# Q3 2023 Tesla Inc Earnings Call Transcript

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**Martin Viecha** - *Tesla, Inc. - Senior Director for IR*

Good afternoon, everyone and welcome to Tesla's Third Quarter 2023 Q&A Webcast. My name is Martin Viecha, VP of Investor Relations, and I'm joined today by Elon Musk, Vaibhav Taneja and a number of other executives. Our Q3 results were announced at about 3:00 p.m. Central Time in the update that 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 followup. (Operator Instructions) But before we jump into the Q&A, Elon has some opening remarks. Elon?

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Thanks, Martin. So just a Q3 recap. Our last quarter was impacted by down time for global factory upgrades that will help us reduce cost per vehicle as well as increase production. We remain focused on 3 main objectives which is the cost reduction of our products, investments in artificial intelligence, and other growth projects like Optimus. And continued free cash flow generation. Regarding vehicle cost, our team was able to reduce the cost per vehicle further in Q3 despite headwinds from factory idle costs and ramp-up of new factories, and we believe there's still meaningful room for improvement there.

Regarding Autopilot and AI, our vehicle has now driven over 0.5 billion miles with FSD Beta, Full Self-Driving Beta, and that number is growing rapidly. We recently completed a 10,000 GPU cluster of H100s. We think probably bringing it into operation faster than anyone's ever brought that much compute per unit time into production since training is the fundamental limiting factor on progress with full self-driving and vehicle autonomy.

We're also seeing significant promise with FSD Version 12. This is the end-to-end AI where it's a photon count in, controls out or really you can think of it as there's just a large bit stream coming in and a tiny bit stream going out, compressing reality into a very small set of outputs, which is actually kind of how humans work. The vast majority of human data input is optics, right from our eyes. And so we are, like the car, photons in, controls out with neural nets, just neural nets in the middle. It's really interesting to think about that.

We will continue to invest significantly in AI development as this is really the massive game changer, and I mean, success in this regard, in the long term, I think, has the potential to make Tesla the most valuable company in the world by far. If you have fully autonomous cars at scale and fully autonomous humanoid robots that are truly useful, it's not clear what the limit is.

Regarding Energy Storage, we deployed 4 gigawatt hours of energy, of storage products in Q3. And

as this business grows, the energy division is becoming our highest-margin business. Energy and service now contribute over $0.5 billion to quarterly profit.

The Cybertruck, I know a lot of people are excited about Cybertruck, I am too. I've driven the car. It's an amazing product. I do want to emphasize that there will be enormous challenges in reaching volume production with the Cybertruck and then in making a Cybertruck cash flow positive. This is simply normal for -- when you've got a product with a lot of new technology or any new -- brand-new vehicle program, but especially one that is as different and advanced as the Cybertruck, you will have problems proportionate to how many new things you're trying to solve at scale. So I just want to emphasize that, one, I think this is potentially our best product ever, and I think it is our best product ever. It is going to be -- require immense work to reach volume production and be cash flow positive at a price that people can afford.

Often, people do not understand what is truly hard. That's why I say prototypes are easy, production is hard. People think it's the idea or you make a prototype, you design a car. And as soon as designing a car is -- it's not just anyone can do it. It does require taste. It does require effort to design a prototype. But the difficulty of going from a prototype to volume production is like 10,000% harder to get to volume production than to make the prototype in the first place. And then it is even harder than that to reach positive cash flow. That is why there have not been new car start-ups that have been successful for 100 years apart from Tesla.

So I just want to temper expectations for Cybertruck. It's a great product. But financially, it will take, I don't know, a year to 18 months before it is a significant positive cash flow contributor. I wish there was some way for that to be different, but that's my best guess.

So really, the demand is off the charts. We have over 1 million people who have reserved the car. So it's not a demand issue, but we have to make it, and we need to make it at a price that people can afford; insanely difficult things.

In conclusion, we continue to focus on ramping production while maintaining a positive cash flow, and we continue to target and expect to have around 1.8 million vehicle deliveries, as stated earlier this year. The Tesla AI team is, I think, one of the world's best, and I think it is actually by far the world's best when it comes to real-world AI. But I'll say that again: Tesla has the best real-world AI team on earth, period, and it's getting better.

And lastly, I wanted to thank all of our employees who are making a lot of extra effort during uncertain times. Thank you very much for your hard work and the impact that you're making.

**Martin Viecha** - *Tesla, Inc. - Senior Director for IR*

Thank you very much, Elon. And our CFO, Vaibhav, had some opening remarks as well.

**Vaibhav Taneja** - *Tesla, Inc. - CFO, Corporate Controller & CAO*

Thanks, Martin. Vehicle deliveries in Q3 outpaced production, and we had yet another record quarter of profitability in our energy business. Congratulations to the Tesla team for their continued focus on operational excellence as we navigate through a period of economic uncertainty, higher interest rates and shifting consumer sentiment.

As Elon mentioned, our Q3 operational and financial performance was impacted by planned downtimes for our factory upgrades. This was necessary to allow for further factory improvements and production rate increases. Despite those factory shutdowns, our cost per vehicle decreased to approximately $37,500. We saw sequential decreases in material costs and freight. Reducing the cost of our vehicles is our top priority.

On the operating expenses front, R&D expenses continue to rise due to Cybertruck prototype builds and pilot production testing, combined with spend on AI technologies like full self-driving Optimus and Dojo. We have and will continue to make investments in these areas and hence, our capital expenditure and R&D will continue to grow in the near term.

However, our focus is to continue making investments through positive cash flow from operations. This year itself we have generated operating cash flows of approximately $8.9 billion and free cash flows of approximately $2.3 billion.

Our other businesses are becoming more prominent on a stand-alone basis, with Energy business leading the charge primarily from the growth in megabyte deployments. Our Services and Other businesses, on a year-on-year basis, also continued to show positive momentum as we benefit from our growing fleet.

As regards our pricing strategy, in addition to what we have shared before, I want to elaborate that most car buying happens with one or other form of financing. And hence, we also view pricing in terms of monthly costs for the customer. And therefore, as interest costs in the U.S. have risen substantially, it has required us to adjust the price of our vehicles to keep the monthly cost in parity. We've tried to offset such adjustments via our focus on reducing costs. However, there is an inherent lag in cost reductions, which in turn impacts margins.

To that extent, we recently announced a partner vehicle leasing program in the U.S., whereby you can get our Standard Range Model Y for as low as $399 a month.

In conclusion, as we navigate through a challenging economic environment, we're focused on reducing costs, maximizing delivery volumes and continue making investments in the future, in particular, AI and other next-generation platforms. We believe this strategy positions us well for the long term. Once again, I would like to thank the Tesla team for their efforts in the last quarter.

## Questions and Answers:

**Martin Viecha** - *Tesla, Inc. - Senior Director for IR*

Thank you very much. And now let's go to investor questions. The first investor question comes from Craig. How many Cybertruck deliveries do you anticipate for 2024?

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

I scruple to make an accurate guess at this point, going back to what I said earlier that the ramp is going to be extremely difficult. And like I said, there's no way around that. If you try to make -- if we just try to do some copycat vehicle design, of which there are literally 200 models that are slight variations on a theme in the combustion engine world, just distinctions without a difference, then it's really not that hard. But if you want to do something radical and innovative and something really special like the Cybertruck, it is extremely difficult because there's nothing to copy. You have to invent it, not just the car but the way to make the car.

So the more uncharted the territory, the less predictable the outcome. Now I can say that -- if you say, "Well, where will things end up," I think we'll end up with roughly 0.25 million Cybertrucks a year, and -- but we're not -- I don't think we're going to reach that output rate next year. I think we'll probably reach it sometime in 2025. That's my best guess.

**Martin Viecha** - *Tesla, Inc. - Senior Director for IR*

Thank you. The second question is can you provide a progress update on the 4680 cell, particularly progress towards performance improvements and cost savings outlined on Battery Day?

**Andrew D. Baglino** - *Tesla, Inc. - SVP of Powertrain & Energy Engineering*

Sure thing, Martin. 4680 cell production in Texas increased 40% quarter-over-quarter. Congrats to the Texas team for producing their 20 millionth cell off of line 1. Texas is now our primary 4680 facility. We're heavily focused on quality. Scrap is down 40% quarter-over-quarter. With the increased volume and yield improvements, cell costs consistently improved month over month within the quarter, although we have a lot more work to do to achieve our steady-state goals. And that is our priority.

The Cybertruck cell, with 10% higher energy than our Model Y cell, started production on line 2 in Texas. This quarter, we convert to building 100% Cybertruck cells to simplify and focus the factory as we ramp all 4 lines in Phase 1 over the next 3 quarters. Phase 2 of the Texas 4680 facility is currently under construction. The additional 4 lines incorporate further capital efficiencies over Phase 1, and our target is for them to start producing in late 2024.

Lastly, in Kato, we're retooling to enable large-scale pilot runs of our next-generation cell designs. Kato's long-term goal is to be the launch pad for new cells, one generation ahead of our mass production facilities, enabling faster iteration and smoother ramp-ups of new designs.

**Martin Viecha** - *Tesla, Inc. - Senior Director for IR*

Thank you. The next question from Institutional Investor is, could you please provide an update on capacity expansion plans for company's factories in Berlin and Austin and the opening schedule of Gigafactory in Mexico?

**Unidentified Company Representative** -

Berlin and Austin factory, the current priority is actually to maximize the output from our existing lines by laser focusing on efficiency improvements. As always, maintaining a high quality and reducing per unit cost will be as critical as growing the production volume. For Mexico, we are working on infrastructure and factory design in parallel with the engineering development of the new production that we will be manufacturing there. That's what I can share for that.

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

In Mexico, we're laying the groundwork to begin construction and doing all the long lead items, but I think we want to just get a sense for what the global economy is like before we go full tilt on the Mexico factory. I am worried about the high interest rate environment that we're in. It's -- I just can't emphasize this enough that the vast majority of people buying a car is about the monthly payment. And as interest rates rise, the proportion of that monthly payment that is interest increases naturally. So that's -- if interest rates remain high or if they go even higher, it's that much harder to -- for people to buy the car. They simply can't afford it.

So -- and we are tracking, I believe, at this point for Model Y to be the best selling car on earth, not just in revenue but in unit value. If you compare that to the other vehicles that are #2 and #3 and whatnot, they cost much less than our car. So we're just hitting the law of large numbers situations here.

I know people want us advertising. We are advertising. I think there is something to be gained on the advertising front. I don't think it's nothing. But informing people of a car that is great but they

cannot afford doesn't really help. So that is really the thing that must be sold, is to make the car affordable or the average person cannot buy it for any amount of money. They simply can't afford it. They can't afford it, so this is a big deal.

**Martin Viecha** - *Tesla, Inc. - Senior Director for IR*

Okay. Thank you very much. The next question is, when do you expect Model 3 Highland to be available in the U.S.? I just wanted to address that, unfortunately, we don't answer product-related questions and timings on earnings calls. So let's go to the next one.

Current sell-side consensus assumes that Tesla will deliver 2.3 million vehicles in 2024, representing 28% growth versus 2023 guidance. Is this growth rate achievable without any mass-market launches in 2024? And when does Tesla expect to return to its 50% long-term CAGR?

**Vaibhav Taneja** - *Tesla, Inc. - CFO, Corporate Controller & CAO*

Thanks for the question. When we look at 2024, there are a lot of moving pieces. Elon just talked about what is happening in the macroeconomic environment. So we're focused on growing our volumes in a very cost-efficient manner and are carefully reviewing all our options, and we'll be able to provide a much more meaningful update at our next earnings call.

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Yes. I mean at the risk of stating the obvious, it is not possible to have a compound growth rate of 50% forever or you will exceed the mass of the known universe. So -- but I think we will grow very rapidly, much faster than any other car company on earth by far.

**Martin Viecha** - *Tesla, Inc. - Senior Director for IR*

Thank you. Next question is, do you have an approximate time line in mind for the robotaxi, driven or nondriven? What excites you most about how this project is progressing?

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Well, the robotaxi is, I guess, certainly nondriven. The -- I guess, I am very excited about our progress with autonomy. The end-to-end, nothing but net, self-driving software is amazing. I -- drives me around Austin with no interventions. So it's clearly the right move. So it's really pretty amazing. And obviously, that same software and approach will enable Optimus to do useful things and enable Optimus to learn how to do things simply by looking. So extremely exciting in the long term.

As I've mentioned before, given that the economic output is the number of people times productivity, if you no longer have a constraint on people, effectively, you've got a humanoid robot that can do as much as you'd like, your economy is twice the infinite or infinite for all intents and purposes. So I don't think anyone is going to do it better than Tesla, not by a long shot. Boston Dynamics is impressive, but their robot lacks the brain. They're like the Wizard of Oz or whatever. Yes, lacks the brain. And then you also need to be able to design the humanoid robot in such a way that it can be mass manufactured. And then at some point, the robots will manufacture the robots.

And obviously, we need to make sure that it's a good place for humans in that future. We do not create some variance of the Terminator outcome. So we're going to put a lot of effort into localized control of the humanoid robot. So basically, anyone will be able to shut it off locally, and you can't change that even if you put -- like a software update, you can't change that. It has to be hard-coded.

**Martin Viecha** - *Tesla, Inc. - Senior Director for IR*

Thank you. The next question is, why was the price dropped on FSD if it is getting better and robotaxi is expected so soon?

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Well, we just wanted to make it more affordable as more people try it. Yes. I think, over time, the price of FSD will increase proportionate to its value. So we'd regard the current price as a kind of a temporary low.

**Martin Viecha** - *Tesla, Inc. - Senior Director for IR*

The next question is, again, on FSD. Mercedes is accepting legal liability for when its Level 3 autonomous driving system, DRIVE PILOT, is active. Is Tesla planning to accept legal liability for FSD? And if so, when?

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Well, there's a lot of people that assume we have legal liability, judging by the lawsuits. We're certainly not being let off the hook on that front, whether we'd like to or wouldn't like to.

**Unidentified Company Representative** -

I mean I think it's important to remember for everyone that Mercedes' system is limited to roads in Nevada and some certain cities in California. It doesn't work in the snow or the fog. It must have a lead car and marked lanes, only 40 miles per hour. Our system is meant to be holistic and drive in any conditions, so we obviously have a much more capable approach. But with those kind of limitations, it's really not very useful.

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Now I think some people understand the profundity of the Tesla AI system, mostly, but very, very few. It's basically baby AGI. It has to understand reality in order to drive, a baby AGI.

**Martin Viecha** - *Tesla, Inc. - Senior Director for IR*

Thank you. The next question on Optimus, will Optimus be working on Gigafactory lines next year? If so, how many would you guess will be deployed?

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

I think at this point, we are not ready to discuss details of the Optimus program, but we will make -- provide periodic updates online. So as you can see, we're -- Optimus, a year ago, could barely walk and now it can do yoga. So a few years from now, it can probably do ballet.

**Martin Viecha** - *Tesla, Inc. - Senior Director for IR*

Sounds good. And the last question from Investors is neural net path planning represents a significant advance in capability and safety for FSD. What steps is Tesla taking to make this technology available outside the U.S.?

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Yes, our approach has been to try to get it -- like, the more places we're trying to make it work, the harder the problem is. So the reason we don't do it in all countries simultaneously is that it would take much longer to make it work anywhere at all. So that's why it's currently just North America. And also for most parts of the world, you have to get approval before deploying things, whereas in the U.S., you can deploy things at risk or at least you can take liability for what you're deploying. So it's a -- whereas most countries require some sort of extensive approval program. So we only want to go through that extensive approval program when we think it's kind of ready for prime time in that country.

I apologize it's not out in those countries, but we keep finding ways to make it better. And it really -- it needs to drive such that it exceeds even the unsupervised, significantly exceeds the probability of injury of a human or significantly better, a lower probability of injury than a human by far. I think we're tracking to that point very quickly.

Obviously, in the past, I've been overly optimistic about this. The reason I've been overly optimistic is that the progress tends to sort of look like a log curve, which is that you have kind of rapid initial improvements that if you were to extrapolate that sort of rapid, fairly linear rate of improvement, you get to self-driving quite quickly, but then the rate of improvement curves over logarithmically as well as the asymptote. That's now happened several times. I would characterize our progress in real world AI as a series of stacked log curves. I think that's also true in other parts of AI, like [LOMs] and whatnot, a series of stacked log curves. Each log curve gets higher than the last one. So if we keep stacking them, we keep stacking logs, eventually, we get to FSD.

**Martin Viecha** - *Tesla, Inc. - Senior Director for IR*

Thank you. Let's now go to analyst questions. The first question comes from Will Stein from Truist.

**William Stein** - *Truist Securities, Inc., Research Division - MD*

We learned earlier on the call, it sounds like you don't think the truck will ramp to significant volume until its third year of production. Should we have a similar anticipation for the ramp of the next-gen platform? Or is there any reason that we should be maybe more optimistic or pessimistic about the ramp profile there?

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Yes. I mean, to be clear, it's not really the third year of production. It's kind of like the 18th month of production is roughly my guess. So it's just that they happen -- it will happen if not the -- it starts this year, spans next year and gets to 2025. So technically, there are 3 calendar years in there, but there's actually only 18 months, not 3 years. I would be very disappointed if it took us -- and that would be shocking if it took us 3 years. But 18 months from initial deliveries to have -- to reach volume and reach prosperity with an immense -- I can't tell you how much -- the blood, sweat and tears level required to achieve that is just staggering. I have been through it many times. And here we go again.

**William Stein** - *Truist Securities, Inc., Research Division - MD*

A similar path for the next-gen platform?

**Andrew D. Baglino** - *Tesla, Inc. - SVP of Powertrain & Energy Engineering*

I mean there's like unique complexity to Cybertruck.

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Yes. I mean Cybertruck is...

**Andrew D. Baglino** - *Tesla, Inc. - SVP of Powertrain & Energy Engineering*

Hence, the 18 months.

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Yes. I mean we dug our own grave with Cybertruck. Nobody, in general, probably nobody digs a grave better than themselves. And so it is -- Cybertruck is one of those special products that comes along only once in a long while. And special products that come along once in a long while are just incredibly difficult to bring to market, to reach volume, to be prosperous. It's fundamental to the nature of the newness. So now the sort of high-volume, low-cost smaller vehicle is actually much more conventional.

**Unidentified Company Representative** -

Yes. In terms of like the technologies we're putting into it, we didn't have to invent how to bend full hard stainless steel or have mega 9,000-ton castings or the largest hot stamping in the world or new -- high voltage level architecture. It's learning from everything we've done, so we hope it will ramp faster than the technology...

**Unidentified Company Representative** -

We also went through the ruthless simplification exercise.

**Unidentified Company Representative** -

Yes we did. Significantly less parts. You're only as [simple] as the least part. If you had less of those, that means you could probably do (inaudible)

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Yes, exactly. I mean that is so...

**Unidentified Company Representative** -

So pretty revolutionary in how we're going to build it.

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

It is. Yes, it's a -- their manufacturing approach for the higher volume small vehicle is revolutionary. It's not revolutionary quite in the same way as the Cybertruck. I think it will be quite a fast ramp. So as I was saying, we're doing everything possible to simplify that vehicle in order to achieve any units per minute level that is unheard of in the auto industry.

**Andrew D. Baglino** - *Tesla, Inc. - SVP of Powertrain & Energy Engineering*

Yes. I mean, a single location makes it easier to automate. It also makes it lower cost. Yes, that's intrinsically lower cost.

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Yes. Let's be clear, it will be cool, but it's utilitarian. It's not meant to be -- fill you with awe and magic. It can get you from A to B. It will be still beautiful, but it's a utility.

**Andrew D. Baglino** - *Tesla, Inc. - SVP of Powertrain & Energy Engineering*

That's not 14 inches of [travel on its] suspension, as an example.

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Yes. So I mean, the Cybertruck has a lot of bells and whistles.

**Martin Viecha** - *Tesla, Inc. - Senior Director for IR*

All right. Thank you very much. Let's go to Pierre Ferragu from New Street Research.

**Pierre C. Ferragu** - *New Street Research LLP - Global Team Head of Technology Infrastructure*

Hey, can you hear me fine, yes?

**Martin Viecha** - *Tesla, Inc. - Senior Director for IR*

Yes.

**Pierre C. Ferragu** - *New Street Research LLP - Global Team Head of Technology Infrastructure*

I have first like a follow-up question on FSD and pricing and adoption. So I agree with you that as FSD improves, we should see its value increasing. But I guess like the ultimate values of FSD, which is to be able to handle like a robotaxi is not going to necessarily interest everybody, and you have a bit of a degraded version that would be like a chauffeur service where the car drives by itself, but you still have to be in the car and around. And then there is like the hands-on, eyes-on version of the service. And I guess, there should be like much lower cost, lower feature kind of variance of the service that could have a very large penetration on your installed base and a more expensive one that would remain at a lower penetration level. So I'm just wondering if you're taking that.

And last but not least, like the simplest version of FSD available are going to work from a technical perspective, probably before like the ultimate robotaxi version can work, if ever. And so I'm wondering how you take that into account and how you're thinking like the financial contribution of FSD over time and whether you could evolve your pricing along that kind of tiers to increase adoption?

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Yes. I mean, a fully autonomous vehicle, I think, Pierre, the sort of the economics of an autonomous vehicle are truly astounding in a positive way. When you look at passenger vehicles today, they only get about 10 to 12 hours of usage per week. That's -- if you drive 1.5 hours a day on average, that's roughly 10 hours a week out of 168 hours. And then there's -- also you're going to have parking and insurance. You've got to take care of the car. It's like there's a lot of overhead.

So I mean, yes, it's like the economics of the system are just insanely positive given that the car -- like, all of the cars we're making and have made for a while, we believe, are capable of full autonomy. So then if you're able to, say, increase the utility of that car by a factor of 5, which only means that you've -- it's being used for maybe 50 hours a week out of 168. So you'll still notice -- you're still assuming -- that still assumes less than 1/3 of the hours of the week it is doing something

useful. You've increased the value of that by 5, but it still costs the same. Like, you have something -- then we're a hardware company with software margins.

**Martin Viecha** - *Tesla, Inc. - Senior Director for IR*

Pierre, do you have a follow-up?

**Pierre C. Ferragu** - *New Street Research LLP - Global Team Head of Technology Infrastructure*

Yes. I have a few on a different topic for you that I have, if that's okay. It's about like your gross margin in the quarter. Could you give us a sense of, like, in how the gross margin evolved sequentially? How much was the impact of idle cost? How much was, like, the sequential benefit, I imagine, of production ramping at Berlin and Austin? And then I saw, like, this massive jump in Energy Storage, a very strong positive surprise. So if you can give us the background on that and tell us how we should think about that gross margin going forward.

**Vaibhav Taneja** - *Tesla, Inc. - CFO, Corporate Controller & CAO*

Thanks for the question. So in terms of -- we have a few different aspects of your question. So for -- if I just look at from a Q3 perspective, obviously, factory idle time had an impact. It did impact by -- and I won't give you the exact percentage, but it had a decent impact for the quarter. And when you look at the other pieces, which we are trying to do, we did see certain of our other factories ramping up pretty well, right? And they actually contributed pretty well to the margin for this quarter. In fact, one of the factories came pretty close to in terms of per unit cost to where we are for our other established factory, which is Fremont. So that was a positive in the quarter.

When it comes to energy margins, Megapack deployment was the key driver there. And that product has done well. On the cost curve also, we've been able to do a lot there. But I do want to caution that Megapack deployments are a bit lumpy. So yes, we had a great quarter this period. But depending upon where we are trying to deploy that product in different markets, you would see periods where there would be downward pressure on deployment because of us trying to get the product to that base way...

**Unidentified Company Representative** -

Yes, the product in transit. Yes.

**Vaibhav Taneja** - *Tesla, Inc. - CFO, Corporate Controller & CAO*

Yes.

**Martin Viecha** - *Tesla, Inc. - Senior Director for IR*

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

**Rod Avraham Lache** - *Wolfe Research, LLC - MD & Senior Analyst*

Really nice to see the rate of vehicle cost improvement despite the downtime that you took. You've taken now about $2,000 out of the average vehicle costs over the past year. Can you give us maybe a sense of the rate of improvement that you see from the changes that you alluded to, the factory changes you alluded to? Is there a way maybe to convey the speed of improvement on your existing product from here? And then related to that, can you share the timing of your next gen -- the lower-priced product that you talked about earlier this year?

**Vaibhav Taneja** - *Tesla, Inc. - CFO, Corporate Controller & CAO*

Yes. So just in terms of product margins, there are lots of puts and takes when you look into this. There are certain things which we control, and there are certain things which we don't control. We get -- we expect that we'll get some benefits from our cost reduction efforts, which are all underway. But on the other hand, we just finished our factory upgrades late in Q3. Some of these factories are still in the early ramp phase in Q4. We're still not up to where we want those factories to be. So they will impact in the near term. Plus, like Elon mentioned, we're going to be ramping Cybertruck, which is going to be another headwind, which we will be dealing with.

On top of all that, there's overall uncertainty in the macroeconomic environment, which even makes it harder to predict precisely as to where we land. But yes, this is something which -- it's an evolving thing which we're observing every day and reacting to it on a daily basis.

**Andrew D. Baglino** - *Tesla, Inc. - SVP of Powertrain & Energy Engineering*

I would just say that on the cost reduction efforts, like we are not -- we are unflagging in our pursuit of additional cost downs for 2024. We do have a good pipeline of them and work on both the engineering side and the factory operations side. And our intention is to like maintain or exceed the trend that you saw. We're trying as hard as we possibly can.

**Rod Avraham Lache** - *Wolfe Research, LLC - MD & Senior Analyst*

The timing of the next-gen product, can you share that?

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Not at this time.

**Rod Avraham Lache** - *Wolfe Research, LLC - MD & Senior Analyst*

Okay. And just as a follow-up, obviously, price is also a driver of demand, but that's obviously not happening in a vacuum. And you mentioned that -- I think you mentioned at some point during this call that you're also maybe hitting the law of large numbers on some of your products. Can you just share how you're thinking about price elasticity just at this point in this macro environment, and any thoughts along those lines?

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

I think that there's very significant price elasticity. I mean to be totally frank, if our car costs the same as a Rav4, nobody would buy a Rav4, or at least they're very unlikely to. It's worth noting that a lot of these incentives like the tax credit and whatnot, they're actually very difficult for the average person to access because they -- most people do not have $10,000 or even $7,500 burning a hole in their bank account. A lot of -- a large number of people are living paycheck to paycheck and with a lot of debt. They've got credit card debt, mortgage debt. So yes, it's -- that's reality for most people. It's sometimes difficult for people who are high income earners, and when I say high, it'd be like someone who's earning over $200,000 a year, to understand what life is like for someone who is earning $50,000 or $60,000 or $70,000 a year, which is most people.

So like, for a lot of people, like, this tax credit just -- they can't front $7,500 for 18 months or even 6 months to -- for the tax credit, and they actually don't, in some cases even have that [an ancillary $7,500] in taxes. So it's really just the vast regard to people is how much money do they have to pay immediately and how much per month. That's it. You can stop right there. And our car is still much more expensive than a Rav4 when you look at it that way.

**Vaibhav Taneja** - *Tesla, Inc. - CFO, Corporate Controller & CAO*

One other thing which I'll add, when you look at car buying in general, we're trying to get to the next set of EV adopters.

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Not an EV adopter, just who wants a great car.

**Vaibhav Taneja** - *Tesla, Inc. - CFO, Corporate Controller & CAO*

Exactly.

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

It's not -- so now you get things like -- honestly, I would say, like, it somewhat correlates with the why doesn't everyone work from home crowd. I'm like -- I mean this is like some real Marie Antoinette vibes from people who say why isn't everyone working from home? Like, what about all the people that have to come to the factory and pull the cars or all the people that have to go to the restaurant and make your food and deliver your food. It's like what are you talking about you -- I mean, how detached from reality does the work-from-home crowd have to be while they take advantage of all those who do -- who cannot work from home? So I mean, you have to say, like, "Why did I sleep in the factory so many times?" Because it mattered.

So I just can't emphasize again how important cost is. It's not an optional thing for most people. It is a necessary thing. We have to make our cars more affordable that people can buy it. And I keep harping on this interest thing, but I mean it just raises the cost of the car. I mean we're looking at it in an internal analysis, which I know we -- we think is more or less on track that when you look at the cost -- or the price reductions we've made in, say, the Model Y and you compare that to how much people's monthly payment has risen due to interest rates, the price of the Model Y is almost unchanged.

**Vaibhav Taneja** - *Tesla, Inc. - CFO, Corporate Controller & CAO*

If you factor in the changing interest rates.

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Yes, which is -- this is what I'm trying to say. The thing that matters is the monthly pay. It's how much money do they have to put down and do they literally have that in their bank account or their check balance? And then what is the monthly payment? And it doesn't matter how -- if that monthly payment is principal interest or whatever, it's just a number, and that number has to not cause their bank account to go negative.

As it -- so going from near 0 interest rates to kind of the current very high interest rates, the actual monthly payment is basically the same. It's just a bunch more of it is going to interest. And there are some incremental challenges beyond that, which is the difficulty of getting credit at all has increased. And so there are a number of people who simply cannot get credit, period. Even if they've got a job and everything is solid, the banks are a little gun-shy on handing out credit given that a bunch of them kicked the bucket earlier this year.

**Andrew D. Baglino** - *Tesla, Inc. - SVP of Powertrain & Energy Engineering*

Yes. There's also just fewer options. Even if they hand out credit, there's fewer banks to go to.

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

It's like does your bank still exist? Well, if your bank does not exist, you have to establish a relationship with a new bank. And so a lot of regional banks have died, and I mean even Credit Suisse, I mean, geez, that was a shocker. You've got a 160-year-old-ish Swiss institution that doesn't exist anymore. That's mind-blowing. And I think there's still quite a few shoes to drop on the bad credit situation. I mean commercial real estate obviously is in terrible shape. Credit card debt has been rising significantly. The credit card interest rates are usurious. It's over 20% interest rates, meaning like -- which over time just becomes obviously extremely punishing. Because if somebody's paying 20% interest on their credit cards, it means they cannot pay them off. And if you cannot pay them off and you're still accruing interest at 20%, you're at best headed to a bad place.

**Martin Viecha** - *Tesla, Inc. - Senior Director for IR*

Thank you. Let's go to next question from George from Canaccord.

**George Gianarikas** - *Canaccord Genuity Corp., Research Division - Analyst*

Just to focus on the cost per vehicle coming down in future quarters as you discussed in your written remarks, I'm curious as to what the levers of that could be. Is it more scale, more factory utilization? Is it material cost reductions? Are there things like Gigacasting? I mean can you just kind of give us some data points to give us confidence that that's going to come down over time?

And if I can sneak one in, please, there are press reports, and I know how perilous it is to believe some of these, but they say that you've included radar as an option in some Model Ys in China. And I'm just here to ask if that's true. And if so, why?

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

We've not included radar. We have radar as -- a Tesla-designed radar is an experiment in Model S and X. That's it. We'll see whether that experiment is worth it, but there are no plans to integrate radar into 3 or Y. Just as humans drive well, and in fact, an excellent human driver can drive with amazing safety simply with their eyes, the car will far exceed the average human safety just with visual, far, far, far. Because, I mean, the car is looking at all directions at once, and we don't have eyes on the back of our head. So -- and the computer never gets tired and never gets distracted, get drunk, hopefully.

And so radar is -- what really matters is how much does it affect the probability of an accident. And in order for the radar to be effective, you have to be able to do radar-only braking or you have to do actions that are radar only. Otherwise, you get this disambiguation problem between vision and radar. That's why we actually turned off the radar in cars historically that we had chipped. All 3 and Y used to have radar, but we turned it off because the radar actually generated more noise than signal. Now the Tesla-designed radar is a high-resolution radar that has some potential to be useful, but the jury is still very much out on whether that is, in fact, the case.

**Unidentified Company Representative** -

On the cost question, I guess, from the vehicle side, like as Drew mentioned earlier, we are always trying to engineer our products to be cheaper to make and more efficient to make. That comes obviously on the engineering side as we come up with new innovations but as well on the supply chain side with our partners, we work with them to automate some of their lines, remove their bottlenecks and their high cost as well. On the logistics side, getting parts to the factory. It's not like

a one thing. You just have to attack cost everywhere, and we do it ruthlessly at all times.

**Unidentified Company Representative** -

And operations efficiency. All of the above.

**Vaibhav Taneja** - *Tesla, Inc. - CFO, Corporate Controller & CAO*

Yes. I would say there's a whole laundry list of things, which we are chasing. We internally call it the cost attack where we are literally going line by line and saying how can we make it better. And it's a grind.

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

It's like Game of Thrones but with pennies. I mean at first approximation, if you've got a $40,000 car, and roughly 10,000 items in that car, that means each thing, on average, costs $4. So in order to get the cost down, say, by 10%, you have to get $0.40 out of each part on average. It is a game of pennies.

**Unidentified Company Representative** -

We play it willingly.

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Yes. We've done it many, many times. And even something as simple as like a sticker, like, there's too many stickers internally in the car that nobody ever sees. There's something as simple as a QR code. You may think, well, putting a QR code on a part, why don't just put them on there. It's like, well, are we actually going to use that QR code?

**Unidentified Company Representative** -

Costs $0.01.

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Yes. Exactly. And then inevitably, sometimes the QR code doesn't go on properly or you can't read it properly, and it stops the line.

**Unidentified Company Representative** -

Costs more than $0.01.

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Yes. Absolutely. So chipping away, with -- I mean it is trying to -- it does feel like digging a tunnel with a spoon at times.

**Unidentified Company Representative** -

Like very much escaping prison.

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Yes.

**Vaibhav Taneja** - *Tesla, Inc. - CFO, Corporate Controller & CAO*

On top of it, like we said, we did some factory upgrades, so we expect volume to go up. That would also bring some cost savings from higher production. But then on the flip side, we're going to be ramping a new product like Cybertruck, which we talked about. So yes, so those are the real puts and takes which we are working through.

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Yes. But there's not like some -- accidently, some brick of gold that we've got, unfortunately. And it's -- we're trying to be very rigorous about improving the quality and capability of the car because -- it's like, any fool can reduce the cost of a car by making it worse and just deleting functionality and capability. That's why I'd call this, sort of any fool that -- like, if you want to like lose weight and you said, "Well, I need to lose 15 pounds right away," well, you could chop your arm off, but then you're sitting here with one arm, and you're still fat. So like...

**Unidentified Company Representative** -

You got to work out.

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Yes, you actually have to eat less food and work out. That's the actual way.

**Unidentified Company Representative** -

And you need doctor's advice.

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Yes. It's not super fun because food is delicious. And personally, I'm not -- I don't love working out. I know some of you do. I wish I did, but I don't. Unless moving the mouse consists of working out, in which case, I love moving the mouse.

**Martin Viecha** - *Tesla, Inc. - Senior Director for IR*

All right. Let's go to Colin Langan from Wells Fargo. Colin?

**Colin M. Langan** - *Wells Fargo Securities, LLC, Research Division - Senior Equity Analyst*

Sorry about that. Do you hear me now?

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Yes.

**Colin M. Langan** - *Wells Fargo Securities, LLC, Research Division - Senior Equity Analyst*

You said in the commentary that you're not going full tilt on the plant in Mexico until there are signs that the economy is strong. Can you continue at a 50% CAGR without that plant? And where would that come from? And any color on what you mean of sort of not going full tilt? Could that plant get delayed indefinitely? Or what are you kind of talking about?

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

No, we're definitely making the factory in Mexico. We feel very good about that. We've put a lot of effort into looking at different locations, and we feel very good about that location, and we are going to build a factory there and it's going to be great. The question is really just one of timing. And it's going to be a broken record on the interest front. It's just the interest rates have to come down. Like, if interest rates keep rising, you just fundamentally reduce affordability. It is just the same as increasing the price of the car. So I just don't have visibility into -- if you can tell me what the interest rates are, I can tell you when we should build the factory. We're going to build it. And I mean we think we'll start the initial phases of construction next year.

But I am still somewhat scarred by 2009 when General Motors and Chrysler went bankrupt. So -- while that's now 14 years ago, it's -- that is seared into my mind with a branding iron because kind of Tesla was just hanging on by a thread during that entire time and with -- I mean, we closed our financing round 2008 at 6 p.m. December 24, Christmas Eve. And if we had not closed that financing round, we would have bounced payroll 2 days after Christmas. So we actually closed that round at the last hour, at the last day that it was possible. Stressful, to say the least, and then barely made it through 2009. So I'm like I want to just -- I don't want to be going at top speed into uncertainty. A lot of wars going on in the world obviously as well, so...

**Unidentified Company Representative** -

And we have room here, like in Giga Texas. You said we still have room in this building. It's not full with Cybertruck and the line. There's plenty of growth opportunities still to have inside the building where our team already is.

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

We also have 2,000 acres here.

**Unidentified Company Representative** -

There's also one for...

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

We're actually only occupying a tiny corner of the land that we own. So we could technically do all the scaling just here. So I mean personnel is our biggest challenge, in that the greater Austin area only has -- generously, the greater Austin area only has 2 million people. So people are moving here and they're willing to move here, but there is somewhat of a housing crisis. They got to live somewhere, so yes.

So I don't know, I mean I'm just curious -- like I just -- I'm not saying things will be bad. I'm just saying they might be. And I think -- like, Tesla is an incredibly capable ship, but we need to make sure like as -- if the macroeconomic conditions are stormy, even the best ship is still going to have tough times. The weaker ships will sink. We're not going to sink. But even a great ship in a storm has challenges. Now that storm will apply to everyone, not just us and not just the auto industry. It will apply to everyone, I think, apart from necessary sort of staples like food and stuff. But -- so I just -- I don't know. If interest rates start coming down, we will accelerate.

**Martin Viecha** - *Tesla, Inc. - Senior Director for IR*

All right.

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

If anybody's got any good guesses on this, I'd love to be less wrong. And I apologize if I'm perhaps more paranoid than I should be because that might also be the case. Because I am -- I have PTSD from 2009, big time. And 2017 through '19 were no picnic, either. That was very tough going. So the auto industry is also somewhat cyclic because people tend to hesitate to buy a new car and if there's uncertainty in the economy. So car companies do very well in good economic times and they don't do as well in tough economic times. So it's just -- whereas if somebody is selling bread, then I think people will still need to eat bread. Yes, we need bread. We need it for all of time. But a new car, you don't have to have right this minute.

**Vaibhav Taneja** - *Tesla, Inc. - CFO, Corporate Controller & CAO*

Especially if there are wars going on and then that impacts your sentiment.

**Elon R. Musk** - *Tesla, Inc. - Technoking of Tesla, CEO & Director*

Yes. I mean people are reading about wars all over the world at this -- buying a new car tends to not be front of mind.

**Martin Viecha** - *Tesla, Inc. - Senior Director for IR*

All right. Unfortunately, that's all the time we have today. Thank you very much for all of your good questions, and we'll see you again in 3 months. Thank you very much.

## Call participants:

### Corporate Participants

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Elon R. Musk, Tesla, Inc. - Technoking of Tesla, CEO & Director
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