery.

Then in August, we also unveiled our breakthrough battery cell chemistry and design that enable 400 watt-hour per kilo energy density with a simultaneous 10C power capability. The energy and power delivered by this cell make it an ideal solution for electrical mobility applications such as aviation and EVs.

For eVTOLs, this battery is designed to provide the necessary propulsion power and the energy for taking off, cruising, and landing, while also extending flight range by as much as 50% as modeled, based on commercially available alternatives. We complete the customer evaluations at the beginning, shipping batteries to select customers in 2023 with expanded commercialization expected in 2024.

We hit the ground running in 2024 as well. In January, we launched our all new cycle product family to go along with our existing silicon nanowire platform, called SiMaxx. While SiMaxx includes our highest performance batteries, the cycle platform services applications that demand high energy density and longer cycle life, offering up to 400 watt-hour per kilo and as many as 1,200 cycles and a full app (ph) of this charge.

Developed in close collaboration with Berzelius, a formerly affiliated company, we are able to achieve greater manufacturing capacity in the short-term by working with the toll manufacturing partners, which we expect will allow us to serve more customers and bring in additional revenue while we extend our U.S. manufacturing capacity. We believe that toll manufacturing capacities can create a bridge until our facility in Colorado comes online.

The SiCore product also have additional form factor flexibility, capable for both pouch and cylindrical cells form factors. This allows them to be used in more applications and to be available at scale today. These two product platforms are the accumulation of years of work in silicon anode space and are just the beginning of our vision here at Amprius to transform electrical mobility.

Overall, when it comes to battery performance, we continued setting new bars for ourselves in 2023. We are confident that Amprius battery can reach unmatched level of performance, and we look forward to trying to extend our performance lead in 2024.

We believe that the highest endorsements of our technology are customer orders. Our industry continues to notice the battery performance success that we are having, and as a result, our demand far outstrips our supply.

Throughout the year, we had several customer wins, we furthered our partnership with AeroVironment, in Q1 started a new technical engagement with a leading high performance automotive OEM in Q2, and reached a long-term battery supply agreement with Tenergy in Q3. Also in the fourth quarter, we made a significant progress on building out our book of customers, shipping to 41 total customers in the quarter, up from 38 in Q3.

While many of them were repeating customers like AALTO/Airbus, Teledyne Clear and the U.S. Army and BAE Systems, 16 of them were new customers who came to us from across the electrical mobility sector. For example, we announced the volume purchase order from an eVTOL manufacturer in October and the complete high volume shipments of SiMaxx cells to the Korean Aerospace Research Institute in December.

We also successfully secured SiMaxx purchase order from three premier electric aviation manufacturers. For customer 450 watt-hour per kilo cell for battery pack development and qualification. These customer cells were developed in collaboration with Amprius' strategic partners to address their unique HAPS qualification requirements and enable these customers to operate in highly challenging environments with greater energy density and the longer cycle life than the previous 400 watt-hour per kilo platform.

The new cell only known commercially available batteries of their kind that can provide enough power and endurance to HAPS overnight stratospheric flight applications. These orders help strengthen Amprius' position as a premier global battery solution for eVTOL and HAPS application.

Also, we think our wearables market, we completed our first volume shipments of the Safe Cell for the U.S. Army in December. This shipment is an important milestone for us because it completes our scale-up manufacturing initiative under the U.S. Army Fund Manufacturing Technology program, which allows us to now have a large deployments of our cells for the mission-critical products.

To meet the market and the customer demand, we have made significant progress in building out our manufacturing capacity. First, we completed our new production line in Fremont, California in December. With this investment, we have increased our manufacturing capacity by approximately 10 times and expect to achieve 2 megawatt hour of capacity exiting 2024.

In our large scale manufacturing site in Brighton, Colorado, we received the final rezoning permit that allows us to move forward with the site. We have made progress in recent months, ordering long lead time items such as electrical, mechanical, and plumbing systems to ensure that we remain on track with our timeline.

We are also continuing the design and the pre-construction work that will allow us to be operational in 2025. In addition to our own manufacturing capacity development, we have developed two manufacturing partnerships to provide us with a large-scale manufacturing capacity for SiCore battery production rather away. Overall, we believe that 2023 was a highly successful year across our major initiatives.

As we turn our attention to 2024, it remains critical to our growth strategy that we continue advancing our technology and expanding our production capacity. We are off to a good start. In addition to alliancing (ph) cycle and making progress on pre-construction activities at the Amprius fab, we announced that we received the AS9100:2016 certification for our Fremont production facility. The crucial certification received from Smithers Quality Assessments as we continue to supply battery to the burgeoning electrical aviation industry, helping to advance the technology like eVTOL, HAPS, and the drones.

As shown in our recent customer wins and the technology advancements, we believe that no one else can commercially offer capabilities that match those of Amprius batteries. Early this week, we were named one of the Fast Company's 2024 most innovative companies, largely due to our

batteries' advanced capabilities. We were also recognized at the recent international battery seminar winning the best-of-show new product award for our SiMaxx 400 watt-hour per kilo cell. This is our second consecutive award in this category at IBS as well, as we won last year for our 450 watt-hour per kilo, 1,150 watt-hour per liter lithium-ion cell.

Overall, these awards further underscore the demand for our innovative solutions. We are working hard to expand our production capacity to meet that demand, and we are confident in the path forward for Amprius.

With that, I will now turn the call over to our CFO, Sandra Wallach, to review our financial results for the quarter. Sandra?

Sandra Wallach

Thank you, Kang. I would now like to spend a few minutes covering some key financial updates. As a reminder, our detailed financials can be found in our shareholder letter.

We finished the fourth quarter with \$3.9 million in revenue, a \$3.1 million increase compared to \$0.8 million in the same quarter last year, and up \$1.1 million sequentially. There were three drivers of this net increase in Q4 versus Q4 of 2022. First, our product revenue increased by \$0.3 million from the prior year period to \$0.9 million, largely driven by shipments to 41 customers in the quarter, a second consecutive quarterly record for Amprius.

Although our product revenue remains largely driven by customer purchase orders that can arrive at uneven times throughout the year, we have shown consistent new customer growth and diversification in recent quarters. Also, of these customers, only two customers represented greater than 10% of revenue, a testament to our diverse customer set.

Second, our development services revenue increased by \$3 million, a reflection of the successful completion of the U.S. Army Manufacturing Technology Program Delivery that Kang mentioned earlier. Development services are non-recurring in their nature due to disparate programs.

Third, these two increases were partially offset by a \$0.2 million reduction in government grant revenue period-over-period due to the completion of the DOE program in Q3, 2023.

Pivoting to our full year results, we closed 2023 with \$9.1 million in revenue. This represents a growth rate of over 100% from 2022.

Moving to our profitability metrics, our gross margin was negative 162% for the full year compared to negative 128% in the prior year period. As we've discussed in prior quarters, we see significant gross margin variation as our product and services revenue mix fluctuates. Also, we anticipated that factory start-up costs would ramp up as we start Colorado design and construction. Longer term, we are confident that our GAAP gross margin will begin to normalize as we approach our capacity expansion goals.

Now on to our operating expense management. Our operating expenses for the full year 2023 were \$24 million, a 94% increase from the prior year. While we continue to maintain a lean cost structure, the increase is primarily attributed to the increased G&A related to public company expenses and transaction related costs as well as targeted staffing increases in R&D and sales and marketing.

Our GAAP net loss for the full year 2023 was \$36.8 million or a net loss of \$0.43 per share, with 86.2 million weighted average number of shares outstanding compared to a net loss of \$0.24 per share with \$71.3 million weighted average number of shares outstanding. Also, as of December 31, 2023, there were 80 full time employees, up from 76 in the third quarter and 59 at the end of 2022, with those employees primarily based in our Fremont, California location. Our share-based compensation for the year was \$3.9 million compared to \$2.7 million in 2022.

Turning to the balance sheet, we exited the year with \$45.8 million in cash and no debt. Key drivers of our cash activity for the year were \$25.6 million used in operating cash flow, \$17.6 million used for costs related to the build-out of the Fremont and Brighton facilities, and \$19.2 million inflow added primarily through the usage of our equity financing. Considering our business achievements and ongoing projects, we believe we are efficiently using capital to drive Amprius forward.

Before I turn the call back over to Kang, I would like to take a moment to discuss our outlook for 2024. We expect to spend another \$2 million to \$3 million completing the new cathode line and other support equipment for the megawatt hour line in Fremont this year. As detailed design work on our facility in Brighton is finalized and construction gets underway, we expect to finalize our construction cost forecast, and we'll provide updates as the year goes on.

As part of our strategic planning efforts, we filed a shelf registration on Form S-3 in October 2023 and once effective, established a new ATM facility for \$100 million. We have terminated the committed equity facility concurrent with the effectiveness of the shelf registration statement.

Subsequent to December 31, 2023, we have raised gross proceeds of about \$6.5 million through the sale of approximately 2 million shares under the ATM facility as of March 18, 2024. To support our strategic plan, we are pursuing additional funding through multiple vehicles, including both equity issuances such as warrant exercises and sales under our ATM and non-dilutive sources such as grants, loans, and incentives.

With that, I will conclude the financial discussion and pass the call back to Kang.

Kang Sun

Thanks, Sandra. I'd like to reemphasize a few key points before closing. First, Amprius' silicon anode technology continues to demonstrate the unmatched performance in our industry. Amprius' battery command a firm lead with their combination of 50 energy power charging time and temperature performance and are uniquely positioned for the electrical mobility market.

Second, Amprius batteries are commercially available today. We have been shipping commercial products since 2018, and our technological advancements continue to bring in significant customer demand. This quarter, we not only delivered to repeat customers and expand our technical engagements, we added 160 new customers as well. Our demand pipeline is robust, and we look forward to further building out our customer book in the coming quarters.

Third, we are scaling our manufacturing capacity to serve significant demand ahead and support a U.S.-based supply chain. We believe that the introduction of SiCore helps us meet some of the near-term demand. Finally, we are looking forward to several exciting milestones in the year ahead.

In 2024, we are looking to begin construction of our gigawatt-scale facility in Brighton, Colorado, fully optimize our SiMaxx mass production process in Fremont, and the new customers and deliver additional cells to current customers as we're increasing our SiMaxx cell production, ramp up our toll manufacturing efforts to secure hundreds of megawatts of capacity in 2024, so that we can maximize our opportunity to deliver SiCore batteries to customers, commercialize our 500 watt-hour per kilo cells that continue to bring to market new and innovative products, and continue to innovate and push the boundary of what is possible for our industry.

As we look to the rest of the year, our strategy and focus at Amprius remains unchanged. We have a tremendous opportunity ahead with a product portfolio that positions us to both growth in aviation market and expand to other industries seeking batteries with leading performance.

The opportunities in front of Amprius are enormous, including the 1.25 billion conformal wearable battery market by 2030, a 33 billion aviation battery market by 2030, and the 591 billion EV battery market by 2033, for which Amprius' growth path in coming years.

2023 was a very productive year for the company, and we believe that 2024 is off to a strong start. We look forward to continuing to deliver what we have planned and promised in the year ahead. Thank you for your continued support of Amprius Technologies.

With that, I will turn it back to the operator for Q&A. Thank you.

Operator

Thank you. And at this time, we'll open up the line for questions. The company requests that each participant limit their comments to one question and one follow-up. To ask a question, press star one on your telephone keypad. A confirmation tone will indicate your line is in the question queue. You may press star two if you would like to remove your question from the queue. For participants using speaker equipment, it may be necessary to pick up your handset before pressing the star keys. Once again, press star one to ask a question and limit yourself to one question and one follow up.

Thank you. And our first question comes from Colin Rusch with Oppenheimer & Company. Please state your question.

Lydia Senatore

Hi. This is Lydia on for Colin. Could you speak to the customer direction and opportunity you're pursuing with SiCore? What has the initial feedback been so far?

Kang Sun

We have been working on SiCore for some time. We explored this market since the middle of 2023. We received a very strong feedback from the customers. So SiCore has a form factor flexibility. Currently, we are not only supplying the pouch cell we have been making in the last few years. This particular product enable us to supply significant energy cylindrical cell as well.

Lydia Senatore

Great. And then for my follow-up, on ramp -- are there any surprises you're running into on ramp-up of your megawatt scale pool? And then, in Colorado, how is the permitting and procurement of equipment going? Have you figured out the best use of your balance sheet? Thank you.

Kang Sun

Yeah. Let me answer the ramping up question. We have a full facility set up in Fremont, California that would enable us to produce approximately 2 megawatt hour product at the end of the year. For Colorado, we finished, the rezoning was successful. Now we are working on the air permitting and emergency response plan.

Operator

Thank you. And our next question comes from Jed Dorsheimer with William Blair. Please state your question.

Mark Schutter

Hi. You have Mark Schutter (ph) on for Jed Dorsheimer. Thanks for your time, Kang. If -- could you give a little bit more color on the revenue breakdown between SiMaxx and SiCore?

Sandra Wallach

So Mark, this is Sandra. So we have not disclosed the separation of those two. It's reported under our product revenue in our filings.

Mark Schutter

Okay. Directionally, do you think that for 2024, that there'll be even, one more than the other?

Sandra Wallach

We will still be limited in 2024 by the capacity that is already spoke for here in Fremont, as 2 megawatts. There is not a capacity restriction on SiCore, because it's being made by our toll manufacturing partners. So it has the potential to be much larger.

Mark Schutter

Okay. Great. Could you speak to a little bit of the IRA subsidies that you are -- are you participating in any of that with the facility in Fremont?

Sandra Wallach

Yes. So we have gone through our study with our tax advisers, and we are pursuing the 45x tax credit -- manufacturing tax credit, which is 10% of the anode manufacturing cost and \$35 per kilowatt-hour. So that will be part of our tax planning for 2023. We can take advantage of it with this year's filing and part of our financial planning going forward.

Mark Schutter

Awesome. Thank you, Sandra.

Operator

Thank you. Our next question comes from Chris Souther with B. Riley Securities. Please state your question.

Christopher Souther

Yeah. Hi. Thanks for taking my question. On the SiCore, how does the pricing compare to kind of commodity batteries that are out there as well as SiMaxx? I'm just kind of curious like where that sits as far as kind of premium pricing, would be helpful to understand.

Kang Sun

Yeah, Chris. Since we have a large scale manufacturing facility available to us, so today, we certainly have a competitive production cost. In terms of ASP, the pricing, what do we charge to our customers, because of the superb performance our battery delivers, we deliver very high energy density as well as long cycle. So we still command the premium for those applications.

Christopher Souther

Got it. Okay. And maybe just a little more on some of the application focus for SiCore. Is that, you know, it seems like it's some pretty similar end markets that you're going after with the SiMaxx. We've been talking about for quite some time. Is the additional form factor something that kind of increases the different applications you're going after or customers you're going after? Maybe just a higher level, like what -- if there's any differentiation as far as the end market focus that you're looking at with that new products?

Kang Sun

Yeah. Our end market focus remain the same, but the SiCore product offer a flexible form factor, so certainly enable us to participate in other market segments. We have our product catalogue available. From that, you can see we have certainly already achieved the EV performance. That means the energy, 350 watt-hour per kilo, 1,200 cycles, and meet all other EV battery specifications. The cylindrical cell opened a new market for us, not only for aviation, also for other electric mobility segment.

Christopher Souther

Okay. That's helpful. I'll hop in the queue. Thanks.

Operator

Our next question comes from Chip Moore with Roth MKM. Please state your question.

Chip Moore

Hey, everybody. Good to you see earlier this week. I wanted to ask another one on SiCore. I think you talked about potential for 100-plus megawatt hours of demand there in the future or already. Maybe just help us think about the ramp of tooling capacity and how we should think about potential revenues there?

Kang Sun

The manufacturing capacity, we have been developing those customers, those partners for some time. So manufacturing capacity is available for us is over 100 megawatts. The question is the qualification. So the customers do need to qualify this product. We have some purchasing orders for commercial applications already, but a larger fraction of the customers still in the evaluation phase. We believe the commercial revenue will come in later of the year. The capacity is not our issue today, but the customer has to go through the factory qualification and the product qualifications.

Chip Moore

Got it. That's very helpful, Kang. Appreciate that. And maybe on my follow-up, for Fremont, I guess, anything to keep in mind as the year progresses, tie in of the cathode line or any other equipment that you need to put in, any downtime or anything like that we should keep in mind? Thanks.

Kang Sun

Yeah, our cathode line will come in probably third quarter. That's the only missing piece of the equipment at this time. The reason is we have for -- our cathode has very specific coding specification. So the suppliers want to make sure they can meet, satisfy our specification.

Chip Moore

Got it. Okay. Congrats on all the progress this year. Thanks.

Operator

Thank you. And our next question comes from Jeff Grampp with Alliance Global Partners. Please state your question.

Jeffrey Grampp

Good afternoon. A question for you guys on the 500 watt-hour product that's going to be commercially available this year. Just curious to dig in on the timing a little bit more. Is that going to be a back half of '24, kind of in line with that cathode line? And just big picture, kind of the pipeline that you guys are seeing in terms of demand there?

Kang Sun

Yes. The cathode line will not affect the shipment of this product. We are planning to have this product shipped to customers this year.

Jeffrey Grampp

Okay. Thank you. And for my follow-up, on the R&D side of things, curious kind of main initiatives or goals maybe for 2024, if you had to maybe bucket those in terms of key objectives, whether those relate to things like density, cycle life, different form factors or just any other kind of big picture objectives you guys are thinking about as it relates to R&D in '24? Thanks.

Kang Sun

Yeah. We have very ambitious goal for '24. And you will see the energy improvement in energy density and the power, particularly the balance of energy density and the power. We are working on additional safety features for our battery. So 2024, you will see some breakthrough performance delivered from Amprius.

Jeffrey Grampp

All right. We'll stay tuned. Thanks for the time.

Operator

Thank you. Just a reminder to the audience, to ask a question, press star one. And to remove yourself from the question queue, press star two on your telephone keypad.

Our next question comes from Donovan Schafer with Northland Capital Markets. Please state your question.

Donovan Schafer

Hey, guys. Thanks for taking the questions. So just really quick for the first one. Sorry if I missed this, and I'm guessing with the cathode line not coming on until Q3, I just want to clarify. So is it correct to say that the run rate for the megawatt hour capacity in Fremont right now is -- from that incremental equipment is essentially zero? It's still just a 250 kilowatt hours of capacity at the moment or are you actually able to get some incremental capacity out of whatever has been put in place already?

Kang Sun

Well, the line start running, already producing anode. As I mentioned, we have been sourcing cathode from our manufacturing partners for years. So meeting this cathode line for next quarter

is nothing to affect our output. So today, we already started producing the battery and anode, but the full capacity will be reached sometime in Q4.

Donovan Schafer

And what would you say is kind of the run rate capacity right now? Is it 0.5 megawatt hour, 1 megawatt hour?

Kang Sun

Not there yet. I think we -- remember, we just set up this line in December. Yeah. But this line certainly help us to meet our revenue plan.

Donovan Schafer

Okay. Okay. And then for 2024, I know you don't give like a revenue guidance or anything like that, but just in kind of a general sense or at a high level with the line coming on and the capacity increasing, should we at least expect to see a revenue increase in '24 versus '23 and maybe even something like a run rate based on the Q4 numbers?

(crosstalk)

Sandra Wallach

So that's a great question. So we absolutely expect to see our revenue continue to ramp up through 2024. over 2023. As Kang mentioned, we've got two drivers of that. One is the capacity for Fremont, that will be coming online and starting to contribute to revenue soon and getting to what we think is capacity exiting 2024 in Q4. We also have the SiCore product, which is available today, and we've been sampling that under a market exploration. That's, again, not capacity constrained, but it will continue to increase as customers get through their qualification and testing.

Donovan Schafer

Kang, did you have anything to add?

Kang Sun

Yeah. 2024 certainly is going to be an exciting year for us. And we have two product families. One of the product family, we actually have significant production capacity behind us.

Donovan Schafer

Okay. And then just one last question. If I can ask about -- you mentioned long lead time items for the Colorado facility. And so, I know there will be a full cost kind of estimate that comes out later and that will be down the line. But can you give us any just kind of broad sense of what kind

of investments or how much funds are needed to do that type of near-term procurements for long lead time items or other things that sort of can't wait to get a full budget put together just in the next, I don't know, whatever this year or something like that or first half of the year, just kind of what expenses are involved in that, just the rough terms? (inaudible)

Sandra Wallach

So the procurement of long lead time items around mechanical and electrical and plumbing work for things like the dehumidifier, the switch gear and the transformers, those purchase orders and down payments were placed in Q3 with some additional payments in Q4. So that's already been taken care of. Those are the long pole in the tent. And we're focused on permitting and finalizing the design in order to be able to share a high confidence construction and build-out budget.

Donovan Schafer

Okay. Okay. Fantastic. Thanks, guys. I'll take rest of my questions offline.

Operator

Thank you. And our next question comes from Amit Dayal with H.C. Wainright. Please state your question.

Amit Dayal

Thank you. Good afternoon, everyone. Sandra, in terms of costs in 2024, should we expect some improvements in the gross margin side given volumes could be a little bit higher for you? And then on the operating costs, also, like how should we expect costs in 2024 relative to 2023?

Sandra Wallach

Great question. So we will get economies of scale on Fremont. You're absolutely right, but we'll also start -- continue to incur cost in Colorado without the benefit of revenue in 2024. So there's design cost and preconstruction work that is ongoing. So I think the margins are still going to be under some pressure in 2024.

And again, we're not expecting to have a significant change in operating expense. We had \$24 million in full year 2023. We continue to look surgically at where we need to add resources, but I wouldn't expect to see something significantly different.

Amit Dayal

Thank you for that. And then for 2024, do you have a sense of what your military versus commercial revenues mix could be?

Sandra Wallach

So that's hard for us to tell because we sell through OEMs. We're not selling directly, unless we're doing a development program. So that's hard for us to estimate. What we do know is that we continue to build our relationships with folks like AeroVironment, Teledyne Clear, and AALTO/Airbus as well as BAE systems. So the development program that we just wrapped up, the \$3 million for the U.S. Army, that was the largest one that we had in the backlog.

Amit Dayal

Okay. Understood. Yeah. That's all I have for now guys. I'll take my other questions offline. Thank you.

Operator

Thank you. At this time, this concludes our question-and-answer session. If you have any additional questions, you may contact Amprius' Investor Relations team at ir@amprius.com. I'd now like to turn the call back over to Dr. Sun for his closing remarks.

Kang Sun

Thanks again, everyone, for joining us today. As a reminder, you may learn more about our company from the additional updates and learn about the upcoming events and presentations from the Investor Relations section of our website. We hope to see you at our upcoming investor conferences, and we'll continue to update you on the exciting progress we are making in Colorado. Finally, I'd like to thank our employees, partners, and shareholders for their continued support. Operator.

Operator

Thank you for joining us today for Amprius Technologies fourth quarter and full year 2023 earnings conference call. You may now disconnect.