

Our first question comes from Adam Jonas with Morgan Stanley. Your line is open.

Adam Jonas – Morgan Stanley

Hey everybody. First I had a question on your forward-year guidance of 100,000 unit run rate by the end of 2015. Can you give us some sense of how much of that's coming from China? I mean we understand the demand for your products in China is off-the-chart strong, but we're a little concerned about your ability to deliver and service the volume while focusing 100% on the quality and building the brand off intensity. So maybe how many China stores or service centers would you need by this time next year that might be commensurate with that volume target.

Elon Musk

Sure. Well, and this is sort of give you rough guesses on the 100K run rate within the next year, which I think is, you know, actually one of the most interesting things in our newsletter which you picked up on. We're expecting that to be sort of roughly split between X and S. So we're talking a little -- roughly 1,000 units a week of each.

And when you look at the market demand for SUVs and sedans, that's about the split; it's almost exactly 50/50. In fact I think recently SUVs might have slightly edged ahead of sedans.

So if we -- so it's sort of reasonable to expect that if one has -- just address the demand and then the servicing side of things -- it's reasonable to expect that if we see sort of a comfortable 1,000 unit demand on the sedan side, well, probably we should expect that similar number on the SUV side. My guess is we'll actually see slightly higher on the SUV side. I think the Model X is going to be a phenomenal car.

On the service front, we are spending a lot of money on service expansion. That's our primary, in the sort of sales and service arena, it's primarily service, like the overall majority is service really.

Adam Jonas – Morgan Stanley

Good.

Elon Musk

So it's not really -- I contend it's not demand generation but how do we make sure that that demand is well-served.

So in terms of number of stores by the end of next year -- or number of service centers I should say by the end of next year, actually I don't have that off-hand. But it's probably on the order of 100 in China alone, I'm guessing, by the end of next year.

We are -- and probably worldwide it's on the order of 300. This is -- I'm speaking off the cuff here --

Adam Jonas – Morgan Stanley

Sure.

Elon Musk

-- but probably north of 300 worldwide.

And I'd say I've been very impressed with the Tesla China team and the quality of people that we're attracting in China. I mean I think the China team is smart and they work super-hard, so. And the pace of progress is just amazing. So I feel pretty comfortable about being able to do good service in China or great service actually. In fact, like the key metric we measure in service is the percentage of customers that are delighted, which is a 10 out of 10 score. That's both the primary thing we look at. And our goal is to get that worldwide to a majority of customers.

And domestically, I believe we're actually -- but in the U.S. we're about 70% of customers who experienced service rated as perfect, or yeah, 10 out of 10 is actually.

And another key metric we measure is the average time to service something. So our average is less than a day. So the car is -- so, in most cases we can actually pick up your car, fix anything that's wrong with it, and give it back to you, without you even knowing it was gone. So you just tell us like my car is at my office and this is where it is, and we'll pick up the car, fix it, and get it back to you before you finish work.

Our goal with service is sort of invisible up, which is, is there even -- it's like elves [ph] service delivery [ph]. Like you don't even see it. It's like -- it happens so fast. And once done, you'll love it.

And so I think there's like -- there's an interesting opportunity to revolutionize service as well. It's not just like, oh, let's do the same thing as before. I think it was a lot of lessons learned from a Formula One car approach. So, because we're not trying to serve customers for the most amount of money possible in a service, which is typical of the conventional auto industry, we want to get the job done super-fast, and then also make

sure that you don't -- like we want to anticipate issues so you don't have to come back again.

And so we actually bring the car and we kind of hit with a pit crew, like a Formula One pit crew. So instead of having one person per bay, the car gets slowly worked on over several days, it actually comes in and a team attacks it, and we're constantly improving the tools and the metrics to say, how can we get the car perfect as fast as possible. We actually bring in people from Formula One to help with the training on this. And I think there's a real opportunity to revolutionize the way service works.

Adam Jonas – Morgan Stanley

That's great color, Elon. Can I just ask a follow-up? Outside of BMW, any other parties -- can you say any other parties that have expressed interest in your patent-sharing gesture? I'm curious to think why you think the -- why the industry is moving towards hydrogen in this -- or so much of the industry seems to be pushing hydrogen like crazy in the past few months. Is this a bullshit move to kind of CARB [ph] to rewrite the rules on EVs, or do you think they actually believe this stuff?

And then just finally, can you confirm the rumor that Mr. Berns [ph] tried to kill you by running you over in an I8 [ph]? Thanks.

Elon Musk

He does intend to kill me in the Simpsons, but not in an I8 [ph].

Adam Jonas – Morgan Stanley

Maybe a vault [ph].

Elon Musk

Yeah. Well, I don't, as you know, I'm not the biggest proponent of hydrogen. RV and JB might be [indiscernible] you know. But really if you take a theoretically optimal fuel cell car and compare that to a car in production, battery electric car, on key metrics of mass, volume complexity, cost, refilling infrastructure, it's just -- it's a loss. So it's the best case in our opinion, the best case fuel cell car, and obviously the fuel cell cars are far from best case, cannot be the current case electric car, well, why even try it? That just makes no sense. Success is not one of the possible outcomes.

JB, anything you'd want to elaborate on that?

JB Straubel

I think that really it's pretty clear, the only real benefits that get touted for fuel cell and hydrogen vehicles are potentially range and refill time, but both of those are not [indiscernible] benefits when you look at where battery technology is today and certainly where it's going in a few years. So I think people make a mistake of comparing today's technology with future potential technology instead of two technologies at the same point in time.

Elon Musk

Yeah. I mean even if you take theoretical optimal, like theoretically perfect [indiscernible] I just don't think you [indiscernible].

Adam Jonas – Morgan Stanley

But then, JB, like why are they doing -- why are they doing this? That's why I asked if it's BS. Is this just kind of a diversionary tactic or do you think they're just not on -- what's up?

Elon Musk

We're quite confused about this.

JB Straubel

Yeah. It does not make a lot of sense. I mean we didn't even touch on the infrastructure challenges that hydrogen brings, but building out that infrastructure is substantially more expensive than building out any electric vehicle infrastructure. And there's almost none of it today.

Elon Musk

Yeah. Also another thing too, like hydrogen is an energy carrier, not an energy source. So you have to create the hydrogen, which is really inefficient. Because you'd either have to crack a hydrocarbon or electrolyzed water.

JB Straubel

And if you want to do it renewably, the water electrolysis route is really the only --

Elon Musk

Yeah, which is super inefficient. Yeah.

And then hydrogen has very low density, so if you're going to pick it chemical energy storage mechanism, the hydrogen is a terrible choice. Like

at least, you know, methane, CH₄, lock up the hydrogen with one carbon atom or something. Anyway --

Adam Jonas – Morgan Stanley

Maybe that answers the question.

JB Straubel

It doesn't make a lot of sense.

Elon Musk

Yeah.

Jeff Evanson

All right. Thanks a lot, Adam. We should get to the next caller please.

Operator

Our next question comes from Andrea James with Doherty & Company. Your line is open.

Andrea James – Doherty & Co.

Thanks for taking my questions. First one is I guess about quality control. Can you talk about the improvements you've made in quality control and where you think it needs to go? Maybe with a nod toward what's going on with the drive train systems?

Elon Musk

Sure. We definitely had some quality issues in the beginning for the [indiscernible] number of cars, because we're just basically figuring out how to make the Model S. And I think we've addressed almost all of those CARB [ph] production cars, I mean not all, but the vast majority have been addressed in cars that are being produced today.

And we're also getting better at diagnosing what's wrong, because in some cases we, particularly with respect to the drive unit, we think that something is wrong with the drive unit but it's actually something wrong with another part of the car. And then we'd replace the drive unit and that wouldn't solve the problem because the drive unit was not the problem.

And we had one particular case where there was vibration, and it was due to -- it was due to the -- a cable detaching itself and touching the drive unit assembly and causing vibration to be transmitted to the body of the car. And

it was somewhat pernicious because if the cable moved a little bit and so that it didn't provide a conductive path, then you wouldn't -- the vibration would go away. If you replace the drive unit, you temporarily tuck the cable back and think the problem was solved and it was -- but then the cable would vibrate itself down and transmit the energy. So I mean that, you know, the cable thing takes us like -- it's nothing to fix it. It's like, virtually, it's like a \$3 cable tied to solve it.

So there's a bunch of things like that which are just [indiscernible] diagnosis of the problems that we've obviously addressed.

There are a few items that will need a fair number of drive pans [ph] will need to be serviced. It's actually related -- one particularly is related to the differential, and we need to assume [ph] the differential. It doesn't require drive unit replacement, it just requires a technician to insert a Shim [ph]. We're going to have to do that on a fair number of cars. But that's like a \$0.50 Shim [ph].

So it's really -- I wouldn't assume that there's going to be some vast number of drive pans [ph] that will need to be replaced, but there's several service buttons [ph] that we'll be instituting, many of which we've already have to address the issue.

And every week I have a product excellence meeting, which is to -- which is a cross-functional group, so we've got engineering, service and production, and we go about all the issues that the customer is reporting with the car, and, you know, the action items that we addressed to get car ultimately to - - photonic ideal of a perfect car, that's what we're aiming for. Because although we -- I think we've got great service, but that service is no service. That's really what we want, is a car that never needs to be serviced. And I think we're getting there quite rapidly.

Andrea James – Doherty & Co.

Would you say you're satisfied more so with the quality control function and team you have in place?

Elon Musk

I think at this point we've got an excellent quality control team. And we weren't there in the beginning but I'm confident that we're there now. I mean our aspiration is sort of order magnitude better quality than any other car. And I -- we'll keep at it unrelentingly until we get there.

Andrea James – Doherty & Co.

And then just to flip over to the Giga Factory, it says in the shareholder letter you've broken ground in Nevada, and I guess it's out there in the blogosphere that construction paused. So I guess my question is, you know, why slow it down? And do you have a drop-dead date for when you really need to make sure you're really up and going?

Elon Musk

Yeah. We've essentially completed the -- creating the pad, the construction pad for the Giga Factory [ph] in Nevada. So in terms of creating a flat pad and getting the rocky foundation, that is substantially complete. There's still a little bit of work ongoing.

We're going to be doing something similar in one or two other states, which is something I previously said we'd do, because I think it makes sense to have multiple things going in parallel.

Before we actually go to the next stage of pouring a lot of concrete though, we want to make sure we have things sorted out at the sort of state level, that the incentives are there that makes sense, and [indiscernible] the state and Tesla. But I do want to emphasize that we're not -- Tesla is not going to ink up for a deal that is unfair to the state or unfair to Tesla. We want to make sure it's compelling for all parties.

And, you know, so I think on the Nevada side, at this point the ball is on the court of the governor and the state legislature.

Andrea James – Doherty & Co.

Is Panasonic having any input into the site selection process?

Elon Musk

We're keeping them closely informed, and so that -- where all the details. And they haven't -- they haven't volunteered advice necessarily. We'd certainly listen to their advice if they provided it. But they seem to be in accordance with our theory on location.

JB Straubel

Yeah. And Tesla is managing all of the utilities and infrastructure at the Giga Factory [ph] sites. So in that regard, you know, Tesla is basically aggregating the inputs and requirements from not just Panasonic but other potential partners as well. So it's primarily Tesla's role to be evaluating those sites.

Andrea James – Doherty & Co.

Appreciate it. Thank you so much.

Operator

Our next question comes from Ryan Brinkman with JPMorgan. Your line is open.

Ryan Brinkman – JPMorgan

Good afternoon. Thanks for taking my question.

Earlier in the year you had discussed the potential I think \$4 billion to \$5 billion investment in the Giga Factory through 2020. Is that still the number that you're working with? And I think too you had planned for the CapEx to be shared by the Giga Factory partners. In your press release this morning you mentioned that Panasonic will provide equipment, you the buildings, utilities, et cetera. Do you think you're on track to sign suppliers on to provide \$2 billion to \$3 billion of investment? And over what rough timeframe might we expect you to announce those partners and their respective investment commitments?

Elon Musk

Sure. Yes, that \$4 billion to \$5 billion number is we think probably accurate. I mean particularly over through 2020, I think it'll be closer to \$4 billion, maybe slightly less than that, before we get to initial high-volume production. But then as we do continued investments to improve output and improve the technology of the pack, it's probably closer to the \$5 billion over the 2020 timeframe, but probably less than \$4 billion to get up to serious production.

And then of that number, we see Tesla probably providing 40% to 50% of the total, Panasonic probably about 30% to 40%, the states maybe 10%, and other industrial partners about 10%, maybe 15% to 20%, depending on how vertical [ph] we go with the factory.

And then with having signed the contract with Panasonic, I mean I think -- well, I was never really -- something I was in doubt from my standpoint, but I think some of these people take things [indiscernible] which are -- I mean there are -- they're going to be fairly conservative in their words, but I think the actions are really what matter. And Panasonic has always taken the actions of an excellent partner. So we feel confident that there will be the amount of money needed to reach the 35 gigawatt-hour level at the cell level and 50 gigawatt-hour at the module impact [ph] level. The module impact [ph] stuff is all Tesla internal.

And then we're expecting precursor -- suppliers have the precursor materials from the [indiscernible] separator, maybe the electrolyte, to be also present in the factory.

Ryan Brinkman – JPMorgan

Right, that's extremely helpful and reassuring too. Switching gears, last question, is there anything you can say at all on the trend to Model X orders? I know that you don't disclose backlog, but perhaps you could speak qualitatively to it, maybe how it compares to when you first started taking Model S orders or how many are maybe returning customers, is there any difference geographically, and who is preferring an SUV versus sedan, where the orders coming from, et cetera?

Elon Musk

Sure. I guess what's important to appreciate for the X, that there -- let's just put the orders in context. There are no cars available for a test drive. There is no information about the cars in our stores because we're only selling the S. In fact, if somebody comes in who wants to buy the X, we try to convince them to buy the S. So we anti-sell it. And we don't really provide all that much information or details about the car or provide [indiscernible] on when you can get it. Despite all that, there's huge demand from around the world for the X.

Now I think that actually people are right, even though they don't have enough -- they don't really have enough information to know they're right, but they are.

Ryan Brinkman – JPMorgan

Great. Thank you.

Elon Musk

Yeah. It's -- our issue is not -- we will not have a demand issue. Yeah.

Ryan Brinkman – JPMorgan

Thanks.

Operator

Our next question comes from Colin Langan with UBS. Your line is open.

Colin Langan – UBS

Great. Thanks for taking my question. Just on the 100,000 exit rate in 2025, is that -- I guess that implies that the battery constraints will be limited, and at what point should we think of sort of that battery constraint limiting you until the Giga Factory comes online?

Elon Musk

Sure. You can sort of see -- I mean we see a path to potentially, you know, 150,000 cars a year. Maybe if you really push it, 200,000 cars a year, without the Giga Factory. So the Giga Factory is needed for that sort of -- that incremental 300,000 cars. But we can probably -- I would guess that probably it could be pushed to a couple of 100,000 cars a year with the existing -- without the Giga Factory. That's probably a good guess. So, yeah, we'll sort of see where that leads.

Colin Langan – UBS

And on the Giga Factory, I mean is the chemistry going to be the same battery chemistry that you're currently using or is that part of the discussions that are going on with Panasonic?

Elon Musk

There are improvements to the chemistry, as well as improvements to the [indiscernible]. So we would expect to see an energy density improvement, and of course a significant cost improvement.

JB, do you want to [indiscernible]?

JB Straubel

Yeah, that's, you know, the cathode and anode materials themselves are next generation, so we're -- I mean we're seeing improvements in the maybe 10% to 15% range on the chemistry itself.

Elon Musk

Yeah, in terms of energy density.

JB Straubel

Energy density. And then, you know, we're also customizing the cell shape and size to further improve the cost efficiency of the cell, and our packaging efficiency.

Elon Musk

Right. We've done a lot of modeling trying to figure out what's the optimal cell size. And it's really not much -- it's not a lot different from where we are right now, but we're sort of in the roughly 10% more diameter, maybe 10% more height. But then the cubic function effectively ends up being, just from a geometry standpoint, probably a third more energy for the cell, if you -- maybe 30%-ish. And then the actual energy density per unit mass increases, so.

JB Straubel

Yeah. Yeah, fundamentally the chemistry of what's inside is what really defines the cost position now. It's often debated what shape and size, but at this point we're developing basically what we feel is the optimum shape and size for the best cost efficiency for an automotive cell.

Elon Musk

Yeah.

Colin Langan – UBS

The chemical formula will be the same, it's just shaped differently or?

Elon Musk

No, no.

JB Straubel

No.

Colin Langan – UBS

It's a different formula.

Elon Musk

Yeah, yeah.

Colin Langan – UBS

Okay. And just one last question. It sounds like the Giga Factory might be very vertically integrated. How do you think about that for the assembly of the model -- a model three [ph]? Do you need to be highly vertically integrated or do you think you'll probably outsource more of that to reduce the costs of that model?

Elon Musk

I don't think outsourcing decreases the cost. That tends to increase the cost in our experience. It's just like -- the reason we don't -- the reason we outsource stuff is just because we had too many fish to fry, otherwise. But it's almost always the case that -- when we've in-sourced something, it got cheaper. Yeah.

I mean it's just -- like if the -- the thing that would make us really efficient - or for any given technology level, is to say, how far did that molecule move? And if the molecule is taking several round trips around the world, that's expensive. If it's just moving from one station to the next, then that's obviously lower cost. And so the vertical integration just means that the molecule doesn't move as much and it's not being put in a box and then put in a truck and then on a boat, and then, you know, going through customs and stuff like that.

So I mean I think that's generally true that a vertical integration and doing things at large scale results in cost reduction. I feel very confident with the 30% cost reduction per unit of energy. We're obviously going to target something higher than that.

Colin Langan – UBS

Okay. All right, thank you very much.

Operator

Our next question comes from Brian Johnson with Barclays. Your line is open.

Brian Johnson – Barclays

Yes, thank you. Could you maybe help us understand how you think about the gap or how we ought to think about the gaps between production and deliveries? It looks like typically production's been running 900 to 1,200 units in recent quarters ahead of deliveries. Your 4Q guide would actually imply delivery to roughly equal or actually a little bit higher than production. So, can you help us kind of think through that?

Elon Musk

Production in Q4 significantly exceeds deliveries. I mean the time from when a car is produced to when it is delivered, it depends on the mix of domestic versus international, because when you -- when cars are sent to Europe or China, they've got -- obviously get on a boat and they got to get through customs, and it's sort of a more lengthy process. So, average time for delivery of a car in North America is about two weeks-ish, thereabout. And

then for -- but for international deliveries, you've got to add another three to four weeks on top of that.

We try to tighten that down a little bit, but then if you blend the two, then maybe it's an average delivery time four or five weeks. So, you know, for cars made in October, they would all be delivered in Q4.

Brian Johnson – Barclays

Go ahead.

Unverified Company Representative

Yeah. The increase of our overall production, there are two factors that drive that gap. One is the ramp of production increase, the other one is the mix of international market.

Elon Musk

Right.

Unverified Company Representative

And even if the mix is the same but we're increasing production, it creates a bigger gap each quarter. And then clearly as we are shipping more to right-hand drive markets and to China, our international mix is increasing too.

So each quarter is a slightly different story, but certainly there will be a gap as we continue.

Brian Johnson – Barclays

Okay. So the implication of that though is your production in 4Q would be not slightly higher than 1,000 a week, that's more than slightly higher than 1,000 a week.

Unverified Company Representative

Yeah, it'll be sufficiently higher that we still deliver to our expectations of slightly over 35,000 cars this year.

Elon Musk

Yeah. At 1,000 cars a week, I mean 1,000 cars a week steady state implies a 50,000 roughly rate number, in steady state. So it doesn't really need to be much -- all that much beyond 1,000 to achieve our goal, on average, for the Q4.

Brian Johnson – Barclays

Okay. And if you think about the difference between the roughly 500 to 600 deliveries per week this quarter and the 1,000 a week rate you're talking about, what, you know, how would you waterfall the step-up in terms of the contribution of the three key geographies, Europe, China, obviously Hong Kong is part of that, and then North America?

Elon Musk

I mean long term I'd probably -- I'd say it's -- well, there's not just China and Asia of course. But I think long term we're probably looking at, this is just a guess, but I mean maybe 40% Asia, 40% North America, 20% Europe, as a rough guess. And Asia is more than China for sure. We have people [indiscernible] in Japan and we, like go to Korea, Hong Kong. Hong Kong being sort of China, part of China of course, special administrative zone. And Australia and New Zealand and that kind of thing. So it's probably 40% Asia Pacific region. And there we tend to do very well in our home markets in North America, has 40% there. And then Europe -- the demand is not just generally strong in Europe. But it's fair to say in Europe can have 25% to 30% of the mix. Those are just a rough guess.

Brian Johnson – Barclays

Our next question comes from Rod Lache with Deutsche Bank. Your line is open.

Rod Lache – Deutsche Bank

Hi everybody. You brought up a few times the future case electric car and you also mentioned that you're comfortable even in the near term with a 30% reduction in costs for batteries per pax, most of which you said is logistics. I wanted to ask you two things on that. One is, is that additional 10% to 15% that you talked about related to anode and cathode chemistry, is that incremental to the 30%?

And if you took a step back and thought about the trajectory for this in the next 10 years rather than in the next three years, what would you sort of -- what do you see on the horizon? Is there kind of a case for \$100 per kilowatt-hour pack in 10 years?

Elon Musk

I'd be disappointed if it took us 10 years to get to \$100 a kilowatt-hour pack.

Rod Lache – Deutsche Bank

So basically you're saying that, you know, within the next -- within that timeframe you would expect electric vehicles to reach cost parity and maybe even improve upon the cost of an internal combustion vehicle?

Elon Musk

Yeah.

Rod Lache – Deutsche Bank

Uh-huh. That's interesting.

Now another -- that's a pretty big statement.

Elon Musk

Seems pretty obvious to me.

In your question you had [indiscernible] should be corrected, like the -- so the 30% savings is not just due to logistics. Logistics is a big factor. We are --

JB Straubel

It's not even the biggest though.

Elon Musk

Logistics [indiscernible] the fact that it's just go to one station to the next instead of going from multiple entities to multiple entities. But really when you get to the kinds of scale that we're talking about, you really get to design customer equipment that's much better at processing each step. And you really get to design the machine that makes the machine, not just do so with off-the-shelf equipment. So it took -- everything about it is going to get a whole lot better. That's why we think the 30% number when the Giga Factory is at full production is a conservative number. Yeah. And then, yeah. So.

Rod Lache – Deutsche Bank

To get to those kind of targets beyond the 30%, is there some kind of breakthrough, you know, anode chemistries or things that you're looking at that you think are highly probable that are needed, or, you know, is it just a bunch of incremental steps that you see kind of playing out over the next years?

JB Straubel

Well, we're tracking things that have a whole range of different horizons for implementation. But to get to -- to realize the Giga Factory and those cost targets, we don't need some fundamental breakthrough in chemistry and material science. That -- those things are pretty well-understood in front of us.

In the long term, there are a lot of very interesting, you know, long term being the 10 years perhaps you mentioned, or more, there's many very interesting things in the horizon with reducing probabilities as you go further up.

Elon Musk

Yes. Yeah, absolutely. It's -- yeah. It's heading to a place of no contest with respect to gas I mean. But I mean we're trying to make it go there as fast as possible because time is important here. You know, the sooner this can be done, the sooner we can reduce carbon output and reduce the probability of a catastrophe. So, yeah. And the absence of Giga Factory, this progress will be much slower.

Rod Lache – Deutsche Bank

Just wanted to ask a quick kind of near-term question. You know, now that it sounds like you're buttoning down a lot of things with regard to the Giga Factory and expansion of service centers and things like this. Can you share any kind of high-level thoughts on how we should be expecting the trajectory of your CapEx, R&D and SG&A as we look beyond this year, just maybe some kind of broad ranges into next year?

Deepak Ahuja

Rod, we can share more details towards the end of the year as we look further out. But clearly given the huge ramp-up in our deliveries and [indiscernible] revenue, we should see a significant improvement in our operating expenses as a percentage of revenue.

Elon Musk

Right.

Deepak Ahuja

As we go forward. And then we can provide a little bit more granular guidance as go further up.

Elon Musk

Yeah. In the past [indiscernible] we've shown all of our cards, so people have kind of gotten used to us showing all of our cards. We're not currently showing all our cards.

Rod Lache – Deutsche Bank

Okay. All right. Well, thank you.

Operator

Our next question comes from Patrick Archambault with Goldman Sachs. Your line is open.

Patrick Archambault – Goldman Sachs

Hi. Thank you very much. Just a question on the cadence of sales. With the, you know, the guide for deliveries of 78 for next quarter, it does appear that you are going to be starving some demand there certainly, which is going to clearly get allocated into the following quarter once the changeover is done. But I guess how do you think about just the risks of kind of associated with hitting that target? I guess if the math is right, I think you go from 78 to 13,000. It just seems like an awful big ramp, maybe not in absolute units but certainly kind of you think about it almost doubling. So how should we think about that and managing that?

Elon Musk

Sure. We try to -- because I agree, it does seem like sort of a crazy leap. But we try to address that by pointing out that there's two weeks missing in Q3 because of the factory retooling. And those two weeks at fairly high production. So you can add almost 2,000 units to what Q3 really would be if we didn't have that two-week interruption.

So it would actually be, you know, more like 9,500 units or something like that in terms of Q3 deliveries. And then it's like, oh, okay, it's much more of -- you can see how we get from sort of 7,500 to 9,500 to 12,000, 13,000, whatever the case may be. That seems -- the progression is much more sensible in that context [indiscernible].

Patrick Archambault – Goldman Sachs

Yeah, it certainly helps us understand in terms of kind of the underlying cadence of purchases, if you will. I mean I suppose, even though we're talking about deliveries, but I guess the one question I would have is, how about in terms of the number of service centers and just the logistics of

actually being able to physically deliver these cars? Is that a constraint or a risk in any way, I suppose?

Elon Musk

No. We actually won't be delivering at the 1,000 or 1,000 plus per week rate at the end of Q3.

Patrick Archambault – Goldman Sachs

Okay, understood. And then I guess another related question, if you have any color on this, is if you just kind of go through what you've laid out there and hold the regional delivery rates kind of constant with where they came in in Q2, I mean most people sort of have those through various sources, it does imply again that clearly you're starving one or more regions in Q3 in terms of demand that they'd want but can't get. But for Asia, it implies something like maybe 5,000 to 6,000 units of deliveries, at least on our preliminary math.

And I guess that's a similar number that you did initially in the U.S. when you launched. And is that something that you've got a backlog for already? I'm imagining the answer is yes, but was just kind of curious.

Elon Musk

Demand will not be a problem. Yeah.

An interesting little item, like how many stores are we building? Well, we're building hardly any. We're building lots of service centers.

We can drive demand up at will. But if drive it up too much, then people would get upset with us because they waited too long for their car. And the only guy in China gets upset that when he got his car, he bashed it, which seems [indiscernible] but he said the reason for bashing the car was that we took too long to deliver to him. I'm like, okay. But -- and when I was visiting in China, the only unhappiness I saw was that, because customers were upset about waiting too long for their car. So it's like, boy, we better not stoke demand in that situation.

And sales per square foot on our stores, I believe Apple's normally the leader on sales per square foot, our sales per square foot are double that of Apple's.

Patrick Archambault – Goldman Sachs

That's a -- thank you. That's helpful perspective.

If I could just ask one more, you know, just building on Rod's question. As you think about OpEx, I know you're not giving guidance for next year, Deepak, but clearly what you've laid out for your expansion of service and distribution, obviously that's an expense that we expect to increase and necessarily steady away [ph]. You know, how do we think about just R&D in the shorter term? I mean obviously it's fairly elevated. I think the math implies more than 400 million this year, if I'm doing it right. Is that something that takes a little bit of a breather in terms of the growth rate, or, you know, just given the significant product ramp you've got, it's something we should look to continue to increase --

Deepak Ahuja

Yeah. We are doing a lot of product related actions at this point, and that is creating an artificial bump. And especially the Model X and other activities that are going on. That will sort of slow down. But then we want to work on so many exciting things. I don't want to just suggest that R&D will slow down. I think if there is one place we want to spend money, it's there, and do more exciting stuff. So I think we'll just provide information as appropriate further on.

Elon Musk

Yeah. I mean another thing, our CapEx and R&D numbers are better than they appear because there are things you don't know about.

Patrick Archambault – Goldman Sachs

Well, okay. A lot of interesting stuff to look ahead to. Thanks for the color guys.

Deepak Ahuja

You're welcome, Patrick.

Operator

Our next question comes from John Lavallo with Merrill Lynch. Your line is open.

John Lavallo – Merrill Lynch

Hey guys. Thanks a lot for taking my call here. First question is, I mean there's clearly a lot of excitement in anticipation about China. It just seems that the Chinese government is doing just about everything in their power to kind of favor the domestic OEs, I mean whether it's the 10% purchase tax avoidance that won't apply to imports, the charging station standards that at

this point don't seem to be compatible with Tesla's technology. And even I mean they're allowing -- or thinking of allowing non-OEs to have licenses to produce autos, including the owner of [Fisk Renee 123] who might be in that race.

So I guess the question is, I mean, how do you see this kind of environment developing? I mean do you think there's going to be just increasing pressure from the Chinese government to kind of favor the domestic guys?

Elon Musk

Actually I've been pretty impressed with the Chinese government at all levels, the city level and the national level. They're actually -- I mean they have done some political [ph] actions maybe quite a bit in the past, but I don't think that's going to be the path going forward for them. And actually for the sales tax exemption, it does actually apply to non-Chinese cars. So I think you may be missing a point [ph] there. There are -- we have to adhere to Chinese charging standards, but we are going to do so. But the challenge was that those standards weren't defined until about a month ago. So it's a little tricky to adhere to something that is not yet definitively been announced. Now that it has, we're committed to meet those standards, and we expect to fit within the sales tax exemption. Yeah.

JB Straubel

It's actually a very -- relatively simple matter to meet the Chinese standards. They're very familiar and quite close to the European standard.

Elon Musk

Right. Yeah, exactly. And we're ready to meet the European standard. So as we're trying to observe the U.S. standard, the European standards, and then we'll be observing the China standard which is, as JB said, very similar to Europe.

John Lavallo – Merrill Lynch

Okay, that's very helpful. Sorry, go ahead.

Deepak Ahuja

Yeah. In Shanghai, we got the exemption plate fees, which is on an imported EV, so it's not just for local EVs that those policies are being applied. And we are having discussions in other cities where that's a possibility too.

So I think so far it's been overall a positive reception that we have received, so it's been good.

Elon Musk

Yeah. They're genuinely committed to electric cars. And it's not just about favoring local manufacturers.

John Lavallo – Merrill Lynch

Okay, that's helpful. I guess the second question, recently Edmunds put out a report on I guess their first year with Model S, and obviously everyone has their own opinion on this. But there's been a lot of talk about quality in the call, and what Edmunds was saying, and you may have read it, is that there were something like 28 to 30 service campaigns that were not part of the regular scheduled maintenance, and because of that they couldn't recommend the car. So I mean I'm just curious how you guys might respond to that.

Elon Musk

Well, there's definitely some genuine issues we have with the car, but they had one of our early production units, and in fact most of the problems that they have encountered there are not present in current cars. We also -- I think this may be ending up being counterproductive, but the service team was ultra proactive with the Edmunds car. So they would -- they were doing their best to make Edmunds happy, and I think unfortunately that resulted in them changing things up, just on the off-chance something might go wrong.

So that drive unit issue that I mentioned earlier were, the drive units [indiscernible] replaced even though it wasn't a drive unit problem, that happened with them twice. So, unfortunate sort of case, but I don't think it's broadly correct. And it's definitely correct of -- for cars that are made in like the past year.

JB Straubel

Yeah. If I might add one thing on the drive unit replacements as well, I think it's important to note that the drive unit is a very complicated sort of assembly of different components, and the pieces that have needed service and failed internal to the drive unit are relatively not very expensive. And they're being replaced in order for expedience, so they get the car back on the road for the customer in the minimum time.

Elon Musk

Yeah.

JB Straubel

But going forward, we're looking at ways to repair them and give people back their same drive unit very, very quickly, in about the same amount of time. If you had to replace your internal combustion engine every time something small went wrong --

Elon Musk

-- the gasket or something --

JB Straubel

[Indiscernible]

Elon Musk

It's literally like the sort of small Shim [ph] that I was mentioning is equivalent to replacing a minor gasket on an internal combustion engine.

JB Straubel

Right.

Elon Musk

And normally you wouldn't get someone a new engine for that. But our optimization was customer happiness. And so we knew exactly what to do. We just wanted to give people back their car right away.

JB Straubel

Yup.

John Lavallo – Merrill Lynch

Yeah. Thanks a lot guys.

Deepak Ahuja

Just to add from a cost perspective, since these are not significant, the overall impact on our warranty reserves has not been significant.

Elon Musk

Right. And we're going to be at it hard core until that car is 10x better than any other car on the road.

Operator

Thank you. Our next question comes from Ben Kallo with Robert W. Baird. Your line is open.

Ben Kallo – Robert W. Baird

Hey. Thanks for taking my question. As we look ahead to next year, in the 100,000 unit by the end of next year, is the biggest production increase happening right now over these two weeks, or is there some other step that has to take place next year to get you to that level?

Elon Musk

Well, there is a big step that's expected to occur in Q1 next year which is the bring up of the body line, the SX body line. So we've -- what we did the past two weeks is the assembly line where basically the bits get put together. But then the body line is where the body itself is welded together, welded and bonded together. So it's like the core skeleton of the car is created. And so we anticipate probably -- well, I'm not sure if -- it may only that we -- actually -- sorry, I take it back.

We're going to bring the body line up in parallel with the current line. So unlike this case with the assembly, we had to -- we didn't have too complete assembly lines, where we had to stop and retool. In the case of new SX body line, which is a line that is designed to be capable of 2,500 units a week, maybe more than that, conservatively at 2,500 units a week, at a lower cost point, we should be able to do that in parallel.

Ben Kallo – Robert W. Baird

Got it. And --

Elon Musk

And I should say that -- another thing that's going to be -- see a big upgrade, really big upgrade, is the paint shops. There are few cases where advanced CapEx spending makes sense, even though it's going to pay off in sort of two to three years, but it's just such a big improvement that you kind of want to do it even at a high discount rate. So our paint shop is being upgraded. It's going to be the most advanced automotive paint shop in the world.

Ben Kallo – Robert W. Baird

Got it.

Elon Musk

But it's expensive to do that.

Ben Kallo – Robert W. Baird

And then we like watching Halle Berry every week, but can you give us any details on when we can see the Model X? And then there's slightly different language about the alpha and beta that I think is new. So could you just tell us the difference between what the alpha model and the beta model?

Elon Musk

Yes. The X that was produced, the sort of the show [ph] car or advanced prototype, is sort of a pre-alpha. The alpha itself is, you know, the production, it's basically production design. We're going to move very quickly from alpha to beta. So in this case, like for the Model S, the alpha was a lot more primitive than X will be, because of course we didn't -- for the X we've got all [indiscernible] and powertrain stuff that's been done for the S that we can build upon. In the S case, we didn't have that.

So it's really a very advanced alpha car that we're producing through the X. And we'll move to beta within three months. So it's a real fast alpha to beta. And you can expect to see production cost, not in customer hands but kind of on the road, doing test and validation in Q1 next year. We'll have quite a few of those.

Ben Kallo – Robert W. Baird

Great. Thanks so much.

Operator

Our next question comes --

Elon Musk

And something I do want to emphasize with the X, is because we're moving very quickly into a high production mode, as opposed -- with S, the S had a -- Model S had a long production slope, starting off very slowly and then taking kind of six months to reach the 400 unit per week level. In the case of the X, I mean we're going to try to move to sort of several hundred units a week within three months of production. So it's like half -- maybe less than half the length. Yeah.

But because of that, we really wanted to [indiscernible] validation on the car, test the heck out of it before going into volume production.

Operator

Thank you. Our next question comes from Colin Rush from Northland Capital Markets. Your line is open.

Colin Rush – Northland Capital Markets

Thanks so much guys. I just wanted to make sure I heard these numbers right. So we're going from 1,000 to 2,000 cars a week in 2015. So if I take the midrange of that, about 1,500 cars a week or production levels of 78,000 cars per year. And if I heard correct on the delivery timeframes, you're about two weeks in North America and something like five to six weeks overseas which you're trying to shorten up, so we'd be thinking about works in progress of roughly 10%.

So are those numbers right in terms of how I'm thinking about kind of targets for you guys for next year?

Elon Musk

It's difficult for us to predict the slope of next year, like -- so what is the slope, you know, what does the exact curve of the production rise look like next year. We feel confident of X ending next year at 2,000 units a week of production and demand, absent like some macroeconomic shock. But it's hard to say exactly what the area under the curve looks like. But it's, you know, yeah, certainly more than 60,000 I would think. But, yeah.

Colin Rush – Northland Capital Markets

Okay. That's perfect. And then can you talk about the weight reduction efforts that you've got going on right now with the vehicles, and how should we think about the cadence of pulling weight out of the vehicle and potential translation of that into extended range?

Elon Musk

Well, the puzzle [ph] on weight versus range is not super strong. There is an improvement but it's not a huge improvement. The Model S has gotten steadily lighter over time. It's really like, you know, it's quarter a pound here, half pound there, but the Model S in production today is at least a few hundred pounds less than that in the start of production. And we'll continue to see improvements over time.

So to get to a step change on -- I mean, there are so many pieces in the car, like you have the battery pack, the motor -- the transmission, or the gear box, the tires and wheels, the seats. I think if you've got like a big

improvement any one of those items, maybe with the exception of the battery pack, it only changes the weight of the car by like 1%, 2% or something. These are all good things, but there's not like one big block [indiscernible] sitting in the car that [indiscernible] more primitive. It requires whittling away at a whole bunch of things.

JB Straubel

And the range impact is, you know, weight is one fraction of impact on range, so, even smaller than the direct percentage of weight reduction.

Elon Musk

Yeah. And it is getting slightly better over time. It's hard for people to sort of perceive it from one month to the next, but if you look at it over the course of a year, you'd notice.

Colin Rush – Northland Capital Markets

Great. Thank you.

Operator

Your next question comes from Andrea James with Doherty & Company. Your line is open.

Jeff Evanson

And Patrick [ph], I should have mentioned, we probably need to cut the call off after this question. So we'll have this be the last question please.

Go ahead, Andrea. Sorry.

Operator

Please check your mute button. Andrea James, your line is open.

Elon Musk

We can take [ph] a different question I guess.

Jeff Evanson

I guess she's no longer in queue. So with that, I guess we'll call it a day. And thank you everyone for joining the call. And we look forward to talking with you for our third quarter earnings release. Goodbye.