

Elon Musk Introduces Tesla Energy Full Transcript

Alright. Welcome everyone to the announcement of Tesla Energy. What I'm going to talk about tonight is a fundamental transformation of how the world works, about how energy is delivered across Earth. This is how it is today - it's pretty bad. It sucks - exactly. I just want to be clear because sometimes people are confused about it - this is real. This is actually how most power is generated, with fossil fuels and if you look at the curve - that's a famous curve, the Keeling curve that shows the growth in CO2 concentration in the atmosphere and every year it ratchets up - it gets higher and higher and if we do nothing that's where it's headed - to levels that we don't even see in the fossil record. I think we collectively should do something about this and not try to win the Darwin award. For us and a lot of other creatures too. The way the grid works today is you've got coal, natural gas, nuclear, hydro and then wind and solar, but not enough wind and solar obviously. That's the grid typically in most countries and you'll notice something - there's quite a big difference in peak to trough usage. The peak usage is typically at least twice the trough usage. Please bare that in mind as I'm going to reference that again later in the presentation. That's an important point.

What we're here to talk about is the solution. I actually think it's a fairly obvious solution but it's something that we need to do, and the solution is in two parts. Part one is the Sun. We have this handy fusion reactor in the sky, called the Sun. You don't have to do anything, it just works. It shows up every day and produces ridiculous amounts of power. A lot of people are unclear on how much surface area is needed to generate enough power to completely get the United States off fossil fuels. Most people have no idea, they think that it must be some huge amount of area - like maybe you need these satellites in space - space solar power, if anyone should be in favor of space solar power it should be me - but this is completely unnecessary, because actually very little land is needed to get rid of all fossil fuel electricity generation in the United States. That blue square there is the land area that's needed to transition the United States to a zero-carbon-emission situation. It's really not much and most of that area is going to be on rooftops. You won't need to disturb land, you won't need to find new areas, it's mostly just going to be on the roofs of existing homes and buildings. I really think that image is an important one to bare in mind when people are thinking about solar power - how much will it take? Is it going to take some enormous amount? No, it's just that blue square.

"Now, the obvious problem with solar power is that the Sun does not shine at night. I think most people are aware of this." So, this problem needs to be solved. We need to store the energy that is generated during the day so that you can use it at night, and also even during the day the energy variation varies. There's a lot more energy generated in the middle of the day than at dawn or dusk. So it's very important to smooth out that energy generation and retain enough so that you can use it at night.

Now, what you may not have noticed in that earlier slide where I showed the blue square, was that there was one red pixel. In the blue square was a red pixel. We've now zoomed in so that you can see that red pixel. That is the size of the batteries needed to transition all of the United

States to being solar with batteries. Okay, it is a very tiny amount. One pixel. Just remember that. One pixel is the size of the batteries needed to bring the United States to have no fossil fuel generated electricity. This is no room at all. Not a problem for solar or batteries.

The issue with existing batteries is that they suck. They're really horrible. They look like that. They're expensive. They're unreliable. They're sort of stinky, ugly, bad in every way, very expensive - you have to combine multiple systems - there's no integrated place you can go and buy a battery that just works. Which is what people really want to buy. We have to come up with a solution. That's the mission piece. That's the thing that's needed to have a proper transition to a sustainable energy world. The missing piece is what we're going to show you tonight.

Alright.

This is a product we call the Tesla Powerwall. If you look back against that wall you'll see a lot of them, in different colors, so you can pick your favorite color, and it looks like a beautiful sculpture on the wall. It's very important - I want to point a few things that are very important about this. The fact that it's wall mounted is vital because it means you don't have to have a battery room. You don't have to have some room full of nasty batteries. It means that a normal household can mount this on their garage or on the outside wall of their house and it doesn't take up any room. It's flat against the wall, it has all of the integrated safety systems, the thermal controls, the DC to AC converter, it's designed to work very well with solar systems right out of the box and it addresses all the needs.

If you're thinking about buying a battery, what does this provide you? Well, it gives you piece of mind. If there's a cut in the utilities you're always going to have power, particularly if you're in a place that's very cold. You don't have to worry about being out of power if there's an ice storm. You actually could go, if you want, completely off-grid. You can take your solar panels, charge the battery packs and that's all you use. So it gives you safety, security, and it gives you a complete and affordable solution and the cost of this is \$3500. It's designed so you can stack them on the wall. So if you look at the wall in the back, you'll see that they're some that are paired up. So you can have two or you can actually stack up to nine of the Powerwalls. If you've got a pretty big thing going on you could have 90 kWhs - it's a lot.

Very importantly, this is going to be a great solution for people in remote parts of the world where there's no electricity wires or where the electricity is extremely intermittent or extremely expensive. So you can take the Tesla Powerwall and it can scale globally. In fact, I think what we'll see is something similar to what happened with cell phones vs landlines where the cell phones actually leapfrogged the landlines and there wasn't a need to put landlines in a lot of countries or in remote locations. People in a remote village or an island somewhere can take solar panels, combine it with a Tesla Powerwall and never have to worry about having electricity lines. I think is going to be great. Electricity lines are not the most pretty thing in the world. Being have to have a solution that just works where ever you are, I think is going to be incredibly helpful to people who don't have electricity today.

You can order the Powerwall right now, on the Tesla website. In fact, go to teslaenergy.com and you can by the Tesla Powerwall right now. We're going to start shipping in approximately three

or four months. Initially the ramp will be slow because these packs will be made in our Fremont factory and then next year the ramp will go much much higher as we transition to the Gigafactory in Nevada.

So, this is a good solution for homes and perhaps for some small commercial applications, but what about something that scales to much much larger levels? For that, we have something else. We have, the Powerpack. The Tesla Powerpack is designed to scale infinitely. You can literally make this into a GWh class solution. You could go gigawatt class or higher - in fact, we already have one utility that wants to do a 250 MWh installation using the Powerpack. I think it'd be a good idea - I think this would be a good time to transition the power that we're using in the building to being battery power of course. So let's go to the camera feed to - let's go check out the power meter. Oh wow, the grid it's actually zero. This entire night has been powered by batteries. Not only that, the batteries were charged by the solar panels on the roof of this building. "This entire night, everything you're experiencing is stored sunlight."

When I say scalable, I really mean scalable. We can do gigawatt class installations with the Powerpack. The whole system is literally designed for infinite scalability. We could power a small city, like Boulder with a GWh class pack and we can keep going here. What I want to do is explore what's really needed to transition the world to sustainable energy. Is this actually possible? Is it something that is within the ability of humanity to actually do or is it some insurmountable super-difficult impossible thing? It's not. With 160 million Powerpacks you could transition the United States. With 900 million you can transition the world. You can basically make all electricity generation in the world renewable and primarily solar. Then, going a little further, if you want to transition all transport and all electricity generation and all heating to renewable you need approximately two billion Powerpacks. Now that might seem like an insane number and I'm very tempted to do the billion thing that - I must restrain my hand - but in order to - like, two billion Powerpacks is that a crazy number? Is that an impossible number? It is not, in fact. The number of cars and trucks that we have on the road is approximately two billion, and every twenty years approximately that gets refreshed. There's a hundred million new cars and trucks made every year. The point I want to make is that this is actually within the power of humanity to do. We have done things like this before. It is not impossible, it is really something that we can do.

"In fact, it's something that obviously we're starting to do, with Gigafactory 1. The way we're approaching the Gigafactory is really like it's a product. We're not really thinking of it in the traditional way that people think of a factory. Like, a building with a bunch of off-the-shelf equipment in it. What we're really designing in the Gigafactory is a giant machine." It's actually - think of it like a product of Tesla. We're making this really big product that doesn't happen to move - but it's really big, and that's what we're doing - Gigafactory version 1. We're building that in Nevada right now, and there will need to be many Gigafactories in the future. I do want to emphasize that this is not something that we think Tesla is going to do alone. We think that there is going to be many other companies building Gigafactory-class operations of their own and we hope they do and the Tesla policy of open sourcing patents will continue for the Gigafactory, for the Powerpack and for all these other things.

We want to show people, most importantly that this is possible. If you look at that - that's the future we could have. Where the curve slowly rolls over and goes to zero - no incremental CO₂ - that's the future we need to have. That's something that - and the path that I've talked about, the solar panels and the batteries - it's the only path that I know of that can do this, and I think it's something that we must do and that we can do and that we will do.

Thank you all for coming tonight and I hope you had a great time.