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What the Tesla Model S Battery Replacement Price Doesn't Say

By [Brad Berman](#) · December 04, 2012

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Tesla Model S battery pack.

In March of this year, there was a minor uproar over [Tesla Roadster](#) batteries being “bricked,” a way of saying that the battery pack was fully depleted and needed to be entirely replaced. The controversial incident revealed that Tesla was exacting a price of \$40,000 to replace the 53-kWh hour pack in the Roadster. That’s why some EV market observers were surprised when George Blankenship, Tesla vice president of worldwide sales and ownership experience, [announced last week](#) that the company will replace the larger 85-kWh pack on the Model S for just \$12,000.

Before taking out your calculator to crunch Tesla’s apparent dollar-per-kilowatt-hour price of its batteries—or jumping to the conclusion that Tesla has unlocked the great secret of EV battery affordability—it’s critical to consider a few points. The very attractive replacement cost for the largest pack—and equally compelling prices of \$10,000 and \$8,000 respectively for the 60-kWh and 40-kWh packs—much be purchased within 90 days of taking ownership, but only will be honored “after the end of the eighth year” of ownership, according to Blankenship.

In other words, folks taking ownership, and paying for the replacement coverage now, will not be eligible for the replacement until the end of 2020. So Tesla’s calculation to some degree represents an assessment of where battery prices will be in the next decade—not where they are right now.

Rate of Change

This past June, I did a fairly exhaustive evaluation about the current price per kilowatt-hour for an EV battery. It’s a tricky thing to nail down, because experts aren’t always talking about the same thing—any one source or another might be talking about prices at the cell level, pack level, fully installed, and with or without profit. (Also, we won’t know which manufacturer is taking cost-saving short cuts now that will only emerge as a problem in five years or so.) Let’s not forget that the price of a pack is closely guarded trade secret, with a lot of hype and obfuscation going on.

The best I could determine as a price for a fully installed pack today is somewhere between \$450 and \$650 per kilowatt-hour. Even if we lower that price to \$400/kWh for the big-battery Model S, we’re talking about a \$34,000 component. (I’m guessing there will be some readers who will say that Tesla’s or Nissan’s price is already much lower, but we can agree that it’s a lot more than \$12,000 for a 85-kWh pack.)

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So then we need to think about the likely rate at which battery prices are following. John Gartner, my colleague at Pike Research, pegs it about 10 percent every year for the next three years. Then, when economies of scale hit 100,000 packs or more—still a few years away—it could drop at an even faster rate. I'll let our more actuarially-oriented readers run the numbers on when the 85-kWh pack price will drop to the \$141-per-kWh price represented by Tesla's \$12,000 offer. But frankly, that's beside the point.





Tesla's offer to replace the Model S battery pack, eight years down the road, is about selling more cars now.



In the world of an automotive start-up like Tesla, eight years is an eternity. The headline-grabbing offer of a cheap battery replacement is not about actually replacing a single battery pack in eight years. It's entirely about selling more cars, and adding to the transaction price, today. Tesla's leadership is smart. They are reinventing business models in all kinds of ways to make sure the company survives a ramp-up of Model S production, and continues to fill the sales pipeline and bring in as much money as possible via more vehicle reservations.



Tesla is also offering free fuel for road trips via the company's supercharger network. Of course, it's not free for Tesla to install fast charging stations all across the country, and to cover the cost of maintenance and electricity. But executives aren't assigning that cost to production—it's a marketing line item. The company knows that free highway fuel is a powerful sales tool. That's also how we should look at the \$12,000 battery replacement offer—a nice way to overcome customer doubts about battery longevity, not as any indication of what batteries really cost.

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About the author



Brad Berman

Bradley Berman is a leading writer and researcher about electric cars and green transportation. He regularly contributes driving reviews and technology articles to The New York Times, KQED Public Media, Reuters, Mother Earth News and other publications. Bradley is a contributor to Home Power magazine, where he serves as transportation editor. He also works as a research analyst of industries ...

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Benjamin (not verified) · 16 weeks ago

When talking about Tesla's supercharger network you fall victim to the same false preconception as everyone else. You're thinking that electricity has a cost, as you said: "the cost of maintenance and electricity". They're solar powered! Electricity is not a cost, it's a revenue! If no one uses the fast chargers, so much the better for Tesla, they'll make free money from selling surplus electricity to the grid! The fast chargers shouldn't be considered consumers of power, but power plants in and of themselves!

Zach McDonald says: Today, General Electric updated the public concerning its WattStation home charging station's potential to damage the...

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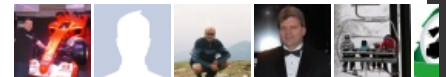
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Brian H (not verified) · 16 weeks ago

Benjamin, you're falling victim to the same false preconception as many others. You're thing that Tesla is paying for the electricity and collecting the solar arrays revenue. They're not! They've handed both those off to Solar City; while it's a "sister company", it is not a subsidiary. Tesla is responsible for the land lease, and charger hardware up front etc., but not the power.

But you're right, it's a promotional and market consolidation expense/investment.



caffeinekid · 16 weeks ago

Gotta' think about what the rest of the car is going to be worth in 2020 and whether a potential party is going to be willing to pay that price PLUS the cost of the \$12K battery adjusted for inflation. If Tesla goes under, you are out the battery...among other things. If Tesla stays afloat, you will have an 8yr old car with a new battery.



Sunpowered (not verified) · 16 weeks ago

8 years is nothing for an all aluminum electric car. Pop a new higher density lighter battery in it 8 years from now and your good to go for 16 more years. I had a 65 Mustang for 30 years so its no issue for me to drive an old good looking fast car. Cant wait to get my black P85 next month.



Modern Marvel Fan (not verified) · 16 weeks ago

Paying upfront will also reduce the cost as well.

laying out the cash is like a free cash flow loan to Tesla.



G (not verified) · 16 weeks ago

When my 2000 Insight's IMA battery went south, Honda replaced it under warranty. That means "free" to me. The car had 149,000 miles at the time. Thinking I'll stay with Honda, though hate the idea of downgrading to 40-50mpg since I get 60-70mpg now. I'll go electric when I can afford it.



EVNow · 16 weeks ago

I don't know at what rate Tesla can barrow - but free loan that needs to be serviced only after 8 years is a great way to finance your company ...



Bill Howland · 16 weeks ago

@Benjamin

I didn't think the Tesla Superchargers were SOLELY solar powered... What happens on a cloudy day? Not sure of the exact dimensions of their Solar Array, but it really doesn't look that big. I don't think it could run 2 model S's at once by itself even on a bright sunny day.. Any info as to the peak power of their typical arrays?

@Brad Berman

I almost went for the \$12k warranty on the Roadster, but the Devil was on the Details. Basically, I complained that the contract stated if Tesla didn't feel like changing out the battery, they'd just give me \$12000 cash back after using it free of charge for 8 years. I loudly complained, then their Legal Dept rewrote the Contract for me! Unfortunately the new contract had too easy an out for Tesla, so I didn't go for it. In another article, if we could see the precise contract language it would be quite illuminating I'm sure.



George B (not verified) · 16 weeks ago



The super chargers must be grid-tied by definition. Tesla has likely struck an arrangement with the utility, and the solar installation is there to offset, if not replace, the energy that was pulled from the grid to charge the cars that stopped by that day.



Todd R. Lockwood · 16 weeks ago

Don't be so sure Tesla isn't making a profit at \$12,000. Panasonic, the maker of the lithium-ion cells used in the pack is now a significant investor in Tesla, and the two companies are working together to further develop the battery technology.



Laurent J. Masson · 16 weeks ago

So, we don't know this battery today's price. Would anyone know its weight?



JackB125 · 16 weeks ago

Using your optimistic cost of \$34,000 dollars for the 85 kWh battery and assuming a 10 percent price decrease for the next 8 years we get...

$\$34,000 * (.9^{**8}) = \14636 for the cost of the replacement battery in 2020.

Over the last 8 years, the average CPI has been 2.6%
(<ftp://ftp.bls.gov/pub/special.requests/cpi/cpiiai.txt>)

Using the 2.6% 8-year average CPI value would give you a future value of \$14,735 2020 dollars for \$12,000 of extended warranty income in 2012.

\$14636 costs in 2020 covered by \$14735 future value income in 2020. It looks to me like they have thought this out fairly well. It's not a money making extended warranty program, but they have probably covered their future costs at the current pricing levels.



Chris T. · 16 weeks ago

The Li-ion price drop (per kWh) has actually been closer to 20%/yr than 10%/yr. Which just makes Tesla's bet all that much safer for them, of course....

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