

Enovix: TJ Rodgers Can't Save this Overhyped Battery Technology

- Enovix claims that its 100% silicon anode battery technology can uniquely solve the most salient problem facing the world's electrification ambitions: battery capacity. Bulls are confident that billionaire TJ Rodgers' involvement in Enovix's management shakeup and manufacturing scale-up ensures a successful outcome.
- Rodgers is playing with proverbial house money. He personally invested just \$15M into Enovix, then very conveniently benefited from his own SPAC (Rodgers Silicon Valley Acquisition Corp, which traded under the ticker RSVA) acquiring it at more than 10x that valuation. Coupled with his sponsor shares, Rodgers is up 10x to 20x on his initial investment so his interests are very different than those of Enovix shareholders.
- An exhaustive analysis of Enovix's filings turns up the likelihood that early board member Greg Reichow, a partner at Eclipse Ventures, was also on both the target and acquirer sides of the Enovix acquisition and that Eclipse similarly made more than 10x its investments in less than a year.
- Why does this matter? Because it appears that Enovix is a classic case of SPAC financial engineering whereby insiders create immense wealth out of thin air in buying a low value asset that garnered little interest elsewhere. Prior to the acquisition, Enovix was a distressed asset with Rodgers as a major investor. By buying the company with his own SPAC, Rodgers turned an otherwise failed investment into a massive multibagger
- Enovix's battery innovation is not that innovative, relying on a brute force mechanical "solution" and constraining the physical expansion of silicon anode by forcing it into a small stainless steel box.
- The relative capacity "advantage" of Enovix's battery technology, *by its own admission*, decreases exponentially with the size of the battery, starting at 2x for wearables, decreasing to 1.25x for a laptop battery, and actually operating at a significant weight *disadvantage* for EV-sized batteries.
- Even in wearables, current competitors have been able to reduce Enovix's theoretical 2x advantage to one that on the order of 15-20%, which would make it impossible for Enovix to charge a significant markup on its batteries if it could ever find a way to manufacture them efficiently.
- While Enovix likes to make believe it has the pole position in silicon-anode technology, it turns out that the competition is intense with dozens of players, including the incumbent lithium ion battery giants. Enovix faces about a dozen companies with larger and more impressive intellectual property portfolios as well as actual signed agreements with global OEMs.
- The best Enovix can hope for is to fight for a share of the already-crowded market for small Li batteries in devices like wearables and mobile phones, where the most successful companies earn razor-thin margins and trade at low valuations, and where

Disclosure: The writers of this report are short ENVX and profit if the price of ENVX shares declines. We may transact in ENVX shares at any time. We are biased, so do your own research or consult a financial advisor.

explosive growth inevitably leads to spectacular blowups resulting from customer leverage.

- All of the above assumes that Enovix can successfully manufacture its own technology efficiently at scale, but there's no evidence that it can.
- In its 2021 SPAC acquisition presentation, Enovix guided to mass production of its batteries and hundreds of millions of dollars of revenue in 2023. Instead the manufacturing line that Enovix was building to accomplish that goal is now expected to *peak* at a total of \$1 *million* in revenue, a shortfall of over 99%.
- In January, Rodgers reset expectations and guided to a new manufacturing facility in Asia that would mass-produce Enovix's batteries come **2025**. But Enovix management has already pushed out the manufacturing guidance, sounding more than a bit uncertain about both demand for their product and the capabilities of their planned facility.
- Management's recent guidance on the manufacturing precision and tolerances necessary for large scale production contradict both Rodgers' January pronouncements and former employees' assessments, which doesn't inspire much confidence in their ability to get this done, even in 2025.
- Enovix had originally published targets for battery capacity improvements using its silicon anode technology, but it recently sprang on investors new interim targets that are much further out than originally guided to. That suggests that their ability to improve upon their theoretical advantages is illusory and they'll struggle to keep up with the continuous advances of competitors.
- Every day that goes by, Enovix falls farther behind in that race with competitors and they now expect investors to give them the benefit of the doubt for the next 18 months without much in the way of verifying whether it's even possible to mass-produce their technology. The odds are slim.

Background and Bull Case: Guided by Proven Winner TJ Rodgers, Enovix is Disrupting Batteries with its Technology and will be a Huge Winner of Mass Electrification

Enovix is a high-density lithium battery company focused on one very narrow solution to the very large-scale problem of energy storage: 100% silicon-anode lithium batteries. The idea is to replace the graphite anode in traditional lithium-ion (Li) batteries with higher capacity silicon, a material that also happens to be abundant and widely available. The physical properties of silicon – its “specific capacity” to be exact – theoretically allow for over 2x the energy storage of graphite in the context of a lithium battery, but they also introduce some problems: in the process of the charge and discharge cycle, silicon physically expands and contracts pretty dramatically, which degrades the silicon's energy storage capacity over time and also makes it very difficult to package.

The bullish case for Enovix is simple: Enovix has figured out how to “tame” silicon, exploiting its specific capacity advantage while “solving” the problems that have plagued the attempts at siliconizing the battery anode.

Enovix investors are also really excited about the involvement of TJ Rodgers. The billionaire scientist entrepreneur is most famous for successfully building Cypress Semiconductor over the course of 40 years and selling it to Infineon in 2019. He’s also well known for his successful involvement in SunPower, the turnaround at Enphase Energy, and his investments in other technology startups. Rodgers was one of the early investors in Enovix and has been its board chairman since the company went public via SPAC in 2021. When Enovix’s manufacturing troubles became too big to ignore late last year, Rodgers was appointed Executive Chairman and committed to “spend whatever time is required at Enovix to ensure the company’s operational success.”

Rodgers is making promises we don’t think he can keep. We also think Rodgers’ involvement is far more shady than investors understand. To us, Enovix is a classic SPAC scam, and Rodgers is its chief architect – he’s simply yet another SPAC sponsor that acquired an unpromising business failure with his SPAC to reap more than \$50m of profits from his sponsor shares. Yet in the case of Rodgers Silicon Valley Acquisition Corporation acquiring Enovix, the financial engineering is even more absurd than the typical SPAC playbook of acquiring a pig, applying a heavy layer of lipstick, and then foisting the dressed up shares onto unsophisticated retail investors while reaping a windfall from the sponsor shares. With Enovix, Rodgers also was a major investor in the private company prior to the SPAC merger, accumulating significant holdings in private Enovix less than a year before beginning the merger process between his SPAC and its ultimate merger target Enovix. Naturally, he acquired his ownership interests in private Enovix at valuations far far lower than the valuation his SPAC would acquire Enovix at, thus reaping monster profits when the publicly traded Enovix shares began trading at a public market valuation north of a billion dollars. Specifically, Rodgers made more than \$150m of profits on his Enovix holdings when the SPAC merger closed (and that’s assuming only a SPAC price of \$10, which in actuality is lower than the ENVX price upon the deal closure, lower than ENVX shares today, and far lower than the peak valuation ENVX reached in 2021).

Underlying this \$200m of wealth generation for Rodgers is a zero revenue battery company with an unviable technology, as we’ll explain in this report. The laundry list of challenges at Enovix are immense. Just to name a few:

- Its technology isn't competitive
- The increase in battery capacity it provides isn't very much
- It hasn't been able to figure out a way to manufacture its batteries successfully because its unusual and unproven stacking methodology requires highly customized and costly machines
- Even with highly customized and costly machines, it's completely unclear whether the batteries can be manufactured at scale, and whether a high enough percentage of the manufactured batteries would be fully functional

- Its battery technology can never be viable for electric vehicles
- The consumer battery market is ultra competitive, and even the winners, which Enovix won't be, suffer from terrible margins and low valuation multiples on their consumer battery business
- Its "brakeflow" technology to address thermal runaway is a silly stock promotion gambit

It's no coincidence that Enovix couldn't attract brand name venture capital investors during its capital raises in 2018, 2019 and 2020, the years preceding the SPAC merger. Sophisticated Silicon Valley investors likely realized pretty quickly that Enovix's business prospects were dire.

Today, no billionaire hero can address the fundamental problems at Enovix. But to us, Rodgers is hardly a hero at all – he's just another opportunist who took advantage of the SPAC bubble to enrich himself off of a failed lab experiment. If you're invested in Enovix because of Rodgers, spend some time understanding the history of how Enovix came to be, how Rodgers' involvement unfolded, and how the SPAC acquisition was structured. Then ask yourself whether the SPAC merger was just a ploy to engineer hundreds of millions of dollars of wealth from his previously failed venture investment, as opposed to a SPAC acquisition guided by an actual bona fide hunt for a truly promising technology with a bright future.

What's the Market Valuing ENVX at?

Below is the capital structure of Enovix.

(\$mms)	
<u>Valuation</u>	
Stock Price (as of 6/6/23)	\$13.11
Shares Outstanding ⁽¹⁾	158.2
Shares from RSUs ⁽²⁾	9.7
Shares from Stock Options ⁽³⁾	1.4
Shares from Warrants ⁽⁴⁾	<u>0.7</u>
Fully Diluted Shares Out.	170.0
Market Capitalization	2,228.5
Cash ⁽⁵⁾	442.2
3% Convertible Notes due 2028 ⁽⁶⁾	<u>172.5</u>
Enterprise Value	1,958.9

(1) 10-Q for quarter ending 3/31/23

(2) Includes 9,687,254 restricted stock units outstanding.

(3) 4,608,824 stock options outstanding at weighted avg stock price of \$9.12.

(4) 6m warrants outstanding at \$11.50 exercise price.

(5) Assumes \$293.8m cash as of quarter end and \$148.4m in proceeds as disclosed in 8-K filed 4-26-23 (also discussed in Note 12 of 10Q for period ending 3/31/23).

(6) Convertible notes, disclosed in Note 12 of 10Q for period ending 3/31/23.

The market is currently valuing Enovix at a \$2b market capitalization. While the company had \$294M of cash as of the most recent quarter end, Enovix has no revenue and is burning capital to pay its staff and build out its manufacturing capabilities. Cash flow from operations less capital expenditures were -\$29M, -\$26M, -\$37M, and -\$25M in each of the past four quarters. Therefore, its current cash balance will be dwindling with each passing quarter. The company also continues to dilute shareholders via stock options, with stock based compensation at \$29.2M in the most recent quarter, and \$8M-\$9M in each of the prior three quarters.

As we argue throughout this report, the company is nowhere close to being worth \$2B. We don't think it's worth anything at all – its technology is not competitive and its manufacturing will never scale to be a viable player. But while niche investors in smallcap U.S. battery startups can argue over whether there's enough option value in Enovix to capture perhaps a couple hundred million dollar valuation, the idea that this business should be valued at \$2B, or anywhere close to its current range, is utterly ridiculous.

TJ Rodgers is Deep in the Money on his Enovix Bet and his Interests are Very Different than those of Shareholders

TJ Rodgers' involvement with Enovix began in [2007](#) when he was still leading Cypress Semiconductor. Since then, a lot of money has been sunk into the cash-consuming enterprise. Below, we break out 4 timelines relevant to Rodgers' involvement with Enovix and the SPAC acquisition he engineered.

The Cypress timeline:

- Between 2012 and 2017, Cypress Semiconductor – the company founded and de facto controlled by TJ Rodgers – invested \$85.1M into Enovix.¹
- Rodgers began his involvement with Enovix in 2007 through Cypress and served on the Enovix board following Cypress's 2012 investment.
- In its 2017 annual report, Cypress disclosed that in Q4 of 2017, it determined that its investment in Enovix - which was most recently topped up with a \$5.6M injection in Q1 of that year - was other than temporarily impaired, and it wrote down the investment to 0. In its 2018 SEC disclosures, Cypress characterized Enovix in our opinion as essentially a failed investment. At year-end 2017, Cypress owned 41.2% of Enovix, carried at 0 on its books.

¹ Cypress 10-Ks for 2013, 2014, 2015, 2016, 2017 and 2018. Prior to 2017, Enovix is referred to as a "battery" company in the Cypress annual reports and not mentioned by name.

- By the end of 2018, Cypress's stake in Enovix had shrunk to 24.8%, reflecting further dilution as a result of capital-raising over the course of 2018. Similarly, at the end of 2019, Cypress's stake was reduced to 23.2%, presumably due to Enovix's capital-raising and dilution.
- As of Cypress's final financial filing before its being acquired by Infineon in April of 2020, Cypress owned 23.2% of Enovix, and Sam Geha, the company's Executive VP of Memory Products, was also an Enovix board member.
- In the last few months of 2020, Infineon disclosed that it sold its Enovix stake for 13M Euros.² We believe this sale was to Rodgers' friend, former colleague and adviser to his SPAC, Gregory Reichow (though not to Reichow personally, but to the venture capital firm he was working for).

The Rodgers timeline:

- While Cypress marks down its Enovix investment to zero in late 2017, Enovix continues to raise money to survive. In 2018, Enovix raises \$23.4M by selling 82.2M shares of Series F Preferred Stock at 28.5c/share³. These are convertible to shares of common stock. Of the 82.2M shares sold, Rodgers' trust buys 26.9M of the shares for \$7.7M. Based on the dilution disclosed by Cypress – from 41.2% to 24.8% – the Series F raise gave the new shareholders just about 40% of the company, implying a valuation of just about \$60M.
- In 2019, Enovix raises a total of \$5.8M, 98% of which comes in the form of a convertible note. Rodgers provides \$5M of that note.
- Between March and November of 2020, Enovix raises \$65.5M by selling 151.6M shares of Series P-2 Preferred Stock for 43.2c/share. It also converts the 2019 note to Series P-2 shares. The total number of P-2 shares issued is 170.6M. These will convert into 1 share of common stock each. Rodgers' \$5M portion of the 2019 note is converted to 16.6M Series P-2 shares, and Rodgers also invests an additional \$3.1M in the 2020 raise, bringing his total P-2 share ownership to 23.8M. The math here works out to about 40% dilution to prior shareholders⁴ and a total company valuation of \$175M⁵.

² In Infineon's 2020 annual report, Enovix is listed as a subsidiary while in its 2021 annual report, Enovix is not, indicating that Enovix was sold in fiscal year 2021. Infineon's fiscal year ends on September 30. In its Half-Year 2021 report, "Proceeds from sales of businesses and interests in subsidiaries, net of cash disbursed" was 13M Euros and in note 10 ("Additional disclosures on financial instruments"), Infineon discloses that this proceed was "relate[d] to the sale of an investment acquired in the course of the acquisition of Cypress". Infineon also realized a gain of 13M Euros upon the sale, since Enovix was previously marked at zero.

³ This and other capital raises discussed in this section are disclosed in the myriad registration statements filed throughout 2021 by Rodgers Silicon Valley Acquisition Corp. and Enovix Corp, such as the [S-4 filed May 10, 2021](#) or the [S-1 filed August 2, 2021](#).

⁴ On page F-46 of S-1 filed August 2, 2021, the company has 94M shares and 324M of convertible preferred stock, which are convertible to 328m of common stock, implying a total of 422M of common shares. The 171M of P-2 shares represent 40% of that 422M share figure.

⁵ The company issued \$65.5M of Series P-2 shares and converted \$5.7m of promissory notes to P-2 shares, for a total capital infusion of \$71.2M. With P-2 shares representing 40% of total shares, that equates to the P-2 share raise implying a \$175M valuation for Enovix. This valuation figure is inexact for a variety of reasons, including the

- After adjusting for internal stock option exercise at Enovix, Rodgers' 50.6M preferred shares are about 12% of Enovix equity and worth about \$20M (assuming the \$175M valuation implied by the P-2 raise). At this point, Infineon's ownership stake is very slightly above that.

The Eclipse timeline:

- As part of the 2020 Series P-2 financing, Enovix raised \$5.8M from a firm called Eclipse Ventures, a Palo Alto-based venture capital firm. The Partner overseeing the investment is Greg Reichow, and Eclipse's fund got 13.4M Series P-2 preferred shares, equivalent to just about 3% of the total company at the time.
- Reichow was at Cypress Semiconductor from 1993-2003 while Rodgers was CEO of Cypress. Reichow was then an executive from 2003 to 2011 at SunPower, which Cypress purchased a majority stake in beginning in 2002. Rodgers was chairman of SunPower from 2002 to 2011. Reichow was also a member of the Technical Advisory Board of Rodgers Silicon Valley Acquisition Corp, the Rodgers SPAC that acquired Enovix. Suffice it to say, Rodgers and Reichow are probably good pals.
- At the time of the SPAC merger, Eclipse's ownership stake in Enovix was listed as 12.1%⁶, which implies a pre-SPAC ownership stake of about 17% (adjusted for the 72% of the public Enovix that ended up in legacy shareholders' hands).
- On December 1, 2020, Enovix published a press release stating that "Eclipse Ventures has made a significant investment in Enovix Corporation, and Eclipse Partner Greg Reichow has joined the Enovix board of directors." This timeframe just so happens to be around when Infineon sold its approximately 12% stake. We are virtually certain that Eclipse acquired Infineon's stake, along with perhaps some other selling shareholders in the private market, resulting in an approximate 17% position in Enovix pre-SPAC.
- In late 2020 and early 2021, Reichow was simultaneously (i) a board member and significant shareholder of private Enovix, actively accumulating an ownership stake and (ii) a member of the Technical Advisory Board of RSVAC who actively participated in the search for acquisition targets for RSVAC

The SPAC (Rodgers Silicon Valley Acquisition Corp – RSVAC) timeline:

- In October 2020, RSVA files its draft registration statement. It begins trading December 2, 2020 with the ticker RSVAU. On December 3, 2020, Rodgers and representatives of RSVAC arrange an "introductory" meeting with Enovix. On 2/22/21, RSVAC announces that it's buying Enovix.

30% discount in the promissory note conversion; nuances in the terms of the other preferred shares; outstanding warrants; and numerous other reasons. Depending on the assumptions used, the P-2 capital raise more broadly implied a valuation range of \$150M-\$250M, but for the purposes of our discussion in the remainder of the report, we use the above methodology discussed and refer to an implied valuation of \$175M for the P-2 raise. Regardless of what methodology one uses, the \$150m-\$250m valuation range during the March-November 2020 Series P-2 raise is a fraction of the \$1b+ valuation the company receives during the SPAC merger in 2021, and the \$2b valuation implied by today's Enovix share price.

⁶ Principal Stockholders, page 92, [S-1 filed August 2, 2021](#).

- RSVAC was sponsored by Rodgers Capital, an investment vehicle owned by Rodgers, and Rodgers was also the chairman and CEO of RSVAC. As a benefit of sponsorship, Rodgers Capital, LLC acquired 5.75M shares of RSVAC for \$25,000, or \$0.00435 per share. Rodgers Capital was therefore a 20% owner of RSVAC.
- Interestingly, in its list of independent directors, the 2020 RSVAC draft registration lists none other than... Greg Reichow. The same partner at Eclipse Ventures that has ostensibly already made a \$5.8M investment in Enovix for an approximate 3% stake and who will, in less than 2 months, invest another \$15M to acquire another 12-14% stake **while joining the Enovix board**. Literally the day after the Enovix press release that announces Eclipse's investment and Reichow's appointment to the board, RSVAC files a prospectus supplement that lists Reichow as "Our Advisor" right before explaining the SPAC's target selection criteria. Coincidentally, less than 3 months later, the target will have turned out to be...Enovix!
- To us, it sure seems like Reichow was so confident that RSVAC would acquire Enovix that he was going door to door convincing private Enovix shareholders and preferred holders to sell him stakes that would soon revalue many times higher when Enovix was taken public through Rodgers' SPAC, which he was a director of.

Just to summarize here: TJ Rodgers, the billionaire that Enovix investors believe will bring them to the battery promised land, first directed \$85M of investment in Enovix through Cypress Semiconductor, which ended up writing that stake down to zero in 2017. While Enovix is being marked at zero on Cypress's books, Rodgers invested \$15M on the side *personally* into Enovix in 2018, 2019 and 2020 at valuations ranging from \$60M to \$175M. By late 2020, Enovix's Series P-2 capital raise implied a valuation of about \$175M for Enovix, valuing Rodgers' stake at about \$20M. Literally as this capital raise is occurring, Rodgers sponsors a black-check acquisition company that, within 3 months of inception, acquires Enovix at a market capitalization of \$1.5 BILLION⁷! The legacy Enovix shareholders – who just a few months earlier owned an illiquid cash-burning machine valued at \$175M now owned 72% – or \$1.1B – of the liquid public company. Oh, and Rodgers – being on both the SPAC sponsor side and the Enovix shareholder side – ended up with a 23M share position that was worth \$230M at the \$10 SPAC price. Pretty neat trick considering he only put \$15M down! SPAC magic!

Enovix's legion of fintwit promoters would like you to believe that TJ Rodgers, a successful and wealthy businessman, scoured the investment landscape in 2020 until he found a promising technology disruptor with a wonderful underlying business that he could turn into the next Cypress or Enphase. Hardly. The truth, in our opinion, is far more sinister. Fifteen years ago, in 2007, TJ Rodgers invested in the Enovix battery startup through Cypress, making a bet that three former IBM engineers would be able to develop a disruptive leader in battery technology. Five years after that, in 2012, Cypress joined the Enovix board and increased its bet. But by 2017, it had become apparent that Enovix hadn't become quite the promising investment Rodgers

⁷ Based on share count of 145,245,628 upon closing, disclosed in registration documents such as S1 dated August 2, 2021 and \$10 SPAC share price. Note that as of July 14, 2021, the date of the SPAC close, shares traded at \$20.36, implying a market capitalization of \$3.0 billion.

originally thought; Cypress wrote the investment down to zero; and Enovix failed to attract brand name venture capital. During the greatest tech bubble in American history, when massive VC firms in Silicon Valley flush with cash were showering the stupidest ideas with billions of dollars, Enovix couldn't entice brand name firms. This isn't surprising though, since the consumer battery industry is a highly competitive sector dominated by Asian behemoths, and Enovix's technology and business aspirations have never been remotely competitive. Incidentally, we're amused at the fact that the largest holder of private Enovix preferred stock raised during its 2018 and 2020 capital raises, outside of Rodgers and his co-worker Reichow, wasn't a Silicon Valley VC firm – it was York Distressed Asset Fund III, L.P., the distressed investor arm of a New York hedge fund.

The following table summarizes the participation in the foregoing transactions by Legacy Enovix's directors, executive officers, and holders of more than 5% of any class of Legacy Enovix's capital stock as of the date of such transactions:

<u>Name of Stockholder</u>	<u>Shares of Legacy Enovix Series F Preferred Stock</u>	<u>Shares of Legacy Enovix Series P-2 Preferred Stock</u>	<u>Aggregate Purchase Price</u>
Rodgers Massey Revocable Living Trust dtd 4/4/11 ⁽¹⁾	26,877,192	23,761,025	15,740,327
Michael John Petrick Revocable Trust, as amended ⁽²⁾	5,511,648	1,987,571	2,276,443
Harold and Margaret Rust Family Trust UTD May 15, 1996 ⁽³⁾	—	196,334	59,330
Ashok Lahiri ⁽⁴⁾	—	196,334	59,330
Eclipse Fund III, L.P. ⁽⁵⁾	—	13,434,650	5,799,725
DPIP Enovix Series	8,542,957	4,432,036	4,348,048

Source: ENVX S1, August 2, 2021. Series F and Series P-2 holders would ultimately own 66% of the company prior to the SPAC transaction.

Rodgers' SPAC didn't take public a promising Silicon Valley high flyer – it took public a distressed asset. As further evidence of the distressed nature of Enovix prior to going public, here is the disclosure from the Cypress 10-K on why it wrote down its Enovix investment.

Enovix Corporation

In 2017, the Company completed its investment commitment in Enovix of \$85.1 million per the original agreement dated February 22, 2012. Certain third-party investors made additional investments in Enovix in 2018, as a result of which the Company's ownership in Enovix decreased from 41.2% as of December 31, 2017 to 24.8% as of December 30, 2018.

During the fourth quarter of fiscal 2017, the Company determined that its investment in Enovix, which is accounted for as an equity method investment, was other-than temporarily impaired as it did not achieve certain key planned product development milestones. The Company considered various factors in determining whether to recognize an impairment charge, including the expectations of the investee's future cash flows and capital needs, the length of time the investee has been in a loss position, the ability to achieve milestones, and the near-term prospect of the investee and its exit strategy. Enovix's estimated enterprise value is sensitive to its ability to achieve these milestones. Consequently, the Company recognized a charge of \$51.2 million in order to write down the carrying amount of the investment to zero. This amount was recorded in "Share in net loss and impairment of equity method investees" in the Consolidated Statements of Operations.

Source: Cypress Semiconductor 10k 12-31-18

That sure sounds like a distressed asset to us. Indeed, from our vantage point, more than a decade after Rodgers first heard of the company, as the late 2010s approached, his patchwork of Enovix investments looked destined for the dustbin. But then Rodgers came up with a stroke of financial engineering that could save him from this mess. With his new SPAC, he could acquire Enovix during the peak of the SPAC bubble, slap on a billion-dollar valuation, and foist the worthless company on unsophisticated retail investors. Suddenly, his previously bleak-looking Enovix investments would get valued 10x higher. Plus, the 5.75 million founder shares

he'd purchased for \$25,000 during his SPAC's launch would become massively in the money. Given that he was a primary shareholder in Enovix, and the lead decision maker of his namesake SPAC, consummating a merger between RSVAC and Enovix was basically a sure thing.

By our math, Rodgers put \$15M into Enovix from 2018 to 2020. He also put \$6,025,000 into his SPAC, purchasing 5.75M shares and 6m private placement warrants during the SPAC launch. When Enovix completed its SPAC transaction on July 14, 2021, Rodgers owned 15.8% of shares⁸. Assuming a \$10 SPAC price, that equated to \$229M (at the July 14, 2021 share price of \$20.36, his stake was worth \$466M), and that doesn't include any value for Rodgers' 6M private placement warrants. So Rodgers made more than about 10x his money in this masterpiece of financial engineering. Underlying all of this "value creation" is a battery company with zero revenue, and a technology and go-to-market strategy that makes little sense in the context of the global battery sector competitive landscape.

Purely based on Enovix's prior capital raising history, the idea that Enovix was worth more than a billion dollars when it went public was absurd. For years, in the midst of a massive venture capital boom, Enovix couldn't attract a brand name VC firm to hand over even \$10M of capital at a \$60M to \$175M valuation range. And yet suddenly, Enovix was worth a billion dollars? Today, with little more than a long list of operational disappointments in its two years as a public company, the market is still valuing Enovix at close to \$2B. We think this is mainly because a motley crew of very active stock promoters have been aggressively pumping the story to retail investors.

By the way, going back to the timeline of financial engineering from 2018-2021, what about Infineon shareholders? Did anyone tell Infineon that their stake in Enovix was worth – at the time they sold it – closer to \$20M and not the \$13M at which they sold it? Did anyone at Infineon know about the Series P-2 capital raise that was happening over the course of 2020? Did Infineon have any clue that the guy who bought it from them – Greg Reichow – was simultaneously involved in a potential SPAC acquisition of the company that could potentially render the Enovix stake worth 10x Infineon's sales price?

What about Reichow and Eclipse? Reichow, like Rodgers, was also playing on both sides of the ball. At some point in 2020 before November, Reichow invested in Enovix at the P-2 \$175M valuation. He joined the RSVAC board in October. Then, in November, while on RSVAC's board, he bought Infineon's stake for... less than what the P-2 raise implied it was worth. Did Infineon know that Reichow was simultaneously engaged in an Enovix investment that valued its stake at 50% more than the \$13M it ended up receiving? After investing something like \$16-20M for a 17% stake in Enovix, Eclipse's stake was revalued – just a few months later through the SPAC acquisition – to... \$175M. Reichow turned the same neat trick as Rodgers, though without receiving any sponsor shares. On the other hand, he did 10x Eclipse's investment in less than 6 months. Eclipse has also wasted no time getting rid of their Enovix investment and has already sold about 60% of it at prices much higher than where the stock currently trades.

⁸ Principal Stockholders, page 92, [S-1 filed August 2, 2021](#).

All of these transactions are disclosed in the relevant Enovix [merger proxy](#) and [registration filing](#). The “Business Combination Proposal” section of the merger proxy, which details the background to the RSVAC acquisition of Enovix, reads almost comically when you consider the background transactions made by Cypress, Rodgers, and Reichow/Eclipse. Rodgers, for example, “was able to arrange an introductory meeting with Enovix” on December 3, 2020 – the day after the SPAC’s IPO! By December 9th, of the half dozen companies the SPAC was considering acquiring, “Enovix [remained] as one on the top of the list, while others were either lowered in priority or considered non-feasible targets.” Enovix’s cash-burn situation was so dire that even after raising \$65M in the P-2 round, the company still needed a \$15M bridge loan from Rodgers in May of 2021 to take them through the acquisition closing. It’s hard to imagine Rodgers and Reichow ponying up \$30M combined for a company that was going to burn it within a year unless they had some idea that a SPAC acquisition was potentially waiting in the wings.

Enovix investors also really need to know that TJ Rodgers’ interests are currently very different than theirs. Rodgers is in for approximately \$20M and the fact that his shares are currently worth \$300M means that he’s well in the money, and sitting on \$280M+ of profit. We don’t believe Enovix is worth anywhere near where it currently trades, and we are not surprised that Reichow has aggressively sold down his Eclipse stake. Rodgers and Reichow paid less than a tenth of the current value, and they probably don’t expect the suckers who are going to be left holding the bag to comb through the filings and piece together the underlying story. But if you’re a shareholder and you’re reading this, think about whether this fact pattern is reassuring.

Enovix’s “Innovation” is Just a Brute Force Physical Reconstruction of a Battery

Aside from “betting on the jockey” in the form of TJ Rodgers, Enovix shareholders are betting that Enovix will be the key to “solving” batteries where the problem is defined as cracking the energy density puzzle, or “how can we get the same size battery to last longer, preferably a lot longer?” The urgency of the problem is obviously most acute for the electric vehicle (EV) use-case because that’s the use-case where the current space and weight constraints have directly impacted a vehicle’s maximum range without recharging.

How does Enovix’s technology address the problem of energy density? In a word, “rearchitecturing.” Whereas “legacy” Li batteries wind the graphite anode in a “jelly roll” inside the battery, Enovix packs the silicon anode (which can store up to 2x the energy) in thin slices within a stainless steel package. The strength of that package constrains the silicon, keeping it from expanding and degrading over the course of numerous charge-discharge cycles.

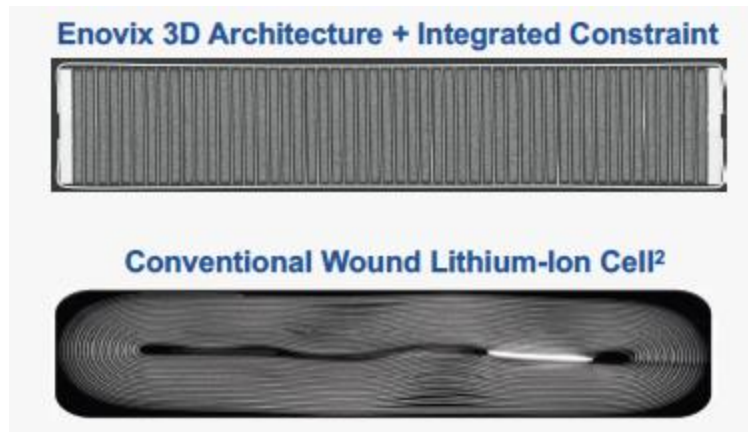


Figure 1 - Enovix Constrained Battery vs Legacy Jelly Roll Anode

This physical rearrangement of the anode inside the battery, along with the strong and durable packaging, is basically what Enovix brings to the electrification table. No new battery chemistries and no original materials, just a brute force physical rearrangement and herculean packaging strength. In other words, Enovix's "solution" *is not very innovative*. Enovix dresses this up by labeling it a "3D cell architecture" and boasting of its patent portfolio (the 45 and 96 US and foreign patents, respectively, look meager compared to the mass of thousands of patents owned by its giant Japanese, Korean, and Chinese competitors). All Enovix has is a packaging idea for a battery.

Enovix's Theoretical Advantage Declines Exponentially with Battery Size and is Comically Overstated

Is it possible that such a *simple* solution to mass electrification exists and that Enovix found it? The answer here is an emphatic NO. Aside from the fact that this packaging solution has yet to prove manufacturable even in its most basic and miniaturized form (more on that later), its energy density advantage relative to legacy Li batteries actually *declines exponentially* as the size of the battery increases. This is just basic math – though energy density increases with size, the energy density of graphite-anode Li batteries increases much more dramatically, shrinking the silicon anode's relative edge. What this means is that Enovix's theoretical value proposition goes from great in something like earbuds to good in something like a cell phone to okay in a laptop battery to non-existent for an EV.

Enovix has never really denied this. From the first presentations it gave, the "Enovix Benefits" slide has consistently looked something like this:

Enovix Battery Benefits¹ In Currently Available Products

Added features often more critical than added battery life

	Garmin Fenix 6X	Bose Frames	Motorola Radio	Motorola Razr Phone	Dell XPS 13
Product					
Current Capacity	450 mAh	110 mAh	3,400 mAh	2,510 mAh	3,520 mAh
Enovix EX-1 Capacity	797 mAh	256 mAh	7,122 mAh	3,996 mAh ²	4,455 mAh
Capacity Increase	1.77x	2.33x	2.10x	1.59x	1.27x
End User Benefit	Adds 16 days to battery life	Extends streaming music battery life to 8 hours	Doubles battery life, reduces size, ruggedizes	Replaces two batteries with one Enovix battery	Supports "Always on, all day battery life" ³

¹Calculated improvement based on existing product battery at end of life dimensions and Enovix EX-1 battery. ²Total for 2 Enovix cells to make direct comparison.

³ Required by Intel Project Athena next generation laptop architecture program.

Figure 2- Enovix prototype battery life advantage in hypothetical products - August 2021

From 2.3x battery life in a pair of Bose frames to a 1.27x advantage for a laptop battery. And EVs aren't even mentioned. If you listen to Enovix's presentations on this, they all sound the same: every time the energy density advantage is discussed, wearables with their 2x battery life come up first, cell phones with their 50% advantage are mentioned next, and laptops with a 25% advantage after that. EVs are never discussed as an energy density play for a very simple reason: in batteries that big, Enovix has virtually no edge compared to what already exists.

Another thing Enovix also never mentions is that there are two pieces to the energy density puzzle: volume and weight. Enovix's battery life advantage comes at the expense of a significant increase in weight. So when the company puts a chart like this in their presentation, which illustrates greater relative energy storage both by volume (y-axis) and weight (x-axis), they're actually just straight up misleading investors.

The Leader in Energy Density

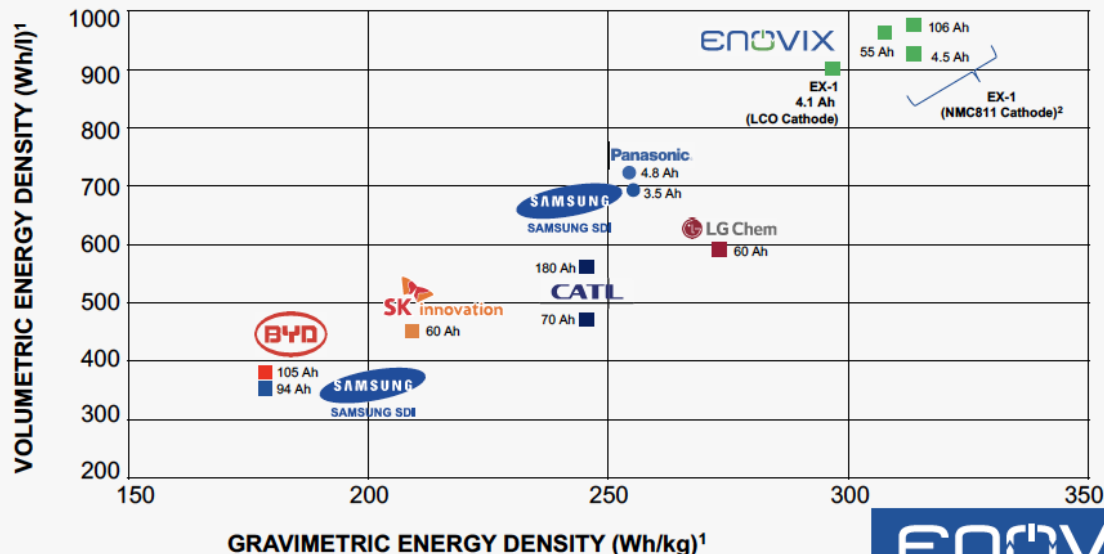


Figure 3 - Enovix Energy Density Comparison to other Battery Companies

You can take a look at, for example, Varta's Primary Lithium Cell [technical specs](#) and see that, at 400 watt hours per kilogram (Wh/kg), their "gravimetric," or weight-based, energy density blows away Enovix's sub-300Wh/kg numbers by about 1.4x. That might not matter so much for a pair of headphones, but once you get to the size of a laptop battery, there's no question the extra weight matters. Move up the size spectrum to EVs, and not only does Enovix have no energy storage advantage by volume, but it's also severely disadvantaged from a weight standpoint. In an EV, where the battery can be 25-30% of the vehicle's weight, the extra weight of an Enovix battery – primarily a function of that critical stainless-steel casing – would actually bring down the expected range of each full charge.


While we're on the topic of comparative energy density, investors should realize that even on a volumetric basis, Enovix greatly exaggerates its advantage. Again, if you look at Figure 2 above, Enovix claims an apples-to-apples ~2x edge versus competitors in small-battery applications like watches and glasses. But just like the cherry-picked competition set in Figure 3 inflated Enovix's gravimetric energy storage performance, Figure 2 massively flatters its volumetric advantage. Take its wearables battery, the specs of which are [published](#) by Enovix, and compare them to Varta's wearable battery [specs](#), and you can quickly calculate that the advantage here – *in what's supposed to be Enovix's most dominant niche* – is 700 watt hours per liter (wh/l) versus 600 wh/l for Varta's battery. That's a mere 17% edge for Enovix's "3D architecture." And Varta's batteries are actually being manufactured and sold to customers while Enovix's spec sheets are aspirational at the moment.

The Race to Perfect Battery Storage is Intense and Enovix is a Bit Player

Varta designs and manufactures Li batteries using traditional chemistries. Yet it has managed to come within striking distance of Enovix's barely-manufacturable prototype in the market segment that's supposed to be the ultimate demonstration of Enovix's technological dominance. Oops.

But Varta is just the tip of the competitive iceberg for Enovix. As Enovix takes the next 2 years to try and crack the manufacturing code that was already supposed to have been solved, the rest of the battery storage industry is not standing still. Just within the narrow realm of companies focused on silicon anode, Enovix faces some impressive competition. Other Enovix skeptics have already pointed out that [Amprius Technologies](#) has commercialized silicon-anode Li batteries with energy densities superior to those being touted by Enovix (specs are below) while occupying a very similar manufacturing position (expecting large scale manufacturing in 2025). At an enterprise value that's less than half of Enovix, the main thing Amprius seems to lack is a promotional and misleading social-media hype machine.

Amprius' Battery Cells Today Outperform Graphite Batteries

Performance Metric	Graphite Anode Battery Cells ⁽¹⁾	 amprius ⁽³⁾
Anode Capacity (mAh/g) ⁽¹⁾⁽²⁾	335-355	1,500-2,500
Specific Energy (Wh/kg)	~215-285	360-500
Energy Density (Wh/L)	~530-715	890-1,400
Charging Time to 80%	30 minutes	<6 minutes ⁽⁴⁾
Rate Capability/Power	Up to 10C	Up to 10C
Cycle Life	500-1,000 cycles	200-1,200 cycles
Operating Temperature	-20 to 60°C	-30 to 55°C

(1) Other than cycle life, based on survey of 18650 technical datasheets (ex. Panasonic NCR18650G), Sony VTC6 technical datasheet, iFixit reports on iPhone and Samsung batteries and Y. Sun et al.: Li-ion Battery Reliability - A Case Study of the Apple iPhone. For cycle life, based on Shmuel De-Leon: Li-ion NCA/NMC Cylindrical Hard Case Cells Market 2021.

(2) Anode Capacity for Graphite Anode Battery (full cells) uses typical N/P ratio of 1.05 - 1.10.

(3) Includes both released and unreleased products with energy and power cell designs.

(4) Based on Amprius' High Power cells.



Figure 4 - Amprius Capacity and Energy Density Specs, August 2022 Investor Presentation

Another company in the silicon anode game is [Sila Nano](#), which is focused not so much on manufacturing batteries but on actually reengineering the silicon itself so that it can be “dropped in” to replace the graphite anode in otherwise already existing battery production. Sila's material has successfully been incorporated into the Li batteries of the Whoop 4.0 fitness wearable, but the real key to Sila's product is that the 20% battery-storage capacity advantage that they claim is maintained even as the battery size gets bigger, which means that unlike

Enovix, Sila might crack the EV market – in which it already has a foothold courtesy of a [deal](#) with Mercedes to supply its silicon material for the anode in the electric G-Wagon. Credulous Enovix investors like to claim that Sila is not really a competitor because Enovix could drop in Sila's material into its own batteries, which is of course idiotic because the whole point of Enovix's 3D-Architecture is to compensate for the weaknesses of silicon, which are absent in Sila's material.

But wait, there's more!

- NanoGraf is a company that, like Sila, is focused on producing silicon-based materials that will increase battery capacity, and they've [illustrated batteries with 800Wh/l energy density](#), matching Enovix's claims. Except that NanoGraf is starting mass [production sooner](#), planning to produce enough of their material next year to power 24 million battery cells.
- Enevate expects to actually [manufacture](#) "large-format EV size cells achieve over 1000 Wh/L and 350 Wh/kg energy density." Their secret sauce? "Pure silicon anode." Oh, and over 500 patents (not that it necessarily means anything, but it's a lot more than Enovix).
- Global Graphene's Honeycomb subsidiary is now [going public via SPAC](#) and boasts a variety of different materials-science advances – including some silicon anode tech – that will increase energy density by 20-80% in batteries large enough to power EVs.

Silicon is not the *only* way that battery startups and incumbents are attempting to build a better battery with greater capacity. There are a host of other approaches to the problem, including solid state batteries and multi-dimensional solutions that address not just the battery anode but the electrolyte and cathode materials as well.

It would also be a mistake for investors to ignore the incumbents in the industry. Companies like Panasonic, LG Chem, Sony, Samsung, ATL, and even Toyota, all have dedicated efforts to the battery storage problem, and their intellectual property portfolio – just within the silicon anode niche – are a lot more significant than those of the startups in the space. Any advances that these companies make are likely to be kept close to the vest until adopted by customers, but their burgeoning patent portfolios indicate they're not asleep at the wheel.

Silicon Anode for Lithium Ion Batteries – Main Patent Assignees

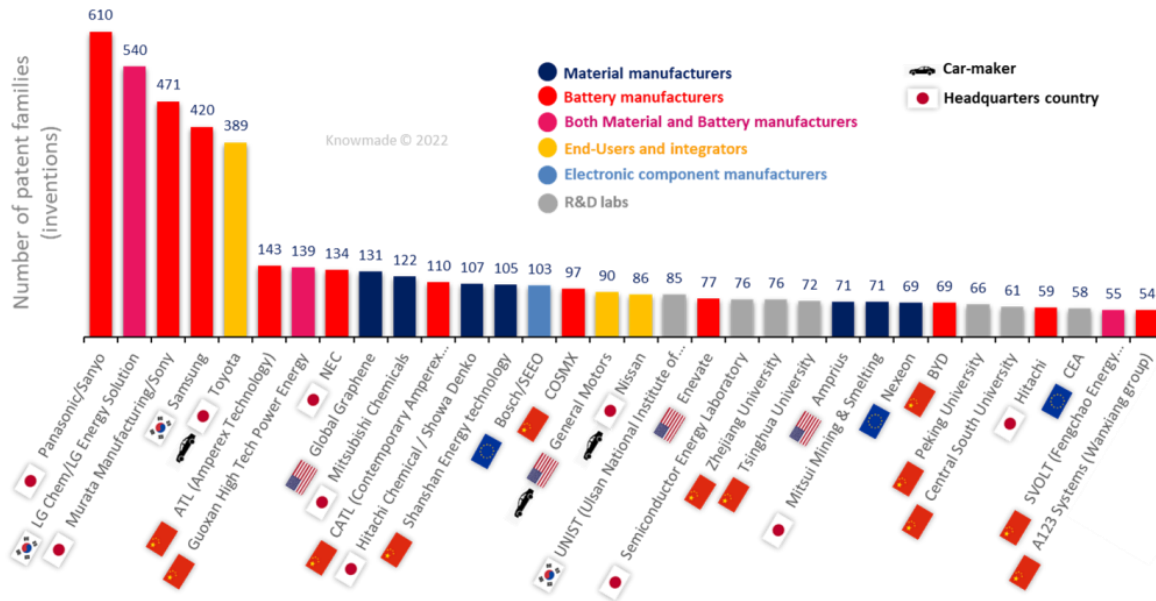


Figure 5 - Patent Assignees in Silicon Anode for Li Batteries

Source: Knowmade, April 2022

The Best Case for Enovix's TAM is the Small and Brutally Competitive Market of Small Batteries

So where does Enovix stand relative to the crowded field? Well, considering the fundamental energy density disadvantage of their technology in larger batteries, investors should assume that Enovix has **zero** chance in the EV space. This is despite Enovix continuing to lead investors to believe that the end-game is EV batteries, with an entire slide in its [April investor presentation](#) dedicated to showing how “Enovix Cell Architecture is Well Suited to EVs” (see below).

Enovix Cell Architecture Well-Suited to EVs

Thermal Advantages Enable Fast Charge; Cycle Life and Calendar Life Demonstrated

Advantaged vs. Conventional Cells¹

~10x Improvement in Cell Internal Temperature Gradient

0-80% Charge in 5.2 Minutes Demonstrated

1,500 Cycles Reached with 88% Capacity Retained

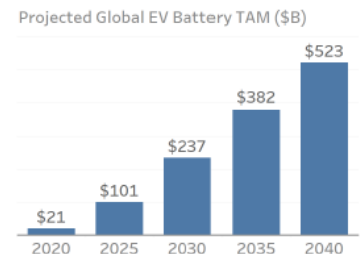
Projected 10+ Year Calendar Life based on High Temp Testing

Pursuing Industry Partner Strategy

Actively Working with Industry Leading OEMs – Focus on JV/Licensing



\$523B EV Battery TAM by 2040²



¹Company estimates based on internal test data shown in Appendix slides 20-22

²The New Oil: Investment Implications of the Global Battery Economy - Morgan Stanley Research, Nov. 15, 2021

Figure 6 - Enovix Continues to Tease an EV End-Market in its Latest Investor Presentation.

Source: April 2023 Investor Presentation

It's funny that in this slide, Enovix doesn't even pretend that its battery will extend vehicle range or have a capacity advantage. It's all about "improvement in cell temperature," charge time, and 10+-year calendar life. These are table stakes for even talking about EV batteries, and if Enovix can't demonstrate an energy density advantage – and it physically can't – then it's downright irresponsible for the company to continue to mislead investors about its chances in EVs. But you don't have to take our word for it. In his January "reset" presentation, TJ Rodgers admitted that

We didn't talk about EVs today. Those cells are made in the R&D line here. The technology for making EV cells, the methodology is different... We have a separate division on EV. It's small, but it's quite effective and gaining traction. We can't really afford right now a lot more than that... 5-person team will cooperate with partners working on doing that right now.

5-person team! Enovix has 5 people in its vaunted R&D operation working on EVs. Investors are completely delusional if they think that a seven-digit R&D budget for EVs staffed with 5 people has a chance to make a dent in a market in which hundreds of billions of dollars are being thrown around in search of a solution. That leaves Enovix with an estimated (by its own account) "\$23B Mobile Computing Battery TAM" in 2026, and a \$1.46B "revenue funnel."

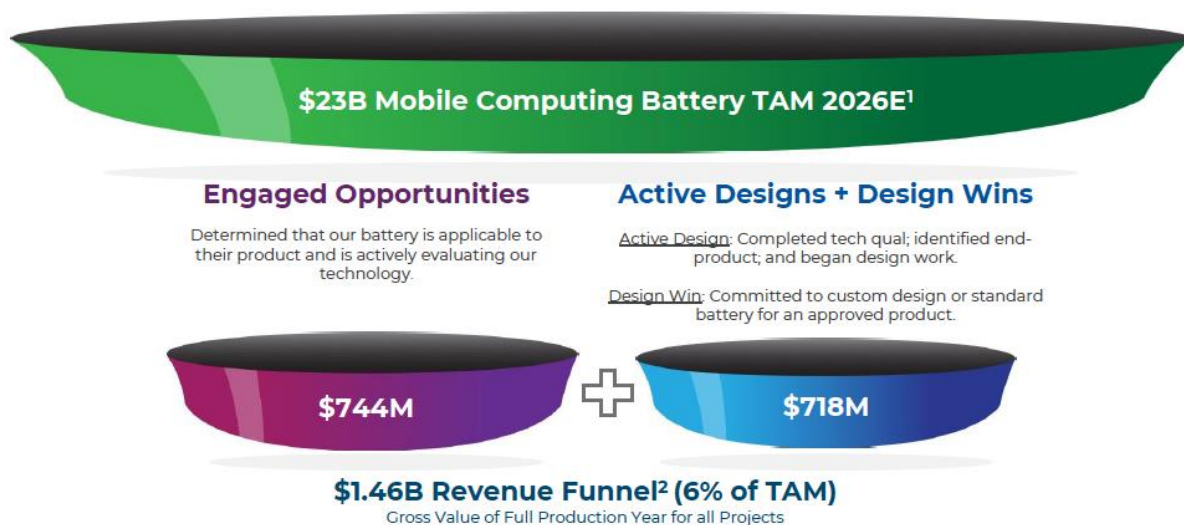


Figure 7 - Enovix Stated 2026 Revenue Funnel
Source: April 2023 Investor Presentation

1. Company estimates as of January 2023 for IoT, Mobile and PC/Tablet markets
2. As of Q3 2023

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How real is that funnel? In that January reset, the best Rodgers could do was give investors the Enovix revenue funnel in “Greg Reyes Format” (seriously, this is what TJ Rodgers actually claims they call their sales funnel format because apparently no one among Enovix’s sales team could depict a sales funnel format better than one of the company’s promotional investors, which seems worrisome). And who are the clients in that pipeline? “Milwaukee, Canon, Panasonic, Sonos, Casio, Nintendo, Samsung, United States Army, Braun, [Genius](#), [Oppo](#) ... these are companies for which we do not have an NDA.” Basically mobile devices and wearables, plus some very-low-volume industrial applications like, say, electric screwdrivers (e.g. from Milwaukee).

While success in these market segments is by no means assured – as of earlier this year, Enovix disclosed that it had one solitary product for which pre-production manufacturing quantities were on the horizon – it’s quite certain that at [\$2B in market cap], investors haven’t really internalized what “success” actually means. Here are some examples:

- TDK Corporation’s ATL subsidiary dominates mobile phone batteries, supplying about 40% of the market’s battery needs globally and generated over \$8.5B in 2022 revenue.
- Panasonic’s battery division generated over \$7B in 2022 revenue, with over \$2B of that coming in consumer products (the rest was in auto).
- Varta – the small German battery company that hit paydirt by getting its battery designed into Apple’s AirPods – generated about \$850M in 2022 revenue, including, of course, that sweet Apple contract.

How does success manifest itself in margins? TDK’s battery operating margins are 15%. Panasonic, substantially less dominant, had operating margins come in at *less than 4%*, though that includes the lower margin auto battery business. Varta, dedicated exclusively to small

mobile-consumer-products batteries, was able to generate EBITDA margins of just under 10%. Contrast that to Enovix's original guidance of 30% steady-state EBIT margins, to which the company was *still* guiding as recently as 6 months ago! Even Rodgers' new-and-reduced 20% margin goal looks absolutely ridiculous compared to what comparable battery companies are able to accomplish. Remember that Enovix's batteries *are not actually that much better* than the competition's so the idea that they can earn margins so much better than their competitors is comical.

What about valuations? TDK trades at less than 1x EV/Sales. But let's entertain for a moment the delusion that Enovix is somehow different because it has a technological secret sauce that results in an incomparable value proposition (it doesn't). Its trajectory might resemble something like Varta's, which was able to more than triple its revenues over 3 years by winning over a major Apple product. Unsurprisingly, along with that kind of revenue growth came a massive boost in EBITDA margin, from 16% to 31% at its peak. The earnings move was also reflected in Varta's stock price, which jumped from €24 to €160 at its peak.

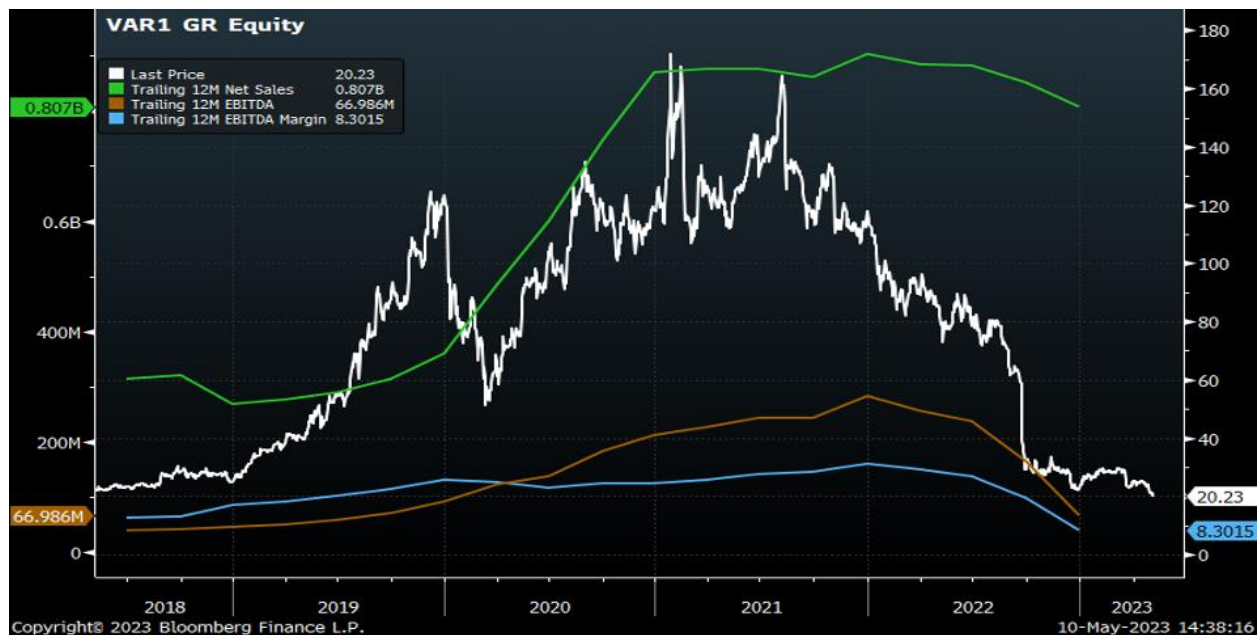


Figure 8 - Varta AG's "Successful" Journey into Apple Earbuds, Told Through Revenue, EBITDA, EBITDA Margin, and ... Stock Price

But as you can see, the honeymoon didn't last very long. Even Varta's best-in-class battery performance was not something Apple was willing to reward with outsized profits. In Fiscal 2022, Varta's revenues *declined* more than 10% and its EBITDA margins fell from 31% to 9.5%. The stock price more than followed and now trades at about €20, with the commensurate valuation at less than 1.5x NTM Revenue. In this "success" story, a revenue stream still more than 3x larger than before realizing the electronic-component dream of winning an Apple design was rewarded with a net *decline* in the stock price. And this is with the absolute best component available. The lesson for Enovix shareholders is that even if the Enovix battery is as good as they think it is (obviously it's not), it won't matter. Selling batteries into megacap

consumer electronics products is a brutally competitive low-margin game, illustrated well by Varta's "winner's curse."

There's really almost no chance that Enovix will get anywhere near \$1B in revenue over the next 5 years (we're not even sure they can run an automated assembly line – see below). For Enovix, the problem is that for the high-volume consumer electronics they're targeting (earbuds, mobile phones, laptops), the batteries for all these products are already pretty good. A 20% improvement in battery life – and as we showed above, it's not more than that – is incremental and it's not going to be something for which mass market hardware manufacturers are going to dip into their own margins. The batteries (if they can manufacture them) are not that differentiated and Enovix simply doesn't have the kind of scale necessary to compete on price/value in mass-volume designs that are necessary to win in order to get to the billion dollar mark, let alone the \$2-3B – in the same league as battery giant Panasonic! – that's required to justify today's market cap. Then, as Varta's cautionary tale indicates, on the very off chance that they manage this kind of feat, it's almost certain shareholders won't benefit.

Enovix Massively Bungled its First Attempt at Large Scale Manufacturing and Management doesn't Sound Very Confident about the Next One

The Enovix SPAC merger proxy notes that one of the reasons why Enovix was the top choice for a potential acquisition merely two weeks after RSVAC's IPO was that "the company [was] already building its first factory ("Fab1")." Just two months later, when the proposal to acquire Enovix was announced, the corporate presentation included the following slide, detailing Enovix's manufacturing strategy:

Fab Scale-Up Strategy

	Fab-1	Fab-2	Fab-3²
Production Site	Fremont	Buy fab & upgrade	JV / licensing in automotive
First Revenue	Q2'22	Q2'23	2025
Revenue (2025)	\$220M ¹	\$581M	
Capacity (cells)	45M/yr	89M/yr	
Capacity (Wh)	254 MWh	1.53 GWh	35 GWh
Cash Flow Trough	(\$208M)	(\$327M)	

Figure 9 - Enovix Manufacturing Guidance – February 2021
Source: ENVX 8K, 2-22-21

The presentation also had a total of 11 slides dedicated to “Fab 1,” including photos of how advanced and rapid the ongoing construction of the fab had been proceeding. In retrospect, the guidance in the above slide now looks absurdly hyperbolic. Fab 1 was supposed to be able to manufacture 45M battery cell units annually, generating \$170M in 2023 revenue and \$220M in peak revenue (FY 2025). Instead, as TJ Rodgers explained in his January reset, “the lines didn’t work, they became manual...the machines didn’t work the way we wanted.” The goal for Fab 1 is now for it to “become economically important, not necessarily profitable.” How did Rodgers define economically important? “It’s \$1M or more in revenue.” That’s quite the miss vs the \$220M target.

With Fab 1 having turned out to be a complete failure, Rodgers has now staked everything on Fab 2, which now has targets that look very similar to the original Fab 1 expectations: newly assembled fab, 4 automated manufacturing lines, 10M units/line with \$5-10 in revenue/unit (depending on battery size). While Enovix’s competitors have been building facilities in the US Midwest, Rodgers was adamant that it would be impossible to turn a profit without the ability to have the high speed machines “get run by people who are making \$2 an hour.” While that doesn’t sound very ESG, there’s still absolutely no reason to believe that Enovix will be able to pull off Fab 2.

Rodgers spent an inordinate amount of time in that January presentation explaining why Enovix now has the right people, the right processes, and the right plan to make sure that Fab 2 will be successful. We haven’t been able to find a single analyst who can explain why the results of this Enovix effort will be substantively different than the Fab 1 attempt. All the arguments come down to something like “this new team knows what it’s doing.” But the old team also supposedly knew what it was doing. Maybe the underlying problem is Enovix’s fanciful business plan and underlying technology, not whomever happens to be its CEO? Here are a few things that we *do* know:

- In January, Rodgers virtually guaranteed that “there will be 4 Gen2 lines in Fab-2 by Q4 '24... These things will be coming out one a quarter.” In other words, Rodgers articulated a plan that would have one battery assembly line installed per quarter starting in the fourth quarter of this year. But more recently, on the company’s Q1 earnings call, in response to a question asking for confirmation that the 4 lines will be installed in Fab 2 by the end of '24, CEO Raj Talluri said:

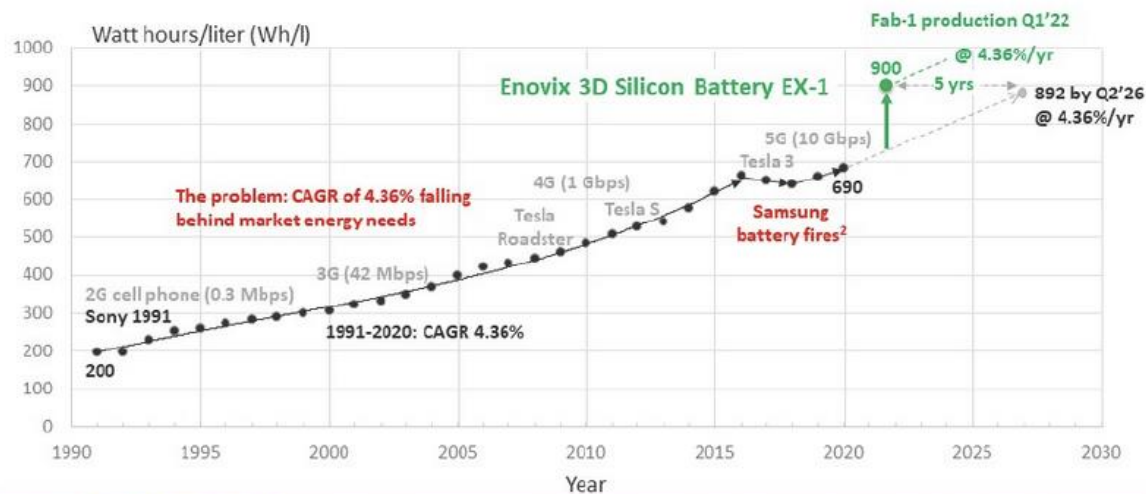
No, the way I mentioned that is we ordered one line and that's the line that will be there... we only commented on building one line through '24. We have the ability to build more now that we have the CapEx stuff sorted out. But we will pull the trigger on those as and when we see the right customer demand come in. And the most important thing in running a manufacturing company is to match the supply and the demand. And as the customer qualifications progress, we'll have better and better visibility into when to build that.

That's a pretty big step back from Rodgers' guidance! The company now doesn't know when it will install the rest of the lines, but they're only going to commit the capex to do it once they know they have customer demand. Looking at the Greg Reyes Sales Funnel indicates that it's going to be a while before Enovix sees demand for 20M units (which is what would be required for the second line in Fab 2), let alone 40M. Instead of back-ending the full capacity utilization to an already long-dated Q4 of 2024, the guidance is now "well, we'll see."

- How precise do the machines on the new assembly line have to be? In January, Rodgers said that the Fab 1 machines operated at tolerances of 100 microns (0.1mm) "and that's not quite good enough for a battery." The Gen 2 machines in Fab 2 would be "taking the accuracy from 100 to 20 microns." Yet in the April earnings call, Talluri stated that "the tolerances to which we have to design our machines and execute this manufacturing is in the 50 microns range." And former Enovix engineers have gone on record to say that the difference between battery cells with higher capacity and those that didn't perform well was in the range of just 10 microns. The problem is that this point is not just theoretical. The equipment necessary to assemble these cells is not available off the shelf, and the cost to get to 10 micron tolerances is prohibitive enough as to make the enterprise, in the words of that former Enovix engineer, "so expensive that there will never be an ROI on it." The fact that Enovix management is now walking back its expected manufacturing targets is concerning.
- Pushing back the timeline on manufacturing essentially puts Enovix not just behind its own schedule but behind the progress the rest of the industry is making. If you look back at Enovix's original "Battery Energy Density Roadmap," their EX-1 cell with 900Wh/l of density was expected to be released last year (2022) with mass quantities being manufactured right now.

Li-ion Battery Energy Density Roadmap¹

Enovix gained 5yrs on the industry with step-change improvement



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ENOVIX

¹Actual and projected Enovix energy density metrics for a smartphone-size battery.
²Samsung Note 7 fire problems resulted in less aggressive cell designs and lower energy density for 2 yrs.

Source: ENVX 8K, 2-22-21

Here's Tallari on the April earnings call talking about this goal:

EX1, EX1.5, EX2 are our various process technologies that actually improve the energy density and cycle life and so on. *We are on target on all of those. EX1.5, we expect to sample towards end of the year and we expect to run all those in our factories in Malaysia. Malaysia factory, as I mentioned will produce samples like in April next year and get into high volume manufacture towards the end of the year. [emphasis added]*

Enovix is in *no way* "on target." They're two years behind on EX-1, and actually if you look at their forecasts – including the one in their November presentation which happened about 6 months ago – they expected EX-2 about a year after EX-1. In fact, EX-1.5 is something that was never in Enovix's original timeline, which further suggests not just manufacturing difficulties, but that Enovix is actually having a tough time improving the product at the pace that they originally promised. Even if they do get their manufacturing going, it seems like there's a harder physical limit on improvements than they originally led investors to believe.

Investors should in no way assume that Enovix can manufacture battery cells at scale come 2025 (which is the bull case). Not only has management already pushed out the timeline for building out Fab 2 production capacity from where it was in January (which was already 2 years behind the schedule to which management guided last August), but it's not even clear that they have a handle on just how precise their manufacturing process needs to be in order to uniformly produce battery cells that perform at the level they've promised. In addition, it seems that the

pace of technological improvement is going a lot slower than the company originally told investors to expect. It may not even be moving at all given that there's been no timeline given for when EX-1.5 is going to be mass-manufactured. Enovix stock is priced for something close to perfect execution despite the fact that the company is – by its own admission – 18 months from investors having any inkling as to the company's ability to manufacture at scale. Given the preceding fact pattern, that's likely to end badly.

Little Innovation, Lots of Competition, and Questionable Execution: Investors Should Run, Not Walk, from this Disaster

Enovix's stock price has doubled since the day after TJ Rodgers' January reset. Since then, the most important aspects of Enovix's value proposition have not changed much. Enovix's brute-force silicon anode "solution" to the great battery capacity problem is not very innovative and has very little room for further improvement. Besides that, the "solution" doesn't improve the battery capacity of large batteries, which makes it useless in the most important electrification arena, that of electric vehicles. Contrary to the "lone innovator" image that Enovix has tried to impress upon its investors, battery enhancements for the electrical vehicle use-case is actually rife with both incumbent and startup companies working towards capacity improvements, based on both Enovix-style silicon-anode as well as other chemistries. Whether you compare Enovix to the rest of these companies by its intellectual property portfolio or by the traction it's received in its supposed customer base, the company is nothing more than an ossifying branch in the Cambrian explosion of battery innovation.

Enovix is left fighting for market share scraps in the slow-growing but brutally competitive market for small-device Li batteries, which puts the company at the mercy of device OEMs like Apple, Samsung, and Google, companies who relentlessly seek cost efficiency at the expense of vendor margins. Success in this arena is marked by thin profit margins, low valuations, and the never-ending prospect of OEMs playing different vendors off each other.

Realistically, though, getting some low-margin market share rewarded by a low multiple stock price is the absolute best case scenario for Enovix. As it stands right now, we doubt Enovix can even competently manufacture the batteries it claims to have innovated. After completely botching its first fabrication facility, Enovix is years behind schedule, and you'll have to wait at least a year and a half before you get any idea of whether its Fab 2 is capable of mass-producing batteries. Considering management's recent pronouncements on the uncertainty of the capacity-buildout timeline as well as the lack of clarity surrounding the manufacturing precision necessary for high-yield production, we're not sure why anyone thinks this company can deliver. The current \$2B valuation gives investors an incredible opportunity to unload shares – operationally, we doubt Enovix will ever generate material profit at all, let alone enough to justify the current valuation.