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Market Intelligence

Tesla, Inc. NasdaqGS:TSLA

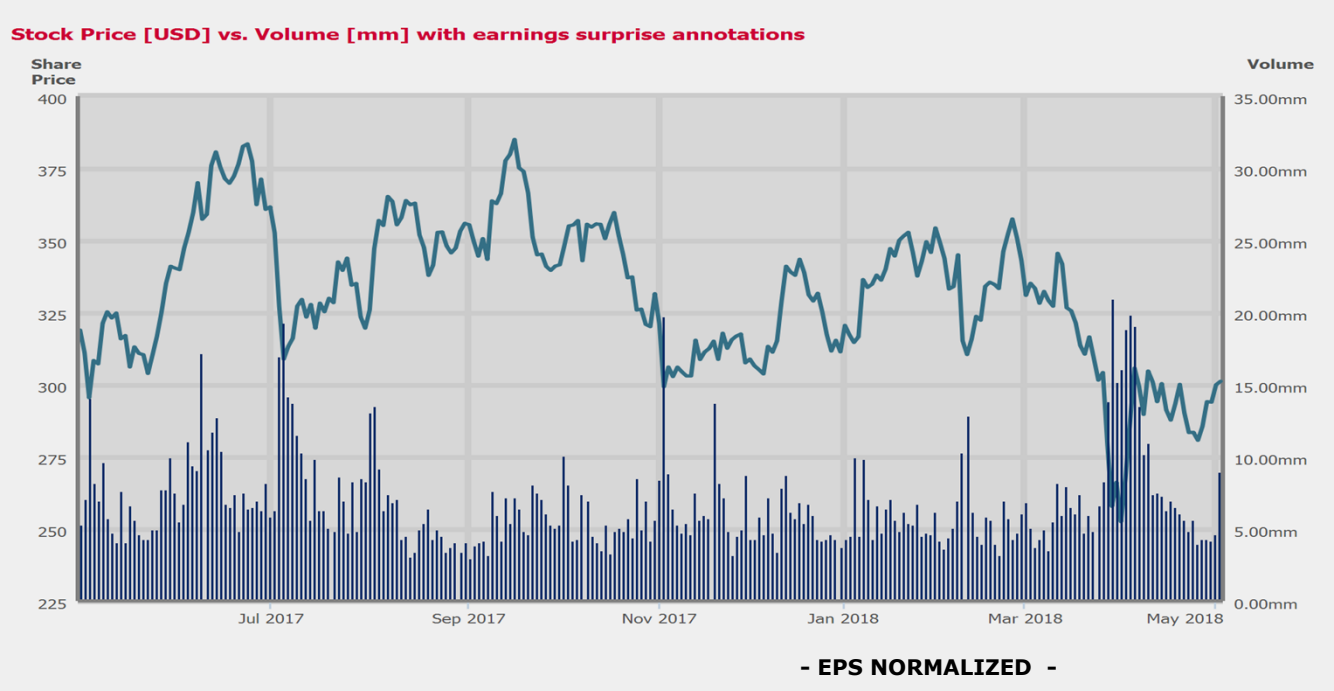
FQ2 2018 Earnings Call Transcripts

Wednesday, August 01, 2018 9:30 PM GMT

S&P Global Market Intelligence Estimates

	-FQ2 2018-			-FQ3 2018-	-FY 2018-	-FY 2019-
	CONSENSUS	ACTUAL	SURPRISE	CONSENSUS	CONSENSUS	CONSENSUS
EPS Normalized	(2.82)	(3.06)	NM	(0.89)	(6.71)	2.05
Revenue (mm)	3934.78	4002.23	1.71	5727.82	19756.59	27587.88

Currency: USD
Consensus as of Aug-01-2018 10:03 PM GMT



- EPS NORMALIZED -

	CONSENSUS	ACTUAL	SURPRISE
FQ2 2017	(1.92)	(1.33)	NM
FQ3 2017	(2.29)	(2.92)	NM
FQ4 2017	(3.15)	(3.04)	NM
FQ1 2018	(3.53)	(3.35)	NM

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EXECUTIVES

Andrej Karpathy
Director of Artificial Intelligence & Autopilot Vision

Deepak Ahuja
Chief Financial Officer

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Jeffrey B. Straubel
Chief Technology Officer

Jerome Guillen
Vice President of Programs

Martin Viecha

Peter Bannon

Robin Ren

Stuart Bowers
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Tim Higgins

Zachary Shahan

Presentation

Operator

Good day, ladies and gentlemen, and welcome to the Tesla Q2 2018 Financial Results and Q&A Webcast Call. [Operator Instructions] As a reminder, this conference may be recorded.

I would now like to introduce your host for today's conference, Mr. Martin Viecha, Senior Director of Investor Relations. Mr. Viecha, you may begin.

Martin Viecha

Thank you very much, Sherry, and good afternoon, everyone. Welcome to Tesla's Second Quarter 2018 Q&A Webcast. I'm joined today by Elon Musk; J.B. Straubel; Deepak Ahuja; Robin Ren, our Head of Sales; Jerome Guillen, our VP of Trucks; and we also have our autopilot team with us here; Andrej Karpathy, Director of AI; Stuart Bowers, our VP of Engineering; and Pete Bannon, our Director of Silicon Engineering.

Our Q2 results were announced at about 1:00 p.m. Pacific Time in the update letter 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]

Before we jump into Q&A, Elon has some opening remarks. Elon?

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Hi, thank you for joining. First of all, I'd like to say, we're incredibly proud of the Tesla team for producing 7,000 Model 3, Model S and Model X vehicles in the last week of June. Those were amazing efforts. So honored to work with such great team to fuse that incredible result. It's like mind-blowing. We continued to achieve 5,000 Model 3s per week, 7,000 combined S, X and 3, multiple weeks in July, showing that we're able to do this on a sustained basis. And we expect to, in the absence of a force majeure or some very unexpected events, be able to achieve an average of 5,000 Model 3s or above for Q3, and 2,000 Model 3, Model S, X or above per week for Q3 as well. So essentially, 7,000 cars a week, plus for -- on average for Q3. So it's an amazing jump from only a year ago when we're producing 2,000 vehicles a week. It's really kind of a mind-blowing leap forward for a manufacturing company. So yes, it's incredible work by the team to do that. Many, many late nights, weekends, extreme amounts of effort and lots of smart ideas. It's amazing.

The results you're seeing is that the Model 3 market share has surpassed all competitor premium, mid-sized sedans combined. So Model 3 market share is now a majority. July was a majority of all premium sedans. That trend is, we think, likely to continue. So it's not -- we do not think it will stop there. I have Robin Ren here, who's our worldwide Head of Sales, to talk about some of the interesting elements that we're seeing in terms of cars that people are trading in, the sales and demand trends. It's looking really, really positive.

We're also getting great feedback from Model 3 from our customers, and we're now delivering the performance dual-motor and all-wheel drive versions. And the Model 3 reviews are outstanding, really couldn't ask for better reviews from some of the toughest critics in the world. And it's -- yes, and just the thing that we're recognizing is that the more Model 3s we deliver to the field, it's actually causing viral growth of our sales. So we deliver our Model 3 to somebody, they love it, they tell all their friends, they are actually -- really, our customers are our primary sales force. They love their car and take their friends for a drive, and that's the thing that fundamentally drives our sales.

But not everyone has Model 3, obviously, so we need to get the cars out there for test drives. As it is right now, not even all stores in North America have Model 3 for test drives. Of course, we prioritize getting cars to customers, but we're soon going to have Model 3s available for test drives in all stores, and both the performance version and the rear-wheel drive version. So a lot of people who will not buy a car until they test drive it, just not unreasonable. Although on Sunday, when I delivered it, testing out like direct delivery, which I think is definitely the future, direct delivery from factory to customer's home or work or wherever they are. The guy here who bought it have never actually even sat in a Model 3. I'm like, wow, okay, Mr. Raul, how do you feel about the car now? You haven't even driven it. He's like, "I love it. It's amazing." So yes, it seems to be really well-received.

Yes, so I'd approximate 7,000 cars a week. We believe we can be sustainably profitable from Q3 onwards. We'll try to raise that rate of Model 3 production steadily in the coming quarters and try to get to the 10,000 cars a week number as soon we can. What we've found, as we spent a lot of time debugging a wide range manufacturer issues, is that the potential for our existing lines to be able to produce far more cars is much greater than expected. That by simplifying production lines, by speeding them up, by, in some cases, having things being done manually instead of automatic, and in other cases having be done automatic instead of manual, we've been able to achieve dramatic improvements to the output of existing lines, which means that our CapEx growing from 5,000 cars a week to 10,000 cars a week is a tiny fraction. CapEx going 5,000 to 10,000 is a tiny fraction to CapEx needing to grow from 0 to 5,000 Model 3s. This is, I think, very good news for capital efficiency of the company. And [indiscernible] that's going to inform future mass market vehicles that we produce.

So -- and from an operating plan standpoint, from Q3 onwards, we're going to emphasize, our goal is to be profitable and cash flow positive for every quarter going forward. Now obviously, if there's a big recession or there's a severe force majeure event that interrupts the supply chain, that's not always possible. But we're confident that -- and provided the economy is roughly where it is today, reasonably good and there's not a big force majeure event that we -- I feel comfortable achieving the GAAP income positive and cash flow positive quarter every quarter from here on out. It's -- I'll just say, there may be occasional quarters where we'll pay back a big loan or something where there may be -- just because we paid back a big loan. But absent that, we'd be cash flow positive.

So once again, I thank the team for their incredible work and our customers for their support. Without the great people we have at Tesla and the customers who put their faith in us by buying our product, we would not be here today. And yes, I've really never been more excited about the future of Tesla. We have a super exciting set of products to bring out in the future. And yes, I mean, sorry if I sound a little tired, I've been working like crazy in the body shop lately. But it's really going great. I'm super excited. Some good people. And a number of the executive team are here. If I could ask the 3 key leaders of the Tesla autopilot team to be here. So I'd like to go from here to see if autopilot leaders at Tesla could introduce themselves and say a bit about what you're working on, what you're excited about in the future. Sorry to put you guys in the spot. But I think we're making pretty radical advances in the core software technology and the vision neural net, and then, very importantly, the Tesla self-driving trip technology that we've been working on for 3 years is finally coming to fruition. Pete Bannon is going to talk a lot about that. But it's a plug-in replacement for the existing computer, and enables an order of magnitude improvements in operations per second or frames per second is the way to think about it. And we can go say, they really are key to Tesla full vehicle autonomy. And [indiscernible] to be really easy to replace. I'll let Pete talk about that. So we're going to start with like, Stuart, Andrej and then Pete. [indiscernible]

Stuart Bowers
Vice President of Engineering

Okay. Hi, I'm Stuart.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

You're going to have to talk a lot louder.

Stuart Bowers

Vice President of Engineering

Oh, yes, I'll just talk extra loud. So I'm Stuart. Yes, I joined team relatively recently. Incredibly excited kind of to see the foundation the team has built up until this point and building on top of that right now. So right now, a lot of the focus is on Autopilot V9, which is our sort of on-ramp to off-ramp solution that's going to automatically attempt to change lanes, understand what lane the car is in, understand the route the user wants to travel and take that route for the user and ultimately hand back control to that user in just kind of safe and controlled.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Integrated navigation. So you're like, you have to get to one place, you say like -- you just -- by the way, a little tip for -- if you're driving Model S or X or 3, is if you just tap and hold -- tap the navigate button and just drag down, it will automatically navigate you to your home or work, depending upon where you are. That's a pretty cool feature. Yes.

Stuart Bowers
Vice President of Engineering

So yes, a lot of focus right now, we're also kind of digging in on some new safety features. I think, probably the thing that's just most exciting for me coming into the team is just seeing the foundations being built out over the last 2 years. I think, Andrej will talk a lot about some of the perception and vision work we've done there, including data engine. That has sort of allowed us to build on top of that very, very quickly. And I think we're all starting to see a new set of safety features that really only makes sense. In this world, we have extremely high understanding of tapping around the vehicle. So I think, when I start to think about what makes me excited about coming to work, it's like, one, starting to introduce real aspects of kind of not just making the kind of reducing the drudgery or kind of the risk of commuting, but also really making the element fun. And the second is like dramatically improving safety in a way that you really can only do once you have this like very nuanced understanding of the world around you through perception.

Andrej Karpathy
Director of Artificial Intelligence & Autopilot Vision

Hello, everyone. My name is Andrej Karpathy, and I'm the Director of AI here at Tesla. In particular, I lead the vision team, which is responsible for turning the video stream that we receive from all the cameras in the vehicle into an understanding of what is around us and around the vehicle. I work with neural networks for about 10 years, earned my -- mostly as PhD student at Stanford, and as a research scientist in OpenAI, And what I'm really excited about is really building up this infrastructure for computer vision that underlies all the neural network training, trying to get those networks to work extremely well and make that really good foundation on top of which we build out all the features of the autopilot, like the features associated with the V9 where really that's going to come up and that Stuart has mentioned.

Peter Bannon

This is Pete Bannon. My team...

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

[indiscernible] talk loudly -- yes.

Peter Bannon

My team is leading currently the hardware 3 development. The chips are up and working, and we have drop-in replacements for S, X and 3. All have been driven in the field. They support the current networks running today in the car at full frame rates, with a lot of idle cycles to spare. So I think we're all really excited about what Andrej and his team will be able to do with this hardware in the future. I think, like one little anecdotal story was I gave a talk to his team on hardware 3 last month, explaining how it

worked and what it was capable of. And then, afterwards, one of the researchers came up to me, he was really excited and he said, "this is so exciting."

So as a hardware designer, having excited software developers is the best. It's a really fun place to work because I do get to work with my 2 primary customers, Stuart and Andrej, and making them happy is pretty fun.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Actually, Pete, maybe -- a lot of people know about your background, but not everyone does, so if you can just like -- Pete's a super humble guy, but if you could just, yes, talk about the stuff you've done before.

Peter Bannon

Let's see, I started working designing computers in Digital Equipment Corporation in 1984, back when they were refrigerator-sized, and have been working on smaller and smaller designs ever since. I was an Intel fellow, working on a team for a little while, then I was VP of Architecture and Verification at PA Semi, which was acquired by Apple. I led the design of the first ARM 32-bit processor that went into the iPhone 5. I built the team that designed the first ARM 64-bit processor in the world, which went into the iPhone 5S. And then, I worked on performance modeling and performance improvements at Apple for 8 years. And then, 2 years later, I came to Tesla, and designed the neural network accelerator that's part of hardware 3 and helped architect the rest of the hardware 3 solution that will be in the car next year.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes, maybe worth articulating some of the details, what the design principles that -- explain why, at Tesla, AI chip or AI computer essentially for the car is able to achieve order of magnitude better processing than anything else that exists.

Peter Bannon

Sure. So like 2 years ago, when I joined Tesla, we did a survey of all of the solutions that were out there for running neural networks, including GPUs. We went and talked to other people like at ARM that were building embedded solutions for running neural networks, and pretty much everywhere we looked, if somebody had a hammer, whether it was a CPU or a GPU or whatever, they were adding something to accelerate neural networks, but nobody was doing a bottoms up design from scratch, which is what we elected to do. We had the benefit of having the insight into seeing what Tesla's neural networks looked like back then, and having projections to what they would look like into the future and we're able to leverage all of that knowledge and are willing to totally commit to that style of computing to produce the design that's dramatically more efficient and has dramatically more performance than what you can buy today.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Well, thanks. Yes, I mean, essentially, the key is to be able to run the neural net at a fundamental -- at a bare metal level so that you're -- in the circuits, especially when you're the calculations in the circuits itself and not in some sort of emulation mode, which is how a GPU or CPU would operate. So you want to do basically a mass amount of localized matrix calculations with the memory right there. So it's a huge number of very simple complications with the memory needed to straight adjust those complications right next to the circuits that are doing the matrix calculations. And the net effect is an order of magnitude improvement in the frames per second. Our current hardware, which I'm a big fan of NVIDIA, they're great stuff, but using a GPU, primarily, it's an emulation mode. So -- and you also get choked on the bus. So the transfer between the GPU and the CPU ends up being one that constrains the system. So the net effect is we're able to, with the Tesla computer, we've been in like semi-stealth mode basically for the last 2 to 3 years on this, but I think it's probably time to let the cat out of the bag because that -- the cat's coming out of the bag anyway. So it's an incredible job by Pete, as seen. It's great, the world's most advanced computer for -- designed specifically for autonomous operation. And as a rough sort of figure of

merit, whereas the current NVIDIA-based hardware can do 200 frames a second, this is able to do over 2,000 frames a second, and with full redundancy and fail over. So it's an amazing design and we're looking to increase the size of our chip team and our investment in that as quickly as possible.

I think we're at some of the best days the world, but I think we want to build on it even more. And it's going to cost the same as our current hardware, and we anticipate that this -- they would actually just replace those replacements, which is why we made it easy to switch out the computer. And that's all that needs to be done. If we take out one computer and plug in the next, that's it. All the connectors are compatible, and an order of magnitude more processing. And you can run all cameras at full frame rate, full resolution with a complex neural net. So it's super kickass. Thank you for doing that.

Peter Bannon

You're welcome.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Thanks for making net and thanks for making the software. And I'd like -- basically, I wanted to introduce 3 of the key people at Tesla that are doing this. I have huge respect and admiration for you guys. And it's because of what you and your team is doing that's how we're successful in this arena.

Martin Viecha
Thank you, Elon. Sherry. Let's go to the first question.

Question and Answer

Operator

[Operator Instructions] Our first question comes from Toni Sacconaghi with Bernstein.

A.M. Sacconaghi
Sanford C. Bernstein & Co., LLC., Research Division

I have one question and one follow-up, please. First, just on gross margins, it looks like S and X gross margins were up maybe 500 basis points sequentially. And I'm wondering, maybe you can articulate what drove that? And then, more importantly, it looks like you're calling for Model 3 gross margins to go from about maybe 3% this quarter to 15% next quarter. That's about a $6,000 cost out per car. And I'm wondering if you can maybe help us understand what sort of the forces that drive that kind of improvement in a relatively short time frame?

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes, absolutely. First of all, I'd like to apologize for being impolite on the prior call. Honestly, I don't think there is really any excuse for bad manners, I was kind of violating my own rule in that regard. So I have some excuse -- there are reasons for it, I've gotten no sleep and have been working sort of 110-hour, 120-hour weeks. But nonetheless, still no excuse. My apologies for not being polite on the prior call.

A.M. Sacconaghi
Sanford C. Bernstein & Co., LLC., Research Division

I appreciate that. Thank you.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

And let's see, with respect to gross margin, I'll touch on that and then hand the rest to Deepak. But certainly, when spooling up the production line, there are tremendous amount of inefficiencies. There's a lot of hurry up and wait where some parts of the production line move well and one part doesn't. And we have associates waiting around with nothing to do. There are parts that we thought were right but then it turns out we've got -- they weren't right and then we send it back to the supplier. It's just like the whole sort of giant machine kind of -- you just need to have to lurch into a high pace. And there's a lot of lurching, which is very inefficient. So you end up having super high labor cost per car. And it just needs -- it takes time to sort of spool up this giant machine. It's a -- basically, a production system is like a giant cybernetic collector. And then, it moves as fast as its slowest part. So as we address those slow parts and as you improve efficiency, then gap -- grow gross margin, and so the profitability of the car just improves dramatically. That's sort of at a high level. Do you want to add to that?

Deepak Ahuja
Chief Financial Officer

No, you described it extremely well. So just to sort of summarize, this was a major milestone for us in Q2 that the gross margin in Model 3 turned slightly positive. And we feel really good about the path ahead. And as Elon said, it's driven predominantly by manufacturing cost efficiencies. It's the labor hours that we use to produce each car becomes less, the initial ramp up costs that we have that are one-time as those inefficiencies disappear. Our fixed cost that are there, that gets leveraged to a higher volume. So all of that.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Actually, a thing that can also happen is that if it turns out that, say, a production part was either designed wrong or built wrong or something wrong with it, then on a kind of emergency basis, we have to go with

low-volume tooling, which can be produced quickly. But a power producer of a low-volume tooling can easily be 10x more than a product produced off of production tooling. And so just wanted -- you can have -- and sometimes, it's -- it gets really nutty [indiscernible]. If you got a machine and something happened out of a block, and it's either that or make a car, but the cost of using low volume, cost of producing low-volume tooling can be really nutty.

Deepak Ahuja
Chief Financial Officer

And that journey just continues. As we stabilize and grow production from these levels, we achieve even more efficiencies. And Q3 also benefits with somewhat improved mix as we're going to sell more all-wheel drive and performance cars. And in the long run, as we continue to achieve those efficiencies on cost, our gross margins will continue to increase.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes. I mean, I don't know if this trend will continue. We're trying to give you essentially all the information that at least we know, but we're seeing roughly half of our customers choose the dual-motor all-wheel drive option, which is actually quite a good positive surprise.

Deepak Ahuja
Chief Financial Officer

Yes, it's been heartening to see that mix in terms of what customers want. And Robin can probably add more to that.

Robin Ren

Yes. So starting from end of June, when we opened the configurator and invited the existing reservation orders, we saw tremendous excitement and response from our customers. As Deepak just mentioned, we actually see more orders for the all-wheel drive dual-motor car and performance cars combined than the rear-wheel drive cars.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes. It's -- we don't want to say this should be assumed to be a continued thing. It's just the thing we are seeing now.

Robin Ren

Correct. And another thing I want to point out is that we are absolutely -- since we opened the configurator to the general public in early July, we are seeing an increased demand coming from people who do not currently hold a reservation. I think that's something that we found super exciting because these are the people who actually had no idea about Model 3 and they heard about Model 3 as available to order. Many of them requested test drives. And since early July, we have over 60,000 test drive requests in the U.S. alone. And these people come into our stores, do the test drive, and they become super excited and they decide to order a car. So we believe that the strong demand coming from, especially the non-reservation orders, is going to dramatically increase as we increase our test drive population. To give you an example, 3 weeks ago, we had only 8 stores having test drive cars, to Elon's point earlier. Now we have over 90 stores having test drive cars.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

It's worth mentioning, just an interesting little bits of information that Robin was telling me -- and Robin, I would just congratulate you on doing a great job running worldwide sales [indiscernible] and the also work done in China, which is like really some next-level stuff. Robin was born and raised in China, and has been -- along with Tom and Grace as well, the team China has been instrumental in establishing the Tesla China

factory and making sure that gets done right and have a great relationship with the government. So nice work in that regard. But it's really -- I think -- and some of the things people won't expect, like what are the top 5 trade-in cars for Model 3?

Robin Ren

Yes, this is very interesting. So we looked at what people who are buying Model 3 cars in the United States, what cars they are trading in. What we found is throughout this year, from January to July, the top 5 non-Tesla cars people are trading in to get into a Model 3, they are Toyota Prius, BMW 3 Series, Honda Accord, Honda Civic and Nissan Leaf.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Really surprising.

Robin Ren

Yes, they are surprising because they are not the traditional premium sedans. They are actually -- many of them are mainstream midsized sedans.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Right. And obviously, at this point, not yet selling at $35,000 a car. So it is promising for the future.

Operator

Our next question comes from Joseph Spak with RBC Capital Markets.

Joseph Robert Spak
RBC Capital Markets, LLC, Research Division

Maybe we could tackle some of the commentary about the Gigafactory coming in, in China. When you first announced the Gigafactory 1, I think you said that was going to be about a $5 billion investment. And you mentioned some volume numbers associated with what you think you can do in China. So we do some extrapolation, looks like maybe 15 gigawatts of -- gigawatt hours of initial capacity. I'm wondering if you could also do a linear extrapolation on the cost you think you need for that factory.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Sure. And I would also like to apologize for being impolite on the last call with you. That was not right. I hope you accept my apologies.

Joseph Robert Spak
RBC Capital Markets, LLC, Research Division

Thanks.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

So with respect to Gigafactory, with CapEx, I think, we booked a tremendous amount with Gigafactory 1. And we're confident that we can do the Gigafactory in China for a lot less. I think it's probably closer to -- this is just a guess, but probably closer to $2 billion. And unless we be at a higher -- and that would be sort of the 250,000 vehicle per year rate. And so I think we could be a lot more efficient with CapEx. And that would include at least battery module and pack production, body shop, paint shop and general assembly. [indiscernible] but that's about the right number for that. And sub production is something we still need to figure out with respect to the Shanghai factory. So J.B. would you like to add to that?

Jeffrey B. Straubel

Chief Technology Officer

Yes, I agree with all that. We found surprising number of ways to improve efficiency and speed and density as well at Gigafactory 1. And all those lessons will absolutely be shared with Gigafactory 3. The teams are already, of course, beginning to collaborate and start to figure out ways to do this more efficiently and with less CapEx than last time. Yes.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes, I think we -- like less than half is like would be a good estimate. And maybe a lot less than half, but not more than half would be a fair estimate for CapEx to get to that 250,000 level. So just launched a tremendous amount of manufacturing, definitely burned out a lot of neurons [indiscernible] like next level. But on the plus side, we really know a lot about volume manufacturing at this point.

Jeffrey B. Straubel
Chief Technology Officer

I mean, there are so many specific examples. But even in just recent weeks and months, we found some certain areas of production that have been very capital-intensive that we've been able to speed up with almost no additional CapEx by maybe 20%, even 25% or 30% just by...

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes, including the cell production.

Jeffrey B. Straubel
Chief Technology Officer

Yes, just by challenging some of the initial assumptions, the specifications, tweaking the control and software.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes, what really matters, what actually doesn't matter, things you think matter. And some of it actually ends up not being -- not matter at all.

Jeffrey B. Straubel
Chief Technology Officer

And that's with basically 0 CapEx. So as you start to add very tactical strategic CapEx to the existing lines, that's how we can get to something close to double or beyond with a really, really small increment.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes. One of the key to the success on the Model 3 production was the [indiscernible] which is led by Jerome. Jerome also was key in doing the Zone 1, 2 order lines, which was critical because [indiscernible] we had a fundamental failure and especially in Zone 1 -- Zone 2 of [indiscernible] module production [indiscernible] that was [indiscernible] is amazing. I feel like [indiscernible] our tent. But by the way, our tent is amazing. And this is not like [indiscernible] like some sort of you buy at REI or something like that, you go camping. This is a tent that is actually commonly used as a permanent structure. It's a giant thing that is very commonly used as a permanent structure. And the -- and we just had to come up with a creative solution because GA 3 was not going to be able to make the rate. And so we have to come up with some ideas and perhaps provide [indiscernible] a little transparent. It's interesting, if you want to...

Deepak Ahuja
Chief Financial Officer

Yes. We -- it was the fun project, actually. So not only was it producing good results, but it was a lot of people contributed from different engineering groups and had a lot of fun in the process. We set out...

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

[indiscernible] boulevard. It's like -- you really -- there's like -- so it's like those are really fast flowing [indiscernible]

Deepak Ahuja
Chief Financial Officer

We just wanted to create an assembly line that would be very easy and very straightforward. So it's a straight line. Very simple. Car enters at one point and it's finished at the other end. Very simple access on all sides, very simple tooling that we reused for most of -- actually, nearly all of it is systems and tools that we discarded from previous S and X all for Model 3.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Especially Model 3. Like it was probably like we got 2 weeks to solve this problem, which is like quasi impossible. So we actually didn't have time to order new equipment because it would have taken too long to arrive. So we took the conveyors that we discarded from the GA 3 line, which didn't work. Or it was way too complex to actually move our products.

Deepak Ahuja
Chief Financial Officer

And we amplified, repurposed them, make them sturdy for what was needed and...

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Well, Like a really cool idea was putting them on the 1% grade. So it's like, technically, the conveyors for parts delivery to GA 3 were not rated to be able to move something as heavy as a car. So we made it downhill and on a 1% downward grade, the car at the top, so then you can actually overcome the...

Deepak Ahuja
Chief Financial Officer

Gravity helps.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes, gravity. So if you basically -- with Newton on your side, you can accomplish a lot.

Deepak Ahuja
Chief Financial Officer

Yes, it's pushing the car.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Exactly.

Deepak Ahuja
Chief Financial Officer

No. And something that I'm particularly happy about is that we installed the quality team at the end of the line, and we wanted to have at least as high standards on this new likeness and the other one. And because it is so simple and straightforward, they can run very quickly to any point in the line if there's

any potential concern and address it very quickly. There is no maze to move around or identify where something happened. And the quality of the cars that come out of this structure is at least as good as -- and we make all the performance cars on this particular line and they seem to be doing quite well. So this is a very pleasant surprise. And the associates seems to be very happy and engaged in that particular area. So this may be a model of how we may want to start general assembly for future vehicles, at least start. And we can always add further automation and complexity.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

And so what is counterintuitive is that this actually has fully considered fewer labor hours per car than like the GA 3 system. And just to elaborate on what I was saying, when we have parts delivery to GA 4, the truck literally like they just backs up to the side of the line. It was like a door in the tent. And then that's used to unload parts from suppliers directly to where they're needed on the line. So there's no intermediate [indiscernible] whereas for GA 3, they unload it, they put it in a warehouse, then they're repackaged for the warehouse into these turrets which just actually -- so we actually have 220 people, something like that across all shifts, whose only job it was, was to repackage parts from the boxes from suppliers to the boxes that -- to these turrets that go into lifters that go up into GA 3. And especially all they do is move things from one box to another box, and we don't need that at all on GA 4.

Deepak Ahuja
Chief Financial Officer

All gone.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

All gone, yes. And the stress of sort of 24/7 robotics, technicians that are constantly trying to make the machines have uptime, that's very expensive. And so when we think about not having to maintain all these robotic systems, that's a big cost savings as well. And now we're going to gradually be adding simple automation into GA 4 to make it easier to build a car and that are sort of labor saving devices. It's fundamental. It's already at an efficiency level greater than GA 3, which is pretty impressive.

Operator

Our next question comes from James Albertine with Consumer Edge.

James Joseph Albertine
Consumer Edge Research, LLC

Appreciate all the color you've been providing. Wanted to dig a little bit deeper though in terms of capital spending plans. Considering your growth you've identified in China with the Model Y, we believe also in the EU, it's been discussed about a factory there. How do you plan to fund all of this growth without going back to the capital markets to raise funds? And can you verify for us whether or not there is a notice from a regulator that would prevent you from raising outside capital?

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

We do not -- we'll not be raising any equity at any point, at least that's -- I have no expectation of doing so, do not plan to do so. For China, I think, we -- our default plan would be to use essentially a loan from local banks in China and fund the Gigafactory in Shanghai with local debt essentially. And there are so many -- we could raise money, but I think we don't need to, and we -- yes, I think it's better discipline to not to.

Deepak Ahuja
Chief Financial Officer

Yes, we're executing on an operating plan that keeps us sufficiently self-funded, despite our CapEx needs and our debts maturing and still keep a very healthy balance on our balance sheet.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes. We're -- our default plan is we pay -- starting paying off our debts. I don't mean refi-ing, I mean paying them off. For example, this convert that's coming due soon, a couple hundred million, $900 million [indiscernible] or something like that. We expect to pay that off with internally generated cash flow.

Deepak Ahuja
Chief Financial Officer

And still be -- still have a healthy cash balance.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes.

James Joseph Albertine
Consumer Edge Research, LLC

And to answer the other question, there is no such notice from a regulator?

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes. I'm not sure what you are talking about, but there's no such notice from a regulator.

Operator

Our next question comes from George Galliers with Evercore. Our next question comes from Adam Jonas with Morgan Stanley.

Adam Michael Jonas
Morgan Stanley, Research Division

Hey. everybody. First is, there's so much love and respect for colleagues and Wall Street analysts on this call. It's almost -- it is lifting my spirits. What can I say? I got 2 questions. The first is for the Autopilot team. There's an argument that a fully autonomous car is essentially like a terminator that is programmed to save lives in highly complex terrestrial environments. And that this same technology, with a few tweaks, have some pretty obvious military capability. Do you see any risk that U.S. companies will ultimately not be allowed to operate weapons grade AI-based technology in a market like China and vice versa?

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Well, this has never come up. I wouldn't call it weapons grade. It's just like the car's trying to drive. And if anything, the autonomous cars will be pretty easy to bully because they'll be optimizing so much for avoiding collision. So that'll be more of a challenge than anything else, is as soon as somebody sees those cars are autonomous, they know they can like cut them off and the car's going to be doing what it can to avoid a collision. So it's like that'll actually be probably a bigger challenge than anything else. But we've not encountered anything of the nature of what you're saying.

Adam Michael Jonas
Morgan Stanley, Research Division

So you don't see autonomous cars as a potential germination or training grounds for things that would have a national security or military interest. Okay. Maybe a follow-up, Elon, and my last question. Who do you think would be a more formidable competitor over time, BMW or Amazon?

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

For Tesla?

Adam Michael Jonas
Morgan Stanley, Research Division

For Tesla.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

No, I don't think either of them are likely to be -- as far as I know, I mean, I'd be pretty shocked if Amazon got into the car business, but I think BMW has great engineering. They're -- and it's good to see that they're making some investments in electrification. Hopefully, they do more of that. And I'm not sure where they stand on autonomy. That's not on our radar from an autonomy standpoint.

Operator

Our next question comes from Pierre Ferragu with New Street Research.

Pierre C. Ferragu
New Street Research LLP

—

So I wanted to make sure we understand well how you stop burning cash going forward in coming quarters. And my understanding is that an important moving part here probably is -- probably the most important one, is a positive impact of the ramp of the Model 3 on your working capital. And so I did some quick math on the quarter and I see your payables increased by $430 million while your receivable didn't move much, which makes sense because you get paid on the spot and you pay your suppliers only on a 60-day notice or more. And so if I divide that by the number of incremental cars you've been producing in the quarter, I get to about $23,000 per car. And of course, my question is whether this is a good way to think about it, which means that going forward, when you move into Q3 and Q4, every additional car, every additional Model 3 you're going to produce, you're going to bump up payables by something in the region of $20,000, and that's going to be the main driver getting you to breakeven and to stop burning cash.

Deepak Ahuja
Chief Financial Officer

Yes, Deepak here. I mean, there are many factors. Clearly, the working capital benefit of the difference in the payable terms versus collecting cash is one of them. But also, it's our gross margin improvement on the business, it's the higher volumes and the higher gross margin resulting in higher gross profit. I'm stating the obvious there on Model 3. Our S and X volumes are increasing, too, in the second half. That's going to help us significantly. And all of our other businesses are improving their profitability while our OpEx is staying essentially flat, so massive leverage in the business. So when you combine all of that, that's what is giving us the cash flow from operations to fund our -- the rest of our business and grow cash. I'm stating the obvious, but just I'm summarizing the whole point, yes.

Pierre C. Ferragu
New Street Research LLP

And in terms of other [indiscernible]? Sorry, go ahead.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Sorry, what's your question?

Deepak Ahuja

Chief Financial Officer

Can you repeat the follow-up?

Pierre C. Ferragu
New Street Research LLP

My follow-up was on a -- in terms of order of magnitude, does like $20,000 per car of payables boost over a 60-day period? Does that sound like something that make sense or am I missing other moving parts?

Deepak Ahuja
Chief Financial Officer

That's a rough order of magnitude, correct. Yes.

Operator

Our next question comes from Romit Shah with Nomura Instinet.

Romit Jitendra Shah
Nomura Securities Co. Ltd., Research Division

I guess my question's for the Autopilot team. We've been looking forward to this fully autonomous coast-to-coast drive. And, Elon, I think you sort of said on previous calls, if I can paraphrase, that the team's been focused on developing a full self-driving suite that would work basically on all different kinds of road conditions. And I'm just curious, what's holding back that capability today to go coast-to-coast? And are we closer now that you've strengthened the compute technology?

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes, the -- we can do a coast-to-coast drive especially if we pick a specific route and then write code to really make that route work. We could do a coast-to-coast route drive, but that would be kind of gaming the system, and I think it's really important for the Autopilot team to be focused on fundamental safety of the existing features. So that's -- the focus is really massively on safety of existing features. And there's a dev -- an advanced dev role that can do things like recognize traffic lights and stop signs and make hard right turns and that kind of thing. But it's not the safety level that [makes it okay for release]. So but -- yes, because it really -- you want many lines of reliability before anything that's released to end customers. So I don't want to take team off that until so we feel like we've really -- done everything we can for the core functionality. And, Stuart, do you want to add to that?

Stuart Bowers
Vice President of Engineering

Yes. I mean, I think, the big thing I'd say is that, Elon, to reiterate Elon's point, there's no question you can kind of build a demo around the stuff. The challenge right now for the team is just increasing the safety and utility of Autopilot to over a quarter million cars we have today and pushing more out after that. So I think, when we look kind of forward to what the next probably 6 to 12 months look like, it's taking those same kind of features that we've been working on, probably deploying them in the form of active safety features. Like that's like a thing we can do already, is to understand like use this rich understanding in environment to actually try to keep you safer, to either beep or brake. And then also, of course, like one huge advantage that we have is we can understand what humans actually did in these vehicles and test our software to make sure that we would have made decisions that were similar, if not safer. So that's going to be a huge part of what we do over the next probably 2 quarters.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes. I mean, that said, we might be able to pull off coast-to-coast demo before the end of the year if we -- but really, like right now, if the Super has now focused on the version 9 software release, which has got a number of really cool things in it, and we're hoping to get that out to a [reaccess] program at the -- in

about 4 weeks and then broadly in September. That's the hardcore focus right now, and that'll certainly include some significant advancements in autonomy. And then once that's out and stable, I think that could be a good time to work on the coast-to-coast driving.

Romit Jitendra Shah
Nomura Securities Co. Ltd., Research Division

I don't know if you guys have shared what attach rates are for Autopilot. I'm just, as my follow-up, I guess I'm curious what you can do to increase the number of cars that have that functionality. It would seem like some of the effects on [outer margins] and cash flows could be pretty positive.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes, I think it's extremely powerful once people are comfortable using the technology and see just how much utility it brings. I think that is a very significant potential for margin gain in the future. But it's contingent on that functionality really making a difference. I think we will really start to see some of the breakthrough stuff in about a month or so.

Operator

Our next question comes from John Murphy with Bank of America.

John Joseph Murphy
BofA Merrill Lynch, Research Division

Just a first question, is it fair to assume the GA4 in the tent is now essentially permanent? And if so, is this potentially a new model for capacity and capacity additions it much -- might be much more capital efficient over time?

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

[indiscernible]

Deepak Ahuja
Chief Financial Officer

It's permanent for now.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes.

Deepak Ahuja
Chief Financial Officer

Yes, unless we come -- until we come up with something different or better. But personally, I think it's a good model to start assembly of any product. There's a lot of flexibility and then we can build and iterate over it, yes.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Like necessity is the mother of invention and when you have to do something quickly, then it just -- you just don't have time to spend a lot of capital. So it forces you to be capital efficient.

Deepak Ahuja
Chief Financial Officer

Yes, it's taught us a lot of lessons on how to be capital efficient in the general assembly area. And so in that sense, those lessons will carry forward, John.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes. I think still, by and large, what we will be aiming for is steel frame buildings. To be clear, it's not like it's going to become tents everywhere.

Unknown Executive

I mean, the tent itself might be a little bit of a distraction from actually the focus of what's happening inside.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes, exactly.

Unknown Executive

And that's a similar methodology that we kind of reverted back to and then moved forward from in the module, where we simplified and then did a very, very linear intuitive process that was a bit more manual and they have automated and scaled that up as we understand it and get good control of it. And I think that's a lesson that we're taking to heart broadly across other things that we're going to do in the future, and it's an efficient way to scale up.

John Joseph Murphy
BofA Merrill Lynch, Research Division

I mean, is that replication of that simplicity why you think Shanghai could be that much less costly and that the Model Y capacity might be that much less costly to add.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes, Model Y was sort of a whole separate thing, but it's definitely one of the elements that convinced us that we can scale up quickly and at low CapEx in Shanghai. We were doing improved version of GA4 and then we'll also -- we're going learn how to make the paint shop a lot simpler and general assembly a lot simpler. And after this call, I'm headed up back out to the body shop [indiscernible]

Deepak Ahuja
Chief Financial Officer

Body shop

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Maybe the body shop will

Deepak Ahuja
Chief Financial Officer

[indiscernible] make it simpler.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes, we can really simplify the body shop then. Wow. And there's a lot that are really easy to improve like design to manufacturing and changing -- change some of the joining approaches that we use and actually make the car lighter, cheaper and better, actually safer. It's really ridiculous to say [indiscernible], but yes.

Jeffrey B. Straubel
Chief Technology Officer

[indiscernible] Maybe just to follow up quickly, I think some people have taken this like a walk back from automation, which is not really accurate either. This is basically -- I mean, a more thoughtful and focused way to apply automation to the actual issues that matter most.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes, well said. That's right. Actually it's really worth emphasizing J.B.'s point here. Yes, worth saying again.

Jeffrey B. Straubel
Chief Technology Officer

Yes, it's not an overall reduction in automation. It is a focusing of our efforts on automating the processes and the value-add processes that matter the most. And I think we got maybe a little bit distracted on this first round automating a lot of things that added complexity that didn't necessarily speed up. And...

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Way too fancy.

Jeffrey B. Straubel
Chief Technology Officer

And we can save...

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Start simple and get fancy later. Don't start fancy. Fancy's going to bite you in the ass.

Jeffrey B. Straubel
Chief Technology Officer

But if it's definitely not like I refer to the dark ages of all manual everything. That's not all the case.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes. I mean, Gigafactory is...

Jeffrey B. Straubel
Chief Technology Officer

Massively automated.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Massively automated. It's pretty -- it looks -- it's pretty crazy and -- but the body production was also heavily automated. Most some [indiscernible] robots. So it's a mix of people and automation. There's so much that goes into producing a car, going from raw metal and plastic and glass to an actual finished car. And yes, so if you're saying, the vast majority of it is highly automated.

John Joseph Murphy
BofA Merrill Lynch, Research Division

Okay. If I can sneak in one quick follow-up, I mean, when we look at the grosses on the Model 3, you're saying 15% in 3Q, 20% in 4Q, and I think the ultimate target is 25%. I mean, what are the average transaction prices you guys are assuming? I mean, it sounds they're going to be a bit higher earlier, but is that 25% gross ultimately still built around the low 40,000 ATP?

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes. So the simple answer is yes.

Deepak Ahuja
Chief Financial Officer

It will be lower ASPs than what we have today clearly. And we are having a richer mix of all-wheel drive, as Elon alluded to earlier, so that's going to help. But yes, 25% is still the target that we have ahead of us.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

I'm highly confident that -- it may not be Q1, but I'd be shocked if it's not Q2 that we get to 25%.

Operator

Our next question comes from Alex Dirpes with Berenberg.

Alexandru-Cristian Dirpes
Joh. Berenberg, Gossler & Co. KG, Research Division

I would like to come back to the point made on the manufacturing efficiencies. I mean, over the 2 main challenges of Tesla, but also for the rest of the industry is the manufacturing parts, which has been overcome by a lot of companies already, with the second one being the technology part. My question is, how would you describe the learning curve of the manufacturing process versus technology? And what is really the pace of advancements you're making? Because it looks like on the manufacturing side, the curve [indiscernible] meaningfully accelerated here?

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Well, I don't really know actually how others do it, to be totally frank. I just know that what we -- the way we -- I see the way we're doing it and I'm told that this is how others do it and we are able to find ways to make it much better.

Jeffrey B. Straubel
Chief Technology Officer

I guess, I...

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

I don't know what the delta would be there.

Jeffrey B. Straubel
Chief Technology Officer

We also don't really, I think, differentiate it quite the way maybe you're implying. I mean, technology and manufacturing are sort of one and the same in many cases, and we're treating a lot of the manufacturing problems as a technology problem and applying our design teams, our technology teams, if you want to call them, that to solving those issues. So I think the learning curves in some ways are quite similar.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes. It's amazing how much of production is actually software.

Jeffrey B. Straubel
Chief Technology Officer

Yes.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

And we're really quite good at software relative to other car companies. And manufacturing at volume is mostly a software problem. I think that was not well appreciated.

Jeffrey B. Straubel
Chief Technology Officer

I think maybe one other lesson learned is that it's obviously not the best approach or best efficiency to outsource some of that development. Some of the areas that we struggle the most through the Model 3 ramp were those where we had perhaps less visibility and less control and less direct kind of skin in the game on how those production lines were designed and built.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

And these are cases where we took -- we engaged with companies that were supposed to be world-class experts in automotive production, and we just assumed that they would do -- that their stuff would work, but it didn't.

Jeffrey B. Straubel
Chief Technology Officer

Yes. So that learning curve often involves Tesla coming directly in, understanding the process intimately and simplifying it and then essentially doing our own design or changes to the lines that were built. And I think that's a key learning point that we've taken. And I think the way that we can do this a lot more efficiently in the future is kind of doing that approach from the start.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes, just having that very rapid iteration between design and production is incredibly helpful. And we're now -- we understand, for example, what are the weight limiters and what makes it hard to produce battery modules. And we came up with a new design that achieved the same outcome. It's actually lighter, better, cheaper and we'll be introducing that around the end of this year probably reach volume production on that in Q1 or something that will -- yes, make that follow up lighter, better and cheaper and achieve higher range. And that line is under construction. It will be -- yes, active in about 6 months.

Jeffrey B. Straubel
Chief Technology Officer

Yes, there's -- we did this somewhat the first time around, but now there is, I think, even more exciting understanding of the value of having those, as Elon said, having the design engineers just working intimately with automation and line engineers simplifying the process as they're designing a product.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes. And I mean, I -- because we're sort of desperate to try to get the production working, we actually took designers from our A team and had them work in the factory and improve -- work on production and it's given them tremendous insight into how they need to change the designs in the future to make it easier to produce because you feel the pain directly.

Jeffrey B. Straubel
Chief Technology Officer

Exactly.

Elon R. Musk

Co-Founder, Chairman, CEO & Product Architect

Yes. Once you feel the pain. Like, okay...

Jeffrey B. Straubel
Chief Technology Officer

I won't do it anymore.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Didn't I realize I was like torturing people with my terrible design. Now I know.

Operator

Our next question comes from Ben Kallo with Baird.

Benjamin Joseph Kallo
Robert W. Baird & Co. Incorporated, Research Division

Elon, [indiscernible] unless everything else [indiscernible].

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

[indiscernible]

Benjamin Joseph Kallo
Robert W. Baird & Co. Incorporated, Research Division

Deepak, so after July here, how close are you to cash flow positive?

Deepak Ahuja
Chief Financial Officer

Sorry, your question is, after July, how close are we to cash flow positive?

Benjamin Joseph Kallo
Robert W. Baird & Co. Incorporated, Research Division

Yes. You have July in the books here. So how close are you to cash flow positive?

Deepak Ahuja
Chief Financial Officer

Yes, well we don't have -- [indiscernible] this one, we don't have July results done. But it doesn't matter exactly where we are in the month of July. What really matters is over the quarter because it depends on deliveries, depends on production, many factors. So we will be significantly cash flow positive for the quarter. I think that's what really matters.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes. [I think the logical] question is like, do we have like a low balance in the bank? The answer is no, we've got -- we're in no -- we're not in any kind of cash flow [indiscernible].

Deepak Ahuja
Chief Financial Officer

Yes. I mean, if that's the -- yes, I mean, that's the simple answer.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Are we running low on money? The answer is no.

Benjamin Joseph Kallo
Robert W. Baird & Co. Incorporated, Research Division

No, no, no, that's not the question. It's just as you're here and you have -- you're selling your higher-priced cars for a better margin, how does the third quarter look from what you said from being cash flow positive?

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes, yes, I'd say highly confident of being cash flow positive and being GAAP profitable in Q3.

Deepak Ahuja
Chief Financial Officer

We're sitting here today saying that based on what our expectation is. So yes, sitting here [indiscernible]

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Based on everything we know at the end of July, it's 1 month in. We're highly confident of being cash flow positive and GAAP profitable in Q3 and Q4. And now there could be a force majeure event like an earthquake [indiscernible], something like that or massive recession all of a sudden. But in the absence of that, of really unusual macro events, yes.

Operator

Our next question comes from Tim Higgins for The Wall Street Journal.

Tim Higgins

A question for you. Do you still plan to make a total of 1 million vehicles in the calendar year of 2020?

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

I think so, yes. If it's not a million, it's going to be pretty close. I'd say if it's not a million, it's probably 750 or something like that in 2020. We're aiming for a million in 2020, but somewhere between 0.5 million and 1 million seems pretty likely.

Tim Higgins

Where do you get the capacity to do that?

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

There's this place called Shanghai.

Tim Higgins

Okay. Shanghai will be important for that?

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes.

Tim Higgins

Okay. Where does the Model Y...

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes, I think so. And I think we can do over 0.5 million vehicles -- well, actually probably more like 600,000 vehicles with current Giga in Fremont. And so then if you throw like 100, 200 more [indiscernible] couple hundred thousand from Shanghai. And I said, we'll probably be more than 600,000 with Fremont and Giga in Nevada. That's why I think maybe -- I think we have a shot at 1 million. But some of that was 700,000 or 800,000 seems pretty likely given the current what we know today.

Tim Higgins

Have you made any decisions on where you're going to make the Model Y? Maybe you'd like to tell me?

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Not yet. So.

Tim Higgins

Do you expect to announce that this year, though?

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Maybe. Maybe. I should say we are hoping to identify a Gigafactory location in Europe before the end of this year. It's not for sure, but we are hoping to do that before the end of the year.

Operator

Our next question comes from Zachary Shahan with CleanTechnica.

Zachary Shahan

First of all, thanks for the recent retweet, Elon. I was really, really impressed with the Model 3 after owning a Model S, and so I'm really impressed how much you've developed since the early days. My first question was about conquest sales actually. Right before the call, we published an article that Camry sales were down 22% year-over-year, Prius sales were down 23% year-over-year, and we're very curious how much you're pulling from these other cars, other segments. It sounds like you've sort of answered that question at the beginning, but can you give anything in terms of what percentage those top 5 are in terms of trade-in sales and how broad you're pulling? I know you pull from pickup trucks, from sports cars. Can you speak a little more about the diversity you're pulling from?

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Actually we don't -- actually what we have right now is just the top 5. I'm not sure what the allocation is between top 5 or where it goes beyond top 5. We're just sort of [indiscernible] ask for the top 5 breakdown. And it's just interesting that a few are trading up into a Tesla, so they're willing to spend more money on a Tesla than their current car just based on the trade-in values. I mean, a Civic is a very inexpensive car compared to a -- particularly the Model 3 today. So that's promising from a market access standpoint. But of course, we're going to do the Model Y and compact SUV. We're going to do pickup truck, the Semi, the next-generation Roadster. I mean, we have such awesome ideas and probably the biggest limiter on our growth is like how fast can we grow battery production and especially cell production on the wholesale supply chain, I think will be the fundamental determinant of Tesla's growth. We're super fired up to the [indiscernible]. Like I think they're all super cool. I know [indiscernible] favorite is the Semi, and that's pretty wicked obviously and -- it's pretty -- it's great. And we are ramping -- we've actually fared, we made significant improvements in the designs since the unveiling that we had and so really even better than what we talked about. The -- probably my personal favorite for the next product is pickup truck and we're just doing an amazing pickup truck. And the Model Y compact SUV, probably the most popular car category in the world, obviously going to sell pretty well. So a lot of cool things. And of course,

solar energy getting the -- we're kind of self-starved for power right now. So we actually had to artificially lift the number of Powerwalls because we don't have enough cells. So we're solving for that very rapidly, and we expect to ramp up Powerwall and Powerpack production substantially later this year and early next. And as well as getting [indiscernible] -- as well as ramping up of the solar and then the Solar Roof. We now have several hundred homes with Solar Roof on them, and that's going well. It takes a while to just confirm that Solar Roof is going to last for 30 years and all the details work out and working with first responders to make sure it's safe in the event of a fire and that kind of thing. So it's quite a long validation program for a roof which has got to last for 30, 40, 50 years. But that we also expect to ramp that up next year at Gigafactory 2 in Buffalo. That's going to be super exciting. So [indiscernible] I think we're [indiscernible] if there's a company with a better product roadmap. I'd like to know what it is because like this is what -- we got some super awesome stuff coming. Yes.

Zachary Shahan

And regarding the Model Y, there's been a lot of questioning if you're going to have the same process as with Model 3 with reservations, if you can shorten the reservation timeline or if you're going to have a different process this time around.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

We haven't made a final decision on that.

Zachary Shahan

So last question, then. Regarding the daily production, we've been seeing a sort of a rise and fall with the daily production of the Model 3 as you incorporate new performance or white seats. Can you speak at all -- we always like to get the technical side of what you're doing there. Can you tell what the bottlenecks are right now that you're working through? And what we can sort of -- how we can picture ourselves in the factory there with you?

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

All right. And the thing -- actually what I love about your writing is that you really care about getting the details right and you really understand things well, which is awesome. And -- but after what -- be careful I don't have soundbite that is then for those that don't have a nuanced appreciation of the situation, that soundbite then gets -- becomes front-page news. That's like, nope, that's not what I meant. Exactly. And like, oh, man. this is like [indiscernible] But the -- right now, the biggest constraint on production again, do not -- please don't make federal case out of this because it's something that will be solved in like in a matter of like a week or 2. It's like it's body production, so that's why -- I mean, you can certainly tell what am I personally working on that's going to be a bottleneck in the company. So most likely producing Model 3 bodies. We made huge progress in the last few weeks and, in fact, I was just told that we're able to achieve our first 24-hour period where we made over 800 Model 3 bodies, which is pretty great. And so that sets us -- so we just make sure again that we sustain that 800-plus per day rate. And then paint is doing great. GA's doing great. Yes, it's good.

Zachary Shahan

A quick request. Years ago, you warned about a coming short tsunami and it seemed obvious that it was coming, but the shorts didn't really seem to recognize it and then sort of attacked you, trolled you for months. And then finally, it came. You again warned very honestly, I think, very directly that there is going to be a short -- kind of epic short squeeze. We have, I think, the whole community has a little request. Don't let the trolls get you down. Don't feed the trolls too much, but we do like it when you tease the trolls a bit. So use your judgment, but thanks a lot for what you're doing.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Right. Well, thank you for your in depth coverage of clean air energy technology.

Martin Viecha

And the very last question comes from Galileo Russell who represents the retail shareholders.

Galileo Russell

Congrats on awesome quarter. Really proud to be a Tesla shareholder with the Model 3 ramping to 5,000 a week. And I think you may have touched on this, but I'm curious, will Tesla ever produce vehicles at Gigafactory 1, maybe the Semi? And then I'm curious on any manufacturing synergies between the Semi and the Model 3.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Oh interesting questions. You always ask us really, really interesting questions. Really, really interesting questions that I cannot actually -- the first one, I cannot -- it gets so much attention where we put production, so I cannot answer any like where we're going to put production questions. The -- but will the Semi use a bunch of Model 3 technology, the answer is yes. Jerome, I don't know if you want to elaborate on that or...

Jerome Guillen
Vice President of Programs

Well, I mean, you can already see in the prototype that we've had virtually out of the Model 3 component, the screen, the door handles, I mean, as much as possible -- yes, the motors, yes, and the prototype a lot of the cell technology. But there are some changes and I'd rather not say it in public, yes. Obviously, it's going to be better than what we showed last year, a lot of improvements. Yes.

Galileo Russell

Okay. So hopefully, you can talk more about this. With the battery project with PG&E that was recently announced, I'm wondering if you can elaborate how you're prioritizing battery pack between auto and energy storage. Because it seems like you ramped auto battery packs to 20 gigawatt hours in the past 12 months, but are only guiding for about 1 gigawatt hour of Tesla energy installation in the next year. So I'm wondering why is Tesla Energy, given its supply constraints, like why not ramp that supply to 10 gigawatts? It seems like the guidance is still below there.

Deepak Ahuja
Chief Financial Officer

Yes. It's -- as Elon suggested earlier, we are -- essentially, it makes sense for us to prioritize Model 3. But we are adding a ton of capacity, self-capacity, and J.B. could talk more about it, that will enable us to dramatically ramp our energy storage business as well in the coming quarters.

Jeffrey B. Straubel
Chief Technology Officer

Yes. You kind of mentioned only 1 gigawatt hour, but that's a big number in that business, and it's maybe on the order of 300% what we did the prior year. And we're still aiming at maybe another 3, 3x to 4x growth for 2019.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

So we're at scale. These are insane growth levels.

Jeffrey B. Straubel
Chief Technology Officer

Crazy growth rate.

Elon R. Musk

Co-Founder, Chairman, CEO & Product Architect

It's a little like serving software. This is like you actually need to build those -- like a lot of atoms but [indiscernible] you know what I mean? Like once you build software, you can obviously have lots of copies, but there's like a lot of really complicated atoms, man.

Jeffrey B. Straubel
Chief Technology Officer

Maybe specifically also to your cell -- to the cell limitation question, I think this has been mentioned before, but we also do use some other vendors.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

We use Panasonic and LG and...

Jeffrey B. Straubel
Chief Technology Officer

Exactly, our energy products. So I heard people feel like this is kind of a zero-sum game or something with Model 3, but that is not the case.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

We do a partial-sum game [indiscernible] we did shut down this Powerwall cell line for Model 3, to be totally honest, but we kind of have to do that. But that's -- we're adding new cell lines, and we'll be able to address that issue very soon.

Deepak Ahuja
Chief Financial Officer

I think one perspective we are seeing tripling [indiscernible] also...

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

So these are mad growth numbers, mad.

Deepak Ahuja
Chief Financial Officer

Last year, and it's one thing to produce, but it's also another thing to install [indiscernible] you need the infrastructure and the people to do that. So this massive scaling is very few companies grow at that rate.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes. And one of the great challenges [indiscernible] there need to be a lot more electricians. So we actually had an electrician training program. We're going to actually have to fast-train new people who've never been electricians before to be electricians because otherwise, [indiscernible] there's not enough electrician capacity in the United States and most places in the world to install Powerwalls. And so we'd have to actually literally train electricians and like it takes like 2 years basically before somebody is certified to be an electrician. So it sounds like, okay, we [obviously] can't grow faster than the rates and number of electricians who can physically install Powerwalls. That's like one of the limitations.

Jeffrey B. Straubel
Chief Technology Officer

And that PG&E project you mentioned is an incredibly exciting one. It kind of is indicative of the growth rate. It has [indiscernible]

Galileo Russell

Yes, can you elaborate on that?

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Saying [indiscernible]

Jeffrey B. Straubel
Chief Technology Officer

But I mean, it is over [indiscernible] gigawatt hour, full considered.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes, gigawatt hour. that's public, right?

Jeffrey B. Straubel
Chief Technology Officer

It is now. And it has a -- and just to give you a sense, it took us 5 years of growing that business to get to a gigawatt hour cumulative deployed.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

And so many people who had said gigawatt hour is an impossible number for lithium-ion. Like that's -- yes.

Jeffrey B. Straubel
Chief Technology Officer

The car business is still much bigger as we sit here today, but the growth rate on energy is faster.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes, if you extrapolate energy growth rate -- well, obviously if you extrapolate anything; triple for a year, pretty soon becomes size of your universe. But long term, we would expect the energy business to catch up to the order of business in size.

Galileo Russell

And then lastly, I'm really curious. Elon, do you have any part of the business that shareholders should be asking or thinking more about? Or what do you wish would have been asked on the call?

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Good question. We're trying to anticipate -- actually we're trying to anticipate the questions that are on people's minds, that's why I have the Autopilot, key leaders of the Autopilot team here and much of the executive team of Tesla here, to try to be proactive in that regard. Was there anything [indiscernible] I think we really covered a lot. So there is any -- yes.

Galileo Russell

Just my very last thing, the new fiscal engineering strategy of profit and cash flow and you saying that will last in perpetuity sort of, sort of caught me by surprise personally. And so I'm curious if there's any tradeoff to growth with that new strategy? Or sort of what's the rationale behind the scenes. Because this just seems like the biggest change in Tesla's financial engineering strategy since the IPO.

Elon R. Musk
Co-Founder, Chairman, CEO & Product Architect

Yes, I mean, being cash flow positive and capital positive doesn't mean we're rolling in money. Like there's definitely going to be cases where we're just barely cash flow positive or barely profitable in some quarters in the future. But I think we're -- and it's been a long time now, it's almost 15 years now. I think we're at a scale where the amount of time that it takes to actually scale up and do things is, there's a certain minimum -- like we're big enough where we actually can spend money efficiently to make things go faster. So we kind of hit scale with volume production of cars. And I think we can -- I think this is probably the right thing to do, is to be sort of essentially self-funding on a go-forward basis. And apart from selective situations where there's some debt, temporary debt for construction of a Gigafactory in China or Europe or something like that, but apart from that, I think we -- like essentially, I don't think we're constraining growth in any significant way by adopting the strategy at this point. It would have been true in times past, but I think it is not the case. Yes.

Martin Viecha

Okay. I think that's all [indiscernible]. Thank you very much. Unfortunately, that's, I think, all the time we have today. Appreciate all of your questions and looking forward to speak to you next quarter.

Operator
Thank you. Ladies and gentlemen, thank you for participating in today's conference. This does conclude the program. You may all disconnect and have a wonderful day.