

Q4 2020 Tesla Inc Earnings Call Transcript

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Operator

Ladies and gentlemen, thank you for standing by, and welcome to Tesla's Q4 2020 Financial Results and Q&A Webcast. (Operator Instructions) Please be advised that today's conference is being recorded. (Operator Instructions)

I would now like to hand the conference over to your speaker, Mr. Martin Viecha, Senior Director of Investor Relations. Please go ahead, sir.

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

Thank you, Sherry, and good afternoon, everyone. Welcome to Tesla's Fourth Quarter 2020 Q&A Webcast. I'm joined today by Elon Musk, Zachary Kirkhorn and a number of other executives. Our Q4 results were announced at about 1 p.m. Pacific 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.

(Operator Instructions) But before we jump into Q&A, Elon has some opening remarks. Elon?

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

Thank you. So just to recap the year, 2020 was a defining year for us on many levels. Despite a challenging environment, we reached an important milestone of producing and delivering 0.5 million cars. And I'd just like to once again thank the people at Tesla for an incredible effort. We delivered almost as many cars last year as we produced in our entire history. So really an incredible growth rate and despite a very challenging 2020. So my hat is off. It's such an honor to work with such great people at Tesla.

So -- and full year, we achieved free cash flow of nearly \$2.8 billion after spending more than \$3 billion on building new factories and other expenditures. We reached industry-leading GAAP operating margins in addition to positive net income and record cash flow.

Regarding capacity expansion, while we focus on execution, we continue to build a lot of new capacity. We started producing the Model Y out of Fremont and almost reached full production speed. We ramped the Model 3 in Shanghai to more than 5,000 cars a week sustainably, and Shanghai continues to grow rapidly. We introduced the heat pump to all of our vehicles.

We ramped the single piece -- we started and we're able to ramp to volume production the single-piece castings for Model Y. This is where -- for the first time in history, the entire rear third skeleton of the car is being cast as a single piece in the largest and most advanced casting machine ever

made.

We built a Model Y factory in China from start to finish in 1 year. We're also building Giga Berlin and Giga Texas, which we expect to start production later this year. And lastly, we built a cell -- a battery cell factory in the Bay Area. And this -- even though it is a pilot plant, it is -- its capacity is large enough that it would be in the -- probably the top 10 battery cell factories on earth despite being a pilot plant.

Regarding the new Model S and X, we are launching the -- we're super excited to announce the new Model S and Model X Plaid are in production now and will be delivered in February. So we've been able to bring forward the Plaid, Model S and X. And so Model S will be delivered in February and Model X a little later. For the Model S Plaid, we're actually in production now and we'll be delivering next month.

So this is a tri-motor Model S with a completely new interior. There are actually a lot of great things about this. I'll do another call about the Model S later. But it's really a tremendous improvement over the prior version.

And the Model S will be the first -- this Model S Plaid will be the first production car ever that is able to go 0 to 60 miles an hour in under 2 seconds. So no production car ever has been able to get below 2 seconds, 0 to 60. This is a luxury sedan that is able to go 0 to 60 in less than 2 seconds and will have the ability to seat up to 7 people with the third-row seats.

So this is pretty nice. This is faster, to be clear, than any car. It's not like there was a different type of car, like a 2-door sports car that was able to do fast -- it's the fastest accelerating car ever made for -- that is allowed to go on roads in history. And like I said, we'll start delivering it in a matter of weeks.

And actually, we'll obviously get into the details what the Model S changes may be later this week or next. But it's really better in many ways. We will be actually raising the price of Model S for these new models of -- the old model -- the new model will be \$10,000 more. So hopefully, people aren't too upset if they bought the old model last month. But this one, \$10,000 more. So yes, we think it's probably the best car of any kind at any price available in the world today.

So then with regard to Full Self-Driving, we've made massive progress on Full Self-Driving. I recommend watching the videos of our public beta. So we've got, I think, almost 1,000 people in the beta at this point. And with each successful release of the beta FSD software, it just gets -- it's really improving rapidly. It's not very common for -- I drive the latest roads.

It's very common for me to have no interventions on drives that I do, including drives to a place that I've never been to. So these are not preplanned routes. The car has never been there before. And it's now actually more -- it's more common than not for the car to have no interventions, even on a complex drive. So -- and this is -- basically, I'm highly confident the car will be able to drive itself with reliability in excess of human this year. This is a very big deal.

And thinking about like how does one justify the value of the company being where it is, I think there is a way, just with back-of-the-envelope math, to potentially justify it, where if Tesla ships, let's say, hypothetically, \$50 billion or \$60 billion worth of vehicles and those vehicles become Full Self-Driving and can be used in robotaxis -- used as robotaxis, the utility increases from an average of 12 hours a week to potentially an average of 60 hours a week if they're capable of serving as robotaxi. So that's like roughly a 5x increase in utility.

But let's -- even if you say like, okay, let's just assume that the car becomes twice as useful as -- not 5x as useful but merely twice as useful, that would be a doubling again of the revenue of the

company, which is almost entirely gross margin. So it would mean -- it would be like if you made \$50 million -- \$50 billion worth of cars, it will be like having [\$50 million] of incremental profit basically from that because of the software.

So -- and if that was the case, then yes, you get 20 PE on that. It's like \$1 trillion and the company is still in high-growth mode. So I think there is a way to sort of like justify the valuation of the company where it is using just the cars and nothing else, the cars with FSD. And I suspect at least a number of investors are taking that approach.

So in conclusion, while 2020 was a turning point for Tesla in terms of profitability, we believe this is just the beginning. We think 2021 is going to be even more exciting. And you don't know what to expect in a given year. Obviously, last year, we did not -- there were many things we did not expect. But assuming that '21 is a relatively normal year from an external standpoint, I think it's going to be a great year for Tesla.

We've got a ton of -- many great new products coming out. We've got factories that are -- advanced factories that can start production. It will also make it easier how you're having a factory in Berlin, one, and in Texas second, just from a logistics standpoint. And Texas can help supply the Eastern half of the U.S. and Berlin can help supply Europe. And there's just fewer cars on boats, much less capital tied up with built cars that are on boats or going -- being transported to customers. And I think the fundamental efficiency of the company will be much better with the factories -- at least having factories on each continent and having 2 factories in the U.S.

So I'm super excited about the future, and yes, we look forward to making it happen. Thank you.

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

Thank you very much. And I think our CFO, Zach Kirkhorn, has some opening remarks as well.

Zachary J. Kirkhorn - *Tesla, Inc. - CFO*

Yes. Thanks, Martin. As Elon mentioned, 2020 has been an extremely successful year while managing through many unforeseen and unexpected challenges.

On cash, we continue to generate strong free cash flows, reaching a record \$1.9 billion in Q4 alongside growth and investment for future programs. Additionally, we've been able to reduce our use of debt and various working capital lines, including settling \$2 billion of convertible debt in Q4, which will continue into Q1.

For net income, we achieved our first calendar year and 6 sequential quarters of profitability. In addition, auto gross margin, excluding credits, improved from 2019 to 2020 despite reductions in ASP and inefficiencies from new product launches and transitions.

On Q4 specifically, this was a noisy quarter. So let's unpack a few things. Stock-based comp increased, part of which is driven by the rise of the stock price over the course of our 2020 employee performance grant process, and a portion of which is unique to Q4 only. The impact of SBC increases is seen across both COGS as well as operating expenses.

Automotive gross margin in Q4 was primarily impacted by 2 things. First, we invested in improving our products built in Fremont, including converting over to the new Model S and Model X, launching the single-piece castings on Model Y and introducing heat pump on Model 3. Second, logistics and labor costs were impacted due to supply chain instability and pandemic inefficiencies. Adjusting for items such as these, as we do in our internal management views, we saw an improvement in auto gross margin.

Our services and other P&L was impacted by many of the same factors just mentioned, including onboarding costs associated with new service capacity. However, what's most important here is that we've accelerated the growth in service capacity and will continue to drive capacity expansion as fast as possible.

On energy gross margin, we saw an impact from Solar Roof-related ramp costs and typical seasonality in the lease/PPA business. OpEx as a percentage of revenue continues to reduce despite impacts from items mentioned as well as increased investment in development of future products.

Finally, the early settlement of our convertible notes resulted in an additional \$100 million of interest expense for the quarter. All that being said, nothing has changed about our view that operating margin will continue to grow and remain industry-leading.

As we look forward, 2021 may be our most meaningful step forward yet as we see the benefits of long-standing investments in capacity and technology. The range of possible outcomes this year is wide given the magnitude of launches.

There's a few things we should keep in mind. We continue to expect a long-term volume CAGR of 50%, of which we may materially exceed this in 2021. As we increase production rates, volumes will skew towards the second half of the year, and ramp inefficiencies will be a part of this year's story and are necessary to achieve our long-term goals. Specifically for Q1, our volumes will have the benefit of early Model Y ramp in Shanghai. However, S and X production will be low due to the transition to the newly rearchitected products.

Additionally, we're working extremely hard to manage through the global semiconductor shortage as well as port capacity, which may have a temporary impact. We will continue to invest heavily in supercharging and service capacity while driving reductions on cost, including OpEx as a percentage of revenue. Global demand continues to outpace production, and we're moving as quickly as we can with a focus on the long term.

I look forward to providing updates on progress throughout the year.

Questions and Answers:

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

Thank you very much. And now we can jump straight into questions from Say Technologies.

The first question from institutional investors is, what is currently holding Tesla back from being the market share leader in solar?

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

Yes. So we're actually seeing tremendous growth in solar quarter-over-quarter last year. And we had our best quarter since, I think, 2018 in Q4. So we do expect to become the market share leader in solar and then go far beyond it. It's -- unfortunately, there were a few years there where we had to devote the whole company to Model 3 production and building. And so we actually basically take the whole company, including a lot of people that were on solar, and have them work on cars. But now we got a little more bandwidth, we're putting a lot of attention on solar, and it is growing rapidly. So I think it will not be long before Tesla is, by far, the market leader in solar.

Zachary J. Kirkhorn - *Tesla, Inc. - CFO*

Another really important part of the solar strategy is achieving an industry-leading cost structure, which then allows us to have industry-leading pricing. And so that's something that we've accomplished over the last year in terms of getting the cost structure in the place that it needs to be. And as Elon mentioned, this is a really important part with industry-leading pricing to become the leader in the space.

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

Yes. And actually, an important part is achieving better integration between the Tesla Powerwall and the Tesla retrofit solar and Tesla roof. And we're confident we'll have excellent integration -- excellent integration with the Powerwall and Tesla Solar, whether it's retrofit or the Tesla Solarglass Roof before the end of the year.

So it's really -- I think we've got a good strategy. As Zach mentioned, we're focused on reducing the amount of time and the complexity of the install, and we're making great progress in that regard. And I think we'll have something that's really dialed in this year.

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

Thank you. The second question is, could current owners get ability to transfer their FSD to their next vehicle? This would be huge for loyalty and overall increase sales of vehicles while offering more FSD sales on the used vehicles.

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

Unfortunately, we're not considering that at this time. We do actually offer an increased -- higher price than -- for a car with FSD than the one without FSD. And I do think that the market currently undervalues -- the consumer market and arguably the stock market probably undervalue just how good FSD is going to be. But we're not currently planning on offering -- on allowing it to get transferred.

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

Thank you.

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

We will be offering subscription pretty soon, in the next month or 2. So that should address a lot of people's concerns about being able to get it.

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

Thank you very much. And the third question is, can you give us a progress update on dry coating of the battery electrode? At the Battery Day, Elon said, "I would not say this is completely in the bag," as -- yet as the yields were low.

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

Drew?

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

Yes. Sure. It's true, the in-house cell manufacturing system we revealed at Battery Day contains new

processes and equipment. So we did expect some unknown unknowns and technical challenges to arise through the production ramp. The Kato team, however, has been able to solve each manufacturing problem presented to date and continues to improve yield and rate week-over-week and month-over-month as we move up the production S-curve. At the same time, the cell engineering team's refined designs and deepened understanding has reinforced our confidence in the drive process and 4680 design, meeting our performance and cost targets.

And from a capacity perspective, we have 10 gigawatt hours worth of equipment landed at Kato. The production staff is nearly all hired. Our material supply chain is established and the team is on track for full production ramp this year. Meanwhile, we've developed enough engineering confidence with our 4680 design and the production process and equipment to kick off manufacturing equipment and facility construction to support our 100 gigawatt hour 2022 goal.

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

Okay. Thank you very much. The next question is, why are you confident in Tesla will achieve Level 5 autonomy in 2021? And why is Dojo not necessary to get there?

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

I guess I'm confident based on my understanding of the technical road map and the progress that we're making between each beta iteration. Yes. As I'm saying, it's not remarkable at all for the car to completely drive you from one location to another through a series of complex intersections. It's now about just improving the corner case reliability and getting it to 99.9999% reliable with respect to an accident.

Basically, we need to get it to better than human by a factor of at least 100% or 200%. And this is happening rapidly because we've got so much training data with all cars in the field. And the software is improving dramatically. The -- we also write the software for labeling. And I'll say it's quite challenging. We're moving everything towards video labeling. So it's all video labeling, all video inference. And so there are still a few of the neural nets that need to be upgraded to video training and video inference. And really, as we transition each net to video, the performances become exceptional.

So this is like a hot thing. The video -- the labeling software that we work for, video labeling, making that better has a huge effect on the efficiency of labeling. And then, of course, the holy grail is auto labeling. So we're putting a lot of work into having the labeling tool be more efficient when used by a person as well as enabling auto labeling where we can.

Dojo is a sort of training supercomputer. We believe it will be -- we think it may be the best neural net training computer in the world by possibly an order of magnitude. So it is a whole thing in and of itself. And this is something we can offer potentially as a service. So some of the others need neural net training. We're not trying to keep it to ourselves.

So I think there could be a whole line of business in and of itself, and then, of course, for training vast amounts video data and getting the reliability from, say, 100% to 200% better than average human to 2,000% better than average human. Dojo will be very helpful in that regard.

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

Thank you. The next question is, what is Tesla's current gigawatt hour run rate of the 4680 cell production? How do you see this run rate evolving by mid-2021 or end of 2021?

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

I think we kind of talked about that, Drew. I mean essentially, what we're saying is that the number to think about or focus on is like we've got a 100 gigawatt hour total Tesla cells produced in 2022. It's not that important to look at the run up to that because these things tend to improve exponentially. But we are installing capacity for -- in 2022 for 200 gigawatt hours a year, and we think probably we should be able to achieve 30% of targeted design capacity in 2022.

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

Yes. Yes. Agreed, Elon. And as you've said before, with the S-curve of production, you can be off a little bit on the initial part of the S-curve, and that makes a difference in absolute capacity by quite a bit 1 month to the next. So yes, I mean we are progressing up that S-curve as fast as we possibly can.

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

Yes. And we don't see any showstoppers.

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

Yes.

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

Thank you very much. And one more question is from the retail investors. What is Tesla doing to improve service experience? Tesla had a reputation for outstanding customer service. Now it's impossible to even call a service center, and appointments are scheduled weeks out. Jerome?

Jerome Guillen - *Tesla, Inc. - President of Automotive Division*

Yes. Well, as far as best service, no service, so we spent a lot of efforts trying to improve the quality and the reliability of our cars. In the last 2 years, the frequency of service visits are reduced by 1/3. So people have to -- customers have to come less frequently in service, which is really the goal, no service. And if service has to take place, we are trying to make it as painless as possible.

One big effort there is to increase mobile service, which is now more than 40% of all visits in North America. We're trying to push that to 50% this year. And 50% of service visits last less than 2 hours. So we're trying to service the cars very quickly so people can get their vehicles back on the road.

And in terms of service appointment, it continues to improve. We have about -- we have actually 140 service centers right now in North America. For 100 out of those 140, you can get appointments in less than 10 days. And we're going to make sure all service centers are -- have a short wait time.

We're accelerating, as Zach mentioned earlier, the pace of opening. In North America, we opened 11 centers in December, and we have plans to open 46 in the first half of this year. So that's what we're doing to improve service.

In terms of phones, our emphasis is on the app. Really, we want all communications to go through the app, the Tesla app, and we're trying to move away from the phone. The app is much better than the phone. It can start directly -- alerts directly from the car and schedule a service appointment. And there is a written record of all communication between the customer and the service team. You can have pictures in there. You can take care of your payment without entering the credit card and

doing all that stuff. You get updates on the service.

And there is even more features that are going to come in the coming months on the app. And I think everybody will be happy, including the ability to spot where your service technician is and how far it is to coming from your car and what's going on there. So we are investing everything on the app, I think, just like most other companies as well, and that's the way of the future.

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

Thank you very much. And now let's go to institutional investor questions. The question number one, what are the key milestones we need to achieve in order to evolve current FSD to a commercial Level 4, Level 5 ridesharing solution?

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

Yes. So it really goes back to what I was saying a moment ago, which is we need to transition over the neural nets in the car to video. And in order to do that, the whole stack has to be -- the whole stack has to be changed to video. That means gathering video clips than using -- and this is actually surround video. So you've got 8 cameras operating simultaneously with synchronized frame rates. So you've got basically 8-frame surround video -- 8-camera surround video. And then you've got to label basically everything in that video snippet and then train against that and have those neural nets operate the car.

So -- and this is coming from the past where we would label, the neural nets would be a single camera, single frame. So no video and not combining the cameras. And then we went from single frame, single frame, one frame at a time, one camera at a time, neural nets to surround camera, neural nets would look at all -- all 8 cameras but only one frame at a time and now to where we include the time dimension. And that's video.

So I really do see this as a question of getting work done. We're getting it done. And you can see the results in the rapidly improving FSD betas that are leased. And we're also going to be expanding the FSD beta itself to include more and more people.

So from my standpoint, it looks like a very clear and obvious path towards a vehicle that will drive 100% safer than a person. Yes. I really don't see any obstacles here. Yes.

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

Thank you. And the second question from institutionals is, does Tesla plan or expect to license any of its software applications, FSD and Autobidder in particular, to third-party OEMs?

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

I think we're very open to licensing our software to third parties. And we've had some preliminary discussions about licensing Autopilot to other OEMs. So this is something we're more than happy to do. And -- but I think, obviously, like we need to probably do a little bit more work to prove that Tesla Autopilot is capable of full self-driving, which, I think, will become obvious later this year. And then we're more than happy to license that to other car companies. We're definitely not trying to keep it to be a Tesla exclusive situation.

And I think probably same goes for Autobidder. We haven't thought as much about Autobidder, but the Tesla philosophy is definitely not to create walled gardens. We're going to allow other companies to use our Supercharger networks, and yes, using our autonomy software and Autobidder and perhaps other things, we'd be fine to.

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

Thank you. The next question is, key differences in product, customer preferences, FSD strategy between China and the rest of the world. Do we need to do things differently to win the Chinese EV market?

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

Well, we currently are winning that -- we are currently the leader in the Chinese EV market. So I think we're must be doing something right if we're the best-selling electric car in China. That said, very few of our customers in China, I think maybe as low as 1% or 2%, actually have selected the FSD option. This is much lower than rest of world. So we definitely need to make it work well in China. I think as soon as it works well in China, then we will have the take rate for FSD.

I find that the customers in China -- Tesla owners in China are among the most discerning in the world. Their attention to detail is incredible. So they -- I'm confident that they will buy FSD as soon as it is working well in China. And hopefully, that is later this year.

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

Thank you. And the next question is, is it fair to argue that the best way to think about company's long-term earnings power is tied to profit per unit of battery capacity? 3 terawatt hours target from Battery Day implies half of long-term battery capacity goes to storage, depending on what you assume for pack size on Elon's 20 million vehicle unit goal?

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

Yes, it is. So the fundamental limit on electric vehicles right now, in general, is total availability of cells, what's the output of factory cells in gigawatt hours. And you can't grow faster than that. Now at Tesla, we've improved the efficiency of our cars dramatically such that you can actually get a pretty good range even with the Standard Range battery pack.

It's in the high -- it's approaching -- for Model 3, it's approaching the sort of high 200s. And with some slight continued improvements, we'll start to get to a 300-mile range even with the Standard pack, an order of 500 kilometers. So there's efficiency improvements in the car. But fundamentally, the growth is dependent on cell production. And there's obviously a lot of other companies that want to -- that have a need for cells.

So -- but the reason Tesla is doing its own cell production is in order to accelerate the growth. It is not to make less use of our cell suppliers. In fact, I want to be really clear, Tesla wants to increase purchases from cell suppliers. And we've been very clear with our cell suppliers, whether it be CATL or Panasonic or LG, that we will take as many batteries as they can produce. So -- and we urge them to increase their production, and we will buy as much as they can send to us.

Obviously, there are some price limits on that because the car still needs to be affordable. But I'm just trying to be as clear as possible that our goal with making our own cells is not to disintermediate our suppliers. It is to supplement our suppliers. And we want our suppliers of cells to increase their production and in addition, have our production that is simply taking up the amount beyond which they are either unable or unwilling to increase their production.

So it's an acceleration over and above the most that our suppliers say they can produce for us. And so we -- since the cell output drives vehicle output, the -- and then -- I mean probably the broad brushstroke value of Tesla is just what's the cell output that implies vehicle output and then at least

double that for autonomy revenue, [probably a whole new] level. And that's how you figure out the value of the company, I think, long term.

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

Thank you very much. The next question is about 4680 cells, which we already covered in the retail section of this call. So let's go straight to the last question from institutional investors, which is, where are you in Cybertruck development? What are your expectations for Cybertruck deliveries in 2021?

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

All right. So we finished almost all of the Cybertruck engineering. So we're no longer iterating at the design center level or design level. We've got the designs fixed. We're getting to -- we'll soon order the equipment necessary to make the Cybertruck work.

We're obviously going to be using even bigger casting machines for the rear body of the Cybertruck because you've got -- obviously, it's a bigger vehicle and you've got a long truck bed that's going to support a lot of load. So we'll be using an 8,000-ton casting press for the rear body casting as opposed to 6,000 tons for Model Y. So 6,000 tons was the biggest casting machine in the world. 8,000 tons is obviously quite a bit bigger than that.

And I think it's going to be an incredible vehicle. If we get lucky, we'll be able to do a few deliveries towards the end of this year, but I expect volume production to be in 2022.

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

Thank you very much. And now we can start with questions in the queue.

Operator

Our first question will come from Colin Rusch with Oppenheimer.

Colin William Rusch - *Oppenheimer & Co. Inc., Research Division - MD and Senior Analyst*

Can you talk a little bit about the regulatory environment for FSD and how you're seeing that play out? Obviously, it's a bit of a moving target right now, and you guys are leading the way here, but we'd love to understand how those conversations are going and how you see that impacting the rollout of FSD throughout the balance of this year and into next year.

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

Okay. Zach, do you want to -- Zach and Jerome?

Zachary J. Kirkhorn - *Tesla, Inc. - CFO*

The -- what we're seeing right now in the U.S., for example, is a pretty dynamic space, but it's overall not particularly limiting on a rule basis. But what we're going to expect is to have to work with regulators to demonstrate really, really high reliability, as Elon said before.

The rest of the world is fairly dynamic. In Europe, we see a general slowdown, generally not reaching past Level 3 right now with some impetus to start working on new working groups to reach past that. And China showed an interest in working on Level 4 or even Level 5 later this year.

So we expect a pretty dynamic 2021 in the regulatory space. We have leadership in the U.S. looking for manufacturers to demonstrate really good launches and really high reliability before releasing to wider and wider groups.

Colin William Rusch - *Oppenheimer & Co. Inc., Research Division - MD and Senior Analyst*

And then just a quick follow-up around inflation on some of the materials markets. Obviously, there's a lot going on as low interest rates flow through the basic material space. Can you talk a little bit about the supply chain and how you're managing some of your exposure around some of your raw material costs?

Jerome Guillen - *Tesla, Inc. - President of Automotive Division*

This is Jerome. Yes. For supply chain, the first priority now is to deal with the disruptions from COVID and shipping, in particular, boats between Asia and North America. But we're also looking forward to pricing, and we're watching this very closely for all the components. We are entering a series of long-term agreements with preferred suppliers to ensure that not only we're going to have enough quantity to support the growth, 50% CAGR as Zach mentioned earlier, but also good pricing with appropriate sharing of the risk.

Operator

Our next question will come from Dan Levy with Credit Suisse.

Dan Meir Levy - *Credit Suisse AG - Research Division - Director & Senior Equity Research Analyst*

Two questions, one on '21 and just one on capital. First, on '21, any expectations for what we should see on regulatory credit sales? And then the second question is on capital. Obviously, you raised a lot of capital in 2020. What should we think about the use of those funds beyond just covering some of the maturities? And can you just give us a sense of what the elevated liquidity does and doesn't buy? Meaning to what extent does elevated capital enable you to accelerate plans on building capacity or expanding vertical integration, accelerating timing on full self-drive features? So those are the questions.

Zachary J. Kirkhorn - *Tesla, Inc. - CFO*

Sure. On the regulatory credit sales side, this is always an area that's extremely difficult for us to forecast. 2020 regulatory credit sales ended up being higher than our expectations. And it's difficult to give guidance on that.

I mean what I said before is that in the long term, regulatory credit sales will not be a material part of the business, and we don't plan the business around that. It's possible that for a handful of additional quarters, it remains strong. It's also possible that it's not.

Most of our regulatory credit revenue from Q4 was not lined up prior to the beginning of the quarter. And these were discrete deals that were struck over the course of the quarter. So I wish I could give you more on this, Dan, but it's a space that's extraordinarily difficult for us to forecast.

On the second side, with respect to capital, a couple of things that we're thinking through there. So as I mentioned in my opening remarks, debt reduction is an important thing that we're focused on now.

Early conversions, these are things we don't have a choice on. We did around \$2 billion of that in

Q4. We currently have \$1.4 billion that we expect to go out in Q1 as a result of early conversions or conversions on convertible debt. That number may increase. And so debt reduction is important. That's helpful on interest expense as well.

We are also using the money with respect to our investments in future capacity. And so what we're able to do now that we haven't had the opportunity to do in the past is, as we're building capacity, particularly in Austin and Berlin, we can build that capacity with the expectation of what the end state of capacity will be, pulling forward some of those investments rather than incrementally adding capacity as we go along. And so this is an important part in terms of capital efficiency that we haven't had the luxury to do in the past, and it's great to be able to have the liquidity to focus on that.

And then more broadly, as Jerome was touching on, service expansion is really important to the future strategy of the company. So as you saw in our Q4 numbers, the expansion of service centers and mobile service from Q3 to Q4 increased quite a bit and was also quite a bit higher than the first part of the year. And so we're able now to make investments there and also in the Supercharging network to get ahead of future demand, which will cost us more in the near term but is what the right long-term thing is for our customers and the company.

Operator

Our next question will come from Alex Potter with Piper Sandler.

Alexander Eugene Potter - *Piper Sandler & Co., Research Division - MD & Senior Research Analyst*

Great. Was wondering, you mentioned how you'd like to increase your purchases of cells from suppliers. Does this require them to also have the capability to build structural 4680 cells of the sort that you're putting in this -- these newer iterations of vehicles?

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

No, it does not. Although we are talking with them about making the 4680 form factor, but they -- it is not required. For example, the new S currently uses the 18650 form factor. So they're just a more advanced cell, and we think we'll continue to use that form factor for at least a few years. But we will, over time, be retiring the form factors and try to move to a consistent form factor.

So -- but it is not a requirement that we place on our suppliers because they would -- it would just result in fewer cells. So it's better for us to deal with the complexity of different cell form factors than insist on a single form factor for our suppliers today. Like I said, over time, it will make sense to have a consistent form factor.

Alexander Eugene Potter - *Piper Sandler & Co., Research Division - MD & Senior Research Analyst*

Okay. Makes sense. And then one additional maybe qualitative question on capacity expansion. You've mentioned in the past, I mean, access to dollars is one thing, but access to human beings that are sufficiently qualified is another. Have you run up against any issues on that front that would potentially limit your growth in any way?

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

That is one of the things that -- or limits the growth rate. It doesn't limit the ultimate size. It limits the growth rate, which is what's the rate at which we can onboard great people and get them trained

in the right areas.

You usually can't like instantaneously -- if you've got a factory that has 20,000 employees, you can't just hire 20,000 people instantly. They've got -- they were usually doing something else. So they've got to transition from whatever they were doing or move from some other part of the country. And so there's a certain amount of time required for that.

I mean that said, we do think that we can maintain a growth rate in excess of 50% per year for many years to come. And at least I'd like to -- yes, at least 50% per year for many years to come. I think this year, we may track to a fair bit above 50%, but we don't want to commit to that. But at least that's what it would appear, and the same again next year. It appears to be meaningfully above 50%.

Operator

Our next question will come from Joseph Spak with RBC Capital Markets.

Joseph Robert Spak - *RBC Capital Markets, Research Division - Autos and Leisure Analyst*

Elon, back in 2018, you tweeted about electric vans and how it could be interesting to work with Daimler on the Sprinter. But we haven't really heard of anything since. But in the meantime, we've seen a lot of activity in electric van and last-mile space from a number of established players or startups. So I know you said that you have a lot of projects on the table, but can you provide us an update of your thoughts on this market? And is it something you're interested in?

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

I think Tesla is definitely going to make an electric van at some point. The thing to bear in mind is that there is fundamentally a constraint on battery cell output. It's like -- if one is not involved in manufacturing, it's really hard to appreciate just how hard it is to scale production. It's the hardest thing in the world. Prototypes are easy. Scaling production is very hard.

So a big part of the reason -- the main reason we have not accelerated new products is -- like, for example, Tesla Semi, is that we simply don't have enough cells built. Like we -- this -- if we were to make the Semi like right now, which we could easily go into production with the Semi, but we would not have enough to cells for it right now. We will have cells -- enough cells for Semi when we were producing the 4680 in volume. But for example, Semi would use typically 5x the number of cells that a car would use, but it would not sell for 5x what a car would sell for.

So it kind of doesn't make -- it would not make sense for us to do the Semi right now, but it will absolutely make sense for us to do it as soon as we can address the cell production constraint. The same would go for a van.

Joseph Robert Spak - *RBC Capital Markets, Research Division - Autos and Leisure Analyst*

Okay. And then maybe if I could dig into your past on one more item. About 2 years ago, at the Autonomy Day, you stated that you're working on the next-gen Tesla chip which was about 2 years away. So is there any update on that front?

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

Yes. I mean to be clear, we are still not -- the software still does not fully use the capabilities of the FSD version 1 computer. It is really just an incredibly powerful computer, and I'm personally certain that you can create Full Self-Driving with safety Level 5 in terms of a person just using the Full Self-Driving version 1 computer.

The version 2, we expect to be about 3x as powerful. And this needs to be paired with higher-resolution cameras. And so it's quite a -- it requires a bunch of things to change simultaneously. But we have not been rushing with version 2 of the chip. It's coming along well and it's in good shape. But since we can achieve FSD, Full Self-Driving, with the current system, it would actually be a distraction right now if we were to introduce the Full Self-Driving -- the Tesla FSD chip 2 because it would set us back quite a bit on software. And software is the critical path to Full Self-Driving.

So I wouldn't worry too much about that. That's not a -- that's an improvement but not a game changer, the FSD 2. Getting the software to work and getting all the neural nets to be video, that's the game changer.

Operator

Our next question will come from Emmanuel Rosner with Deutsche Bank.

Emmanuel Rosner - *Deutsche Bank AG, Research Division - Director & Research Analyst*

My first question is about your in-house cell manufacturing efforts. So in addition to building up capacity, some of the goals you highlighted was to cut the pricing or the cost by about 50%, boost the range by about 50% over a number of years. So wanted to know if your initial efforts are trending in that direction. What is sort of like the time line to achieve these goals? And maybe related to this, how are you thinking about the time line for the cheaper Tesla, the entry model, eventually?

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

I mean I think we feel very confident about achieving those targets, let's say, over a 3-year time frame. I don't know. Drew? It's not like year 1. So 3, maybe 4 years, give ourselves a little room. But for 3 or 4 years, I'd say, yes.

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

We put together the trajectory in the Battery Day, and we're on that trajectory still. I think that's probably the best reference for the cost trajectory that we are on.

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

Yes. We're aspiring to do better than what was presented at Battery Day, but we are confident of at least doing what we presented at Battery Day.

Operator

Our next question will come from Ben Kallo with Baird.

Benjamin Joseph Kallo - *Robert W. Baird & Co. Incorporated, Research Division - Senior Research Analyst*

Congrats to the whole team. So we're trying to put together all the breadcrumbs. If I remember correctly, going back 10 years, you talked about when you have a mass market car on the road, that you'd step down as CEO and be a Chief Architect. And then we have -- you're going to Hawaii and see Larry and the X.com, and I'm trying to put it all together. So there's a lot of questions there.

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

Sure. Well, I expect to be CEO of Tesla for several years. So I think there's still a lot that I'm super excited about doing. And I think it would be hard to leave a lot of these great projects halfway or partway done. So I do expect to be running the company for several years into the future.

Now obviously, nobody is or should be CEO forever. So I don't expect to be -- like the sheer amount of work required to be CEO of Tesla is insane. And I do -- I think I do probably more -- I definitely do more technical work than is typical for a CEO. So it would be nice to have a bit more free time on my hands as opposed to just working day and night, from when I wake up to when I go to sleep 7 days a week. Pretty intense.

So -- but I think the mission isn't over yet, and we still got a long way to go before we can really make a dent in the world on accelerating the advent of sustainable energy. I mean the goal of Tesla from beginning has been to accelerate sustainable energy. And -- but if you say like what percentage of cars on the road are electric today, it's still very, very tiny, like an order of 1% or less than 1% of the total fleet worldwide.

So that's still a hell of a long way to go for "on the order of 1% of the fleet is electric." There's also a tremendous way to go on solar power, although it's exciting to see the advent of very cost-competitive wind and solar and geothermal. And of course, we need a large volume of stationary battery packs.

I mean basically, the -- I mean the 3 legs of a sustainable energy future are sustainable energy generation led by solar, wind, geothermal and hydro and a few others. And I'm actually not against nuclear fusion. I actually think nuclear fusion is -- with a well-designed reactor in a situation that is not subject to bad weather or seriously bad weather is actually -- it is a good thing to do.

So -- and then the second thing you need is you need stationary storage. You need batteries because most renewable energy is intermittent. It doesn't -- the wind doesn't blow all the time. The sun doesn't shine all the time. So you need a lot of batteries. And it needs to be very long-lasting and high cycle life. And then you need electric transport.

And if you have those 3 things, we've got a very bright future with respect to energy and the environment. So still a long way to go on that. And so I'm still very much fired up to work on that.

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

Fantastic. And let's take the last question, please.

Operator

Our last question will come from Gene Munster with Loop Ventures.

Charles Eugene Munster - *Loop Ventures, LLC - Managing Partner, Co-Founder & Head of Research*

I was happy to see the update on the timing of Semi and had a couple of related questions. And first, since Semi trucks typically travel predictable highway miles, will Tesla Semi may be the first to achieve full autonomy?

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

I think that's quite likely, yes. Yes, I can't imagine -- I'm not sure who would be #2, but yes, it seems highly likely, yes.

Charles Eugene Munster - *Loup Ventures, LLC - Managing Partner, Co-Founder & Head of Research*

Okay. And then the hardware...

Jerome Guillen - *Tesla, Inc. - President of Automotive Division*

It's the exact same part numbers on the Semi based on the Tesla cars. There's no difference.

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

Yes. That's true, yes. As it is, we need to modify the parameters. Software parameters change for Autopilot or Full Self-Driving because it needs to know if it's in a Model 3, Model Y, Model X or Model S. And so this is -- we just need to inform the vehicle -- inform the Full Self-Driving brain that it is now in a Semi truck.

Charles Eugene Munster - *Loup Ventures, LLC - Managing Partner, Co-Founder & Head of Research*

Would it need to be retrained then as part of that?

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

No. I think there will be -- you have different control functions because there are turns that you could do in a regular car that you cannot do in a Semi. Like you don't want to try to parallel park this thing on the street in a city. It needs to know its limitations being a giant truck.

Charles Eugene Munster - *Loup Ventures, LLC - Managing Partner, Co-Founder & Head of Research*

Makes sense. My follow-up question was related to if you could just help us explain why battery electric will win versus hydrogen cell fuel tech.

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

Yes. I mean honestly, I've had this question a million times for -- just for regular vehicles, even back in the early Roadster days, even before we had the Roadster out. People were saying that somehow hydrogen is going to be a better means of energy storage in a car than batteries. And it was like this is just really not the case.

Hydrogen is a very -- it's #1 in the periodic table. It's got very low density. It's got low density as liquid, like styrofoam-level density as liquid. And then it's only liquid very close to absolute 0. So you have to have a -- it's really not realistic to keep it as liquid. You want to have it as a high-pressure gas that has even lower density. So you need a gigantic fuel tank volumetrically, and it's got to be very high pressure. It's a big pain in the ass basically.

If somebody is going to say use an ultimate chemical energy storage mechanism to hydrogen, I'd say just use propane or something like that or methane or -- those will be way better than hydrogen. And then having it be a fuel cell just adds even further complications to the situation. It's just crazy basically.

And we're extremely confident that we could do a long-range trucking with batteries. The math works out. You don't -- if you could just like take, say, what hours per kilogram of currently

available cells and say, okay, how much -- what weight would you need to go, let's say, 500 miles and to what degree does that affect your payload and it's like, okay, you could do this. If you do it right, you basically have no effect on your payload or almost nothing, and you can have a long-range truck.

I mean, Jerome, do you want to add to that?

Jerome Guillen - *Tesla, Inc. - President of Automotive Division*

I agree with you. And we see also an increase on the regionalization of trucks. And I think it will be perfect. The Tesla Semi will be perfect for it, yes. And yes, I'm very -- I'm looking forward to having some additional ones on the road very soon.

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

But basically, we do not see any issues with creating a compelling long-range truck with batteries. The problem with cell supply -- cell supply is the only thing. Cell supply, yes.

Jerome Guillen - *Tesla, Inc. - President of Automotive Division*

It's going to be awesome.

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

Yes.

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

All right. Thank you very much. And unfortunately, that's all the time we have today. So thanks for all of your great questions, and we will speak to you again in about 3 months. Thank you.

Elon R. Musk - *Tesla, Inc. - Co-Founder, CEO & Director*

Thanks so much. Bye.

Operator

Ladies and gentlemen, this concludes today's conference call. Thank you for your participation. You may now disconnect.

Call participants:

Corporate Participants

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Elon R. Musk, Tesla, Inc. - Co-Founder, CEO & Director

Jerome Guillen, Tesla, Inc. - President of Automotive Division

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