

Battery + Storage Podcast: Domesticating the Battery Supply Chain With ENTEK and KORE Power**Host: Bill Derasmo****Guest Host: Dan Anziska****Guests: Jay Bellows, Graeme Fraser-Bell, and Rick Pekala****Recorded 10/31/23****Bill Derasmo:**

Hello and welcome back to the Troutman Pepper *Battery + Storage Podcast*. And today we have three guests plus a guest host. We've got my partner, Dan Anziska, who I will be handing the baton to here in a moment. But before I do that, let me mention that we will have Jay Bellows from KORE Power and Rick Pekala and Graeme Fraser-Bell from ENTEK, and they're going to talk about each of their companies as well as collaboration that they're working on. So Dan, why don't I hand the baton to you?

Dan Anziska:

Thanks again for joining. Really excited. The topic for today is domestication of the battery supply chain and really excited to have two companies joining us. One on the battery side, which is KORE Power and President Jay Bellows. And the other is on the battery component side, vis-a-vis separators. And Rick Pekala and Graeme Fraser-Bell from ENTEK are joining.

I'm going to break this up into three pieces. First, we're going to spend a few minutes speaking to ENTEK about its background. Then we'll flip over to Jay and KORE Power to hear about them. And then I think the most interesting part will be to speak to both of them to learn about their collaboration as well as what they're seeing in the domestic marketplace right now and batteries in the supply chain. So with that, I'm going to flip right over to Rick and Graeme. Why don't you two briefly tell me about your roles at ENTEK and what ENTEK actually does.

Rick Pekala:

Okay, I'll start, Dan. This is Rick Pekala. I'm the Chief Technology Officer for ENTEK. I've been here 24 years. Palmer Scientist by training. ENTEK was a company founded back in 1984. It was actually founded as an engineering company to build equipment for manufacturer of lead acid battery separators. That has evolved over the years to today we are the second-largest lead acid battery separator manufacturer in the world. We continue to have an equipment and engineering division that will build, for example, twin screw extruders for the plastics industry. And then finally, we have an entity that is focused on making lithium-ion battery separators that was started back in approximately 2001.

Dan Anziska:

Before you go to Graeme, Rick, can you briefly describe what a separator is and how it fits into batteries?

Rick Pekala:

Yes, a separator, no matter what the battery chemistry is, sits between the positive and negative electrodes. These are porous membranes. The porous structure is filled with electrolyte, thereby allowing ionic conduction between the electrodes. When you think about how a battery works, you have electrons flowing through an external circuit, but internally you have ions flowing between the electrodes and meaning through the separator.

Dan Anziska:

Thanks, Rick. And Graeme, why don't you briefly describe your role with ENTEK.

Graeme Fraser-Bell:

Sure, Dan, thanks very much for having us along. Graeme Fraser-Bell, vice president of lithium sales and market development for the lithium business. Like Rick, I have a doctorate. Mine's in organic chemistry, and as Rick was saying, one of the key differentiators for ENTEK is the fact that we actually produce the vast majority of our equipment. And as Rick and I were intimately involved in the startup of the lithium business back in around 2001, we really integrated a great deal of the engineering capability and competence of the ENTEK organization at that time.

Dan Anziska:

Thanks, Graeme. And I know many of our audience members are aware of the distinctions between lead acid and lithium ion batteries, but explaining that ENTEK had built these separators for these different types of battery chemistries and platforms.

Graeme Fraser-Bell:

That expanded over the last two years as well with the acquisition of the separator business of Nippon Sheet Glass that gave us the polyethylene lead acid battery separator business, the absorptive glass mat battery separator business for valve regulated, standby, and high-end automotive batteries together with that lithium battery capability.

Dan Anziska:

Let's discuss right now. A lot of the focus has been the past couple of years with the inflation reduction act and the bipartisan infrastructure law about the growth of the domestic lithium-ion battery marketplace and the various components. What is ENTEK's target customer base right now in that particular battery industry in the US?

Graeme Fraser-Bell:

It would have to be the xEV target segment. We see that going from a potential production of about 55 gigawatt hours of EV lithium battery demand in 2022 up to greater than, what, 1,200 gigawatt hours by 2030. So tremendously exciting in 20-fold growth. So that's the primary focus. But within that pipeline, it's very important that we look at the ESS as well. So the ESS, the energy storage systems, and the standby lithium-ion developments within which KORE Power plays a key part. That's an important part of that growth because that is actually growing at a

faster rate than the EV growth and is essential in terms of supporting that renewable energy build out and the storage systems to support that.

Dan Anziska:

That would be what some of our clients would call kind of a scale battery storage systems. And as you know, those projects have really grown. We've seen enormous growth in 2023 and I'm going to get to that with Jay and then we can discuss that growing market together a bit later. ENTEK's recently, congratulations, announced an exciting expansion in Terre Haute, Indiana. Can you guys tell me a little bit about that announcement?

Rick Pekala:

Yeah, I'll take that one, Graeme. As part of the Department of Energy, the Inflation Reduction Act, really looking for this domestication of the manufacturer, both lithium-ion batteries, but of course with key components. ENTEK was awarded a grant to build this new plant in Indiana and it's structured so that we will have at that site a 1.4 billion square meters in separator capacity, which will still be a pretty small portion of what's going to be required in 2030. But we envision having a second site one day, and we broke ground here in Terre Haute, Indiana in early September and we're fully permitted in terms of our Title V permit. So we're ready to go. We need one more approval from Department of Energy before we'll start moving ground there in the month of November.

Dan Anziska:

For those members of Department of Energy listening, that's a not-so-subtle reminder to please sign off so that we can have some domestic separators for battery producers in this country. They're better sales guys than I am, Rick. They're at all the conferences, as you guys know.

Graeme Fraser-Bell:

That DOE funding opportunity is absolutely crucial to the expansion in Indiana as well as the investments from the Indiana Economic Development Corporation and economic incentives from Vigo County. I think as Rick was alluding to, it was very important for us to find a state, a county, a social structure that would embrace manufacturing and that's very much what Vigo County represents to us.

Dan Anziska:

Thanks so much, Rick and Graeme, for giving that background. I'm now going to flip to Jay and KORE. Jay, I know earlier this year you also had an exciting announcement for an expansion in Arizona, which similarly is receiving DOE support. So why don't you take us through that?

Jay Bellows:

Sure. So we went through the DOE process as well. We're awarded \$850 million conditional note. This is a loan to help us build out the KORE plex in Buckeye, Arizona. The first phase is a seven-gigawatt hour facility. Phase two will bring on another 10 to 12 gigawatt hours. It's a dual chemistry, so it's both NMC and LFP, which is pretty significant being able to cross the

chemistry line and built for really everything within the battery spectrum. We'll be doing EV, mostly focusing on ESS. As Graeme talked about earlier, the grid applications are far exceeding the EV applications and on top of that, the grid and ESS will be supporting EV charging.

So there's the whole equation down that line too. I can certainly talk about that later. But yeah, we're really excited to be developing and building batteries here in the US and partnering with companies like ENTEK to make sure that everything's domestic in the process. That's the goal of the IRA. I think it's certainly pertinent and it's doing a nice job bringing that manufacturing and supply chain here so that we're not dependent on other countries for those sourcings.

Dan Anziska:

Right, Jay, and like ENTEK, take us a little bit into the background. KORE has been around a while. You may be somewhat new in this particular niche, but why don't you take us through your history.

Jay Bellows:

Yeah, for sure. KORE, on the battery side of things has been around for about six years, but on the energy solutions side is actually the oldest energy storage company. It's about 53 years. That was through a merger with a company called Northern Reliability, which has been developing and building projects since 1970, 1100 deployments worldwide. Lots of projects in Antarctica, the Arctic Circle, oil rigs, mountain tops, anything you can think of.

And I think it's important to understand that in the early days of ESS it was really about bringing energy where there wasn't any. That's where it really lied. Being co-generated through different forms of renewable energy and fossil fuels quite frankly. And all of that, like ENTEK was talking about earlier, was lead acid at the time. Straight lead then going into advanced lead acid with carbon injections, things like that growing down into lithium and different forms of chemistry within the lithium lineup.

So yeah, we've been around a really long time, worked with a lot of battery manufacturers throughout that timeframe and are really happy to be able to bring all of those experience into a solution being built by US employees, US citizens, for US customers to use.

Dan Anziska:

That's great. Now take me a little bit through the LFP chemistry, your focus chemistry right now.

Jay Bellows:

We do both NMC and LFP and I think with all of the demand in the market, both have their place. The majority of EVs are still using pouch NMC. And on the ESS side, we're seeing more of a push towards LFP. LFP is a little bit cheaper, by chemistry it's a little bit safer, although I think that's arguable. NMC has been around for a really long time. LFP certainly doesn't have the footprint yet that NMC has had, but working through on the LFP side, these are for large scale deployments. We're talking with a lot of developers about building really large gigawatt scale, multi hundreds of megawatt hours at different locations.

And then of course the diversification of assets is going to be really significant in this process of electrifying our world, our goals are lofty to say the least. To be 100% EV by 2035 will mean that we'll probably need between two and three times the amount of electricity that we have right now on the grid. That includes making it much more efficient because at the same time we're also saying we're going to step away from fossil fuels and head more towards relying on renewable energy, which generates when Mother Nature wants it to, not necessarily when we need it. So the ability to store that energy that's generated by Mother Nature and have it as energy on demand and disperse it into the grid is significant. So really excited to be a part of that process.

Dan Anziska:

And I know we do have a lot of developer clients that rely heavily on the ESS kind of framework, and it's important that they be made aware that companies like KORE are domestic companies that are doing this. And it's not only the Asia-based suppliers that have expertise in this technology. You guys, please feel free both now to jump in. I don't want to lecture the audience about the benefits of domestic, Jay, Rick, and Graeme. Why don't you educate our audience a little bit about all the benefits and goodies that one can receive when you use domestic batteries and components, both on the ESS side as well as the EV side?

Jay Bellows:

Sure. I certainly can start. Again, we were on the ESS side of things on our solutions group. We've been around for a long time and we were really dependent on batteries coming from Asia, from Korea early on, and then China later on for the LFP technology. And I think this is understanding that this is what the IRA is trying to achieve is domestication. And the reason for that is we were solely dependent on batteries coming from there. Domesticating that gets us away from that dependency and then of course, onshore and the remainder at the chemical level, at the component level of each battery. It's so important to have all of that be here too, because we don't want to be relying from everywhere else.

And as far as pricing and grid integration, all those things, we want to own all that IP too. The pricing coming from China, there's a pretty significant tariff. So we can domesticate this whole process. That tariff gets alleviated. We're building the batteries and all the supply chain to the batteries here. We can avoid all those additional costs that don't go towards the project. As we talked about earlier, the demand for energy storage is monstrous. We have all of these goals. We are electrifying everything. There's heat pumps and electric lawnmowers and tools and all kinds of stuff. How do we support all of that? It is absolutely the holy grail to that process is batteries, is ESS to support all of that. The streamlining of that process means that the projects are done more rapidly. We'll be able to get them in cost-effectively and understand where the IP came from and have better control of it. It's really significant in the process of getting us to where we want to go.

Graeme Fraser-Bell:

Jay, I guess there was a recent announcement by the Clean Energy Association just over the last couple of days suggesting that US made battery energy storage systems could become cost competitive with Chinese source by 2025. And I think that kind of dovetails into that 45X tax credit, the ITC, the PTC and all of those motivational opportunities, incentives through the IRA

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Act, linked to regionalization of that supply chain. So by us feeding in with US manufactured material, with regional content, enabling the benefits from those production tax credits enabling you to compete with Asian imports.

Jay Bellows:

Yeah, I was going to say, I totally agree, Graeme. I think as we look at the process right now, this is one of the things that a lot of people don't really understand in our industry is, I'll just use ESS as an example because I think, Graeme, you really pointed out early on that the demand there is far outreaching than the EV side. If you look at what happens right now in our industry, the majority of the companies are having their cells made somewhere, China. Having them shipped to another location where they get put into modules to avoid tariffs coming from China. Then they get shipped over to a contract manufacturer here who puts those modules into a rack and then a solution, and then they partner with another group to install them and then they slap their sticker on it to say that it's theirs.

So throughout that process, there's four markups, four. And then significant logistics in that process too. Multiple shipping aspects of that. So the costs go up. And so I think right out of the gate, we'll at the very least be competitive, at the very least, right out of the gate. Because for companies like KORE, for example, we work with our partners like ENTEK and others. We provide the product, we build the system, we do all the IP, all the BMSs, all the controls, we do everything in the system. And then on top of it, we bring it back to our NOC, our network operating center here where we can monitor, maintain, and operate the system.

So those four markups in the process don't exist. We're able to continue to get our margins while not increasing the cost to our customers. And we were cost competitive before the IRA existed. Energy storage as a whole was very attractive for investors before the IRA. This wasn't solar. Solar wasn't attractive until the ITCs got into place. They were great for the people that could afford it. They were doing good for the earth and it was wonderful to do those projects. But the ITCs, the tax credits are what pushed it forward. Programs like the speed program and others really put solar onto the grid. It made it financially attractive. And same thing with wind.

With ESS, it already made financial sense. You had a between four- and six-year return on investment on a 20-year PPA and a product that lasts 20 years. If you're putting it in the right location, if you're using domestic supply, you get up to 50% tax credit. That means between four and six years, now it turns into two and three years for your return on investment on a 20-year contract. So it already made incredible financial sense. So if we look at it, I think as a whole, we're going to be cost competitive one-to-one, and then you add in everything else on it, it should be very, very attractive.

Dan Anziska:

And obviously for the developer clients listening in on this, the fact that you could actually get the PTC tax credit, the fact that with the domestic steel and metal on the project that you can use domestic batteries with domestic components from companies like ENTEK, which provides separators for you and other domestic companies. You could actually get the benefit where right now developers really are not able to take advantage of that benefit and are mainly relying on China. And then there's the other issue, which is the foreign entity of concern issue, though not yet finalized, that there is risk for Chinese manufacturers that you won't be able necessarily on

the EV side to get the benefit at all. And it remains unclear what disadvantages can develop over time on the ESS side of the credit.

So it goes twofold over there. Let's discuss collaboration. I know, Rick, Graeme, it's been important for ENTEK as a company that grew locally in the US to partner over the years with US companies. Why don't you describe your strategy of partnering with companies like KORE to help bring forward the domestication of the battery supply chain?

Graeme Fraser-Bell:

In the case of KORE, it's quite easy because we like regionalization, evangelists like KORE Power, they speak exactly the same language as us, and it's almost like an intertwined DNA and culture. I guess it started with the two of us being selected as winners of the bipartisan and infrastructure law grants back in October, 2022. There was a good connection between our president, Kim Medford, and obviously Lindsay Gorrill. So they connected.

Actually Rick and I knew the executive VP of R&D, Liang Tao of KORE Power in any case. So there were multilevel connections there and just that alignment of the kind of intent for a domestic supply chain. So partnering with the US domiciled in a battery manufacturer absolutely made sense to a component manufacturer that is US domiciled and US based as well. So like I said, just a meeting of the minds and for us also an essential diversification away from a sole focus on xEV. As we said before and as Jay agreed, the growth of ESS is going to accelerate beyond that of xEV. And so if the novel products that they've got, such as the NOMAD deployable power systems, those are great ideas and that could really take off. So we're really pleased with the relationship that we've got and where it's going.

Dan Anziska:

That's great to hear. And from the KORE side, Jay, are you looking to find for each of the main components, let's say on anode, cathode, separator, maybe rack, are you at least trying to identify one or two domestic possibilities?

Jay Bellows:

For sure. There's not a lot of companies like ENTEK around, so we're trying to find that with the remainder of the supply chain as best we can. We definitely want to get the entirety of the supply chain here, if not to the US, at least to North America. It's a process. I think this is one of the things that the IRA is going to have more of a residual effect on than an immediate, because the process is a long one. Even just talking about lithium as a whole. It's not so much finding lithium and mining it, lithium's everywhere. It's the processing. You got to process that, turn it into a lithium salt that's usable and applicable. So it's going to take a while I think for the remainder of the supply chain for everybody, anybody that's looking to build batteries here. But certainly our goal for sure is to onshore as much of that if not everything as soon as we possibly can.

Dan Anziska:

What's the biggest challenge that you guys see over the next 12 months in the domestic market? Let's call it the macro US battery market? I know it's really markets, Jay, but let's just say in the US based on the subject matter we're discussing today.

Jay Bellows:

Yeah, buildouts are hard. That's a big process. Whether you're talking about the manufacturing facility, whether it's Terre Haute or Buckeye, Arizona, there are significant buildouts. Supply chain is still just recovering from COVID. It's gotten way better. I don't mean to focus or harp on that, but supply chain can have its hurdles. Those are two big things within the process. As far as the end product, whether it's going into a car or even more importantly, if it's going into the grid, you're looking at pretty significant permitting processes, interconnection processes, all of those take time. All of those impact, by the way, the manufacturing as well, but all of it takes time. Those are two of the biggest hurdles. The ENTEK guys have their own.

Dan Anziska:

Yeah. Rick and Graeme, what do you see the next 12 months?

Graeme Fraser-Bell:

Dan, if you asked us this question back in July, 2022, we'd have reeled off a whole bunch of challenges and obstacles that we face. But with the advent of the IRA in August, those challenges were massively reduced by the implementation of IRA with this progressive regional content requirements and restrictions on materials of foreign entity of concerns. That's a great help. But if we look at how the market is concentrated, there is an Asian centric production and supply oligopoly still in the US. So we have to engage with that. It's essential we engage with that. Rick and I are probably spending more time in Asia Pacific than we do in the US developing our domestic business because that's to some degree where the decisions are made.

If we look at actual practicalities, for new entrants coming in now I'd suggest availability of power and the right power is a growing challenge for these major installations that we're talking about. And even simple things that sound simple like a 138-kilovolt transformer, that lead time is now three years. You better replace that order now to be in operation by 2026.

Dan Anziska:

Right. Now have you guys noticed that going through the whole DOE processes, whether it's the labor requirements or understanding the energy requirements, has that rigorous process helped you be prepared for the build out itself?

Rick Pekala:

I think as we've all mentioned, it's just going to be a big challenge getting all these new facilities to play and the market's not going to be there. We're not going to be able to sell separators unless somebody can manufacture cells. Well, I think one of the interesting things is just the fact

that building a battery plant or a separator plant in the US, there aren't as many general contractors that have done this or that are readily available. When you're talking about clean room environments and the sophisticated equipment that's going to go into these buildings.

I find it quite interesting every time Graeme and I go back to Asia and we look at other separator manufacturers that may want to come to the US, one of their big hesitations is just the cost to put the building in place. What we hear is it's almost 4X compared to what they can do in Asia. That's a big factor and one that we have to overcome in terms of our efficiencies and scale to be able to offer the product to KORE Power and others at the price.

Dan Anziska:

Right. Go ahead, Jay.

Jay Bellows:

I agree with everything, quite frankly. I think your initial question about if it got us ready, going through the process with DOE got us ready, I think the two different processes. The processes with DOE really strongly model based showing how you're going to do things, why you're going to do things, the route. It's a significant undertaking. It was two years for us to go through that DOE process. And I think it's important to understand, probably just like ENTEK, we were going this route anyway. So our business wasn't built on the IRA. We were already trying to domesticate battery supply before the IRA started. So for us it was just a nice kind of backer, hey, you're doing the right thing. This is great. We're in line with what you're trying to achieve. But it's a two-year process. Modeling being the key focus of that.

The actual process of doing all the things that Graeme was talking about with transformer, supply, and all of the processes to build this out with permitting and everything else, it's totally different. It's a totally different process. Now it is the actual process of what the modeling did, but doing it in reality is very different. And I again will just echo what Graeme said earlier. In 2022, this conversation would've been very, very different. In 2018 it would've been even more different. So as we look at the ability to get things done and how we would do them, a lot of things are still up in the air, but we're learning. You have to learn on the fly through this process. And just like any major manufacturing exercise, there's hurdles and you have to figure out how to get through them. And some of the supply chain is a big part of it.

Graeme Fraser-Bell:

There's lots of quotes we can throw out here, go big or go home. But one of the ones that I like is from [inaudible 00:26:47] of DOE, ready, fire, aim. And that doesn't necessarily mean everybody should just jump in, throw a bunch of capital and build that and they will come. But it means you've got to move quickly and you've got to make those bold moves and you've got to have some degree of those off take agreements, but chase up those agreements. And we've already got, Rick, correct me if I'm wrong, but about five line commitments out of the initial eight line of the first stage. So about 870 million square meters out of the 1.4 billion square meters is already committed. So we're still chasing on that aim on the final three.

Dan Anziska:

And those are all going to be for lithium-ion batteries, is that right?

Graeme Fraser-Bell:

Yeah.

Dan Anziska:

Okay. And just confirming what we heard earlier, every single lithium-ion battery, no matter the form of it, requires a separator in order for it to work. Is that a fair characterization?

Graeme Fraser-Bell:

Exactly right at the moment. As long as it's not an SSB, a solid-state battery. But your semi-solid state batteries are still using the polyphonic separator, and every lithium-ion battery is using separators, and every EV application is using wet process separators.

Jay Bellows:

And let's be clear too, on the solid-state battery, we have a ways to go for that. There's a long time to go for that. And true solid state needs a chemical reaction, so heat or something to happen that takes energy costs. So the true solid state's got a long way to go before a separator is not needed.

Dan Anziska:

Yeah, long way, not meaning 10 years, meaning 30, 40 plus years probably. Is that fair, Jay?

Jay Bellows:

Potentially, yeah. I think what's really important, this gets lost a lot. When we come up with new battery technologies and if you have a Google account, you see it every day. Someone's got something new somewhere somehow. That's really great. Let's say on a curve, lithium's on a certain point today with its ability, and they're saying that based on this new battery technology, whatever it may be, it's ahead of lithium. You're looking at probably a minimum of 10 years to get it market ready, go through all of the certifications, find the manufacturing way, how it's going to be efficient, how it's going to work until it's really market ready.

In 10 years from now, lithium will be twice the product that it is today. It's just the way it works. Lead acid went through the same thing. And by the way, you guys at ENTEK probably know this better than I, but I still believe lead acid is still the predominant battery in the world right now. So it's not like that goes away. It just keeps getting better. And that's what lithium will do as well.

Graeme Fraser-Bell:

Exactly right, Jay. And I guess if you look at the, what, 410 gigafactories in the pipeline over the next seven to eight years, not a single one of those is a solid-state battery gigafactory

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installation. And as you alluded to that economic scale, when you hit four terawatt hours and it's all wet electrolytes and that it's not going to be SSB. And absolutely right. Every xEV at the moment has got a lead acid battery in it as a 12-volt auxiliary system. And from what we see, that's going to remain the same. Unfortunately, 77% of the lead acid automotive industry is replacement. So that's going to remain at lead acid for a long time.

Dan Anziska:

So before we wrap things up, are there any parting comments that you want to pass along to our listening audience? This has been fascinating, and I'm sure illuminating for some, particularly on the ESS side, where the media has been so focused, at least the mainstream business media on the EV side, but this has been a fascinating conversation. So any parting words, Jay?

Jay Bellows:

I would just say, and I think we talked about this throughout this podcast, but the biggest thing is that the battery demand is going to be significant. Our goals here in the US with electrification, especially on the EV side, not that the batteries for the EV level, I'm talking about the grid level. I don't think people quite understand the capacity increase that's going to be required just to charge EVs.

Dan Anziska:

Give us a sense of the scale, Jay.

Jay Bellows:

Yeah, for sure. Right now in the US there's 290 million internal combustion engines registered. We all have friends that forget to register their car. It's probably closer to 300. 300 million vehicles right now generate their own electricity, all of them. So as we get to 2035, when we're saying will be a 100% EV, that means all of them will be consumers from the grid, 300 million cars. So the amount of electricity that's going to be required to support them and at the time of day that's going to be required is going to be significant. That's why we can say between two and three times the amount of generation that we have today, plus the efficiency gains from having storage. Because while a lot of companies are coming up with ways that they can try to make it a little bit more efficient to charge vehicles, maybe time of day charging, stuff like that at home, the truth is that no one's going to stop a parent from going to the hospital with a two-year-old.

So you have to charge your vehicle, you have to charge your vehicle. And as humans right now, we're pretty spoiled. We just go to the gas station, fill up, we can go as far as we want, as long as we want, whatever. It doesn't work that way with EVs, you have to be able to charge too. So if you look at it regionally, the demand for charging, all is going to happen most likely around the same time, within 20% of the day. So you're going to have to have as a utility that much energy to charge, otherwise something's going to have to give. So on the battery side of things, it's significant what the demand is going to be like.

Dan Anziska:

Right. And ESS, the form of ESS would support that growth of energy storage. Is that fair, Jay? You build both that storage battery as well as the one you can put in the car?

Jay Bellows:

We do, and on the storage side, we build the whole solution. So we build everything, including how it operates. We can do all of it. I think the diversification of those assets in this process is going to be huge too, because we need to learn how to share those assets, whether it's a large manufacturing site that shares that asset with the utility, because if the utility can offset a singular peak event that saves all of their customers across the entire grid. There's a lot of ways that we're going to mature in this industry in the coming years, but clearly the demand is monstrous.

Graeme Fraser-Bell:

Just building on what Jay was saying, the timing of this podcast is quite prescient because of the recent announcements from GM and Ford about those pullbacks and those postponements, and you can see it's having major impacts on the market, and people are rethinking, well, is this a fallback? But I think it's a quarterly short-term headwinds facing the long-term seminal demand event. And don't think for a second the Chinese will take a breather for a minute. If we think prior to the IRA announcement, there were, what, about 490 gigawatt hours of lithium-ion pipeline announcements between 2020 and 2022. Since August last year, 15 announcements, 640 gigawatt hours. Tesla was, what, a month away from bankruptcy in 2019? Now look at them now. So don't look at one point in time, let's have another chat in a month's time or two months' time. And the long-term impact of the magnitude of where this market is going, as Jay indicates, will be with us again.

Dan Anziska:

Right. Ready, aim, fire. Right, Graeme?

Graeme Fraser-Bell:

Yeah, exactly.

Rick Pekala:

That presents the real challenge too, and Jay said it earlier, the scale up that's required and the timing to get all of this done. It's a big challenge, not only from an equipment standpoint but from a personnel standpoint, training, employing and having these facilities up and running, and the timeline that the Department of Energy has required both companies. It's a big challenge.

Dan Anziska:

But I guess the good news is, Rick, you and Jay have helped manage companies that have done this before and have built and manufactured and employed workers and treated them well

and complied with environmental regulations and emissions regulations and everything like that before. This isn't brand new, which it is to some of the other market entrants. Is that fair?

Rick Pekala:

That's a fair point. The other thing I like about KORE Power is just the communication, the ability to innovate. It's a lot easier when you're in the same country than if we're worlds apart.

Bill Derasmo:

Right. Well, let me just say thanks very much to our guests, Jay, Rick, and Graeme. We really appreciate the discussion. Really interesting to hear your perspectives and also your collaboration. Really interesting stuff in the market. Dan Anziska, thanks for making my job easy today as the guest host. We appreciate that. Until next time. Thanks very much.

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