

Q1 2023 Earnings Call

Company Participants

- Andrew D. Baglino, Senior Vice President, Powertrain and Energy Engineering
- Elon R. Musk, Chief Executive Officer
- Karn Budhiraj, Vice President, Supply Chain
- Martin Viecha, Head of Investor Relations
- Roshan Thomas, Vice President, Supply Chain
- Zachary Kirkhorn, Chief Financial Officer

Other Participants

- Adam Jonas
- Alex Potter
- Benjamin Kallo
- Colin Rusch
- Dan Levy
- Emmanuel Rosner
- George Gianarikas
- Mark Delaney
- Philippe Houchois
- Rod Lache

Presentation

Martin Viecha {BIO 17153377 <GO>}

Good afternoon, everyone, and welcome to Tesla's First Quarter 2023 Q&A webcast. My name is Martin Viecha, VP of Investor Relations, and I'm joined today by Elon Musk, Zachary Kirkhorn, and a number of other executives.

Our Q1 results were announced at about 3:00 P.M. Central Time in the update deck we published at the same link as this webcast. During this call, we will discuss our business outlook and make forward-looking statements. These comments are based on our predictions and expectations as of today. Actual events or results could differ materially due to a number of risks and uncertainties, including those mentioned in our most recent filings with the SEC.

During the question-and-answer portion of today's call, please limit yourself to one question and one follow-up. Please use the raise hand button to join the question queue. But before we jump into Q&A, Elon has some opening remarks. Elon?

Elon R. Musk {BIO 1954518 <GO>}

Thank you, Martin. So just a Q1 recap. Model Y became the best-selling vehicle of any kind in Europe and the best-selling non-pickup vehicle in the United States. And this is in spite of a lot of challenges in production and delivery. So it's a huge credit to the Tesla team for achieving these great results.

It is worth pointing out that the current macro environment remains uncertain. I don't think I'm telling anyone anything that people don't already know, especially with large purchases such as cars. And while we reduced prices considerably in early Q1, it's worth noting that our operating margin remains among the best in the industry.

We've taken a view that pushing for higher volumes and a larger fleet is the right choice here, versus a lower volume and higher margin. However, we expect our vehicles over time will be able to generate significant profit through autonomy. So we do believe we're like laying the groundwork here and then it's started to ship a large number of cars at a lower margin, and subsequently, harvest that margin in the future as we perfect autonomy. This is an extremely important point.

Let's see. Regarding the Cybertruck, we continue to build Alpha versions of the Cybertruck on our pilot line. For testing purposes, it's a great product, and we're completing the installation of the volume production line at Giga Texas. And we're anticipating having a delivery event -- a great delivery event probably in Q3.

As with all new products, it'll follow an S-curve of -- production starts out slow and then accelerates. So the Cybertruck is no different. So it's -- there's fair amount of demand for the product obviously. It is, in my view, a fantastic product, a Hall of Famer. But as with all new products, it takes time to get the manufacturing line going. And this is really a very radical product. It's not made in the way that other cars are made. So let's see.

With regard to Megapack, we're making great progress. Our energy storage deployment reached nearly 4 gigawatt-hours in Q1. So by far, the strongest quarter ever. And this growth was achieved thanks to the ongoing ramp at our Megafactory in Lathrop, California. There's still some way to go to reach the full run rate of 40 gigawatt-hours per year. And then we additionally announced the start of a new Megafactory in Shanghai. So we're -- as we've expected, the stationary storage growth actually will significantly exceed the vehicle growth.

Regarding Autopilot and Full Self-Driving, we've now crossed over 150 million miles driven by Full Self-Driving beta, and this number is growing exponentially. We're -- I mean, this is a data advantage that really no one else has. Those who understand AI, will understand the importance of data -- of training data and how fundamental that is to achieving an incredible outcome.

So, yes. So we're also very focused on improving our neural net training capabilities, as it is one of the main limiting factors of achieving full autonomy. So we're continuing to simultaneously make significant purchases of NVIDIA GPUs, and also putting a lot of effort

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into Dojo, which we believe has the potential for an order of magnitude improvement in the cost of training.

And it also -- Dojo also has the potential to become a sellable service that we would offer to other companies in the same way that Amazon Web Services offers more web services, even though it started out as a bookstore. So I really think that, yes, the Dojo potential is very significant.

In conclusion, we're taking a view that we want to keep making and selling as many cars as we can. Despite this being an uncertain macro environment, this is a good time to increase our lead further, and we'll continue to invest in growth as fast as possible. Once again, I'd like to give a huge thanks to all Tesla employees worldwide for doing an incredible job again. And yes, super appreciate it.

Martin Viecha {BIO 17153377 <GO>}

Thank you very much. And Zach has some remarks as well.

Zachary Kirkhorn {BIO 20940148 <GO>}

Yes. Thanks, Martin. I want to start by congratulating the Tesla team for record vehicle production and deliveries. And I also want to congratulate our energy storage team for record volumes as well.

There's three main points I want to make. First, Automotive gross margin and operating margin reduced sequentially, but as Elon mentioned, these remain at healthy levels. In particular, Automotive gross margin was impacted by a few factors since our discussion on the last earnings call, which include additional action taken in the second half of the quarter to improve vehicle pricing and one-time items, most notably warranty adjustments on older S and X vehicles, as well as increased deferred revenue for certain Autopilot features as we transition technologies.

Progress on vehicle cost reduction continued in Q1 with meaningful improvements on logistics, and the beginnings of some commodity cost reduction starting to be realized. Per unit costs for Austin and Berlin improved as well, driven by record volumes. However, these factories still provide a margin headwind and will likely continue to do so until after we reach and stabilize at our intended volumes.

Note that Q1 was our third quarter in our multi-quarter plan to move to a more regionally balanced mix of build and deliveries. As I've mentioned previously, this results in lower deliveries and production within a quarter, due to a higher volume of cars in transit at the end of the quarter, and has an associated impact on quarter-ending free cash flows. This was particularly prevalent in Q1 for S and X, as we began exporting cars for international deliveries.

Second, our storage business is starting to take shape, and this is exciting to see after many years of investment and focus. This business is growing as a percentage of the

businesses -- of the company's revenue and reached its highest level yet in Q1, driven by an increasing rate of deliveries for our Megapack products. We are also making progress on storage profitability, generating our highest gross profit yet in the quarter.

Third, I want to reiterate the philosophy by which we are operating the business this year. Our approach is to grow volumes as quickly as possible in both our vehicle and energy businesses. We plan to continue to invest heavily into our future plans, which include the Cybertruck, next-generation platform, in-house self-production, energy storage business, and our autonomy and AI-enabled products. And we plan to do this while keeping the business financially healthy and industry-leading. To accomplish this, we need to remain focused on cost efficiency and working capital, and in particular, unwinding the strategic inventory buildup left over from the pandemic.

I want to conclude by thanking the Tesla team again as well as thanking our suppliers and our customers.

Questions And Answers

A - Martin Viecha {BIO 17153377 <GO>}

(Question And Answer)

Thank you very much. And let's go to investor questions on say.com. The first one is, what is the process to make auto pricing adjustments? What variables do you consider? How frequently do you review pricing?

A - Zachary Kirkhorn {BIO 20940148 <GO>}

Do you want to take that, Elon, or do you want me to take it?

A - Elon R. Musk {BIO 1954518 <GO>}

My apologies. I was on mute. Yes, I think this is not something that we can really talk about. It's just -- we do our best to evaluate the production output and macroeconomic conditions, and we make a decision. But again unless there's something you'd like to add, Zach?

A - Zachary Kirkhorn {BIO 20940148 <GO>}

I think that's right. I mean, as a team, we review where we stand globally on a weekly basis and certainly can't get into the details of the reasons why certain decisions are made. But it is something that's very actively managed by a subset of the leadership team.

A - Martin Viecha {BIO 17153377 <GO>}

Thank you. The second question is, do you still believe Tesla Energy will be bigger than Auto? And when will you provide more formal guidance on Megapack and overall Tesla Energy?

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A - Elon R. Musk {BIO 1954518 <GO>}

Yes. So I should just clarify, bigger than Auto from the standpoint of total gigawatt-hours deployed. So it's possible, Automotive revenue may be higher, but gigawatt-hours I think will be probably higher with stationary storage. If you just look at the -- what's needed to transition the world to a sustainable energy economy, there is more stationary energy storage needed than there is mobile energy storage. So -- and we are seeing growth of our stationary storage grow in excess of Automotive. So that is in line with expectations.

A - Zachary Kirkhorn {BIO 20940148 <GO>}

Yes. And on the guidance part of the question, and maybe Martin, we can combine this with the next question, which is on guidance for margins. Just have a single comment there.

I think we are -- we will get to the point where we, as a company, provide guidance on the storage business. I say storage is a combination of both the Megapack business and the Powerwall business. And relative to total revenues of the company, it's still fairly small. And the business has a lot of volatility currently, both in terms of volumes as well as financials, just given the small volumes and kind of diversification of the customer pool there. But as this business grows and smooths out, I don't think we're that far away from it. I think including these volumes on our day two production and deliveries release is something that we'll start doing and then we can talk more formally as a business about our expectations over the coming year. I think it'll be a few more quarters before we pick that.

A - Martin Viecha {BIO 17153377 <GO>}

Thank you. The next question, as you said, was already answered. So let's go to the battery question.

A - Zachary Kirkhorn {BIO 20940148 <GO>}

And so just one other thing I wanted to mention on margin. While we're not providing specific guidance there, I mean, just to set expectations of where we think this business will go, in terms of margins, we're probably generally in the ballpark of what we've seen historically on the vehicle business. We generally look to mid-20% gross margins for any program that we launch. And so we're not there yet on this business, but that's what we're working towards.

A - Elon R. Musk {BIO 1954518 <GO>}

We're hopeful to get there later this year, but that's not a promise, that's an aspiration.

A - Martin Viecha {BIO 17153377 <GO>}

Thank you. The next question is, how well are 4680 cells meeting the expectations described on the Battery Day? How long will it be until the cells meet those goals? Drew?

A - Andrew D. Baglino {BIO 21161872 <GO>}

Yes. So on Battery Day, we established a cost-down roadmap through 2026 across five areas of effort. There was the cell design we discussed, anode and cathode materials, the structural pack concept, and the cell factory itself. We've been making progress across all of these aspects since then.

For the cell factory, the Texas 4680 factory, we are part way through building and commissioning and installing and operating, will be 70% lower CapEx per gigawatt-hour than typical cell factories when fully ramped, in line with what we described on Battery Day. And we're continuing to further pursue densification and investment reduction opportunities in the future factory build-outs like in Nevada.

On the cell design, we're in production with not only the first generation tabless cell we unveiled on Battery Day, but a second more manufactured version in Texas today. On the cathode material side, we have a number of activities underway per the Battery Day roadmap.

For lithium, our Corpus Christi lithium refinery breaks ground this May. Our goal is to start commissioning portions of the facility before the end of the year. The refinery uses the sulfate-free spodumene refining process with reduced process cost, no acid or caustic reagents, lower embodied energy, and actually produces a beneficial byproduct that can be repurposed in construction materials. We discussed all of these concepts on Battery Day.

Same with cathode precursor. We've successfully demonstrated a lower process cost, zero wastewater precursor process that we described on Battery Day at both lab and pilot scale, and are in the detailed design phase for incorporating this technology into the front end of our Austin cathode facility.

On cathode production, we're at 50% equipment and 75% utilities installed at our new cathode building in Austin with our goal to begin dry and wet commissioning this quarter and next quarter with the target to produce first material before the end of the year.

Structural pack, we saw big improvements with pack manufacturing with the 4680 cell in the structural pack concept, 50% lower CapEx and 66% smaller factory for the same output in gigawatt-hours per year. We do believe structural as a concept is a good one. It's simpler. We'll continue to structurally load the cells and use the pack as the floor of the vehicle while iterating the design to closer to B-level execution of this A-level architecture in future programs.

And zooming out for the 4680 team, Q1 was all about cost and quality. We made significant improvements in both areas. On Texas, production increased 50% quarter-over-quarter, through yields increased 12%, and Kato peak rate increased by 20% and through yields improved by 20%.

Altogether, the team accomplished a 25% reduction in COGS over the quarter, and we are on track to achieve steady-state cost targets over the next 12 months. And going forward

for the rest of the year, the priority one is yielding cost for the 4680 program as we steadily ramp production ahead of Cybertruck next year.

A - Martin Viecha {BIO 17153377 <GO>}

Thank you very much. The next question is what do you anticipate 2023 Automotive gross margins ex-credits will be at the company's current pricing levels?

A - Zachary Kirkhorn {BIO 20940148 <GO>}

Yes. I can start off on this one. This is a difficult environment to make a projection like this. There's a lot of macro uncertainty. There's also headwinds and tailwinds. And this is basically a question I think that's asking about or if you point out where cost will go.

And within costs, there's a set of costs in which we do control the set of costs in which we're kind of subject to what's going on in the macro world. Within the bucket of things we control, the -- most of the cost down that we're working on is around ramping our Austin factory, stabilizing that, and then doing the cost optimization work once we get to our intended volumes there. And a part of the cost journey in the Austin factory is, as Drew mentioned, the 4680 cell, which is an input into our Austin COGS.

And so, as the 4680 program improves over the course of the year on cost, as Drew mentioned, and then the non-cell portion of the factory improves, we see a pretty good trajectory in the Austin facility.

A similar story exists in the Berlin factory. It does not have 4680 as an input, but for that factory, the journey to complete localization is still ongoing. And so over the course of this year, as volume increases, more localization occurs, we do see a good path to cost reduction in the Berlin factory as well.

In existing factories, too, we talk about this on every call, so I don't need to rehash it. But the expectation is that every existing factory improves all of their key metrics and we continue to see the progress there.

There's also a handful of other costs in which we have the influence, but the philosophy here is that progressively going across every cost bucket that we can. Within the world that we don't control, the two major costs there being logistics, which fortunately is moving in our favor. And I think our supply chain team has done a great job both on logistics optimization and taking advantage of reduced spot rates where they can. And so thank you to our supply chain team.

And then is the commodities world, which has been a huge pinch point in our cost structure over the last, say, two years or so. And we're still kind of at the maximum of paying for commodities in our cost structure. Kind of maximize -- it maxed out in the second half of last year. We did start to see in Q1 a little bit of improvement. We think there'll be a little bit more improvement in Q2. But --

A - Elon R. Musk {BIO 1954518 <GO>}

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And lithium has dropped a lot. It's worth mentioning that price of lithium has dropped significantly.

A - Zachary Kirkhorn {BIO 20940148 <GO>}

And that's the piece that we expect to see more impact from in Q2. And generally, as a company, we do expect commodity prices to come down and have a more meaningful impact in the second half of the year.

A - Elon R. Musk {BIO 1954518 <GO>}

Yes.

A - Zachary Kirkhorn {BIO 20940148 <GO>}

So this is our approach. How that nets out, I mean, there's just a lot of risk and we'll have to see how the year progresses.

A - Martin Viecha {BIO 17153377 <GO>}

Thank you. The next question is how has global order intake tracked since the most recent round of price cuts?

A - Elon R. Musk {BIO 1954518 <GO>}

I think the overall thing we can say is that orders are in excess of production.

A - Martin Viecha {BIO 17153377 <GO>}

Thank you. And maybe the last question from investors. Can you give updated specs and pricing for Cybertruck and any new features that will make it to production?

A - Elon R. Musk {BIO 1954518 <GO>}

Well, I think we'll save that for the Cybertruck handover, which will hopefully be around the end of Q3 this year. And I -- and one thing I am confident of saying is that it's an incredible product. It's a Hall of Famer I think. And a product like this only comes along once in a long while. So people will not be disappointed at all. It's amazing.

A - Martin Viecha {BIO 17153377 <GO>}

Great. Thank you very much. And let's go to analyst questions. We'll start with Alex Potter from Piper Sandler. Alex, go ahead and unmute.

Q - Alex Potter {BIO 16150582 <GO>}

Can you hear me?

A - Martin Viecha {BIO 17153377 <GO>}

Yes.

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A - Elon R. Musk {BIO 1954518 <GO>}

Yes.

Q - Alex Potter {BIO 16150582 <GO>}

Okay. Perfect. So first question was on Lathrop. Obviously, that's -- it's great to see the growth there. Just wondering when do you think that facility might be closer to full utilization? Are you just sort of deliberately working your way up the S-curve there? Demand, obviously, isn't the limitation. So what are the steps, I guess, to unlocking full utilization there?

A - Andrew D. Baglino {BIO 21161872 <GO>}

Sure. There are some classic factory ramp aspects of what's going on in Lathrop. We actually have two phases of the CapEx there we faced, some of the general assembly parts of the facility. But in addition, we also have ramps with our suppliers that we are following, so both on the cell side and on the power electronic side. And we will see that unlock in the latter half of this year with both those inputs. So the overall facility was phased with the second phase of CapEx coming online towards the end of this year.

Q - Alex Potter {BIO 16150582 <GO>}

Okay, great. And then, I guess my second question is on your ability to serve other markets out of Shanghai. Obviously, the facility in Berlin should be opening up your ability to, I guess, allocate more vehicles to Southeast Asia, Australia, other areas. I'm just wondering what other regions you think you're maybe not yet serving effectively. What are your timelines for addressing some of those gaps in your regional exposure? Thanks.

A - Elon R. Musk {BIO 1954518 <GO>}

Yes. That's a good question because there are still many parts of the world that we do not yet serve, with respect to vehicles especially. So we do expect to open up new markets around the world. And while those markets are not necessarily individually gigantic, they do add up a whole bunch of markets, they do collectively sum up to something significant. So it's high time that Tesla offered its cars to the rest of the world and that is something that we intend to do.

A - Martin Viecha {BIO 17153377 <GO>}

Thank you very much. Let's go to the next analyst, George from Canaccord. Go ahead and unmute.

Q - George Gianarikas {BIO 19376739 <GO>}

Hey. Thanks for taking my question. I was wondering, first, if you could discuss your FSD take rates and whether you've seen any significant positive or negative change there. And also, given that you've reduced the prices for your vehicles, do you think you need to do that for FSD as well? Thanks.

A - Elon R. Musk {BIO 1954518 <GO>}

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I'll decline to answer the details on the FSD take rate. But the -- it's a tricky pricing question, because the value of a car that is autonomous is enormous. So in a way the price right now is an option value on an autonomous vehicle and that value is -- that will ultimately be very significant. And it's really -- I mean, for those that are using the FSD Beta, I think you can see the improvements are really quite dramatic. There'll be a little bit of two steps forward one step back between releases and for those trying the Beta, but the trend is very clearly towards full self-driving, towards full autonomy. And I hesitate to say this, but I think we'll do it this year. So that's what it looks like, yes.

Q - George Gianarikas {BIO 19376739 <GO>}

Thank you. Maybe on the dramatic change we've seen in EV-related commodity prices, if you think that's a reflection of any recent overcapacity in mining and refining, or is that sort of a coincident indicator on global EV demand? And how do you expect those prices to kind of track over the next several quarters? Thank you.

A - Elon R. Musk {BIO 1954518 <GO>}

Man, I wish I had a crystal ball to answer your question. I don't know if we can provide a question that would have with -- that would have any value really. It's -- I think we're in uncertain times. And if somebody has got a crystal ball, they can lend me, I'd really like to borrow it. But these are uncertain times. My guess is this -- it's economics to me, whether for about a year or so, and if we hold roughly 12 months, and then -- this is just my guess. I'm -- it's just pure speculation. Stormy weather for about 12 months and then provided there are no major geopolitical wildcards that show up, that -- things start getting sunny around spring next year.

A - Andrew D. Baglino {BIO 21161872 <GO>}

The only thing I would say on the, like, EV materials markets, they're not all super liquid. And some of them, for example, like less than -- like single-digit percentage of the market is actually traded on the spot market. And not only are they not super liquid, there's not -- like, storage isn't particularly facile for all of the materials. So like, small mismatches in supply and demand drive like large price swings, not really real price swings, but just like temporarily large price swings. So it's hard to read into this price swings. I don't know, Karn, if you want to add anything?

A - Karn Budhiraj

Yes. Well -- this is Karn, by the way. We are seeing, as Elon mentioned, quite a bit of softening in the lithium carbonate market. This was -- six months ago, we were trading at like \$85,000 a ton, and today's spot price is about \$26,000. So there's been a dramatic decrease in that. Of course, we were able to take advantage of low lithium pricing earlier on with fixed price contracts. And we find that this is going to be another opportune moment that basically extend that into the later half of the decade. But the -- we -- at the quantities we're procuring, we're not as impacted by the spot market, because we have all those contracts in place and we're just going to be going and doing more of that.

The other thing that's happening is because of the price spike, a lot of the companies that are in this business are becoming more ambitious about finding more upstream resources

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and exploring locations in Africa as well as South America. So that's also helping the macro situation with pricing.

A - Elon R. Musk {BIO 1954518 <GO>}

Yes. But just on the lithium front, to reemphasize, the choke point is much more on refining capacity than it is on mining. Lithium is actually is very common throughout the world, including in the U.S. and really in -- it's just a very common element on earth is lithium. So it's much more a question of where is the refining capacity and can the refining capacity keep up? That's really what matters more than where is the lithium ore. It's everywhere basically.

I think that same question also extends to refining of the cathode, and to some degree, refining of the anode. And this is why we've -- at Tesla, we're building our lithium refinery capability at Corpus Christi and our cathode refinery outside of Austin.

It's worth noting, like, I hope other companies do the same thing. We will have by far the most lithium refining capability and the most cathode refining capability in North America, I think probably more than everyone else combined, by a lot. So can other people please do this work? That would be great. We're begging you. We don't want to do it. Can someone, please? Like instead of making a picture sharing app, please refine lithium. Mining and refining, heavy industry, come on.

A - Karn Budhiraj

It's fun. It's actually fun.

A - Elon R. Musk {BIO 1954518 <GO>}

Yes, yes. Exactly. It's real.

A - Zachary Kirkhorn {BIO 20940148 <GO>}

We have -- we're here, ready to buy.

A - Karn Budhiraj

Yes. That's right.

A - Elon R. Musk {BIO 1954518 <GO>}

Yes. Just to emphasize, Tesla is not doing this because we want to do it. We have a lot of fish to fry, obviously. But we're doing it because others aren't doing it, and we wish others would do it.

A - Martin Viecha {BIO 17153377 <GO>}

Awesome. Thank you very much. Let's go to Emmanuel Rosner from Deutsche Bank. Hey, Emmanuel, can you hear us?

Q - Emmanuel Rosner {BIO 16323493 <GO>}

Hey, can you hear me?

A - Martin Viecha {BIO 17153377 <GO>}

Yes, we can.

A - Elon R. Musk {BIO 1954518 <GO>}

Yes.

Q - Emmanuel Rosner {BIO 16323493 <GO>}

Perfect. Thank you so much for taking my questions. Maybe first question for Elon on your pricing strategy. So if I understand your message, you're saying Tesla feels it's worth maximizing the volume, increasing the size of the fleet, as fast as you can because you'll be able to monetize this over the life cycle of the vehicle. Can you be a little bit more specific around ways you would be able to monetize sort of like this existing fleet in the future? Obviously, I think autonomous seems to be a big piece of it, but my understanding was that Robotaxi would probably be for the next-generation vehicle, not the existing one. So I guess in which ways would you monetize it?

A - Elon R. Musk {BIO 1954518 <GO>}

That's right. The Robotaxi terminology can be a bit confusing, because that's sort of like a generic term for our next-generation vehicle. And we, obviously, are working on a next-generation vehicle, that's going to be very compelling. This is just not the time to talk about it in detail as a product. So we internally call it Robotaxi. But really all of the vehicles that have Hardware 3, which is the vast majority of our fleet, we believe will achieve full autonomy. So there will be a robot -- like a Model 3 or Model Y would be a Robotaxi -- a robotic taxi. So yes, that's -- to the best of our knowledge that we believe that the current hardware can achieve full autonomy.

Q - Emmanuel Rosner {BIO 16323493 <GO>}

Understood. And then maybe a question for Zach, back on the automotive gross margin. So I think I guess a few months ago, even after major price cuts, we felt pretty strongly that 20% automotive gross margin was still probably a reasonable floor. Obviously, the macro has gone worse and additional price cuts have happened. Is there anything else that has changed in terms of the outlook? Is it just the macro deteriorating? Is it the competitive landscape? Anything else that's sort of like makes you think differently around the full year? And is there a way, therefore, to frame a floor?

A - Zachary Kirkhorn {BIO 20940148 <GO>}

Yes. About half of the miss against that previous conversation last quarter is attributed to adjustments we made in pricing in the second half of the quarter. May I guess you could argue that, that lowers the floor in a sense. We've also made pricing adjustments so far this quarter, so that brings it down further. About the other half of the miss in Q1 was attributed to things that are nonrecurring. So I mentioned these in my opening remarks. The warranty adjustment for cars that were previously produced but not part of the pedigree of cars we're building now and some autopilot related deferrals as we make some technology changes here that this deferral should get recognized once some of the

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software catches up. So those two things are non-repeating. So hopefully that helps answer your question.

A - Elon R. Musk {BIO 1954518 <GO>}

Yes. I mean, there's really two macro factors that are tricky. The biggest thing being the interest rate. So if there's a very high Fed rate or interest rates are very high, that is -- every time that the Fed raises the interest rates, that's equivalent to increasing the price of a car. It makes the cars less affordable because people are able to buy cars as a function of what they can afford on a monthly basis. So that's -- so it's just almost directly equivalent to a price increase as any kind of interest rate increase.

Then the other factor is whenever there's uncertainty in the economy, people will generally postpone your new -- big new capital purchases, like a new car. This is a natural human reaction. So if people are reading about layoffs and whatnot in the press, they're like, well, they might be worried about they might be laid off. So then they'll be naturally a little more hesitant than they would otherwise be to buy a new car. Now this is just the nature of the auto industry. But there is -- there will be a tremendous amount of pent-up demand for new cars. So -- but it goes through cycles.

A - Martin Viecha {BIO 17153377 <GO>}

Thank you. Let's go to Ben Kallo from Baird. Ben, go ahead and unmute.

Q - Benjamin Kallo

Hey, guys. Elon, when you talk about many fish to fry, you talked about Dojo being a product that you can sell outside of Tesla. How do we rank all the things you have going on and then in the economic environment --- I mean, like heat pumps and everything else you have going on versus the -- investing in the vehicle business? Or is that not the right way to look at it?

A - Elon R. Musk {BIO 1954518 <GO>}

I'm not sure I fully understand your question, but the -- I'd look at Dojo as like kind of a long-shot bet. But if it's a long-shot bet that pays off, it'll pay off in a very, very big way. But potentially -- yes, potentially in a very, very big way, like, in the multi-hundred-billion dollar level, but the thing is like -- still put it in the long shot category, but long shot with a multi-hundred-billion dollar potential outcome. And so it's a bet worth making, but not one you can sort of say like take it to the bank type of thing. Although these days take it to the bank, it's maybe not as secure as it used to be.

So -- and obviously, we have big beliefs in heat pumps and that is on our list that over time is to do a really good heat pump for homes and commercial offices and stuff. And we have the technology, it's really good. But it's still -- it's a back-burner item. Our focus is very much on vehicles, autonomy, stationary storage, basically solving sustainable energy and solving autonomy, which would be -- like I said, solving autonomy, if we're able to have a fleet of several million vehicles that, with a software update, can be -- potentially worth several times their original value, that's -- that will be -- if that happens, that will be the -- and I think it will happen, that'll be the biggest asset value increase in history, I think.

Q - Benjamin Kallo

Thank you. Moving to sort of pricing, but a lot of pundits talk about the pie and losing share or gaining share. But how do you guys look at pricing versus the EVs or the ICE vehicles? Or does that not come into the equation? Sorry to ask about pricing again, thank you.

A - Elon R. Musk {BIO 1954518 <GO>}

No, it's really just like we're -- every day, we're getting a daily real-time update of how many cars were ordered yesterday, how many cars were produced yesterday. We must have -- if there's a company that's got more real-time data than Tesla, I'm not sure there's any company on earth that has better real-time data than Tesla except maybe SpaceX, Starlink. So because we don't have to -- for the other car companies, they will make the cars, send them to the dealers, then the dealers will sell the cars. And then it takes quite a long time for them to get the data back to actually figure out how many cars were sold. Whereas we know how many cars were ordered yesterday throughout the world.

So our fingers on the pulse is real-time and does not have latency, whereas the other car companies have a lot of latency in their data, as does the government. The government has a lot of latency in their data. So we're just looking at and saying, okay, what does it take to achieve a clearing price for our vehicle production? And then we make a pricing change and we see what happens immediately and adjust the course. So we're adjusting course. And we're thinking about it literally every day, seven days a week. Seven days a week, I look at that email, and so does the rest of the team. We try to make the least dumb decision that we can. On balance, I think our decisions are pretty good. Sometimes, they'll be down, but on average, they're, I think, better than the rest of industry.

A - Zachary Kirkhorn {BIO 20940148 <GO>}

Just to add on the question about EV market share or ICE. This comes up a lot, I think a lot of the public debate is there on this concept of EV market share. We don't look at it that way. And we look at it as market share of the cars.

A - Elon R. Musk {BIO 1954518 <GO>}

Yes.

A - Zachary Kirkhorn {BIO 20940148 <GO>}

It's a car market, not the EV market. And actually the mission of the company requires internal combustion engine cars to be switched over to electric vehicles. So that's what we pay attention to.

A - Andrew D. Baglino {BIO 21161872 <GO>}

Yes, I said that last time, too. We got to -- you guys got to stop looking at it as EV, BEV market. It's how many cars are we selling, just start looking at it that way, please.

A - Elon R. Musk {BIO 1954518 <GO>}

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All cars will be EVs. It's going to -- I've said this for a long time. We'll look back, I don't know, assuming civilization is still around in 20 years, we'll look back on internal combustion engine vehicles the same way we look back on external combustion engine vehicles, which is like a steam engine. A steam engine is an external combustion engine vehicle. And there's still a few around, they're kind of quirky and kind of cool collector's items, that's how gasoline cars will be in the future.

A - Martin Viecha {BIO 17153377 <GO>}

Thank you. Let's go to Colin Rusch from Oppenheimer. Colin, go ahead and unmute, please.

Q - Colin Rusch {BIO 15823117 <GO>}

Thanks so much, guys. Can you talk a little bit about how much of the actual cost structure is variable on these vehicles? And if you could give us a range on, plus or minus, the lithium cost within those contracted volumes that you're seeing?

A - Elon R. Musk {BIO 1954518 <GO>}

Well, I think -- again, we'd really love to have a crystal ball here, but we don't have it. Depending on what timescale you're looking at, most of the car is variable. So most of the car cost is variable. So -- and probably, if I were to guess, I think we will see improved costs from suppliers. Yes, I think we will.

A - Karn Budhiraj

Yes.

A - Elon R. Musk {BIO 1954518 <GO>}

That is our expectation.

A - Karn Budhiraj

And we're already starting to see that, Elon. I think you mentioned before that we anticipated a crash in the lithium prices. And some of that has flowed through by way of lithium carbonate reductions into battery cost. And the same thing will happen with lithium hydroxide. The length of the supply chain matters also, because what we're talking about is very far upstream. So by the time it makes it into the battery that ends up in car, it'll be several months.

But beyond just the commodity pricing, as Zach mentioned earlier, we're also very focused on other metrics that make production very efficient, for example, detention and demurrage, air expedites. I think our air expedites are down 90%, detention and demurrage is down 93% from the peaks. That can be hundreds of thousands of dollars per vehicle. So we're sort of attacking all vectors and becoming very efficient.

Q - Colin Rusch {BIO 15823117 <GO>}

Okay. And then my follow-up is really around stationary storage demand on the utility scale. I mean, obviously, there's a gigantic queue for interconnection in the U.S. And can

you talk about the volume of quotation you're seeing at this point around stationary storage for that renewables queue on a global basis? And how much of that is converted into actual sales?

A - Elon R. Musk {BIO 1954518 <GO>}

Drew, do you want to take that?

A - Andrew D. Baglino {BIO 21161872 <GO>}

I mean -- yes, that's also not exactly how we look at it, really. We're not, like -- yes, we're not engaged in the interconnection queue. Like we're focused on ramping Megapack as quickly and efficiently as we can. And we have visibility into the pipelines of a variety of different renewable energy and just pure stationary storage developers, and we also develop our own projects. And we're mostly just going -- we're being selective in trying to pick the projects that best fit our mission and our objectives.

A - Elon R. Musk {BIO 1954518 <GO>}

Yes, this is -- again, this is not a product call, but we'll have something -- I mean, this -- we're making improvements on many fronts including Megapack. So I think some of those improvements will improve the speed at which you can connect the Megapacks to the grid.

A - Martin Viecha {BIO 17153377 <GO>}

Thank you. The next question is from Mark Delaney from Goldman Sachs.

Q - Mark Delaney {BIO 20093495 <GO>}

Yes, good afternoon. Thank you for taking the question. Do you still see 2 million units as an upside case for volume this year? And is the gating factor for reaching 1.8 million or 2 million units in 2023 still supply chain as was mentioned on your last conference call? Or is it more about demand at this point?

A - Elon R. Musk {BIO 1954518 <GO>}

Well, if you have a crystal ball, you can lend me, back to the crystal ball situation. These are volatile times. From a production standpoint, if things go well, we've got a shot at 2 million vehicles this year. But that is the upside case. And we feel comfortable with 1.8 million. And we'll just have to see how this year unfolds.

Q - Mark Delaney {BIO 20093495 <GO>}

That's helpful. Thanks. And then the company has spoken at the Investor Day and in some of the past conference calls about opening up its vehicle charging network. Can you speak to some of the feedback you've been getting from both Tesla owners and non-Tesla owners, and how the ramp of the charging network may progress from here? Thanks.

A - Elon R. Musk {BIO 1954518 <GO>}

Drew, do you want to take that?

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A - Andrew D. Baglino {BIO 21161872 <GO>}

Yes. So as you may have seen, we opened our first V4 post in Europe and our Magic Dock post in North America in Q1. And that is indicative of the direction we're heading with universal compatibility for all vehicles, no matter where the charge port is, et cetera, in all major markets. And we're going to continue to roll out those sort of improved offerings as we build new stations.

We're always balancing, like, our ability to serve our own customers with our ability to serve new customers when doing that. I think we've been able to balance it rather well. For example, in Europe, 50% of all of our supercharging stations are open to all EVs, and we've been able to do that without any increase in wait times at all for anybody. So we're going to continue to take a similar approach as we do this in North America and China over the coming quarters.

A - Martin Viecha {BIO 17153377 <GO>}

Okay. Thank you very much. Let's go to Rod Lache from Wolfe Research.

Q - Rod Lache {BIO 1528384 <GO>}

Hi, everybody. I just wanted to first just follow up on your comments in your letter about leveraging your cost position as others struggle with unit economics and also taking into account the lifetime revenue, actually in a way that most other automakers will never see, just given your service network and supercharging and other attributes. Can you just maybe give us a sense of how far you'd be willing to take this? Are there brackets around the range of initial margin that you'd be comfortable with? And again, any color that you might provide on the updated range of margins that you'd expect in the auto business?

A - Elon R. Musk {BIO 1954518 <GO>}

I think we may have answered this question or tried to answer this question a few times, but it's difficult to say what the margin will be. It depends on what the macroeconomic environment is like. So for example, if the Fed were to lower the rates, that would be super helpful for demand; if they raise them, that just raises the interest costs that buyers have to pay for -- to buy a car, so it reduces affordability, and therefore, reduces demand. If we look past, say, this year or like could go sometime next year or middle of next year, so I think things are looking really -- I think like I said, albeit if there's some major geopolitical wildcard that turns up. But in the absence of that, I think I would be very optimistic about middle of the next year, end of next year.

A - Zachary Kirkhorn {BIO 20940148 <GO>}

Yes, and just to add to Elon's comments, just two other points. What's really important for us this year, in addition to just managing the day-to-day of the business, right, is also investing in, as Elon mentioned, what 2024 and 2025 will look like. And so, using the cash generated from the sale of products today and reinvesting that, this is very important for us. I think that what happens to margins over the next couple of quarters only matters in the context of what that means for our ability to reinvest into 2024 and 2025.

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And we have a lot of space before that becomes something that we have to revisit our investment plans. And so we're planning to keep the business healthy. But I just want to caution folks about reading too much into what happens over the near term here, because we're very focused as a company on making sure that when we exit this macroeconomic situation, this company is positioned in the best possible way.

A - Elon R. Musk {BIO 1954518 <GO>}

Yes, exactly.

Q - Rod Lache {BIO 1528384 <GO>}

Just to elaborate on that point though, the revenue -- the long-term lifetime revenue that you're targeting from each vehicle is massive. So if you took that to the extreme, it would seem that you'd be comfortable with a relatively low initial margin. Am I --

A - Elon R. Musk {BIO 1954518 <GO>}

Correct.

Q - Rod Lache {BIO 1528384 <GO>}

-- misinterpreting that or is that exactly right? And just --

A - Elon R. Musk {BIO 1954518 <GO>}

That's exactly right.

Q - Rod Lache {BIO 1528384 <GO>}

Okay. And the -- normally, in a recession, when consumers feel less financially secure, actually price elasticity deteriorates. Just based on your pulse taking of the consumer, do you have a view on elasticity of demand?

A - Elon R. Musk {BIO 1954518 <GO>}

Well, I can't emphasize enough the whole -- just the fundamental question of affordability. For most people, their ability to buy a car is a function of can they make monthly payment or not. And so, like I said, if interest rates are really high like they are right now, then in some cases, people can't get a loan at all. So it's -- I think probably banks are pretty not leaning forward in providing loans as I expect these days.

So that's -- but like, there is quite a powerful story here when you -- going back to something that was alluded to a moment ago or mentioned a moment ago, that Tesla is in a uniquely strong strategic position, because we're the only ones making cars that technically we could sell for zero profit for now, and then yield actually tremendous economics in the future through autonomy. No one else can do that. I'm not sure how many of you will appreciate the profundity of what I've just said, but it is extremely significant.

A - Martin Viecha {BIO 17153377 <GO>}

Thank you. Let's go to Adam Jonas from Morgan Stanley.

Q - Adam Jonas {BIO 3339456 <GO>}

Hi, everybody. So first, Elon, good luck with tomorrow's launch at Boca Chica. Break a leg.

A - Elon R. Musk {BIO 1954518 <GO>}

Thanks. We definitely can't have too much luck in the rocket business, that's for sure.

Q - Adam Jonas {BIO 3339456 <GO>}

Incredible. So now that you've gotten to know the Twitter architecture kind of intimately well over the past six months, what can you tell Tesla stakeholders about how an X.com or super app could be potentially accelerative to Tesla's business model?

A - Elon R. Musk {BIO 1954518 <GO>}

Well, I don't know. I guess it could make it -- potentially make it easier to buy cars. So we are straying somewhat off topic here, because this is --

Q - Adam Jonas {BIO 3339456 <GO>}

Okay. All right. If I put --

A - Elon R. Musk {BIO 1954518 <GO>}

But I think there's some benefit. I think probably there's some benefit. Yes, sure.

Q - Adam Jonas {BIO 3339456 <GO>}

I get it, Elon. So just as a follow-up on manufacturing. You're a student of history, and you'll know that back in 1913, Henry Ford introduced the moving assembly line in Highland Park, Michigan. And the price of a Model T, which had already been undercutting cars around that time fell another 70% or 80%, and hundreds of rival car companies went bust.

A - Elon R. Musk {BIO 1954518 <GO>}

Yes.

Q - Adam Jonas {BIO 3339456 <GO>}

I'm wondering if history is repeating itself here, Elon, and that the recent pattern of cuts with you is way ahead of the cost curve compared to competition. Is this -- it seems like it's a calculated strategy, not just in reaction to competition or changing supply demand in the market, but could we catalyze some Darwinian forces in the EV market?

A - Elon R. Musk {BIO 1954518 <GO>}

Well, I mean, we're not trying to, say, take pricing actions in order to be deliberately -- to deliberately undermine competitors or anything like that. We really don't think about competitors that much. We just look at do people like our cars, how can we make the product better, can they afford our cars, and the sort of -- the things like improving service

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and whatnot. But like I said, we do have this unique strategic advantage that we have and we're making a car that if autonomy pans out, and we think it will, where -- that asset is actually will be worth a hell of a lot more in the future than it is now. So it is technically possible to sell it at zero profit, but still have the net present value of future cash flows associated with that asset is very significant.

A - Andrew D. Baglino {BIO 21161872 <GO>}

Yes. And service and charging and insurance and all of these other ongoing revenue streams that other companies don't have.

A - Elon R. Musk {BIO 1954518 <GO>}

Yes.

A - Karn Budhiraj

Certainly, we want all EVs to succeed, too. We just want to say that we're not in like some malicious attack to try to just crush everybody.

A - Elon R. Musk {BIO 1954518 <GO>}

Definitely not. We're like opening up superchargers, we've made our patents available for free. So it's like we're trying to be helpful here. So we're not trying to -- we're not out to sort of destroy competitors or anything like that. We're trying to help competitors, frankly, in any way we can.

A - Martin Viecha {BIO 17153377 <GO>}

Thank you. Let's go to Dan Levy from Barclays.

Q - Dan Levy {BIO 17519730 <GO>}

Hi, good evening. Thank you. First question, you're ramping supply at Austin and Berlin. So wanted to understand just how critical it is to further increase volume at those plants just to get the vertical integration benefits, in the face of the sort of market with some demand questions. And just broadly, should we -- I mean, historically, you've been operating at the pace at which your supply allows you to produce as opposed to gauging to demand.

Should we generally expect that you're going to continue to produce at your, whatever the max capacity that you're allowed within your supply constraints, regardless of what the broader economic environment is just to continue to get that volume out there?

A - Elon R. Musk {BIO 1954518 <GO>}

That is -- yes, I mean there's -- there could be, like obviously, a macro shock that is so severe that people just stop buying cars for some reason. But in the absence of that, we will continue to grow output at a rapid clip.

Q - Dan Levy {BIO 17519730 <GO>}

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Great. Thank you. And then just on the margins associated with Austin and Berlin, you mentioned Austin and Berlin have the margin drag until you reach intended volumes. I don't know if you can disclose what those volumes are. Then maybe you could just remind us of what the margin profile of Austin and Berlin will look like versus Shanghai once you get the vertical integration benefits in place?

A - Elon R. Musk {BIO 1954518 <GO>}

Well, probably won't have be quite as good as Shanghai. Shanghai is hard to -- has a very efficient cost structure, obviously, our lowest cost structure in the world. But we do expect to make significant improvements in Austin and Berlin, and continue to make improvements in Fremont as well. So yes.

A - Roshan Thomas {BIO 19053050 <GO>}

We've increased -- this is Roshan, by the way. We've increased our localization efforts. So that will then drive down our days on on-hand requirements. We've made 10% quarter-on-quarter improvement in days on on-hand. So we'll continue on that path as localization improves.

A - Martin Viecha {BIO 17153377 <GO>}

Okay. Thank you very much. And our final question comes from Philippe Houchois from Jefferies.

Q - Philippe Houchois {BIO 6464462 <GO>}

Yes. Good evening. Thanks for taking the question. It's slightly longer term. I completely agree with your comments that we should look at Tesla in terms of auto market share, and not EV market share. But I'm just wondering, as you build up the market share globally, is there a limit to the direct selling business model as you practice it? And should we think about going forward, you need to look into the agency or using importers to basically develop market share more smoothly, I guess, globally? And to say in other words, is there a kind of a felll[ph] by date for the direct business model as you practice it today?

A - Elon R. Musk {BIO 1954518 <GO>}

It seems to be working well so far.

Q - Philippe Houchois {BIO 6464462 <GO>}

Because we hear different feedback from customers who miss the human interaction or unhappy with the service. And I'm just wondering if you're seeing some growth pains in there, that would lead you to change. You're not seeing that?

A - Elon R. Musk {BIO 1954518 <GO>}

Well, I mean, there are -- since we're always going to have some growing pains, where at times -- and it depends on which geography we're talking about where sometimes service is behind sales, sometimes it's ahead of sales. This is -- I mean, Tesla is growing, I believe, faster than any company in history that makes a large complex manufactured object. So these are -- if you're trying to max, it's always difficult to match exponentials.

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So -- but I think it is helpful to have the feedback loop with a service, because that means we feel the pain of service, and then we can address the design to make the car need less service. And I think that gives us the right incentive structure because the best service is no service, the car doesn't break. And whereas if you have, say, a dealer network that is reliant upon services revenue, then you arguably have a misalignment of incentives where they're making money on service. But actually, we want to -- the best thing for the consumer is the car doesn't need servicing, so.

Q - Philippe Houchois {BIO 6464462 <GO>}

And then last one, just if I can follow up, have you worked out -- I mean, for many of your traditional competitors, a fair amount of profits for them comes from selling spare parts and servicing. You don't have that in your profit structure. And have you worked out how much of a deficit you have compared to your peers?

A - Elon R. Musk {BIO 1954518 <GO>}

Yes. Actually, this one is something I could wax on about for a while because really people didn't understand that the best short-selling argument against Tesla for the longest time was the fact that Tesla does not have an existing fleet. And that the auto industry, the reason incumbents succeed and newcomers fail, the biggest reason is that the incumbents have a large fleet and they're able to sell new cars at close to zero margin, and then sell spare parts at a very high margin, sort of razors and blades type thing.

And so the only way to actually succeed -- for a newcomer to succeed is to have a product that is so compelling that people are willing to pay a premium over the incumbent product. And in the absence of electrification and autonomy, I don't think a newcomer can succeed.

A - Martin Viecha {BIO 17153377 <GO>}

Thank you very much, everyone. Unfortunately, that's all the time we have for this quarter. We'll see you again in three months from now. Thank you.

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