Battery + _Storage_ Podcast — Navigating the Energy Frontier With Aric Zurek, Fluence
Host: Bill Derasmo
Guest: Aric Zurek
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Bill Derasmo:

Hello, welcome back to the Troutman Pepper Locke *Battery* + *Storage* podcast. I am your host, Bill Derasmo, partner at Troutman Pepper Locke. Today, I am pleased to have with me Aric Zurek, president of Fluence Digital, and senior vice president at Fluence. Welcome to the program, Aric.

Aric Zurek:

Yes, thank you very much, Bill. I appreciate it. And excited to hear more about the podcast and have a discussion.

Bill Derasmo:

Excellent. Well, great to have you on today. As I mentioned, you are president at Fluence Digital. But why don't I give you a chance to introduce yourself and tell us a little bit about your career journey, and Fluence Digital, and then we can get into a conversation?

Aric Zurek:

Yeah, absolutely. No, I appreciate the time. Look, I think it's such an interesting time in the market as we think about energy storage. And my career to this point has been really interesting journey as well. I started out, I actually worked for GE, General Electric, for the first 20 years of my career. I came straight out of school as a mechanical engineer. Really interesting experience joining a large company, a global company like GE. I started as a system design engineer, kind of for reviewing documents, and process diagrams, and system diagrams, which is a great way to learn how energy works on the front line.

I then had a great opportunity to travel to Japan, of all places. I worked at Fukushima and a plant called Tōkai. And so I did nuclear services. I was a tooling engineer. And that was a formative time in my career because I got to spend a lot of time with customers and solving, I would say, real-world problems and mechanical issues, and how do you make large equipment operate and run properly. That sort of started my career on this idea of services and technology together in a combined way.

I came back to the States. I spent a couple of years running various business units for GE. I was doing a parts business, a controls business. We did several nuclear control room upgrades at

the time. We started working on things like adjustable speed drives. So, we're thinking about motor, and pump controls, and flow control for reactors, and upgrading those reactors.

I then shifted my career path more towards marketing and commercial, which is really unusual. So, kind of came out of the heavy equipment and engineering aspect, more into working with customers and securing long lead orders for nuclear reactors. At the time, nuclear was going through, I would say, one of the first resurgent of the market.

I then transitioned into more, I would say, the core GE business, which was gas turbines. And so I spent some time in power generation services or energy services, they called it at the time, working in Atlanta, Georgia. And so that was a fun and really challenging part of my career working with multiple regions and large product lines that had parts, and repairs, and upgrades.

Then transitioned – ironically, I looked at oil and gas as a big growth segment. And you know, it's an extremely volatile market. My family and I moved to Florence, Italy, which was really neat working as an expat. And so at the time, GE was focused heavily on many large acquisitions. I think we acquired almost $10 billion of acquisitions into the portfolio. And so I spent a lot of time traveling to different GE locations in the oil and gas family. It was Cramlington, and Newcastle, and Aberdeen, and Oklahoma City, some of these other places where we were adding to the portfolio.

And so really interesting to me to see from power generation in something like nuclear, which is high technology, heavy equipment, into the gas turbine world where you had to learn about gas economics, and how the markets work, and how gas is deployed in peakers and combined cycles. And then I completely switched and went into, I would say, the very upstream of energy, which is oil and gas.

I came back to the States again after two years working across all those segments and worked in the – at the time, fracking was a big concern and kind of interest in the market, and things were moving so fast. And then after GE, I joined a company called Flowserve, which was a company that focused most specifically on downstream oil and gas, but also chemical and industrial customers. And so, again, thinking about this whole energy value chain, from pulling energy out of the ground, processing it, refining it, seeing it, and utilization, and then how power gen interacts with the rest of the energy markets.

I was then recruited out of Flowserve because I had started a small software business within that aftermarket services company, that part of Flowserve. And Fluence called. And it was just a really interesting pivot for me to then sort of end up in renewable energy, and specifically, battery storage, which is such a unique part of the renewable value chain and the power generation value chain.

The fact that batteries can maneuver and change the grid in the way that they're doing today is just phenomenal. And really interesting for me. I get to play in the software space, which is right on the leading edge of how these batteries are deployed into the market. And we'll talk a little bit about that and how Fluence got into that, if you like.

Bill Derasmo:

Well, a couple of things there if, I can jump in. I mean, your background may be one of the most well-rounded backgrounds of anyone we've had on the podcast because you hit all the major high notes, nuclear, natural gas, oil and gas, and then over to grid-scale storage. And so, that's a really, like I said, well-rounded background. And it's not often that we have someone on who's got that type of background when we started to say with nuclear. And it is very different, right?

And the other thing I noticed in your background is the mechanical engineering, and then also the MBA background. A couple of questions I wanted to ask you first was what was it like in that career move when you did something so totally different from what you'd been doing to go to a company like Fluence as compared to more conventional sources of energy that we think about? That was number one. And number two, just the difference in mindset from your engineering background to someone who has a business background, an MBA, and applying those different disciplines as you go through and work for these companies.

Aric Zurek:

I appreciate that, Bill. I think, yeah, it's so interesting. I would like to say that I perfectly designed that, but I think it was like happenstance and circumstance that drove down that path. It was so interesting because I got to work in terms of base load generation. And then I worked in combined cycles, which is like the next factor. And then talking about peaker units. And just working my way through the industry. And now we're in battery storage, which is really at the leading edge. And you talk about these batteries deploying in 500 milliseconds type frequency, and that grid dynamics, and how the grid's changed over the years.

For me, I think the key is risk. Do you take risk in your career? And there was a couple points where it was like, "Hey, do I want to go to Japan and work in nuclear reactors?" Clearly, I didn't know what I was doing when I had that thought. But just an amazing experience to build on.

And then the second major risk was when I looked at joining a commercial role as a marketing leader for the nuclear business. Again, I had a strong foundation of technology, but to go into the commercial side and start talking about contracting and how you position the company within the industry. And then, again, this big risk of – well, there was a small risk in Flowserve of leading a software business. It was a very industrial company that said, "Hey, we want to get into software."

And then Fluence is the same. I didn't have a background, let's say, in batteries. And I think it's a very small number of people that have that unique experience. But to take everything that I had and sort of build towards, "Okay, it's a system." There's mechanical, there's electrical, there's controls, and then there's software. And so how do you put all those pieces together to optimize it? And I think that's really, if you're thinking about some of your younger listeners, how do you take these, I would say, controlled risks or measurable risks and move your career forward? That's an interesting way to think about it.

And then in terms of the MBA versus the technical piece, I think both are so important. I see engineers today that do a tremendous job in terms of design and laying out systems and optimizing the machine, if you will, whatever industry that's in. But if you don't take an eye to the

economics and say, "Why are we doing this? What revenue does it create for the customer?" Does it actually create value at the back end? Because you can optimize the heck out of something, but if it doesn't drive the bottom line, then it's not going to get prioritized, or the customer is not going to adopt it. And so it's managing that balance between the two. Again, you can make great financial decisions, but at the cost of technology. And so you're always looking for that balance.

Bill Derasmo:

Sure. All right. One more question on your background that you ran through. Florence, Italy. I think when most people think of Florence, they think of art and art history. And my child didn't, but a lot of people, their children study abroad, and they spend a semester in Florence. You don't think of heavy industry. How did you end up in Florence for a while?

Aric Zurek:

Actually, it's a really interesting story. I highlighted the acquisitions that GE was going through, and they said somebody that has deep experience in GE process. That's where it came from, is they said, "You know the technical development cycle, like marketing requirements, product requirements, tech specs. How do you do test documentation?" A lot of the new acquisitions didn't have that capability.

And so Florence happened to be the headquarters for oil and gas at the time. And so there was a big compression business that was based out of there. They basically build really nice compressors for oil and gas. And that was, I would say, the bread and butter of the oil and gas, origin story for oil and gas. And then we added fracking, and risers, and directional drilling, and all the other components that you need for a full portfolio. It's really amazing to see GE through that development cycle.

And yes, Florence is amazing. Art, and culture, and coffee, and all the wonderful things that it has. That was a tremendous time in my career. But I was also very impressed. And credit to the Italian engineers and the manufacturing, it was just world-class in terms of what they were developing in terms of compression equipment. Really amazing. And so a lot can be learned. You have assumptions going, "Oh, maybe in the United States, we're the best in this or that." But, actually, there's a lot of centers of excellence around the world in different technologies. Really interesting to see.

Bill Derasmo:

Well, thanks for sharing that. I went to Florence once in my life, many years ago, and it did not involve oil and gas. But anyway, I was curious about that. Well, all right. So, let's fast forward a little bit. Let's talk about Fluence as a company and what Fluence is up to. And then you're specifically involved with in terms of software.

Aric Zurek:

Fluence really wants to change the way the world is powered. I mean, it's an amazing mission statement in terms of – it was one of the first world leaders in terms of developing battery and storage technology. I think some of the earliest technology was developed by Fluence in the formative years, but continues that innovation path. And I'll come back to this later, but we just launched a new product called Smartstack, which really combines all the best technology, software and controls together into one package. Energy density, all the things that you need for great products in a great battery storage system. And then combining that with services and digital.

I think what's interesting to me is a little bit of the path that Fluence took on software. Because, of course, it had the great storage technology. It was well before I got here. I've been here about 18 months. Several years ago, this is about four years ago, Fluence went and acquired a couple different software businesses. One was a company called AMS, which did this trading application called Mosaic, which does bidding optimization, and I would say revenue optimization for the customers on the market side.

And then the second application that they went on and acquired was a small company based out of Zurich, Switzerland that does asset performance management software. And that was created because I believe there were some issues with wind OEMs and some solar PD OEMs that didn't really provide their users with enough detail and capability to understand how the equipment was performing. And so the small startup, it's a really a group of Italian folks that started this company in Zurich, and really did a nice job that Fluence took a look at them and acquired a company called Nispera a couple of years ago. And so you combine those two things, which is, I would say, asset performance management, combined with market optimization. It gives us two really nice tool sets that we can use to optimize storage and batteries in the market.

Bill Derasmo:

That's fantastic. Well, and my exposure to this, I think we were talking off camera, so to speak. It started with a facility called the Harding Street Best, which is owned by one of your affiliated companies, AES Indiana. And the use case for that ended up being primary frequency response and the instantaneous response. And it does an unbelievably fantastic job. And I think you alluded to the time, the millisecond that it can respond.

And so one of the things I was thinking about when you were talking about Mosaic, and Nispera, and the different capabilities that they brought to Fluence, and when I think about battery storage, it's always, "Okay, what's the use case for this facility?" And a lot of times, it can be customized. It can be bespoke. And so if you compare the use case for, say, the Harding Street Best with, say, someone who wants to provide energy at the peak, for the 4-hour peak, or whatever it is, let's say, in California, or Texas, or whatever. Talk about how Fluence has been involved in some of those use cases and just the flexibility of storage to be able to fill those needs.

Aric Zurek:

Yeah, absolutely. I think it's so interesting. It also changes over time. Again, I've only been with a company for about a year and a half. But even in that 18 months, I've seen a tremendous change in the flexibility of the software applications to react to how the grid is changing. I'm thinking a little bit about ERCOT. And so as ERCOT developed as a market, specifically in the trading and the grid side, it was really around basically ancillary services and capabilities to provide quick response times and stabilize the grid.

And then as more batteries come online, then it becomes more about energy arbitrage, and the mission of the batteries might change. You also see a change in the characterization of the customer types. These segments are emerging where maybe in the beginning it was more traditional energy generators or generation providers. But you start to get into more like the IPPs, the merchants, and the developers. And so now they're looking for different use cases for these batteries depending on where in the grid, which node they're applied to.

I can see even within a single site the battery can be partitioned to do multiple missions, let's say. And so you might have some that's basically on a demand basis. And then you have other parts of that site that are providing grid resiliency, for example. And so the ability to respond and act as a shock absorber to the grid. We see that with some of our clients.

One of them I'm thinking of in Australia recently is doing, let's say, virtual tolling for the battery. They're providing, let's say, access to that energy storage capacity into the market to other providers. And so you see all these dynamic changes in the economics of how batteries can be deployed. It's only going to get more complex as we go. It's not going to get simpler. And I think that speaks to the requirement for software to be able to adjust to the market and provide all these different services.

I think rewind the tape on Mosaic, which is our trading application. Just a couple of, let's say, design features to be able to handle four or five different capabilities in a single market. Now we're reaching like seven, or eight, or nine different modes for the batteries. And so to be able to operate with that flexibility is really important for some of our customers.

Bill Derasmo:

Oh yeah. Well, I just think about PJM and the challenges. Just using that as an example, because I think a lot of regions are in a similar spot. But the challenge is where they say, "Oh my gosh, we've got all this load growth mainly driven by data centers and AI." But there's other things, too. And the way that they need to bring resources online quickly, and the fact that storage, you could collocate it with a lot of different other types of resources. And then you're talking about the flexibility and how you can deploy it for multiple uses in a location. I think it gets into maximization. What do you see as the single most important way to generate more value from energy storage assets? And what role does AI play compared to human expertise in driving value?

Aric Zurek:

Yeah, it's a really good question. I'll try and keep it simple, but it's kind of a complicated answer. The way I think about it is two parts of it. There's the revenue generation side, which, to me is the more tangible piece. If you're thinking about how you maximize the value of the battery in the market, clearly it's with a revenue optimizer. It's with something like a Mosaic. And there's others out there that do this. But you've got to maximize your bid strategy the day before. That's the day ahead market. And then you get into the real-time market where you're adjusting on every 15 minutes or every five minutes.

And so, if you think about human trading at that level, it wouldn't keep up with the capabilities of the battery. I think a lot of people know that, but it's just having software be able to create bids into the market in a real-time basis. It's something that can only be done. And now you're talking about like six or seven different modalities for that battery. It just gets highly complex. And then the grid changes throughout the day. You might have a disturbance, you might have a weather event, the software is able to react to that.

Again, still on this first part of revenue generation, you talked about human interaction. It would be easy as a software guy to say, "Oh, the software can handle all of that." In fact, what they talk about is human in the loop or human on the loop. The traders have to have an ability to intervene. Or we'll talk to a lot of customers. They do have good trading experience and gut instinct. And so they've asked us for, let's say – we call it like an override button, but it's something called volatility mode that says, "Hey, there may be an opportunity I want to take advantage of. I don't want to go full auto. Can I somehow manipulate the trading application to take advantage of something that I see or hear?" And so I think it's important. You've got to have that trading expertise.

Again, thinking numerically, what does that mean? Typically, software gives you a 50% lift on your trading performance. And then if you add a human on top of that, it's probably another 10% to 15% adder on top of that. And so it's really humans working with the software together that gives you the maximum benefit. That was part one answer.

Part two is on the APM side. I also think about asset availability. And so that's really important. You want to maximize the assets in the market that you have in your portfolio. But if they're not available to call on because they're in an outage or because maybe you have some modules that are down or you've got some deferred maintenance that's happening, what you want to do is maximize that availability on the market.

And so the way we do that is applications like Nispera or other APM providers can tell you, "Okay, you might have a module down in that rack, but you basically want to –" maybe that's okay. You run for another two weeks because the market's hot right now. You want to maximize the availability. Let's not roll trucks until it's absolutely required. And so maybe you're predicting, "Okay, in two or three weeks, there might be two or three more modules down. And so let's roll one truck and replace all those at the same time." Maybe it's a cooling issue. Maybe you can live with that temperature, or the weather's about to change. And so you're not as concerned.

And so having all that information at your fingertips is really important. It's asset availability and reliability, and the ability to dispatch that unit. And then combine that with the grid dynamics of the day. And you want to marry those two things together to give you your maximum result.

Bill Derasmo:

You've gone into a level of detail on this that I don't know that we've gone into. This has been really fascinating to listen to. I'm learning here in real time. Maybe this is a question that goes down a rabbit hole, but how much of this involves machine learning, so-called?

Aric Zurek:

I'm going to be a little generic and say all of it. Because, again, I have to break it up into two segments. Back to the trading and revenue side. The early models were basically linear approximations, and then curve fitting, and then we get into stochastic modeling. And now we're talking about like models of models. And then you get into things like scenario generation. Again, you're going to reach the limit of my background on this. But our traders who program the applications and work with, let's say, the compliance folks in each of the markets, they absolutely use machine learning and advanced AI methods to be able to predict the future. You got to look at things like weather patterns. You got to look at forecasting grid demand. You have to look at generation a day ahead to understand, "How do we want to bid this asset tomorrow?" And then you got to be able to adjust on the fly. The computations are running in the background all the time.

Again, flipping over to the equipment side. Again, this is where all my service background is really interesting, because I think about asset performance and availability, and reliability of the asset. You can look at things like – and this is something that we're actually just now releasing to a couple sites, where you look at things like thermal degradation of – this would be like a pressure in your cooling lines. These are liquid-cooled machines. And so you're looking at things like when there's a pressure drop, maybe you have a leak in the system somewhere. And so as you're circulating that cooling water, that's a pre-indication of potential failure. Or maybe it's just standard degradation over time.

And so if you model then using AI or machine learning models, you can actually predict when that equipment might fail. And so again, it's not rocket science. Other companies have done this before for different modules, but it's applying it to something like energy storage. And if we know as a manufacturer how these pieces of equipment should operate, then we take those algorithms and we can predict the future, if you will. Or understand what the impact might be if you're running hotter than normal. How much of that capacity is available to dispatch?

Bill Derasmo:

Well, you say it's not rocket science. But to someone like me who's a lawyer, it sounds like rocket science. I would imagine at a high level, anyway, it's maybe the opposite. Garbage in, garbage out. But the opposite of good data in, good results out. It's all in the inputs, I would imagine, of everything you ran through. The weather data, the outage data prediction, those types of things, and what your competitors in the market might or might not be doing, etc. Really interesting to me to hear about all that.

Well, as performance and technology get standardized – and I'm not sure we're at standardization yet, right? People are playing around with different chemistries and technologies. But is there a greater interest in financial or economic optimization of projects? Wondering if you could walk through that.

Aric Zurek:

Yeah, it's an interesting question. Yes, of course. I think as the technology advances, what we're finding just to keep up with the market trends. Fluence itself is releasing new products every year, every 12 to 18 months. We have a new storage platform. I think we're starting to see standardization, where we're going to see reuse of components. For example, in a new smart stack, a lot of the base can be standardized, and the cooling components, and the controls, and electronics. And then you start thinking about how do you maybe change the amount of cells, right, in each one of those pods. There's four pods on a smart stack. You can go higher and add more density if you want to. And so that standardization of the product is good. Certainly, as a software guy that has to ingest all the data. The more standard we make it, the easier it is to manipulate.

I think what's also interesting – your second part of that question was around financial certainty. Or how does the economics change? One of the things we're seeing with some of these next round of developers – because storage is starting to be more prevalent. It's not just the large utilities that are getting into it. There have been small developers. They don't need a lot of folks to do this, but they do need capital.

And so one of the recent questions that we've seen is they said how does Mosaic help me give greater certainty? Once I understand how the battery can perform in the market, can you provide guarantees? And so the more experience we have, we say, "Yes, we know how the battery is going to perform at this node, at these market conditions over this time frame." We can give you greater certainty, which allows you to then maybe get a financial backstop. That's either through like an insurance provider. Or their financial providers look at something like, "Okay, who are you going to use as your OEM?" There's various OEMs. Who are you going to use as your optimization engine? And then if you use somebody like a Fluence that has credibility, okay, we could see the path to a certain base load of revenue generation. That's a little bit of a complicated answer. But by having that certainty with somebody like Fluence, then they can go to their funding sources and basically provide better guarantees. And that allows them to secure the capital to move the project forward. We're excited about that. That's almost like using software as like an enabler for project finance, if that makes sense.

Bill Derasmo:

It gives the financiers confidence, right? If you have a proven track record, then they're going to be more willing to provide the capital, whether it be in debt or if they're going to come in as an equity investor. And maybe we could pause on that. And I know we're talking a lot about technology, and software, and all. But I'm curious because it's such a fascinating time in the capital markets right now, I think. And I don't know what you're seeing. Any observations you're willing to share on that front? I'm always interested in the capital raise aspects, the difference between going with debt versus equity, those types of questions.

Aric Zurek:

First, I would say I'm not an expert in that at all by any means. I'm on the software and equipment side. That's where my point of view is. What I can say is it's been interesting that the conversations have shifted. And where we would typically have customers say, "Well, how does Mosaic predict the bids? Or what is the engine behind it? Or tell me about the analytics." Those questions are starting to drop to the background. And then the foreground is like, "How can you guarantee the financial performance of this asset?"

It's really interesting because we're almost spending more time with the frontline project developers rather than serving the traders so much. We still, of course, serve all the existing clients. But that's going to allow more capital to come in. I also see the economics of batteries changing. Again, not speaking as a financier, but as an OEM provider with Fluence, the cost of capital is dropping. I would say the requirement for service certainty and trading performance certainty is going up. And so there's this relative – we're hearing our customers use the word total cost of ownership is becoming more important. And so it's less around like, "Tell me about the cost of the battery." It's, "Tell me about the life cycle cost of the battery." And that speaks to me like a maturity of the markets.

And so this is where the industry is maturing and saying, "Okay, we're starting to think about 20, 25 year life cycles. And tell me about the revenue over the time. Tell me about the cost." You'll see this prevalence of like LTSAs and services that start to become more of the conversation, rather than just, "Tell me about the capital cost of the battery." That actually leans towards companies like Fluence that have a more of a portfolio offering.

Bill Derasmo:

And a proven track record.

Aric Zurek:

And a proven track record.

Bill Derasmo:

That's a fascinating insight, and someone who's close to it to hear that because it does have all the earmarking of maturity. I'll just be personal about it. When we started the podcast, I don't know how many years ago, it really was a nascent, sort of wild west thing. And now it's mature. I mean, California has relied on fleets of batteries. Texas, ERCOT, right? I mean, it's no longer this sort of special niche and exotic thing. It's become much more mature.

And a lot of states like New York and others are trying to get much larger numbers in terms of gigawatts, gigawatt hours deployed in terms of storage because, again, it's easy to – easier, I should say. Nothing's easy in terms of site. But it's easier because of maybe a smaller footprint. And you can collocate and do things like that. You can deploy it more quickly than, obviously, something like a nuclear plant or whatever.

There's a great interest nationally. And some of the markets that I'm close to, I can see there's really an effort to try to ramp up the deployment. And then when you layer in – there's so much that goes into it. But when you layer in some of the things you said, like greater interest in LTSAs, you're managing the degradation of the cells, right? And what goes into what you're willing to warranty or guarantee? Those types of things. But as the industry gets more and more experienced, those things become more and more standardized, I would imagine. It's really an interesting point in history for storage. Well, that might be a good segue to what do you see as next for this industry? And where do you see Fluence going in the near future?

Aric Zurek:

Oh, it's a broad question. I think I'm proud to be working for a company that's, I would say, at the leading edge of technology. It's interesting to see us continue to invest in R&D. We know the technology curve is still, I would say, in its early days, right? The ability of these batteries to provide more energy density, more power, more capacity. I think I heard today even in our earnings call, highly competitive with gas, if not cheaper and faster to get to the market. And so that's extremely attractive for customers that don't want to overbuild, right? In terms of their assets, batteries is the fastest path.

And again, go back to my background. I think it's so interesting, every generation type or stored energy asset has its place in the market, right? Whether it's Vaisala, generation, or combined cycle, or peakers, or however you look at the market. Wind and solar certainly have the role to play. And then now comes batteries, which is like the next evolution in the market. It's hard to predict what will come next.

What I can say is as you were going through that sort of summary of the last segment, what's interesting maybe to your listeners is early days of market optimization, as somebody that provides an engine for that, you could be pretty rough and be accurate in the early days. You just had to bid the battery into the market. You had to be roughly close to what was needed to make a profit.

What we're finding as the markets mature is your system has to be that much more refined and that much faster. And the algorithms have to be that much more accurate. Because more batteries come onto the grid, it almost – I won't say saturated. But there's so many people that have now flexible generation, that to make money, you're going to have to be that much faster and that much more refined. And so that just tells me, in the world of software, you have to continue to develop. You got to make your algorithms better than the next guys. And I think that's an interesting path.

I think what's next for energy storage, you'll see maturity in these markets. We'll see the markets open up in terms of the US in terms of more application of storage. I think you see like MISO and some of these projects in Michigan are starting to get legs. And there's more interest in other markets other than just CAISO and ERCOT. Those were the fastest to develop because of the most opportunity there. But I think you'll see it in the rest of the US.

And then I'm excited about around the world. So I think we're in something like 30 countries around the world with Nispera. We already are soaking in data from all these different types of assets around the world. For Mosaic, we're still in the beginning phases of the story. We're in

CAISO today. We're in ERCOT. We're highly successful in Australia and the NEM. We've got some early projects going on that look very successful in Japan. And so as these markets mature, like Japan that starts adding energy storage to the mix, that's just a whole new market that's going to develop both for the equipment side, for the service side. And I think you'll see more players becoming more multinational, I guess, is probably the short answer. You got to be able to be dynamically involved in all these different markets, which have all different requirements.

Bill Derasmo:

Sure. Sure. Well, say I'm a company that we have the responsibility to serve load. Pick your region. I'm more focused in the United States, obviously. I don't know. Say, I'm in PJM, or MISO, or wherever I am, SPP, New York. And I know New York, by the way, is going out for different tranches, RFPs, to get more storage deployed. But let's say I'm working with one of these organizations, and I look at it and I say, "Gee. I got to deploy storage because of all the advantages." You said it's quicker to get deployed. It's easier, etc. As compared to a conventional resource. And I want to work with Fluence. How do I go about that?

Aric Zurek:

Yeah, absolutely. I would say reach out to any of the folks on the Fluence leadership team. And certainly, we have a well-tooled sales team that's able to work with the customers. I think it's looking at what's the location that they're sighting? What's the permitting time? What are all the requirements that are needed? What's the right use of technology.

Even within Fluence, we have several different products or different generations that are best fit for that particular application. And I think going through like the economics of the deal, I think that's really, really important. And as I mentioned, it's not just about low cost. It's let's look at the life cycle. Let's look at things in the battery world. Let's talk about augmentation and repowering that asset a couple times over the life. And how are we going to service the asset over the lifetime? All of those elements are extremely important.

And so I think companies like Fluence that can partner with those clients that are out there. And again, the client base is expanding. The number of new customers that we're working with every year is it seems to be exponential. It started in the early days with just a handful of folks that were kind of experimenting in the space. But now, like I said, it's becoming a much more mature market.

Bill Derasmo:

On the use case issue, again, I'll give you one more hypothetical. I could talk about this all day, so I apologize if we're going long. But no, it's interesting. But let's say I'm with some company in one of these regions, and I'm looking at a retiring generator, and I say, "Gee, we're going to have some issues with voltage support." Or maybe my favorite, primary frequency response. But, "Hey, also, I see this looming capacity issue in the region." Design me a battery array that can solve my voltage support problem, my PFR problem, but also is going to be capable of providing me energy at the peak. I would assume that's the kind of problem that you're well-suited to solve.

Aric Zurek:

That's right. We love those problems. And we can work with EPC partners if the client has one. We can bring in our own partners that do, I would say, full-scale development of the project. And what are the requirements? And, again, like I mentioned, the mission of these batteries might be – like you said, it could be voltage control, it could be response frequency, it could be understanding the energy arbitrage piece of it. And maybe, like I said, this one customer in Australia starts to look at things like virtual tolling agreements. Now you're parsing out parts of the battery for different activities, which is really fascinating. I think, again, it's still early days of the market. I mean, it's going to be very interesting as this thing goes for the next 20 years. How does it develop? And the more storage that's on the market, it just makes it that much more complex.

Bill Derasmo:

All right, one last question. Alternative technologies. I assume Fluence works mostly with lithium ion or lithium-ion variations, maybe. But we've had others on the program that have talked about things like vanadium, and iron, and zinc, and different things. Where do you see the market for those other types of battery chemistries or technologies going?

Aric Zurek:

Yeah, I would say I think we're hopeful on technology continuing to push forward. Right now, the mission has really been standardizing on a singular cell form factor, because what we're seeing is the tremendous demand on volume. And so one of the things that we've talked about recently is having that domestic content in the US. We're spinning up these different, I would say, component factories, whether it's enclosures, or modules, or cell production lines, and that sort of thing. And in order to get scale, you've got to standardize.

For now, Fluence is kind of focused on what's the technology that's proven and available today. But we do have engineers. There's a whole technology team sitting down the hall from me that's looking at specific technology, long-form storage, higher density. You've got these 500 cells that have the ability to provide more power. But there's always a tradeoff. Maybe there's a thermal tradeoff. There's a performance trade-off. Maybe there's a life cycle tradeoff. Like anything, I think the industry will start to standardize on a few things. But you have to keep one eye to the future. What are we developing?

And in the software space, we do the same thing. We're trying to outguess, right, and figure out, "Okay, what else could be coming down the line in terms of new technology for software? How do we apply AI?" I think back to the APM space, something like prescriptive analytics. One of the things our application does very, very well is Nispera takes in tons of information. It coordinates it. You can drill down into specific failure modes. You get reports. There's a dashboard. But, again, we have customers that say, "Well, can you tell me what to do next?" Right? That's such an interesting problem. Because maybe you can apply AI to – it's basically like generative AI that says, "Hey, based on all the conditions, here's exactly what you need to do for this particular battery module at this site." Right?

We haven't even explored that option, and I don't think we're starting to look at it. But now you think about, wow, there's all these different uses of AI that could be out there for the future. I think you got to maintain some portion of your team looking at technology and what could be coming down the pipe.

Bill Derasmo:

Well, that is fascinating. I always like hearing about those longer-term issues. Well, I think we should leave it there. We've gone longer maybe than we planned, but that's my fault because I was so interested in some of the issues that you were raising, and I just had to ask some questions. I really appreciate you being on the program today. Folks want to learn more about Fluence, you go to their website, you contact one of their leadership team members, contact Aric. And you can work with a global market leader delivering intelligent energy storage systems, services, and asset optimization software. I'll give you the last word though, Aric.

Aric Zurek:

I really appreciate the time. I hope your listeners found something interesting in this. And I love talking about it myself. It's so fascinating to be on the front edge, the leading edge of technology and software, and a space, a market that's just developing, I think, just getting its legs. And I think you'll see it accelerate through the next 10 years. Excited about the future, and really appreciate your time today.

Bill Derasmo:

And thank you.