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Philippe Houchois: Okay. Good morning, good afternoon. Thank you very much for joining us. Very pleased and honored to have Lisa Drake with us, Vice President of Ford Motor Company who is basically right now the battery guru. And for at the time it's very, very interesting because it seems like I think a debate with some investors as we look at what's happening today in terms of redefining the greenhouse gas emission regulation in the U.S. is that a stop and the death of EVs or is that basically logical step, we retrench, we think again and we jump forward. And I think that's probably the message today. And I think what's key for us today is trying to dig into what you've been doing recently at Ford with battery innovation with CATL, LFP, first carmaker, I think building LFP batteries in North America and of course, the Universal platforms that you've announced.

So, if that's okay with you, I'll just throw a few questions at you.

Lisa Drake: Yes, sounds great and very kind words. I would say our team at Ford are the battery gurus. I have just – I have the honor of being able to lead them, so – but thanks for having us here.

Philippe Houchois: Okay. Thank you very much. I guess, as I said, so much is happening, I think the first one, could you maybe kind of frame the agreement you made with CATL? Because I think it's unusual to see Chinese companies work closely with an American company today to that extent and how much technology you're working with and is it a one-off agreement where the CATL technology or is that an ongoing partnership that means that your products will also continue to improve as CATL technology also improve.

Lisa Drake: I see. So, it's not a partnership. So our arrangement with CATL, it actually started when we had set out to develop what we're now calling the Universal EV Platform. And we just announced that it was a – we're going to build it in Louisville assembly plant coming in 2027. And when we started to build a team that was developing that product, they wanted to build it with an integration of the best battery technology that was available and the most cost effective that was available, integrated into the platform design and then integrate that into the manufacturing process. So that was one of the key tenets from the very beginning.

When you look around the globe and you think about what you have to do in order to have an affordable EV and especially to compete globally or even in the U.S. against very aggressive Chinese entrants, it was very clear that the only choice was an LFP prismatic type of battery cell. And the problem with that is that there weren't any being built in the United States. And we knew we wanted to launch this product in the U.S. first. It is a truck. We know our trucks really well.

And so, we decided we weren't going to compromise, that we had to go find a way to make that happen even if it almost looked impossible on paper. The – we went in search of the best supplier on the planet who had the best cost, the best quality, who could scale with the likes of Ford. And it happened to be a piece of

technology that CATL had.

So, we licensed it. And that's the extent of our agreement with CATL. We were able to license that technology, but we wanted to own the ability to build it. We wanted it built in the United States. We wanted to own the workforce. We wanted to own the production. We wanted to own the supply chain.

And so that's what we did. So, it's a licensing agreement for the tech and we will use that in a battery plant in Marshall, Michigan, wholly-owned by Ford Motor Company. It's called battery BlueOval Battery Park Michigan. And we're very excited about that. As you mentioned, it's the first OEM backed high scale LFP prismatic in the U.S. It's one of the only facilities of this size that, that we're aware of. We're super excited about it. So that's how the relationship with CATL came about.

Philippe Houchois: And you mentioned materials in terms of sourcing materials, how much of them come from North America, more from the U.S., how much are imported, how you've been able to manage that mix today and maybe in 12, 18 months?

Lisa Drake: Yeah. So right around the time that we were developing the platform, the IRA bill came out and it was very clear that we wanted to have what we called a production tax credit, PTC compliant battery. And you can imagine the raw material value chain is very complicated, especially on an LFP battery that really isn't built in the United States.

So, we built a raw material battery supply chain team and we went out and we essentially created a non-China LFP prismatic raw material value chain. 90% of the raw materials that will go into those cells in Michigan are not from China. We will be PTC compliant for those batteries. And honestly, I would say we built that, that supply chain that didn't exist before. Again, we weren't going to compromise on what it took to make sure that that affordable EV was indeed affordable.

Philippe Houchois: Right. Okay. That's LFP. But you still have a nickel chemistry with SK On. How do you think going forward is Ford's EV offers going to be LFP majority or is it a mix or is it going to be all of it? I'm just trying to…

Lisa Drake: Yeah. So, nickel based chemistry is very ubiquitous. We have hybrids. We have plug-in hybrids. We have EVs. All of them have some level of nickel-based chemistry in them. So, it's not just SK, its LG, Panasonic, VEJ. So, most of the supply base in any big automaker is a nickel-based chemistry if you're building anything electrified.

LFP is pretty special and unique in that it works incredibly well for affordable EVs and also in commercial vehicles as well where the requirements are very different than sort of a daily retail customer. So yes, we do have nickel-based chemistries, but we invest very heavily in researching those as well.

So, I mean we've been in the hybrid space for over two decades now. I mean our first HEV was in 2004. So, it's the Escape Hybrid. And so, we spend a lot of time with the battery suppliers and we know the nickel-based chemistries pretty well. I'd say they're going to stay probably the dominant chemistry and then we'll use the LFP where we need to compete again affordable space where no one else has the access to those right now and then also in our commercial vehicles.

Philippe Houchois: Right. Okay, makes sense. But you mentioned hybrids, I think it's about a year

ago, I think it was noise out of Ford seems like there was a lot of work going on around range extender hybrids. Because you have hybrids, I don't think you have many plug-in hybrids in the lineup, but come and create more.

Lisa Drake: Yes, so yeah.

Philippe Houchois: But then it seemed like range extenders seem to be a logical choice for many countries, including the U.S. So where – what you – where does Ford stand on this? And then is LFP the right chemistry for range extenders?

Lisa Drake: So range extenders are a great. We call it sort of the "and" solution where customers really do want to take most of their daily commutes in EV mode and they can do that. But – and those one or two or three times a year when they really want to drive a distance, they want to have the ability to have the range extender there and not worry about it. So, it is a great technology. We have deep experience in that.

There are – many years ago, we have what we call plug-in hybrids, PHEVs. Concept is a bit similar and I won't go into the technical rabbit hole, but we do know enough about how to turn an engine into a generator for battery power and switch it on and off like at the customer demand. So, it wouldn't be surprising then to think that as we – the EV adoption slowed and we still want to service these customers, that we could come out with some sort of technology like EREVs.

Philippe Houchois: Right. And would the Universal Platform be amenable to an EREV in a way, because it's an EV platform. You could use an engine as a generator on top of it or…?

Lisa Drake: Perhaps, we, I mean any, most platforms can be modified in a certain way. Right now it's not intended to be. Right now, it is a pure EV. It was really purpose built for that. But I think if the need arises, we could get creative about it.

Philippe Houchois: Right. Okay. Now I didn't have a chance to go to Kentucky for the presentation on the August 11. I watched the videos, et cetera. I'm kind of wondering if we think about this Universal Platform, what I retained from it. There's a lot of work around design, designing a simpler, fewer parts, take out some of the excess complexity that the industry is so famous for. Then the other bucket, I guess, is the batteries. And the third one is of course this assembly tree.

And we've heard a lot about changing the way cars are assembled. But how would you say of those three kind of big drivers of the uniform platform, which one matters more? Which one is more challenging to you to achieve?

Lisa Drake: I would say, very, very equal in terms of what mattered. As a matter of fact, they all three had to go together. That's what actually was the magic about that particular project. You can always do a new battery technology, but if you don't leverage that tech and change the platform and try and take costs out of the platform, you don't get very far. And if you do both of those things, but you don't take advantage of making the car differently, you don't get very far.

So, you have to actually do all three things, which is very difficult to do. It's not something that automakers do often. So, when Ford set out to do this, we knew we had to approach it differently, which was why we had the California team that started that process on some of the initial design work.

Again, you have to have an attitude of no compromise. You can't take a second-best choice when you're really reaching that far. So again, when they wanted to design the platform around the battery, it was very clear we had to have the LFP prismatic battery cell format. That was the one that was going to unlock all of the cost reduction because the battery is essentially built into the structure.

And then once we did that, we knew that the manufacturing team could take a lot of labor out, a lot of complexity out if they just changed the way they built the vehicle and then that's what we did together. So, you can't really have – you can have one without the other, but you wouldn't have unlocked what the team did to be able to still hit that $30,000 price point, which was the big aim, they wouldn't have been able to get there without one of those.

Philippe Houchois: Right. Okay. And then we talked about LFP being applicable to hybrids as well as EVs. But two questions for me, I guess, one is, what is the potential for LFP batteries to be commercialized outside of the auto industry? Is that something that you're looking at Ford? This would be my first part of the question. The second one would be, could you duplicate the Michigan factory to other locations in the U.S. or are you limited to one project?

Lisa Drake: Yes. So, I don't have anything specific to share, but I really like your question. So let me talk a little bit about how you can think about this space. So, the question about, can you use these LFP prismatic batteries in applications other than auto. Actually, yes. They are well known to be used for energy storage. That is actually the choice of battery technology for stationary energy storage or battery energy storage systems. And globally, that's the dominant form factor. It's no surprise that when the EV adoption slowed, all automakers including Ford had to relook at their capacity expansions.

And since that Capital Markets Day that you and I talked about earlier in 2023, we've reduced our battery capacity footprint already by about 40%. And we've done that through more organic means, like, we were able to slow down some of our investments, some of the programs that we had canceled. We were able to move some of that capacity elsewhere and move some of that capital elsewhere. Now we still have some left. So, we're sitting on some open battery capacity. And we do have this license for what I would call world class, low cost, high quality LFP technology that can be used for stationary. And we do have the ability to answer your second question to replicate the factory that we have in Marshall, Michigan. So, there's a lot to think about there. Again, we don't have anything that we are announcing today, and nothing specific, but it's a very interesting space to pontificate.

Philippe Houchois: Okay. All right, we'll look forward to the next announcements then. Speaking of technology, because you worked with CATL, that was the right choice during what we see in the industry globally. Now what we hear from CATL is now there was nickel and then there was NFP and then there's sulfur. Is that something that when you think about the future, I think LFP is here to stay and require new needs for the next 5, 10 years. Or is Ford already thinking about where the next chemistries could be?

Lisa Drake: Yeah, we're always thinking about the next chemistry. I mean, I've been in this space for – since we started this journey for the last four years and we've already gone from a high nickel-based chemistry to a mid-nickel-based chemistry to an LFP chemistry to now we have LMR which is a manganese rich chemistry. So, if

you don't have irons in the fire on all of them, you will miss out and you have to stay on your toes in the space. And the way we install our capacity is that we always make sure it can flex one or two ways. So, we don't like to install any capital if we know it can't flex into one or another adjacent chemistry. So, if we have to pivot, we can.

And I do think LFP will be – it'll be a bedrock. So, if you look globally at where LFP technology is used in chemistry, it's used in auto, it's used in energy storage, it's now making its way into marine and in some cases airline industry – air industry applications, aviation applications. So, I think it's a tried and true and it's here to stay. The incremental improvements will always be made on it. And their agreement with CATL is as they advance that technology that our license would cover that advancement. And we often have deep technology exchanges with them.

I will mention we have a research arm called Ford Ion Park and that's who does all of our R&D. But I will tell you it is very important to have relationships like we do with companies like CATL, because their R&D spend and what they put into developing technology is quite remarkable. There's no way Ford could compete directly with that. But we don't need to. We use our capital wisely. We focus on the areas of the chemistries that are most important to Ford unique. We drive the battery supply chain to do that development for us and then we work with them with joint development agreements to use those cells in our products. So, you don't have to carry a $3 billion to $4 billion R&D budget on batteries. Actually, that would be an unwise thing to do. You don't need to, there's plenty of research being done, you have to direct it and use your commercial leverage and scale to buy it and license it when you need.

Philippe Houchois: All right, makes sense. Now, we have talked about cost, of course, cost of batteries. I think you answered one of the questions, of course, and then the production in Marshall is eligible for PTC production tax credit. So that's a positive. You're saying 90%, I think, of what you'll be using in material will be sourced outside of China.

Lisa Drake: Correct. That’s right.

Philippe Houchois: So, we don't know. So, I assume there may be some import duties. But now when I track battery costs over time, we always look at the cost of components that go – the materials that go into an NFP versus an NMC, and we always get about half. Does it mean that the battery that you're able to use in a universal platform per kilowatt hour would be about half what you're incurring today in nickel rich chemistry? Or is that more complicated than that?

Lisa Drake: So, it's a little more complicated, but you're very close. So, there's two ways to look at battery costs. There's the battery cell itself and then there's the battery pack that the cell goes in. So, with the Universal EV Platform, we had to go after both of those sets of cost, which means on the – let's talk about the pack side first, you want as little – you would rather just have the battery go right into the car with nothing else around it. And in order to do that, you actually do that, you design the car around the battery, which is what we did.

So, I can't get into too much of the technical detail. I know that team wants to have their time to really explain this, but we took a lot of what we would call the battery pack cost out because of the direct integration of the cell to the vehicle. So that's key. Also, because it's LFP, it's much easier chemistry to work with

when you talk about thermal propagation and some safety measures. So it allows itself to be integrated into a vehicle more than any nickel-based chemistry really could. So that's an unlock that the chemistry allowed.

The battery itself, because it is PTC compliant, because it is an LFP chemistry, much less expensive than an NCM just on a dollar per kilowatt hour basis. And because we have the scale, and by the way, the manufacturing technology in the Marshall plant is not really replicated elsewhere in the world other than one or two other factories. So, the manufacturing process itself is something we call a 40 ppm process, 40 parts per minute. And most LFP battery factories around the globe and almost all in China are 20 ppm. So, we have the latest manufacturing equipment that actually doubles the efficiency of the battery cells being made in Marshall. Again, part of the license agreement that we had. And that also contributes to the reduced cost. So, we could not leave any piece of that unturned. We had to go after every single element, which is why underpinning that $30,000 affordable price point was absolutely critical for us. And that's why we took so many – took such effort to uncover all those reductions.

Philippe Houchois: Right. Okay. In terms of – we get the cost, in terms of my understanding is that the EV platform, the $30,000 truck, will come out 2027. Is that the same timeframe for when you start producing in Marshall or is that going to be earlier than that or…

Lisa Drake: Yes. So, Marshall will be earlier. And that's because – from the battery perspective, we want to use production batteries actually in our prototype builds that lead up to that vehicle launch. So, the battery always usually is ahead of the vehicle launch by about six months. So, we will start production next year in Marshall. We'll take those battery cells, we'll put them into the early prototypes that we have for the universal EV platform. They'll do all their development work and then we'll launch. So, we're super excited to finally take folks through Marshall next year.

Philippe Houchois: Okay. All right. Lynn, I'll look for some visits with you if I can. Now, what about Europe? Because you've chosen from the beginning to do something a bit different in Europe, working with Volkswagen. It's interesting actually to see in Europe, I'm based there, is the biggest progression in EV share today is Ford and Volkswagen under share platform. So that MEB is scaling quite nicely. Is that a separate project or could it be at some point LFP? Because LFP doesn't get used in Europe yet, except in the Chinese and a few Teslas. I think Stellantis will be the first one to produce, also with CATL in Spain. We'll see when that happens. Could there be some transfer or some supply from the U.S.? Mr. Trump wants exports of the U.S. on a bigger scale. Is that something that is making sense or does Marshall have the capacity to do that?

Lisa Drake: Yeah. We know – we don't have any plans to export to Europe at this point, but I would say one of the nice things about LFP is you actually, if an EV was running in NCM chemistry, you can put an LFP pack in it. As an example, our Mustang Mach-E, we launched it with an NCM chemistry and then as we wanted to take cost out over time to improve margins. And we were learning about LFP, we were able to put an LFP battery pack in that same Mustang Mach-E in the same envelope that exists today, very, very efficiently. There wasn't much engineering in terms of the vehicle side of it. So you can substitute LFP and NCM.

And of course, we're learning a lot. I mean, to have, close to a 20-gigawatt hour facility in the United States that we're building ourselves and that we sourced all

this raw materials ourselves. We understand now what it takes to build LFP prismatic. And if we needed to do it in Europe, we could. We don't have plans to do it now, but that's part of learning this piece of technology that frunk hood by the way, was invented in the United States. So now we're sort of reclaiming our rights. Yeah.

Philippe Houchois: Okay. All right. And when you say when you switch battery chemistry on like the Mustang Mach-E, so there's a physical of course, but how commonly is it from a software update to actually run the energy flow differently with an NMC versus LFP. Was that like it'd be simple?

Lisa Drake: I wouldn't say it was simple, but it's something that we could do quite quickly because it was just software work and we were able to really just – it's really down to energy management. It's a bit agnostic in terms of which type of cell and form factor you're dealing with. It has different state of charge and some of the duty cycles that are a bit different. But we were able to adapt it pretty quickly. It was not a long lead project at all for us once we decided to put it in and we saved several thousand dollars moving to that LFP chemistry on the Mach-E.

Philippe Houchois: All right. Okay. That's very significant, yeah. And just I'm wondering if someone in the audience has a question specifically on batteries that they want to ask just to make sure that everybody has a chance. If not, then I'd like to go back a little more on raw material sourcing because so still 10% comes from China. Can that be taken down to zero technically, or is it?

Lisa Drake: It could, but I don't think it's a wise thing to do. There are some very smart – when you get down to the last 10% and you're talking about parts that aren't made, whether they're separators or canning material or binders or they're parts that are, I would say, less risky. And you have to be laser focused on cost. Just being outside of China, to be outside of China is not really a strategy. You have to look at it part by part. And there are some cases where the parts there are less expensive, they're not covered by tariff, they have an easy lead time to switch. We can find another supplier in the U.S. if we were – or somewhere else if we wanted to. We can protect supply. Why not take the best part with the best quality and the best cost? So, I think the parts that matter are not there. Your cathode materials, your anode materials, those are things that you don't want in China and they're not. But some of the parts, it's okay. We're a global economy. I think it would be almost impossible to think or you would just pay so much more to just be outside of China for no, no, real first principal reason. Yeah.

Philippe Houchois: Okay, good. All right. Good to hear. And again, maybe my question wasn't formulated well, I didn't understand you. But in terms of the technology you have today with CATL is not set. It can evolve. You're still in regular contact with CATL and research and expressing more…

Lisa Drake: Absolutely, yeah. We…

Philippe Houchois: …we're trying to steer what you expect from…

Lisa Drake: Yes, because in this space, as I mentioned, in the last four years we've moved technologies already and you can never have an agreement to just lock in on one chemistry. You would put yourself in a non-competitive position. So, as they mature their technology curve, Ford would be right there with them including any manufacturing improvements as well. Yeah.

Philippe Houchois: Okay. And 2027 is the first vehicle. But my understanding is that Universal Platform, it's a different approach to design, make it simple and reduce number of parts. That's very applicable to a number of other vehicles as well. And so, when should we think about the rollout of a family of vehicles around the Universal Platform? And are we restricted on size? Does it have to be a mid-size pickup and similar sizes on geometry? Or can we look at a concept that can be stretched on small cars and larger cars?

Lisa Drake: Yeah. So, the way I would think about it is at any level, it definitely can be, and I don't know that I would say a concept, but a framework that Ford is now understanding a bit better, which is design, manufacturing and supply chain working to disrupt each other and setting a different standard and working differently. The big learning from Ford for me and for many of the executive team wasn't actually the end product. It was the fact that if we work differently, we can compete in a different way than we had been.

So even that model, if you apply it to our truck business, to our SUV business, to our commercial vehicle business, it's working differently, setting your sights more aggressively on how you're going to compete and making things happen that seem impossible, like landing prismatic LFP in the United States. So, I think that's the bigger unlock for Ford is working differently, being more efficient with our capital. That team in California was super scrappy with how they were tooling things. They built very low complexity. They really challenged the way Ford worked, and it was uncomfortable, but it was very beneficial for us. So that way of thinking can be transferred.

The platform itself can have more than a pickup on it. That's why it's a Universal EV platform. You could expect maybe SUVs off of it. Obviously, we have multiple brands inside of Ford, so we're excited to see what we can do with it and we have the capacity to do it if we wanted.

Philippe Houchois: Okay. So, the learnings of Skunkworks we've heard so much about and we should know so little about at the same time, is that going to be kind of now that best practice is going to be transferred to other?

Lisa Drake: I hope so. I hope so. The way that, hey, I was a chief engineer at Ford on many programs and I would have loved to have had the ability to think and design the way they did. It's very hard to do when you're in Dearborn and you're in the throes of everything that the auto industry throws at you. That's why you don't see breakout products like this from many OEMs. And this one is a breakout product. I will tell you, I cannot wait until you guys can see it. The digital capability inside of it is going to blow your mind. It's really cool. And it's a truck and we know our trucks well.

So, it is so well positioned to really make a difference. So, I think that – but what they need is at the end of the day, the Ford industrial system that can then take all those great ideas and then turn it into a high scale, high pole manufacturing product. And that's the process that we're in right now. Design work is done, sourcing is done. Now we're industrializing it and launching it. So, you need that big powerhouse of Ford to actually now take that great idea and put it into production.

Philippe Houchois: Right.

Lisa Drake: Yeah.

Philippe Houchois: It seems like we don't have to wait that long.

Lisa Drake: You don't have to wait much longer. No.

Philippe Houchois: Yeah. Okay, great. Thank you very much. That was very helpful. Thank you. I know much more now. I think I would like to know a little more Skunkworks. But I don't think I'm going to get much out of that discussion, so I'll try again in a different way.

Lisa Drake: No, I can't be the spoiler for what they have to come so yeah.

Philippe Houchois: Exactly. But thank you very much.

Lisa Drake: Thank you.

Philippe Houchois: We look forward to seeing the truck. Thank you very much to the Ford team to come to us and look forward to.

Lisa Drake: Thanks for having us. I really appreciate it.

Philippe Houchois: All right. Thank you.

Lisa Drake: Thanks.