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John Felts is the co-founder and CEO of Cruz Foam, which produces bio-benign foam and eco-friendly alternative packaging solutions that power key industry leaders to be the catalyst for a cleaner environment. In this conversation with Stanford adjunct lecturer Toby Corey, Felts shares how his engineering studies and career led him to launching a startup, and offers advice for new tech entrepreneurs learning how to pitch to investors and build scalable solutions.

Transcript

Announcer Who you are defines how you built. 00:00:06,080 (upbeat music) - Hello, Stanford community students around the world, 00:00:12,110 and all those interested in phenomenal entrepreneurship. I'm Toby Corey and I'd like to welcome you to Entrepreneurial Thought Leader series. It's presented by STVP and that's the Entrepreneurship Center in Stanford School of Engineering and BASES, the Business Association of Stanford Entrepreneurial Students. Today, I'm not only delighted, I'm super excited to welcome an amazingly talented entrepreneur who's tackling some of our biggest challenges, John Felts to ETL. Let tell you a little bit about John. John is the co-founder and CEO of Cruz Foam and Cruz Foam produces a bio benign foam, an eco-friendly EPS and EPE that's expanded polystyrene, expanded polyethylene alternative solutions, that power key industry leaders to be a catalyst for cleaner environment. John holds a BS in Chemical Engineering from UC Santa Barbara, and an Ms. in Materials Engineering from the University of Washington. He co-founded Cruz Foam in 2017 with the mission of saving our oceans and helping end the global epidemic of plastic pollution.

Before I welcome John, he's got a couple slides which will give you a good overview, and then we're gonna jump in and do a live fireside chat and dive more deeply into this so John, welcome the ETL tell us about Cruz Foam. - No awesome. 00:01:28,500 Thanks Toby great intro and really, really excited to be part of the conversation and have this opportunity. So excited for everybody joining and look forward to engaging with your questions and so I don't think anybody's on this call is probably unaware of the huge issue we have around plastic pollution and really the problem has become so enormous. I think it's pretty apparent that every single one of us now has microplastics inside our bodies. So there's no more denying it, it's literally on our doorsteps, it's in our systems. And one of the craziest things I think is a stat that isn't said a lot and it's something that really resonates with me. It was actually in 2020 Nature came out with an article that said essentially, "Human made materials now outweigh the entire Earth's biomass." That's trees, that's plants, that's animals, and just plastic alone is greater than all land animals and marine creatures combined in mass. Trying to wrap your head around that is a little scary and it's really what drives the work and the mission behind Cruz Foam, what we're really looking to achieve with our technology. And that is a rethinking and reapproach of materials, really designing materials to be truly circular and that's not just looking at the end of life that definitely needs to be improved, but I think what's really not grasped or really thought of at the forefront is how we start at the beginning, how we design materials, how we source the raw inputs to really create that entire circular system with green manufacturing and clean capture of high value waste in the end of life.

And with us, what we've been able to do is take one of the most abundant biopolymers chitin, and really combine it with diverse byproduct waste to create materials. But really what's differentiating for our technology is we've done it in a way that can drop in interface and really lower the barriers and friction to entry by working with existing plastic manufacturers. And really what we're excited about now is we see this huge need, this huge shift and our first really technology and product we're looking to tackle is styrofoam, expanded polystyrene, protective packaging. It's mind boggling, how much is still used by just single companies and this is the type of material that breaks into a microplastic there is no cleaning it up. So we have to figure out how to address the problem at the beginning. So excited for the chat I'll stop there. I'm sure we'll have plenty of time to talk about, the whole journey and everything along the way. So excited for the conversation Toby. - That's fantastic over man there's so much unpack there. 00:04:24,110 So let's break this down to slowest common denominator.

I know one of the things that students are always really curious about is how this kind of journey got started. So let's go back and a little bit of time here and start with your decision first to study chemical engineering as an undergrad and did you go into that field with the idea that you wanted to be an inventor or an entrepreneur, other motivations, like let's start there and then we'll start to break this down. - Yeah, it's an interesting start period 00:04:51,950 and it really kind of does start at when I went to get my chemical engineering degree and I'll cover that in a second, what I mean? But when I went into to school, I knew I was very technically scientific minded. I knew I wanted to be an engineer, I didn't know what type of engineer. I struggled between mechanical, electrical and chemical. And at the time when I was at UC Santa Barbara, I think they ramped it up, but the materials department wasn't really its own standalone thing. So it merger with chemical engineering and I was really tracked to materials and so the natural fit was chemistry and chemical engineering. And when I got involved in that, I got really exposed to, academia and the thought patterns that go into, learning a practice or, a discipline like chemical engineering really, really robust. But a lot of it, I found at least in my experience was geared towards PhD, geared towards research aspect and that's not really what drove me as a person, and what I wanted to achieve. I dunno if I would call it, entrepreneurial at the time, but it was definitely, I wanted to create something.

And so when I was going through school, ironically enough looking back at it now, it was probably just my naivety or youngness, but I wanted to become a petroleum engineer. It's really funny to think and the real driver was, hey, there's a lot of, innovation in that space they're always creating, it pays well and it's kind of what chemical engineers do. And that was the track I was on and about halfway through my schooling, I had a pretty significant life event my mother got sick she's okay but it really shifted my viewpoint on life and honestly, it was a moment where she was someone that I really admired. She started at a company with American Red Cross at the very bottom working as a thrift store and became a regional COO and it was just really this trajectory that I really emulated and really wanted to model, that path as much as I could and seeing what happened to her, she had to quit her job, entire life changed and it just was this realization of how short life is and that's when I dived into the ocean, I literally started surfing almost every day, twice a day and it really just shifted my perspective on life, and really aligned with, the cliché life is short, but really do what you're passionate about and that for me was, it was this resignation I had with the ocean and this draw that really shifted. I see what's happening in plastics. I see what's happening when I'm in the ocean every day. When in Santa Barbara, I don't know how many people have been there, but there's oil rigs off of the coast. I used to literally have to go home after surfing and use a knife to scrape the tar off of the bottom of my feet, because they would be caked in black tar that was floating on top of the surface and it was just that moment where I realized this is what I wanted dedicate my life to is making change in the space around ocean and ocean tech and that was the seed that's where it started. - Yeah, well then there's two other pieces 00:07:56,530 that fell into place for you. One was you spent eight years at Tetra Tech and so talk us a little bit about like, what that was like, what you learned there, and then after that you decided to go get your master's degree in material science up at U-Dub.

So what did the eight years, and then the graduate degree set you up for the master's degree? - No, 100% what was interesting was, 00:08:24,627 I never wanted or had the idea of going to graduate school. I wanted to go into industry. I wanted to apply in real life, applications and scenarios and when I graduated in 2008, I dunno how many people were familiar, but it was arguably the worst possible time to graduate in the last two decades barring maybe, COVID, but I would argue maybe worse, but I can commiserate and I had a lot of pull to go get a good job petroleum. It was available, but it wasn't in my ethos. It wasn't in my drive anymore and I got a job at Tetra Tech, not quite what a chemical engineer would hope to get paid out of college, but it aligned with what I wanted to do and really what I think I learned most through that experience is A, it was a job where it was involving a lot of out of the office, on field running teams, and it was cleaning up old remediation or old environmental waste and remediating basically land or soil, wetlands, groundwater. I worked and contracted for the Navy, the Air Force, the EPA, and it was large projects, three, four months long on site, and then coming back, and doing the reporting and writing and I think what it really gave me perspective is how industries of that scale operate in a way that is so different from what you see in academic environments, the expectations, the timelines, the engagement and I think what really was one of the things that changed and prepared me well for what I do now was, you're exposed to some, I would call them heavy hitters back then, but people with big titles, and you're kind of cautious being a young student coming outta school, how do I engage? How do I communicate? And one of the things I can't remember if it's some, I feel like it's something someone told me during that job was at the end of the day people are people, it may be a title, but everybody, at the core is a human being and you're gonna get the outliers that are crazy, and whatnot, but at most point you can relate to people in ways that are just being a human interactions on a very, very simple level and I think that's where I build a lot of my relationship building was through that job, putting myself in really uncomfortable positions, having to go into areas and in Las Vegas and some sketchy spots and working in remote areas in the desert really kind of developed this approach to how I saw what I could apply my learnings, my real expertise that I was growing and really transition it to what I

wanted to put my trajectory of my life on and that was really this environmental mission, if you want to call it and about eight years in, it was honestly my wife, she said, you can do more than this go apply yourself and thank God she said that and that's when I took the jump went back to school. I was 30 at the time, It was pretty funny going through a master's program and clearly being the oldest person in the room but it was definitely a moment where I knew exactly what I was going there to do. The time at Tetra Tech really allowed me to kind of gain that confidence in that career trajectory I wanted to take. And for me, that's why a lot of times I would advocate a lot for people to spend time in industry between undergrad and graduate. I know it's not always possible on the situation, but I think it can be very, very advantageous to take that time and really learn what options are out there and who you are as a person, because until you put yourself in those uncomfortable situations, it's always gonna be kind of the guessing game and going through University of Washington the masters program, it was a great opportunity.

Naturally, me and my wife loved Seattle, but the bigger, obviously coalescing event was meeting Marco and ironically enough, we bonded over surfing. He was a professor at the time and like I said, people are people, and he's, this kind of was this lofty professor in the materials department up there and he was turning away all these PhD students 'cause nobody knew, but he was on his way down to Santa Cruz and he couldn't commit, but everybody was like, why is it Marco taking anybody? And it was funny 'cause I just went in there and sat down and I don't know if we talked about school, I think we immediately just started talking about me being from Santa Barbara and surfing and it was an immediate connection on a personal level and I think when you have that skillset or, try to mature and improve that in yourself, it can really benefit you in so many different ways, and for me, it's really about network and for startups, there's almost nothing more important in my opinion, when you look at what can really push things forward in different ways, meeting Toby good example but. - Yeah, life takes crazy twists and turns. 00:13:25,760 So let's dive in this a little bit more. So tell me how, this is a two part question like where this initial idea came from? I know like it was like, hey, we're gonna take shrimp shells and we're gonna return them and get rid of all these foam boards in the ocean and solve that big problem and then you made a really extraordinary pivot. So one like where the idea of surf forces, shrimp shells come from, and then what was the inflection point of the pivot that turned out to be an incredibly strategic move? Those two pieces. (John laughs) - Yeah, this'll be a good one. 00:14:00,440 Okay, so we had the idea for surf or for kind of this idea, this really business was based around surfboards, and how that came about is, like I said, me and Marco kinda connected around the idea of surfing more love of the ocean, but it was through the medium of surfing and when I went up to University of Washington, I got exposed to his research group and what he was doing and specifically he was sort of on his way out as a technical lead of another startup, it's called KitoTech Medical and at the time what they were doing was making and they still are, they're actually commercial, but they make microneedle bandages that can replace the need for stitches during ER visits, less intrusive, cheaper and at the time they were looking at doing the micro needles with chitin, 'cause chitin as a biopolymer has really fantastic microbial properties, it's really well suited for that type application, long story, short FDA, they eventually went to stainless steel, but I got originally exposed the material and Marco and kind of this idea around, material development by working with him on that specific, thesis project based on that company and when we sat down kind of at the end of it, we started, what am I gonna do? What's kinda the idea for next steps in career and that's when he brought up the fact that, he's going down to Santa Cruz, and there's an opportunity to kind of look at what could be done with this material and specifically in the other aspects of his research lab, he was using chitin lot for bioplastics, but for thin films, it was thin films looking at very high end army, DARPA research type of applications, niche, nothing of scale, but he saw the potential and my background in chemical engineering actually did some work in foams during my bachelors and we saw this opportunity where, when we landscape the kind of transition novel early days, technology around bioplastics, nobody was really looking at foams. I think at the time TemperPack was just getting legs. I think Ecovative was maybe getting, something underneath them, but we didn't see anybody addressing it well and when we looked at chitin and the material properties, the mechanical strength, the weight ratio is so fantastic.

We're like, why not? Why couldn't this be a foam? And that's where we thought surfboards are almost always made out of polystyrene or polyurethane plastic foam trash for all intensive purposes. We're riding around on that in the ocean. This just seems like it makes absolutely no sense and so that's where the idea kicked on. We're like, let's make surfboards out of this and we tried for a year and the stories I have behind that are intense and I'll share a couple, but I think what really benefited us choosing that, was A, was really what we were passionate about and it really lended a lot to what the core mission was, was around ocean focus, changing that, what we're doing to our oceans. But I think also having that high lofty target really allowed us to pivot later on and I'll touch on that and that's specifically because styrofoam, or surfboard foam is so high mechanically strong, the requirements behind it and performance are probably the highest foam out there. There probably isn't anything high with guys surfing down 100 foot waves, it has to stay intact. It has to perform. And so when we kind of really tried to develop it, the real issue for us became scale, how do we scale this properly, keeping that performance and really matching what the industry needs and probably the best story is we near the end, before we pivoted, we were at a point where I think there was three of us total, one guy we got from Cabrillo college. He's actually working for us now, again, it's great when you see people come back, but he's super hands on, we had him build us steel surfboard molds out of sheet metal. He welded them together.

We put them in our parking lot behind our closet facility. We were literally looking, working in 200 square feet at the time and we had to mix the foam originally in five gallon buckets in series, dump them into this steel case mold and heat over barbecue and this is how we originally tried to make our surfboard foam. And so you think about that starting point and people, look at startups and think they happen like that, it takes time. And it starts always with the most outrageous approaches and ideas because you don't know no one's done it. And we tried, we kept trying it for a little while and what we

saw was people loved it. People really wanted what we were trying to make. The scale was gonna be really difficult and the market was just tiny and at the end of the day, you basically need a team, a market and product. And for us, it was really this moment where we saw, if we don't change what we're doing, we're gonna be done and we had a really honest sit down session. I think Toby was actually part of it and it was me and my original co-founder. And we said, what's the core mission behind what we're doing and how are we gonna realistically achieve that? And we boil it down and it was simply that we had to have a catalytic moment to change the amount of plastic and impact we're having on our oceans and the technology to do that is gonna need to be something that can really displace one of the biggest offenders in that space and that is single use materials like packaging.

And when we looked at that landscape and the need around that industry, it was absolutely enormous. Not only because consumers were there, brands were starting to make really, really big ESG goals and regulations were starting to really gain legs and this was in 2018, I believe 2000, yeah, 2018 and at this time when we noticed this, we're like, okay, well, we don't know anything about this industry. Packaging we're surfers, we kind of get it enough, but we didn't know anything about packaging besides that's what we saw our technology being a really, really strong fit for and we went through this program called the National Science Foundation I-Corp, it has nodes in the around the U.S. where you go through a week long program and the goal is to help you really define your business model and the goal by doing this, you have to go do in person. I dunno if it's still in person with COVID, but the idea then was in person over 100 interviews to fully define your business model. I flew to Australia to do some of these interviews because realistically you have to find conferences and going through this arduous process, I'm not gonna lie. It is extremely daunting, really, really tough. They really, really challenge you, but it's good. It's what's needed because it really helps you kind of be honest with what you're trying to build and coming out of that, that's where we pivoted really, really hard, really, really aligned with single use plastic packaging and specifically protective foam packaging. But that's just the beginning, we had to really figure out in that gargantuan world of packaging, what was that entry point? And that's a whole nother story.

- Yeah so in addition to all of the insane, both pivot, 00:21:16,133 formula development, the other extraordinary innovation that, I don't have any other company that's tried this or doing this, which is to actually use existing manufacturing equipment, which is designed for petroleum based materials. And, did that idea start early on because that's what gives you your scale instead of having massive CapEx, buying your own manufacturing equipment and just, you've got companies that want millions of units a year, tens of million units a year. So first, like where did that idea kind of come up into ethos? And two, just talk to us a little bit, how hard it is to not only produce a formula, but then to actually have it run on existing extrusion machines out there. - Yeah, it is by far the most differentiated factor 00:22:00,983 of our technology, and it's been definitely the core of our approach from the beginning, I think a lot of this was very beneficial to have Marco as part of the core team, one of co-founders understanding kind of materials, what goes into the manufacturing the development and also not that my industry experience was not directly related to that technology, but I understood how businesses cost structure, how kind of it needed to be worked, and when you looked at manufacturing specifically, what we really identified at the beginning and we identified it through surfboards, honestly, it's the same principles existed really to make a product or a material, a final finished item. It's the material cost at a very high level and the manufacturing cost, there's obviously things that go in there, but those are usually the two biggest inputs. When you looked at surfboards, our original idea was, well, if we can get a material cost that meets that surfboard, as it currently costs a material size now, that's one step, but we can't have to, laminate a billion little squares together, like certain people were trying to do with surfboards. We couldn't, have these exotic, like wood boards or are pretty a good example, they're too exotic. That's why they cost extreme amounts of money and so we were trying to emulate a mold, pour it into a mold, blow it up, follow the exact same way they make surfboards today and the idea being is if we can meet the material cost and scale to meet the manufacturing cost with the same drop in style, there would be a natural coming together of cost parity and that's really what we translated when we went to packaging and we saw, okay, we're gonna no longer work with a liquid material like we were looking to do with surfboards. How do we take this and make it into something that'll scale into the industries around how plastic packaging is made and really when you boil it down and really understand it, it all starts the foundation starts from pellets. Almost every large scale manufacturing technique has an input step where pellets go in.

Extrusion is what we do now, you think of injection molding, most adhesives coatings, all of these things are either liquid or pellets that are basically melted in the liquid form and that's really where we saw if we can take our material, turn it into a pellet and then understand how that can then be transferred into those larger environments, that's the only way this impact is really gonna be achieved. And we knew that when we went through the I-Corp, we went through NSF when we looked at current other foam materials and kind of just plastics in general, good example is Ecovative's Mushroom Foam I think it's a fantastic technology, taking mycelium bacteria, growing it into different novel materials, but the sheer time in which it takes to create a final product we saw it, even then, I was like, that's not gonna work and lo and behold, three, four years later, they're now making bacon and there's a reason because the scalability behind trying to tackle packaging with that approach was just unachievable and that's really where from our viewpoint, we knew it was gonna be difficult. It was gonna be extremely tough because one of the biggest things with bio-materials is the processability, the variability and inputs, the different environmental ambient conditions, the different logistics of where you might get it from sourcing wise, all come into play because it's not a standardized material that's sitting under the earth for millions of years. That's very, homogeneous and everybody knows how to work with it and so what we've really been having to do is build it from the ground up in a way where knowing what we need to achieve, how do we do that with this lower friction of adoption for our partners and industry and we saw extrusion as the best first tackling point to achieve that because it's the highest volume output and it's usually

one of the simpler ones to achieve from app pallet format and what we've been able to take is chitin combining with other byproduct waste, we have the ability to create a proprietary pellet that has thermoplastic properties and why that's so key is because most of these larger industries, or manufacturing partners out there, their large machines have a single input. So you need a homogenized single material and not any, I don't know of any other bio-based material company that's been able to achieve what we have taking that from the raw grade and dropping it in with large partners and we're at this stage now where it's really just about putting all the pieces together. We've seen it work, we've validated it and it's gonna be exciting because I think what we've seen is a real excitement around this possibility. And in the last six months, the overwhelming amount of interest we've had from, starting with brands, but it's really been transition manufacturers really speaks to these guys, wanna switch. Nobody's like, I love polluting the planet. It's just that if it doesn't meet A, the performance, but more importantly, the scale and cost structure, especially in packaging and kind of just plastic materials in general, it's never gonna be adopted at scale and that's kind of what we really have been working our hardest at is to have that be an option for these guys and have this be a realized impact that can be really changed. - Yeah that's amazing.

00:27:13,458 It's such an extraordinarily hard problem to solve. You know what, as you were talking, it really reminded me of this was a very Tesla S. Story, because Tesla's got, it looks like a car, it's a cool car, it's great looking car, but literally had to completely innovate everything underneath that. I know your phone like, looks like cool, like EPS phone, but like, it is an entirely, so much magic that goes into that and I think that to me is like the right way to think about like the extraordinary work, the extraordinary innovation that's happening over there and with that, we all know like one of the hardest things of being an entrepreneur and a CEO is raising money. Take us through that journey 'cause I know how hard you've worked to get here and then that culminating in most recently getting direct investments from Ashton Kutcher, Leonardo DiCaprio, having him join the advisory board, that whole trajectory just it's fascinating. Students always like, how do I raise money? How does that whole thing come together? You're an engineer. Like, how'd you raise money for this stuff? (John laughs) - Yeah, it's really honestly the most challenging part, 00:28:19,110 especially at the early days and I think it ties back into what I think I was lucky when I spent my time at Tetra Tech, you build these soft skills in a way that allows you to relate to people in ways that really transcend, the work environment let's say it's on a more personal level and for me, I think that served me well, but it was incredibly hard. At the beginning, A, you don't know where to start, is do I go try to, you just don't, you have no idea and luckily, I think the networks and the support systems are building in this space, but definitely here in Santa Cruz, it was limited let's say, and I think I was lucky 'cause Marco had some experience, but he wasn't the one raising money for his former company and so at the time I came outta UC, me and Marco were like, okay, this seems like a good idea. I think we won the Grad Slam from the UC and got like a couple thousand dollars. I'm like, great this will pay me for a month.

And you take the risk and I think, there's that moment where a lot of people ask me, how did you make that choice? How did you, jump off that cliff and go and really commit? And I think, it's not black and white. I think the best answer I've always arrived to that I like to give is, I believe most people have a handful of opportunities that come across them that offer huge reward, huge opportunity, but also enormous risk and A, you gotta be in a place where you identify that you have your mindset to realize that that's happening in front of you, but you also have to be in a time in your life, to accept it because there it may happen, but something extraordinary could happen in your life or really terrible and it just, isn't the timing for you. But if those two things come together, that's the best answer and that's really what I relied on was I've always felt I wanted to create something and really put myself out there and it was a moment in my life where I had the support of my wife. I was moved here to Santa Cruz, my sister lives here felt like this is worth doing and going out and raising money is a daunting effort when you're an engineer, you don't have any idea what it means. I had to teach myself from the ground up, what cap tables are, what valuations are, saves, convertible notes, equity, the whole range, I had no idea before I started this business and the amount of accelerated learning that you do is incredible. I would honestly say the last five years starting this company and running this business I've learned handover fist more than I did at both my degrees and at my former job and it's just because you have to go full in and if you don't, you're not gonna succeed and that's same with fundraising money. At the beginning, you get a little bit of capital in different ways. Some can be, pitch events, some can be grants, if you can apply for them. Usually it's a little bit early if you were just starting to get a grant, we went and raised a little bit of capital from friends and family. So we're able to raise, I think it was 80K from friends and family would allowed us to just get outta the school, which I'll recommend.

I think Stanford maybe is a little bit more palatable, but get outta the school, 'cause it gives you the idea, the ability to get your own IP. You can like you can start really developing a technology on your terms in a little bit more ways, but that's another story. I think once you kind of get that initial capital through friends, grants pitching, it's really about how you start telling the story and telling in a way that really resonates with the market, but obviously angels at probably the early stage it's gonna be and then eventually VC's venture capital and for me being the CEO, I think what's the key is it's really on you. You really have to have the perseverance and really the drive and that vision has to be so laser focused in telling that story and really bringing that to the forefront and the conversations you have and if it's not, then it's never gonna succeed. If you don't have that sheer perseverance and will, you're gonna wanna quit, it's true and when I tried to go raise our first round, let's call it, I came out of an accelerator and this was in 2000, I think it was late 2018, they were like, go raise \$2 million and I was like, great, let's do it and I was in Santa Cruz I was driving to San Francisco, I would say three to four times a week spending all day. I probably did over 150 investor venture fund interviews. I ended up raising \$225,000 and the amount of nos I heard, the amount of basically blown off meetings I had is incredibly disheartened and it's incredibly challenging, but I think what really propelled me was the support that we had and it was the early network and people I was able to connect with. One was clearly my co-founder Marco. We had some good team, I believe I had connected Toby by then he was one of the first people

we were able to connect here in Santa Cruz and thank God and it's really, those are the people when you can rely on and get real, just kind of advice, just human connection on a real level that can really help you keep that drive real, really keep it fresh and going because sometimes it's really important to revisit the mission, why it started while you're doing what you're doing and something, I don't tell a lot of people, but it's something that's important is the first two years I was delivering pizzas at night because literally how, I'm not paying myself and the humility and looking back at that is just crazy 'cause I also had a daughter near the same time period, and you think I can't do this, I have to stop. But when you have everybody around you propelling you and pushing you forward, it just that's what's needed.

Otherwise, if you're alone, it's gonna be so incredibly difficult and I think with that vision, that drive, it really allowed me to really apply myself and really put myself out there in high risk kind of uncomfortable scenarios and in doing that, one of the things that really kind of changed was this moment in time where I was able to connect, build my network enough, and guess what got connected to an incredible ocean technology system and ecosystem around entrepreneurial, investing, funding and it took me three and a half years to get to that point and it was a gargantuan and struggle up into that point. There's probably two or three times where we had less than \$1000 in the bank and I didn't know what I was gonna do. We had a pitch competition the next week and we had to win and thank Marco actually did that one and thank you, Marco, because we literally had no cash and that was \$20,000 that let us go for another three months and that's really what it takes and I'm sure so many entrepreneurs and so many startups will have that very similar story and you get to a point where things start really making sense. You start having conversations with the right people. You start really having this moment where you don't feel like you're talking to a wall, you're not talking to a venture capital that's just interested in what you're doing and you get to a point where you can identify that pretty quickly. And I'm at a point now where raising capital is by no means easy, but it's definitely you learn who's serious, how they're really gonna engage in a way that's not only gonna add value to them but value to you and then really position your story in a way that paints that picture of execution in a way that only you, your team, your product and the market is so timed and ready for this, that you're the ones to do it and that happens over a long period. And I think one of the best things to sum it up when I found to tell the story along that trajectory is the three prongs that I touched on before it's product, team and market. And this is my own personal experience, but I've found at the beginning, your products probably, could be an idea for all intensive purposes at that point. Your team, is more or less just you and the market you probably don't even know what your market is. I mean, we try to do surfboards.

We didn't know what our market was at the beginning. So at the beginning for me, the most important thing is team. They have to buy into you, you are the person that's gonna change this industry, your passion, your vision, your drive is unlike anybody else who's trying to tackle this problem, that's the first key. If you can do that, you'll get some raise, you'll raise early capital. After that, you need to paint the picture of the market. You better know what your market is, the whole landscape, how it's shifting, how your technology's the right fit, the timing, everything that defines the market and that product market fit around the technology you're building. And then the point that we're at right now is product. I think once you get to the, A, your product better be kick ass, it better be going into the market. It better be ready to scale and really start getting some real commercial opportunities behind it and that's when you have this kind of complete picture team, market, product that allows you to really go and run at the startup. - Yeah, that's fascinating.

00:38:04,400 I was with you in some of those meetings, a lot of the nos. We did that keep that great yes from that Australian firm, they were for a wide Combinator contest and we were over at some dump office space. So it was, the journey's awesome and your resiliency is absolutely incredible. The company would not be where it's at without your incredible leadership. So lots more to talk about here. Some questions that have come into Q and A. John, how does the price of Cruz Foam compare with styrofoam? What, if anything, may refrain companies from switching to a bio sustainable plastic alternative and purchasing your product? - Yeah, cost is obviously one of the bigger things, 00:38:43,430 especially when you look at packaging and materials and so as I touched on before it's really materials and manufacturing. Right now our material cost is nearly on parity with EPS and that's pretty incredible. And really what we see, the thing that needs to catch up is the manufacturing and that's really what we've developed with the ability to drop in with current manufacturers and scale with the existing infrastructure. And so right now, I'd say when you compare us to EPS, we're probably about two and a half, 3X is expensive, depending on the quality of EPS 'cause I won't get into weeds, but you can have one pound EPS, which is really crappy stuff and then three pound EPS, which is really strong, really tough, different cost structures, but roughly two and a half to 3X.

But really what happens with that accelerated manufacturing, the material gets only better and the manufacturing, really starts to drop down and we see cost parity being achievable with EPS, I would say no later than the middle of next year. What's really interesting for the entry point for our market around electronics and appliances is with the regulations around styrofoam and plastic. These global suppliers are looking to switch not only to sustainable materials, but if they can't get sustainable materials, they're going to other plastic foams and the most widely one is polyethylene. What's interesting about this is polyethylene a lot of times is two and a half to 3X the cost of expanded polystyrene interestingly enough. Offers none of the sustainability benefits and kind of matches the performance and that's where there's this really strong market opportunity for our technology to displace EPS, but doing in a way where we don't really need to match cost parity with them, we need to beat or match cost parity with what they're trying to replace it on their side to polyethylene and so that's where there's this strong opportunity to get into market, get this scale, drop the cost parity and that's really where the door's open for a much wider application set for different EPS, working in small electronics or other eCommerce applications, that have less of that ability to switch or go to polyethylene. And when you look at why some companies might not use it, I think the biggest thing

right now is probably the cost. Honestly, you're gonna have some companies that just don't have the ability in their business or their structure to make that kind of quick moving switch. For us we can identify that pretty quickly and we work with people that are really trying to be thought leaders in this space, pioneers, and those are the whirlpools of the world. The other thing might be, if there's certain aesthetics that somebody wants, there might be, something that we just can't necessarily achieve yet and that's fine because we can't boil the ocean with every single product application that comes with development. That's what MVPs are for, you always start with something minimal viable product and expand.

And then finally I think, what was the last one? I had one other one I was trying to think of, this is changing but one of the big things right now is end of life. A lot of people still rely on recycling right now. I think people become pretty aware how broken that system is and how much need there is for other solutions and capturing waste and the value behind waste. And that's one of the things right now, our first products compostable, industrial compostable, we're getting our home compostable. Certification, it can go through recycling stream, you won't capture anything, it won't damage it. But the point is we see how we can make a product that can be tenable starting with compostable and then potentially also recyclable. So that's one other gating item right now. Some people are like, oh, we can only use recyclable. We're like, that's kinda shortsighted, but fine. We've got plenty of other opportunities.

- Yeah, great call. 00:42:27,314 Another key question. Many students out there are either currently pursuing an entrepreneurial path, have ideas, have a product they've built as you've pointed out raising money's really, really hard. So this student says, hey John, what are the biggest adjustments you made to pitch along the way of fundraising to make it successful at the end? - I think, what I could probably say 00:42:52,330 is the best advice I got and I'm not sure if I don't know if you gave this to me Toby, it could have been someone else, but it was the very early days of pitching and it's very common when you're starting to pitch this is what you do, you focus on the technology. I learned very early when someone told me and it really changed my conversations in pitching, nobody cares about your technology. That sounds really harsh, but it's probably the best advice I got because really when you start understanding that they wanna understand it, it's at the beginning and it's also where I am now. They care a little bit more about the technology 'cause obviously the commercialization and whatnot, but most these guys in raising capital they're businessmen, they wanna make money and so to understand that they need to understand at the very early days what your mission is, your vision, your story, and how that's realized into a global really impactful large business, having huge revenue. Naturally, you always kind of paint this ridiculous picture at the beginning, but I think it's really taken the viewpoint of telling your story more through the lens of the impact, the scale, the business, really how it becomes this entity of capturing high value and not so much about your nuanced, really cool specific technology that, two people in the world understand what you're talking about and I think it's how do you distill that in a way where not don't ignore the technology, but really framing it a way to highlight the business and how that's gonna be super successful and I think if you can tell the story with that kinda strategy, that's really where I saw a lot of resonance, and kind of changing of excitement around what I was telling them. - Yeah and I think watching you go through that, 00:44:46,010 it really was just an extraordinary evolution. I think more importantly, it's like, and you hit on it.

It's like it has to come together like a successful Hollywood motion picture where the story's like really exciting, the character that's describing it and I can connect with it emotionally. And I think like, and through the venture journey, it's similar to that, where like, is this guy really passionate? Does he really understand what's going on? Am I resonating with him? Am I resonating with this story? Am I resonating with these characters? I think more like what is the problem that he's solving? Like being able to tell that in your story and that you have the ability and unique capabilities to solve that and it's a really large problem. So like it's been awesome for those students out there. John's an absolute pro at that, so maybe he'll just do a pitch class. - Thanks Toby. 00:45:31,431 - We'll bring him back for a pitch class 00:45:32,670 so all right this one's pretty cool too, 'cause I think kind of looking at the horizon, what other applications are you exploring for further growth? Betting furniture, building materials, like what does that envelope look like? - Yeah, no, that's a great question. 00:45:48,040 (John clears throat) I'll try to make it short. But the idea here is we really wanna build a company that's continually innovating and biomaterial technologies around the idea of catalyzing these global supply chains from petroleum based materials, non-renewable materials to renewable circular, really bio-based solutions that solve and really answer this call around plastic waste. And for us, as I said, the pellets, the kind of foundation to achieve that but when we look at what's in front of us and what's capable, starting with just foam, you nailed a couple on the head, packaging and protective, single use plastics and whatnot, is probably where I see the biggest impact in need, but construction, huge market. I mean, clearly we've innovated some of our stuff and engineered it to be, not last forever, but that's in soil.

There's definitely ways to develop our foam in ways to last, the requirements of construction cushioning is a big one, surfboards, why not? But what's really interesting when you look at these markets, some of them are growing exponentially, construction and foam is twice the market of packaging. It's about 40 billion, 50 billion, and that's only gonna keep going. When you look at third world countries and all these things going into areas where populations are really just starting to pop and so that's one huge avenue that we see just in the foam space. We could build this company just on foam if we wanted to, but our vision's bigger than that. We really see this capability of taking our core technology and looking across the spectrum of materials, really focusing on the higher need ones. The ones that would really result in the best impact and for the environment in our oceans, but we've tested injection molding, we've tested different adhesives, we've tested codings. We've tested a lot of different early stage technologies with our different biomaterials and it's really that platform that we wanna build as a company that allows us to really be the leader in this space, allowing large industries, markets, starting with packaging, construction, automotive, electronics in general, to really make and have the capabilities to transition from their

standard petroleum based plastics to our different biomaterial sets and that's really done with this idea of global sourcing, regional production, licensing, and distribution and that's really the only way that it can be done on a global scale to really transcend the entire supply chain around materials and that's the longer term vision it's gonna take a lot of work, but the first step, and really model to replicate in different applications is what we're doing with foam. - Yeah, that's awesome. 00:48:46,470 Sounds like sky's the limit, all right we had time for one more question and this one ties back to a little bit what we talked about, just the journey on fundraising and there's the technical satellite, the right product at the right market, understand the right costing structure, manufacturing, all of that. Then there's like the mental side of it, and that is as important if not more important.

So the question is, hey John, during those tough times, like when Cruz Foam only had \$1000 to the bank, how did you stay focused rather than freak out, spend all your time, concocting exit strategies and alternative career paths and I know like working with you going back four years, like we never talked about an exit strategy. There's never like career plans, but how did you keep that all together? - Man that's a really good question. 00:49:31,720 I think, the core of it's definitely support. I think, even though its good co-founder, it's family, it's friends finding that network of support a lot of times outside of the business, I think it's gonna be really what you need. For me personally (clears throat) I think a lot of it came down to, as I said, this is something that I really saw as a unique opportunity in my life and if I wasn't gonna go to my wits, and see this to the absolute last breath, then I wouldn't have done it from the beginning and I think that's kind of something you really have to be honest with yourself before you even start a journey like this is, are you willing to take this to the very, very end of its life, be good or bad, and that if you're working on exit strategies before that point, you've answered that question. And I think when my biggest struggles was, the nights where we're baking stuff over a steel barbecue, or something, I've just worked eight hours delivering pizzas. I come home my six month year old daughter's screaming her head off and I'm just exhausted and really it's having outlets that allow you to really clear your mind and really allow you to reconnect with that core, personal spirit vision, drive that helped you and really put you on this path to begin with and that for me was the ocean. And so I don't get back to the ocean as much as I'd love to, but in the early days it was critical. You have certain mediums and you have certain, energies I think that if you can identify those and tap into those, they'd really allow you to regenerate yourself in a way to keep driving. 'Cause at the end of the day, if as a CEO you're feeling you can't bring your best, it's gonna be really hard for your team to wanna do that and I think that's where it starts at the top and having good support, having good outlets to regenerate and really step away I think is key and that's why, co-founder or founder burnout is a real thing and having that separation even at the early days can be really daunting 'cause how do I step away if I step away from it its gonna crumble its not and a lot of the time that's gonna be more way beneficial for you and your team.

(upbeat music)..