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Aspen Aerogels, Inc. NYSE:ASPN

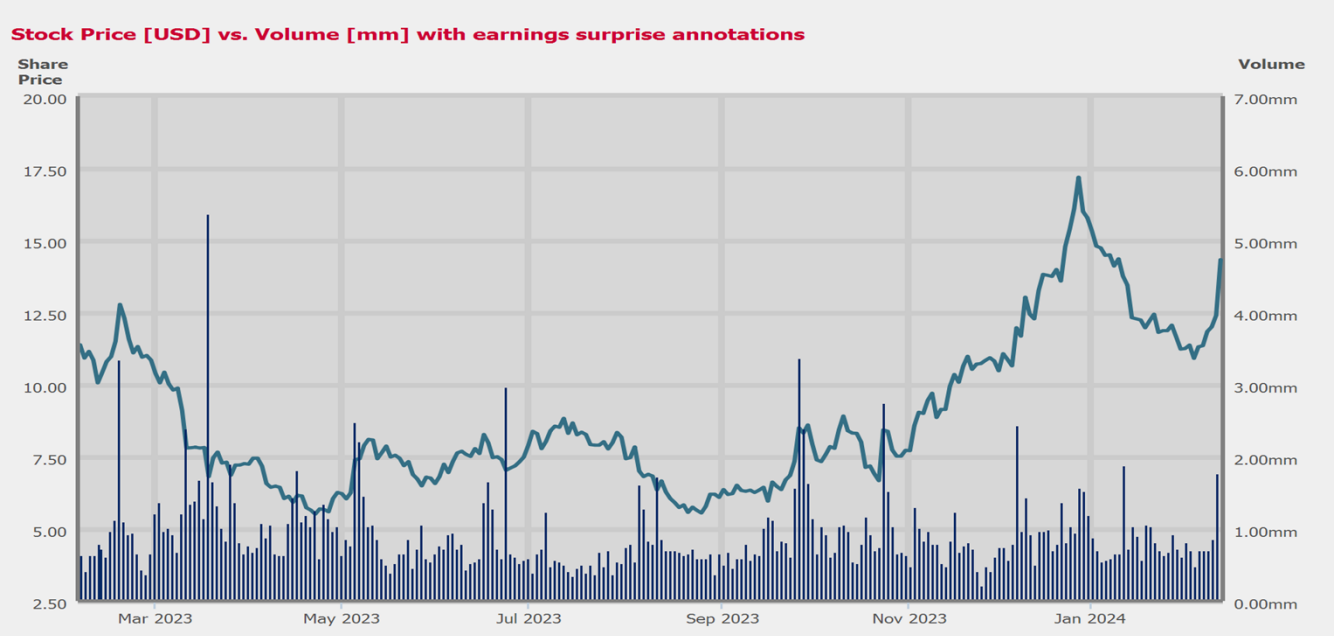
FQ4 2023 Earnings Call Transcripts

Tuesday, February 13, 2024 1:30 PM GMT

S&P Global Market Intelligence Estimates

	-FQ4 2023-			-FQ1 2024-	-FY 2023-			-FY 2024-
	CONSENSUS	ACTUAL	SURPRISE	CONSENSUS	CONSENSUS	ACTUAL	SURPRISE	CONSENSUS
EPS Normalized	(0.12)	(0.01)	NM	(0.07)	(0.78)	(0.66)	NM	(0.14)
Revenue (mm)	83.83	84.22	▲0.47	87.50	238.33	238.72	▲0.16	350.00

Currency: USD
Consensus as of Feb-13-2024 12:43 PM GMT



- EPS NORMALIZED -

	CONSENSUS	ACTUAL	SURPRISE
FQ1 2023	(0.39)	(0.24)	NM
FQ2 2023	(0.36)	(0.22)	NM
FQ3 2023	(0.27)	(0.19)	NM
FQ4 2023	(0.12)	(0.01)	NM

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Presentation

Operator

Good morning, and thank you for attending the Aspen Aerogels Inc. Fourth Quarter and Fiscal Year 2023 Financial Results Call. [Operator Instructions]

I would now like to turn this conference call over to our host, Neal Baranosky, Aspen's Senior Director of Corporate Strategy and Finance. Thank you. You may proceed, Mr. Baranosky.

Neal Baranosky
Senior Director of Corporate of Strategy & Finance

Thank you, Candice. Good morning, and thank you for joining us for the Aspen Aerogels Fourth Quarter and Fiscal Year 2023 Financial Results Conference Call. With us today are Don Young, President and CEO; and Ricardo Rodriguez, Chief Financial Officer. There are a few housekeeping items that I'd like to address before turning the call over to Don.

The press release announcing Aspen's financial results and business developments as well as a reconciliation of management's use of non-GAAP financial measures compared to the most applicable U.S. generally accepted accounting principles, or GAAP measures, is available on the Investor's section of Aspen's website, www.aerogel.com.

In addition, I'd like to highlight that we've uploaded to our website a slide deck that will accompany our conversation today. You can find the deck in the Investor's section of our website.

On today's call, management will make forward-looking statements about our expectations. These statements are subject to risks and uncertainties that could cause our actual results to differ materially. These risks and uncertainties include the factors identified in our filings with the SEC. Please review the disclaimer statements on pages 1 and 2 of the slide deck as the content of our call will be governed by this language.

During this call, we will refer to non-GAAP financial measures, including adjusted EBITDA. These financial measures are not prepared in accordance with GAAP. These non-GAAP financial measures are not intended to be considered in isolation or as a substitute for results prepared in accordance with GAAP. The definitions and reconciliations of these non-GAAP financial measures to the most directly comparable GAAP financial measures and discussion of why we present these non-GAAP financial measures are included in yesterday's press release.

I'd also like to note that from time to time in connection with the vesting or pending expiration of restricted stock units and/or stock options issued under our long-term equity incentive program that we expect our Section 16 officers will file Form 4s to report the withholding by the company or sale of shares related to tax withholdings or the covering of exercise prices in connection with vesting or pending expiration of restricted stock units and/or stock options.

Lastly, I want to call out a few near-term IR engagements. This Thursday, February 15, Ricardo will participate in a fireside chat in New York at the Wolfe Global Auto, Auto Tech and Mobility Conference. Don, Ricardo and I would also host one-on-one discussions at this event. On March 18, Don will be hosting one-on-one investor discussions in Dana Point, California at the 36th Annual ROTH Conference.

I'll now turn the call over to Don. Don?

Donald R. Young
President, CEO & Director

Thank you, Neal. Good morning, everyone. Thank you for joining us for our Q4 2023 earnings call. My comments will recap recent announcements, highlight our Q4 and 2023 full year performance and provide an early look at 2024, including the status and impact of several critical elements of our strategy. Ricardo

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will dig deeper into our financial performance and outlook and our business strategy. We will conclude with a Q&A session.

Before we do a quick flyover of our recent announcements, I want to thank the Aspen team for producing excellent results in Q4: revenue of over $84 million, gross margin of 35% and adjusted EBITDA of over $9 million. These numbers signify record performance and we believe are signs of good things to come. Every person in the company contributed to this success.

Since our last earnings call, we have provided several updates. In December, we announced the PyroThin Thermal Barrier Design Award from the Automotive Cells Company, or ACC, a battery cell joint venture with Stellantis, Saft-Total and Mercedes-Benz, to supply the Stellantis STLA Medium vehicle platform designed to host multiple brands across the world and is aimed at the passenger SUV and crossover vehicle markets with an expected start of production in 2025.

Stellantis is one of the world's leading automakers with brands, including Jeep, Ram, Fiat, Chrysler, Dodge, Peugeot and several others. According to Stellantis, the medium vehicle platform has the potential for up to 2 million vehicles per year built in several plants across the globe, starting in Europe.

At the same time, we announced that the U.S. Department of Energy Loan Programs Office invited Aspen into the formal due diligence and term sheet negotiation stage of the process. This loan application is in connection with the construction of Aspen's planned second aerogel manufacturing facility in Georgia.

While the DOE's invitation to the formal due diligence stage is not an assurance that the DOE will issue a loan, we remain deeply engaged with the LPO and its advisors and continue to believe that we are a strong candidate to partner with the DOE LPO in this program. We anticipate providing the next update on this subject during our Q1 2024 earnings call.

Later in December, we announced the $75 million registered direct common stock offering with Hood River Capital Management and certain other institutional investors. The financing enabled us to finish 2023 with approximately $140 million of cash on the balance sheet, and we believe it adequately supports the company for additional significant growth in our EV Thermal Barrier and Energy Industrial business segments.

On January 11, we provided preliminary revenue levels for the full year 2023 and announced the expectation of positive adjusted EBITDA for the fourth quarter. We also announced the successful launch of our supplemental supply to serve our important Energy Industrial segment. This part of our business has been hamstrung by capacity constraints for over a year and we are now in the position to restock the channel and we believe to support long term highly profitable growth.

Energy Industrial activity remains strong across all regions and segments of the business. With so much focus on the PyroThin Thermal Barrier business, it is important not to forget that we are an important supplier to our global energy industrial customers and partners with an installed base that we expect will surpass $1.5 billion in 2024.

The Energy Industrial business is a key part of our multi-lever strategy to reach our growth and profitability goals, especially during the early phases of EV penetration. We have an excellent team serving this global market, and we anticipate that it will meet our growth and profitability expectations.

The January announcement also hinted at a vastly improved profitability profile for the company overall. With Q4 revenue of over $84 million, gross margin of 35% and adjusted EBITDA of over $9 million, we began to demonstrate the leverage of efficient operations, higher volumes and fuller fixed cost absorption. While we have more work to do, we believe this strong trend will continue in 2024.

As I noted earlier, Q4 revenue was over $84 million and it substantially exceeded the record revenue of approximately $60 million that we posted just the quarter before. Q4 revenue included $53 million of EV PyroThin Thermal Barriers. The PyroThin Thermal Barrier business has grown on an annual basis from less than $7 million in 2021 to over $55 million in 2022 and now to over $110 million in 2023.

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Over the past year, our deep engagement with the various EV OEMs has helped us accurately calibrate the trajectory of the EV trend. While we recognize the challenges that EV OEMs face with launching and scaling new EV nameplates, we are confident that we will see continued substantial PyroThin Thermal Barrier growth in 2024. We are finalizing the terms of our sixth automotive OEM design award and anticipate adding new OEMs to our roster throughout the year.

In addition to the ramping of the PyroThin Thermal Barrier business and the initiation of our supplemental supply to support the growth and profitability of the Energy Industrial business, a highlight for 2023 was the continued progression of our gross margins through the year, 11% in Q1, 17% in Q2, 23% in Q3 and 35% in Q4.

The strong gross margin expansion and a careful approach to OpEx translated into a similar quarterly progression for adjusted EBITDA, culminating in adjusted EBITDA margin of positive 11% in Q4. We continue to believe that we can drive adjusted EBITDA margins to approximately 25%.

In addition to our progress towards our top line and profitability goals, we continue to advance the 3 key elements of our strategy: first, the transition of Plant 1 in East Providence, Rhode Island to support the growth of the PyroThin Thermal Barrier business; second, the commencement of our supplemental supply dedicated to the growth of the Energy Industrial business; and third, the balancing of overall growth, profitability and capitalization.

On the transition of Plant 1 to PyroThin Thermal Barrier production, our initial estimates for revenue capacity were approximately $400 million. Based on current productivity and yields, we believe annual revenue capacity for PyroThin Thermal Barriers to now be approximately $500 million. When combined with our supplemental supply, which supports our Energy Industrial business, we believe we have over $650 million of revenue capacity from our existing assets and supply arrangements and can generate 25% adjusted EBITDA margins or over $160 million of adjusted EBITDA. We believe we are well positioned to attain this level of performance.

Ricardo, over to you.

Ricardo C. Rodriguez
CFO & Treasurer

Thank you, Don, and Good morning, everyone. I'll start by covering our fourth quarter and full year results, before walking you through the thought process behind our outlook for 2024. I'll also spend some time discussing our assessment of forecasts for global EV production and how some of the recent production increases aren't captured by most headlines or the current sentiment.

Early last year, we highlighted ahead of the industry that things weren't as great as they seemed and quickly focused on right timing our CapEx and gearing Aspen for near-term profitability. Today, we can confidently say that things are not as bad as the headlines suggest. Before handing the call back to Don, I'll also explain why our team will remain heads down executing with conviction what we believe is a clearly defined long-term plan to build value.

In our awarded business and quote pipeline, we see a path that maximizes our capacity regardless of any potential near-term shifts in demand or delays in sourcing decisions.

To cover our performance, I'll start on Slide 4, beginning with revenue. We delivered $84.2 million of revenue in Q4, which translates into 41% growth year-over-year and 39% growth quarter-over-quarter. This was an all-time company record and reflects an annual run rate of $336.8 million that demonstrates the company's ability to quickly flex up to meet an increase in demand at our sites in Rhode Island and Mexico, along with a bit of capacity from our supplemental supply for Energy Industrial products, which drove $3.1 million of our revenues in December.

For all of 2023, our revenue was $238.7 million, which reflects a 32% year-over-year increase. As expected, when we first communicated our outlook for the year, over 60% of our sales materialized in the second half of the year, and this was due to the nature of the growth ramp that we are on.

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For the full year, Energy Industrial revenue was $128.6 million, an increase of 3% year-over-year. Revenue continued to be a supply concern in Q4 even though we tested the system during the quarter, with supplemental supply manufacturing delivering $3.1 million of product in December. Our quarterly sales of $31.3 million reflect a 9% year-over-year decrease and a 12% quarter-over-quarter increase.

As we previously mentioned, our energy business is sold out. To fulfill this excess demand, we now have our supplemental supply in place that we'll continue ramping up as we allocate more of our aerogel production capacity in Rhode Island to EV thermal barriers.

EV Thermal Barrier revenue of $52.9 million was up 110% year-over-year and 61% quarter-over-quarter, reflecting the accelerating ramp in GM's production of Ultium platform-based electric vehicles during the second half of the year and stable volumes on the Toyota-related nameplates that we supply, along with increasing prototype orders from additional customers.

Our full year EV Thermal Barrier revenue was $110.1 million, representing a 98% increase when compared to 2022. This growth reflects the benefit of starting a business that supplies the EV market from 0. And realizing over 77% of our sales in this segment during the second half of the year did not surprise us.

Next, I'll provide a summary of our main expenses. Material expenses of $28.7 million for the quarter made up 34 percentage points of sales, a 2 percentage point improvement quarter-over-quarter. This continued to reflect the work that our supply chain and procurement groups have put into reducing the cost of some of our main raw materials in a more stable environment along with optimizing our inbound logistics costs. We remain vigilant with the goal of ensuring that we can keep these below 40 percentage points of sales and prefer to continue conservatively planning with this as our target here.

The Q4 performance enabled our total year-to-date material cost to be of $86.7 million or 36 percentage points of sales. This was 400 basis points favorable to our running target of 40 percentage points of sales. Conversion costs, which we describe as all production costs required to convert raw materials into finished products, were $25.9 million or 31 percentage points of sales in Q4. These include all elements of direct labor, manufacturing overhead, factory supplies, rent, insurance, utilities, process logistics, quality and inspection.

These results compare favorably to conversion costs in Q3 of this year, which were 41 percentage points of sales. This is the result of much better fixed cost absorption on our aerogel production costs, driven by the higher sales run rate level of this quarter. As previously mentioned, our long-term target for these costs at a roughly double revenue run rate is 20 to 25 percentage points of sales. So we are not done managing these.

The recent work from our team increasing the uptime of our equipment in Mexico and driving an optimized production mix in Rhode Island, along with improving our production yields at every step of the process is paying off, and we still got more opportunity for improvement.

For the full year, our conversion cost of $95.1 million reflect 40 percentage points of sales, a 6 percentage point improvement year-over-year. In Q4, company-level gross profit margins were 35% and our gross profit of $29.6 million is a $15.3 million improvement over our gross profit of $14.3 million during the same quarter of last year.

Our Energy Industrial segment delivered $9.9 million of gross profit or a 9% year-over-year increase. In EV Thermal Barriers, we delivered $19.7 million of gross profit in Q4. If we compare this quarter with Q3, our EV Thermal Barrier gross profit improved by $11.7 million on incremental revenue of $20.1 million.

Our fourth quarter of 2023 gross profit in EV Thermal Barriers was $13.2 million higher than the gross profit of $6.5 million that we incurred during Q4 of last year in this segment, reflecting the benefits of starting to operate at a revenue run rate that aligns with the size of our operation.

The resulting gross profit margins during the quarter were 32% and 37% for Energy Industrial and EV Thermal Barrier segments, respectively. For the full year, our gross profit of $56.9 million reflects a $51.9 million improvement versus our gross profit of $4.9 million last year. 2023's revenue level and our teams

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work at maximizing our asset base enable a tipping point in our economics, with 89% of the incremental revenues falling to the gross profit line.

Seeing $51.9 million of incremental gross profit while adding only $58.3 million of sales is in my view the ultimate near-term validation of our business model and the gearing of our operations.

Operating expenses, which are sized for our near-term projected annual revenue capacity of now over $650 million, were at $28.2 million in Q4. These were down by about $200,000 quarter-over-quarter and reflect the first quarterly decrease in OpEx that we've had since Q2 of 2020. Our work optimizing OpEx is not done, because although our annual OpEx was $106.1 million, our quarterly run rate of $28.2 million was still about $700,000 away from the quarterly run rate required to have $110 million of annual OpEx.

Putting these elements together, our adjusted EBITDA was $9.1 million in Q4 compared to negative $4.5 million during the same period last year, resulting in a $13.6 million year-over-year reduction in our EBITDA loss. The last time our team delivered a positive EBITDA quarter of $500,000 was in Q1 of 2020. So delivering over $9 million here in Q4 is a big milestone for us.

As a reminder, we define adjusted EBITDA as net income or loss before interest, taxes, depreciation, amortization, stock-based compensation expenses and other items that we do not believe are indicative of our core operating performance. In Q4, these other items included $3.2 million of stock-based compensation, $1 million of interest income and $2.9 million of interest expenses.

Our net loss in Q4 decreased to $0.5 million or $0.01 per share versus a net loss of $9.6 million or $0.20 per share in the same quarter of 2022. We were so close to breaking even for the quarter. Our full year net loss of $45.8 million is $36.9 million lower than our loss of $82.7 million during last year, or down by 45%.

Next, I'll turn to cash flow and our balance sheet. Cash used in operations of $2.8 million reflected our adjusted EBITDA of $9.1 million and cash used for working capital of $12.9 million, offset by interest income of $1 million. The key items that resulted in a usage of working capital were an increase in accounts receivable and inventory offset by an increase in accounts payable and accrued expenses.

Our CapEx during the quarter was of $27.8 million. These put our operating cash needs for the quarter at $30.6 million. As we work our way through Q1, we're focused on aggressively reducing our working capital needs and freeing up over $20 million of cash by reducing our raw material inventories in what is now a more stable procurement environment and staying on top of accounts receivable.

Our CapEx in 2023 was $175.5 million, which is closely in line with our latest guidance of $175 million. $115.2 million were spent towards Plant 2 and the rest funded maintenance and various process improvements in our aerogel plant in Rhode Island, along with equipping our facilities in Mexico with the necessary automated thermal barrier assembly equipment for this year's expected ramp.

We have incurred $279.7 million in cumulative capital expenses through the end of the fourth quarter towards Plant 2 in Georgia to position the project for a potential restart of construction in the second half of 2024, and only spent $3.3 million of the other CapEx as the team managed to deliver our Q4 EV Thermal Barrier volumes with existing assets.

On December 20 of last year, we completed a $75 million registered direct offering of common stock to Hood River Capital and a handful of other institutional investors at a price of $12.37 per share. Hood River's interest in making an investment in Aspen before the holidays enabled us to efficiently pull this together and provided a straightforward path for us to continue executing without entertaining large near-term financing options outside of our application with the DoE for Plant 2. I'll go into this later as we review our 2024 CapEx outlook. With the support of this transaction, we ended the quarter with $139.7 million of cash and shareholders' equity of $488.1 million.

Now I'll turn over to Slide 5. On January 11 of this year, as we preannounced our revenue for last year, we also communicated that we expect our revenue to surpass $350 million in 2024, resulting in a 47% year-over-year increase. We thought this communication was pertinent as stakeholders assess some of

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the press around EVs, along with earnings releases and the EV production outlooks of various automotive OEMs.

Today, I'd like to spend a minute here outlining our thinking behind this $350 million baseline revenue expectation, starting with our EV Thermal Barrier segment. It's no surprise that the lion's share of our 39% quarter-over-quarter revenue ramp was driven by a meaningful increase in demand of EV Thermal Barrier parts for General Motors' Ultium platform vehicles, and that GM's production of these vehicles will drive the majority of 2024 demand in this segment for us.

With this in mind, let's look at the chart on the left side of the slide. Our main EV thermal barrier customer is expected to produce 150,000 EVs in 2023. For IHS, we estimate that they produced almost 120,000, so around 80% of GM's target.

On January 30 of this year, GM broadly communicated that it expects to make 200,000 to 300,000 EVs in 2024 and that it has discontinued production of non-Ultium-based EVs. That's a big range for us to plan our operations on, particularly our fixed costs. And therefore, although we're excited and eagerly ready for the prospects and potential of higher volumes, we are assuming 80% of GM's 200,000 unit estimate as we develop our 2024 EV Thermal Barrier revenue outlook, so approximately 160,000 units. For reference, the latest IHS forecast expects 279,000 Ultium-based EVs to be produced in 2024. So we're currently discounting IHS' estimate by 42% until we see volumes materialize as we work our way through the year.

On the upper right side of Slide 5, one can see that GM's estimated production of Ultium vehicles has increased to around 20,000 units in Q4, and that in this 279,000 unit IHS estimate, the ramp is expected to increase significantly in Q2 and Q3 of this year, potentially leading to a demand profile that will look similar to what we experienced last year, with approximately 70% of the volume materializing in the second half of the year.

GM is launching several important high-volume nameplates this year that drive this production increase, and we see that interest in them remains high on Google Trends. So the onus is on all of us on the value chain to produce them this year.

Turning over to Slide 6 and continuing the topic of our 2024 revenue outlook. If we take our 160,000 units for Ultium-based EVs, apply our estimated content per vehicle levels from 2023 and assume our traditional revenues from other customers and prototype sales, we land at a $200 million revenue baseline estimate for 2024 Thermal Barriers.

Units produced in 2024 beyond 160,000 by General Motors, the potential launch of another accurate nameplate powered by Ultium cells, additional OEM prototype orders and the mix of larger battery packed vehicles that drives higher content per vehicle will drive upside, which we are ready to capture but would prefer to estimate more precisely as it materializes.

For our Energy Industrial business, the 2024 revenue outlook is easier to size at $150 million, which is our expected capacity in this segment today. Upside to the $150 million can be driven by a more favorable product mix that requires less standard hours of our capacity, ramping up additional supplemental supply and utilizing some capacity in Rhode Island that isn't taken up by thermal barrier aerogel production in the first half of the year.

Combining our 2 segments revenue outlooks for 2024 results in a total revenue baseline estimate of $350 million, which again would be a 47% year-over-year increase from our revenues in 2023. With this revenue baseline, we believe that we can deliver positive operating income in 2024, which assuming our depreciation and amortization being of around $30 million, would translate into over $30 million of EBITDA.

Even though we delivered $9.1 million of EBITDA in Q4, the $30 million 2024 EBITDA outlook takes into account some potential headwinds to our near-term profitability, such as the cost of new launches, higher power prototype sales, engineering changes that could lead to inventory obsolescence and expedited freight costs driven by the start-stop nature of some of the nameplates in our thermal barrier demand.

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We could also opportunistically decide to add OpEx to continue advancing our R&D in key areas and accelerate the development of our technical sales capabilities and fund new program launches.

On the flip side, if additional demand is there, we expect a disproportionate amount of it to flow to our bottom line, and our team will continue applying a lot of the lessons learned in 2023 to keep reducing our fixed costs, increasing our production yields, our uptime and driving the right energy industrial pricing and mix.

The favorable trends around raw material costs could also continue to help make up for some of the recent increases the world is seeing on inbound freight costs along some of the main sea freight routes in Europe and the Middle East.

Continuing on Slide 7 with the rest of our 2024 outlook. $30 million of positive EBITDA would translate into a net loss of $23 million or $0.30 per share assuming a share count of 76.5 million shares. Our CapEx, without including Plant 2, is expected to be $50 million for the year. This is for equipment to fund additional productivity gains at our aerogel plant in Rhode Island, along with equipping our operations in Mexico with the tooling to ramp up our part production capacity in 2025.

We are now planning to spend more than $30 million advancing the construction of Plant 2 in Georgia during the first half of the year to ensure that the site is advanced enough to preserve all of our investments made to date and to enable the potential reacceleration of construction in the second half of the year. If construction on Plant 2 continues being right timed, we expect expenses of $50 million in expenses to be incurred in the second half of the year.

However, we continue to see an important need for the capacity that Plant 2 brings by 2027 at the latest and continue working our way through the due diligence and term sheet negotiation phase with the U.S. Department of Energy's Loan Programs Office as part of our application to fund the construction through a loan pursuant to the DoE's Advanced Technology Vehicles Manufacturing or ATVM program.

On the left side of the slide, one can see that we spent the last 12 months improving the profit potential of our business quarter-over-quarter while also reducing our CapEx by over 50% from the same quarter last year. This along with our current cash position enables us to manage the company with the right level of liquidity, fund all of our CapEx outside of Plant 2 and continue driving profitable growth without having to raise outside funds.

The main balance sheet focus areas for us over the next 4 months are 2: freeing up working capital by bringing down our raw material and inventories in what is now a more stable sourcing environment, and bringing our discussions with the DoE to a hopefully positive outcome.

In January, we received $5 million in funding through a sale leaseback of some of our recently purchased hard assets in Rhode Island and the Boston area. And we will continue to opportunistically rely on this form of financing to cover some of our CapEx in the near term, preserve liquidity and lower our overall cost of capital.

Next, I'd like to step back a bit and spend some time driving a fact-based discussion around the EV market, and I'll be referring to Slide 8 as I do this. As I mentioned earlier, a year ago we were quick to assess that in a rising interest rate environment our potential customers would be forced to reassess some of their EV investment commitments from 2020 and 2021. At the same time, we foresaw that as soon as light vehicle production ramped up to pre-COVID levels, consumers wouldn't necessarily be able to pay COVID era pricing for new vehicles and that either retail inventories would increase or that pricing for new mass market vehicles would need to decrease.

Seeing that things weren't as great as they seemed, we decided to right time our investments and accelerate our path to profitability. Now we are encouraged to see that things aren't as bad as they seem. We have all read the articles of the frozen EVs in Chicago that consumers forgot to charge or the articles of recent price decreases for mass-market EVs, but comparing the reality and the new forecast for global EV production reveals some interesting facts.

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If we compare IHS' forecast in October of 2021 for global EV production in 2022 with actual production, the actuals outpaced expectations by 27% or 1.7 million vehicles. In 2023, actual global EV production was 900,000 units higher than the expectations from October of 2021, demonstrating not only that global EV production increased by 28%, but that this market continued to grow at a high rate. This is particularly important for a company like ours that started supplying the EV market in 2021 with no prior exposure to the global new vehicle market at all.

In North America, EV production still grew by 53% from 2022 to 2023, and actual 2023 production was only 200,000 units short of the forecast from the peak EV sentiment days of October of 2021. 200,000 units in our view is a capacity and supply problem, not a demand one. We believe that a single OEM could have more than covered this gap in North America last year.

Looking forward, as some key OEMs launch new nameplates in North America, IHS is expecting all the units lost of 2023 and 600,000 units lost relative to the 2021 forecast in 2024 to be made up by 2027, with 1.2 million additional units expected in 2028 over the forecast from 2021. We don't believe that this forecast is unreasonable and, again, feel that the wind is on our sails in North America as we continue building our EV Thermal Barrier segment from no revenues in 2020 with an vehicle production market that is expected to compound at 38% per year over the next 5 years.

In Europe, the story is similar as EV production in that market is expected to grow at an average rate of 32% over the next 5 years. We believe that the CO2 emissions regulations that led to a 2.6 million production unit EV market in Europe in 2023 are not going away. And as they get stricter, it is not unreasonable to expect 8.9 million EVs to be produced in Europe in 2028.

I'll let you spend some more time comparing the EV production forecast from 2021 with the latest expectations, but it is clear to us that production over the last 2 years shows that this is still a nascent market with more than enough energy and investment behind it to power the growth of a company like ours that is starting without any exposure to it. We are in the first inning of a very long game here.

To show you more specifically how we forecast this growth and optimally plan our capacity, let's turn over to Slide 9. If we take the estimated value of our currently awarded and quoted business, which assumes our customers' internal volume projections times the price that we've quoted for each part, this demand is significantly higher than our planned thermal barrier capacity from 2025 onwards. For example, for 2024, we are discounting our customers' communicated demand by 56% to land at our $200 million thermal barrier baseline revenue outlook as we stand ready to fulfill the $500 million.

For 2025 and 2026, although we continue working to secure additional demand through OEM awards that go well beyond these years, we need to discount the estimated demand on hand by 37% and 75%, respectively, to be able to fulfill it with our aerogel capacity in Rhode Island.

If we bring Plant 2 online with its estimated incremental $1.2 billion of thermal barrier revenue capacity in 2027, we will need to continue discounting our estimated 2027 and 2028 demand by 41% and 46% to be able to fulfill it with both aerogel plants.

In summary, over the next 5 years, we estimate that there are over $4.4 billion of excess demand between our customers' estimates of their demand and our latest capacity plant assessment. We believe that this leaves room for plenty of program delays, lower volume ramps, long sourcing processes and multi-stakeholder decisions that are customary in the automotive industry without affecting our ability to grow profitably and drive our business model. This is precisely why our team is so motivated and why we continue to execute with conviction and our eyes wide open despite most of what we read in the media around electric vehicles.

Speaking of execution, before handing the call back to Don, I'd like to spend a few minutes on Slide 10, which we've now been updating for the past 2 quarters with our results alongside the main annual targets of our business model with our current capacity, which we believe can now deliver $650 million of revenue and 25% EBITDA margins.

On an annual run rate basis, it's obvious that we've continued to make progress towards our targets by bringing our cost of goods sold to the target of 65 percentage points of sales without relying on outsized

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revenue growth, while continuing to decrease our OpEx as a percentage of sales in Q4. Accelerating this level of scalability was not an easy feat, and I would like to thank everyone on our team for bringing us to this point. I truly can't be more excited about our prospects, happier or prouder of playing a small part in this team as we continue sharpening our acts in 2024. Thanks again, everyone.

And with that, over to you, Don.

Donald R. Young
President, CEO & Director

Thank you, Ricardo. We have covered a significant amount of ground today in reviewing Q4 full year 2023, our near-term outlook and our longer-term strategy. Before we move to Q&A, I would like to emphasize the focus on driving significant profitability from our existing resources and commercial opportunities, while at the same time maintaining our full longer-term upside potential as we continue to win design awards from EV OEMs, grow our baseload Energy Industrial revenue and leverage our aerogel technology platform into additional high-value markets. We believe 2024 will be another significant step towards building this dynamic and highly profitable technology company.
Candice, let's turn to Q&A.

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Question and Answer

Operator

[Operator Instructions] So our first question comes from George Gianarikas of Canaccord.

George Gianarikas
Canaccord Genuity Corp., Research Division

Appreciate all the detail around your expectations for this year and for next year. I'm wondering if you could just give us a little bit of comfort around previous sales into some of your larger OEM customers. If we just do the quick math around how much material you've shipped into customers like GM versus how much their sell-through has been, there seems to be a little bit of a discrepancy there.

And they have some -- that large customer has indicated that they've had some issues with module production. Can we just chalk up some of that shipments relative to sell-through to issues with module production? Or we can -- or is there a worry that, that might come back to bite Aspen in the future?

Ricardo C. Rodriguez
CFO & Treasurer

Yes. I mean, I think -- yes, of course, if you run the math, it's no secret that it is very likely that some of our parts did not end up in a completed module or a completed vehicle, and quite a few of them. So I mean, for us, when we look at the signals around this customer's demand pool, we still feel pretty good about the fact that they don't have a ton of inventory of our parts that hasn't made its way into vehicles. And so we think that you may have some variability of around a month in the value chain, waiting for a part to ultimately land into a vehicle assuming 100% yields within their processes, and we think that, that variability is so small that it's pretty well captured within the discounting that we're doing of the low end of their production guideline for Ultium for this year, and then, obviously, a much higher level of discounting that we take to the IHS forecast.

So -- I mean, so far we still see a pool for parts. We know that there isn't a ton of inventory in the value chain as these vehicles get built. And as we showed here on some of the slides, they're expected to continue making more vehicles.

We actually are an important part in the solution of improving the yields around module assembly and ultimate vehicle integration, and so we know that, that's also on an improving pattern here.

George Gianarikas
Canaccord Genuity Corp., Research Division

Great. And just as a follow-up, there seems to be a lot of momentum with silicon anodes. And I was wondering if you can give us an update on your silicon battery materials segment and any traction you have there.

Donald R. Young
President, CEO & Director

We continue to make progress in our aerogel technology center on our silicon anode activities. And we are very focused on having a cost-advantaged product. And as we -- and I would expect that we will sample customers over the course of 2024 with those materials. We have some key internal milestones to reach before we do that. And the team is very talented and very focused on doing that.

As you know, George, it's a challenging problem to solve, and that's why doing so could be so valuable to us and to the industry overall. So we've got a great team working on it. And I guess I would just say sort of standby, we're going to continue to make progress over 2024 and very likely talk more about it in subsequent earnings calls.

Operator

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Our next question comes from the line of Colin Rusch of Oppenheimer.

Colin William Rusch
Oppenheimer & Co. Inc., Research Division

Can you talk a little bit about the cadence and the rate of customer sampling and how that's evolved over the last 12 to 15 months for the company?

Ricardo C. Rodriguez
CFO & Treasurer

Yes. I mean, we've scaled our processes there, so -- and if you talk to our sales team, I mean, we're -- and if you came by our building here in Marlborough where we build the prototype parts, we're getting prototype parts to new customers for new applications within 2 to 3 days of when they ask for them. And we're still seeing a lot of the product road maps that these OEMs had shaped up in 2020 and 2021 still hold as some of these programs are getting into the sourcing phases.

And I think this is sort of reflected by the broader market itself, right? I mean a lot of these decisions that -- and the CapEx that was put to work towards launching nameplates in 2021, I mean those trains have sort of left the station and are in the sourcing stage today. And so that will continue to move, I think, at the same pace that we saw last year.

It's really the new product decisions that will come into sourcing here in 2025 and 2026 where there may be some retiming. But the coming -- the pace we see it comparable to what it was last year. And what's actually accelerated now is our ability to respond quickly. We've got a larger sales team and our turnaround time is much faster.

Colin William Rusch
Oppenheimer & Co. Inc., Research Division

Okay. That's super helpful. And then I guess from a pricing strategy perspective, obviously, you guys have been able to demonstrate a fair amount of value in terms of the safety side of things. But the ability to monetize some of the other elements of cost reduction that you're facilitating for your OEMs at the pack level, can you talk a little bit about your ability to press price and how that might impact margins or any assumptions that are in some of the commentary you made on the margin profile for the company?

Ricardo C. Rodriguez
CFO & Treasurer

Yes. I mean the -- so the margin profile and what we've been laying out here for the past several quarters is just really more of a framework, right? And we think that a key tenet in enabling that framework is being sold out, right? So if you don't have more capacity than you need, you're able to have the right pricing discussion and in many ways stand your ground relative to the value that you're creating for the customer.

And our team -- going back to your earlier question on the sales cycle, our sales team is incredible at saying yes to solving the customer's problem. But we're very good at saying no to bring the price below a level that I think compensates for the capital that we're deploying and all of the resources that we have in the company to solve these customers' problems.

So being sold out is a key tenet of the strategy. And then, of course, the team continues to generate additional demand and we'll continue increasing our demand over the next several years, but, again, without giving up pricing. We really think that the pricing lever is the main one at driving our business model here.

Donald R. Young
President, CEO & Director

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I think Colin also just to turn the wheel a little bit over to the Energy Industrial side. Also, I would anticipate that as we continue to convert over to the supplemental supply, that, that will support the kind of gross margins that we and you expect here over the course of 2024 and the years to come.

Operator

Our next question comes from the line of Chris Souther of B. Riley.

Christopher Curran Souther
B. Riley Securities, Inc., Research Division

Congrats on all that progress on the gross margins. Maybe to kind of follow up there. Could you talk a bit about, if you're already hitting your target model gross margins in the fourth quarter, like what are the puts and takes between -- on the path to $650 million run rate? Are there any reasons we shouldn't expect continued improvements on the materials and conversion side? Are price downs kind of scheduled within that kind of path to that run rate? Like what should we be thinking about with those puts and takes?

Ricardo C. Rodriguez
CFO & Treasurer

Look -- I mean, if you look at the performance of Q4 that Don and I have been joking here, we almost feel like we ran a 6-minute mile on the treadmill and our knees sort of hurt. And so we just want to take it step by step here and really look at the various elements of the cost structure that -- where even though we're already there, we still have to keep optimizing it to make it a recurring thing.

And so on the material side, we -- again, like we're still budgeting for the 40% as a percentage of sales. And while the 36% as a percentage of sales is favorable, you always want to have a little bit of buffer there for -- in our case for inbound freight costs, for example, right?

Then on conversion costs, I mean, we're not there yet, right? We're still about -- at the run rate of Q4, I'd say we're still about 10 percentage points away from where we need to be. And there's also a buffer in there actually for expedited freight, which, as we launch new programs -- I mean, we're potentially starting programs with 2 OEMs here this year.

And if you go back to our cost structure in 2021, we're almost adding P&Ls that had that same pretty bad profit profile as you get ramped up here this year to come in alongside the business that we have. And so for us, while it would be great to assume that and think that we can continue running a 6-minute mile here on the treadmill, we'd like to slow it down a little bit as we launch some of these programs, deal with the nature of expediting things and the cost of being reactive here when you're still in the launch phase, even on some of the nameplates where we've been supplying parts here for a couple of quarters now. And those are really the main ones, right?

Then there's also this element of labor costs. And there's a point in which -- you break into a point where your labor costs actually start being pretty well absorbed, but then building up that next level of capacity could actually have you go finding different types of labor that has a different cost structure. And so we want to protect for that here as we plan for the year.

But those are really the main elements. It's really the cost of being able to react quickly to change that we want to factor into the profitability outlook without going into the year assuming that we can run a 6-minute mile consistently.

Donald R. Young
President, CEO & Director

I would also just say that the teams really across Aspen did a lot of the small things really well over the course of the quarter and really over the course of the year. You heard me reference the gross margin progression starting with the 11% in Q1 and making our way all the way to 35%. So we did a lot of things well in Q4.

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I agree with Ricardo's cautionary comments. I do think the 35% was certainly a confidence builder for us that we're going to be able to do this over any period of time, but perhaps with some variability.

Ricardo C. Rodriguez
CFO & Treasurer

And also, I mean, don't get us wrong, right? I mean if the revenue shows up -- we actually have a little chart that actually looks like a set of stairs. And the first $50 million, a good amount of that flows to the bottom line. The $50 million on top of that, I mean, at least 20% of that flows down to the EBITDA line. So we are pretty excited about the prospects of additional revenues. And that would obviously have us then update our profitability estimates if that revenue starts to materialize.

Christopher Curran Souther
B. Riley Securities, Inc., Research Division

Understood. No, that's really helpful. And then maybe just on the 10 additional OEMs and additional programs you talked about as far as over the next couple of years. I'm curious how many you have 2025 launches? And whether any vehicles or platforms you've previously been highlighting that you were testing or quoting have moved forward without PyroThin? And to what extent are the opportunities getting posted? It sound like it's more of the kind of 2026, 2027, 2028 kind of potential programs that are - seem to be shifting rather than kind of the more near term. But if you could just provide color on that overall pipeline.

Donald R. Young
President, CEO & Director

Sure. Well, I referenced in my comments the sixth one that we've talked about for some time. Technically, we reached all the milestones, and this is a matter of negotiating final terms, if you will, in that announcement.

In terms of additional ones, we are heavily engaged with additional OEMs as they work through the timing of the development of their own platforms. And we believe that we will be part of those platforms.

In terms of timing, I think it's fair to say that the start of production for additional OEMs is probably more likely to be SOP 2026 and 2025. Quite honestly, I think we have our hands full from a revenue demand point of view in 2024 and 2025. So that probably suits us quite well. We are not aware of our, say, losing a process to other materials or other solutions. And we think we have an excellent solution that addresses both the thermal management and the mechanical challenges associated with these thermal barriers.

So we feel like we're in good shape.

Operator

Our next question comes from the line of Eric Stine of Craig-Hallum.

Eric Stine
Craig-Hallum Capital Group LLC, Research Division

So maybe -- hey, doing well. So maybe if we could just talk about '24 a little bit. Obviously, you've laid out a pretty it sounds like conservative baseline and some scenarios that are upside for the second half. I know previously, you had talked about kind of a goal or a $550 million revenue run rate. With the expectation that you could hit that as early as third quarter of '24, just curious if you have updated thoughts on that. Is that still the type of time line, which is possible?

Ricardo C. Rodriguez
CFO & Treasurer

I think it's still possible, but it's not really up to us, frankly. I mean, I think we're ready to capture it, but it really depends more on our main customer here. And it's still a possibility.

Donald R. Young

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President, CEO & Director

We have the capacity in place to be able to do that, Eric, as we -- I think one important thing that we voiced today was this additional capacity from our East Providence facility for thermal barriers from originally $400 million to $500 million, and again, based really empirically on our productivity and yields that we're experiencing today. And then, of course, on top of that is our supplemental supply that we target at $150 million. So that ability to get out to a run rate of the $550 million as you cite even with additional capacity from there.

So we feel like we've sort of done our part, and now we're doing everything we can to make our OEM successful.

Eric Stine
Craig-Hallum Capital Group LLC, Research Division

No, that makes sense. And maybe for my second one, this is just a follow-up on a previous question. You talked about the pricing strength you have, especially in energy, industrial because it's capacity constrained. I mean, is there a scenario that you are able to increase that? I mean maybe this is a question a couple of quarters from now, but when you're at $150 million, I think in the past, you've talked about you see demand in excess of $200 million a year. So just maybe thoughts on how you think about that longer term.

Donald R. Young
President, CEO & Director

Our team has a strong track record of increasing prices associated with the value that we're bringing to those end users. And so I think you will see us continue to test the market with strong pricing. I'm very pleased with the arrangement that we have with our supplemental supply supporting our cost structure, a pretty known cost structure, if you will. And so as I said in my comments, I think you will see our energy industrial business meet our expectations, and I think it's got a lot of potential to continue to grow as well from that sort of nominal $150 million baseline that we've created, both from a demand point of view and from a capacity point of view.

Operator

Our next question comes from the line of Alex Potter of Piper Sandler.

Alexander Eugene Potter
Piper Sandler & Co., Research Division

One question on, I guess, incremental OEM. To what extent are they, I guess, making orders contingent upon Aspen opening additional capacity in Georgia or elsewhere? I know that historically, some of these automotive suppliers get a little jittery when they have so much reliance on a single plant. It's a meteor strike, the Rhode Island facility, what happens to their supply chain. So to what extent is that factoring into conversations that you're having either with existing customers or additional ones?

Ricardo C. Rodriguez
CFO & Treasurer

We don't see the same level of sensitivity to the single supply source as one would think. I mean they are very concentrated on sales and actually some of the raw materials throughout the rest of the battery value chain. But for us, I mean, we -- if an OEM is asking us about 2027, we present that as being supplied out of Georgia. And that gives customers a lot of comfort, if you combine it with Rhode Island.

And so right now, in our selling efforts, I think customers are just assuming that the Georgia plant will be there in 2027 and that's giving them the necessary comfort to commit.

Donald R. Young
President, CEO & Director

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I think, Alex, that sort of the area where they are likely or are, I should say, are pushing us a little bit is on the fabrication side, especially our European customers. I think they would like us to shorten that part of the supply chain, if you will. And so as we win more and more European business, I think you may very well see us create a fabrication capability like the one we have in Mexico to serve that part of our market.

Ricardo C. Rodriguez
CFO & Treasurer

Or just build up more inventory in Europe, right?

Donald R. Young
President, CEO & Director

Exactly. Yes.

Ricardo C. Rodriguez
CFO & Treasurer

For instance, the idea of setting up a storage and inspection facility at a neutral point -- Netherlands, Belgium in Europe -- is something that customers have been totally okay with. And we'll probably take that step before looking at manufacturing in Europe.

Alexander Eugene Potter
Piper Sandler & Co., Research Division

Okay. Good. That's helpful. And then maybe you mentioned talking about 2027 and beyond sourcing out of Georgia, obviously, you're not going to be able to provide any incremental commentary on the DOE loan process. But one thing I am sort of interested and something that's come up in conversations with clients is the election. Again, maybe hard to predict, but to what extent, let's say, that the loan isn't finalized and the capital was not deployed prior to November? And then who knows how things happened in November, but assuming you have a less maybe DOE-friendly administration coming in, in November, to what extent does that put your, I guess, the DOE loan at risk?

Donald R. Young
President, CEO & Director

We're working very hard to do it in a time frame that brings us -- and there are no assurances here -- but brings us to a conditional approval and final terms. And at that point, that money is allocated from the DOE and wouldn't be reversed come November election that might be less favorable towards these kinds of programs.

So we're working hard and fast as possible on this. And I think, again, as I said in my comments, the LPO loan programs office, we're very engaged with them and their advisers. And again, it's no assurance of a final result, but we're in a really good position, we believe.

Ricardo C. Rodriguez
CFO & Treasurer

Yes, that is worth highlighting. I mean, once you get into this diligence and term negotiation phase with the DOE, we've actually been very surprised at the speed at which the DOE moves. I mean, it's moving faster than a lot of the private investors that we were encountering last year, right? Everybody is very actively engaged. We actually have to step up our response to beat the DOE in many cases. And so we feel confident about the timing and where we are today.

Donald R. Young
President, CEO & Director

And Alex, we're a good candidate. We have proven technology, we have customers, we have contracts, we're positive EBITDA as of fourth quarter, our projections are strong, we have 2 different businesses supporting the overall growth of our company, growth and profitability of our company. We're a good candidate, I think, for this program.

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Operator

Our next question comes from the line of Tom Curran of Seaport Research Partners.

Thomas Patrick Curran
Seaport Research Partners

At East Providence, you just saw for and will unleash another -- so at East Providence, you just saw for and will unleash another 20% of annual capacity. That's a considerable increase, and this is not the first time Aspen has unlocked significantly higher throughput and/or yields there.

Just theoretically, assuming Plant 1 remains dedicated to PyroThin, just how much more productive capacity could you potentially bring out of that facility?

Ricardo C. Rodriguez
CFO & Treasurer

I think we're at the point where it really depends more on the mix and who we're producing parts for than finding more capacity through improving the yields, increasing the line speeds, introducing longer roll lengths, et cetera, which the team is still continuing to work on. But I think, yes, above that $500 million annual revenue capacity level, I think if we're producing some of the thinner material for a broader set of customers, there's potential for additional capacity. But there, we sort of need the mix to work in our favor.

But then again, I mean, I think our team has been really incredible at coming up with a couple of breakthroughs here particularly in improving our yields. And we're still working on that. So it's a bit of a balance, but I do feel much less conservative around the latest capacity assessment than when we were calculating the $400 million a year ago.

Donald R. Young
President, CEO & Director

We made some capital investments over the course of 2023 as we convert the 3 lines in East Providence one at a time from optimized around energy industrial to optimize around EV. And we still have a little bit more of that to do. But again, the team has done an excellent job on this. And as Ricardo says, we feel confident in what we talked about today.

And also as Ricardo said, I think what you'll see from here is more incremental than a big 20% jump that we talked about earlier today.

Thomas Patrick Curran
Seaport Research Partners

Got it. And I mistakenly said 20%. I think it's actually 25%, right? So even more impressive. And then...

Ricardo C. Rodriguez
CFO & Treasurer

[indiscernible].

Thomas Patrick Curran
Seaport Research Partners

Right. We don't want to undercut what your team has achieved. Again, very impressive.

And then based on GM's current Ultium production guidance and sales targets for 2024, so not your internal discounted baseline, but their actual bounded plans, and then the resulting expected nameplate mix, Ricardo, what is the weighted average range for CPV that you'd expect to realize for Ultium sales this year?

Ricardo C. Rodriguez
CFO & Treasurer

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About $900, right? Like $900 to $1,000 a vehicle.

Thomas Patrick Curran
Seaport Research Partners

Right. And that would be like the weighted average midpoint of their range?

Ricardo C. Rodriguez
CFO & Treasurer

[indiscernible]...

Thomas Patrick Curran
Seaport Research Partners

Or we will not -- do not expect it's really there...

Ricardo C. Rodriguez
CFO & Treasurer

If we take the IHS mix -- I mean, it could vary more to the upside, frankly. It does seem like some of the larger battery pack models will probably be built first. But we kind of need to wait and see that.

Operator

Our final question comes from Amit Dayal of H.C. Wainwright.

Amit Dayal
H.C. Wainwright & Co, LLC, Research Division

Just one question on the CapEx plans. Is any of that dependent on the DOE loan coming through? Or is that sort of baked into your cash flow assumptions, et cetera, already?

Ricardo C. Rodriguez
CFO & Treasurer

No. What we've communicated is what we would spend without the DOE's potential funding. If the DOE funding materializes, then we would be basically plotting the reacceleration of the construction, and that has a different spend profile for the second half of the year.

Amit Dayal
H.C. Wainwright & Co, LLC, Research Division

Okay.

Ricardo C. Rodriguez
CFO & Treasurer

Which we're assessing right now, but it would look a lot like the trajectory that we were on before we decided the right time of the plant.

Operator

As there are no additional questions waiting at this time, I'd like to hand the conference call back over to Donald for closing remarks.

Donald R. Young
President, CEO & Director

Thank you, Candice, for your help today. We appreciate your interest in Aspen Aerogels and look forward to reporting to you our first quarter 2024 results in early May. Be well. Have a good day. Thank you.

Operator

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Ladies and gentlemen, thank you for joining us on today's conference call. Have a great rest of your day. You may now disconnect your lines.

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