**_Battery + Storage Podcast_: Overcoming Energy Conversion Challenges With Jason Barmann, EPC Power Corp**
**Host: Bill Derasmo**
**Guest: Jason Barmann**
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**Bill Derasmo:**

Hello and welcome back to the Troutman Pepper *Battery + Storage Podcast*. I am your host, Bill Derasmo. As we move comfortably into 2024 now, I want to once again express my appreciation for the audience because without all of you listeners, the program would not continue to grow, and we would not be able to attract the interesting guests that we continue to draw.

Turning to the present, with me today is Jason Barmann, the Director of Grid Integration with EPC Power Corp. Welcome to the program, Jason.

**Jason Barmann:**

Thanks, Bill. Appreciate you guys having us.

**Bill Derasmo:**

Great to have you on today. I feel like this is a geographically appropriate guest today because at least as of the date of this recording, we are fresh off the Kansas City Chiefs winning the Super Bowl. Congratulations to the Chiefs. Are you a Chiefs fan?

**Jason Barmann:**

I am. I was born and raised in the Kansas City area, so Chiefs fan through and through. It's been a lot more exciting here the last couple of years than it has been my entire life. Yes, I know. It's a fun time. The city's electric, so it's fun time to be part of that.

**Bill Derasmo:**

That's great. That's great. Well, three Super Bowl wins in the last five years will do that for you as a sports fan. That's –

**Jason Barmann:**

It will.

**Bill Derasmo:**

It's pretty exciting. Well, yes. When I was reviewing your background, I saw the Missouri ties and Kansas City ties, so I figured I would ask about that. Now that I've given away your Kansas City ties here, let me just say a few words about you. You're a licensed professional engineer. You have an extensive academic and professional engineering background but also an MBA from the University of Missouri at Kansas City. You've worked in a variety of engineering-oriented and business positions for a number of different companies, including two stints at Burns & McDonnell. Why don't I give you a chance, though, to introduce yourself here and let us know how your career journey led you to EPC Power?

**Jason Barmann:**

Yes, absolutely. I graduated, like you said, electrical engineering degree. I started off in the overall power generation space, just doing electrical designs for various types of power plants. Then I realized, hey, there's a lot of really cool technologies out there. I was kind of just looking around one day at kind of what the next big thing is. This is like in 2016 or so, and I started reading up on this energy storage that was really starting to take off. I saw the huge opportunity and the exponential growth and the unique services it could provide for the grid. So I decided to kind of just jump on in.

I got to basically do that for five years. It was all sorts of – we would do consulting, owner's engineering, to detail design, to actually doing boots-on-the-ground construction. That's how I originally met EPC Power. We bought inverters from them. I was a customer before I was an employee. It was great to meet the team there to interface with them. What really struck me about EPC was it's a US-based inverter manufacturer, but it just seemed like the way that they go about business was just a little different as well. It just seemed like everyone was a little more personable, and it just seemed kind of that startup vibe that I wasn't really used to from in an industrial manufacturer.

I was fortunate enough to get a great opportunity to join the team almost one year ago now. I think I'm at like 11 months, so definitely exciting to be there. Yes, as EPC Power continues to scale and grow, that's where I kind of fit in is making sure that we do so in a responsible manner and just – yes, it's been a crazy ride just the last 11 months.

**Bill Derasmo:**

Well, you described EPC as a US-based inverter producer, manufacturer. Tell me a little bit about that and why being US-based gives you a leg up in today's market.

**Jason Barmann:**

That's an awesome question. We have two manufacturing facilities, for those who aren't familiar. One is based in San Diego. It's actually about 30 minutes north in Poway, California. Then the other one is in Greenville, South Carolina. Being a US manufacturer, it's our entire engineering team, our entire site support team, and the entire production facility is there in the

United States. For those that want to come see it, kick the tires, just check us out. It provides a lot easier to get to, rather than trying to travel internationally over to Europe or to Asia.

Also, when things go bump the night, all of our core expertise is right there with most of the storage being in California. That's where our headquarters is. So you can get any number of our talented team out to your site. In cases where there's a large amount of commissioning needed to happen to meet a project schedule, we're able to mobilize and get to site a little quicker than what some of our competitors are in that space.

Then, obviously, with the huge incentives from the IRA for domestic manufacturing to help with the tax credit credits, that's been just a huge boom to us because we've always been here. I know that a lot of people are looking to come to the United States, whether it's battery manufacturing, solar panels. I mean, you name it. We just get that benefit as kind of built into our core business.

We know that a lot of people are starting to come to the United States. We say, “Hey, welcome. We've been here. If you got any questions, we can kind of help you out.” I think it's going to be a big effort to be able to build the amount of storage and solar that we need to as a country.

**Bill Derasmo:**

Sure. With you guys being here in the US, as you said, with your two manufacturing facilities, not only do you get to take advantage of the IRA provisions, the Inflation Reduction Act provisions. Also, just from a supply chain perspective, too, I'm sure that that gives greater reassurance to your customers, right? You're not worried about a port access or materials moving, as you say, from overseas that it's here. It just makes that supply chain issue, I would assume, quite a bit simpler.

I don't know if you want to talk about supply chain a little bit, but I do think that that's been a concern over the last few years. Maybe it's eased a little bit. But I also think that's an interesting point to discuss.

**Jason Barmann:**

Yes, it definitely is. I know prior to joining EPC Power, the international shipping had hit a lot of whether the Suez Canal or just getting shipping containers alone from Asia. It seemed like there's just one after another risk that's introduced to a project. When did we start looking overseas for shipping? That's one thing that we don't have to worry about as far as delivering to site. Obviously, our supply chain, we get our components from everywhere. We try to get as much of it here in the United States as we can. It is something that it is not as much of a challenge, but I think it's still something that we don't want to take our eye off the ball. We want to make sure that we're still focused on that.

I always like to joke with some customers. They say, “Well, what type of – what happens if I have a broken part or something that happens?” It's, “You know, well, we got a couple gigawatts worth of spare parts just south of your side about 30 minutes or so or maybe a couple states away.” It is nice to be able to say, “Hey, look. This is a – one of our customers is going through

a big challenge. Let's see how we can help them, even if we pull some units from manufacturing to be able to help them out."

**Bill Derasmo:**

Oh, fantastic. Well, as this is the Battery + Storage Podcast, why don't we focus on that for a moment? Tell me about EPC's interest in the storage space and your personal interest in the storage space.

**Jason Barmann:**

Yes. It's interesting because our technology, right? For those who maybe are as familiar with inverters is we don't actually do the storing of the energy, but we do all of the charging and the discharging the active parts of a battery system. The battery just sits there. It's a big reservoir, and we fill it up. So we are an essential component. Though, we are a very, very cheap component compared to the battery itself. It's an essential part.

That's really one thing that I was reading the other day about storage facilities is that while the inverter might not be the most expensive part, it does play a critical role because it is what actually provides a lot of maybe the ancillary service revenue. If you're looking at a fast frequency response or some type of black start capability where you're trying to re-energize a portion of the grid while it's down all the way to some of the more advanced stuff that we're doing in Australia right now around grid support, grid forming functionalities to help really stabilize this remote grid. They might have very wild swings in frequency or in voltage, and the battery resource just being connected can help kind of stabilize that in these remote parts. The inverter really is the one that does all the work.

**Bill Derasmo:**

Yes, the inverter, obviously, a critical component. When I toured a BESS, battery energy storage system, it looked almost like a data server or something. You have all these racks filled with the cells, right? Then at the top of each stack was – I'm like, "What is that?" Like, "Oh, that's the inverter." Now, they could be configured different ways, I'm sure. But, yes, without the inverter, you're going to have a lot of cells sitting there.

Well, and you mentioned frequency response and primary frequency response. I always like to bring that up because that was my entree into the space. We had a case that involved the provision of primary frequency response, and it's amazing what a BESS lithium-ion array can do in that space, as opposed to the conventional way that we used to provide. We still do in a lot of areas provide primary frequency response literally through the inertial response of the conventional resources.

Well, now, within a millisecond, you can have a response from a BESS. It's an interesting advancement. I don't know if you were heavily involved in that in your career as you came up, but that's one of the great use cases for these grid-scale batteries.

**Jason Barmann:**

Yes. It is fascinating. I know that the first time I started working on a storage project, I looked at these inverter ramp rates saying like it's a slow ramp if we have to go 0 to 100 percent output in two seconds, even though the grid doesn't want that most of the time. But because it is just a programmed set point, we are able to do some really creative things with the software itself. Like you said, the physics of a traditional generator, right? A gas or a steam-powered generator and being able to provide that inertial response.

When you see a big disturbance on the grid, it can just ride through that because it has a huge rotating mass. These inverters with some really clever code can actually provide what they call that synthetic inertia. They call it this grid forming while grid-connected. There's a lot of different names for it, but it's essentially where it sees the grid start to deviate from what, I'll call it, a stable condition, it will start to resist that change. It's not as powerful as a traditional generator is. With the amount of renewables that we're going to be adding to the grid and all the storage we're going to be adding to the grid, then it can definitely – if they all have that capability enabled, then it can provide that.

That's actually one thing that we're very, very excited about. Like I mentioned, we're doing that in Australia. It's very popular in islands today. We have several island projects that we're in over 45 countries around the world in counting. That's probably out of date. It seems like just another one pops up, but it is something that Hawaii is really on the forefront in the United States. Hawaii and Puerto Rico are kind of the two places that we're starting to see that pop up. But, yes, it's really exciting and really fascinating. Once we start getting into the details, I have to make sure our technical team is on the call, too, to make sure that we are capable of performing in that manner.

**Bill Derasmo:**

Well, you've got the engineering background. You should be able to knock that right out, those issues.

**Jason Barmann:**

Yes. That’s the nice thing I like about EPC Powers that I don't have to provide that technical capability. They have that in spades, and so that's something that I can just semi-talk to it. But I can guarantee you, there's always going to be smarter people on our side that can all save me when I get too deep into the weeds.

**Bill Derasmo:**

Well, on that point, you're the Director of Grid Integration. What is a day in the life of being the Director of Grid Integration for EPC? What does that usually entail?

**Jason Barmann:**

Yes. It's going out and trying to figure out what the problems are and how our inverter might be able to solve those. One thing that our team was looking on last year was these inertial responses and making sure that trying to come up with strategy so that as every single country, it seems like it's coming up with these standards around grid forming while grid-connected, right?

Nerc came out last year, and they kind of came out with this opinion and paper on what exactly is a grid forming while grid-connected inverter, and how can it provide benefits to the grid. It seems like Australia, the UK, Finland, every country is kind of coming up with their own version of that. So we're trying to make sure that there's nothing too far out of left field that we don't see coming, as well as trying to find other benefits that our inverter can provide today.

A lot of people are looking at remote lines on their distribution system that they want kind of a UPS-style pickup for an inverter, which requires a very quick ramp rate. That's something that we're looking for as well. So really just trying to figure out other parts of the big picture of the grid and where our technology can play best.

**Bill Derasmo:**

Well, it sounds like you're with projects all over the place. You said 40-plus countries. It sounds like probably each day is pretty busy. What do you see coming down the pike in this market? You see storage being deployed, obviously, each year quite a bit more. You see a movement. I think there's still plenty of standalone storage, but I think there's going to be continued growth in these so-called hybrid projects, the solar connected to storage. What trends do you see coming down the pike in the marketplace?

**Jason Barmann:**

Yes. The jobs are getting bigger. I think that the shift is going to be towards those collocated facilities that you talked about. That's something that we see that huge massive amount of solar and storage in the interconnect. Obviously, some of the insulator services seem to be kind of getting deployed and not really hitting their ceiling. As you add more and more assets that are only doing ancillary services, it kind of depletes that resource. So, yes, definitely where you're seeing high renewables penetration battery will go.

I think that utilities are starting to get in the game, too. They're really starting to understand that they're able to start qualifying for some of these tax credits directly because the transferability portion of it. That's something that's exciting is people who care about reliable equipment are starting to have a decision on exactly what gets procured. I mean, that's our best customer, someone who really cares about reliability.

There's a consultant that came out with the two best ways to be able to improve reliability for your storage site. One of them was the HVAC for the best bang for your buck. You can also just deploy twice the amount of storage and have double redundancy. Really, it came down to if you're not looking at that, if you're looking at what small components can I change to greatly

reduce the amount of outages, they said 80% of the outages are caused by the HVAC unit like on the battery container, just because those batteries, they really got to be kept cool. Anyone who's worked on commercial or industrial HVAC systems knows there's a scale of costs that go with reliability. If you go with cheap, you will get cheap, and it will fail. That's just something that it depends on how quickly it fails and how long it takes to be able to service it.

Then the other side of that was the inverter, and that was something that we take a lot of pride on, our well over 99% reliability. That's one thing that as people see in the solar market, those inverter companies that really just drove to the bottom on cost, what got sacrificed a lot of the time was reliability or maybe some components that were reliable. It's something that it wasn't the main focus. That has always been our focus. Customers that value that is – that's just music to our ears when someone says, "Hey, we want to make sure that this project's going to be reliable." We kind of sit up on our seats a little straighter.

**Bill Derasmo:**

Well, that should be the number one concern of everyone, right? That's certainly regulators and I would say just using the term broadly traditional utilities because they're the ones typically that are answerable most directly to the state regulators, FERC**.** So reliability is going to be at the top of the list. No, that's good to hear.

In terms of a typical project, if you're involved with providing the inverters for, say, a collocated solar and storage facility, how heavily involved would your company be in the integration of that site or integration of your components into that site?

**Jason Barmann:**

That's a good question, and it really depends on what the procurement strategy is. There's a lot of owners that might be looking at kind of buying inverters, buying batteries, buying solar panels, and doing the integration themselves. In that case, depending on that sophistication of that owner, it depends on how much we play. A lot of our team has had experience as either on the integration side or on the balance of plant side.

My background was in – I would design everything on the site-wide, so the balance of plant electrical systems. I still have that experience, and I can still give some advice here and there when owners are trying to come up with a certain solution to make it work. We have a lot of good partners as far as like third-party EMS providers that can build a system like that. Then on the flip side, for those that might want a turnkey package, something that's proven, deployed, we've got a lot of great partners out there that deploy a lot of our inverters, and they can make that customer's overall system work very seamlessly.

That's something that depending on that procurement strategy, we're going to be involved either way. It's just is it via one of our integration partners, or is it just directly.

**Bill Derasmo:**

Sure. We see a lot of the turnkey model, the turnkey projects. It's fairly common. In terms of those hybrid projects with solar and storage or wind and storage, so would your company provide the inverters for both the storage, the BESS, and for the renewable resource?

**Jason Barmann:**

That's a good question. Up until this last year, I would say, "Oh, we would stick to the storage piece." You can use our inverter as a solar inverter. It works. It's just we design it around a really rugged application, a very difficult application, and that is energy storage. It's not a great fit. It wasn't designed around solar, whereas it seems like most of the products out there are kind of designed around solar and then applied to batteries. We kind of started with the opposite focus.

We are launching a product that we announced last year at RE+ called the M, and it is going to be a solar and a storage inverter. Now, we're still ramping up manufacturing for that. But in 2025, we'll have plenty of capacity, and we are excited that we'll slowly dip into that solar side, so we will be able to provide that inverter. But at least at the initial release, it's going to be around storage first.

**Bill Derasmo:**

For many of the people who probably are interested in this podcast who are in the storage space, it sounds like you've got the inverter that's designed specifically for storage so that maybe another sort of market advantage that you guys have, and that's it's an interesting focus. I hadn't thought about what you said where a lot of times it was an inverter that was applied in a solar resource, for instance. Then try to apply it for storage. You guys are sort of the opposite. It's interesting to hear. It highlights your company's focus on the storage space, which is interesting.

**Jason Barmann:**

Yes. It's something that our company got started doing e-mobility, electric vehicles, the power conversion systems on e-transit systems. Over the years, that inverter, they found out whenever you're charging and discharging a battery, when you're bouncing it around all over the road, that's really rough on an inverter. You also see some crazy high-power demands whenever you're accelerating.

When you take it off the truck, you just kind of sit it down, and you let it sit there, and you charge and discharge from the grid at a four-hour dispatch or one-hour dispatch, whatever the storage is, it lasts a lot longer, and it's a lot more reliable. That was kind of that core technology that we applied from our e-mobility roots back in the day. Then we found energy storage, and we said, "Okay, this is a great fit for how we've designed these components." Yes, it's something that it just always made sense charging, discharging batteries. It's what our team knows a lot more than anything else.

I say batteries. But honestly, it's getting to the point where because we kind of have a team that's a little willing to be flexible and look at things a little bit differently, we're using our inverters today and hydrogen fuel cells and hydrogen rectifiers for electrolysis. That's a lot of people looking at that. There's a lot of incentives in that market. You've got the Hydrogen Hubs Program for that. That's something else that it's an easy fit for our application, and we're working with some of those vendors. That's another part of my role is to try to figure out, well, what other markets can we grow into using our core technology and what we know.

**Bill Derasmo:**

Well, a couple things there, one on the hydrogen front. We would maybe just come back to that in a second because I do think that's sort of, for lack of a better word, the next big thing that's coming. I mean, we've talked about the evolution of technologies. There's a dash to gas. Then there was a lot of wind and then solar and then storage. Now, maybe we're going to see a lot of hydrogen start to come on. It's interesting to hear that you guys are positioning yourself for the hydrogen market and that you're already involved in it. That's an exciting story in terms of looking forward. I don't know if you want to talk for a minute about hydrogen.

**Jason Barmann:**

Yes. It's a really interesting market. It's something that it makes sense for us because of all the variations of how you make hydrogen. Typically, green hydrogen is made by green energy developers. So a lot of those renewables developers that are looking into kind of how else they can supply, build more solar, build more wind, whatever it might be. They're also looking at deploying hydrogen.

We've got a lot of great partners that we're already working with and trying to figure out exactly how all these systems go together. Yes, it's got a lot of headwinds. I mean, hey, everything does at one point. It just depends on kind of how the technology adapts to those headwinds. There's a lot of investment right now going into it, so it's really interesting to see all the – people are like, "Oh, we can decarbonize everything." That probably won't be the realistic outcome, but it will probably fit in some really interesting applications. Talking with some developers that are deploying these systems, it's a lot of fun to learn about something new.

**Bill Derasmo:**

Absolutely, tremendous amount of interest and activity in the sector. As you say, it may not be the cure-all for everything, but it could play a significant role in decarbonization, so definitely. I think it's the next thing coming down after storage. Storage will continue to grow as well. But, yes, a lot of exciting things. Then it'll be up to us to figure out what comes after hydrogen.

**Jason Barmann:**

Yes. I don't know. I'll have to look at the components for fusion or something like that and see if they need an inverter. Anytime you need to convert between different types of power, whether it's AC or DC or DC to DC, hey, our technology will fit. Inverters typically just go one way, and it is from DC to AC. When you think about a solar inverter, that makes sense. Ours are

bidirectional inverters, so they can go back and forth. Usually, when you're going from AC to DC, you'll call that a rectifier. It's just a different terminology, a little different topology. But, typically, our inverters are used bidirectionally. If you're looking at that electrolysis where you take an AC to DC to run the electrolyser, you can use our inverter as a rectifier in that application. Or if it's a fuel cell or a battery or anything else that DC needs to convert it to AC for the grid, it is the same box that you would use for any of those applications.

**Bill Derasmo:**

Sure, sure. Well, and it makes sense that in the storage space, of course, that it'd be bidirectional because you have to draw the power off the grid, fill it up, and then let it – release it at the appropriate time. No, it's good to review the basic physics that are involved from time to time.

**Jason Barmann:**

Yes.

**Bill Derasmo:**

Anyway, we appreciate having you on the program today, very interesting discussion. If folks are interested in learning more about EPC Power, just let us know where they can find out more information.

**Jason Barmann:**

Yes. You can go to epcpower.com or email us at info@epcpower.com. Or check us out on LinkedIn. Definitely just any way you want to reach out. We're more than happy to answer questions. Or if you want to buy an inverter, we'll sell you one.

**Bill Derasmo:**

I'm sure you will. All right. Well, let's wrap it up. It was great to have you on the program and until next time. We will say have a great day.

**Jason Barmann:**

Thanks, Bill.

**Bill Derasmo:**

Thank you.