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Shareholder/Analyst Call

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Martin Viecha
Senior Director for Investor Relations

Good afternoon, everyone, and welcome to Tesla's 2021 Annual Meeting of Stockholders. We're glad you could join us today. My name is Martin Viecha, and I'm Tesla's Senior Director of Investor Relations.

There will be 2 parts of today's meeting. First, the formal part of the meeting will cover the 9 items that stockholders have been asked to vote on. After the voting, I will introduce Tesla's Co-Founder and CEO, Elon Musk. He will give a presentation about Tesla's year in review.

At this time, I'd like to thank the members of the Tesla team and Board who are with -- here with us today. A representative from PricewaterhouseCoopers, Tesla's independent auditor, is present on the phone with us as well.

But before we begin, I'd like to introduce you to Robyn Denholm, the Chair of Tesla's Board, who would like to say a few words.

Robyn M. Denholm
Independent Chairwoman

Thanks, Martin. Well, welcome to the 2021 Annual Shareholders' Meeting here, in virtual form this year. We hope next year that we'll be able to have our regular in-person gathering just like we have over the last decade.

Since we last met as a shareholder group in September of 2020, a lot has happened at Tesla. I want to just recap some of the things that have happened over this last 12 months. So in the 12 months that ended September of 2021, we've delivered over 800,000 vehicles. We've also started new production lines in Shanghai. We've commenced the pilot production of our own in-house battery cells. And on top of that, we've constructed 2 new gigafactories on 2 different continents, including the one that we're here today in Texas.

But maybe most importantly, our mission of accelerating the world's transition to sustainable energy remains at the center of what we do. Over the last 12 months, Tesla has continued to help shift the public perception of electric vehicles. And it wasn't too long ago that many people were still questioning the future of EVs. I would say that, today, that's no longer the case.

There is no doubt that the transition to sustainable transportation and the transportation industry is turning electric. In many places around the world, you can't drive down the street without seeing many Teslas, which, to me, is an incredibly proud thing and a testament to our progress.

While our performance to date has surpassed many common expectations, we believe that we're only at the beginning of what -- the long journey ahead that we have. As we disclosed in our impact report this year, by 2030, we are aiming to sell 20 million electric vehicles per year and deploy 1,500 gigawatt hours of energy storage per year.

Our mission is clear. The automotive sector and the energy sector have to become fully electric. There's no question about it. While producing and selling 0.5 million cars in the last calendar year is more than most expected, we need to continue to grow exponentially to create a true impact for the planet and for our shareholders.

I also want to acknowledge that Tesla's achievements so far and our future aspirations would simply not be possible without the unrelenting efforts of our amazing employees. Each and every one of them who globally now number almost 100,000 are doing everything that they can every day in the name of our mission. While our investors might recognize some -- a handful of Tesla executives or directors, we know that Tesla's success is due to the creativity, the ingenuity and the sheer hard work of our tens of thousands of employees globally. As we expand into a truly global manufacturer, we are committed to making sure that we employ, grow and retain people with a passion for what we do and are aligned with our mission and our values and culture globally.

I also want to acknowledge and thank my fellow Tesla Board members who've been unwavering in their commitment to Tesla to help grow, guide and evolve the company and its governance practices. And I especially want to call out and thank Antonio Gracias as this will be his last shareholder meeting as a Board member after 14 years of unrelenting

support and being on the Board. He's made a significant part of Tesla's journey and a key member of the Board for all of those years. Antonio, we appreciate everything that you've done for the company, and we will miss you.

And lastly, I wanted to say thank you to you, all of our shareholders. You are an intrinsic part of our journey and this unique journey. We're proud to say that our shareholder base is probably the most committed, most active and most engaged base I've ever seen. Thank you for spreading the word for us, for being with us through our ups and downs, and we wouldn't be here or where we are today without your support. And we are focused on continuing to deliver to our mission and for you for many years to come.

And so now I will hand it over back to Martin, who's the Chair of our meeting today. Thank you.

Martin Viecha
Senior Director for Investor Relations

Thank you, Robyn. I will now call the meeting to order. Please refer to the meeting agenda that is posted on our virtual meeting site. The time is now 4:36 p.m. Central Time, and I declare that the polls are now open.

We have already received, over the past few weeks, voting proxies from our stockholders, meaning that almost all of the votes that will be counted were already submitted before this meeting. However, if you wish to vote your shares or change your prior vote, you may do so through the virtual meeting site.

Tesla's Board of Directors has appointed Computershare Trust Company to serve as an inspector of election for this meeting. Computershare has taken and signed an oath as an inspector of election and has certified that starting on August 26, 2021, the proxy materials or a notice of Internet availability of the proxy materials were mailed or provided to all Tesla stockholders of record as of August 9, 2021.

We have a majority of all the outstanding shares represented at the meeting, so I declare that there is a quorum present and that we may proceed with the meeting.

These -- the items on the agenda are as follows: Number one, the election of 2 Class II directors, James Murdoch and Kimbal Musk, to serve for a term of 2 years; number two, to adopt amendments of our certificate of incorporation to reduce director terms to 2 years; number three, to adopt amendments to our certificate of incorporation and bylaws to eliminate applicable supermajority voting requirements; and number four, to ratify the appointment of PricewaterhouseCoopers LLP as Tesla's independent registered public accounting firm for the fiscal year 2021.

Tesla's Board has recommended that our stockholders vote for each of the director nominees and for proposals 2 and 4. We have also received 5 stockholder proposals as described in our proxy statement. I would like to remind our stockholders that Tesla's Board has prepared a statement in opposition to each of these proposals, which appeared in our proxy statement. The first stockholder proposal is an advisory vote regarding reduction of director terms to 1 year. Our Board has recommended that our stockholders vote against this stockholder proposal.

The stockholder proposal is proposed by James McRitchie, who is on the line to present this proposal. Mr. McRitchie, I would like to invite you to speak. You will have 3 minutes.

James McRitchie

Thank you. Can you hear me? I'm sorry.

Martin Viecha
Senior Director for Investor Relations

Yes, we can hear you.

James McRitchie

Okay. Thank you. Almost 90% key 500 -- Fortune 500 companies [seeks] the Board and [choose] a widely viewed corporate governance [benefit]. The annual election of [each of] directors more [indiscernible] to improve performance [Audio Gap] company's eyes.

Here's what [one] point said, when they [Audio Gap] their votes in advance [indiscernible] shareholders should be able to participate in frequently -- frequent elections of all Board members, preferably on an annual basis. This proposal should

also be evaluated in the context of Tesla's overall corporate governance. Shareholders cannot hold special meetings backed by written consent, nominate directors through proxy access.

At our 2020 Annual Meeting, 56% of shares voted in favor of my advisory proposal eliminating supermajority requirements. The Board is now letting you vote to repeal those supermajority requirements through proposal #4. However, notice the Board takes no position on this measure. That probably means Elon Musk and his inner circle are voting against this. Without this measure, obtaining a 67% approval rating means the Board's proposal to move to 2-year terms or mine to move to 1-year term will pass. This is essentially a way for the Board to look like they want to increase the frequency of elections without actually doing it.

Our company's technology is second to none. Our company's corporate governance should meet the same high standards. Vote for proposal #5. Thank you.

Martin Viecha
Senior Director for Investor Relations

Thank you, Mr. McRitchie. The second stockholder proposal is an advisory vote regarding additional reporting on diversity and inclusion efforts. Our Board has recommended that our stockholders vote against this stockholder proposal.

The stockholder proposal by Calvert Research and Management, whose representative, Kimberly Stokes, is on the line to present the proposal. Ms. Stokes, I would like to invite you to speak. You will have 3 minutes.

Kimberly Stokes

Thank you. Tesla states in its 2020 Diversity, Equity and Inclusion report that it is on a mission to accelerate the world's transition to sustainable energy. We at Calvert Research and Management heartily support this effort and understand how important it is to invest in companies that are leading the charge to a net zero economy.

However, we also know that it takes human resources to achieve these goals and ask Tesla to demonstrate how the company's human capital management strategy and specifically its diversity, equity and inclusion strategy supports the level of innovation and collaboration necessary to achieve this goal.

The business case for diversity is clear. Numerous studies demonstrate the benefits of a diverse corporate workforce. These include better financial returns, superior stock performance and importantly, research shows that diverse and inclusive teams support more innovation. Tesla's 2020 DEI report lacks sufficient quantitative and qualitative information for investors to adequately compare the company's performance over time and relative to peer. What the report does reveal is that Tesla's leadership is 83% male and 59% white despite having what the company described as a majority minority workforce, all at a time in which Tesla's customer base is evolving and growing more diverse.

Calvert asks that Tesla's reporting include the process the Board follows for assessing the effectiveness of the company's DEI program and the results of that assessment. We also ask that Tesla disclose its full EEO-1 report, a comprehensive breakdown of Tesla's workforce by race and gender according to 10 employment categories, which is already collected and provided to the United States Equal Employment Opportunity Commission every year.

In its DEI report, Tesla states, "We do the work required to ensure that our culture is as diverse and inclusive as it is collaborative and driven." However, in order to fully understand whether or not Tesla is executing well on its stated strategy, the company must be more transparent about its policies and practices and do the work to provide investors with reliable, consistent and comparable data that we need to make informed investment decisions.

We acknowledge that Tesla is committed to integrating DEI reporting into the company's annual impact report but want the Board to understand that Tesla's disclosure lags far behind peers. In 2020, Calvert analyzed the top companies held in our core portfolio. At that time, less than 20% were disclosing EEO-1 data, including Tesla. Following our engagement, 70% of these companies have committed to disclosing their full EEO-1 report on an annual basis. As shareholders, we are concerned that Tesla's lack of focus on diversity, equity and inclusion could hinder the company's ability to innovate in the future. We urge the Board to commit in full disclosure rather than incremental ineffective action. Thank you.

Martin Viecha
Senior Director for Investor Relations

Thank you, Ms. Stokes. The third stockholder proposal is an advisory vote regarding reporting on employee arbitration. Our Board has recommended that our stockholders vote against this stockholder proposal.

This stockholder proposal is proposed by Nia Impact Capital, whose representative, Kristin Hull, is on the line to present the proposal. Dr. Hull, I would like to invite you to speak. You'll have 3 minutes.

Kristin Hull

Thank you. Hello. This is Kristin Hull. Can you hear me? I am Dr. Kristin Hull, Founder and CEO at Nia Impact Capital. On behalf of Nia and our co-filers, I formally move Proposal 7.

This resolution requests that Tesla's Board of Directors oversee the preparation of a report on the impact of the use of mandatory arbitration on Tesla employees and on its overall workplace culture.

Why is this report needed? After this week's headlines and many other employee allegations of racial discrimination, we, as investors, need a look under the hood. The use of mandatory arbitration limits employees' remedies when it comes to both harassment and discrimination. Precluding employees from suing in court often keeping underlying facts, misconduct and case outcome secret, these clauses may allow harassment and discrimination to continue, hidden from other employees and from investors.

Bias, discrimination and harassment in the workplace create unknown and uncompensated risks for investors, inviting unnecessary legal, brand, financial and human capital issues to a company. On the flip side, the benefits of a positive and inclusive company culture with diverse teams include access to top talent, better understanding of consumer preferences, fewer blind spots when it comes to leadership decisions, more informed strategy discussions and improved risk management. A diverse workforce and a different perspective it encourages has also been shown to produce more creative and innovative workplace environments.

Of particular relevance to Tesla, research shows a strong link between diversity and revenue from innovation, where companies with above-average diversity produce significantly greater revenue from innovative products or services than those with below-average diversity. Many technologies with which Tesla may compete for recruitment and hiring such as Adobe, Airbnb, Google, IBM, Intel, Lyft, Microsoft, Salesforce and Uber no longer use these policies.

Tesla simply cannot rest on its laurels, assuming its first-mover advantage will last. Given the allegations raised by over 100 past employees, these racial slurs, discrimination in promotions, a retaliatory culture and lack of response from human resources, investors are counting on Tesla to step up and make human capital management a priority.

Tesla is a known leader in innovation, and it's time now for Tesla to also lead when it comes to promoting a fair and inclusive workplace. Tesla's Board is asked again to complete the requested report to determine if mandatory employee arbitration is in the best interest of Tesla, its employees and its shareholders. Thank you.

Martin Viecha
Senior Director for Investor Relations

Thank you, Dr. Hull. The fourth stockholder proposal is an advisory vote regarding assigning responsibility for strategic oversight of human capital management to an independent board-level committee. Our Board has recommended that our stockholders vote against this stockholder proposal.

This stockholder proposal is proposed by Comptroller of the City of New York, whose representative, Michael Garland, is on the line to present the proposal. Mr. Garland, I would like to invite you to speak. You will have 3 minutes.

Michael Garland

Great. Thank you. Good afternoon, Chair Denholm, Board members and fellow shareholders. The New York City pension funds are long-term Tesla shareholders with roughly 1.3 million shares, representing nearly $1 billion of capital at risk. Our proposal calls on the Board to assign responsibility for strategic oversight of human capital management to an independent board committee that will, one, review corporate policies and practices on principal strategy and management of workforce-related matters, including those related to addressing workforce equity and inclusion and compensation for employees other than executive officers; two, oversee the extent to which Tesla's policy standards and requirements are applied consistently across its operations; and three, offer guidance on strategic decisions that may have an impact on the workforce.

Investors are increasingly focused on the essential role that effective human capital management plays in creating long-term shareholder value and to the material risks created by poor human capital management practices such as those exhibited by Tesla. We had 4 of the 5 shareholder proposal at today's meeting focused on worker and human rights to serve as a wake-up call to the Board.

Under new SEC disclosure rules, companies are expected to include human capital measures and objectives that the company focuses on in managing the business. Many boards, including at Ford and GM have signaled greater attention to human capital management by defining explicit oversight responsibilities in committee charters.

In opposing proposal 8, the Board claims that independent board committees already perform the requested functions. The Board highlights the role of its Compensation and Audit Committees play in overseeing workforce management and workforce issues. However, neither the Compensation nor the Audit Committee lists these responsibilities in their charters or in the proxy statement. According to its charter, the Compensation Committee's responsibilities are limited to compensating executive officers and Board members and administering the company's employee benefit plans.

Finally, in opposing our proposal, the Board also asserts that our supporting statements -- supporting statement references one-sided allegations from media headlines, lacking context and facts and that we are drawing speculative conclusions from them. Let me now delineate some facts that underscore the need for the requested Board responsibilities.

In March of this year, the National Labor Relations Board upheld an earlier ruling that Tesla acted unlawfully when it fired a union activist, interrogated and disciplined workers, issued a new restriction in response to workers exercising their labor law rights, and by threatened workers against -- threatening workers against unionizing via a tweet from CEO Elon Musk.

And just this week, a jury ordered Tesla to pay $137 million to a former worker over racist treatment. Unlike other Tesla employees who allege racial discrimination, the plaintiff was exempt from the company's mandatory arbitration policy that is the subject of proposal 7 and able to pursue his case in federal court.

Our fundamental concern is that Tesla's weak labor management practices pose material risks to the company's exponential growth. We expect the independent directors we elect to provide the oversight necessary to protect the long-term interests of the company, its employees and its shareholders. We urge shareholders vote for proposal 8.

Martin Viecha
Senior Director for Investor Relations

Thank you, Mr. Garland.

Michael Garland

Thank you.

Martin Viecha
Senior Director for Investor Relations

Thank you. The fifth stockholder proposal is an advisory vote regarding additional reporting on human rights. Our Board has recommended that our stockholders vote against this stockholder proposal.

This stockholder proposal is proposed by Sisters of the Good Shepherd New York Province, whose representative, Winifred Doherty is on the line to present the proposal. Ms. Doherty, I would like to invite you to speak. You will have 3 minutes.

Winifred Doherty

Thank you very much, and good afternoon. I am Winifred Doherty, a member of the Sisters of the Good Shepherd, a global international congregation of catholic sisters and partners in mission. Today, I represent the Sisters of Good Shepherd New York as shareholders and the project participants of Bon Pasteur in the cobalt mines around Kolwezi in the Democratic Republic of Congo.

A similar human rights proposal signed by the sisters received nearly 25% investor support last year. And we again urge all Tesla shareholders to support proposal 9, which requests that the Board of Directors commission an independent third-

party report, assessing the extent to which Tesla is effectively fulfilling its responsibilities to -- in respect to human rights and engagement in responsible sourcing practices.

Today, I challenge the Tesla Board and shareholders to apply the same efficacy, efficiency and high quality standards to the supply chain from source to factory, to showrooms where Tesla's ingenuity and creativity excel in its latest models, which delight the consumer. 2021 is the international year for the eradication of child labor. The UN agenda for sustainable development seeks to end child labor in all its forms by 2025.

Under the UN guiding principles on business and human rights, Tesla has a responsibility to respect human rights within company-owned operations and through their business relationships, including suppliers. Pope Francis in May 2019 urged that mining be at the service of the human person and their inalienable fundamental human rights, not vice versa.

Having human rights compliance at the center of your activities, we ask that you acknowledge the harm done to people and planet through your current organizational model and recognize that today's world urgently needs social and environmental sustainability, demanding a balance of economic growth and holistic well-being of people and planet.

We invite you to join initiatives to advocate for better regulation and adjust the enforcement of existing laws by all duty bearers; ensure all supply chains are ethical with 0 tolerance of child labor; implement just working conditions, safety, fair wages and hours for each and every person within the company; support with funding local initiatives that promote a sustainable and diversified economic development at the upstream of the supply chain; and finally, complete the final rights assessment requested by proposal 9. Thank you.

Martin Viecha
Senior Director for Investor Relations

Thank you, Ms. Doherty. Please note that this is the final opportunity to submit any proxies for them to be counted.

[Voting]

Martin Viecha
Senior Director for Investor Relations

I declare the polls are now closed. Based on the proxies that we have previously received, I'd like to announce, on a preliminary basis, that our stockholders have approved the recommendations of the Tesla Board on all agenda items, except item 2, regarding the reduction of director terms to 2 years; item 5 for an advisory vote regarding the reduction of director terms to 1 year; and item 6 for an advisory vote regarding additional reporting on diversity and inclusion efforts. While over 99% of shares present are entitled to vote on item 2, did so as recommended by the Board, unfortunately, less than 66.7% of our total outstanding shares, which were required to approve this item, submitted votes for this item.

After the final tabulation is completed, we will formally announce the results by -- of the voting by filing a Form 8-K within 4 business days of today's meeting. That concludes the official business of today's shareholder meeting, which is now adjourned.

We will now move into company's update presentation by Elon. Please go to the website, www.tesla.com/2021shareholder meeting in order to watch the presentation. During the course of the following session, we may discuss our business outlook and make other forward-looking statements. Such statements are prediction based on our current expectations. Actual events or results could differ materially due to a number of risks and uncertainties, including those disclosed in our most recent Form 10-Q filed with the SEC. Such forward-looking statements represent our view as of today, should not be relied on then after and as we disclaim any obligation to update them after today.

With that, please welcome Elon Musk.

Elon R. Musk
Technoking of Tesla, CEO & Director

Welcome to the Annual Shareholder Meeting coming to you live from Austin, Texas. So we've had a fantastic year thanks to the great work of the Tesla team. I'd just like to start off by just thanking the Tesla team for the incredible work over the past year to get where we are. Well done.

So we have record vehicle deliveries, as we've already reported this. But you can see that there's a pretty -- I mean, I think this might be the fastest that any large manufactured object has grown. Like -- yes, certainly, one of the fastest,

perhaps the fastest. And it looks like we have a good chance of maintaining that into the future, really dependent on supplier challenges. So if -- basically, if we can get the chips, we can do it. So hopefully, this chip shortage will alleviate soon, but I feel confident of being able to maintain something like this, at least above 50% for quite a while.

The Model 3 became the best-selling premium vehicle globally, so of any premium vehicle. But I mean I once got arrested at one point for claiming that we'd do 5,000 a week, literally. You're laughing now. Anyway, this is great.

We think the Model Y will be the best-selling vehicle of any kind globally. So I think it will exceed the Model 3. I think we've got a good chance of it being the best-selling vehicle by revenue next year and then I think quite likely to be the best-selling vehicle in just of any kind numerically in '23, in 2023. So basically, we need Austin to get online and Berlin to get online and reach volume production, and then I think that's going to happen.

Cash -- in terms of free cash flow generation, obviously, we had some tough years back then. Things were looking a little dicey to say the least in 2017 and 2018. Don't want to go back there again. But we got through that, and now things are looking really good. So I think we'll see continued strong cash flow generation. And especially as you multiply unit volume times autonomy and increased efficiency in the factories because I think, over time, you'll see all manufacturers will make electric vehicles, and eventually, all manufacturers will make autonomous vehicles. And Tesla's open to licensing autonomy because I think autonomy will be such a significant lifesaver and preventer of injuries that it is not a technology we want to keep to ourselves. So I think it will be morally right to license it to other manufacturers if they would like to use it.

And of course, we made a lot of progress on cost reduction. And so despite our average selling price actually going down significantly because, with the introduction of the Model 3 and Model Y, these are much lower priced cars, we've managed to still do decently well on gross margin. So this is getting the average price down and gross margin up is very difficult, but we've managed to do that. So yes, it's good.

Our goal really is to make the cars as affordable as possible. We are seeing significant cost pressure in our supply chain. And so we've had to increase vehicle prices at least temporarily, but we do hope to actually reduce the prices over time and make them more affordable. So yes, unfortunately, we just expedite -- like I mean the sheer amount of money we're spending on flying parts around the world is just not great but hopefully temporary. So -- and we need a lot of batteries.

Hence, Battery Day, this is what this shirt means, very obtuse. But we are going to need a lot of batteries. And this is going to be a combination of batteries from our suppliers. And in supplier discussions, some of our suppliers have just asked me outright, are we going to just put them out of business or something? I'm like not at all. As many cells as you want to make and supply to us at an affordable price, we will buy, no limit. They're like, "Oh, okay. So like you want to have -- yes, increase by 100%?" Sounds good to me.

So the basic plan is we're really going to order a lot of -- I mean we have ordered a lot of batteries from suppliers, basically telling suppliers literally go -- as much as you can make, we'll take. And we'll prioritize batteries for vehicles, but then use any excess cells that we have in the Powerwall and Megapack because, over time, we think the demand for stationary storage is going to be at least as high as the demand for vehicles.

So sustainable energy, primarily solar and wind, is intermittent. And so the wind doesn't blow up all the time. The sun doesn't shine all the time obviously, and so you need batteries to buffer that power. So the fundamental pillars of a sustainable energy future are basically solar and wind. Those are the primary stationary batteries and electric transport. And if you have those 3, then you have a sustainable energy future as long as the sun is shining.

So some of the people ask me about fusion, and I like it as an idea. And by the way, I think it's totally doable. But there's a giant fusion reactor in the sky that shows up every morning and zero maintenance. So I'm like sounds like a good deal. I'll just catch a little bit of that sunlight and power Earth. A shockingly small amount of land is needed to power Earth. It's like a couple of hundred miles by a couple of hundred miles of solar panels will power the entire United States. So it's like, okay, it's not that hard.

And then I believe we calculated you only needed 1 square mile of batteries. So we think like, wow, a lot of batteries. 1 square mile of batteries, it's not that crazy. So I mean -- so we've got a plan to reduce the cost per kilowatt hour of batteries. And our suppliers have similar plans. So this is really supplemental to our suppliers. We'll make cells. They will make cells. We'll use them all. The fundamental good of Tesla, I think, is by how many years did we accelerate sustainable energy. This is the fundamental, I think, way to think of the value of Tesla. And so if we are able to accelerate sustainable energy by more years, that is good. Hence, the need to grow quickly.

We've got 3 new factories. Giga Shanghai has done an incredible job. And Giga Shanghai now exceeds Fremont in production. So actually, I'd like to just give a special hand to our Tesla China team. So it's the best quality, lowest cost and also low drama, so it's great.

And -- but that said, we are continuing to expand our Fremont operations and expect to hopefully increase Fremont output by 50%. So -- and that's still where we make old Model S and Xs, are made in Fremont. But it kind of makes sense, especially for the high-volume vehicles, to have production that's at least on the continent where the consumers are. Otherwise, it's just -- it's also not good for the environment to be shipping cars several thousand miles. So the basic idea is have the high-volume vehicles be where the customers are approximately at least.

And then also great progress with building Giga Texas, which is where we are right now and Giga Berlin-Brandenburg. So just hand for those teams as well. And the -- these factories will have cell production in them as well. So this will be really kind of raw materials in, cars out, so really, really big. Yes. I mean these things will be in like units of Pentagon basically. Let's see.

So impact report, there's a lot of, I think, interesting stuff in our impact report. We go into quite a lot of detail on all things we're doing. And Tesla is certainly a company that's -- tries very hard to do the right thing in all respects. We try very hard to do the right thing in all respects. We do not always succeed. But if you're looking for a company where we say, is that company really trying to do the right thing, that is Tesla. Okay. We really try.

Okay. I mean that's -- anyway. So as I was mentioning, we've got the 3 parts of sustainable energy future, solar and wind. But I think primarily solar will be the main source of energy, of sustainable energy -- and energy in general. And then you need to store that energy with stationary battery packs, and then you need electric vehicles and electric airplanes and boats and whatnot. So yes, great.

Yes. And then the average life cycle emissions in the U.S., this is only going to get better. As we move to a sustainable grid and electric vehicles, then obviously, we move to a fully sustainable energy economy, which is where we want to get to as quickly as possible. The sooner, the better.

And can there be a carbon tax? I mean what the hell? So people say like, oh, carbon tax, that would benefit Tesla. I'm like, yes, but it would hurt SpaceX. So how about a carbon tax, which is really needed. So...

See, battery materials are definitely in -- cyclable. Burned gas is not. CO2 is an extremely stable molecule. Mars' atmosphere has been primarily CO2 for billions of years. It's extremely stable. So as soon as people worry about methane, do not worry too much about methane. Methane quickly breaks down into CO2. Methane is not a stable molecule. CO2 is extremely stable. So -- and of course, you can recycle battery materials.

So you can think of batteries as essentially high-grade ore. So you can either get your lithium and your nickel and the various constituents of the battery from rocks or from batteries. It is much better to get them from batteries. So batteries are basically high-grade ore. And Tesla has already started recycling, and there are a lot of companies that are going to do recycling because it basically pays to do recycling for batteries.

So we're seeing increased extreme weather events. And there's like wildfires. And here in Austin, there was a massive snowstorm that turned the power off. I was actually in Austin for that snowstorm in a house with no electric -- no lights, no power, no heating, no Internet. Couldn't actually even get to a food store. If you could get to a food store, there was no food there. That went out for several days. However, if we had the solar plus Powerwall, the car would have had lights and electricity and actually, if you've got a Starlink Internet, you'd have Internet, too, so all the things you need for a prepper basically. If doom's day comes, could be helpful.

So in factory safety, we've done -- we made huge improvements on factory safety. So we're now 18% better than the industry average. So this is a -- this is great. It's always tough with safety as you ramp production lines and as you start up factories. But then as -- once it's in steady state, then the injuries naturally decline because people get used to it and you iron out the issues. And so we're seeing excellent factory safety at Tesla. And our goal is to have the safest factory on Earth.

And then AI Day, I think it was important to change the fundamental perception of Tesla because people do -- they sort of think of Tesla as a car company. And yes, we made cars, but the AI part of Tesla was not well understood. Like Tesla is as much a software company as it is a hardware company. And we also do the chips. So we designed the full self-driving inference computer. We're designing a training computer that's going to be able to, we think, be the most efficient neural

net training computer in the world by far. And we're seeing a tremendous response. So daily applicants by role. As you can see, it's basically on the Y axis there. And then after AI Day, that's -- the AI applicants increased dramatically. So I thought that was a very successful day. Team did a great job.

And yes, AI is going to be a very important part of the future. Self-driving is obviously one of the functions. And I obviously have mixed thoughts about AI, and we're going to watch out for AI being a danger. But it's happening either way. So I guess if we help do it, we can try our best to make sure it is positive, good AI, hopefully. Yes.

And then I'm excited to announce that we're moving our headquarters to Austin, Texas. So just to be clear, though, we will be continuing to expand our activities in California. So this is not a matter of sort of Tesla leaving California. As I said, we're -- our intention is to actually increase output from Fremont and from Giga Nevada by 50%. So -- but we're just hitting the sides of the bowl. I mean if you go to our Fremont factory, it is jammed. I mean it is jammed. It's like whoa.

When we first went in there, it was like -- we're like a kid in his parent's shoes. It was ridiculous, like tiny a** in a giant factory. And now we're like spam in a can here. Like how do we put more stuff? And it's tough for people to afford houses, and a lot of people have to come in from far away. And so it's -- we'll take -- taken it as far as possible, but it's -- there's limit to how big you can scale in the Bay Area.

So here in Austin, our factory's like 5 minutes from the airport, 15 minutes from downtown. And we're going to create an ecological paradise here on the -- because we're out on the Colorado River, it's going to be great. So to emphasize again, continuing to expand in California significantly but even more so here in Texas.
So with that, we can go to questions.

Question and Answer

Elon R. Musk
Technoking of Tesla, CEO & Director

Okay. So when will Cybertruck production begin? And at what rate will the ramp-up happen?

Well, so this year has been just a constant struggle with parts supply. So just to be clear, if we had like 5 extra products, we would not change our vehicle output at all because we're just basically limited by multiple supply chain shortages, like so many supply chains -- of so many types, not just chips. There were lots of supply chain shortages. So the -- so it really wouldn't matter if we had like the Semi or Cybertruck or anything. We would not be able to make it.

And the Semi in particular needs a lot of cells. So it needs a lot of cells, a lot of chips, and so that will be -- we've got to have enough. Otherwise, it's pointless. So I think most likely what we'll see is Cybertruck start production end of next year and then reach volume production in 2023. And hopefully, we can also be producing the Semi and the new Roadster in '23 as well. So we should be through our severe supply chain shortages in '23. I'm optimistic that that will be the case. We'll see.

Will we do a stock split?

Well, maybe not yet. Maybe we'll consider a stock split at some point in the future. But I think we'll not quite do that quite yet.

Will we see 4680 battery cell production in Texas?

I don't think we will see 4680 production in Texas this year, but we are making 4680s in California at a -- our pilot plant, which is a big plant by normal standards. It's like a -- capable of 10 gigawatt hours a year. So it's just a mile away from our vehicle factory in Fremont. So it's -- that basically -- that factory will be able to make more than enough cells for Giga Texas to scale production of Model Y.

And I do want to emphasize like from the point at which a factory is able to start making cars to where it reaches high-volume production is typically about a year. And that's considered very fast. So it's -- it takes longer -- or at least in Tesla land, it takes longer to build the factory than it does to reach volume production once the factory is built.

So like in Shanghai, we built the factory in 11 months, but to get to high-volume production took about a year. And so I expect something similar here. We'll start production this year, and we'll deliver -- like comfortably deliver some cars from Giga Texas this year for Model Ys. But we won't reach high-volume production until probably the end of next year. So -- but then I also expect we'll reach high-volume production, the 4680 cell here in Giga Texas next year as well.

More factories. Man, it's hard to build a factory. I've said many times that prototypes are easy. Production is hard. Like -- or whatever, it's like 1% inspiration, 99% perspiration. But I think for high-volume production, it's like 99% perspiration. So I think we'll -- I mean we might start scouting for locations next year, but I think we can do a lot with Berlin and Austin and expanding in China, so -- and expanding in Fremont. So the nice thing is like having at least a factory in Europe and a factory in China, a factory in North America, we at least have factories where -- for our high-volume products where -- that are on the continent where most of our customers are. This is great.

So we do not -- like one of the biggest challenges we had in Q3 was can we get enough chips because like there was a huge chip shortage. So that was a challenge. And that boat that got stuck in the Panama -- I mean the Suez Canal, it caused havoc. So these things, you do not expect these things, but they happen. So I don't know, we'll probably get to new factory locations, start to investigate them next year. Maybe make a decision in '23.

Does Tesla plan to offer dividends?

We do not currently have plans for dividends. I do kind of feel like the time when a company offers dividends is it's kind of cresting the hill, if you will. It's not -- usually not -- they've run out of things to invest internally. We have not run out of things to invest in internally by a long shot.

Can we provide a quarterly update on energy along with automotive?

Yes. I mean we need to make more progress on energy. The -- yes, this year has been limited, like I said, the chip shortage -- the same chips go into our stationary battery packs as in the cars, and we prioritize the cars. So -- and we need the inverters for solar and that kind of thing. So this year has not been a good guide for progress in energy. I think next year, it will be probably a good guide, and we can start providing updates that I think people would interpret correctly as opposed to having to explain where we either had to short cars or energy and we pick cars. So all right.

Yes, Model 2 is not a car. There's no Model 2. 3 means E. So we're -- Model 3, we try to do -- get the -- we're going to call it the Model E, but then Ford threatened to sue us. And so we said let's call it the Model 3. So it's S, 3, X, Y instead of you know. Anyway.

Gigafactory is getting bigger with each iteration.

Not all Gigafactories will get bigger with each iteration, I think, but yes, most of them -- they will get more advanced, more efficient. And looking at sort of taking a first principles approach to manufacturing, you want to look at the volumetric efficiency of a factory and the average speed of a factory is kind of like the rocket equation, where delta-v is like exhaust velocity times the log of the start to end mass ratios. So I think it's something similar to that for a factory.

And you also think about like a chip. Like if you make chips, get more out of chips by making them bigger or by bringing things closer together and increasing the clock speed? And actually, I think there's tremendous opportunity in factories to actually bring things closer together and increase the cycle time or clock speed. And there's actually, I think, tremendous opportunity to improve the efficiency of factories.

And Tesla's long-term competitive advantage will be manufacturing because all cars will be electric. Eventually, all cars will be autonomous. The thing that's the hardest to, I think, sort of match Tesla or copy is manufacturing. And so I think that will be the long-term advantage of Tesla.

Yes, limiting factor to growth is engineering. Yes, there's really not a like factory stamping out amazing engineers. So it's hard to -- you've got to basically recruit people. You've got to like train them in the right way, and this just takes time. And it -- like sometimes companies think you just hire anyone with an engineering degree, slap them together and get amazing stuff. This is not the case at all. Often, adding more engineers to a program makes it go slower.

So -- and the excellence of an engineer matters tremendously. There are the huge differences in engineering talent that are -- boggles the mind. But I do wonder today, like if Nikola Tesla applied to Tesla, would we even give him an interview? I'm not sure we would. It's like we should obviously. So that does concern me. Like, I think we could do a better job of vetting resumes.

And really, we're just looking for evidence of exceptional ability, like not whether somebody graduated from a particular school or whatever but like just 3 bullet points, evidence of exceptional ability. And do you say wow if you read those 3 bullet points? Then great. That should be the approach. Okay.

I'm actually a big fan of the original VW sort of bus. That was really cool. And I haven't really seen the new one. But yes, I mean, I think, over time, Tesla will make basically all major variants of vehicle. Why not? One in every significant category, I think. Yes. Right.

So I guess people can see these slides, right? So I'll just -- I don't need to read the question. Yes, I think we're actually making rapid progress with Solar Roof. Solar in general and energy in general got kind of short changed for a couple of years there because we're desperately trying to make the Model 3 and reach volume production. So we just moved everyone from anywhere in the company that could possibly work on Model 3, was working on Model 3. It was all hands on deck as you know.

So there's just a couple of years where we just -- if we got to save -- if Model 3 fails, the whole company is dead. So we're just going to move everyone from solar, from everywhere to help with Model 3. So we're a couple of years behind on that.

But I think we're now making rapid progress with the Solar Roof and in particular, with new homebuilders. Obviously, the most efficient way to get a Solar Roof is to put it on -- put a roof on once instead of -- like doing retrofit is obviously fundamentally more expensive than just -- than doing Solar Roof on new homes.

So we now have relationships with a number of new homebuilders. And we expect that -- those to gather significant momentum. And then we're going to have a campaign, which is kind of like, well, updating myself here. I want my MTV. So I want my Solar Roof. Where is it? So I think we get people actively asking in new home developments, well, does it

have a Solar Roof and a Powerwall because then you generate your own power and you can help stabilize the rest of the grid by using the Powerwall. And we're doing this in partnership with utilities.

Like the thing that I think people need to appreciate is that there's a lot more electricity production that needs to occur as we move to an electric vehicle future. For 2 homes where both cars are electric, the power electricity usage will approximately double. And so if you don't have local power production at the homes with a battery, because the battery's got to buffer the power, otherwise, if you just have solar without batteries, it causes these massive waves in the grid. And so you have to have the batteries to stabilize the grid.

But those batteries can then act collectively to stabilize the whole grid. And that's software that we've developed that is -- I think we're first going to go into use in Australia. That's going to be, I think, quite compelling.

But you really need -- for a sustainable energy future, you have to address electricity at the homeowner level. This is essential. But there will still be very prosperous future for utilities because electric power will approximately double. And then if you transition heating to electric as well, it approximately triples. So this is a lot of work both at the local level of electricity distribution and at the utilities. Utilities got to expand, and there's got to be solar and batteries at the homeowner level.

But having a Tesla solar with battery means that you have power no matter what. If the utility shuts you off or just -- for any reason, you still have power.

When I was here in the Austin blizzard, it's like I was just staying at a friend's house, who didn't have the Solar Roof and battery, sitting in the dark in the cold. And I was like, okay, really, really brings on the need for the Solar Roof and battery. So anyway, so I think that's going to see -- I think Solar Roof will see massive growth in the years to come.

Yes. 10.2 is going out tomorrow night. Yes.

Anyway, this is too much inside baseball on FSD. But the -- we're going to start rolling out the FSD beta to all customers with a perfect safety drive record tomorrow night at midnight, California time. And then we'll see how that goes. And we want to be very cautious about the rollout. If that's looking good, then we'll -- because there's like a little over 1,000 people that have a perfect score. Then we'll start giving it to people with 99, 98, 97 and so forth. We'll probably have to have some cutoff obviously. 60%, I don't know. But it's got to be really people who are extremely conscientious drivers for the beta program. So -- but it's looking really good.

I actually drove here from a friend's house I'm staying at in Austin, which is quite far away and has quite a complicated drive, and the car took me all the way from my friend's house to the Gigafactory with no interventions. So perfect drive. Yes.

All right. Is that -- are those all the questions? Or I guess we'll take some from -- yes, the audience? Sure. Or you can just yell or whatever I don't know.

Unknown Attendee

[indiscernible]

Elon R. Musk
Technoking of Tesla, CEO & Director

When will we not need to do any more mining for batteries?

Basically, it'll be a while because we've got to extend the fleet. So the fleet of cars out there is gigantic. There's about 2 billion cars and trucks in use in the world. And so that's a lot. So annual global capacity for vehicles is 100 million a year roughly, which kind of makes sense. Like cars and trucks tend to last about 20 years before they go to the junkyard.

So that's important -- an important statistic to bear in mind. Like even if all cars were -- and all vehicles were electric tomorrow, it would still take 20 years to change out the fleet. So I think people don't -- like you see a lot of noise and sort of stories about electric vehicles, but the fleet is what matters. And so it basically rounds down to nothing. If you look at total fleet of vehicles on Earth and electric cars at this point, I think, are still well under 1% of the fleet. So -- but I don't know, probably 30 years-ish, 30, 40 years. Yes, it's not bad. Yes.

Yes. And I think clarify a few things that are sometimes misunderstood out there. Lithium is extremely plentiful. It is one of the most plentiful things on Earth. It is not rare at all. It's hard to avoid lithium. If you said where can we dig a bunch of rock that doesn't have some lithium in it, you would have a hard time. It's in seawater. It's -- basically lithium is salt. So where is the salt? There's a little bit of salt pretty much everywhere, so there's lithium everywhere. So that's not an issue.

Also lithium is only like maybe you 1% or 2% of the cell. And so the actual thing that matters is the cathode. And most of our -- well, actually, our higher -- our long-range vehicles use a nickel-based cathode, and people think it's a cobalt-based cathode. No, cobalt is used in phones and laptops, but we use nickel because nickel has higher energy density for long-range vehicles.

But for our standard range vehicles and for stationary storage, I think all of that will move to iron-based -- iron cathodes. And iron is also extremely plentiful. Nickel is not rare, but there's -- I mean something about maybe 10 to 100x more iron than there is nickel. So moving to an iron-based chemistry, which is sort of finally at the point where it's competitive on range when combined with an efficient powertrain, I think that will be the vast majority of batteries in the future will be iron-based. So I do not see any shortages. It's just a question of making all the equipment to kind of process that into a cell and then into a pack.

Unknown Attendee

[indiscernible] off-planet factory.

Elon R. Musk
Technoking of Tesla, CEO & Director

Off-planet factory. I like the way you think. So we're how many years before Tesla's first off-planet factory? I mean, I'd like to see one before I'm dead. That would be cool. So I don't know if like 40 years-ish. Hopefully, before I'm dead basically. That would be great.

Unknown Attendee

[indiscernible] safety score for driving?

Elon R. Musk
Technoking of Tesla, CEO & Director

What's my safety score? Oh, great question. I don't know actually. Yes, I don't know what it is. I'll check. I'll check when -- because I think it's -- mine just get turned on. Yes, pick that one up.

By the way, our safety score calculation is obviously imperfect. That's why we try to emphasize very much that it is beta, if not, alpha in safety score calculation. So it's going to get a lot of changes -- yes, expect it to improve in its accuracy substantially over time. This is really just -- it's a very early-stage algorithm.

Unknown Attendee

[indiscernible]

Elon R. Musk
Technoking of Tesla, CEO & Director

Is there anything we do with the grid system here? Yes. In fact, Tesla is doing a number of projects in Tesla -- in Texas. Tesla, Texas. The -- we've got a large battery project, I believe, in the Houston area. Yes, Houston area.

Unknown Attendee

100 megawatts.

Elon R. Musk
Technoking of Tesla, CEO & Director

Sorry?

Unknown Attendee

100 megawatts.

Elon R. Musk
Technoking of Tesla, CEO & Director

Yes. Doing 100 megawatts in the Houston area. And we're talking to ERCOT about doing other major installations. The Tesla Megapack system is actually really great at dealing with power fluctuations. So if you look at power usage, it varies dramatically during the day. So you get -- particularly on a summer day or a winter day, if you've got electric heating or electric cooling, then you're going to see big spikes on hot or cold days. And so just even during the day, you see big variances.

And then from when -- like in order for a power -- if a power grid has no sort of energy storage buffer, then it's as resilient as the worst second of the worst day of the worst year. So that's not -- that's obviously not great. And they sort of -- they'll throw peaker plants in there, but if the peaker plant is reliant on natural gas and you -- and then people start using natural gas for heating, which is kind of what happened in Austin, people were using the gas to heat, then the peaker plants didn't have the gas and like, okay. But batteries would work great. So if there had been Tesla Megapacks here during the blizzard, the power would not have gone out.

Unknown Attendee

[indiscernible] the target capacity for the Megapack factory?

Elon R. Musk
Technoking of Tesla, CEO & Director

Target capacity for the Megapack factory? No, I don't actually know what the target capacity is, but it's big.

Unknown Attendee

40 gigawatt hours.

Elon R. Musk
Technoking of Tesla, CEO & Director

Okay. 40 gigawatt hours. Yes. Actually, that's an example of where we are expanding -- also where we're expanding manufacturing in California. So this is in Lathrop, California we just opened a big Megapack production facility.

Unknown Attendee

[indiscernible]

Elon R. Musk
Technoking of Tesla, CEO & Director

Sorry, it's difficult to hear.

Unknown Attendee

[indiscernible]

Elon R. Musk
Technoking of Tesla, CEO & Director

Oh, Tesla Insurance. Yes. So like the degree in which insurance is a regulatory labyrinth is insane. It was like designed to be hard. Feeling you. Got to admit. I don't know, it's like -- but it certainly is very difficult.

So there's a zillion applications, and you have to wait for a bunch of time. And get -- it's long and complicated and a lot of it is state by state. Most of it is state by state. So we're just processing applications in states across the country. And then the states also have different regulations, so you can't actually -- aren't legally allowed to offer the same insurance in every state. So you've got to adjust the software to be different every state. It's basically very complicated. But I think we'll be offering it in Texas very soon and like maybe in a month or something -- next week. Great. Phone a friend.

So yes, so Tesla Insurance goes live in Texas next week. And I knew it was this month, but -- and then we have it in California. We're going to be upgrading the version in California because in -- we want to have the same kind of real-time insurance that -- where your insurance costs are based on your actual driving history, which is like the right way to do it.

But we're currently not allowed to do that in California for some reason. So we're trying to get permission from the regulators to be allowed to give accurate scores for insurance. Like that's the thing you'd want to do. And then hopefully, I don't know, we'll probably have most of the country next year. Aspirationally, that's our goal.

Unknown Attendee

[indiscernible]

Elon R. Musk
Technoking of Tesla, CEO & Director

Really getting into the weeds here. So we're definitely going to be making Cybertruck here and so probably the ATV, too. So the ATV is an interesting design challenge because ATVs are pretty dangerous. And so we want to make an ATV that is the least dangerous ATV. So if you're going to ATV, well, you might as well have the least dangerous ATV. So we'll have a really low center of gravity because the battery pack will be down low, and I think we can do some things with the suspension, just make it really hard to roll this thing. So it'll -- because when ATVs roll is when bad things happen, so it's going to be the ATV that won't roll. So it would be cool. You got to have one with the Cybertruck. Okay. So let -- I'll take one last question. Yes?

Unknown Attendee

[indiscernible] electric planes [indiscernible]

Elon R. Musk
Technoking of Tesla, CEO & Director

What about electric planes? Yes, yes. We have a lot on our plate here. But electric planes, yes, I've been dying to do that for a decade, honestly. But we got quite a few fish to fry here. So maybe one day an electric plane.

Battery energy density is improving every year, so that's an important metric to get the cell energy density to around 450, 500 watt-hours per kilogram and have a pack efficiency of around 400 watt-hours per kilogram. That's when electric planes start to get interesting. So it'd be a fun problem to work on at some point, but we have a lot to do over the next few years. So we're going to focus on these things, get them right and maybe one day do that.
All right. Thanks, everyone, for tuning in. Thanks for being here. Great.