Askeladden Research Document:
Aspen Aerogels (ASPN)

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Executive Summary

Aspen Aerogels (ASPN) is one of only a handful of companies owning proprietary technology around the commercial-scale manufacturing of an insulation material (silica aerogel, commonly referred to as just "aerogel" as it is the most common of a broader class of materials) that represents a step-change improvement relative to existing insulation materials such as fiberglass, mineral wool, polystyrene, and so on that have been around in relatively similar form for 50 - 100 years. The company's aerogel blankets offer 2-5x the thermal insulation of comparably thick insulation alternatives (reducing installation expense and enabling more efficient/compact design), while providing other important qualities like hydrophobicity (repelling water rather than absorbing it and thereby preventing corrosion or mold under the insulation).

Aspen's first commercialized market was energy (where it has a sub-5% share of a roughly $2B+ TAM) and this market, from subsea pipelines to refineries, has obviously been challenged as of late; Aspen has been treading water on the top line while gaining share of a market that has gotten dramatically smaller. But most interestingly of all, they have pushed through consistent mid-single-digit price increases on top of three or four years of similar pricing improvement, despite the soft energy environment - suggesting that their product has real value (considering that other clearly differentiated energy-focused technical products vendors, such as Thermon and Dynamic Materials, have reported material pricing pressure - even premium products are getting punished in today's environment - yet aerogel is not). Meanwhile, customer partnerships and third party research suggest that the company should, without a terrible amount of incremental effort or expense, be able to develop and market products that address new end-use cases, expanding their TAM toward the estimated ~$40 billion total annual spending on insulation. With a current revenue level of $100 million, the company could quadruple its revenues over the next decade and still represent a paltry 1% of the total insulation market - seemingly an achievable level for what by all accounts appears to be next-generation technology.

Since its inception in 2001, Aspen has accumulated a retained deficit of over $400MM on a GAAP basis, and as recently as 2012, the company actually had *negative* gross margins. However, the company has clearly turned the corner: gross margins are now in the mid-20s, and the company is also demonstrating operating leverage on line items like R&D. While the company is not yet close to being materially profitable on a true GAAP basis (i.e. after subtracting stock comp and book taxes), they are strongly positive on operating cash flow and the majority of capex will be tied to growth investments.

Although incremental unit economics for new capacity builds currently appear mediocre at best (a low double digit cash on cash return), I believe Aspen's rapid improvement in gross margins over the past few years, combined with its ability to raise prices and enter new markets with limited incremental R&D expense (the core product is very similar), will allow it to deliver double-digit annualized growth over the next decade or two with incremental returns on capital improving into the teens or twenties over time (a very attractive proposition for a company that has a long growth runway). In the near term, a substantial base of deferred tax assets roughly equivalent to the company's market cap will boost/protect cash flow, and management has made the smart financial decision to not get ahead of their skis by deferring the construction of a second factory (that would double their existing capacity) to better align capacity coming online with end-market demand (i.e., the energy market strengthens and some of their products for new use cases hitting the market). While the market reacted extremely negatively to the company's decision to defer the capacity addition (sending shares down from $6.60 prior to the November earnings report down to a low in the $3.70 range and a price of $4.20 today), I believe this was absolutely the right decision from a financial perspective.

At a current enterprise value of sub-$80MM against forward revenue in excess of $100 million and likely better than $110 million, with strongly positive operating cash flow and a clean balance sheet (although they will incur material debt at such time as they choose to build the new facility) and a clearly disruptive technology that should take substantial share of the global insulation market over the long term, Aspen Aerogels seems like a reasonable investment candidate (at a small position size). While there will inevitably be some competition in the market, particularly out a decade or two when some of Aspen's patents start to expire, aerogels have been around for 85 years and yet Aspen is only one of only a handful firms to commercialize them at any sort of scale - after 15 years of research and $400MM in cash down the drain - so that's not really a concern at this point in the firm's lifecycle. The bigger risk is that management builds a big facility they can't run profitably (a la ZINC), but their measured approach, clearly differentiated (i.e. non-commodity) product with pricing power, and historical success in building out additional capacity and profitably scaling revenue suggest that this is not a risk so large as to obviate the company's attractiveness as an investment.

Background/Context on Aerogels and Aspen

Aerogels were invented/discovered in 1931 by a California chemist; an aerogel is basically a gel where what would normally be liquid is instead replaced by a gas (air, hence, "aerogel.") These aerogels, which are 97%+ air, have a number of interesting properties - they are quite strong relative to their size, they are incredibly low density (typically weighing only 15x air), can be treated to become extremely hydrophobic (i.e. water-repellent), and perhaps most interestingly for our purposes, are astonishingly good insulators - a 10mm aerogel blanket can provide 2-5x the thermal insulation (measured by R-value) of comparably thick layers of conventional insulation materials such as mineral wool, fiberglass, or expanded polystyrene.

The following photograph from Berkeley National Laboratory, of a flower resting on a piece of silica aerogel that is suspended in midair by the flame of a bunsen burner, dramatically illustrates both the aerogel's low density (it's floating!) and its superinsulating properties. (Another video, featuring a Hershey's Kiss protected from a flame by a piece of aerogel, is available here.)

While aerogels have been around for 85 years and their interesting properties are well-understood, they never really progressed beyond laboratory curiosities until recently. Founded in 2001 as a spin-off of Aspen Systems, Aspen Aerogel has developed a line of products based on incorporating aerogels into a fibrous mat, which obviates some of aerogels' typically tough-to-handle physical properties.

Rather than reinvent the wheel, for some deeper technical context on Aspen's product, here is an excerpt of a blog post from Steve Steiner, who completed a PhD in Materials Chemistry at MIT and runs a website called aerogels.org to provide the public with information about aerogel technology.

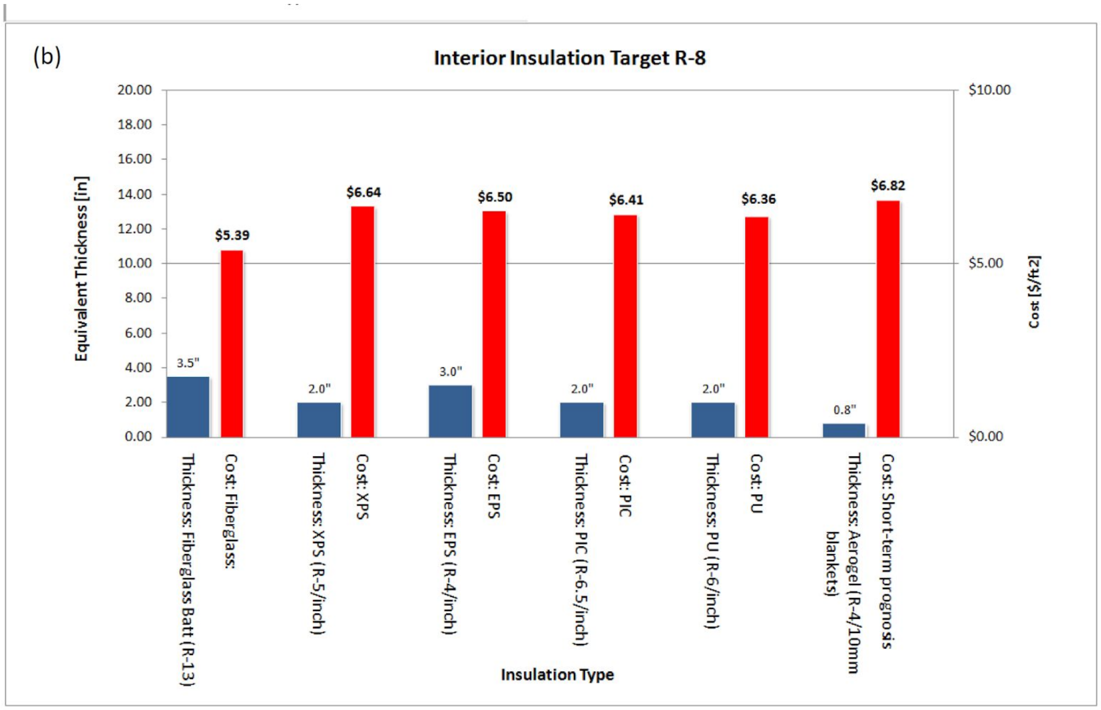
[blog excerpt redacted - please see above link]

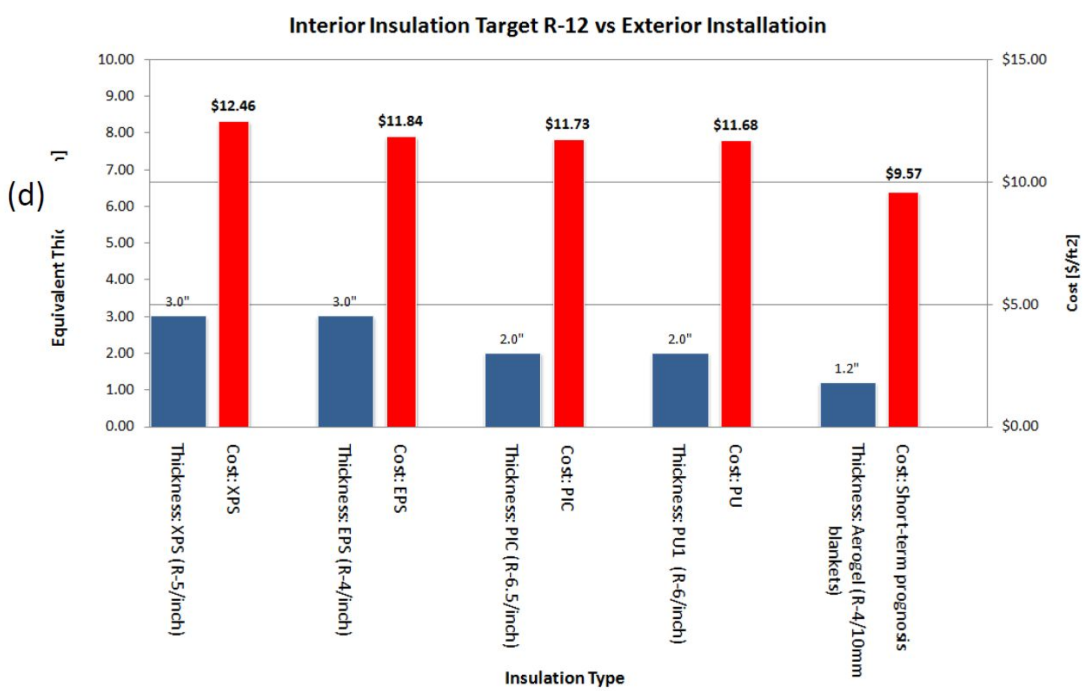
Customer Value Proposition

From a technical perspective, the value proposition of aerogel as insulation relative to legacy materials is utterly obvious and doesn't really bear any more analysis - aerogels are clearly a step-function improvement relative to other insulation alternatives, providing substantially improved thermal performance coupled with useful qualities such as a thin profile (reducing construction costs and making installation easier) and hydrophobicity (preventing the accumulation of water in the material). Aspen's investor materials contain the standard slide talking about how they are used by 24 of the world's top 25 refinery operators, etc etc - their technology has been validated by demanding customers already; the issue now is around penetration.

The question, as with any new technology, is cost-effectiveness: as of right now, it appears that aerogel is modestly to significantly more expensive on a raw cost per equivalent thermal insulation (R-value)[1] basis. Some research (admittedly with Aspen Aerogels' name on it!)[2] finds that aerogel can be cost-competitive for certain interior insulation projects:

[1] When comparing the cost of insulation materials, raw square feet is not a good metric because different thicknesses of different materials will have different insulation capacity. Long story short, the most appropriate way to compare is based on something called "R-value" which is basically a measure of how effective the insulation actually is from a thermal perspective.
[2] https://www.brikbase.org/sites/default/files/best3_shukla.pdf





… while other research[3] indicates that it is currently significantly more expensive for most buildings.

[3] http://kth.diva-portal.org/smash/get/diva2:533307/FULLTEXT01 paper by Lang Huang at Stockholm'sKTH Industrial Engineering and Management (university)

As was discussed in the blog post excerpted earlier, the “killer app” for silica aerogel proved to be the energy industry - in refineries, LNG facilities, and subsea oil pipelines, aerogel’s relatively thinner profile allows more compact construction (saving on steel and other costs), while its hydrophobic nature prevents potentially costly and dangerous corrosion under insulation. Thus, while aerogel is likely not directly cost-competitive purely on the basis of installed cost, when more of a TCO approach is taken, Aspen has an opportunity to win.

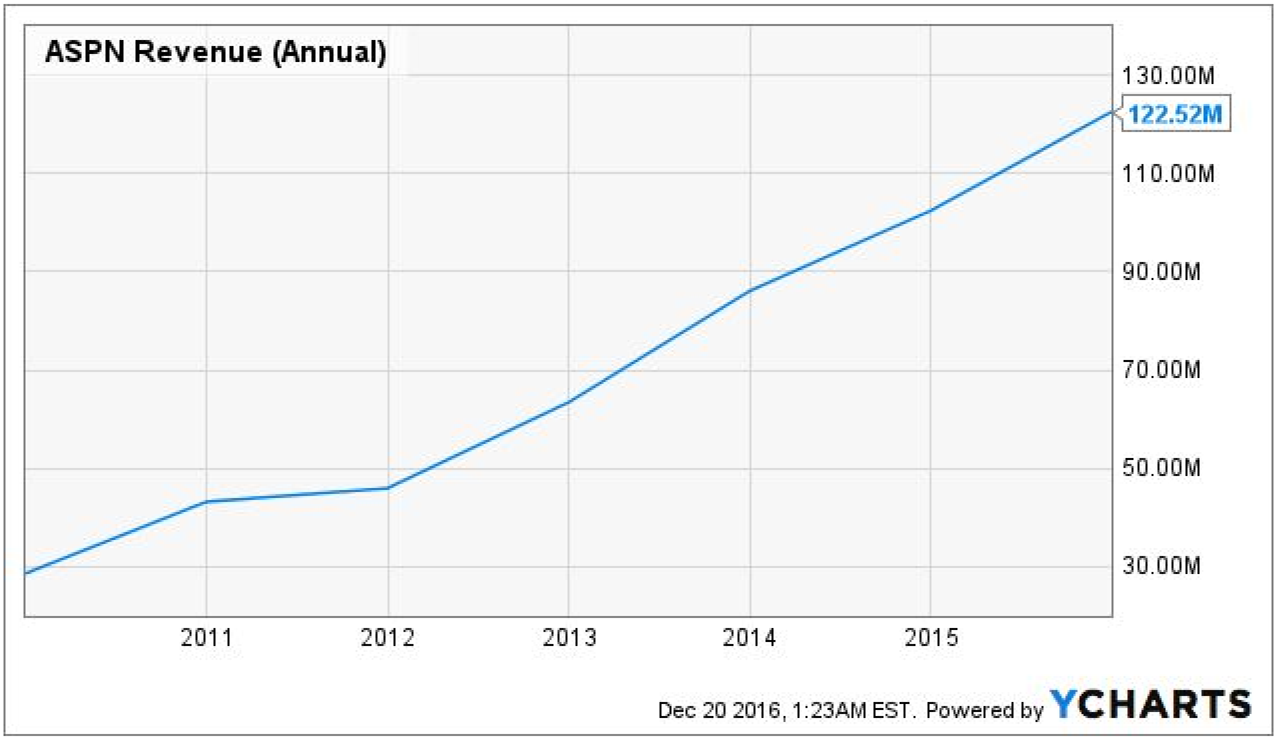
From my research, four specific things substantiated to me that Aspen’s technology has a strong value proposition. In rough order of importance,

1. Aspen has increased pricing by 4-5%/yr for the past 4-5 years - *despite the brutal energy environment*. Companies with strongly differentiated, functionally duopolistic or unsubstitutable technical product offerings, such as Dynamic Materials (perf guns for well completion) and Thermon (heat tracing for both upstream oil sands and downstream refineries / chemical plants), have seen modest to material pricing pressure. While I haven’t reviewed every single energy-levered company out there, it is literally stunning that Aspen has told its customers to pay more for the same product in this environment and they’ve said “okay.”
2. While Aspen’s revenue growth has stalled out (will discuss this momentarily), there is reason to believe that they have gained a point of market share by maintaining flattish revenue in a market that is down 20 - 30% y/y.
3. In exchange for exclusivity on some of their building products offerings in Europe, BASF recently agreed to provide $22MM of financing for their new plant in Georgia (temporarily delayed) that is basically interest free and not due for seven years.
4. Prior to the IPO, Aspen was facing capacity constraints and decided for both the sake of margin and telling a clean story to focus on energy rather than building products. Prior to that, however, building products revenue had doubled from $2MM in 2011 to $4MM in 2012 to $8MM in 2013 to a $16MM annual run-rate in Q1 2014. Thus, even within the building products market, there are/were clearly applications where aerogel is valuable.

Economic Model

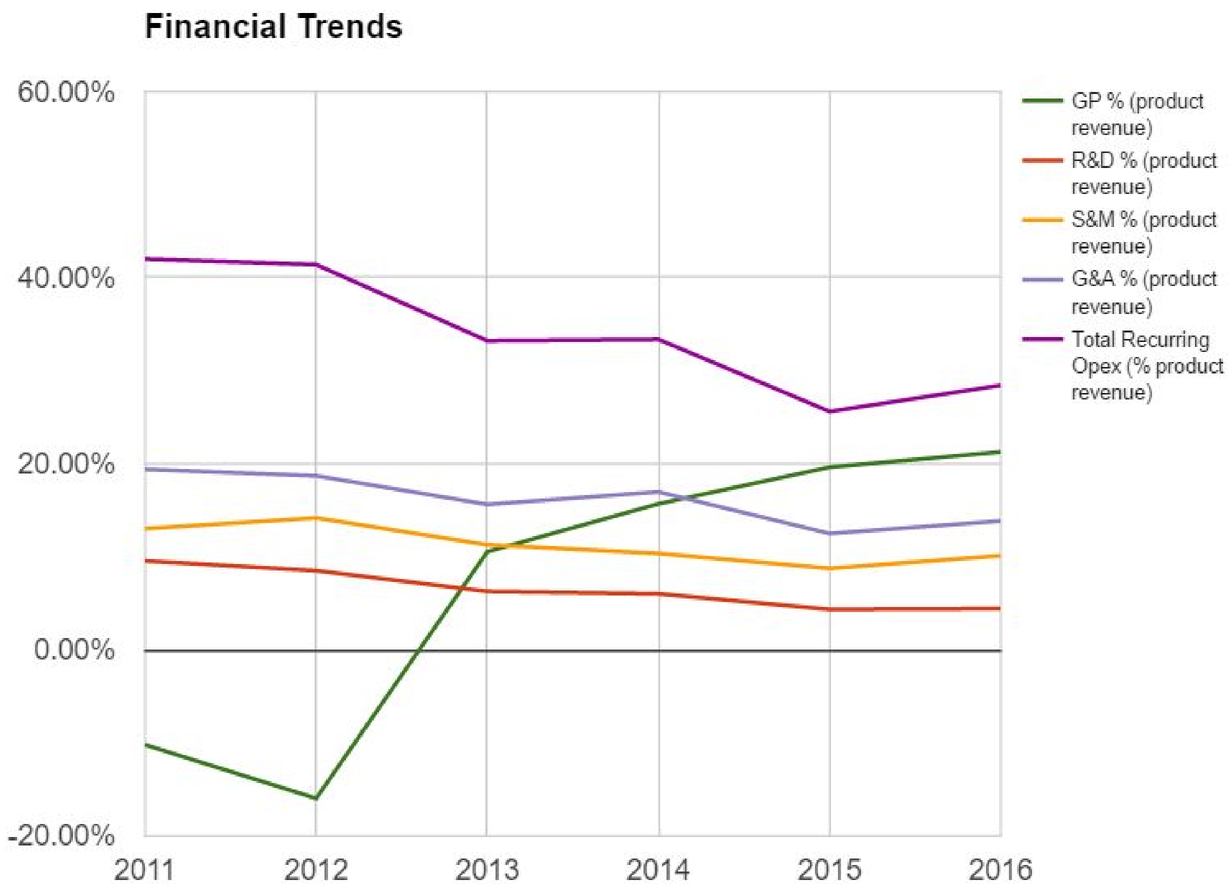
From a financial standpoint, it has been a long, tough journey to commercialize this technology. On a GAAP basis, ASPN has a retained deficit of over $400MM, has apparently diluted many rounds of investors to zero along the way[4], and is still not consistently GAAP-profitable (although it is strongly operating cash flow positive, as I’ll get to momentarily.) ASPN’s major commercial products were introduced in 2008 and the firm has since rapidly grown revenue…

[4] https://mnordan.com/2011/07/01/aspen-aerogels-s-1-analysis/ worth reading



...

... but profitability has taken a while to come by:



Note that the above numbers are GAAP and include elevated D&A, litigation costs, and stock comp - I will discuss these adjustments in turn.

Relative to many new technology plays, Aspen is quite capital intensive. Its last capacity expansion (adding a third line at its East Providence, Rhode Island manufacturing facility) added ~10mm square feet of annual production capacity, and was budgeted to cost $30MM (actually costing $27MM). The new facility planned for Statesboro, GA will be completed in two phases, totaling $115MM or so in cost for another 40mm sqft in capacity - or just under ~$3 per square foot in budgeted cost.

For comparison's sake, the current ASP of a square foot of their aerogel is in the mid to high $2 range (we'll call it $2.60). For the current facility, low-to-mid-teens EBITDA margins are targeted at full utilization (of $150MM). Momentarily pretending that stock comp doesn't exist, and also pretending that maintenance capex doesn't exist, and also pretending that taxes don't exist, cash-on-cash returns for incremental capacity additions would, at this point, be a pretty pitiful low double digit valuation. The math looks like this:

- Denominator: $3/sq foot of capital cost
- Numerator: $2.60 ASP x 13% EBITDA margin = $0.34 EBITDA
- ROIC: $0.34 / $3.00 = ~11%

Considering that there is operating deleverage if you're not operating at full capacity, and also the inherent risks in investing in what is still a wet-behind-the-ears graduate from "science project" status, why the heck did I not stop here?

Well, there are clear signs (to me) that Aspen can and will dramatically improve its margins and returns on capital going forward. They have a long term target of 40% gross margins, and I believe that whether or not they get all the way there, 20%+ Adj. EBITDA margins (and double-digit GAAP operating margins) will end up being quite achievable.

First and foremost, it is clear that in the high value applications where it currently plays, it has been able to drive significant market share gains *while also increasing pricing* - a pretty powerful combination. If annual mid-single-digit price increases continue, that alone will be a material source of margin improvement.

Second, the company has shown clear progress on the gross margin front, with GM% rising from *negative* levels prior to the IPO to the mid-20s today. As the company continues to gain experience with its process and increase yields / find areas to wring out cost, margins should continue to improve. They are still early on in the learning curve and the experience of hundreds of manufacturing companies from previous decades suggest that the more of this stuff the make, the better they'll get at it.

Third, this is a company that is relatively new to manufacturing. Beyond process-specific improvements, there are likely a lot of improvements in standard lean-oriented physical design of facilities and material handling and so on. Their partnership with BASF includes technical support to this end.

Fourth, below the gross margin line (which will be benefited by some combination of the previous three factors), there should be material leverage on all lines. R&D has flattened out in the $5 - 6MM range since 2012 despite product revenue doubling from $60MM to $120MM; while some incremental R&D expenditure will be required to port the company's technology to new markets, the heavy lifting is already done - developing the base technology was the 80; the incremental improvements and new applications will be the 20 (in Pareto terminology). The company's G&A and S&M will also leverage well as they scale.

Industry/ Near/Long-Term Trends / A Bit on Management

The energy-specific insulation market is estimated at a ~$3B annual TAM (maybe $2B, maybe $4B), while the total global insulation market is ~$40B. With around $120MM in revenue, Aspen estimates they currently have around a 4% market share in the niches they serve; over time, it is not unreasonable for me to believe that their directly addressable market will expand to be at least 5 - 10% of the total global insulation market (i.e. $2 - $4B). While it could certainly be more than this, the point is that they are not growth constrained - the sky is the limit so long as they continue introducing new products targeting new niches.

Speaking of, the reason that Aspen's stock is down is that they decided to delay the construction of their new plant (which would nearly double existing capacity). The reason they decided to delay construction is that the energy markets have been down - no surprise.

Indeed, while Aspen's projection for CY/FY2017 revenue is flat to down from CY/FY2016's ~$120MM (roughly), which in and of itself is flattish from FY2015's ~$120MM, the devil is in the details. From 2015 to 2016, Aspen's revenue related to upstream projects (deepsea / oil sands) dropped from $25MM to $5MM - understandably - creating a $20MM revenue hole to fill just to stay flat on the revenue line. On top of that, they estimate that insulation consumption in their downstream MRO market (comprising a large chunk of their revenue) was down 20 - 30% - so even though they gained significant market share, they were basically treading water there.

This is a good time for a quick detour - over time, Aspen appears to be aspiring to a roughly 50/50 mix of MRO/project work, not dissimilar from what Thermon targets. Turnaround/routine maintenance activity at refineries, chemical plants, and so on provides a nice baseload of business. Recently, due to some big project wins, that has been skewed to the project side, but interestingly, many of these projects will translate into captive future maintenance revenue (although it may be 5-7 years out) - some customers are building more compact designs thanks to the thinner nature of Aspen's insulation, and you can't just rip that out and put standard fiberglass in.

Aspen managed to fill the revenue hole by winning a lot of work related to a large Asian petrochemical plant buildout, but now that that's going away, they have another $20MM y/y hole to fill (and they are not projecting any improvement in the energy market for conservatism). They have gained significant traction in the district heating market (i.e. universities, hospitals, and other facilities where steam is heated centrally then transported across the campus for heating purposes) and are introducing a new product aimed at the power/utility market in the second half of 2017. They estimate that district heating alone could be a $50MM+ annual market. Meanwhile, they are also working with BASF to attack the European building-materials market (where a focus on energy efficiency makes them less cost focused, and therefore better consumers of aerogel, than the American market). Nonetheless, their initial guidance for 2017 is for flat-to-downish revenue, and I'm personally modeling $110MM (for what little that's worth). The good news is that their margin performance has been relatively good and there doesn't seem to be any risk of operating cash burn (although they might be breakeven to negative after capex spending.)

From a high level, growth investors have clearly bailed on the story because a company that was growing at a 30-whatever CAGR is now not growing at all. Indeed, this merits a lower valuation, but I think it's important to differentiate structural issues from temporary/cyclical issues. It's not exactly Aspen's fault that the energy market imploded, and indeed, holding revenues flat from 2015 through 2017 is looking like a better performance than many quite respectable companies in the space, even those with high downstream/MRO mixes (Team, Thermon, etc). Throw in pricing power in an environment where everyone else faced pricing pressure, and clearly Aspen's doing something right. As for the lumpy project work, at $120MM in revenue, that's somewhat bound to happen - while the market is sad about that work being gone, they could sign a needle-moving $10MM contract tomorrow - and as Aspen scales, the importance of any one piece of work will start to level out.

Structurally, nothing appears to have changed: Aspen still has a disruptive, leading-edge product that will likely steal massive share in high-end applications over time, and increasingly become applicable in a broader portion of the global insulation market. While the company's G&A spending has been elevated by a few million dollars related to IP litigation against Chinese infringers, absent that, their margins for this year would have come in pretty much on track with what they expected - they are delivering well on their promises. (I went back and compared guidance vs results quarter by quarter, and all of the shortfalls over the past few years are attributable to noncontrollable factors, in my view.)

Indeed, while the market may not have liked it, I thought that management's decision to delay the startup of the new plant was prudent. While they did secure $22MM of seven-year interest-free financing from BASF (and have $20MM of cash on their balance sheet), the $80MM project budget would still require them to obtain probably $40 - 50MM of total debt financing (vs. their current $20MM credit line and $10MM of Adj. EBITDA if we're being generous).

Waiting for the market to stabilize probably allows them to generate a little more operating cash, perhaps fill up their facility and start generating a lot of operating cash (the existing facility should do $20MM+ of Adj. EBITDA when fully loaded), and obtain credit on more favorable terms in a more robust market environment. If what they are saying about their competitive position is correct (and I believe it is), then there's no real rush - if they end up being capacity constrained for a year to 18 months because the market recovers quicker than they expect, so be it - there is so much long term opportunity here that the focus should be on getting it right rather than rushing it. They repeatedly stressed the importance of maintaining a "pristine balance sheet" because of the energy macro - and honestly, if they'd been really hell bent on getting the plant done at any cost, they could've found financing for it in this environment - the fact that they chose to take the conservative route is interesting.

I don't have any strong takes on management other than that they appear to be well-regarded in the industry and their tone is generally cautious, conservative, and surprisingly non-promotional given that they're sitting on a truly disruptive product. They intend to partner (as they did with BASF) to improve their distribution in certain markets, which seems like a smart move to me.

Competition

From a competitive standpoint, there are other firms that market aerogel (for example, Dow Corning with aerogel blankets, Johns Manville licensing from Cabot for subsea pipe-in-pipe, American Aerogels selling pharma/bio transport boxes insulated with aerogel, a company called Aerogel Technologies, some Swedish firm messing around with windows made of aerogel) but my understanding (from both the company and third-party sources such as the MIT PhD's blog) is that Cabot and Aspen are really the only two firms that own IP around commercial-scale production of aerogel.

Given the cost and complexity of developing commercial-scale aerogel production, I think anyone who wanted to get into the business in a serious way would either license from Cabot or just buy out Aspen - and it's also worth noting that most of the major insulation players don't have the same incentive to promote aerogel as Aspen does, as it would cannibalize their existing business rather than really being incremental/additive. Ultimately, I think the market is at the stage that a few more firms entering (whether via license or trying to develop their own technology) would really just validate the market for customers, and I don't think direct aerogel competition is the issue that is really relevant at this point in the market's development.

There are a few Chinese firms selling product (conceivably based on stolen IP) and Aspen is aggressively litigating, but I would be surprised if they are a substantial competitive threat at the high end of the market anyway - refineries/offshore field operators tend to be risk averse (for obvious reasons) and if they're going to go with aerogel vs. conventional insulation, I have a hard time believing they'd have an incentive to buy cheap Chinese knockoff aerogel for what amounts to basis points on their total installed cost (and potentially ruinous costs over the life of the asset).

Valuation

Valuing an early-stage company like Aspen is more art than science. Directionally speaking, the company's current valuation looks way too cheap - with 23.2mm shares out at a price of $4 with $20MM of cash on the balance sheet, the EV is $70 - $75MM for a company that I estimate will do $110MM in 2017 revenue (filling half the $20MM y/y revenue gap). Looking out a few years, energy isn't going to get any worse, and I have confidence that by 2019 or 2020, the company should fill up its existing plant and do $150MM of revenue at say 13% Adj. EBITDA margins (~$20MM adj ebitda). While I hate-hate-hate valuing companies as if stock comp is a non cash cost, Aspen has $140MM of federal NOLS / $62MM of DTAs that aren't on their balance sheet thanks to a valuation allowance, so EBITDA less maint. Capx will convert directly to FCF for quite a while. All in all, 10x adj. EBITDA in 2020 (seemingly reasonable for a disruptive growth company) would get you to around a $200MM valuation three or four years out, vs. the $70MM valuation today.

Now, obviously there are caveats here; the company will take on significant debt to fund its capacity expansion, which may not yet be at a superb ROIC. Still, it seems reasonable to assume that the company will eventually reach a reasonable low-mid double-digit ROIC, and after building this next plant, should be throwing off enough cash flow to self-fund growth.

Ultimately, in the near term, I feel comfortable valuing this business at ~1x revenues, which would translate to a $110MM EV and a $130MM market cap - which translates to a $5.60 PPS based on current S/O. In the low $4s, that makes ASPN seem quite reasonable.

There are many obvious risks here: the new plant ends up horribly over budget and over time, management team screws up in new product development, customers don't decide to adopt, etc. But the last line was completed on-time and below-budget, and management's generally cautious, methodical approach suggests that they will manage the project risk appropriately - and waiting for market conditions to strengthen and some of their new non-energy products to come to market significantly derisks the project (not to mention BASF's interest-free support, although there is no take or pay commitment involved).

Ultimately, a disruptive product with clear pricing power that could become a multi-hundred-million dollar business over the next decade should not be trading for $70MM. Given the risks, I am currently sizing this small (3% allocation), but this is one of those ideas that could actually become higher conviction at a higher price, if they have gotten through some of these temporal issues. For example, if they were to deliver revenue growth and stronger cash flow, enabling them to self-fund some more of the new plant and take out less debt, I would be willing to pay a higher price.

Next Steps

- Understand the broader insulation market in more depth
- Learn more about management
- Talk to IR (call scheduled for week after Xmas, need to come up with questions - they will likely revolve around diving into unit economics, newbuild capex costs, maintenance capex costs, just generally trying to bridge the gap from 20s GMs to 40%)

Ongoing Monitoring/Journal

2016-12-28 IR Call with Shawn Severson (External IR - Energy Tech Investor)

[[NOTES REDACTED]]

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Key takeaways: interesting to know that they had financing ready to go for the plant but decided to delay it anyway; confirms that they are taking a prudent approach. I did not like his answer on Cabot but I also think I exhausted his technical knowledge on aerogels (and we were running into a time constraint he had for another call) - he was more than willing to set up a call with management and I think they will be better able to answer the technical questions.

I think the risk here is much less Chinese patent infringement and much more whether or not there are any key pieces of their IP that eventually roll off and allow "generic k-cups" to be built. That is a) not a short term risk, b) something that is likely only an issue once aerogel is standard technology for many industries, and c) there are other barriers to entry such as getting the mfg process right, etc. However, I don't think they'll be able to sustain 40% GMs into perpetuity without very strong patent protection, and as the story develops over the next few years, this is an issue to understand in more depth.

I actually know a guy who is somewhat of an IP expert and has resources he could draw upon that might be able to understand this issue... I'm not going to reach out to him right now but something to keep in mind for future.

12/31/2016

Reached out to my IP guy after reupping ASPN allocation with new client capital. His take:

He thinks that they will have a hard time "evergreening" original patents - i.e., if they have Patent A on the base technology, then apply for patents B, C, and D every time they come up with a new application or so on, at some point they will lose patent A and it will become commoditized. B/C/D, however, will remain protected.

That said, he doesn't think patents are all that important to the upside case here - while he thinks they would be attractive to a prospective acquirer, he agrees with my business logic argument insofar as the time/money required to replicate ASPN's position (even if you had their patents) makes it unlikely that anyone would really want to try to do that - and also that this is a much later stage problem; at this point in ASPN's development, more competitors trying to get into aerogels would probably only validate the market rather than eating into ASPN's share.

2017-02-07 Review of Needham Webcast (Jan 10)

CEO Don Young:

- Not quite ready to talk about Q4 or give guidance for 2017
- Want to - especially for those of you who are not familiar with the story - step back and talk about the origins of the company, earlier focus
- First slide - we talk about being an aerogel technology company - platform that was initiall funded by NASA along with our research team over the course of many years, we have raised research grants from NASA, DoD, DOE, we continue to win those kinds of research grants, and it's enabled us to develop much of this technology, put in place over 80 patents, 80+ additional patents pending… move from the R side to the D side and now to commercialization.
- We fortified those research grants with VC, strategic investments, and then the IPO - have invested mightily in the business over those years
- Our focus in commercializing aerogels was the energy and infrastructure segment - particularly refinery, subsea, and petrochemical.
- Our product comes in the form of a flexible aerogel blanket - a very durable product - it is one that operates particularly effectively at extreme temperatures (both hot and cold) in contrast to the ambient part of the spectrum.
- We have typically taken a partnered approach in the development of our markets, starting probably the best example was with technip, the large french engineering company, in subsea, working on pipe-in-pipe configurations, we've now done over 50 such projects, this is where you have a flow line, a annular space for insulation, and a carrier pipe. Value of our product was the extraordinary thermal properties allowed them to shrink that down considerably - as trend went to deeper water, longer flow lines, they could execute more difficult projects and improve marine costs associated with laying those lines.
- We worked with exxon-mobile in 2007-2008 to develop pyrogel/cryogel - $550MM+ of installations since 2008 - product that is well tested, still new in the market, no longer exotic in the market - have penetrated, are in virtually all the refining and petrochemical companies - done a lot of the good groundwork and feel we have tremendous growth in these core markets
- Very much an international company - 66% outside the U.S. - that number grew in 2016 to something like 70% export at this point - just a reflection of the markets that we serve.
- Pyro - hot, cryo - cold, spaceloft - ambient (temperature)
- In the middle of 2016, we signed an agreement with BASF - had commercial/distribution, financial components - we have a long relationship with BASF dating back to 2010 where they made an equity investment in our company - we began our first generation of joint development - produced spaceloft A2 which is the subject of our most recent agreement. They've agreed to make a $22MM pre-payment for product going forward that will enable us

to build our second manufacturing plant. Our first plant is in east providence, RI, has revenue capacity of ~$150MM.

- Going back just a bit on our technology - aerogels have been around for decades, mostly in university laboratories - they always fascinated scientists because they have world-class, unique physical properties. We have focused our work on the thermal aspects - nanoporous, open-porous - the element that has frustrated the commercialization historically was not their performance, but the fragile nature of these materials. Part of our research and really this dates back to the work we did with NASA - when they asked our research team to ask how aerogels could be used in the spacesuit program - it caused our scientists to think about a textile, the way they asked a question - so we were able to infuse these silica aerogels into a batting material for strength, durability - after many years of work, we have been able to maintain all the unique physical properties in an industrially robust form and manufacture it at high volume
- People think of our products for the thermal performance - 2-34-5-x more efficient than incumbent materials like perlite, calcium silicate, mineral wool - these were introduced (the most recent ones) in the 1970s - and mineral wool, product with most market share, was introduced 100 years ago. So our customers are not used to tremendous innovation - that has always been an interesting challenge, getting an engineer to move from a product he or she has been using for a long period of time and convert to a new generation
- People are focused on thermal performance for sure but if you ask XOM or Shell, they will reference thermal, but go right to the fact that it reduces corrosion
- Our product is hydrophobic and vapor permeable - unusual in the same material - enables any water that has entered to evacuate and be able to reduce the incidence of substantial, very important, both from maintenance cost and safety point of view
- Great thermal performance translates - the amount of material is lower - you can have a very thin profile, shrink your systems meaningfully - and when you are installnig much less, also much more rapidly - user-friendly and logistics friendly within these complex projects and sites. Finally, great fire properties. Fire properties are gonna come into play in certain types of applications.
- One of the trends in the energy business is to do modular systems - do them centrally then move the system out into a more remote location - durability, compressive strength of our products, ability to withstand great vibration is an attribute that distinguishes it from those incumbent materials, we've been beneficiaries of the move toward modularity in construction.
- As I referenced, we are very much an international company - we have created a substantial asset in our distribution around the world - we're selling now into over 40 countries - it's a real asset for our company relative to - for a company our size.
- We pride ourselves, as a small company, on our important, sustained relationships with some of the largest customers in the world - in several cases, our customers are investors, research partners - we have deep and multidimensional relationships with several of these global companies
- I want to talk a little bit about our strategy, about where we see the market today.

- As I said, our strategy is to leverage our aerogel technology platform, in many cases using a partnered approach, creating aerogel-enhanced products for a variety of different applications.
    - first/core market - subsea, refinery, petrochem that represents 75% of our revenue in 2016 - is a very important part of our history - very important part of our future. We have penetrated these accounts, we're making inroads on a regular basis, and we have an enormous ways to go in terms of growth in these core accounts themselves. While we have broadened our strategy to diversify from core energy market, I don't want people to interpret that as a move away from those core markets, because they're very important to us and we will grow substantially in those for years to come.
    - Second is adjacent markets - those markets here we can use largely the same products, distribution channels, contractors/engineering comapnies, similar end users, and our ability to articulate our value is - we often use a common language in these adjacent markets. Examples of those are LNG, district energy, power generation.
        - LNG: we did, we won three projects in 2016, on the LNG side, each one on average about $3MM per project. I think what's important about this part of the story is that in the years before that, we worked in maintenance doing maintenance within these various - about 19-20 LNG facilities around the world - a lot of times those orders would be tens or hundreds of thousands per opportunity, we executed very well, people came to believe in our product, in the value proposition behind it. Example I would use is - we delivered on a project on Thailand, PTT? Lng receiving terminal - we had done maintenance on their train #1 and what we delivered on in 2016 was a $3MM PO for train 2 - and we are now working with them on their train 3 which is a 2018-2019 project but what's important is we're working on a scope not of $3MM but of $25MM - I could tell that kind of story about several of our efforts, not in LNG but across the board - you start in maintenance, gain their confidence, then you start to gain scope… that PTT example is an important one and we have a great value proposition in LNG; winning a few projects in the U.S. and Australia and Thailand with some of the largest companies in the world gives us a real running start.
        - District energy: this is where you have central steam generation distributed in a tunneled system, you see it in a lot of campuses, medical centers, when you walk around New York and see con ed signs and steam coming out of the sidewalk - those are steam lines that have corroded badly and are in the midst of repair. That's been - that really tests our product in all the ways that our great for us - confined space, where thin profile works well. Hydrophobicity, durability - those tunnels get flooded on a frequent basis - our ability to rebound after being flooded is unique. The ease of installation - rapid rate of installation - these are really important elements. We have grown that business substantially, admittedly from single digit millions, but we feel that

could be a $30 $40 $50 million business in the coming handful of years, contribute to the diversification - not just top line but bottom line…
        - Power generation - what we have said about that, and I believe we will execute well, is that we will introduce in 2H 2017, a product specific to the power generation markets. And this is a product that is similar to our pyrogel that we use, but optimized for that part of the temperature curve that is abundant if you will within power stations - they operate at higher temperatures than refiners/petrochem for the most part - so coming out with this product, I would anticipate coming out with a lead customer just as we did with technip in subsea, exxon in refinery, BASF in spaceloft. We'll do the same - it's a large market. Power industry is roughly a $1.2 billion per annum market (for insulation?) - we're focused on a $400MM subset of that market and think we have an important value proposition there.similar distribution - same E&C companies we're using - so strategic element, adjacent market.
    - New markets: our effort to leverage our aerogel technology platform, and do it using a partnered approach - think about our product as a component within systems which will allow us to go into new markets. BASF is an interesting example - again, riding their broad shoulders into a market that is - would be very difficult for us to address ourselves. And you know, the great thing about choosing the refinery market is - there are roughly 500 important refineries owned by 15 companies - so target rich group of assets that is not that hard for a small group of people to get after - but building materials, europe alone, is a much more difficult with all the owners and architects and contractors and municipal code - really complicated to cover effectively - came to light when we have 37 salesmen globally and BASF has 37 in Belgium. They've been a terrific partner from a technology point of view, financial point of view, commercial point of view, we have high hopes for our ability to develop that market. We are combining some of our best technologies (BASF and Aspen) - the one we're using today is frankly an adaptation of our energy product and I think with this work that we're doing, more spot on for those applications. Again, taking that partnered approach into those markets.
    - In 2016, numbers are not tallied up so I'll give a broad range - but we had between $5 - $10MM in transportation segment - this is primarily high speed trains, bus systems - one other platform - not saying we haven't focused on that area but we haven't had a concerted effort around transportation, has more been by our partners in the field, there's clearly an opportunity to build a business there. Believe it's a business that can be measured in the tens of millions of dollars.
    - So I think you get a sense for, some of the ideas that we have around leveraging aerogel technology.
- So that's the presentation. I was going to just say a word about the market. During our 1x1s we had questions about the energy market and how it impacts our company and whether we have seen any uptick in activity after a relatively quiet 2016 - I would characterize 2016 as an environment where upstream, for us that's subsea and oil sands - big record years in 2014

and 2015 and we - we knew going into 2016 that it was going to be a quiet year and sure enough we went from $25 - $30MM revenue in those markets in 2015 to about $5MM in upstream in 2016 - created a pretty big hole for us to work out of - but what surprised us is that some of our downstream work, industry-wide not specific to aspen, was quieter than we thought - whenever they had a chance to defer ap roject, delay a maintenance, it seems they were taking that, especially in the U.S. but also Europe - Asia was gangbusters - going into 2017, we've assumed the world will be about the same. Quiet on the upstream, same tepid approach to the downstream. We believe we've set internal and external expectations to the extent that if there are surprises, they'll be positive and not negative. So that's our outlook on the energy market, I think parts of our success will be determined in 2017 by how effectively we move into these adjacent markets, new markets that allow us to continue to diversify - I don't like to say away, but diversify, add to our opportunities, away from is the wrong terminology, we're very determined to have a mult hundred million dollar business in core energy.

- Pricing - we put in place a 3% pricing increase on 1/1/2017 - followed 4% price increases in 13, 14, 15, 16 - we have a pretty good trend of putting price increases in place. We feel that value - was enhanced over the course of that time. One asterisk - and that is, the strong dollar has not been our friend - we're a big export machine - we deal only in dollars so if you're a canadian, suncor buying our product, it's 25% more expensive than it was 24 months ago - that has been a more difficult swallow for those international players than the price increases themself. You are right - we have to demonstrate our ROI across a spectrum - the way most of those engineers think about it, there's one measure that is just material cost - for equivalent thermal performance - the second sort of measuring mark is total installed cost. That obviously includes the material, the labor, the logistics around getting the materials installed in a given location. We're quite effective at that point especially with foam materials - and then if we can get you to concentrate on lifecycle, where we're adading durability, corrosion protection - that's why we do well with the most sophisticated companies. We're - we win most of our business - we're multiples more expensive than they are on first cost, so we have to articulate our value in these other areas - but we win most of our business from those, especially outside the U.S., from that product.
- With respect to IP - we have 80 seomthing patents issued, 80 something patents pending - beneficiaries of an important cross license with Cabot - we think we have a rich IP portfolio that protects certain product/process characteristics and surrounding chemistry. We took action against two european distributors and two chinese aerogel companies and - it comes with the territory - we've created a big and interesting market and it has attracted imitators. We're coming aggressively, preemptively, and believe we'll prevail. But lawyers are expensive.
- For us, it's kind of gray where maintenance stops and project starts. Think maintenance as scheduled turnaround and our definition of a project is a beginning, middle, end - debottlenecking or expanding or changing technology in some manner - thermon if you're familiar, they simply said anything >$1MM PO is a porject and anything sub-$1MM is

maintenance - but roughly 50% of our business in any given year is maintenance and 50% is project - in 2016 it was weighted 60/40 to project.
- BASF - not a commitment to buy - they provided $22MM to enable us to build our second plant - they have reserved about $87MM of product. So as they take the $87MM, they earn their credit back - so - and if they never take a single dollar of product, in 2024 we have to pay back the $22MM - so the worst case is it's a 7 year interest free loan.
- We will break ground in earnest when we see the market strengthen - our next step is to order the long lead time items -
- The spectrum of pricing and margin - we love our energy business, we're really good at it, and that's particularly high margin business. Building materials, it's a bit newer, we're still fine tuning manufacturing, and it's - a less valuable end use and so those margins are a little lower but still attractive for us.
- No question that the chatter in the market is more positive - we've seen oil prices that are - that have been up above $50 for some meaningful number of weeks - that's generally a positive thing for us - I think - I'm not sure I'm ready to hang my hat on a handshake echo test - don't feel great about that - we just want to wait and see that the chatter turns into purchase orders - tricky part will be, if we win a $50MM order we'll be tempted to turn on the second plant, but I'd prefer to win 10 $5MM orders - breadth, adjacency, diversity - that'll be a relatively high class problem to have

2017-02-23 ASPN Q4 2016 Conference Call

Don Young:

- No question that 2016 was challenging for us - after achieving CAGR of 30% for the seven years from 2008 - 2015, we faced significant market headwinds
    - Solid upstream business led to record 2015 revenue, we expected it would not be a strong contributor in 2016. Subsea, primary component of upsea, declined from $24MM in 2015 to $4MM in 2016.
    - Lag is reflective of late cycle nature of insulation to users.
    - $20MM y/y gap proved difficult to fill and overall product revenue declined by $5MM (4%)
    - While we expected weakness in upstream, we did not fully anticipate softness in downstream, particularly activity levels in refineries and petrochemical. Not nearly as dramatic but the market showed weakness, particularly during 2H. Whenever asset owners had a chance to defer or delay projects or maintenance, they did so. In U.S. our distributors indicated that insulation sales declined 20% industry-wide in 2016. This environment made growth difficult although we were able to mitigate by continuing to take market share and by realizing our price increases.
    - The positive surprise in 2016 was the significant surge in volume from the South Asia petrochemical project - we delivered in 2014 and 2015 at a rate of $14MM/yr, that

annual rate more than doubled in 2016 to more than $29MM - comprising 25% of our total 2016 revenue. On the one hand, project shows scope and scale of a large global project for Aspen - on the other hand, with the facility transitioning to maintenance mode, we expect our 2017 revenue from this account to be $5MM. This leaves us with another substantial revenue hole to fill. We'll discuss this further in our market outlook.

    - Final point regarding 2016 relates to key catalysts that we defined entering the year. There were three - plant 2, market diversity, technology development. In september, we received approval from board for plant 2 and debt. But we decided and announced to pause development of plant 2 to better pace against demand in 2018 - 2020 timeframe - aligns debt and spending with our demand forecast based on the current energy market. We believe it is prudent to maintain a strong debt-free financial position in this market environment - we believe we made the right decision - we remain ready and eager to restart as our core market strengthen and as adjacent/new market continues to grow. In the interim, important to remember we have annual revenue capacity of $145MM.
- Leveraging platform
    - Still substantial room to grow in core markets, we also have important opportunities in adjacent markets.
    - We define adjacent market as - value proposition similar to core, we can use largely the same products, distribution channels, and contractors. First efforts have focused on LNG and district energy. We won three substantial LNG orders - believe they demonstrate the long term role we will play in the LNG market.
    - We believe LNG experience is indicative of adoption cycles in other parts.
    - From '13 - '15 we did small scale maintenance work on 20 LNG facilities. Engineering firms and owners gained experience and confidence with pyrogel - led to project specifications - won increasing scope in LNG projects - three orders in 2016 are good initial wins with $2 - $4MM order sizes. Next step is to leverage these into greater scope in expansion and greenfield projects. Typical range of scope is between $4 and $8MM with a significant project reaching as high as $20MM. We have now earned the credibility to compete for these with a proven solution with a strong ROI for our end users.
    - Key point is appreciating progression from maintenance to small project onto large project - we believe this applies to many of our end markets with most recent being south asian petrochemical - $60MM pyrogel over past four years.
    - District energy - where steam is generated centrally and distributed through a tunneled system - adjacent market where thin profile and hydrophobic nature of pyrogel are important characteristics. Introduced in 2015, more than doubled revenue in 2016, we remain on track to launch for poewr in 2017.
    - Power consumes more than $1B insulation per year.

    - LNG, district energy, and power are examples of our progress thus far in developing high-value adjacent markets to supplement core refinery, petrochemical, and subsea work.
    - No question that market environment in 2016 was challenging and our financial performance was impacted - we remain focused on implementing plan.
    - Believe we are poised to return to growth as energy market strengthens and we develop adjacent and new markets.
- Looking forward to 2017,
    - Assuming upstream and downstream markets will be about on par with 2016. That is to say, no meaningful upstream activity and frugal downstream spending by refining and petrochemical end-users.
    - In light of $24MM hole by south asia petrochemical, we are projecting a decline in product revenue of $5 - $15MM. While there is recent industry sentiment suggesting the potential for increased activity, we believe planning for a slower, more conservative recovery is prudent, given the late-cycle nature of our products.
    - Our goal for 2017 is to build momentum each quarter by gaining share in core end markets, demonstrating value and growth in LNG/power/district energy, and by taking a partnered approach in the development of new markets, including building materials.
    - The interesting element to 2017 projections is that it is comprised nearly entirely of singles and doubles and contains no significant project work. Excluding project work, our base revenue has grown from $72MM in 2014 to $81MM in 2015 to $82MM in 2016 - we project continued growth in this base revenue to $90 - $100MM, representing a significant component of our guidance range. To complete the picture, in addition to the $90 - $100MM of base business, we expect that $10MM of revenue will be derived from a combination of our ongoing subsea and asia work.
    - Growth in base revenue is driven by steady gains in market penetration, growth in district energy and power, and our price increases.
    - Accordingly, we believe we are unlikely to have a significant project-driven revenue gap going into 2018, and given our record of gaining market share and adjacent markets, we believe we are positioned to resume a revenue growth trajectory in 2018.
- Our long-term strategy is to leverage aerogel technology platform
    - Believe core markets will see significant growth as energy activity increases
    - We have continue to invest in R&D and sales/marketing, those investments have resulted in strong technical and commercial positions in core and adjacent markets
    - With respect to potential new markets, another element is to utilize partnerships to diversify our end-markets. Our goal is to leverage our technology platform to create aerogel enhanced products in new markets using a partnered approach. BASF for example. The commercial, technical and financial characteristics of BASF are important components of future relationships with other world class companies.
    - Related note - we commissioned, during Q3 2016, full scale pilot line in East Providence - dedicated to next generation products and operational excellence - pilot

line is an important asset as we leverage our platform with category leading global partners.

John Fairbanks, CFO

- Q4 revenue declined 26% to $27.6MM versus a record in 2015.
- Significant patent enforcement costs - $1.9MM in Q4 versus $100K previous year - for full year, total revenue declined 4% - net loss was $12MM or 52 cents per share - Adj. EBITDA was $3.9MM - patent enforcement costs had a disproportionate impact on net loss and Adj. EBITDA - we incurred $3.6MM in patent enforcement during the year.
- Q4 revenue was $27.2MM product revenue and research revenue of $435K. For the year, product revenue of $115.5MM and $2.2MM of research revenue.
- During Q4, product revenue decreased by $9.4MM or 26% versus last year's record level - this decline was driven by a decrease in subsea revenue and weakness in downstream, offset by petrochemical.
- Root cause of weak demand continues to be constrained capex
- Decrease in ASP - y/y decline in mix - subsea higher margin, southeast asia was project base established in 2013, higher mix of 5mm product
- We expect ASP to increase to $2.75 plus minus ten cents, due to lower SE project mix and impact of 2017 price increases. ASP expectation is included in our 2017 annual revenue guidance.
- Gross margin of 20% unchanged… however, gross profit dollar decreased
- Our variable contribution margin is 45% - so a decrease in capacity utilization will lead to gross margins declining to mid teens for 2017
- I'd like to emphasize we have not seen any significant change to economics of our business - product pricing, material costs, and expenses are stable - projected decrease in GM is a function of decline in revenue volume and capacity utilization
- 2017 guidance - opex increase includes planned increase in sales/R&D, combined with budgeted increase in incentive comp, patent enforcement actions
- Ended 2016 with $18MM cash. $20MM revolver remains untapped - extended term through January 2018.
- Guidance - revenue of $102 - $112MM. Adj. EBITDA - $2MM to $5.4MM loss (incl $4MM of patent enforcement?)
    - Patent enforcement costs will be frontloaded - 60% in Q1, with remainder spread over final three quarters
- During 2017, we will focus on controlling capex to maintain a strong balance sheet - our budget of $7.3MM is comprised of $2MM in new projects and $5.3MM of pilot line, new power market product, and other projects approved in 2016. We expect capex will be frontloaded, with $6.2MM in first half. During second half we plan to constrain capex to $0.5MM/qtr.
- Turning to cash - we expect to use cash during H1 to fund operating losses, patent enforcement, and capex - during second half, we expect to generate cash. In the context of range of guidance, we expect to exit 2017 with $10 - $14MM of cash on hand.

- We don't plan to provide specific quarterly guidance but do think it's important from time to time for expectations during the year. Our financial performance in first quarter is expected to deviate and reflect a new floor for the company - we expect revenue of $102 - $112MM for full year - within scope, we expect $20 - $24MM during first quarter, with growth expected from this base throughout the year.
- As I noted earlier, expect gross margins in mid teens for full year, however, given differential in quarterly projections, we expect GMs of 13% during first quarter and second quarter, with improvement to high teens during second half.
- We also expect operating expense levels to be significantly higher during H1 2017 due to patent enforcement of $2.3 - $2.6MM… so we're projecting Q1 Adj. EBITDA loss of $4MM with improvement on a quarterly basis.

Q&A

- Craig Hallum: LNG - based on lessons learned in more mature segments, any thoughts on when you would expect to see involvement in some of these larger, $20MM projects?
    - not in 2017 - we have a team of people focused on this segment and as projects emerge in all regions, including in Asia where a lot of the activity is taking place, we think we're in a very good place to compete for those projects - again, as I said in my notes, 2017 is going to be made up of singles and doubles - I think that's interesting, that's a nice base of business, avoiding if you will the revenue gap driven by one or two projects as we experienced from subsea and south asia - again, I think it's going to be made up of smaller pieces of business and we'll get that growth from penetration across a much broader group of customers, number of segments.
    - To your LNG point, we think we've done the legwork, proved our value, we'll compete hard for projects as they come up.
- Is this inroads with EPC, project owners, combination?
    - Combination of both - work we did in Thailand - that was very much with the contractor and asset owner as well, very much a joint effort as well - that's an area that is rich with opportunity -
- Last one - petrochem - longer-term question - thinking about other geographies, aramco has been making a lot of noise that they are looking to remake themselves into a petrochemical power - just curious, your historical involvement with aramco?
    - It has been - not significant historically, some of the joint work they did with shell, we were involved with here - there's - a little bit of history to this - if you go back to when we were sold out in 2014 - 2015, even beginning of 2016, we were a little hesitant to open another region, i.e. the middle east, because we were having enough trouble delivering on regions we had begun to penetrate - so it was really about a year ago that we dedicated assets to the middle east - not only aramco but across the region - we are developing distributors and contractors, working with end users across that region - you're right - it is rich with opportunity both directly there but some of the JV work outside of the region

- Canaccord - on the $90 - $100 base business, can you talk about visibility - what you did to build that up? A sense of confidence in that recurring business
    - As I indicated in my script, that number has increased from the low $70s into the low $80s and as I said, will build it to $90 - $100... a little bit of it goes to the progression story that I told about LNG in a way and how that relates to some of our other segments - we are penetrating these accounts, more and more activity at each facility, we're building relationships in new facilities - again, I think it's just a natural progression of penetrating these accounts and being effective globally. John mentioned an increase in sales and marketing, more feet on the street, pushing those accounts hard - we think we have a very good chance of growing downstream business.
    - Continued progress in district energy - introducing power product in second half will make a small but building contribution
    - And of course, smaller price increases but nevertheless 2-3% price increases which - math will work for us.
- On the patent litigation costs - bigger picture, can you walk us through your strategy there - is it aggressive enforcement moving forward, would you be open to settle...
    - A couple of thoughts... this company has spent $100MM+ in R&D developing the platform and it is valuable and deserves to be protected - I would say we are being aggressive - we will continue to be aggressive. The dollars spent in 2016, John mentioned, $3.5 - $4MM, and heavy spending now - we're in high season right now with the U.S. effort and so we expect meaningful Q1 - we think we will prevail and that will send a strong message across the market - so that's our philosophy - we do not anticipate this will be endless at these kinds of levels - but we tried to go out preemptively to stem this early on.
- On new product side - how should we think about 17 milestones around, BASF or new u tility product - should we see decent order flow or is this more of a seeding the market, getting channel ready, and when 18 is some of the orders
    - Utility - we're really excited - right on schedule, installing equipment in east providence, have a team working accounts there - we would love to, in the second half, launch it with a lead customer if you will, a partner customer - and really come out of the gates hard - not suggesting large volume in 2H 17 but will lay the groundwork for an interesting contribution in 2018 - we're confident that we've got a winner there.
    - With BASF - working very closely on a range of opportunities that improve our company, build out that relationship - some contribution, steady contribution, from building materials segment - and some of our other partners in that area - we really are thinking that 2018 and 2019 will be breakout years for those products.
- Needham - sounds like there's a rough expectation you should see some continued pickup into back end of the year. IIRC in terms of your visibility, lead times, it's improved... visibility has shrank over the course of the last 12-18 months... I'm jus ttrying to get a better understanding of what gives you that viewpoint that you can grow in the back end of the year, is that growth vs. the first half completely incremental? Or how can we think about that

- From a core market point of view - we have expanded our sales and marketing, we have - I think we're doing a good job penetrating these accounts, getting more feet on the street - I would say that in those core markets, we feel there's some buildup occurring, a good chance of - because these are smaller orders, these are containers and not project work, maintenance activities - we don't have the visibility in the sense of purchase orders - we were feeling that we were going to build momentum, each quarter - our goal is for each quarter to be better than quarter before.
- Adjacent will be incremental contributors to that - district energy and power, building materials - we think we can - put some growth on the board here - throughout the year. And again, with power contributing in second half of the year - not enormous numbers - but incrementally positive.

- In terms of downstream, my understanding is after a prolonged period of pushouts of turnarounds… that there's an expectation, growing chatter that turnarounds are really starting, are going to start to become much more active, at least in U.S., pretty good expectation for a healthy uptick - so I would suspect from a maintenance standpoint, those are where you have opportunities - is that part of some of your thinking?
  - For our planning - we have said that 2017 is gonna look a lot like 2016 just in terms of - not further decreases but in terms of flattish market - we certainly are listening for and pushing hard on the maintenance season being richer this spring and fall than it was in 2016 - and you know, we've been - we've been doing the rain dance around that for a while as a lot of companies like ours have been - it's gotta happen - we're hearing same things you're hearing
- So it sounds like you're hopeful but attempting to be conservative and pragmatic as it translates through to numbers
  - Yeah - we're just - we're taking, operating under the premise that it's gonna be - tomorrow's gonna be a lot like yesterday - we have to drive our numbers on current end market - we're not gonna get bailed out by any project - our team needs to be effective penetrating these accounts, developing adjacent markets, driving growth - that's what we're doing - getting better at it with every day that passes - we think building momentum one quarter after another - positioning ourself for a growth spurt -
- Baird: how long can that carry out - into 2018, 2019, 2020 do you need energy to rebound and what if they don't
  - We are operating in a large market here - just in energy infrastructure, upwards of $3 billion - so we have globally - 3-4-5% of that market, higher some lower others - enormous amount of opportunity - even in the market that we're experiencing today to continue to grow this company - yes, we would grow more rapidly, no doubt, in a more friendly environment, but we think we can grow the company even in the environment we're in. new markets as well… not 2017, but 2018 and beyond… ability to get market share will enable us to be successful here.

- JPMorgan: plant 2 - we talked about the hurdle was a 25% increase in shipments, 7-8 quarter lead time… given another quarter under your belt - updated thoughts around the plant 2 framework
    - Really a few factors that we're looking for - to pull the trigger - just to sort of restate, I think what I might've said, is that from the time we pull the trigger to the time we have that operational will be approximately 7 quarters - factors that we're looking for, we would love to see these activity levels, this base business kinda concept, singles and doubles - we would love growth from that segment - we love our projects but growing that base creates a little less whipsaw in our numbers - so that and the downstream numbers will be important.
    - We'd love to see - and we're working the project pipeline all the time - it's not just, knockout type projects in 2017, but we see lots of opportunities in 18, 19, 20 - so as we - as those become closer and we gain visibility and work our way into those specifications and become lead participants in those projects, we'll have some visibility on that, that will give us more confidence as well
    - Third area - this notion of diversity - having things like district energy, power, building materials - absorb more and more of our capacity on the increment - that too will give us confidence - so, I think those three things, I think some combination of those three things will make it relatively easy to pullt hat trigger
    - I think the hard thing would be, if we had another $60MM project sitting there, without growth in the base business and diversification - that's a much harder decision to make - we're really focused on those three elements I decide
- On BASF - any updates on additional partnerships in the pipeline?
    - Well, we're - nothing that we're able to announce now - we're working on, projects, new markets let me say - and a lot of that work starts on the technology side, R&D side, this idea of enhancing products using our aerogel technology - we're a component in a system - these are some of the - discussions we're having, we're in the midst of proving out some of that technology to demonstrate we've got something that is special and unique and protected

2017-03-06 Management Interview

Attendees - CFO + CEO + external IR (Shawn S.)

[REDACTED]

2017-05-04 - ASPN Q1 2017 Earnings

In late February 2017, Aspen provided the following guidance for Q1 2017:

- Revenue of $20 - $24MM
- Gross margins of 13%
- Adj. EBITDA of ($4MM)

Actual results were as follows:

- Revenue of $23MM
- Gross margins of 9.6%
- Adj EBITDA of ($5.1MM)

Despite the slight bottom-line miss, they reaffirmed full year guidance:

- Revenue of $102 - $112MM
- Adj. EBITDA of ($5.4MM) to ($2.0MM) - implying positive Adj. EBITDA for the rest of the year, more or less.

It is worth noting that patent enforcement costs totaled $2.7MM during Q1 2017 (up from $1.9MM in Q4 2016). These are not excluded from Adj. EBITDA, so the core business looked more like a loss of $2.4MM.

Call:

LNG - have proved themselves in maintenance and are now delivering projects - quoting for $10MM, $20MM projects.

District energy (steam delivery) - introduced in 2015, doubled revenue in 2016. Products have been installed by 50 customers, and were recently qualified by ConEdison. Remain on track to launch, in 2H '17, products for power industry, with TAM of $1B/yr.

Three key performance indicators - 1) gain market share each quarter in core petrochemical, refinery, demonstrating growth in LNG, power, district energy adjacent, and taking partnered approach in new markets, including building materials. Q2 stronger than Q1, Q3 stronger than Q2, Q4 stronger than Q3. believe they will resume growth trajectory in 2018.

Second performance indicator - base revenue - all other than subsea and south asia - last year, $80MM annualized; this year, high $80s 1H, expect $90MM+ annualized in second half. In combination with final shipments, this level of base business will allow us to deliver on 2017 guidance. Nature of 2017 revenue, with no big ticket items, helps us avoid negative revenue comparison from the completion of significant project work.

Third indicator of success relates to strategic importance of diversifying into adjacent markets. We remain on track to launch a new product (Pyrogel HPS) for the power industry. Success - $2 - $3MM (?) during late 2017… maintenance, then project, etc. bonus would be to attract a lead customer, as we have in the past with Technip, Exxon, and BASF. Successful rollout of Pyrogel HPS is also an important demonstration of an Aspen core compentency - ability to commercialize new aerogel products. They are hoping for a partnership with one of the big turbine manufacturers rather than an actual utility - they didn't specify but it sounds from tone like they're in discussions…

Contribution margin / incrementals are 45%. They also expect to see a meaningful decline in patent enforcement costs to $400 - $600K per quarter. Reiterate cash exiting year of $10 - $14MM.

--

Going into earnings, I'd taken the position up to about as high as I feel comfortable with (~480 bps or so) given the idiosyncratic risk factors here. I did note an interesting insider buying pattern - director Robert M. Gervis, who has been on ASPN's board since January 2011 and had 15 years of experience at Fidelity from 1994 - 2009, including running their structured credit business and doing random stints in operational and private equity roles, set up some sort of 10b-5-1 buying program that had him in the market almost every day since late February. He appears to have bought ~100k shares over the past few months - $400K probably isn't hugely material to his net worth, but it's still a sign of confidence.

Insider	Relation	Last Date ▼	Transaction Type	OwnerType	Shares Traded	Last Price	Shares Held
GERVIS ROBERT M.	Director	05/01/2017	Automatic Buy	indirect	110	4.0000	71,302
GERVIS ROBERT M.	Director	05/01/2017	Automatic Buy	direct	140	4.0000	97,727
GERVIS ROBERT M.	Director	02/24/2017	Automatic Buy	indirect	18,355	3.9600	18,655
GERVIS ROBERT M.	Director	02/24/2017	Automatic Buy	direct	18,430	3.9600	44,708

There wasn't any explicit good news / upside in the Q1 results, in my mind - I was hoping for a bit more of a pickup in the energy market - but it met my expectations on the whole. While profitability was a bit weaker than expected, it seems like the patent enforcement costs will significantly reduce and then hopefully go away; meanwhile, the company continues to sound very confident about the outlook for this year based on singles and doubles and expansion in markets like LNG/District Energy, without any uptick in energy or major project work.

I continue to believe that on relatively achievable results (say, $130MM revenue in 2019, or a ~12% CAGR off $105MM in 2017 revenue), the company should be a double or better in three years (1.5x revenues or thereabouts / assuming no cash generated and existing cash offset by share dilution). I don't think there's much to do here but sit and wait patiently.

2017-07-28:

I've been buying ASPN when I can this month (it's sort of hard). Up to 530 bps now and trying to take it to 6-ish at or below $4.37 (kind of arbitrary). They PRed their new product for the power market but didn't announce a partner - let's see what they say on the call…

2017-11-03 Update

Date Today: 2017-11-03

Price Today: $4.80 / $110MM market cap / ~1x P/S (closer to 0.9x EV/S)

Fair Value Estimate Today: $5.50 / $130MM market cap / ~1.1x forward year P/S

Date Last Time: 2017-07-28

Price Last Time: $4.40 / $100MM market cap / ~1x P/S (closer to 0.9x EV/S) / ~1.0x forward year EV/S

Fair Value Estimate Last Time: $5.50 / $130MM market cap / ~1.1x forward year P/S / ~1.0x forward year EV/S

Delta Explanation: I guess I didn't ever get around to writing an update after Aspen's last quarter, nor did I ever really note down thoughts from my August visit to their plant in East Providence, RI (where I met their CFO, John Fairbanks.)

Summarily, my position on (and in) the company continues to be more or less the same. Results during 2017 have been very slightly weaker than I would've liked, not from a top-line sense but rather in the sense that the composition of revenue during Q3 was a little more mixed toward project work than I would've liked. On the other hand, the company stated that it has secured some "large project" orders for 2019-2020, which is a welcome and positive sign that could serve to materially boost revenue and profitability in those years. They successfully released their Pyrogel HPS product (optimized for the Power industry / high temperature applications), and it is shipping for revenue, and should generate a couple million in revenue this fiscal year. Adj. EBITDA and revenue guidance were modified slightly (lower and higher respectively) but more or less, ASPN is still on track with my thesis.

I did trim the position a little bit - it had been above 6% but I sold a little at $4.40 and then again today at $4.80 - partially driven by rising price, and partially driven by addition of ~300 bps of [Energy Micro-Cap], which, while not theoretically *that* correlated with ASPN given that [Energy Micro-Cap] is upstream/oilfield whereas ASPN is more chemical plants / refineries / etc, there is clearly still some similarity in terms of exposure.

Developments: Slightly Weak Base Revenue, Strong Subsea, Strong Long-Term Project Orders, Patent Case Going Well…

Starting with revenue, on the whole things look good:

> *Our second topic today is an update of the 3 important indicators related to the 2017 performance of our business. Our first indicator is focused on our goal for 2017 to build commercial momentum each consecutive quarter by gaining market share in our core end markets, principally refinery and petrochemical companies, by demonstrating value and growth in our adjacent markets, including LNG, district energy and power, and by taking a partnered approach in the development of new markets, including building materials.*
>
> *We are measuring our progress towards achieving this goal by driving increases in quarterly revenue throughout the year, with Q2 stronger than Q1, Q3 stronger than Q2, and Q4 stronger than Q3. We believe this momentum and the continued successful development of our core, adjacent and new markets will position us to achieve our revenue and adjusted EBITDA goals in the years ahead. We've met this goal this year by growing revenue from $23 million in Q1 to $25.1 million in Q2, to $27.2 million in Q3. And as our financial guidance indicates, we expect even stronger sequential growth.*
>
> *During Q3 we supplied over $3 million of Pyrogel XTE to an important project in Brazil and saw steady revenue growth in Europe and the United States, the latter despite the initial negative impact of Hurricane Harvey. Asia was down after strong growth in 2016 and during the first part of 2017.*
>
> *[...]*
>
> *The second indicator centers on our revenue not comprised of subsea in the South Asia petrochemical [project]. Tracking revenue other than subsea in the South Asia petrochemical project permits us to gauge our day-in-and-day-out maintenance and small project work, which we believe is the base for sustained future growth.*
>
> *To provide context, it is important to remember that subsea and the South Asia petrochemical project together accounted for approximately 30% of our revenue in both 2015 and 2016. However, in 2017 we anticipate that they will account for slightly less than 20% of our total revenue. On the other hand, our base revenue -- revenue not comprised of subsea in the South*

Asia petrochemical project -- has grown in millions of dollars from the low 70s in 2013 and 2014 to the low 80s in 2015 and 2016.

We project continued growth in this base revenue during 2017, driven by anticipated gains in market penetration in our core markets, growth in our adjacent markets and by our price [increase]. We are confident we will grow base revenue to a record level in 2017 and we have a keen focus on reaching $90 million.

This continued growth in base revenue is especially notable given the backdrop of lower 2017 overall market activity levels in energy infrastructure relative to the years 2014 and 2015. With strong orders already in hand from the subsea and from our South Asia petrochemical customer, our focus to close out the year strongly is on generating base revenue

If you want to pick at something, while they're making their revenue targets, the composition/quality is not exactly what I was expecting - they had $5MM of subsea orders in Q3, and it now sounds like $90MM is either the target or the stretch goal for the highly-recurring "base" revenue. In Q1, on the other hand, it sounded like they were shooting for higher:

"We project continued growth in the base revenue during 2017 to between $90 million and $100 million. This projected growth in base revenue in 2017 is driven by anticipated gains in market penetration in our core markets, growth in our adjacent markets and by our price increases."

On the flip side, the resurgence of subsea is nice - it sounds like they have continued order volume for Q4 and Q1 - this is higher-margin product because rather than just shipping it out in rolls, they cut it to size and package it in foil so it can be easily prefabricated around pipes. (I got to see this when I toured their plant.) Here is their commentary around subsea:

Eric Andrew Stine, Craig-Hallum Capital Group LLC, Research Division - Senior Research Analyst [3]

Is that something where -- I mean, I know -- well, along with the refinery and petrochem, you've been a little hesitant to kind of view that as sustainable. Is what you're seeing in subsea -- does that make you more confident that that is something that's sustainable, or are you still kind of taking a wait-and-see approach on that?

Donald R. Young, Aspen Aerogels, Inc. - CEO, President and Director [4]

If you go back, we've been doing subsea work since, I'd say, about 2005. And our historic averages in that space are sort of in the $4 million to $8 million range. When you go back to those years where we had spike in oil prices -- $80, $90, $100 oil prices, those numbers -- our subsea numbers went up considerably. John, correct me -- I think we had roughly $15 million in 2014 and over $20 million of subsea business in 2015. It came down in 2016 to numbers approximately $3 million or $4 million, if I remember correctly. And this year we've seen a nice uptick as, let's just say, oil prices have stabilized and technology has improved; cost-cutting has taken place; combinations have taken place of companies in the subsea, and they have found a way to be

> *more economic for -- and projects are economically attractive in these areas. They're extending existing assets. Our products are terrific in that longer pipelines have greater thermal challenges. So we continue to win a dominant amount of those more challenging opportunities. And all I can tell you is we've got a good Q4 lined up. We've got good Q1 lined up. And there's a lot of -- let me call it this sort of positive body language out there across 2018, as projects are being either dusted off or conceived of right now. So we -- again, we feel better about that business. We do not expect to return to 2014 and 2015 levels, but to be solidly in our historical range is -- feels good to us.*

Meanwhile, they did launch the power market product and are looking to generate "$1 to $3MM" in revenue this year, which bodes well for adding a few points of growth next year. Similarly, it sounds like they are still optimistic about the building products market:

> *And then the third element was the rollout of what we were referring to as Spaceloft A2, in our building materials effort, a first-generation product that we have gone through testing and certification, particularly in the European market. And that process takes longer than we had anticipated and -- but we still believe that that product will contribute here in 2018 and beyond. What I would just kind of try to categorize for you is, just generally speaking, building materials was roughly 4% or 5% of our revenue here in 2017. We believe it can play a much larger role as we roll out in 2018, 2019, and [2020], especially if we continue to make progress with the next-generation product here. So that will have some attributes that we think will be important. Let me just say sort of more broadly, we are working closely with BASF on some of our other -- we talk about the Aerogel Technology Platform. There are lots of concepts that we have, that we have traded ideas with BASF around. And again, it's an important and strong relationship for our company, and we're confident it will pay dividends here in the short term, medium term and [I'm gonna assume they said long term here… there was technical difficulty.]*

Finally, an unexpected positive was that they have apparently been specified into a number of "large projects' in the 2019-2020 timeframe. No specific color was provided, but given that the South Asia plant provided $10 - $20MM per year (or some similarly large number - I don't remember exactly) for a couple of years, this does have the potential to meaningfully boost revenues and profits in those years.

> *Furthermore, we believe the adoption pattern that has characterized our core markets, from maintenance to small-scale projects to larger-scale projects, applies to many of our end markets, most recently LNG. We are now specified for important large-scope projects in our core and adjacent markets which are planned for the 2019 and 2020 time period. Our ability to build base revenue, to position ourselves for significant project work and to continue to exhibit strength in entering new markets gives us confidence that over a 2- to 3-year period we can experience substantial and diverse growth even within the current price environment.*

They expect to be solidly FCF+ in Q4; cash balances should increase:

> *Within the context of the adjusted EBITDA range set out in our 2017 full-year outlook, we expect to exit the year with between $10 million and $12 million of cash on hand*

Meanwhile, although not unexpected, it sounds like their patent defense is going well:

> *While the ITC was deliberating, one of the defendants challenged the validity of 4 of our patents at the United States Patent and Trademark Office. The defendant's challenge to the validity of the patents was denied by the USPTO, a very favorable outcome for Aspen. Then on September 29 the judge overseeing the ITC investigation found that all patent claims that we asserted were valid and infringed by each of the 2 China-based companies. The judge recommended a limited exclusion order as a remedy to prevent the importation of infringing aerogel products into the United States. We anticipate a final determination on the violation and remedy to be issued by the full ITC Commission by the end of January 2018.*

Plant Visit Thoughts / Conclusions

In late August 2017, I visited the company's plant for a tour with CFO John Fairbanks and one of their engineers (Dan O'Hara). Thoughts:

- I did think they were a little bit cavalier about the risks of interim volume declines while they're building their new plant - they didn't seem concerned about the amount of debt coupled with the potential for decremental margins… they seem very confident they will have the volume.
- CFO noted they were pricing / investing "for growth" - apparently they could meaningfully boost prices and invest less if they weren't focused on growth - so, for what that's worth.
- I was surprised how automated the plant was - much less labor than I expected - nice demonstration of the variable margins - and was also, not per-se surprised, but I don't think I had fully internalized how manufacturing-intensive this business is - lots of giant boilers and tanks, a very warm plant environment, etc. This is not light manufacturing / assembly by any means.
- Ultimately, I didn't see any red flags, and came away somewhat more positive (although I'm trying not to be swayed by that.)

This one is going to be difficult for me over time… setting aside the slight position reduction for risk management, I don't think that the ride from here to a higher valuation in the 2018-2019 time frame is all that difficult. The question is how much I like this business: I definitely don't want to own it while they're taking on a lot of debt and building the new plant, but I'm less clear about what I want to do in the interim - once they have positive operating momentum (and operating leverage), will I still want to own the stock if it's at $6 because I think it can go to $8? Or is this really just a business with a price? It remains to be seen…

2018-02-22: ASPN Q4 2017 Earnings: On The Perils Of Bad Economics…

Date Today: 2018-02-22

Position Size Today: ~380 bps (had been trimming in high $4s and maybe $5s, added a bit around $4.50) - probably won't do anything with it for now, although more inclined to trim on strength. (UPDATE: trimmed to 330 bps in the mid-high $4.40s to free up capital for ZIXI.)

Price Today: $4.36 / $105MM market cap assuming 24mm s/o / 0.95x 2018 P/S

Fair Value Estimate Today: $5.25 / $125MM market cap / 1.15x 2018 P/S

Date Last Time: 2017-11-03

Position Size Last Time: ~600 bps (had been trimming)

Price Last Time: $4.80 / $110MM market cap / ~1x P/S (closer to 0.9x EV/S)

Fair Value Estimate Last Time: $5.50 / $130MM market cap / ~1.1x forward year P/S

Reason for Update: Q4 2017 results.

BLUF: ASPN's numbers for 2017 were mediocre and guidance for 2018 is terrible. The longer-term story is hard to call. I'm certainly not adding, but I also don't feel a pressing need to sell: I will continue to watch and learn.

Action Items: I sent CFO John Fairbanks an email (pasted below) and he replied setting up a call for Monday afternoon - although I'm not going to take their responses too seriously (I'd rather analyze this one on the numbers at this point as I'm a bit concerned about charisma bias), I do want to see what they say. (I also want to ask about pricing…)

Explanation: A fund manager friend recently joked that he should abandon his rigorous research process and just buy whatever I thought looked good, since *"everything you've touched this year has turned to gold."* Considering that I view the overall strong portfolio performance in early 2018 (~+24% or so) as merely making up for last year's -3% gross, I've been far more focused on the results I need for the *rest* of 2018 to put up an acceptable two-year 15%+ gross CAGR, and as such I don't think my head has gotten too inflated.

Nonetheless, setting aside market performance, pure fundamentals have been quite kind to me so far this year: LQDT reported its first solidly good quarter in a while, FC obviously blew the roof off, FOGO posted good comps and got bought out, LDL posted solid growth numbers, and so on. Most of my frustration with last year's mark-to-market performance is that I didn't feel like I had any really *bad* earnings reports relative to my estimates - sure, there were a few marginal disappointments, as there always will be, but they were modest in scope. On the whole, nothing to suggest that already-undervalued stocks should languish or get even more undervalued in a generally supportive market environment.

With that context, the golden boy found some pyrite: Aspen Aerogels (ASPN) today put out Q4 2017 numbers, and more importantly FY 2018 guidance, that, if I were in a dramatic mood, I'd call "nothing short of an unmitigated disaster." I'm actually not *that* bearish and I'll instead stick to a more objective "extremely disappointing," but the point is that there's not a lot to like here and a lot to not like: in fact, I'd go so far as to say that this is singlehandedly the worst earnings report I've been through in my now slightly over two years of running a fund. The jury is still out on what exactly that means I should do with ASPN going forward. The easy and obvious answer is "not add," but (depending on price action) trimming may be a reasonable thing to do if I have somewhere else I'd like to put the capital, even though I'd already (thankfully) reduced the position in late 2017 and early 2018 on pockets of price strength.

Although the story hasn't deteriorated so much (relative to valuation) that I think it's uninvestable, ASPN has also clearly not met my expectations after a full year of owning it, and it seems difficult to predict whether the forward expectations in 2019 will be materially better than the very disappointing forward expectations for 2018.

There are really three separate questions I need to answer here: whether ASPN is a company that is investable independent of valuation to anyone (I think yes, strongly), whether ASPN's current valuation is attractive relative to that (I also think yes, but less strongly, and would totally accept counterarguments), and whether ASPN is the sort of idea that my skillset and temperament lead me to be good at analyzing (this one is the biggest question). At this point, I don't view Aspen as a process mistake *per-se*, as it's unrealistic to expect a batting average of 100 - but I do need to think about this one quite closely going forward and figure out if it's the type of story that I am actually capable of evaluating and owning.

Q4 / FY 2017: Pockets of Strength, But Overall, Disappointing

Directionally and roughly, the story on ASPN was that after years of rapid revenue growth, the collapse in oil prices destroyed some of their most lucrative niches (such as pipe-in-pipe subsea applications) and caused a major pullback/pause in discretionary growth, and sometimes nondiscretionary maintenance, capex spend at customers who weren't necessarily upstream but were still affected enough; refineries were also running full-out and deferring maintenance/turnaround type activity. After a few years of flattish to down revenue where projects fell off and market share gains + new product launches more or less just offset the revenue "hole" left by lower end-market demand, 2018 was supposed to be the year where things got back on track: energy markets are looking up and Aspen should have had a bigger and broader base to drive teens-plus revenue growth from.

Instead, "base revenue" grew from a low-$80s number in 2016 to merely $88MM in 2017 against prior guidance of $90 - $100MM, despite price increases and the launch of Pyrogel HPS, which apparently achieved somewhere between $1MM to $3MM in revenue in the back half of 2017.

Putting the numbers together, it's not clear that there was much volume growth in their core business despite energy markets that were unquestionably stronger in 2017 than during 2016. Aspen did note that they tend to be "late-cycle," but they should've had at least *some* tailwinds: Mistras, for example, noted in January 2018 that "fall 2017 turnaround activity was improved over low comparable levels in the fall of 2016," so between that and market share gains and price increases, I would've expected a better result.

Profitability also didn't excite anyone; Adj. EBITDA was negative ($3.3MM), although if you exclude patent enforcement costs of ~$3.5MM, it was roughly breakeven. Of course, "Adjusted EBITDA" is hardly anything to get excited about, as this business is quite capital-intensive and dilution is also fairly meaningful ($4 - $5MM of annual GAAP stock comp on a $100MM market cap). In other words, we're a long way from anything resembling true economic profitability.

And 2018 Guidance Is Worse!

Worse yet, Aspen doesn't seem terribly optimistic about 2018: their "base revenue" target is $100MM, which would represent only 13% growth - considering the seemingly much more favorable market conditions, their usual price increases, and the fact that mere annualization of Pyrogel HPS (not to mention growth off a low base) should, all by itself, contribute 2-3 points of growth. On the project side, they also once again expect a big hole to fill, with South Asia and subsea having contributed ~$20MM in revenue in 2017, expected to drop to what seems like sub-$10MM in 2018 (their guidance was a bit confusing). If there's a bright spot, it's that there doesn't seem to be any particular bottom-up rationale for their subsea forecast; an analyst called them out on it and perhaps this could be a source of upside in 2018, as it was in 2017:

> ***Eric Andrew Stine, Craig-Hallum Capital Group LLC, Research Division - Senior Research Analyst [6]***
>
> *Right, okay. Maybe last one from if you're just on subsea yesterday, Technip called pretty positive commentary on activity continuing in 2018. And going forward, if your view of 2018 more case of -- I know you don't report a backlog but the backdrop for subsea is stands today isn't necessarily there and it's more about guides late cycle and so that would be more late '18 or 2019 work, is that the reason? What technique said and what looking for is different views.*
>
> ***Donald R. Young, Aspen Aerogels, Inc. - CEO, President and Director [7]***
>
> *So Technip has been our largest customer in the subsea dating back to 2004 and '05, so there are great partners for us. I was encouraged to hearing the report I listened then and read their work. Subsea is really difficult to us for a project. We are more than a dozen projects today along the vault in the subsea. And those could break any time. So the hard part is predicting it. And we just -- if you just look at the last 3 years, and John correct me if I'm wrong, subsea numbers were $24 million, $4 million and $14 million. So they are just banging all around the place. So it's really difficult to kind of hanging hard on any particular number and so what we do is we take a longer term deal and just try to find kind of an average number and if you go out 5 years, the average number is kind of that 7, 8, 9 kind of range and we are sort of just projecting that forward here in 2018. We hope Tech me a spot on they are like the middle of that market of history, so they know*

> *a lot. Yes, we do come in late cycle so it would have the biggest impact on us late '18 and into 2019. We feel good about 2019 for a lot of different reasons and that's one of them.*

Elsewhere, on the previous (Q3 2017) call, they'd hinted at some tantalizingly large projects...

> *Furthermore, we believe the adoption pattern that has characterized our core markets, from maintenance to small-scale projects to larger-scale projects, applies to many of our end markets, most recently LNG. We are now specified for important large-scope projects in our core and adjacent markets which are planned for the 2019 and 2020 time period. Our ability to build base revenue, to position ourselves for significant project work and to continue to exhibit strength in entering new markets gives us confidence that over a 2- to 3-year period we can experience substantial and diverse growth even within the current price environment.*

They sort of referenced those on this call, but it's not really clear that "specification" means "win" - here's the commentary from the Q4 2017 call on potential out-year project work:

> ***Donald R. Young, Aspen Aerogels, Inc. - CEO, President and Director [12]***
>
> *Well, let me just -- I can make a couple of comments. We have nice growth in 2017 in both the United States and across Europe. Good growth number very significant numbers in fact in the U.S. and continuing good momentum in that market. And I talked about increasing the size of our sales force. I'm really after a good amount of travel and the second half of 2017, I'm convinced that we can get in front of business in a timely way, our products are now well accepted, they are well proven, there are no longer exotic are now products and we can get in front of business what I'm trying to say what timely way get into the specifications early on and some of these made in large-size projects. I think we are more than where it. So I'm feeling good about maturation level of our products or about adoption cycle the art and so that's been good. I feel good about that. I talked in the past about the LNG market again, we were very successful delivering the 3 projects and the engineering companies and the asset owners gave us very high marks for doing what we said we would do and for that product to be valuable to them. And as you look forward, some of those very same engineering companies and end-users asset owners have next stage project right on the drawing board. So we are in a terrific position to compete not so much for the size that we did in 2017. You remembered those were $3 million, $5 million and $8 million in size, but for projects that could be measured, you know, in the $10 million, $20 million, even $30 million kinds of range, so we've done a terrific job doing that. So -- and also I just want to focus on adjacent markets in addition to LNG. Our district energy business and that launch of our HPS project -- product and continue to be successful. So getting incremental growth from those segment is really critical to versus we as we grow based revenue and position ourselves for some good product workforce.*

Meanwhile, they - extremely confusingly - had this gem:

> *The second performance indicator for 2018 relates to growth in revenue and adjusted EBITDA. The performance indicator is growth and a year-to-date revenue and adjusted EBITDA as measured at the end of each quarter. After delivering a 30% (inaudible) revenue*

> *from 2008 to 2015, our goal is to return to double-digit revenue growth and we firmly believe that significant growth in adjusted EBITDA will follow.*

That's utterly nonsensical. Adj. EBITDA for 2017 was negative $3.3MM, and midpoint of guidance for 2018 is negative $3.5MM, unless I can't do math, so we're already starting out $200K in the hole. It gets worse, though - patent enforcement costs are supposed to decrease from $3.5MM to $1MM or so, while it looks like stock-based comp will decline from $5MM to $4.3MM y/y, such that "core" Adj. EBITDA of the actual operating business will actually be about $3MM *lower* y/y. I might be getting some of this math wrong, but there's basically no scenario where ASPN is throwing off more cash flow in 2018 than 2017.

Part of this, it seems, is discretionary - but also in a disappointing way. ASPN noted in their press release that:

> *In line with this commitment, we have included an additional $6 million in expense for new initiatives and personnel in our 2018 operating plan intended to drive revenue growth in our energy infrastructure business and to leverage our aerogel technology platform to developbreakout opportunities in new markets," said Mr. Young*

Color from the call:

> *We believe, if we can get out in front of business in a timely way, that we will continue to win a growing market share. We are increasing the size of our sales force by 25% in order to take increasing market share in a strengthening commercial environment, an action we believe will enable us to outpace the market and result in strong growth.*
>
> *[...]*
>
> *Looking forward to 2018, we expect gross margins to remain in the high teens for full year, but like 2017, quarterly gross margins to run from a low double digits to the low 20s depending on quarterly revenue fall. This gross margin expectations includes our planned investment and manufacturing personnel to reestablish full time 3 lines operations in the East Providence plant, to improve manufacturing productivity and costs and in support of our EP20 initiative, to expand the capacity of the East Providence facility by 20% by the end of 2020. This gross margin expectation is included in our 2018 guidance.*

While some of this may be one-time R&D project type stuff, it seems like the majority of it is permanent cost structure. It's difficult to reconcile this increased level of investment with their commentary about maintaining their Adj. EBITDA target at capacity:

> *With growth in revenue from our 2017 level of approximately $110 million to our current revenue capacity of approximately $150 million, we estimate that our adjusted EBITDA, excluding IP enforcement cost, will and increase from breakeven in 2017 to a projected range of between $16 million and $20 million. In other words, 40% to 50% of the revenue we generate from current levels drops to the adjusted EBITDA line.*

One of the things I want to figure out (see email below) is how they see these investment playing out going forward. Recall from the initial writeup that ASPN's current ROIC is pitiful and, even if everything goes well, their ROIC at capacity will be marginal at best for a technology leader - this has been a black hole for capital. Any incremental costs would add serious questions to whether this is a business that (at least at this scale) can be run with acceptable ongoing returns on future capacity expansion, although to the extent that they can generate *any* cash flow at this point, past capital spending is more or less a sunk cost.

EP20: Maybe The Only Bright Spot

If there's a bright spot in the results, it's that the company has decided to initiate a capacity expansion, but in a more measured way than their initial new plant idea (which they already spent some money on; it's not clear at this point when they might decide to go back to that). The amount of debt they were going to take on for the startup of the new plant in a market that clearly has the potential for volatility was enough to give any investor who ever heard the term "Horsehead Holdings" a week's worth of nightmares; indeed, I explicitly noted after touring their plant that *"I definitely don't want to own it while they're taking on a lot of debt and building the new plant, but I'm less clear about what I want to do in the interim."*

Instead, what they're doing is something called "EP20," a cute name for expanding their capacity in East Providence 20% by 2020 at the cost of $20MM:

> *The second initiative is our new EP20 capacity expansion project. The goal of EP20 is to increase the manufacturing capacity of our East Providence facility by 20% by the end of 2020. Additional capacity in our existing facility is very valuable. With growth in revenue from our 2017 level of approximately $110 million to our current revenue capacity of approximately $150 million, we estimate that our adjusted EBITDA, excluding IP enforcement cost, will and increase from breakeven in 2017 to a projected range of between $16 million and $20 million. In other words, 40% to 50% of the revenue we generate from current levels drops to the adjusted EBITDA line. The goal of our EP20 project is to expand our current revenue capacity from approximately $150 million to approximately $180 million per year. At $180 million, we project that the East Providence facility will have potential to generate adjusted EBITDA in the range of $28 million to $35 million per year. The $5 million prepayment from BASF will help to accelerate the EP20 project, which in turn will significantly enhance the profit potential and economic profile of our existing business.*

Why expand now, when they seem to be well away from filling up the existing $150MM worth of capacity?

> ***John F. Fairbanks, Aspen Aerogels, Inc. - CFO, VP and Treasurer [15]***
>
> *So our target for base revenue this year is $100 million and we're going to put our resources into achieving that number. And I would anticipate that that number continues to grow in that 10% to 15% range year in and year out, as we move forward. And if you start to put a couple of projects*

> *on top of that level, over the course of 2018, 2019 and 2020, we are pushing apart again that $150 million number. And second, as I said earlier, the only time we can really make these investments and these problems do not manager running full out at a 100% capacity, but as you lead up to that, we have a little bit of flexibility injure management of that facility. And -- of your making that -- we have a strong conviction that they're going to grow double as we talked about and that's why we are making those investments now.*

The good news is that this is a stage-gated rather than "big bang" project; they are spending $3MM in 2018:

> *And one other point Sean some of the advanced that will make this year that $3 million in capital expenditures, will be to improve yield and our plant. And that -- those yield improvements increase our outlook, but it also drops or cost. So there will be a benefit to that bottom line that will accrue later in 2018, into 2019 and '20. So -- it will help us becomes more profitable. The other piece of it is the EP20 projects themselves are principally capital. So it's capital expenditures. And this will not require us to increase the operating expense level in our business and that's why the incremental profitability associated with the increased potential profitability will increase of $30 million from $150 million to $180 million if so profitable to us. So I think this investments are making in 2018 is limited to $3 million of CapEx. That's the right time for those projects when we start to fill the plant we won't be able to accomplish those projects. We get an immediate benefit from yield improvement and then we get the benefit from improved profitability and cash flow when we do will the plant. So from that perspective, we thought it was the right time to make the investment.*

As analysts obviously pointed out, there's a contradiction implicit in the contrast between the weak 2018 guidance and the decision to expand capacity; management has never seemed super promotional (see their clear, honest assessment of "underperforming" on the call) or outright *stupid* (I did think CFO John Fairbanks was a bit cavalier on being willing to take on so much debt to build the new big plant in Georgia eventually, but they seem to have found a more acceptable solution). Nonetheless, perhaps the most intriguing bullish angle here (beside the directionally-positive long-term implications) is the fact that BASF, the world's largest chemical company, hasn't gone anywhere:

> *My second topic today is the $5 million prepayment we will receive from BASF in 2018. BASF is clearly among our most important global business partners. In June 2016, we signed agreements with BASF that included commercial, technical and financial elements. The financial support was initially linked to our capacity expansion plan in Statesboro, Georgia. Last week, we amended the agreements to receive $5 million in prepayments in 2018, which will be focused principally on 2 initiatives. The first initiative is our joint development work with BASF, focused on building insulation. We have made rapid technical progress on an important next-generation product, which has world-class thermal properties and is noncombustible and is easy to use. We, both BASF and Aspen are excited about completing these development efforts and realizing the*

potential of our combined technologies. The $5 million prepayment will help to accelerate these efforts.

[...]

Eric Andrew Stine, Craig-Hallum Capital Group LLC, Research Division - Senior Research Analyst [4]

Right. And that is said to my second question. It seems like the health of that relationship is in very good shape is. Is it a case where -- I mentioned to think about that plan to -- I mean that pushes that off quite a bit over the BASF doesn't necessarily care whether there are $20 million eventually goes to plan to our it's invested in your plant. Just want to have that capacity?

Donald R. Young, Aspen Aerogels, Inc. - CEO, President and Director [5]

Yes, they would like to access to that. Guaranteed access to the capacity. If you go back to the 2015, early '16 timeframe, there were points in time there fever capacity constraints, significantly -- wait '14, '15 and the early '16, and they were concerned having that happen to them again and so this part of their motivation here in helping us with our capacity expansion. And obviously, those provides nice baseload activity for them as well as we go and create this new capacity. So those are the drivers. The relationship is very strong. We know we have talked a bit here about the financial parts of it, but they helped us with some of the operating improvements that we are making in our facility in these problems and of course, we are working closely with the JDA on these next-generation products as well. So it's a strong relationship. We appreciate their help

Aspen is obviously not even a small bite for BASF; it's not even a nibble… it's a teensy-weensy speck of a crumb. The fact that BASF continues to be willing to be willing to invest (on very attractive terms to ASPN relative to market debt) in securing capacity for the building-products market, after a few years of messing around with it and seemingly not reaching commercial viability, is a positive sign.

Valuation: What Is The ASPN Thesis Anyway?

Aspen has always been a black hole for capital; my thesis was that it will grow and at the end of that growth, it is worth *something* to *someone* on the basis of revenues and technology: either the company will figure out a way to more effectively engineer product as it grows, or some chemical/industrial giant with a penchant for good management will snap them up, use their massive salesforce to distribute the product, and generate some efficiencies via purchasing power or spare capacity somewhere or who knows.

That's obviously a very "squishy" thesis relative to an industrial company like Lydall or Dynamic Materials that has the growth and also the ongoing cash flow that will likely be allocated in a thoughtful, shareholder-friendly way. My initial expectation was that ASPN's returns at capacity will be mediocre, but not so terrible as to make it uninvestable; clearly with the incremental opex investments, that is now a question that somewhat has to be reopened.

Nonetheless, after all that, it still seems that Aspen is meaningfully undervalued - even using assumptions more conservative than management's and accounting for dilution, the fair value of ASPN on a forward-looking basis appears to be somewhere from $5.00 - $5.50; $5.25 seems like a reasonable midpoint. Here is my current methodology:

	2018	2019	2020	2021	2022
revenue	$110.0MM	$126.5MM	$145.5MM	$162.9MM	$179.2MM
adj ebitda	-$3.0MM	$3.6MM	$11.2MM	$18.2MM	$24.7MM
rev growth		15%	15%	12%	10%
incrementals		40%	40%	40%	40%
fair multiple (rev)	1.00x	1.05x	1.10x	1.15x	1.20x
implied ev/adj ebitda	NM	NM	14.3x	10.3x	8.7x
fair value	$110.0MM	$132.8MM	$160.0MM	$187.4MM	$215.1MM
sharecount	24.0mm	24.5mm	25.0mm	25.5mm	26.0mm
fair value/share	$4.58	$5.43	$6.41	$7.36	$8.28
NPV (value as of Feb-2018) @ 10% discount		$4.93	$5.30	$5.53	$5.65

I assume a 24mm diluted sharecount for 2018 (up from 23.5mm at year-end for conservatism) and 2% annual dilution thereafter. I make the simplifying assumption that all free cash flow is reinvested; in other words, near-term cash burn is offset by out-year cash generation, and they end up with a more or less net neutral balance sheet (which is where it seems they'll be at the end of 2018 - they cited $10MM cash exiting the year, but they will have $5MM of "debt" to BASF and currently have $4MM or so drawn on the credit line.)

I assume they do get solid growth in 2019 - 2020 from projects, but I assume that once they fill up all the capacity by 2022, their adj. EBITDA will only be $25MM, vs. mgmt's guidance of $28 - $35MM. I continue to use a relatively low revenue multiple and (at scale) a low EBITDA multiple to account for the capital intensity of the business. I'm not assigning any discrete value to the massive pile of NOLs, either (there has to be meaningful cash flow for there to be meaningful NOL value, and ASPN is a long way from tax rates being a meaningful valuation input).

The long/short of all this is that even with more tepid assumptions than I was using previously, ASPN seems reasonable. While you could certainly use more bearish numbers given the disappointing 2018 guidance, I'm not in the habit of violently whipsawing around my projections on the basis of one quarter or one year; on the upside, ASPN's base revenue does at least appear to be fairly stable, and winning one or two large projects could meaningfull boost their revenue in 2019 - 2020.

Alternatively, using a 20% discount rate (my required rate of return), the fair value of ASPN would be anywhere from $4.00 to $4.50 today depending which year you use to back-calculate - in other words, with shares in the middle of that bracket as of close today (and seemingly likely to drop based on the disappointing guidance), it doesn't seem like there's a reasonable case to sell as of yet.

Ultimately, this gets moved down from the "everything's going okay" pile to the "needs close monitoring and thought" pile, but I'm not in a hurry to liquidate the position, as I think you have to underwrite a pretty bearish scenario to justify fair value being lower than the prevailing share price (let alone whatever it opens at tomorrow). That said, with there being plenty of other, lower-hassle names offering attractive prospective returns at the moment, I don't feel like taking on any more judgment/execution risk with ASPN than I have already.

Follow-up Q&A (To Be Completed on Monday)

[REDACTED]

2018-05-02: Throwing In The Towel Before Earnings? (Kind Of)

ASPN reports earnings tomorrow and, on the basis of no news whatsoever, I ended up trimming the position over the last few weeks in the $4.40s from the 330 bps as of late February (380 bps right after earnings) to about ~140 - 150 bps today for no particular reason. I haven't felt a pressing *need* to sell it but also haven't felt a pressing *need* to own it.

A reasonable question to ask is why now, and the answer is: it's complicated. I'm not expecting a bad quarter (I'm not expecting much of anything at all), but I think my attraction to ASPN has faded. I'm roughly around the point of having owned ASPN in decent size for a year, and I think over that time, I've come to realize how much I value business quality and capital allocation when it comes to industrials.

Although not all of the businesses I invest in are an otherworldly level of quality, ASPN certainly sticks out like a sore thumb within the industrials I look at. It's a story stock, plain and simple. The thesis is that as they move up the learning curve, they'll generate economies of scale that allow them to deliver decent margins, but I went into this knowing that at least over the medium term, their economics aren't particularly attractive. The offsetting attraction was: a) a seemingly disruptive product/technology with the potential for rapid growth in many verticals, and b) a high maintenance/recurring revenue/annuity-type mix, a la Thermon (THR) or Kadant (KAI), that I like/love in a business.

My feeling now is that while investing in ASPN at $4 or whatever my basis was wasn't a mistake and it's a totally defensible position, it didn't merit the position size that I had it at (600 bps at one point, although a decent chunk of that was gains and not cost basis). Call me a heretic, but I think I've moved fairly dramatically up the "quality" spectrum in terms of what interests me, and late '16 / early '17 (when I started looking at ASPN) was sort of an in-between period where I was still bargain-fishing and looking at dumb names like DTEA and KONA that, in retrospect, were a total waste of my time because I was never gonna buy them anyway... ASPN is not the sort of story that I feel like I've been particularly proficient at evaluating, historically speaking.

I don't feel a lot of sunk costs in giving up a big chunk of my position in ASPN - in fact, I don't have a lot of emotions tied to it at all. Nothing's changed in terms of me believing the company is probably worth more than it trades for, and almost certainly would see a stock price pop if/when they get back to revenue growth, but I also simply have a lot of opportunities that seem better than ASPN (like say LDL below $41, and even CSWI, which I've been opportunistically adding to), and also believe that opportunities will pop up over the course of the year that are better than ASPN.

Given the stock's low liquidity and ability to move down meaningfully, it felt like taking a mid-to-high $4.40s price for a little over half of my position was a reasonable move. ~150 bps feels like the right size as a spec position.

We'll see what earnings tomorrow bring.

2018-05-04: Aspen Aerogels Q1 2018 Update

Position Size Today: ~145 bps

Date Today: 2018-05-04

Price Today: $4.55 / ~$107MM market cap / ~1x 2017 P/S

Fair Value Estimate Today: unchanged - $5.25 / $125MM market cap / 1.15x 2018 P/S

Date Last Time: 2018-02-22

Position Size Last Time: ~330 bps after earnings, down from ~380 before and higher prior

Price Last Time: $4.36 / $105MM market cap assuming 24mm s/o / 0.95x 2018 P/S

Fair Value Estimate Last Time: $5.25 / $125MM market cap / 1.15x 2018 P/S

BLUF: No incremental insight, other than an observation that ASPN will start to become a balance sheet risk (in my view) if they don't start seeing some meaningful revenue growth in 2019. It's hard to call the decision to own ASPN an ex-ante mistake since it was always a somewhat speculative position and things haven't been all that bad, but it's certainly been closer to the low end of my expectations and I may have paid too much attention to the seemingly sharp management / growth opportunity and not enough to the bad fundamentals of the business.

Action Items: none…

Documents Reviewed: ASPN Q1 2018 conference call

Explanation: Are we at peak (or, well, trough) nobody-cares-about-ASPN? As mentioned in my last update, I semi-bailed on the stock, and my exposure has been reduced from over 600 bps at one point to 380 bps to 330 bps down to 140 bps… where it stands today. ASPN's 2017 was pretty okay all things considered, but they didn't grow base revenue as much as they initially thought they would, and their new target for 2018 base revenue, which they're (as of Q1) not even really on track to meet, is equivalent to their *original* target for 2018.

> *With respect to Q1, revenue of $23.1 million was slightly above revenue for the same period in 2017. While not robust growth, we showed improvement in gross profit and margin, in average sales price and in adjusted EBITDA. The activity levels in North America were especially strong, both in Q4 2017 and in Q1 2018. The performance of the U.S. market, in particular, often is a leading indicator for the emerging strength of our core and adjacent markets. As we've described in the past, insulation in the energy infrastructure market is a late cycle product. And therefore, if current market conditions continue to gain strength through 2018, then we would expect to feel the full positive impact later this year and during 2019 and 2020. Our products are well established in the market. Our installed base of Pyrogel and Cryogel is expected to surpass $750 million by midyear. We believe that if we can get in front of business in a timely way, then we will drive growth in revenue. By year-end, we will have increased the size of our sales force by 25% in order to take increasing market share in the improving commercial environment. We have also assembled a talented team to reinforce our approach to project-based work, starting with our products being specified early in the project cycle and ending with definitive purchase orders. Our ability to build base revenue to position ourselves for significant project work and to continue to exhibit strength in entering new markets gives us confidence that we can experience substantial and diverse growth*
>
> *[…]*
>
> *The first performance indicator, base revenue, again, defined for these purposes as revenue not comprised of subsea or the large South Asia petrochemical project is a good indicator of day in and day out maintenance and small scope project work, our version of a recurring revenue stream. We are targeting $100 million in base revenue for 2018, consistent with our goal of long term year-over-year growth in base revenue of between 10% and 15%. Base revenue in the first quarter this year was $21.7 million, which represented growth over last year of 8%, a little under our target range, but we remain confident that we can achieve growth in base revenue for the year in the 10% to 15% range.*

Again, for context, 2017 base revenue was ~$88MM, so getting to ~$100MM would require 13% growth… while salespeople do take some time to ramp up and so on, ~8% growth (with seemingly positive pricing) for a disruptive product in an improving market doesn't seem great. Especially since they expanded into the power market last year and should see adoption there, as well as maybe in building products:

Donald R. Young, Aspen Aerogels, Inc. - CEO, President and Director [3]

Well, this is focused, Eric, on the building materials area, really our first significant foray outside of energy infrastructure. And what I would be able to say right now is that we have continued to work very closely with BASF on a next generation product for this market that combines some of their interesting technology with our aerogel technology and -- to address some interesting characteristics of the building materials market with the principal focus, or the initial focus, at least, for the European markets. So these would be products that would have great thermal performance as you would expect from our materials, but are -- very importantly are noncombustible materials, which are of heightened importance in that market, and of course, around the world. We continue to just make very, very good progress, work very closely with the teams in Europe and here in the United States.

Eric Andrew Stine, Craig-Hallum Capital Group LLC, Research Division - Senior Research Analyst [4]

So we should view this now as more kind of the path that you've been on, just progressing there with the goal. I know at one time they'd looked at potentially -- they've been testing, getting feedback from key customers, looking at potentially launching the Slentex system in Europe in 2018 at some point. I mean, basically this is -- you're just going along that path.

Donald R. Young, Aspen Aerogels, Inc. - CEO, President and Director [5]

Yes. So that was the first generation product, what we refer to as Spaceloft A2, and there's no question that we will generate revenue this year from that product. The JDA itself is really focused on this second-generation product. Really, again, a nice advancement, but there is no question that we will generate revenue from Spaceloft A2, the first generation product, here in 2018.

On the flip side, management commentary on larger project activity for 2019/beyond seems to be pretty positive, and given the size of the company, it seemingly wouldn't take more than one or two decent-sized project wins to get from ~$110MM in revenue to, say, $130 - $140MM:

Donald R. Young, Aspen Aerogels, Inc. - CEO, President and Director [7]

So on the subsea front, yes, it was a terrific project that we worked hard for, and we're able to win. We do see 3 or 4 projects that are about to be awarded, where we think we're in a very good position. They're smaller than the $4.5 million project. I would put them in the category of $1.5 million each, plus or minus $1 million. And -- but again, I think, the revenue's great, 2018 revenue. We had anticipated some nonbase revenue this year. So it's -- I would call it sort of consistent with our guidance. And so we feel good about subsea. But I think it's also a great signal for just activity levels in the market in general. I hope you were able to sense from my comments that we are feeling better about the market. I think we were maybe guardedly optimistic in the last couple of earnings calls, but I think that has continued to move forward and we anticipate strong finish in this year and really positioning ourselves to a really terrific 2019 and 2020

Back on the negative side, I don't think ASPN is going to end this year with a lot of net cash pro forma for the BASF obligation…

> *Next I'll discuss balance sheet and cash flow for the first quarter. Cash used in operations was equivalent to our adjusted EBITDA of negative $2.4 million. Our investment in working capital was unchanged from the end of 2017. Capital expenditures during the first quarter totaled $677,000, down from $2.1 million in the first quarter last year. During the quarter, we also received the first of 2 prepayments of $2.5 million each expected from BASF during 2018. We ended the first quarter with $9.6 million of cash, $3.8 million on our revolving credit facility, net current assets of $25.1 million and shareholders equity of $94.7 million.*
>
> *[...]*
>
> *Turning to cash at an aggregate level. Within the context of the adjusted EBITDA range set out in our 2018 full-year outlook, we expect to exit 2018 with between $8 million and $11 million of net cash on hand. Included in our 2018 year-end cash guidance, is the second of 2 prepayments of $2.5 million from BASF, which we expect to receive in July. We also continue to project the capital expenditures including funds for our EP20 initiative of total $4 million for the year.*

I still don't think the company's balance sheet is "rickety," but it's certainly not a reinforced concrete bunker, either - if the company were to see further downturns, it would either have to significantly curtail R&D or cut to bare-bones maintenance capex to keep from going cash flow negative with a balance sheet that really can't support doing that for very long.

I feel pretty unattached to ASPN at this point despite all the work I've put into it: I don't feel openly *disgusted* or *exhausted* (as I sometimes do with LQDT)… it's more of a very passive 'meh" type feeling. I don't think there's anything wrong with continuing to own ~140 bps, as I think ASPN's 2019 guidance could be genuinely surprising/positive. On the other hand, I also don't feel like it's such a compelling, slam-dunk opportunity here that I would hesitate to sell the remaining position I have if something else really interesting came along.

Notwithstanding the eventual outcome here, I think ASPN is a reminder of the potential pitfalls of being lured by "story" stocks that don't have good fundamental businesses… relative to LQDT, ASPN doesn't even have the backstop of a really robust balance sheet (there is no scenario in which LQDT has to seek financing, whereas there is one for ASPN). ASPN was always a "high-spread" situation and I may have been mentally misled by the comfort of my "midpoint" type estimate. I don't think I've followed it for long enough to come to a conclusive takeaway on its investment merits, but I do think that it's, going forward, not the sort of investment I should try to make.

2018-05-10: Out of ASPN (for now)

Position Size Today: zero

Date Today: 2018-05-10

Price Today: $4.90 / $117MM market cap / 1.08x 2018 P/S

Fair Value Estimate Today: unchanged - $5.25 / $125MM market cap / 1.15x 2018 P/S

Position Size Last Time: ~145 bps

Date Last Time: 2018-05-04

Price Last Time: $4.55 / ~$107MM market cap / ~1x 2017 P/S

Fair Value Estimate Last Time: unchanged - $5.25 / $125MM market cap / 1.15x 2018 P/S

BLUF: I'm out of ASPN around $4.70 as I like the story less than I originally did (I'm now more focused on their crappy economics and potential balance sheet risk) and I have better uses for capital.

Action Items: none…

Documents Reviewed: none

Explanation: I don't really have a lot of new insights here, but 65 pages of research documentation, one visit to their plant, two calls with management, and six conference calls or so have cumulatively led me to decide that ASPN, while still an intriguing story, just isn't the sort of thing I underwrite very well. I sold out at around $4.70 and of course, the stock proceeded to pop close to $5 to end the day.

I wanted to free up capital to buy LGIH while still remaining in the neighborhood of my 10% cash threshold; ASPN proved to be the borderline idea.

I don't think that ASPN was a bad idea when I got into it, but I do now believe that it's not the sort of idea I'm really good at evaluating and owning. I think having a small position was (and still would be) reasonable, but in retrospect, this wasn't the sort of name that should ever have been a 6% position (notwithstanding that it worked out okay.)

I would be willing to own ASPN again in the future as a small spec position if I had tons of capital, OR if their economics improved materially to the point where the business was generating FCF but perhaps not getting full credit for its growth potential. For now, though, it's just going to be on the watchlist.