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**Battery + Storage Podcast: Advancing Eco-Friendly Battery Recycling With Storm Energia****Host: Bill Derasmo****Guest Host: Dan Anziska****Guest: MJ Chandilya****Recorded: 12/06/23****Bill Derasmo:**

Hello and welcome to the Troutman Pepper *Battery + Storage Podcast*. I'm your host, Bill Derasmo. Today I am pleased to introduce our guest host and my partner and colleague Dan Anziska, and the program's guest for today, MJ Chandilya, the CEO and founder of Storm Energia. Take it away, Dan.

**Dan Anziska:**

Thanks, Bill. Really excited to have my friend MJ here today joining us, actually closing out the 2023 calendar year for our *Battery + Storage Podcast* with probably the most talked about important subject, which is black mass recycling. And that subject has literally taken over multiple of these battery storage conferences and ESG conferences related to the subject.

Very briefly, MJ has an amazing background, six-page resume and really fills it beautifully. Everything from the youngest CEO of a transportation company in Asia, worked with Adani in a very senior role, and really is global educated in the US but has extensively worked in Asia. Presently is in Europe. And the purpose for today's conversation is that he is the founder and CEO of Storm Energia, which is a black mass recycling company.

So with that, MJ, welcome to the podcast.

**MJ Chandilya:**

Thank you so much Dan and Bill for having me here. I'm really excited about speaking to both of you here.

**Dan Anziska:**

Let's just jump right into it, MJ, because our network is always interested in hearing on this subject. So what is Storm Energia?

**MJ Chandilya:**

Storm Energia basically has been formed with the mandate, the vision to take EV batteries and any sort of lithium ion batteries actually and recycle them, destroy them in a very safe and secure manner, but also ensure that we're refining and pulling all of the metals in powder form right back into battery manufacturing in a very economic way, which is really our whole purpose. We've been in this business for close to about six years in various avatars, and we've really been focused on the last three years on the EV battery space and larger portable batteries like ESS packs.

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**Dan Anziska:**

Right now, you're based out of Europe. Is that correct? And that your main market is in Europe right now?

**MJ Chandilya:**

For the last two years, we've been really based out of Europe with two facilities in the UK, which have now been amalgamated into one larger facility in the UK. In the early part of this year, 2023, we decided to pivot and move to the US. So we're now headquartered in the US. We have our large facility, which is coming up in North Carolina. It's in the process of being cleaned out. Equipment's already over there. And we should be having that commissioned in January and we believe that's going to be the future of everything that we do. But yes, our bloodlines come from Europe. And all of our customers, all of our feedstock, all of our black moms have typically ended up either in Europe or in the UK.

**Dan Anziska:**

When we talk about feedstock and customers, what we hear at all the conferences, MJ, and we're going to get into your processes and emissions, let's call those the environmental concerns with recycling, but let's start with the customer, the feedstock and collection. How do you obtain the spent lithium-ion batteries so that you can implement your recycling?

**MJ Chandilya:**

Yeah, that's a great question. Our customers typically end up being OEM battery manufacturers, OEM car manufacturers, or OEM energy storage system manufacturers. And as of now, we've predominantly been working with them on collecting their production-based, so it comes right from their manufacturing facilities or their depots where they collect a lot of these production-based batteries or any type of scrap that they have in these collection depots. Obviously, we've been working closely on end-of-life batteries and working closely with the OEM car manufacturers as well as OEM battery manufacturers to pick up from nodal points that we've designated for a lot of these end-of-life batteries.

We see that, Dan, really picking up in about a year's time when you see the end-of-life batteries really flooding into the market. Predominantly, until now, production waste ends up being anywhere between 10 to 15% of all of production. So it's quite a heavy volume that comes out keeping us quite busy as of today.

**Dan Anziska:**

So it sounds like your facility will be close enough to be able to collect from the battery plants themselves, the production waste or the erroneous batteries, the ones that can't be used in actual EVs, and you're going actually and collecting those from the battery manufacturer.

**MJ Chandilya:**

That's right. It actually comes to one of the competitive advantages of Storm Energia. One of our distinctive advantages has been our footprint. Our capacity is extremely bike-sized when

you compare it to other recyclers out there in the marketplace. We're looking at maybe a size of... I mean, just to give you a visual feeling, it's about the size of half an American football field. And we're able to, with that site, do 10,000 metric tons in terms of recycling capacity per year on a single shift. What that means is that we can actually put these facilities, which are very modular in its nature, right next to battery manufacturers if we have to. Right now, our footprints being built where we're in close proximity to most of our OEM manufacturers, not on-site, but very close where we can just designate those facilities exactly for those very particular customers, but we have the ability to actually go literally on-site and we've been having some discussions to that nature right now.

**Dan Anziska:**

Right. So your actual facility is quite small compared to some of your competitors who have massive plants. Can you take me through, MJ, that footprint, and without sharing the secret sauce, the difference between your process and other recycler's processes?

**MJ Chandilya:**

Yeah, the industry's been evolving quite a bit as battery technology's been evolving quite a bit, and I think we've really honed in on ensuring that our process has been entirely mechanical. And what that means is that we don't use any chemicals, we don't use any water. So we got zero water discharge, zero chemical discharge. We worked off of that principle, how can we be environmentally secure, safe and truly be a sustainable business? And the whole premise was let's not create more of a damage to the world and try and do this in the most environmentally efficient manner.

So when you think about our entire process, you could break that down into four key phases. You've got a discharging phase, and the discharging phase really is where we take all the batteries, whether they're discharged or they're charged. We still run them through our process of ensuring there's no residual charge. And once they're deemed to have no charge in them, then we put them through our shredding process.

We do this in a fairly unique manner from the standpoint of how we shred these batteries and how we stack up our lines to do so. And once we're done with that, we take it through a drying process, a thermal dryer that we use as well as a vacuum dryer that we use. These are proprietary equipment that we've honed in and customized to our needs. And that brings our moisture levels down to less than 1%, and that allows for us to do, Dan, your words, our secret sauce, which is really dry separate this out. So our dry separation line really breaks down what we have into extremely refined black mass, copper and aluminum, and it's able to do that at very high efficiency rate and a percentage of about 98% recycling efficiency.

**Dan Anziska:**

Very interesting. And in terms of the black mass itself, how is that broken down?

**MJ Chandilya:**

A black mass is a typical lithium, nickel, manganese, cobalt and graphite in them. And we're able to customize our process and our equipment's calibrated to ensure that we're getting

certain amount of percentages on each one of those metals. Now, a lot of that has to do with input feedstock, but also in the way that we calibrate that out to separate the materials out there.

I think the future on black mass, going back to some of your comments, Dan, in the beginning of our discussion, it's going to go through quite an interesting phase of an evolution. So we've got NMC batteries, we've got LFP batteries. NMC being nickel, manganese and cobalt and LFP being the lithium ion and phosphate batteries, obviously, which do not have nickel or cobalt, which are valuable recovery metals. Our lines are battery chemistry agnostic, so we're able to recycle and pull out materials from both.

Apart from the regular process of discharging, shredding, drying, and then finally dry separating out our materials, I think that few things that Storm Energia is doing, which is extremely interesting, and one is around graphite separation, and the second is around lithium separation from LFP batteries, which is something we've been able to crack and do it at quite a efficient level to be able to deliver both metals at a very high recovery rate.

**Dan Anziska:**

Graphite, as we know, there's that whole issue right now with China and the US that there's a shortage and a desperate shortage of graphite in the US. So having someone with the capability of separating graphite out of existing lithium batteries obviously is very important from a supply chain standpoint.

Just making sure that all of our audience is clear, MJ, on the differentiation here, it sounds to me like because you focus on your process and your equipment and your expertise and it's mechanical instead of chemical that you're avoiding some of the emission issues, water discharge issues and environmental issues.

**MJ Chandilya:**

That's right.

**Dan Anziska:**

That may be present for some of your competitors and also because you're more compact, let's say. I assume you don't have the same need for an enormous workforce and for some of the CapEx that some of the larger recycling companies have.

**MJ Chandilya:**

Yeah, you're absolutely right, Dan. Our lines are very automated, so what I mean by that is our lines work with roughly six to eight people on a single shift. And in terms of CapEx, based on CapEx numbers, we've seen of close enough competitors where about one-tenth of their size in terms of just pure CapEx requirements for just equipment. And our facilities don't need to be these massive large facilities. We're talking about 10,000 square feet at a very maximum plus storage capacity for a lot of these batteries. So you're almost looking at a retail-ish battery recycling corporation, which can be rolled out and as an ability to build a network effect that you can actually recycle in various points and then move all of the black mass back.

One point I just wanted to make about black mass, Dan, to your earlier point, absolutely, graphite has been a challenge. And separating our graphite actually solves two problems. One, your black mass that gets pushed over is far more valuable once a graphite's removed. And the second thing is once you have graphite back out as a product, that's something that we're able to put back into the supply chain by any of the buyers that are there. So it is quite a big impact that it's going to have in the industry and the way we're able to do it.

**Dan Anziska:**

Particularly based on that recent development out of China, the critical scarcity in the near term on graphite. It's good to know for the audience. You talked about North Carolina facility planning to have that up and running in a month or so. Can you just tell us a bit about your experience and process to get an actual facility up and running in the United States?

**MJ Chandilya:**

Yeah, and I say this with a cheeky smile now because when you are totally agnostic to locations, you're almost both for choice. So when we started this process and we said, "Look, these are the specs of what we need our first facility in the US to be like." And we went out to the various states, we looked at obviously state governments, which were very supportive and particularly active in the space that we are in. And if I broaden that out into battery manufacturing or even to EV car production, it gave us a slate of eight to nine states that we looked at. Then we started having discussions with the state governments then as well as with the local EPA, or the counties, just to get a real sense of how supportive are they of this and educate them on our process versus someone else's process because anytime anybody hears lithium, everybody gets worried.

And one of the things we've been extremely proud about, and this comes from my background in the airline segment where safety and everything around environmental security has been extremely top-notch. So we are very particular about our process. We're very, very proud about our safety records, just ensuring that we have a process which is truly focused on that mechanical process.

Once we went through that phase of educating all of our counterparts at the state level, it became very clear to us, which were the states that were really excited about what we were doing and wanted us to be there as a plant in their state for many years to come. We then took that process and ultimately narrowed down to three states. We ended up choosing North Carolina just because we found the facility. It wasn't so much about a state being better than another state, but rather the facility just really called to us. It had proximity to our customers and possibly had a lot of room with regards to logistics, storing, R&D and everything that we wanted to do in that state in the true manner that we wanted to. Through this process, we've actually tried to bring in our customers as much as possible into our decision-making and allow them to be part of this process where we ended up choosing the site that we ended up with right now.

**Dan Anziska:**

I know the discussion really has been focused on batteries for EVs. Is there a potential, MJ, in future facilities to retrofit to address things like utility scale, lithium batteries or other kind of formats which may be physically larger?

**MJ Chandilya:**

Yeah, that's a great question. Apart from EV batteries, we've been working quite extensively with ESS packs. And through that, it's actually opened us out to BSS packs where you have container sized portable batteries. We've actually started having discussions with a couple of fairly large sized players in that space where we could potentially recycle. So we have a test program which is going on as we speak, and we think that could be quite interesting. This is where we're moving closer to the folks who are in the reuse industry where they can refurbish and have these batteries performing at a certain level with residual charge before it comes out to us. I think it's going to be quite interesting just because the size of these things and the remote locations that they're at, it fits really well with Storm Energia's footprint of having smaller size facilities, which can be fairly remote themselves.

**Bill Derasmo:**

Just jump in for a second. I think listeners of the program know this is one of my pet issues, is this recycling and second life issue, and it's really interesting to hear that your company is right in the middle of it. With this last piece where you're working on ESS packs, that just really perked up my ears when you guys started talking about that. If you just want to comment maybe just a little bit more about where you guys sit in that process because you've got the second life battery folks where they're taking the batteries from the OEMs and then plugging them into a grid scale application. We obviously been focused on the recycling issue, but the second life issue to me is always fascinating. So if you want to just talk a little bit more about that.

**MJ Chandilya:**

Yeah, I mean, it's a phenomenal opportunity and it's a phenomenal opportunity for the whole industry to assess. And how we started on that, Bill, is that when we get a lot of these batteries coming to us, when we discharge them, actually there's quite a lot of residual charge left. What we started doing was, when we electrically discharged these batteries, we put the charge right back into the grid that we use, and that was really with the intent of being truly cyclical. That could evolved into having discussions with players who actually use a lot of these batteries in this second life and this reuse capacity, and that then evolved into, "Hey, okay, so maybe we could partner up and we could send you batteries or link you up with our OEMs, which may want to try and get some additional life out of these batteries. And then once you're done with it, we could then destroy them and recycle them out."

We particularly haven't gotten into the reuse space just because that's not our focus and our forte. Our focus is recycling. Usually, when our customers come to us, they expect it to be destroyed within a certain amount of time and then metals recovered out of it, but this is a space I see growing quite significantly, especially at the larger sizes. So when we're talking BSS packs and more in terms of remote power, I think you're seeing a significant uptake there as you would with any industry that's in its early phase. The reuse industry is going through challenges around performance issues of these batteries and whether they can deliver optimal power or committed power, but from a recycling standpoint, it positions us really well because it gives us another avenue in which we're pulling waste batteries out, giving them a chance to potentially have a second life, and then recycling back and putting all of these metals right back into the circular economy of battery manufacturing.



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**Dan Anziska:**

Yeah, that flexibility is really good to know. My final question is, in terms of growth plans, what's on the horizon the next year or two in the US? Are you looking to take on investors who may be lucky enough to hook up with you? What do you see in the next 12 to 24 months?

**MJ Chandilya:**

We've been fortunate to have commercial success, Dan, where we've been revenue generating and profit generating over the last two years. It's not easy to do in this space because you need almost a perfect storm of having proprietary technology with a book of customers and a proven ability to be able to do this on some industrial scale. We've been able to do that over the last two years. Now our focus really is growth in terms of capacity. So we're rolling out a lot more plants. And the famous adage that we've all heard, field of Dreams, one of my favorite movies, once you build them, you're going to get a lot more of these orders coming.

And that's really been our focus as of now. We're trying to roll out close to eight of our plants by next year. That's a significant amount of our retained earnings, which is going back into our growth charter, so we are definitely looking at potentially strategic investors who come in, who are really committed to this growth of the circular economy of electrified mobility and being able to ensure that these batteries don't end up in landfills and metals are really going back and there's a play around metal security.

And most of that growth, Dan, is coming in the US. We have a second phase growth, which is happening in Europe where we came from. We are seeing still a significant amount of activity, which is going out there. Asia, you have a lot of smaller recyclers who are owning their markets. We see that as a third phase avenue that we have been focused in on. We get a lot of interests and calls out for joint ventures and licensees where we can roll out this growth. We've been very selective about who we work with, but we've been very focused on ensuring that our proprietary know-how is getting rolled out in the optimal way in which we can continue to keep delivering great efficiency in terms of recycling. And we're focused on that 98% recycling efficiency, three metric tons per hour, and do that at the scale and growth plans that we currently have.

**Dan Anziska:**

That's great to know. And network, you've heard it straight from MJ. This is an exciting business that is now headquartered and operated from the US, successful track record. Actually the P word, it has been profitable, which is almost shocking, MJ, in this environment. But the fact that you've kept your CapEx low, which also helps you on the ESG side, I think explains a lot of it, and also that you're a very seasoned executive and you have a strong track record running companies. And that may distinguish you a bit from some of the other companies who may be founded by supply chain people who've never really managed an overall company.

**MJ Chandilya:**

If I could add one more point to that, Dan, I'm also really privileged and lucky to have a really awesome team. We have executives who've been in the recycling industry for more than 30 years, each one of them. And so they bring a significant amount of expertise, and in the lithium industry and the lithium recycling industry for well over eight years. And they've been with us in

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this journey with me for that period, so I'm really fortunate to have a great team that also supports us and driving this growth. It's technology, commercial books, proven track record, and a great team.

**Bill Derasmo:**

Thank you very much, Dan, for being our guest host and for MJ. Really wonderful program and great to have you on the program. Great to learn about your company. We appreciate our audience as well as we wrap up our next season here. And that'll do it for 2023. Thanks, everyone.

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