[00:00:02] Zander Isaacson: So what we usually see when we deploy chargers is drivers will see them and see another driver or their neighbor get an EVIC and ask them questions. Then they'll get an evic. So if the main trigger to getting there is installing more chargers in places that don't already have chargers, then we need to make sure that we're not oversaturating key metros, but focusing on areas that have grown populations so we can convert more drivers to electric. Our perspective is that the market is going to continue growing regardless. The more people that are interested in this, the more buildings that have charging stations faster adoption we're going to see.

[00:00:37] Ryan Newman: This is Dare to Disrupt, a podcast about Penn State alumni who are innovators, entrepreneurs and leaders and the stories behind their success. I'm your host Ryan Newman and on the show today we have a panel of EV related startup founders. First we have Ben Birnbaum, co founder and Partner at keyframe, a New York City based investment firm focused on the energy transition's impact on industry. Prior to keyframe, Ben founded Terawatt, an infrastructure developer, owner and operator for large scale electric vehicle charging. Terawatt has raised over $1 billion and provides fleet charging to companies like Pepsi and Waymo. Ben graduated from the Penn State Smeal College of Business. Welcome Ben. Next we have Diallo Powell, Co Founder and CEO of Stack Mobility. Stack is tackling urban mobility challenges with an automated vertical carousel system for vehicle storage and EV charging combining smart software and space saving infrastructure. Diallo is a graduate of the Penn State College of Liberal Arts. Welcome Diallo. And finally we have Zander Isaacson, CEO and Co Founder of Xeal, the technology first EV charging company. At the intersection of proptech, energy and the Internet of Things.

[00:01:54] Ryan Newman: Xeal is partnered with over 70 of the largest real estate companies nationw. Zander is a graduate of the Penn State Smeal College of Business and today marks a first for our podcast. Zander is our first ever repeat guest on Dare to Disrupt. Welcome back Zander. This is also a first for us as a whole to have a panel discussion with three founders of three different companies on the same episode. So thank you all for being here today.

[00:02:21] Ryan Newman: We really want to begin with a series of questions about the EV industry landscape. The electric vehicle industry is at a critical turning point. Adoption is accelerating with EVs making up a growing share of new car sales. But challenges remain, especially when it comes to infrastructure. Charging networks need to expand rapidly to meet demand and innovative solutions and are essential to ensure accessibility, reliability and efficiency. Today we'll explore how our Panelists are tackling these challenges and, and shaping the future of EV infrastructure. So first I'll begin with Ben. Ben, given your work at Terawatt and Keyframe, what role do large scale infrastructure projects play in accelerating EV adoption?

[00:03:09] Ben Birnbaum: Infrastructure is a big word, means a lot of different things. But to put into a little context, 15 to 20% of vehicles in the US are in fleets relative to personal vehicles that are parked 95% or so of the time. Fleet vehicles are in constant operation and so their chargers are being constantly utilized. And so the scale of energy demand for a fleet site, you know, could be 10 to 100 times that of a public charging site. If you were to electrify the Cata Depot at Penn State, you'd be using as much electricity as a New York skyscraper. With fleet, with a, you know, 15 to 20% of the market, you end up having a infrastructure be the bottleneck. In a lot of cases you need infrastructure to advance fleets and if you can advance fleets, you know, you help advance the entire US ecosystem, vehicles, supply chain services. And so it's, you know, it's a, it's a smaller part of the market that needs larger scale infrastructure but can be an unlock for the whole market.

[00:04:17] Ryan Newman: And Ben, you're obviously doing so much at the center of that which we're going to talk to today. And I'll now turn to Zander Xeal emphasizes a self reliant charging model. What gaps are there existing in infrastructure that motivated you to really try to take on this challenging problem?

[00:04:34] Zander Isaacson: We had hundreds of drivers that were getting stranded. I was getting some not so nice emails from drivers saying I, you know, I was stranded again, I couldn't drive my kids to, to school, I couldn't drive my kids to the doctor's appointment and all these things, I, even though they were, you know, someone else's problem, maybe like an IT team or the building manager's team for the charging stations to operate. We, we took the plan. So I was running out of money, not having the product that worked, that made us want to think about, okay, if we're going to take this extreme ownership approach, it's not about just saying it's my fault, it's about finding a solution that puts you in control over the entire end to end experience. So for us, we look at self reliance as a way to guarantee a flawless experience. And a flawless experience to us is, you know, what is better than what people like today outside EV charging. And it's a simple tap, charge, go kind of model.

[00:05:24] Ryan Newman: Incredible. We'll get into that more and how you are able to maximize your Internet of things approach to be able to solve that problem. Diallo. We think about EV infrastructure as one issue, but then EV infrastructure in urban environments, that's a whole nother level challenge, my friend. So what is Stack mobility doing to integrate both space saving design and EV charging, specifically in urban environments?

[00:05:48] Diallo Powell: Yeah, I would say that's the key word is space. Right. So home for us is, is Brooklyn, New York. So it's a, it's a common issue, especially when you think about parking and vehicles on the street and what are you going to do with them. And I think, you know, as we look at the need for infrastructure, EV infrastructure just exacerbates that problem. So, you know, we're all about improving the economics and efficiency of land use. We're using vertical automation and, you know, modularity and vertical scaling. And essentially what we, what we have the ability to do is in two surface spaces, we can park and charge up to 14 SUVs going vertically. So, you know, we, we think about that and the ability to take a more modular approach to deployment. So there are some kind of tricky spaces that we're able to deploy to. Looking at that, what we've been able to do in some of our deployments as far as more efficient land use is in our first deployment in Pittsburgh, we've been able to, to allow our partners to reclaim about 10,000 square feet of commercial space that they otherwise wouldn't have had access to. And another project where we've, we've allowed our partners to be able to add an additional 50 units of housing. Now working on a project with a health center to allow them to grow in space by allowing them to reclaim some space that's currently being used for vehicles so that they can also add more, more facilities.

[00:07:09] Ryan Newman: Really incredible. And you think about how challenging this is in general, but then to do it in urban environments raises the bar even more. And I know, I know both Ben and Zander are also trying to tackle this problem from an urban standpoint as we think about EV adoption and the, it really is a function of convenience and accessibility. And so let's turn to what specific innovations are making EV ownership more seamless. Ben, for you, Terawatt focuses on fleet charging for major corporations. How does fleet electrification differ from consumer charging and what's really the impact on the grid in that regard?

[00:07:46] Ben Birnbaum: Yeah, I think something that all Terrad, Zeal and Stack all have in common is charging vehicles in the same place at the same time creates additional challenge and fleet Vehicles, given what I was saying before, kind of charging, operating around the clock, it exacerbates the energy use from. From electrification. But fleet really differs from consumer, I think, in three ways. One, the buying decision for fleets is entirely economic. They, first of all,

when it comes to buying a vehicle, the second that the math makes sense, they're focused on doing whatever they can to drive out costs from operations. And so the second the math makes sense for ev, they're looking to turn over their entire fleet quickly and in a lot of cases, simultaneously. And so you don't see a ton of gradual change. The second is batteries can be much larger. Vehicles go from Class 1 to Class 8, which is kind of your personal sedan, through a semi in the middle, you have things like buses and box trucks. Bigger battery on a box truck or a bus equals more energy consumption. The third that I mentioned before, charging happens around the clock when you combine all these things. Instead of being a business that needs to focus on convenience, because consumers care a lot about convenience, you're focused on the economics and delivering a massive amount of power. So the name of the game is really, where in the world can you find that much power in an urban environment? A bus charging depot can use as much power as an airport. And so you think about bringing that much power to a city corner or every city corner. And there's a lot of different business opportunities related to that. But one that I'll just highlight that I think is interesting is you only do that so many times, at least at once. And so there's a. There's a ton of scarcity and there's a ton of value to. To tying up power on the grid to be able to deliver that, which is not as true in consumer personal charging, because there is capacity to add a charger to your house or add four chargers to the corner of a Whole Foods parking lot. Even if there's, you know, it's complicated and there's. There's permitting and electrical work that has to be done.

[00:10:09] Ryan Newman: Really incredible challenge that you all are trying to take on. Zander, you mentioned before about having customers express a level of dissatisfaction, shall we say, and wanting to take ownership of how to solve the problem. So can you talk about Zeal's offline capabilities in terms of charging as a major differentiator of the business? And how does this improve reliability and what's been the reception from property owners in terms of this technology?

[00:10:35] Zander Isaacson: I think the first thing that we did was we stopped looking at this from like an EV charging perspective, which is one window and we can step viewed it as okay, EV charging is this smart connected device that it can't turn on, it can't function, it can't operate unless it communicates, talks and asks questions to a physical building that is 2,000 miles away. And that physical building within that building in the middle of the country, there's this big giant data center. And within that data center is a physical on premise server. And that that physical location is called the cloud. And when you realize that this is a gigantic single point of failure and we're just building the new technology or a new railroad on the same railroad tracks that already has a single point of failures, it's destined to fail. So when Ben's talking about the grid and things like that, it's almost analogous with computing where you have a source and that source distributes it through the country and the world. And then same thing with computing, the server communicates to all the devices. So when we first ran to this, we started with an offline mode, which was essentially 2019. Three things happened. Covid happened. So Covid made people a lot more comfortable with contactless payments tapping. Second thing that happened was that there was this new wave of this new concept that instead of communicating across the country to a physical server, you could communicate directly. So it'd be like instead of me going through 20 different people would play a game of telephone, I just communicate directly to you like this. That's called distributed ledger technology. And then the third thing that happened, Apple and Google just advanced their entire toolkit where now we can actually send our technology through different devices to basically take all the dependency on the other side of the country I mentioned and turn that into this digital on device computing so that it augments all the intelligence of the devices right there. So before it, it didn't have a brain. So it was constantly, you know, calling their mom and dad across the country. And now it's actually able to think on its own. So you know, for us, when we're dependent on something that we can't control, there's no way to optimize the experience. And by doing this, we created 100% off time guarantee experience. No driver stranded, we guarantee no IT upgrades or O and M network related costs,

which saves hundreds of thousand dollars per property. And we made sure that just works. So when driver comes up to the charger, it always turns on within milliseconds, not actual charging activity, but the actual plugging in and going to sleep and waking up. We've done this not just for like offline mode. But we've advanced the technology to really be like a full computing platform that if you have Internet, it augments that speed because the computer is right there. And then if you don't have it, of course, the edge cases, we also work without Internet too.

[00:13:22] Ryan Newman: And the best part of all is you're not getting any more emails from angry customers.

[00:13:26] Zander Isaacson: Yeah. And to be clear, you know, we still get support tickets. I just, I see a fraction of them, so.

[00:13:31] Ryan Newman: Diallo, speaking of really trying to address pain points, one of the main pain points is as we talked about EV charging or EV infrastructure in dense cities. And so Stack Mobility is really rethinking this, how space is used for parking and for charging. So what are the biggest misconceptions about this idea that EV infrastructure in dense cities? And I'll just start with my biggest concern would be cost.

[00:13:58] Diallo Powell: Yeah, yeah, I. And that's what we're doing to bring down the cost by using less space.

So that's, that's a big focus for us. But, you know, I think a big misconception, or the way I see it, or as far as how we talk about the future at Stack, is that, you know, it's going to be like we refill fuel our vehicles today. So I, I think a lot of people are feeling like, well, I'm still going to be pulling in like it's a gas station and plug in, I'm going to charge and it's going to be like, just like the gas station experience today. And I don't think that's what we're in for in the future, you know, So I think what we're looking at is today the, the full pie of where you're refueling your, your vehicle. That entire pie is all gas static. Right. But, you know, how many people in this room charge their phone 90% of the time at home or at work?

Right.

[00:14:50] Ryan Newman: Lots of hands going up.

[00:14:51] Diallo Powell: Yeah, lots, lots of hands in the room. So, you know, we, we think about it as, can we get people living in multifamily housing, the suburban garage experience. Right. Can we allow them to. When they pull in, they know they're going to have a space, a dedicated space. Pull in, charge, and don't even worry about it. Just like you would get home and plug in your phone. So, you know, we, we see this as kind of that, that process that's now completely isolated to the gas station is fracturing to being at work and at home. And, and then you're going to have a lot of different, other types of experience that need to fill that out. You know, if you're on a long trip, you know, you want to be able to get that fast charging or if you need to top off while you're, you're traveling to or from work for whatever reason. So I think there's a, there's a role to play for a lot of these different, different solutions. That's the way we come at this problem is to say what, what could the future of this look like and how do we fit into that future? And then as we think about designing this, we try to think about it from the user experience, right? Like if I were using this every day, how would I want this to operate? For example, we, we did a deployment at one of our sites and initially you had to get out of your car, you had to walk up to it, you know, you're scanning a QR code, a gate is going up. And we said that that doesn't feel like a great experience, right? Having to get out of my car and do all this. So we were able to say, hey, we're going to make this proximity based, we're going to geofence this, you can drive up to this, we're going to recognize that you're within 10ft of the system and at that point you can

initiate a parking operation. Gate will go up and you drive right into the system. So we're always thinking about how we can improve the process and improve the experience. So I think if we can get ourselves to a place where this feels convenient, it feels easy for people, then we'll see an acceleration.

[00:16:35] Ryan Newman: Well, and it's, what's really amazing is the way in which you're able to talk through first what those pain points were and then how you ultimately ameliorate those issues by virtue of finding the solutions. Let's talk about some of the frameworks that are surrounding what you all are trying to do. We, we have financial frameworks, regulatory frameworks, logistical challenges. As you think about the biggest obstacle to scaling your companies and how you've overcome them, I'll start again with you, Ben. Keyframe invests in large scale capital intensive projects. I mean, that just sounds expensive. What advice do you have for startups navigating funding in a space such as this?

[00:17:13] Ben Birnbaum: I think so. We've raised over a billion dollars for terawatt following just really like two principles, I think, just kind of narrowly focusing on capital intensive businesses. The first one is just like own it. I think there are a lot of people who try to be cute about what they're offering or business model looks like to try to hide being capital intensive, you, you gotta be kind of true to who you are. And that, that leads to the. The second thing is it's different to set up a corporate and capital structure and to raise capital for a capital intense business than it is for a capital light business. And almost all startups are capital light businesses. And so almost all the information that you can Google from, you know, go to YC's website and download like how do I start a company and raise a series A and what do my documents look like and things like that. It's almost all geared towards capital light, generally software and some consumer businesses. But if you're, you can make good money building a real asset business, a lot of really rich real estate investors and stuff like that, but you need a capital structure that matches that. So I think the way that I try to think about it is if you're doing something innovative, narrow that innovation into a business and then try to sell that innovation to customers. Don't try to be a vertically integrated technology company and developer, an asset owner. Great example of this in the market today is like nuclear. There's folks trying to bring new modular reactors to market. They're also trying to, you know, say we want to test out and show the world our technology works before we sell it to someone else. You know, and a nuclear plant costs billions of dollars to build. So that technology value gets kind of diluted somewhere. Then on the other side, if you have like really development oriented or project capital needs, the last thing someone who wants to invest in that or lend you money if they're a bank or an infrastructure fund wants is technology risk and your, your business's execution risk. They just want as low risk as possible, cleanest box as possible. So my two tips I guess are own it and set your capital structure up in a way that the investors who are going to fund your business makes sense for the way that they deploy capital.

[00:19:47] Ryan Newman: Well, Ben, we appreciate the candor of your answer and hopefully we'll talk more about the role that candor can play in having these discussions. Zander, you've raised significant capital for zeal and we're going to talk about that capital raise as well in our discussion today. But what are the key factors of attracting investors? And then once you've actually managed to attract investors, how do you think about scale without compromising the reliability of the actual product that you're providing to your customers regarding fundraising?

[00:20:17] Zander Isaacson: So I, when I left my job in investment banking, I thought that I was special And I could just go raise money and then, you know, figure it out. I didn't have much in savings, so I really was thinking I'll raise within six months. Needless to say, that didn't work. There's.
There's too many startups and companies out there, and the only way to not make it a gamble is, is to control the outcome and just focus on building the business. We kind of like accepted that we wouldn't raise money in the first couple years, so we didn't have a choice. And by going

all in, we learned more about our customers, we learned what doesn't work. We were only focused on Plan A. Think about the secondary factor of fundraising. It was, what do customers want, what do they need, what is working, what's not working? And that's what has allowed us to find all these innovations. Because innovation, in my opinion, is not based on some idea that comes off in the shower, but it's really about spending a lot of time with your customers. And iteration is innovation. So that's kind of how we got started. And then we started getting luckier and we started attracting the right people. I'd say with investors, it's very similar to customers. It's knowing what's most important to the company and what is moving the needle and then focusing on who can add the most value and help drive that. Because then the conversations become a lot different when you're talking to investors, and it becomes more like a partnership. For example, when we raise our Series A, you know, there was a lot of different types of funds that were interested at the time, but we really, really wanted one climate tech fund, but. But also have a prop tech fund which is like a real estate technology VC fund. And they never invested in EV charging. They didn't. I don't know if they did renewable energy, but they knew every single real estate partner. So if every single real estate partner owned the majority of parking spaces, and we want to be in those parking spaces, and then we need to partner with them. And if this group is the one that can open the door for all them, then that's a great opportunity for us. And it's a great opportunity for them because then they're limited partners. Investors in the fund can invest in our success by partnering with us and scaling our solution. So I say, like, it's focusing on the business and then making it make sense when you are raising money. And outside that, I would just say genuine relationships. You got to build it and you don't build it thinking that, you know, oh, sometimes you might think that you might raise from them someday, but it usually doesn't work that way. It's just build it. You never know what's going to happen. Just, you know, when you're an entrepreneur, you got to meet people, and if you think they can't help today, it's. There's always something you can learn from them. So, for example, Ben met in, I want to say, 2019, but let's just call it early 2020.

[00:22:53] Ben Birnbaum: Before COVID for sure.

[00:22:54] Zander Isaacson: Yeah. So we were. We were very early, and he was working on a fund at the time that did not invest at our stage. So he just became a mentor and he gave me a ton of advice and we learned all these different things, and then you never know what's gonna happen. It felt like we're, you know, been in this Covid and then kind of the market we're in, but it's always been something after another, and each challenge has made us into a different company. And when we went to go raise our series B out of an opportunity to expand the business further, I called Ben. We worked together and we talked about it, and they ended up leading our series big and then some of the other investors we've been talking to for, you know, a few years. So I'd say relationships and just focus on building the business.

[00:23:33] Ryan Newman: Ben, from your perspective, when you first met Zander and it was so early in their life cycle of their business, and you knew that it was not going to be an appropriate investment for your fund, was the instinct to mentor a natural one or something that you had to think more as a calculating move to make sure you'd get the call later on? I mean, speak to us about your motives or more importantly, the instincts to want to potentially be helpful, knowing that it may not ever lead to anything.

[00:24:00] Ben Birnbaum: Just a personal philosophy of mine. First of all, us Penn State got to have each other's backs. So I was pretty excited to see another ev Charging entrepreneur from Penn State. I. I think you just help people and you give without expectations of. Of anything in return. And if you do that enough, you build great relationships and trust and people have your back and come back to surprise you in interesting ways. So I would say it's a personal philosophy, and I do that without any expectation, any calculation of what that will be in the future. But more often than not, it turns out to be true. So I do it because it's fun to help other people, but also it

brings great stuff back.

[00:24:42] Ryan Newman: Really incredible. Adam Grant has a book called Give and Take, and he Describes three types of personality styles, givers, takers and matchers. And you pretty much just describe the givers to a T, those who give without anything in return. I'm looking at another giver here to my left. Diallo. And Diallo, obviously with Stack Mobility, there is an integration of automation and software that, that you need to solve in a unique way. You talked about this idea of not having to, quote, unquote, get out of the car, right, to actually enable the charging to occur. What challenges have you based in the deployment and scaling of this technology and how have you overcome those?

[00:25:22] Diallo Powell: So my previous company was called Zapari. It was a SaaS platform for health tech and that exited in December 2020. And there was an investor there that I really respected. I went to him and I said, I want to get your perspective on what I want to build. Now he was like, seems pretty cool, but why on earth would you do this?

And at the time I just thought it was a really great concept. I thought there was an opportunity for it. I thought we had a pretty compelling model. But it comes with a lot of challenges that I haven't been through before. This is the reality. And, you know, we're, the last two weeks we've been, you know, just looking at different changes in policy and tariffs and taxes and, you know, where is all this going to land and us going through scenario planning and trying to figure out how do we absorb this, how do we handle this, having to deal with supply chain risk and as we deploy to different markets, different nuances in specific local markets, whether it's through zoning and permitting or, you know, working with the utility. So it just introduces all these things. Our team has done an amazing job and we've been really fortunate that, you know, we've been able to generate revenue early on. And we have a lot of B2B deals that we've been able to get over the finish line. And we've gotten a lot of projects in the ground. You know, at this point we're approaching managing about 4,000 automated transactions a month and about 1,500 kilowatt hours of charging every month. So, you know, it's coming. You know, we try to face these things honestly and objectively and not put our head in the sand when it comes to them and really try to identify real solutions. We've been fortunate to build an advisory board and we lean on them pretty, pretty heavily to come in by perspective.

[00:27:10] Ryan Newman: Let's talk about the future of the EV industry and how you potentially, if you look out 5 to 10 years where this is going, but let's be specific to your individual businesses. You know Ben, when you think of fleet electrification outpacing individual consumer adoption, what shifts need to happen for this scale to further take place, in your opinion?

[00:27:33] Ben Birnbaum: It's, it's all about price and vehicle availability for fleets. I think hopefully consumer adoption we see gradual continued increase for a fleet. The second the economics make sense, they want to turn everything over and we're there. In light duty vehicles, I think folks can pay close attention to Uber and Lyft and the ride share economy to, to see that ride share ecosystem as well as like medium duty delivery. Probably notice a lot more Amazon trucks, vans in your neighborhood that are electric. That is also being massively accelerated by autonomous vehicles, which is kind of cool thing to pay attention to, but it's all about vehicle availability and pricing. And in heavy duty I think things are a little further behind larger vehicles, more expensive, even more price sensitivity. The technology seems to exist and certainly exists globally. See massive turnover in fleets in Asia with BYD vehicles that are a fraction of what we're able to produce here in the U.S. but here in the U.S. the thing to pay close attention to is the Tesla Semi. It seems like auto OEMs have the technology to try to compete the Freightliners and the Volvos of the world in heavy duty, but they're not chomping at the bit to cannibalize their businesses and turn them fully over to electric. And so everyone else's guess is as good as mine of what Elon Musk is like actually up to and when things are going to be be released and target

dates have been inconsistent. I've been waiting for the the full scale commercial release of the Tesla Semi since 2019. And the first couple of times I was told that the Semi was Tesla Semi was coming out and believed it. I think I got caught. So they say now tens of thousands of vehicles will be coming off the Tesla Semi production facility by the end of this year. And if that happens, I think you'll see, you know, the same kind of acceleration in, in freight as you have seen in in medium and light duty.

[00:29:44] Ryan Newman: Zander, taking the same question to you as we think about your, your focus of your company on property owners, how do you anticipate that relationship between real estate and EV charging evolving? And specifically what needs do you think will, how will the needs of the tenants of these various real estate properties evolve over time and how is XEAL positioned to be able to take advantage of that growth and evolution?

[00:30:08] Zander Isaacson: I think it's about categorizing each stakeholder based on and understanding their interests. So for a real estate owner, the building is an asset. So it's almost like a, you know, hedge fund manages assets. This is a real estate owner. So when they look at their asset, they're making most their biggest revenue products is the units. So they're thinking, how can I charge higher premiums on rent, how can I add a new amenity fee, how can I be something differentiated? But that eventually converts their biggest products, which is the rental growth. So it's really understanding and familiarizing yourself with how do other capital improvements work in the building. When do they make those decisions? Why did they make those decisions to install mobile access control where they can open a door with their phone. And by understanding this, it's much easier to speak their language, that you can connect what they already believe in with what you want them to understand. That's on the ownership side or on our side. We've seen minimal to zero correlation with the percent of EV adoption in the metros that we install in and the number of EV drivers that convert to electric at the building level over the next 18 months. And what I mean by that is, is the whole, you build it, they will come as cliche it might sound, it really is how it works with apartments and workplaces because that's where the 95% of idling happens. You don't care about your phone charging in five minutes when you're sleeping. You don't want to think about it. So the point is, is that, you know, this next wave of EV drivers, the current wave, right now, they're not the early adopters. They're not doing it just for green reasons. They're doing it just because it's a core product. You have a Hyundai Ioniq 5. This is a, these cars don't look electric, which is for better or worse because people don't realize they're electric. These things are self driving. They, they can do their own thing. They, they have all these different spaces, seat can go around the corner. The auto brands themselves are making really interesting products that people want regardless. It's not about the cost savings, it's not about the rebate, it's not about any of that anymore. And the best way to represent this, I mean you have the Kia lineup. This is a global company. They came into the US and became one of the fastest growing EVs. They doubled initially, they keep growing.

All the Uber drivers in New York City drive Ikea. Not all of them, but most of Them. And the best part about all this, they doubled in growth, these companies, and they were never getting the tax credit to begin with. So when you see these things going away, it's like that was never the leading indicator. They didn't have the US Factory till now. So when I look at the market, I'm looking at the, what is this substance? What is the intrinsic value? What is the main driver, why people would do this? And when you think about, like, the BlackBerry, like, initially, it's good for emails. They think about the iPhone. He's like video games on an app store. But then nobody thought about the Uber. And the Airbnb is in the marketplace. Well, that's kind of what's happening now where you have, you know, three years ago, there were three EV models that crossed 20,000 car sales, like Tesla, Chevy Volt, Nissan Leaf. Last year there were over 20 different models, most of them brand new, that just came out last year that crossed that point. And where Tesla used to be 80% market share, 90%, they are below 50% of the EV market keeps growing. So you have this flood of new vehicles. People are excited about them. They're

better than the gas versions, and they're buying it just because they're fun. So what we usually see when we deploy chargers is the future is not this distant thing, at least with the, on the consumer side, where this will happen by 2030, it will happen by then because you have to build the chargers, and then drivers will see them and see another driver, their neighbor, get, get EV and ask them questions and build comfort. Then they'll get an ev. So if the main trigger to getting there is installing more chargers in places that don't already have chargers, then we need to make sure that we're not oversaturating key Metros. That makes sense. But focusing on areas that have grown populations so we can, we can convert more drivers to electric. Our perspective is that the market is going to continue growing regardless. For the first time, people are buying these things for, like, technology reasons as well as other reasons. And the more people that are interested in this and the more buildings that have charging stations, faster adoption, we're going to see.

[00:34:24] Diallo Powell: I think it allows urban drivers to participate in this transition at scale. And I think Zander nailed it, and I think we are looking at just a superior product. So without all the incentive, without all the other things to accelerate the market, you know, we're seeing Consumer Reports where, you know, consumers are saying 80% of them would buy an EV. Again, you know, we just saw Polestar last quarter, post 76% increase on sales. The year before, same quarter. We're seeing just really good indicators. But I think for us at this point, a lot of people look at it and they think of it as a novel solution. And we've been able to break through that barrier by sitting down, running through numbers with a lot of our partners. So on 80% of our deals, we've been able to displace the traditional partner garage. Our goal is to go from novel to being business as usual or being ubiquitous in cities. And I think what's next for us? Right now, a lot of our deals are B2B developments, but we're starting to see a large amount of growth in the fleet market.

And so, you know, we're working with a utility right now on site identification and evaluation to be able to support some of their fleets. And we are now housing Zipcars. We are also now storing our first EV Uber. We're starting to get into different segments of the market and opportunities. So, you know, that's. That's something that's really, really exciting for us, and we see that as probably the, the next step. So, you know, when we, we go into the conversation and we're talking to Zipcar about some of their challenges, they're already battling for curbside space. And, you know, they're trying to figure out, how can I deploy more vehicles in cities and places where people want to use car sharing more frequently. So a lack of space ends up impacting them and that they have a lack of scale, and if they can't get to the scale they need and they can't get to the price where more people will use it. So when they look at different mandates in cities, and now a lot of cities are saying, hey, if you want to continue to do car sharing here, you have to transition to electric vehicles. That just introduces another challenge for them. So we've been able to walk in the door and have a conversation where we say, hey, we can solve your problem of space.

[00:36:38] Ryan Newman: Amazing. And so as we think about the advice you'd give, you're all incredibly successful entrepreneurs. You're building amazing businesses.

And so as we think about the advice you would offer for people that want to enter the EV space, I'll start with Ben, because we've spoken a lot, Ben, today about your role at Terrawatt, but the reality is your role at Keyframe as an investor, which was what facilitated the investment in zeal into Zander's company, is a great example. Ben, you've said before that you have Two lighthouses. If you care about someone, you owe them fast and radical candor. And if the market looks chaotic, there's probably opportunity. So with that, with those two lighthouses as your guide, my friend, how do you actually go about thinking about investment for businesses and what it is that makes sense for the EV space?

[00:37:25] Ben Birnbaum: In the space, it's critical to have like an unsubsidized value proposition. I think Zander spoke about that. Reliance on subsidy is something that a lot of energy oriented businesses do and you know, you see how that's working out for them right now. When it comes to like startups generally, it's not enough to simply be resilient. You need to be obsessed with resilience and fascinated by resilience because building a business sucks. It sucks in so many ways. Things go wrong every day and you're under resourced and no matter how experienced you are, are coming across things that you have to make hard decisions about that you don't have the right advice, enough of the right advisors ever to help you make them. You have to think that's like fun and fascinating. It's not enough to just be able to do it, but you have to be able to like lean really hard into it and learn from it. So to me I, I don't know if that's advice but you know, I think if you're that kind of person then you could be a great entrepreneur and if you're not that kind of person, you know, I wouldn't try to be an entrepreneur because it's most of the time it's not fun.

[00:38:42] Ryan Newman: Well Ben, in many ways that's, you know, clarity is power, right? And in many ways you're providing the clarity for people to decide what makes sense for them with that answer. So Zander, as we think about zeal and being at the intersection of prop tech and energy and IoT and being able to mix through all these things and also hearing the a little bit of a glass of cold water that, that Ben just splashed upon us. How do you think about resilience and how do you think about waking up every day and rising to that challenge that Ben so aptly described as a daily fight for survival?

[00:39:15] Zander Isaacson: I have to fully agree. Entrepreneurs naturally want to see the world as, as they want to see it naturally. Like a naive first time founder is going to be running through brick walls based on them not knowing it's brick wall and then when it happens they think the next wall is just right there. And then when it happens a few times and, and you, and you don't see anything in the distance. That that's when it really kicks in. And you realize, okay, for me, it was like realizing that this is not a school project. This isn't. You just go raise money and do things.
This is, you need to be the top, top. Not even 1%, the top level of your field. And then if you, if you don't have that based on your experience, then you gotta put in the 10,000 hours. Except that's not over a period that, that's as fast as possible to get that many intervals and reps in. So you, you have to be like that. And I, I kind of always had the idea like, anybody can change any moment. I still believe that, but I don't think everybody wants to change at any given moment. And that's kind of what I realized. And it's very difficult. It's challenging. It's definitely not fun all the time. You have to have a purpose and a passion. I always felt that passion is a, is also not, you know, just something that magically you wake up with. Unless you're my co founder and you've been that. You've been that way your whole life. But for me, it's going in with the mentality. It's like, no matter how hard this gets, I'm going to go in and obsess and, you know, never say this is happening because of xyz, but this is happening. What can I do because I had to do something. And when you have that mentality, you just got to keep going and going and going. So I don't encourage this, but there's a lot of nighters, there's, you know, carrying the. Whatever needs to get done. There's, you know, I'm back and forth traveling whatever I need to do to help the team, whether that's partnerships or our tech team or operations or me with customers or physically being there with our installers, network of installers. So it's really, you got to do anything and everything and it's never, it's never really kicking your feet up. I'm still operating the same way as I did on day one. Definitely hasn't gotten easier, but it's gotten more rewarding. So when a new challenge comes, it's not, oh, this is a enormous. This is a 10x ray challenge. It's, wait a second. I did a 10x challenge two years ago and this is just relatively the same. I just have to operate with first principles in day one. Attitude.

[00:41:33] Ryan Newman: Amazing. And in many ways, Zander, you just described the ability to Operate with lack of resources that Ben so described in the sense that Ben talked about. You know, you think about having a lack of resources, but as anyone that's been successful knows,

it's really not the resources but the resourcefulness of the person that ultimately leads to the abundance of the outcome. And that's very much what you've just described in the way which you're rolling up your sleeves.

[00:41:57] Zander Isaacson: Sort of our five core values. The first one is be a scrappy entrepreneur, not a consultant. Nothing bad about consultants, but the idea behind it is that don't say what needs to be done. Look at your own two hands and say, how can I do this myself? And then the second thing that leads, basically all the core values is how we do anything is how we do everything.

So just because we're a tech company and just because we don't, you know, actually do the installation, that doesn't mean we're not going to make sure the landscaping is perfect, the cement isn't perfectly same color as the sidewalk, the not so exciting stuff, but the stuff that's important when you kind of have that mentality of extreme ownership and urgency. And if not me, then who, who else would do this without, you know, and kind of looking at yourself as a single thread owner? And that's just not me. I'm saying it's everyone on our team. It really does change the outcome. And it's the opposite of, you know, the concept of diminishing marketing utility because it's compounding activity on a, on a talent density level.

[00:42:55] Ryan Newman: Use many ways to describe the definition of grinding. So with all of that grinding diallo, it's so easy to just really focus on the bottom line. But I mentioned earlier that as Ben espoused the real merits of being a net giver, you also are very much leading with a giving mentality. And that's in the form of your philosophy. And what I mean by that is your philosophy of how to think through the social and environmental impact of what it is that you're doing, not just the financial impact. Can you talk about how that double bottom line thinking has A, guided you and B, led to your success.

[00:43:32] Diallo Powell: So for me, it's just a core motivator and it just helps me get out of bed in the morning and keep grinding, keep fighting. And, you know, I think it's a really good way to establish a North Star for an organization that for me, my, you know, my first, one of the first things I worked on entrepreneurially was a founding member of a social purpose health Insurance company. And, you know, we were the first health insurance company to be a B corp. And that's something I'm very proud of. Next business was, you know, focused on giving health care subscribers greater visibility into the cost administration of their care to make better decisions. Again, we were driven. Driven by that mission, you know, and I'm also a founding board member and currently vice chair of a nonprofit called the Public Housing Community Fund. So I think it's just.

For me, it's just the way things should be, you know, and. And I think it. It also then makes the right people gravitate towards me and, you know, who I'm working with. And so we feel the same way about what we're building here is, you know, can we have a. Have an impact? Talked about our transactions now or not all the way there. You know, we're kind of chiseling away at having, you know, a meaningful impact. But, you know, I. I think every day we walk in the door and this team believes that we can do something impactful. It's not about any one individual walking in the door. That's just the environment that we try to create. I think, you know, we've done a pretty good job of doing that. As we grow in scale and, you know, the sphere gets little broader, it gets harder to maintain that, but that's something that we always focus on.

[00:45:19] Ryan Newman: Well, thank you, Ben Diallo and Zander, for taking the time today to share your insights with us into the EV industry. I'd now like to open the floor for any questions we may have from our audience for either Ben Zander or Diallo.

[00:45:32] Audience Member 1: So social impact, right? I grew up in Bushwick, Queens. My wife grew up

in Hollis. I'd love to hear more about that initiative. And are you bringing in. You said it was a B corp, right? Elizabeth Kilo is a friend of mine. She started B Corps Untowards.

And are you bringing the private industry and kind of marrying that in some way and shifting resources towards that positive social impact In New York?

[00:46:00] Diallo Powell: Yeah, in New York, we're working towards that. So you actually have to be for profit to be a V corp. When we first became a B corp with the first company I was working on, the health insurance company. One of the founders of B Lab, B Corp, was on our board, Andrew Kosoy.

So, you know, we had. It was the beginning of them working through this and saying that, you know, there should be some social metrics for businesses, and we love the concept, and the CEO there just really kind of dove into it and adopted it, which was great to see and I saw the impact that that had on the culture of the environment and the people that, you know, it attracted. So as far as the programs that we're working on for the public housing community fund. Yeah, so we are, we're constantly looking on programs around, you know, education, getting people to transition to new careers. We actually just had a graduating class of our green tech training program. So we're working on training people for the green economy or clean tech economy. So we're, we're bringing all those things and deploying them in New York City and working with a lot of other public housing departments across the country to just learn from each other. And in our goal, as you know, as Stack is then to be able to hire people out of the.

[00:47:15] Zander Isaacson: Hello.

[00:47:16] Diallo Powell: I'm wondering if you guys can share the biggest challenges that you guys went through and what helped you overcome them.

[00:47:23] Ben Birnbaum: You have a initial phase of really clear vision for a business and hopefully you can get through that phase and drive towards getting from, from zero to one. You know, you, you reach a point in a business's life where not everybody, there is a founder and not everybody cares as much or has as comprehensive of an understanding of the, you know, the vision and the purpose of the company as the founders have. After the beginning, things get a little bit more corporate and your organization gets like a little bit less flexible. But you're still a young company and so, you know, and we're, we're electric vehicles are, are an industry that's still very early and so customer needs are, are still changing and so big challenge and requires constant investment is how to keep the culture of innovation and flexibility throughout and make sure that the, that the people that you have have that. And for anyone that doesn't have it, find ways for them to not be at your company anymore so that you can continue to innovate at the, at the speed that you need to, to stay relevant and keep winning in an industry that's, that's changing pretty fast.

[00:48:42] Audience Member 2: So can you comment while in terms of innovation looking forward, you may entail hardware, software and data to train the software. Right. Can you comment on in that innovation ecosystem how nonprofit entities such as the universities may play a role? Because typically universities may sit on a large collection of data.

[00:49:04] Diallo Powell: Absolutely.

[00:49:05] Ryan Newman: Ben, do you want to handle that one?

[00:49:07] Ben Birnbaum: Sure. You know, I think there's like a lot of, I mean there's a million different

ways, but pre commercialization for a lot of technology, the university research environment is so critical in advancing things that like material science for example that maybe don't yet have a fully fleshed out economic value proposition, don't know how to describe themselves to the market yet, or it's not the right time for financial capital. So at least in that way extremely critical to have university system university research grants to advance science and technology. I think the other way is changing technology and changing regulation have really rippling impacts on industries and the interconnectedness of industries. And to have the data sets that universities have that provide people with a more macro futurist view of how an industry could shape out.

I think that actually really advances the way that entrepreneurs think about what business doesn't exist in that ecosystem today that could that I should start and I you know, I see that coming from big consulting firms and and universities. So extremely valuable and plays a huge role.

[00:50:33] Ryan Newman: Thank you so much Ben. It's also worth noting that both Ben and Zander were not only Smeal College of Business graduates, they also were both participants in Wall Street Boot Camp at Smeal, which is where I'm actually headed right after this. And I can't wait to tell them that two out of the three of our panelists all literally were sitting in the classrooms within within side of the last decade, which is pretty phenomenal. So thank you so much for not only all that you've done, but for also returning to your roots as well as Diallo here, my my friend here on the stage.

I want to close out by saying that was Ben Birnbaum, co founder and partner of Keyframe and founder of Terawatt Diallo Powell, co founder and CEO of Stack Mobility and Zander Isaacson, co founder and CEO of Zeal. This episode was produced in partnership with the Penn Stater AV team and edited by our amazing executive producer, Katie DiFiore. If you haven't already, be sure to subscribe to Dare to Disrupt wherever you listen to podcasts and look out for next month's episode. Thanks for listen.