

Aspen Aerogels, Inc. NYSE:ASPN

FQ1 2022 Earnings Call Transcripts

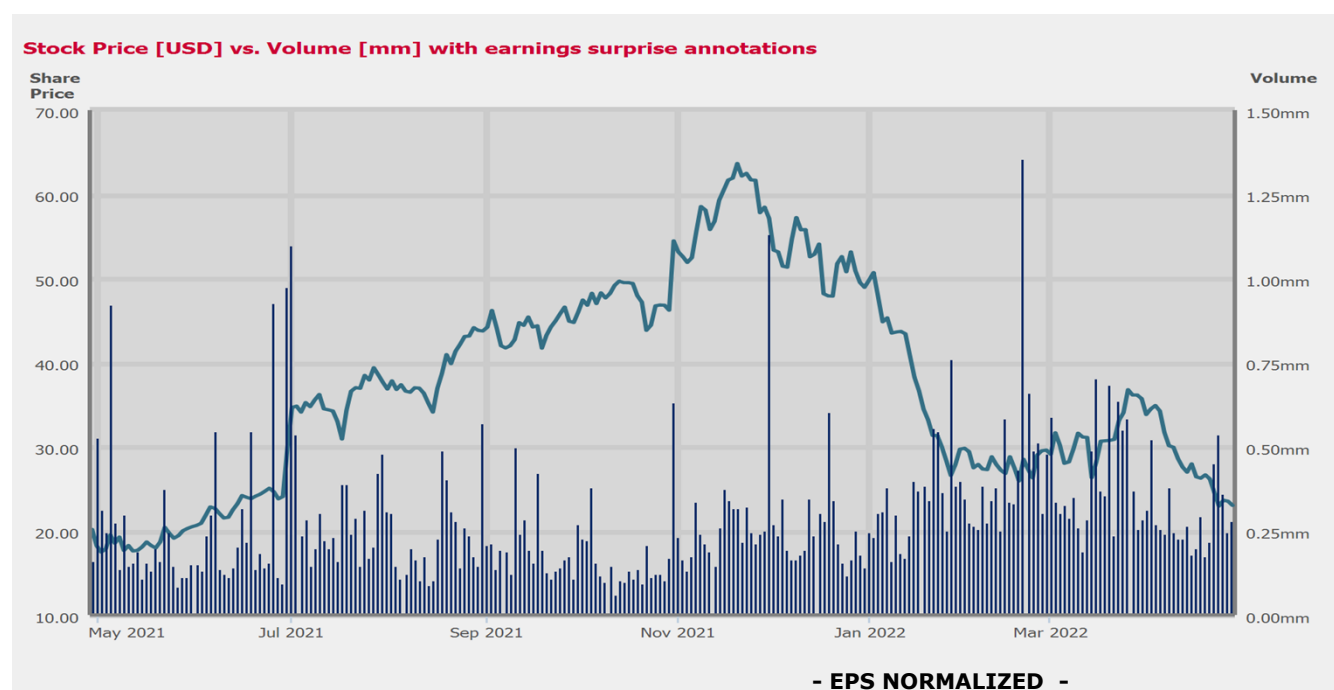
Thursday, April 28, 2022 12:30 PM GMT

S&P Global Market Intelligence Estimates

	-FQ1 2022-			-FQ2 2022-	-FY 2022-	-FY 2023-	
	CONSENSUS	ACTUAL	SURPRISE	CONSENSUS	CONSENSUS	CONSENSUS	GUIDANCE
EPS Normalized	(0.47)	(0.59)	NM	(0.47)	(1.86)	(1.25)	-
Revenue (mm)	32.34	38.41	▲18.77	35.43	151.44	237.58	225.00

Currency: USD

Consensus as of Feb-22-2022 1:36 AM GMT



	CONSENSUS	ACTUAL	SURPRISE
FQ2 2021	(0.27)	(0.23)	NM
FQ3 2021	(0.26)	(0.24)	NM
FQ4 2021	(0.29)	(0.50)	NM
FQ1 2022	(0.47)	(0.59)	NM

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Call Participants

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Presentation

Operator

Good morning. Thank you for attending the Aspen Aerogels, Inc. Q1 2020 Earnings Call. All lines will be muted during the presentation portion of the call with an opportunity for questions and answers at the end. I would now like to turn the conference over to your host, Laura Guerrant, Aspen's Vice President, Investor Relations and Corporate Communications. Thank you. You may proceed, Ms. Guerrant.

Laura J. Guerrant-Oiye

Vice President of Investor Relations & Corporate Communications

Thank you, Emily. Good morning, and thank you for joining us for the Aspen Aerogels Fiscal Year 2022 First Quarter Financial Results Conference Call. With us today are Don Young, President and CEO; Ricardo Rodriguez, Chief Financial Officer; and Keith Schilling, Senior Vice President, Technology.

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 Investors section of Aspen's website, www.aerogel.com.

Included in the press release is a summary statement of operations, a summary balance sheet and a summary of key financial and operating statistics for the 2022 first quarter ended March 31, 2022. In addition, I'd like to highlight that we have uploaded to our website a slide deck that will accompany our conversation today. You can find the deck at the Investors section of our website. An archive of today's webcast will be on our site for approximately 1 year.

Please note that our discussion today will include forward-looking statements, including any statement regarding outlook, expectations, beliefs, projections, estimates, targets, prospects, business plans and any other statement that is not a historical fact. These forward-looking statements are subject to risks and uncertainties. Aspen Aerogel's actual results may differ materially from those expressed in these forward-looking statements. A list of factors that could affect the company's actual results can be found in Aspen's press release issued yesterday, Page 1 of the presentation, and are discussed in more detail on the report has been filed with the SEC, particularly in the company's most recent annual report on Form 10-K.

The company's press release issued yesterday and filings with the SEC can also be found in the Investors section of Aspen's website. Forward-looking statements made today represent the company's views as of today, April 28, 2022. Aspen Aerogels disclaims any obligation to update these forward-looking statements to reflect future events or circumstances.

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 a discussion of why we present these non-GAAP financial measures are included in yesterday's press release.

And one final note. During the Q&A session, in the interest of time, we ask that you limit your questions to 2 questions at a time. If you have additional questions beyond the initial tools, please get back into the queue, and we will get to all questions. I'll now turn the call over to Don. Don?

Donald R. Young

President, CEO & Director

Thank you, Laura. Good morning, everyone. Thank you for joining us for our Q1 2022 earnings call. I will kick things off with a progress report on recent business developments. Ricardo will discuss business

results and outlook, and Keith will cover our work at Aspen Battery Materials. We will conclude with a Q&A session.

Starting on Slide 3. I'm highly encouraged by the progress we are making towards achieving our goals. Our teams throughout the company are operating at a high level of performance. These outstanding teams are being strengthened as we continue to recruit talented people with deep experience. On the heels of a solid 2021, Aspen is off to a strong start in 2022. Total first quarter revenue was up 37% year-over-year and 22% sequentially, reflecting continued penetration in the EV market and an advancing recovery in the energy and industrial market.

With this commercial momentum, and of course, our existing awarded programs with GM and Toyota, we are confident that we will meet or exceed our 2022 revenue guidance of \$145 million to \$155 million, and we believe that we are in a strong position to meet our \$240 million revenue target in 2023. I'll talk more about that shortly.

During the quarter, we were honored to receive the Overdrive Award as part of GM's 30th Annual Supplier of the Year ceremony. We won the award for Launch Excellence, which recognized our role in GM's thermal propagation strategy for its Ultium battery platform. The recognition is indicative of the depth of the technical and commercial collaboration between Aspen and GM. We are excited to see GM's unwavering commitment to battery performance and safety in its Ultium battery platform and are equally excited to be part of GM's fast-paced transition to electrification.

Turning to Slide 4. Let's talk further about our growth targets and what is driving our momentum and conviction. We consider our growth targets to double annual revenue from 2021 to 2023 and to triple annual revenue from 2023 to 2025 to approximately \$720 million to be Stage 1 of our long-range plan. The strong outlook for the energy industrial business is fueled by pent-up maintenance demand following the pandemic, high energy prices, and strong activity levels in LNG projects. The thermal barrier business is coming at us faster than we had initially anticipated. PyroThin thermal barrier revenue was \$7.6 million in Q1 alone, exceeded our revenue level for full year 2021. This strong outlook for PyroThin thermal barriers is supported by awarded programs that we currently assess at approximately \$1 billion to be fulfilled in Stage 1 of our long-range plan through 2025 and an additional approximately \$2 billion to be fulfilled in Stage 2 beginning in 2026.

We estimate that the awarded programs from GM and Toyota to whom we have been delivering production parts for 2 quarters, represents 100% of the 2023 PyroThin thermal barrier revenue target and 60% of the 2025 target. Like other Tier 1 suppliers, we define the term awarded programs as estimated gross revenues from the volume forecast of customers taking into account our negotiated program pricing.

In addition to our work with GM and Toyota, we are working closely with other automotive OEMs and are striving to convert additional quotes into awarded programs with our unique thermal barrier products. During Stage 1, we are making upfront investments in people, optimize processes, automation and capacity that not only enable the doubling and then tripling of revenue but also the transition to positive cash flow and to the monetization of the investments throughout Stage 2.

These investments burden margins in the short term, but we believe they set us up structurally so that in 2025, at the targeted revenue level of \$720 million, we are positioned to deliver gross margins approaching 35% and EBITDA margins approaching 25%. These margin levels are similar to those of other advanced engineering components delivered to the automotive industry for critical functions that enable electrification, such as high-voltage connectors, advanced power electronics and silicon carbide components. With our proprietary technology and scale, we are positioning ourselves to be a valued supplier to a growing list of EV producers.

I'd also like to provide a brief update on Plant 2. On March 31, we celebrated the groundbreaking ceremony for our second aerogel manufacturing facility in Statesboro Bullet County, Georgia, with long lead time items purchased starting in Q4 2021, the first phase of Plant 2 is on a projected time line for completion in late 2023. The first phase of Plant 2 targets \$650 million of annual revenue capacity and will bring our total annual revenue capacity to approximately \$900 million.

As we approach full capacity utilization at this level, we project our EBITDA will be approximately \$225 million per year. Upon the completion of the second phase of Plant 2, we expect to have overall targeted annual revenue capacity of \$1.6 billion across both plants and the capability to generate approximately \$550 million of gross profit and approximately \$400 million of EBITDA, with the auto industry on track to invest \$0.5 trillion in the next 5 years to make the transition to electric vehicles, the speed and size of our potential ramp is increasing rapidly.

In addition to our EV and energy industrial businesses, we continue to invest in the strategy to leverage our Aerogel technology platform into other high-value markets with sustainability themes. We have an extremely talented group of people, laser-focused on this part of our business, and we expect these investments will continue to validate the richness of our aerogel technology platform and create significant value.

We believe our carbon aerogel initiative within acid battery materials is next in line to commercialized products. I would like to turn the call over to Keith Schilling to comment more fully on ABM. Keith?

Keith Schilling

Thanks, Don. Turning to Slide 5. First, let me attempt to describe the opportunity. Electric vehicles consist of multiple types of batteries today that are stacked or wound to form pouches or cylinders, each with lithium ion that flow through the electrolyte from a negative anode through a permeable separator to a positive cathode.

We'll focus on the anode for this discussion as this is one of the more difficult challenges facing the industry. Current forms of batteries use graphite as the anode material. Silicon would be a better choice since it's plentiful, less expensive, and holds 10x more lithium than graphite. It is widely accepted that boosting performance relies on incorporating additional silicon in the anode.

The challenge is that when silicon reacts with and absorbs lithium ion, it swells by nearly 300% compared to roughly 7% for graphite. This swelling through charge and discharge cycles eventually destroys the silicon's ability to carry the lithium ion as shown through the cracking of silicon as a result of swelling shown in the images here, as well as solid electrolyte interface formation also seen in the images, resulting in decreased battery performance.

The opportunity for a carbon aerogel solution is shown compared on the right to alternative solutions in terms of key performance metrics of energy density, sync, range, and cost. As you can see, what is commercially available and in use in the market is represented as the white ellipse. There are other potential alternatives that are being explored but have not commercialized as represented by the colored ellipse in the top right of the chart.

Our solution is captured in the bottom right of the graphic, representing our ambition, and backed by early and very encouraging test results for our solution. So what exactly is carbon aerogel? It's a unique technology platform where we're leveraging the inimitable combination of mechanical, electrical, and nanomorphology properties to enable higher amounts of silicon in the anode.

Turning to Slide 6. Why does this matter? And how do we earn our right to win inside the battery. It's widely known and accepted that incorporating higher amounts of silicon is the nearest term path to making improvements in energy density. Other silicon technologies have demonstrated meaningful improvements in energy density while exhibiting cycle-life performance necessary for EVs.

What remains is the ability to achieve performance and below cost. We believe the Battery Materials team at Aspen has a solution that is on track to meet the performance targets of automotive and battery OEMs using synthetic approaches that are scalable. Aspen's team has been working very hard to solve silicon's challenges by leveraging its know-how on carbon aerogel synthesis and the importance of this intimate interaction with silicon contained within it.

The ability to maintain silicon's connectivity to the carbon aerogel during cycling has allowed us to begin testing our materials in full single-layer pouch cells that would translate to more than a 10% improvement in energy density when tested in multi-amp hour pouch cells.

On the right of the graphic, we articulate how we are currently performing and our targets, as well as key cell level validation milestones we will continue to work over the near term. Aspen silicon carbon anode materials have already demonstrated energy densities that will deliver on the need of next-generation electric vehicles while maintaining the critical dollar per kilogram cost target of automotive OEMs.

Our materials meet or exceed the energy densities of competitive offerings, but can drop in to existing battery manufacturing processes at a competitive cost. We see our materials providing the performance road map for EVs, beginning as an additive to graphite and progressing to full tunable silicon carbon composition. The average EV battery contains approximately 60 to 70 kilograms of graphite in the anode. And as such, this represents an opportunity of approximately \$1,000 of content per vehicle for Aspen.

We have already achieved our targets in testing for cell variability, and we will continue validating these metrics as we scale. So what's unique in our development approach and what can we expect over the next 18 months, both technically and commercially. Our chemical synthesis process for our silicon carbon aerogel anode is truly unique as it offers a tunable platform where we can accommodate increasing amounts of silicon to meet the performance and cost road map of the EV industry.

The existing approaches to increased silicon content in the anode have hit a wall with the only solutions out there being either too expensive or very much in the research phase. For Aspen over the next 18 months, we anticipate completing the development phase of our silicon carbon anode aerogel platform and leveraging our relationships with battery and automotive OEMs to begin rapidly commercializing these materials.

Our manufacturing ability, competitive cost basis and relationships with automotive and battery OEMs gives us confidence that we can move these materials quickly into production. Our anode materials are one among many advancements that we are already targeting with our aerogel technology platform aligned with our strategy, and I couldn't be more excited about our future. I'll now turn the call over to Ricardo. Ricardo?

Ricardo C. Rodriguez
Senior VP, CFO & Treasurer

Thank you, Keith. Good morning, everyone. I will start by providing a summary of our Q1 2022 financial results, then go into a short recap of our outlook for the year and detail our current thinking on funding stage 1 of our business plan before turning the call back to Don.

Turning to Slide 7 and our financial highlights for the quarter. At a high level, our results show a clear continuation of the growth drivers that we have been investing to capture for several quarters with 37% year-over-year quarterly revenue growth driven by all our principal markets.

As Don mentioned, the thermal barrier opportunity is materializing faster than expected, thanks to various successful vehicle launches combined with higher-than-anticipated initial volumes. To illustrate this, our internal expectations for the quarter's thermal barrier revenues were \$4.3 million as we budgeted for the year in December of 2021. We delivered \$7.6 million of thermal barrier revenues during the first quarter of 2022, a 76% increase over our original plan.

Our energy industrial revenues were up 10% year-over-year from \$27.9 million in the same quarter last year to \$30.7 million in Q1 of this year, reflecting the industry's need to increase capacity while enabling alternate value chains. Our growth expectations for the energy industrial market are aligned with what we see in the order books of our distribution partners and the broader value chain. Ensuring that our sales channels have enough inventory on hand to sustain the near-term demand increase is at the top of our mind as we finish the first half of the year.

It is also worth highlighting that we are managing for the capacity and levels of service that we anticipate at least 5 quarters from now and continue to make the necessary investments in people, systems, and equipment before these are needed, given the growth required to fulfill our thermal barrier awarded programs in a world class way. We are confident that these investments are commensurate with the scale of our opportunity and can see a clear path to profitability enabled by our pricing, estimates of material

and structural conversion costs, which have significant potential for operating leverage as we reach our target revenue level run rates.

Further developing our ability to manage engineering changes favorably and drive convergence in the requirements of multiple OEMs, makes adding additional engineering resources upfront a worthwhile investment. Before turning to cost and expenses, I cannot stress enough that we are carrying most of the overhead of the much higher run rate revenue operation that we will become as we target to double our 2021 revenues by the end of 2023 and then triple these by 2025.

Our material costs also reflect the delivery of world-class automotive Tier 1 levels of service in a roughly \$30 million annual run rate thermal barrier operation, which we realize is suboptimal in the near term. When I look around the room at our thermal barrier manufacturing facility in Rhode Island, or sit with the launch team of our fabrication facility in Monterrey, Mexico, I see the quality and size of a team that is used to driving a \$1 billion run rate operation at a sophisticated automotive Tier 1 or specialty materials company.

We're instilling in ourselves the discipline and the habits required to manage a business on a scale that the world's largest OEMs can depend on. As Don mentioned, these efforts are being highly valued by customers such as GM as they accelerate their electrification goals.

Our expenses have scaled and will continue to increase as a step function, while the thermal barrier revenue run rates are on an accelerating curve that needs to absorb the next level of fixed expenses and investments that currently get captured as material or conversion costs.

Material costs increased year-over-year by 65% or \$8.3 million and conversion costs by 68% or \$7.8 million during the quarter. These reflect the relatively small size of the operation that we're currently running to enable our customers' launches while establishing the capabilities of a much higher run rate automated multi-site operation.

Operating expenses, which are key to delivering our revenue profitability goals for 2023 and beyond, increased by \$6.7 million quarter-over-quarter as we increased spending to enhance multiple theses. One, our technical, operational, and commercial teams supporting our thermal barrier business; 2, the research and development team supporting our core aerogel development efforts and the battery materials opportunity that Keith just shared our objectives on; 3, our legal resources to expand and defend our IP portfolio; and 4, our core infrastructure, which includes the finance, IT and general management personnel required to manage the targeted growth in our business.

Accordingly, our net loss increased to \$19.5 million or \$0.59 per share versus a net loss of \$6.3 million or \$0.22 per share in the same quarter of 2021. Adjusted EBITDA was negative \$14.7 million in Q1 compared to negative \$2.6 million in Q1 of last year. 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 Q1, these other items included \$1.8 million of stock-based compensation and \$0.8 million of interest expense.

Next, I'll turn to our balance sheet and cash flow. Cash used in operations of \$22.8 million reflected our adjusted EBITDA of negative \$14.6 million and an \$8.2 million investment in additional working capital. Capital expenditures during the quarter of \$14.5 million included engineering and design for our second aerogel manufacturing facility, assembly equipment for higher-volume thermal barrier operations and R&D lab upgrades for our carbon aerogel battery material efforts.

Cash provided by financing activities of \$165.9 million included \$100 million of proceeds from our convertible note issuance to Koch Strategic Platforms, \$50 million from their purchase of common stock at \$27.90 per share and \$23.6 million of net proceeds from our ATM offering transactions at a gross average price of \$35.10 per share.

These were all offset by a \$4.7 million repayment to BASF and \$2.7 million in other financing-related disbursements. We ended the quarter with \$205.2 million of cash, no borrowings under our revolving credit facility and shareholders' equity of \$181.6 million.

Now, I'll provide an update into our outlook for the rest of the year. We expect continued revenue growth in 2020 associated with our plan for a higher than tripling of our PyroThin thermal barrier revenue to cover \$20 million for the year. This is further supported by a continuation of the post-COVID recovery in the global energy industrial market. As a result, we feel strongly about being able to meet or exceed our annual revenue outlook of between \$145 million and \$155 million for the year, equivalent to growth of between 19% and 27% when compared to 2021.

The 37% year-over-year growth that we delivered in Q1, coupled with the strategic purchasing of key materials to derisk our fulfillment of this year's revenue plan is encouraging. However, we remain cautiously optimistic in a volatile supply chain environment that is not exclusive to Aspen and are proactively monitoring the delivery of key material inputs to our processes. Effectively, increasing our capacity and being ready to fulfill the growth that's outlined in Stage 1 of our long-range plan is the main driver of this year's CapEx.

Having this capacity ready to be put to work will be prioritized over near-term capital cost variances. The R&D investments required to equip our ABM team for them to deliver and validate the development milestones that Keith outlined in his remarks on our battery material efforts will [indiscernible] our current thinking on funding our business plan.

As we work our way through the year, completing the funding of Stage 1 of our long-range plan is something that you can expect us to focus on opportunistically with the intent of efficiently raising the funds needed to increase our capacity. Echoing Don's earlier remarks, we're investing aggressively during the early part of Stage 1 of our long-range plan, more specifically during the next 5 quarters.

These investments support a much longer duration period of growth that position us to generate cash at the end of stage 1 and will enable the company to continue growing without requiring additional funding. A range of capital sources are available for unique assets like Aspen that enable sustainability in partnership with large customers that have awarded significant business to fulfill.

These range from the sale of equity to relevant strategic partners such as KSP, debt that suits our cash flow profile and equity. We have several levers to pull as part of a well laid out plan to ensure that our balance sheet continues supporting our growth targets. With Stage 1 of our long-range plan fully funded in the near term, we are confident in our ability to efficiently turn capital investments into capacity that is immediately put to work to deliver our target revenues in 2025 and further growth in the perpetuity or what we're now calling Stage 2 of our long-range plan. With that, I'm happy to turn the call back to Don.

Donald R. Young
President, CEO & Director

Thank you, Ricardo. Turning to Slide 8. And before we move to Q&A, I would like to continue the practice of highlighting our ESG work during quarterly earnings calls. We value environmental, social and governance criteria as an integral part of our business strategy, and it started the process of reorganizing our sustainability-related policies and programs into a formal ESG strategy. It is a natural fit for us to explore new uses for our aerogel technology platform with the goal of improving the environmental performance and safety of our customers' products and processes.

It is also at the core of our culture to respect and celebrate our employees by striving to create a diverse and inclusive environment in which people thrive. We will be publishing our first ESG report shortly, which will outline key sustainability initiatives and ESG priorities. Our goal is to provide a foundation for deeper discussions with investors and other stakeholders on specific ESG topics and to enable everyone to have access to accurate and timely information. I will now turn the call back to Emily for the Q&A session.

Question and Answer

Operator

[Operator Instructions] Our first question today comes from Eric Stine from Craig-Hallum.

Eric Andrew Stine

Craig-Hallum Capital Group LLC, Research Division

So on that \$7.4 million of PyroThin revenue, I mean, obviously, GM and Toyota make up the lion's share of that. So just curious if you could talk about how many customers went into that number. And then in terms of number of units, is it as easy as just dividing by your average content? Or do you have other revenue lines in there, whether that's development milestones or other things in that number?

Ricardo C. Rodriguez

Senior VP, CFO & Treasurer

Yes, Eric. I think -- I mean, dividing by the weighted average CPV that we sort of outlined in the prior quarter would make sense if you're trying to back into the number of units that we shipped.

Frankly, there on the number of customers, it's fair to assume that the bulk of the revenue really came from both GM and Toyota. Breaking out the additional customers that we've been selling prototype parts to, we don't really think it's an indicative measure of the commercial progress. In fact, our prototyping activities have intensified with other customers. And whether we're shipping parts to 10 customers, as we disclosed last year, to 20 or 4, we don't think it's an indication of the true depth and the progress of the commercial pipeline. So we'd like to leave it at that.

Donald R. Young

President, CEO & Director

Yes, Eric, I would just add and just to emphasize the intensity part of Ricardo's comment, the activity level from our thermal barrier team has never been greater in all 3 of the important regions producing electric vehicles today.

Eric Andrew Stine

Craig-Hallum Capital Group LLC, Research Division

Well, I mean, I was -- for my second question, I guess I was going to talk about those 10, I mean, and maybe not necessarily from a quantity or revenue perspective. But whether it's those 10 or others, are you seeing -- I mean, clearly, it sounds like you're seeing a step up those programs moving forward. I would assume some of those launch plans crystallize and then whether or not your confidence level, where that lies in terms of being part of the platform when it launches.

So I mean, if you could just go into what you can, again, not from a unit perspective, but more just high level. And then thoughts about why wouldn't this be the industry standard going forward given the early progress you've made and the progress within that pipeline that you're seeing right now?

Ricardo C. Rodriguez

Senior VP, CFO & Treasurer

Yes. I mean I think in terms of managing those customers that we're engaged with at the prototyping or the technical assessment stage, right, this is an area where you do all of your work, and then you're almost at the mercy of the different programs being available to accept the technology.

And not every OEM is positioned in the way that somebody like GM is where they're starting from scratch with an all-new battery platform that immediately scales to multiple vehicle nameplates. Some of those customers that we've sent prototype parts to or are engaged with in the commercial funnel are balancing a mixed portfolio of nameplates that have old battery platforms combined with what seems to be, on the surface, an all-new battery platform, but it's really just an evolution of the prior battery.

And so to your question on why this isn't adopted as the standard from the get-go. It's really because it's difficult to adapt prior batteries unless you're in the fortunate position that GM finds itself in, where they're really starting from scratch and have the wherewithal to invest as aggressively as they are today.

So for us, really, we also have to pick and choose who our prototype team supports to be honest. And it's really with these OEMs that have taken a platform approach to the battery and then have the resources to scale something akin to what GM is doing with Ultium. And so you can at least find one customer in each region of the world that is taking that approach, and that's really where we're focused.

Donald R. Young

President, CEO & Director

Eric, I would add, I think if you just go a little higher to -- I think our feeling has never been stronger that it is inevitable that these EV producers are going to have a strategy for thermal management and to mitigate thermal runaway.

I think that is becoming crystal clear for all of them. And maybe some of them were a little slow at to want to get there, but I think that is becoming increasingly clear. The second thing I would say, and again, to reiterate what was, I think, in my script and in Ricardo's, for our 2023 doubling of revenue, we have the awarded programs necessary to -- from a PyroThin thermal barrier point of view -- to reach that target. That also assumes 10% growth in our energy industrial business as well, which we feel very positive about. And we feel we have 60% of the revenue -- EV revenue necessary to hit the 2025 tripling.

And so if you think about the programs that Ricardo referenced, the additional programs that you referenced from other OEMs, we're filling in at least to the stage 1 of this long-range plan, we're filling in that last 40%. And these come in pretty big chunks, as you can tell and when you have a design win.

And so let me just say we have multiple opportunities to fill in the remaining 40% of our 2025 target. So we have a lot of common -- and if you look back on sort of the time frame of General Motors and how that sort of played out and how we competed in the RFQs and how we had our early wins and then provided prototype parts and then ultimately, production parts.

If you think about that time frame, it was an 18-, 24-month sort of time frame. And we're sort of engaged in that process with several other OEMs right now, which is perfect for us in the sense that it's likely to come on in meaningful volumes in that 2024, 2025 time frame just as we're bringing up Phase 1 of Plant 2. So there's some good, good questions, and there's some detail for you.

Operator

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

Alexander Eugene Potter

Piper Sandler & Co., Research Division

So obviously, encouraging to see the higher-than-expected revenue on PyroThin in the quarter. I was wondering if you could dig a little deeper into that. Do you think that this reflects your customers being surprised by the amount of demand and their ability to sort of front-end load production? Or are they trying to, I don't know, stock up inventory in advance of their own launch to sort of derisk their production curve? Any sort of insight into why you think revenue is tracking ahead of plan for that particular product would be helpful.

Ricardo C. Rodriguez

Senior VP, CFO & Treasurer

I mean I think this one really seems to be just these launches, in particular, for instance, The Lyric. The Lyric, as we see it launched actually several months ahead of when even GM was planning to launch it. And so that's a good example of just GM prioritizing their EV launches as they try to meet their electrification goals.

And then, of course, having the material on hand to make the vehicles themselves. When it comes to demand for the vehicles, I think we've all seen that the new car market right now is really hurting for inventory and units to sell. And so we're seeing this right now as a sudden acceleration of revenue. And as we work with our customers here over the next quarters, we'll see how much of that truly comes in as real additional demand for the year, right?

Donald R. Young
President, CEO & Director

I think also both Ricardo and I used the phrase that these activities and what you cited, Alex, give us the momentum and the confidence to make the statement that we feel that we're positioned to meet or exceed our \$145 million to \$155 million of outlook -- revenue outlook.

I think if we knew the exact answer to your question, we might have been a little bit more aggressive in playing around with our outlook. But we feel very good about meeting and potentially exceeding just given where we are in the momentum. And as you know, it's not always the case where these new technologies come faster. I mean, normally, they come slower, right?

And so the fact that it's coming faster, I think, is definitely noteworthy. And we're working hard to be prepared to fulfill that and to be able to meet or exceed our revenue outlook for the year.

Alexander Eugene Potter
Piper Sandler & Co., Research Division

Then one other question, maybe following up on some of the others that were asked previously. Would you say that if we're talking about potential customers. Obviously, there's an ocean of different OEMs out there, and they all have different battery strategies. But there's also this handful of Tier 1 battery specialists who are trying to achieve scale and make, quote-unquote, commoditized cells. How high on the priority list would you say customers or potential customers like that are? And what are the pros and cons of aligning with somebody like that relative to something like Ultium, which is obviously more of a brand-specific or company-specific battery platform?

Ricardo C. Rodriguez
Senior VP, CFO & Treasurer

I mean when we look at the OEMs and the ones that can deliver you the steady volumes with franchise nameplates that you can rely on, we don't see a trend towards actually wanting to integrate a pack from someone else. And so instead, it's actually -- they're leaning heavily into it and replacing a lot of their internal combustion engine development with development into all of the details of the battery itself in developing a battery platform that is not just the cells, but the overall battery as a system within the broader system that is the car.

And so for us, on our products, it makes more sense to align with customers that are resourced to think that way. And really, when we look at the customers that the team is engaged with, it's really hard to be happier with the folks that we're engaged in and the level of technical depth that one is able to go into when your system-level approach is really the car and not just the battery or the cell, right?

So for us to come at this from a cell perspective or to engage more aggressively with folks who are limited to the scope of the cell, when this really is a broader system issue, doesn't make as much sense as some of the OEMs that we're engaged with.

Donald R. Young
President, CEO & Director

Yes, it's just evident to us that the automotive OEMs are owning this issue and more broadly, the strategy of their battery platform. And as you cite, Alex, they all have little twist and turns on how they think about their battery platform, but they're owning this issue.

Ricardo C. Rodriguez
Senior VP, CFO & Treasurer

The other piece that we look at is just folks access to capital, right? So the OEMs seem to have quite a bit of access to capital. And it's interesting even when we look at where are the battery experts and a lot of them really are at the OEMs at this point.

Operator

The next question comes from Jon Dorsheimer from Canaccord Genuity.

Jonathan Edward Dorsheimer

Canaccord Genuity Corp., Research Division

Excellent job in the progression year, guys. Just 2 questions and a little under the weather, so I apologize if that [indiscernible] you. But I guess, first, just on the ramp of Georgia. Can you outline some of the time lines that we should be looking at or for in terms of how to gauge that progression of that facility?

Donald R. Young

President, CEO & Director

So we've targeted our 2023 revenue at that doubling would be -- we've targeted \$240 million, and we feel our revenue capacity with our existing assets, and as we build out our fabrication capability, et cetera, is about \$250 million. So we're right up against it as we go -- work our way deep into 2023.

So we are laser focused on bringing that plant up in late 2023 and have it contribute in the early part of 2024. And so we've built a heck of a team to execute that project. And as I've said before, that team is made up not only of an outstanding Aspen strategic capital projects team, but a strong group of supporting cast and leadership, frankly, from our friends at Koch as well who are highly experienced at building this scale of a facility and other excellent resources as well.

And frankly, a very cooperative Statesboro Bullet County State Georgia folks as well who are facilitating our every move down there. So we really -- we feel we've got a strong team, and we're on track to do what we've said we're going to do, and that is to bring that facility up later in the late part of 2023.

Jonathan Edward Dorsheimer

Canaccord Genuity Corp., Research Division

And then just as a follow-up, one maybe a bit more technical, but on the silicon composite solution for the anode, you pointed out some technical details in terms of the states versus charge. I'm wondering, can you comment on dendritic growth within the battery over that? Or have you published any peer-reviewed literature or data around this? Because it seems like you're becoming more open at this point. That's just my read on it in terms of what you're doing here and it seems like a shift directionally, I guess based on the progress that you're now seeing. So I'm curious about that.

Donald R. Young

President, CEO & Director

Our commitment is to be more open on this as -- over the course of 2022. And I think I hope today was a good example of that. I'll let Keith and Ricardo comment on the more technical aspect of the question.

Keith Schilling

So thanks, Don. We haven't published something yet. Our intention obviously is to continue to work through the validation of our solution. And then obviously, we'll continue to be more forthcoming with those kind of technical details. We're working through, as you can imagine, a long list of opportunities in terms of how to continue to solve this challenge that is an opportunity in the industry.

And as Don mentioned, we'll continue to be more forthcoming in the future as those technical details are at a place where we can share them relative to our intellectual capital position. So I appreciate the question, and we'll look forward to more information there as we continue to evolve.

Operator

Our next question comes from Chip Moore from E.F. Hutton

Chip Moore

EF Hutton, Research Division

One follow-up there on battery materials. Great to see the update and the good progress. Just give us some of your comments on development and commercialization over the next, call it, 18 months or so. Maybe you can expand on how we should think about upcoming investments? I know you've talked about potential licensing efforts in the past, other efforts. Anything you can offer there?

Donald R. Young

President, CEO & Director

Keith, do you want to grab that?

Keith Schilling

Yes. So thanks, Chip. Right now, we've made some investments in all of our lab space and probably more importantly, in the human capital part of that business. As Ricardo mentioned in the prepared comments, we're expecting that expanded space and facility to be completed. We're targeting for the first half of this year. And really, our efforts have been really laser-focused on solving some of the technical challenges because as you know, they're quite daunting.

But we've made some really good progress. We've highlighted that here. And as we continue to progress towards those validation targets, I think we're seeing good results, and we'll continue to invest in that space where necessary and where it's appropriate, but we believe the investments we've included so far are necessary and meet the needs that we need today to really accelerate our program. We're done in [indiscernible].

Ricardo C. Rodriguez

Senior VP, CFO & Treasurer

And Chip, if I may add there, just to your point on the licensing versus going at this on our own. I mean, I think as Keith laid out, the opportunity is substantial here, but we definitely want to match the capital commitments with the eagerness from other folks to cooperate with us in this, and obviously, our achievement of the technical milestones that will enable commercial viability. And so we're trying to not get ahead of our skis here in funding this and committing us to processes and actually making the material at scale until commercial viability is proven, ideally with the help of some outside parties or customers. And then really fund this as efficiently as possible. And if licensing is the business model that does that more quickly and effectively, then so be it. But we'll cross that bridge when we get there.

Donald R. Young

President, CEO & Director

Yes, absolutely. We'll stay tuned. Thanks. Thank you, Chip.

Operator

Our next question comes from Chris Souther from B. Riley.

Christopher Curran Souther

B. Riley Securities, Inc., Research Division

I just wanted to get a sense of if you could provide a margin breakdown for the thermal barrier business versus the energy infrastructure business. I'd just love to get some color on the investment and ramp up fixed costs and how the sampling component is baked in on the thermal side? And how should we think about that gross margin cadence throughout the year, I think, would be helpful.

Ricardo C. Rodriguez

Senior VP, CFO & Treasurer

That's a good question, Chris. I mean, really for us, as we look at the thermal barrier side, and in our remarks, we mentioned how we feel good about the structural costs that we have there, right? So I mean when you're quoting something of this scale, you obviously don't want to let the material costs get above a certain point and then really keep your conversion costs in that 20% to 35% of sales range, right.

For us right now, really the -- I mean when you're running a \$30 million run rate operation, but have quite a bit of amount of fixed expenses and the overhead that could almost pretty much run a \$240 million operation, you operate at a negative gross margin there. And so we're working through the allocations, and you're going to see the breakdown in the Q.

But in that sense, we can expect our Energy and Industrial business to be bringing in low double-digits gross margins. While the thermal barrier side stays slightly negative in the near term, with that potentially worsening in the next quarter as we have 2 facilities running, right. We have the overhead of the Mexico facility that's getting ramped up without the revenue to show for that just yet.

But then as we mentioned in our remarks, we really are managing for 5 quarters from now when we'll have the higher volume manual processes that the team has designed along with an automated facility kicking in and just a much higher revenue run rate.

Christopher Curran Souther

B. Riley Securities, Inc., Research Division

That all makes sense. And obviously, with the PyroThin revenue well above the run rate that you previously talked about here, I just wanted to kind of clarify, it seems like you guys are taking a wait-and-see approach on overall volumes coming through, but there might have been a bit of kind of pre-shipments with the Lyric launch, et cetera. So just wanted to get a sense over the next quarter visibility, should we expect kind of a similar run rate to what we saw or some moderation for the PyroThin business as customers kind of digest what the impressive shipments you had?

Ricardo C. Rodriguez

Senior VP, CFO & Treasurer

Yes. I mean we think the current run rate is an indication of where things are looking. But again, there's quite a few factors here outside of ours or even GM's control, or Toyota's that actually getting the vehicles assembled. So for us, operating -- that's why even in my remarks, I mentioned the \$30 million run rate instead of the \$20 million run rate because we are gearing ourselves up for a much higher run rate anyway, right? So whether it's \$20 million or \$30 million, that's not the main thing that's driving our decisions. Right now, our decisions are truly based on the \$200 million to \$240 million annual run rate that we have to be ready to deliver.

And the interesting thing is that the levels of service don't really change the engagement of our quality team, our supply chain team has the same intensity whether the operation is [indiscernible].

Donald R. Young

President, CEO & Director

But when we say doubling revenue '21 to 2023 from 2021 to 2023 to \$240 million, to make the obvious statement, 2023 is just next year. We're talking about a serious ramp of this business. And that's why we're making these pre-investments. That's why we're going to have 2 facilities fabricating at the same time because we want to move to those higher volumes to more automation, to more -- better manufacturability of design, to a lower labor cost environment, et cetera.

And so we're doing that. But sometimes we have these sort of redundant activities going on. And that's what we're sort of facing here this quarter, next quarter. But let me just say that we're confident in the ramp and the communications that we're getting from General Motors and Toyota, and quite frankly, from some of the other OEMs where we're engaged very intensely right now in the quoting process.

Operator

Our next question comes from Colin Rusch from Oppenheimer.

Colin William Rusch

Oppenheimer & Co. Inc., Research Division

Can you talk about with the new anode material, the volume of cells that you guys are testing as well as the maturity of your efforts around electrolyte and separator technology at this point to support that material?

Donald R. Young

President, CEO & Director

Keith?

Keith Schilling

So thanks for the question, Colin. So in terms of -- we're really focused on the anode at this point. We have some other products -- projects in our pipeline that we're really not discussing right now, primarily around cathode materials, but not necessarily separators or others.

So I think just to focus on it, it's really more about a plug-and-play anode material, and that's really where our focus is at. And in terms of the quality performance and quantities, we're working through a pretty systematic validation program and we're handling that appropriately and at the right pace and scale. And I feel like we've been able to demonstrate good progress. And as we continue to evolve that technology and build out our platform, we'll be sharing additional details over the course of the next 18 months. But it feels like really good progress has been made by the team, and we wanted to share that here today.

Colin William Rusch

Oppenheimer & Co. Inc., Research Division

And then around input costs and pricing and marketing structure. Obviously, you guys are getting to better utilization levels on the current facility and still kind of running at breakeven margins or so. Can you talk a little bit about your interest or willingness to go to a cost-plus model? Is that something that you guys are exploring with your customers? Is that something that you guys want to do? And how many other areas are there for you guys to start driving costs down and control those -- start driving margin on top of the utilization levels.

Ricardo C. Rodriguez

Senior VP, CFO & Treasurer

Yes. I mean, on the pricing side, I mean, that's a fluid conversation that we're having with folks, particularly on the energy industrial side. And on some of the inputs, it is worth evaluating the cost plus model, which we are already mirroring with some of our inputs. Going back to your point on the cost, right? So really at this point, on the energy infrastructure side, it's really worth focusing on just getting the material side right, and then optimizing the conversion side as we make further investments that are also the same ones that are behind the increase in capacity for the facility in Rhode Island.

Then when we scale the thermal barrier side, it's really interesting because a lot of the investments that we're making to deliver the additional throughput are also going to help the way our production flows for energy industrial. Right now, energy industrial is, for example, being overly penalized every time we have to change over products in the facility in Rhode Island or with some of the extra overhead that we have managing the criticality of the operation as we're delivering to GM and Toyota.

And so as that gets better absorbed with the run rate increase, both businesses will benefit, and you're going to start seeing the improvement, particularly on the conversion side.

Operator

Our next question comes from Tom Curran with Seaport Research Partners.

Thomas Patrick Curran

Seaport Research Partners

Don, you've repeatedly emphasized the real competition between EV OEMs to own leading shares of the EV future is really a race between branded battery platforms. When you look at the customer prospects who are in Stage 3 of your commercial development funnel, the most advanced stage, how many of them have proprietary platforms or have joined the platform of Arrival such as Honda has done with GM?

And then if Toyota were to decide to use PyroThin in another EV model launch or even to adopt it for platform-wide standardization, when would you expect to see that incremental award from Toyota?

Donald R. Young
President, CEO & Director

So let me start with the first part of that. And Ricardo commented on this, I think, in a slightly different way. But our focus is on the OEMs who are having -- who are developing a unique broad-based platform for all of their models and for all of their nameplates. And that's a much more efficient relationship in some sense for us. And the entity that I would say -- maybe I should say entities that are most engaged with us from an intensity point of view, have broad-based platforms that are going to be used across multiple models.

And again, it comes in pretty big chunks of business, and it's another reason why we're building the capacity the way we're building it. I've talked about building Plant 2 in 2 phases. But during Phase 1, we're putting in the infrastructure to be able to support Phase 2, an additional \$700 million of annual revenue capacity because of the nature of the design wins, the award programs that we get. So we're principally focused on the big platforms themselves as opposed to individual models. It just makes more sense for us.

And then with Toyota, obviously, a deep relationship with Toyota. And that's a little contrary to what I was just talking about. But even with Toyota, we see them moving, if not a universal platform, a platform that will serve multiple models, multiple nameplates. And we're engaged with them in those discussions in a significant way and feel we're delivering excellent prices. We're on schedule, et cetera. We've been a good partner to them. And we think that's the best sort of advertisement, if you will, for adopting us more broadly in that nameplate.

So we believe -- Toyota is rolling out vehicles between now and 2025, many of them are in that 2023, 2024 time frame. And so we think we're in a good position to participate with those.

I just think the other part of your question is this idea of piggybacking on other people's nameplates. It takes a lot to have your own battery platform in terms of investment, and capital, and technical expertise, and scale. And it's not for the faint hearted. And so we do believe that we'll see more and more of these collaborations take place. It just makes tons of sense to do that.

Your example of Honda and GM, and even since we last spoke, we've seen additional announcements about some high-volume vehicles coming out. I believe it was in the 2025 time frame. I might have that slightly wrong, but not immediately, but in that 2025 time frame, but some high-volume GM/Honda vehicles coming out, which are going to use the Ultium battery platform.

Thomas Patrick Curran
Seaport Research Partners

And then turning to ABM. When it comes to your plug-and-play silicon carbon anode material, you've previously contemplated potentially setting a commercial target of getting that material specked into a 2023 vintage battery. Should we still think of that as sort of the key commercial milestone to look to as that first commercial breakthrough? And if so, what sort of time frame do you seem to be on track for at this point?

Donald R. Young
President, CEO & Director

And Keith, do you want to talk a little bit more about sort of the 18-month profile that you alluded to in your script?

Keith Schilling

Sure. So one of the things, just to maybe go backwards a little bit to go forward. Our first step is really validation. We are looking to ensure that we can use third-party validation of a 300 watt hour per kilogram solution that supports 80% energy density at 500 cycles. So that's kind of the near-term target in terms of metrics that we're working towards, and we believe we're on track to achieve that within the next 18 months. So it really comes down to validation first.

And then obviously, the second portion of that is our ability to do that with low variability. And in our current coin cell, if I refer back to the chart that we had shown, you can see that our cell variability, at least in the current coin cells has been at OEM type levels. So kind of 3%, which is really state-of-the-art. And so that gives us some confidence. We wanted to be below 10% variability and a 31 amp hour pouch cell using our material. And we've got some confidence that given our variability that we can continue to tune and get to a place where we can commercialize at a very commercially viable target.

So I hope that answers your question. We've got an 18-month road map, and we are well on our way with some very early and excellent results from our extremely talented team at Aspen, and we're really proud of what we're showing. We want to be open and share what we're learning as we go through this process because it's pretty exciting and meaningful in terms of our ability to service this market.

Donald R. Young

President, CEO & Director

I think that makes sense. We're very comfortable with that idea. And as we said in our last earnings call, and we'll say again here, and I think Keith has -- and I think it even goes back, I think, to Jed's question a little bit, about providing meaningful data, comparative data, third-party data, apples-to-apples data.

I think that's really our goal through the year 2022 here. And I think the logical extension of that is deeper relationships with a small handful of important companies in this space.

Thomas Patrick Curran

Seaport Research Partners

Got it. So 2022 will be a technical validation year and once you've made it past those hurdles, then you can turn to commercial targets. Understood..

Operator

The next question comes from the line of Jeff Osborne with Cowen.

Jeffrey David Osborne

Cowen and Company, LLC, Research Division

Just 2 quick ones. Don, I was wondering a lot has happened in the last 3 months since your last call. The comment you made about the awarded programs, \$1 billion through '25 and then \$2 billion beyond '26 -- is that new? Or has that changed at all in the last 3 months?

Donald R. Young

President, CEO & Director

It has changed slightly, but not significantly actually. These are obviously coming from General Motors and Toyota. And while the revenue is coming out a little faster, the awarded programs are more or less the same in terms of projected volumes out over time. So we had to think about it a little bit, but I think wallets coming at us faster. The absolute number has stayed roughly the same, I think, is a good way of thinking about it.

Jeffrey David Osborne

Cowen and Company, LLC, Research Division

Got it. That's helpful. And then the follow-up I had is just is there anything that you're monitoring and would encourage investors to monitor over the next 12 to 18 months on the policy side as the U.S. or

Europe might consider adopting the Chinese rules around safety or something possibly more stringent. And the potential policy -- sorry for the follow-up -- but does the potential policy changes, change the way OEMs are approaching you folks?

Donald R. Young
President, CEO & Director

I did talk a little bit about -- I believe it was Eric's question, sort of the inevitability of these battery platform, these automotive OEMs having a thermal management and a strategy to mitigate thermal runaway. And I think that's sort of twofold.

The reason I used the word inevitable, I think it's twofold. One is you just -- we think a catastrophic event for any brand, it really impairs the entire industry and the entire megatrend. And we think that there will be internal reasons for the industry to have these strategies, these thermal management strategies, one.

And the second one, and I do -- I put this second because I think it's second most important is that there will be -- I think there is an inevitability also that we'll see policy across Asia, across Europe and here in the United States that will put some baseline requirements on these companies when it comes to protecting -- battery safety let's call it. I just think for those 2 reasons, you're going to see all of these companies execute on the strategy here around thermal runaway.

Ricardo C. Rodriguez
Senior VP, CFO & Treasurer

Yes. In many ways, it goes back to this whole notion of are you system-oriented or are you component-oriented right? And we see the industry recently just in this effort of getting batteries to this \$100 per kilowatt hour milestone, there's been a lot of focus on performance, right?

But when one actually steps back and looks at it from the broader system that is a car parked next to a house that's when safety really becomes critical. And we're starting to see more and more OEMs take that broader system and user level approach versus focusing on the performance of specific components.

Donald R. Young
President, CEO & Director

I think, Jeff, and just I mean just going to brand is so critical to -- I mean, they're investing billions of dollars, tens of billions of dollars, and we know how fragile brand can be and how few catastrophic events would need to take place for any one of those brands to wipe out those billions of dollars of investment. And so again, for so many reasons, there is an inevitability to getting one's arms around this issue. And we do have a solution.

Operator

[Operator Instructions] Our next question comes from Amit Dayal from H.C. Wainwright.

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

Just a few more questions from me. If you were to exceed guidance, Don, for this year, would that come from the energy infrastructure business or from the EV side?

Donald R. Young
President, CEO & Director

Ricardo in his comments said that we're seeing acceleration of business in both of our principal markets. And I think that's absolutely right. Yes, we cited that it's \$7.6 million of EV thermal barrier revenue in Q1 exceeded our internal thoughts that we put in place coming into the year, for sure. But we're seeing a significant amount of activity in the energy industrial business as well. And it's really a function of pent-up demand coming out of the pandemic. High energy prices always spark activity.

And then -- and this is partly driven geopolitically, but the LNG activity, it's hard to imagine a more active moment in time for that business in all 3 of the major regions as well. So we're really excited about our energy industrial business right now. And so again, to answer your question on outlook, it would be a broad-based set of reasons why we would ultimately increase the outlook. But today, we're very comfortable saying that we're confident that we'll meet or beat it.

Amit Dayal

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

Okay. And just one more. Are you already pursuing applications outside the EV space for the thermal barrier product? Or is it too early? I mean you don't have enough bandwidth right now to pursue those types of customers?

Donald R. Young

President, CEO & Director

We're swimming as fast as we can right now with everything we've got on our plate, to be honest with you. And I would say that we are -- all of our focus around these thermal barriers today is in converting additional prototype work, additional quoting activity into awarded programs. And that just makes all the difference in the world for us.

And if we can get 1 or 2 more of these, then we can start talking about not having 60% of our 2025 target accounted for with existing awards, but 70%, 80%, 90% or 100%. And that puts us in a very, very strong position through Stage 1 of this long-range plan. And as Ricardo pointed out, puts us in a very solid cash position, cash flow position and self-sustaining and really monetizing these investments that we're making today over the course of the next 4 or 5 quarters, we think, in a very attractive way.

Operator

Those are all the questions we have for today. I'll now turn the call back to Mr. Young for concluding remarks.

Donald R. Young

President, CEO & Director

Thank you, Emily. We appreciate everyone's interest in Aspen Aerogels, and we look forward to reporting our second quarter 2022 results in late July. Be well. Have a good day. Thank you very much.

Operator

Thank you, everyone, for joining us today. This concludes our call. You may now disconnect your lines.

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