

Fast Ion Battery

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Executive Summary

The following managerial report exhibits how our consulting team analyzed the “Fast Ion Battery” case study. In general, the main business question we aim to answer is “*Should investors invest more money into Fast Ion, even though their expectations were not met?*” After conducting a thorough analysis of all factors that affected the company and reviewing the data that we were provided with, we ended up with the recommendation that further investing should be halted. If investors still believe in Fast Ion and are willing to continue investment, then we’ve highlighted three recommendations that will help investors with their decision.

We pointed out what the short-term and long-term problem for Fast Ion was and then focused on questions that would help us target our main business problems. Moreover, our report includes a SWOT analysis which illustrates the factors that affect the investors’ decision making. Regarding technical analysis, Fast Ion is asking for the same financial support as when they started, but comes at a higher financial burden to the investors - more than industry standard for a company of its size, and over-promising its future milestones.

To sum up, we would like to conclude by providing three recommendations for Fast Ion in order to convince the investors:

- New CEO must build a renewed management team; define team members’ responsibilities and top priorities; and develop a business model, plans and goals strategically
- Technology and marketing teams must coordinate and have the same direction following Fast Ion’s business goals and mission
- Initial monthly meetings with the Board members to update the progress of the milestones outlined in the financing agreement, and present with the financial statements

Problem Presentation

Short-term Problem:

When John Davidson from WSC reached out to Bluelock and Franconia Ventures in December 2011 to discuss the possibility of a \$5 million bridge financing, it had been 42 months since Fast Ion had received the initial funds from the three venture capitalists. Clearly, the eye-catching problem is Fast Ion needs more funding. To identify the underlying problem, a root cause analysis is a valuable technique to utilize.

Five Whys Root Cause Analysis

1. Why does Fast Ion need the \$5 million bridge financing?

Answer: Because the new CEO wanted to ensure Fast Ion had sufficient resources to implement the changes that were needed before being willing to formally sign on.

2. Why does Fast Ion need a new CEO?

Answer: Because the Board realized the current CEO, who is the founder of Fast Ion, is lacking in success in focusing the team or advancing the go to market strategy.

3. Why does the founder lack success in focusing the team or advancing the go to market strategy?

Answer: Because the founder did not make significant progress to accomplish the milestones as how it was planned out since the company was incorporated (in the handout Exhibit 5) including the build-out of the management team, defining market and customer segments as well as developing a business model.

4. Why didn't he make any progress?

Answer: Probably the founder was not clear of his duties and responsibilities. And most likely, he had no experience in the past and had nobody to rely on.

5. Why couldn't he rely on his team and work things out together to make progress?

Answer: Because the fund did not make any progress on building-out the management team as it indicated in the original handout Exhibit 5.

Long-term problem:

The three venture capitalists are expecting the postdoctoral MIT founder to develop a remarkable product in order to generate high returns to make the investment worth, however, due to this bad management at Fast Ion, it failed to identify a clear market segment that would use its technology. This is a big problem because market segmentation is a critical component for Fast Ion to identify their potential market to gain competitive position and to create advantages strategically before any new entrants in the similar sector so the possibility of selling its product will be higher.

Other Problems:

Davidson at WSC as one of the three Board members, he had a good amount of responsibility to govern Fast Ion but it seemed like he had missed the perfect timing to roll out an efficient plan. In December 2011, Fast Ion was running out of cash. Interestingly, the two rounds of financing since June 2008 did not help Fast Ion to achieve all of its milestones. It's an investment in battery technology in the cleantech sector, to view this opportunity at a macro level, this is an investment in time like most of all the investments that you put in money as a seed and add time to let it grow. Apparently, as a Board member, Davidson perhaps never had frequent joint conversations with the other two Board members including the founder/CEO to establish the business as well as to monitor and manage Fast Ion's financial resources. These are important responsibilities for a Board member to get involved especially in a startup business like Fast Ion's.

Other Risks:

At its current position in December 2011, aside from all the major problems and issues, there are risk warnings indicating Fast Ion might be a very risky company to invest further due to internal and external causes, shown in Figure 1.

Risk Warnings to Invest Further	Source Section	Page Number
Cleantech funded in the prior decade had failed to deliver on their promises.	Intro	Page 1
Only a few companies that had managed to go IPO or get acquired had generated large returns.	Intro	Page 1
A high profile solar cell manufacturer went bankrupted and tainted the sector, leading VCs turned away from funding clean energy ventures.	Intro	Page 1
Not all the milestones had been met by the timeline.	Fast Ion's Promise	Page 2
WSC is lack of successful experience that only one other investment was made at an estimated net IRR of less than 5%.	Investor Backgrounds	Page 2
Davidson's mentality of pushing the round through in the hope to not fail but win this first investment.	Investor Backgrounds	Page 3
Fast Ion failed to identify a clear market segment that would use its technology due to bad management.	Bridge Round	Page 3
June 2011, Fast Ion pivoting away from grid-scale storage towards developing batteries for EV with verbal interest, but no commercial agreements and proof of market validation.	Bridge Round	Page 3
Founder is lack of success in focusing the team or advancing the go to market strategy.	Bridge Round	Page 3
In 2011, VC investors had reduced new capital commitments to cleantech startups.	Investment Climate	Page 3
Fewer than expected cleantech investments had achieved good exits through acquisitions or IPO.	Investment Climate	Page 3
A123 was struggling after IPO with large-scale layoffs as demand for their customers' products had weakened due to competition from lower cost providers.	Investment Climate	Page 3
Investors realized that the long time frames and equity intensity of the cleantech was a poor match for many of them.	Investment Climate	Page 3
Majority of venture investors were forecasting that investment in cleantech startups would decline substantially.	Investment Climate	Page 3
IPOs in software, services and consumer focused internet technologies had recently outperformed those in cleantech.	Investment Climate	Page 3
Opportunities to Invest Further	Source Section	Page Number
Bill Gates addressed the need for big breakthroughs and radical innovations in the energy storage landscape.	Fast Ion's Promise	Page 1
Tremendous need for improvements in battery technologies as electric vehicles became more mainstream.	Fast Ion's Promise	Page 1
Won a \$2 million prestigious grant. (Wrong decision to throw in more investment based on this wrong measurement which looked different from the initial financing agreement)	Fast Ion's Promise	Page 2

Figure 1. Risk Warnings to Invest Further

Business Problem & Questions

Taking into consideration the problems and challenges that Fast Ion is facing, the general business problem can be defined as:

**Should investors invest more money in Fast Ion,
even though their expectations were not met?**

In order to target this question, there should be some additional supporting questions answered to comprehend what are the factors that are affecting this decision:

1. What was Fast Ion's market segment?

Fast Ion is a company that faced many challenges. After both Series A tranches, the cleantech company was unable to identify an explicit market segment that would use its products. Not having a clear vision on what their target audience was showed that Fast Ion was lacking in its marketing operations as well as targeting additional customers that didn't find value in their products. Fast Ion had to take into consideration the fact that each segment has limited customers. Hence, they would not be able to sell their products on a mass scale for every different market segment. Whether investing in market segmentation or not, it would have been critical for them to implement marketing strategies in order to target customers based on their needs, interests, habits, and attitude.

2. How would a new CEO change Fast Ion's future and gain their investors' trust?

As a result of the founder's lack of success in implementing an effective market strategy to target its audience, the company was forced to replace the CEO. Two main challenges that they faced was a. limited capital and b. potential CEO candidates wanted to see that the company

had enough resources to execute the necessary changes. While Fast Ion was operating without an active CEO, it was very challenging to set a clear path for the development of the company.

After narrowing down their search to two potential and highly qualified candidates, Davidson, a board member, believed that Fast Ion had the potential to turn a \$75 million investment to \$350 million.

3. What is the impact from Bill Gates' "Innovation To Zero" TED talk?

Bill Gates, an individual with an extremely powerful impact with his statements in the world, had a TED talk in 2010 in Long Beach, California where he envisioned how energy and climate will look in the future. After explaining the declining path that climate was most likely to take, he addressed the urgency for new innovations in the industry of energy. More specifically, he said that "all the batteries on Earth could currently store less than 10 minutes of the world's electricity needs". This opened a huge gap for companies to take on new opportunities. Hence, that was a positive sign to convince investors on how they should consider taking another chance with Fast Ion.

4. How was Fast Ion's situation compared to its competitors that had "succeeded"?

At that time, the cleantech industry was still at a very early stage compared to what it is now. Due to people not knowing much about the industry and not being able to predict the future due to various obstacles, it was very difficult to foresee if another investment would turn Fast Ion's situation around. Another reason that it was not easy to convince investors was because the only companies that were successful, in terms of generating high revenues based on their expectations, were companies that had either been acquired by another company or gone public. On the other hand, none of those cases were applying for Fast Ion.

Fast Ion SWOT analysis

To better understand Fast Ion's current position, a strategic framework is needed. A SWOT Analysis is a useful technique to help Fast Ion to identify its strengths, weaknesses, opportunities and threats in the industry.

SWOT Analysis for Fast Ion Through December 2011

	Helpful	Harmful
Internal	Strengths <ul style="list-style-type: none"> CEO's background as a post-doctoral student at MIT Not a brand new but a 3 years old startup 	Weaknesses <ul style="list-style-type: none"> CEO lack of experience Did not meet the milestones Management team did not work together towards the common goals Business model, market and customer segments were not defined No customers and sales yet Shortage in cash
External	Opportunities <ul style="list-style-type: none"> Big breakthroughs in the energy storage sector is needed Electric vehicle battery technology improvements is in demand Verbal interests from potential customers in the new transportation segment Received two rounds of funds Research is qualified for and won a \$2 million prestigious grant 	Threats <ul style="list-style-type: none"> Cleamtech funded earlier failed to deliver on their promises Cleamtech's "Valley of Death" development cycle A bankrupted high profile government heavily-funded company (Nobel, 2010) in the sector caused VCs walked away to invest in other more profitable sectors US government support continues to lag compares to other countries' governing policies and fundings to favor the sector Emerging competitors in the marketplace like Garfeng, Panasonic, Livent, LG Chem and CATL (Palandrani, 2020)

Figure 2. Fast Ion's SWOT Analysis Through December 2011

Exhibits interpretation and business purpose

1. Constant financial support through Exhibit 5 (Nanda R., White R. Puzio S.): Assuming that most money is used up in each series (hence the need for more rounds), the rate of funds usage is the same, what is the rate of using the money?

Monthly funds usage per investment round

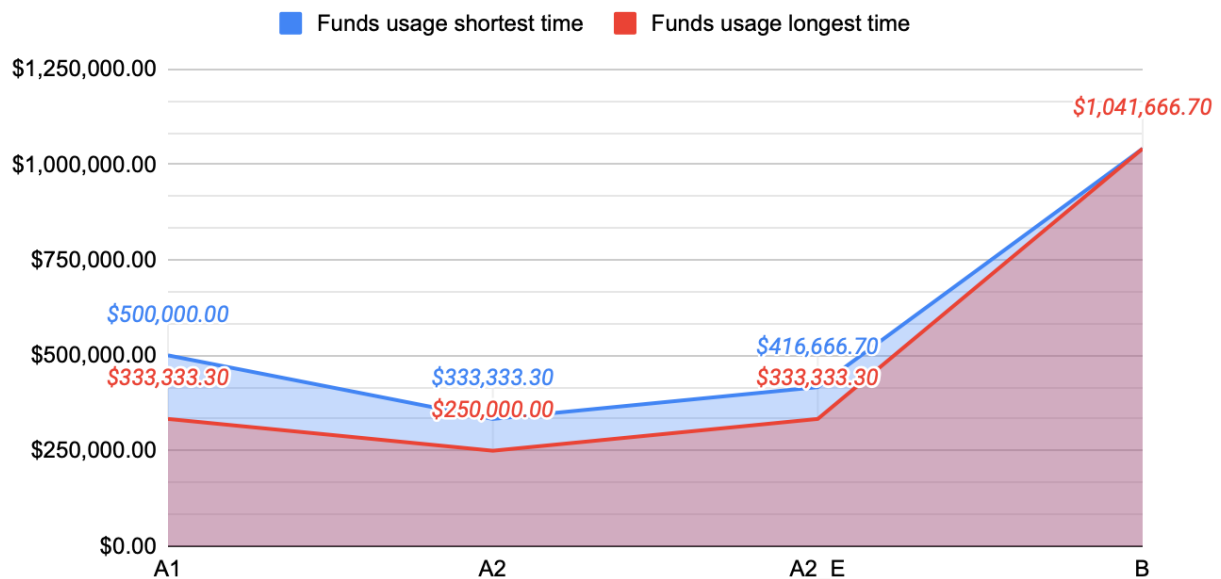


Figure 3. Monthly Funds Usage per Investment Round

The above plot¹ shows the monthly spending within the runway time. The bridge round is asking for a range of spending between 333,333.30 USD to 416.666.70 USD, a smaller range compared to initial round A1, but more money spending than round A2. This can be seen as while there are remaining facilities and staff from round A1 and A2, Fast Ion Battery is asking for the same financial support as the beginning.

Another point to consider is the Average spending on Series B round. This round is dealing with constructions of manufacturing plants, low scale productions, and generating

¹ Refer to Appendix 1

revenue. This can be considered a risky investment, due to the lack of contractual customers (as stated in Exhibit 5's Actual progress for Series A2), and within the time span of Series A2 Extension, Fast Ion Battery must be able to acquire customers in the new market and complete its engineering and sales team, and prepare the ground for Series B, all with the fundings from this round.

2. Exhibit 2 and 4 (Nanda R., White R. Puzio S.): Shares purchasing and investors' responsibilities and penalty

This would be the third round in Series A investment that Fast Ion Battery is asking for, with a total reaching 15 Million USD (17 millions with the grant) raised for Fast Ion Battery. This is usually the step where a company needs to be able to finalize customers, production channels, and marketing process, yet Fast Ion Battery is nowhere near done (Law, R.).

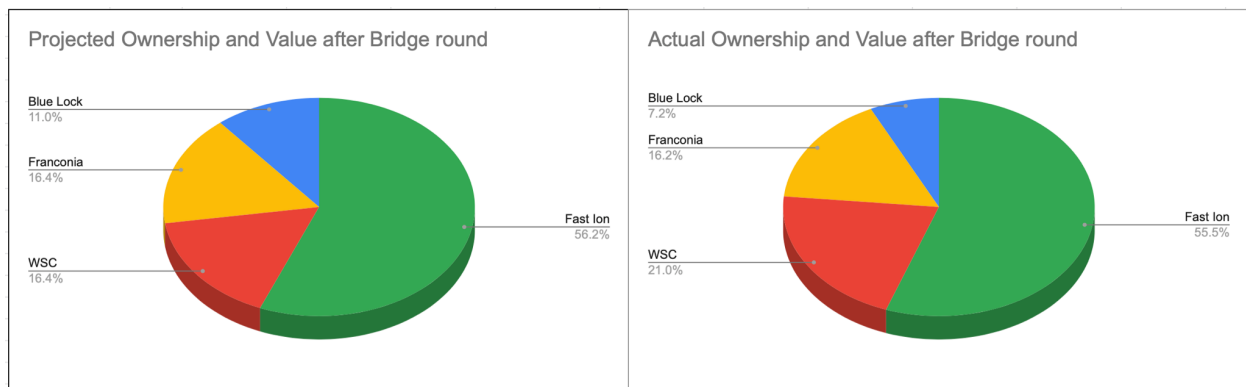


Figure 4. Ownership and Value after Bridge Round

Assuming that no new investors are coming in, this means either WSC or Franconia would have to pick up the pro-rata price. Also, assuming Franconia is not going to pick up the money, then WSC would now control Bluelock's share, increasing its share from 16% to 21% of the company, as shown above². This is not advisable, since WSC's purpose is to invest capital into the company, not to gain control. Firstly, WSC is also not looking to invest more money into

² Assumption that WSC is buying all Bluelock's pro rata to proceed with Bridge round. Refer to Appendix 2

a business that has the value to be less than billions. Secondly, upon purchasing more than their pro-rata share, a warrant is applied, and the price of those shares are increased, along with a time duration that they must be held. That means the 4% extra seen above must be held for at least 10 years, according to the proposed terms of the bridge round (Nanda R., White R., Puzio S.). Lastly, according to exhibit 1 (Nanda R., White R., Puzio S.), the provided share would have to be converted to common shares - if no one were to cover that portion, and would need outside investors. However, even John has made the remarks that on new investors would come at this round. Hence this would be another argument to not invest into Fast Ion Battery.

3. Exhibit 2 (Nanda R., White R. Puzio S.): Unrealistic milestones to attain with the current market situation.

Assuming that Fast Ion Battery's sales teams could perform excellently, and gain enough deals to reach the desired potential incumbent at 200 Millions USD valuation. According to Statistia (Published by Statista Research Department, & 30, A.), in 2011, roughly 80 millions vehicles are made, and the market share for transportation is roughly estimated to be 2 billion dollars (*Knight-Swift Transportation Holdings Market Cap 2009-2021*). Unless Fast Ion is looking to extract roughly to claim 10% of the market to be an electric vehicle. In order to claim that much, Fast Ion would need to partner with large companies such as Toyota, GM, or Volkswagen (Comments, T. C. B. M).

4. Not promising future for Fast Ion through Exhibit 9 (Nanda R., White R. Puzio S.)

This exhibit shows the differences in the IPO performances between select cleantech and internet software companies. By inputting these performances into a spreadsheet and calculating the average appreciation per industry³, we can see that on average internet and software investment historically appreciates at a higher average rate than cleantech. The cleantech

³ Refer to appendix 3

companies had an average appreciation (depreciation) of -21%, while the internet and software companies were +139%. These are limited numbers, but based on them the long term successful exit through IPO for Fast Ion does not look promising.

Recommendations

Recommendation 1: Team work makes the dream work! Immediately, the CEO should begin to build out the management team. Define team member's responsibilities, top priorities, milestones to achieve, and its timeline to fulfil. Out of all the missed milestones, the top priority will be:

- Management team building to identify department heads and their responsibilities.
- Define market/customer segments so the product would be developed to meet customers' needs efficiently when the budget is tight.
- Develop a business model to sketch out Fast Ion's business concept.

These will build a strong foundation to support the startup business running towards Fast Ion's short-term missions and goals.

Recommendation 2: The management team should not pull the technology and marketing teams in a different direction. The CEO should lead his management team to deeply discuss Fast Ion's overall business plans, goals and concerns for the short-run and long-term. Making a decision to pivot away from grid-scale storage towards developing batteries for electric vehicles could be an irrational action and another dead-end for Fast Ion. In order to avoid this type of mishandling, the management should come together as one team to plan the business at the company level and execute their individual plans at the department level for the long-run.

Recommendation 3: Time is money. As a venture Board member, funding the company is not the only mission. If it was not initiated by Fast Ion, WSC should constantly request monthly board meetings to be held to monitor and push the progress ahead to avoid future delays. In addition, financial statements should be reviewed frequently, and quarterly statements should be

distributed to the Board by the accountant. The monthly meeting should be formal, productive and in the focus of governing the business for profitable growth. It is a great opportunity for the founder to gain trust from WSC and other venture capitalists to showcase the innovative product and steady progress. This routine not only includes the Board members as a part of this exciting opportunity to develop breakthrough products, but also increases capitalists' confidence level in a company they initially ventured.

Conclusion

Through our analysis we have concluded that John Davidson and Ware Street Capital should not pursue the further funding and development of Fast Ion. Although the technology that Fast Ion has developed is extremely promising, it will take too much capital and time to get the company to a go-to-market stage, time and money that Ware Street Capital, and other investors, do not have. Fast Ion also does not show a good track record of meeting expectations and milestone deadlines. This could change with the onboarding of a new CEO. However, even with a new CEO that keeps the company on track, historical data shows that most cleantech companies that make it to an exit through IPO do not appreciate in value. This is compounded by the fact that there is also burgeoning competition in the sector from other large and well established companies.

There are numerous factors facing Fast Ion when deciding which investment decision to make. These factors, both internal and external, contributed to a very risky profile. Such a profile, even when provided the bridge funding, would mean facing considerable obstacles to accomplish its goals and solve its problems. The management team should have presented more meaningful financial reports to the board of directors constantly, and showed the usefulness of the bridge fund in order to generate a greater interest from investors' side. The recommendations that are found in this report were made based on the assumption that no sales were made since the business's inception. The initial funds from both A series rounds, in addition to the grants, should have been realized significantly, and would have been much more profitable for the investors in other market sectors, like internet and software technology.

References

Comments, T. C. B. M. (n.d.). *U.S. Auto Brand Market Share Charts – December 2011 And 2011 Year End*. GCBC.

<https://www.goodcarbadcar.net/us-auto-brand-market-share-charts/#:~:text=Nissan%20USA%20grew%20its%20share%20of%20the%20U.S.,situation%2C%20details%20of%20which%20can%20be%20viewed%20here.>

Nanda R., White R., Puzio S. (2015). *Fast Ion Battery*. HBS No. 9-815-025.

<https://www.hbs.edu/faculty/Pages/item.aspx?num=47911>

Knight-Swift Transportation Holdings Market Cap 2009-2021: KNX. Macrotrends. (n.d.).

<https://www.macrotrends.net/stocks/charts/KNX/knight-swift-transportation-holdings/market-cap#:~:text=Market%20capitalization%20%28or%20market%20value%29%20is%20the%20most,2021%20is%20%247.68B.%20Compare%20KNX%20With%20Other%20Stocks.>

Law, R. (2017, September 13). *From Pre-Seed to Series C: Startup Funding Rounds Explained*. Medium.

[https://medium.com/the-saas-growth-blog/from-pre-seed-to-series-c-startup-funding-rounds-explained-f6647156e28b.](https://medium.com/the-saas-growth-blog/from-pre-seed-to-series-c-startup-funding-rounds-explained-f6647156e28b)

Published by Statista Research Department, & 30, A. (2021, April 30). *Car production: Number of cars produced worldwide 2018*. Statista.

[https://www.statista.com/statistics/262747/worldwide-automobile-production-since-2000/.](https://www.statista.com/statistics/262747/worldwide-automobile-production-since-2000/)

Gates, Bill, director. *Innovating to Zero!* TED,

www.ted.com/talks/bill_gates_innovating_to_zero?language=lb#t-116172.

Nobel, C., 2010. *Venture Capital's Disconnect with Clean Tech*. [online] HBS Working Knowledge. Available at:

<<https://hbswk.hbs.edu/item/venture-capitals-disconnect-with-clean-tech>>

Dr. Chu, S., n.d. *Key Facts: Solyndra Solar*. [online] Energy.gov. Available at:

<<https://www.energy.gov/key-facts-solyndra-solar>>

Palandrani, P., 2020. *Four Companies Leading the Rise of Lithium & Battery Technology*.

[online] Global X ETFs. Available at:

<<https://www.globalxetfs.com/four-companies-leading-the-rise-of-lithium-battery-technology/>>

Appendix

Appendix 1 - Average capital spending from Fast Ion based on the runway time of each round

Series	Fund raised	Minimum runtime (months)	Maximum runtime (months)	Funds usage shortest time	Funds usage longest time
A1	\$6,000,000.00	12	18	\$500,000.00	\$333,333.30
A2	\$6,000,000.00	18	24	\$333,333.30	\$250,000.00
A2_E	\$5,000,000.00	12	15	\$416,666.70	\$333,333.30
B	\$25,000,000.00	24	24	\$1,041,666.70	\$1,041,666.70

Appendix 2 - Ownership and values of investments before and after bridge round, when WSC bought Bluelock's pro-rata share

Name	Ownership	Value	Name	Ownership	Value
Fast Ion	56.18%	\$19,230,769.00	Fast Ion	55.50%	\$19,230,769.00
WSC	16.43%	\$5,625,000.00	WSC	21.05%	\$7,291,666.67
Franconia	16.43%	\$5,625,000.00	Franconia	16.23%	\$5,625,000.00
Blueblock	10.96%	\$3,750,000.00	Blue Lock	7.22%	\$2,500,000.00

Appendix 3 - Average appreciation among select companies in the clean energy and software/internet industries

Ticker	Appreciation
Energy	
ASTI	29%
CSIQ	-78%
Clean Energy	-1%
AONE	-84%
GNRC	90%
LEDs	-79%
Average	-21%
Internet and Software	
BIDU	442%
SFLY	178%
LNKD	173%
Z	81%
ZIP	-1%
P	-38%
Average	139%