

**TESTIMONY OF
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**BEFORE THE
SENATE FINANCE COMMITTEE
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Good morning, Chairman Bingaman, Ranking Member Thomas, and Members of the Committee. Thank you for the opportunity to testify about electric vehicles and battery technologies.

The efforts of this Committee properly reflect our country's renewed emphasis on addressing global climate change and dependence on oil from nations that do not always have our best interests in mind.

These concerns are my own top priorities and are the reason that I founded Tesla Motors. Four years ago, I had no bias towards electric cars or any other technology – I set out from an engineer's perspective to understand which technologies could best help break America's dependence on oil. After considerable research, I came to the conclusion that electric cars are by far the most efficient transportation technology – even when the electricity to power them is produced from coal; much more so with cleaner sources. Electric cars have the added advantage of being the only kind of car that breaks the tradeoff between performance and efficiency.

To put this in perspective, allow me a brief commercial to describe Tesla's first model, the Tesla Roadster. The Roadster is a great looking two-seat convertible designed to beat a gasoline sports car like a Porsche or a Ferrari in a head-to-head showdown, yet with twice the energy efficiency of a Prius. It is a great sports car without compromises:

- Breathtaking 0 to 60 acceleration in 4 seconds
- 135 mpg equivalent, per the conversion rate used by the EPA
- More than 200 mile driving range
- Fully DOT-compliant: crash tested, with airbags, crash structures, etc.

In short, the Tesla Roadster is the first electric car that people want to own because it is a great car. But at \$92,000, one could reasonably ask whether such a car does any good for the world. Do we really need of another high-performance sports car? Will an expensive car make any difference to global carbon emissions or to our oil dependence? The answers, of course are no and not much. However, that misses the point. Almost any new technology has high cost before it can be optimized, and this is no less true for electric cars.

Tesla's second model will be a roomy four door family car starting at \$50,000, to be manufactured in our own plant in New Mexico beginning in 2009. Our third model will follow as quickly as we can, and will be more affordable still.

Tesla intends to become a major car company with a full line of highly efficient – but also highly desirable – electric cars. Our strategy is to enter at the high end of the market, where customers are prepared to pay a premium, and then move down-market as quickly as possible to higher production levels and lower prices with each successive model. This strategy also allows us to change radically the public perception of electric cars, opening the market for a full spectrum of electric car models.

Tesla Motors is not looking for government handouts. Our business model is sensible, our cars are designed to be desirable and profitable, and I must answer to shareholders who expect a decent return on their investment. However, there are two ways that the tax system can help to catalyze consumer acceptance of zero emissions vehicles:

1. Restore and enhance the EV Income Tax Credit

Until 2006, taxpayers who purchased electric cars could claim up to a \$4,000 tax credit through the Qualified Electric Vehicle Credit on IRS form 8834. In 2006, this deduction was reduced to \$1,000, and now it is gone.

In the past, Senator Rockefeller and Representative Camp – and others – have proposed legislation that would have restored and even enhanced this tax credit. None of these measures passed; I suspect this is in part because since the 2003 rewrite of California's Zero Emissions Vehicle Mandate, no car companies offer electric cars for sale anyway.

Meanwhile, the Energy Policy Act of 2005 created new tax credits for purchasers of hybrid cars – up to \$3,400 for a car that still, in fact, burns gasoline and emits CO₂. (This is the piece of legislation described by Bill Ford as the “buy Japanese” bill.) Please don't misunderstand me: hybrids are fine – they usually do have higher gas mileage than their non-hybrid equivalents. But in the end, they are gasoline-powered cars. The only way to put energy into your Prius is through its gas tank.

However, a real electric car does a whole lot more to reduce our dependence on foreign oil and to reduce our emissions of greenhouse gasses than any hybrid ever can. We should be encouraging new car buyers to consider an electric car instead of a gasoline car – even instead of a hybrid.

For this reason I propose reconsidering some of what Senator Rockefeller proposed in his Alternative Fuel Promotion Act a few years back:

1. Reinstating the electric vehicle (EV) tax credit and increasing this credit for advanced technology electric vehicles. Specifically, provide a tax credit of 10% of the EV purchase price, up to \$4,000, with an additional \$5,000 credit for any EV that has at least a 100-mile range. Do not sunset this credit sooner than 4 years.
2. Give a tax deduction (not a credit) for the cost of installation of charging stations.
3. Continue to provide states the authority to allow single occupant, electric fuel vehicles in high occupancy vehicle (HOV) lanes, independently of allocations for hybrid access to these lanes.

2. Level the playing field with large SUVs

Under the Jobs and Growth Act of 2003, Congress raised the deduction ceiling for heavy-class vehicles (those over 3 tons) to \$100,000, bumped the “bonus deduction” to 50 percent, and continued the accelerated five-year depreciation schedule. This, in effect, made virtually all three-ton, so-called business-use SUVs fully deductible in the first year. More than 50 vehicle models qualified for the tax break, and many were sold because of it.

The American Jobs Creation Act of 2004 lowered this SUV loophole to \$25,000 while retaining both the 50-percent bonus deduction and the five-year depreciation schedule. This deduction is still claimed as a Section 179 expense by many Americans who use their SUVs at least 50% for business uses.

While I certainly sympathize with the need to help sell Hummers, I would like to propose a similar incentive program for true zero-emissions, zero-gasoline vehicles. Surely an accountant, a home inspector, or an attorney can use an electric car to visit his clients. And getting these business people out of gas guzzling 3-ton SUVs and into cars that burn no gasoline is good for America and good for the environment.

I therefore propose leveling the playing field for electric cars purchased for business use: amend the American Jobs Creation Act of 2004 to allow zero-emissions vehicles also to qualify for a \$25,000 deduction, a bonus deduction of 50% of the car's cost, and an accelerated depreciation schedule.

Moving from the tax system to the EPA, I would like to encourage you to allow car companies to buy and sell corporate average fuel economy (CAFE) credits. This kind of credit trading is widely supported, allowing more freedom in the marketplace while encouraging technological progress. CAFE credit trading would be a win-win-win, providing financing for new technology companies like Tesla Motors, solving regulatory problems for larger car companies like General Motors, all the while costing the American

taxpayer nothing. The EPA already clearly specifies how to convert electric consumption to equivalent gasoline consumption. All we need is the ability to buy and sell the credits.

I would like to turn your attention now to energy storage, specifically batteries. I believe that large capacity energy storage will become one of the key issues in the coming decade, as we strive toward energy independence. Batteries are at the heart of every electric or hybrid car. They are also critical to making clean energy generation technologies such as wind and solar truly useful by capturing the energy when it is generated, and releasing it when it is needed.

First a couple definitions: the big box that powers our car; the little box that plugs into your laptop computer – these are called batteries. If you take either box apart, inside you would find a collection of individual cylindrical or rectangular energy storage devices – these are called cells.

Tesla Motors has pioneered a radical battery technology for cars, and that is the use of commodity cells – the kind used in laptops and cell phones – as the energy storage element in its batteries. We did this so that we could ride on the commodity coattails of the highly competitive consumer electronics market. This is how we broke the chicken-and-egg problem that even the largest car companies suffers when trying to produce an electric car.

The auto industry battery consortium, USABC, set about to invent automotive batteries made from specialty cells for cars; Tesla uses commodity cells to make its automotive batteries. This is why Tesla's battery is cheaper, higher capacity, more reliable, and more available than anything produced by USABC. And we went into production for a fraction of the money already spent by the consortium. Note that Tesla Motors has been approached by quite a few of the car companies around the world about its battery technology, and has just signed a deal to provide batteries to one.

Here is the thing: practically all commodity cells today are made in Asia – mainly Japan, South Korea, and China. There is no significant production anywhere in the US. Even American battery companies – such as A123, Valance, and AltairNano – turn to Asia for mass production. As James Woolsey noted shortly after taking a test drive in a Tesla Roadster, this will become a national security problem as we become more dependent on stored electricity.

There is no good reason why commodity cell production could not to be here in the US. A modern lithium ion cell plant – such as those in Japan – is a highly automated affair with very low labor content. These plants resemble chip fabrication plants more than anything else. And, like chip fabrication, the year-to-year advances in capacity, quality, and price come not from great leaps of innovation, but rather from constant manufacturing improvement driven by fierce competition.

The trouble is that this manufacturing progress is like a moving walkway – if you ever step off, the walkway moves on without you, and it is difficult ever to catch up. Companies that decided in the '80s to become “fab-less semiconductor companies” – outsourcing their chip fabrication to Asia – will never again make chips. Companies – American companies like Intel – that stayed on the walkway continue to drive the technology and remain among the best and most competitive chip makers in the world.

Every American battery manufacturer stepped off the moving walkway years ago. We have no choice but to buy our cells from Asia, and the US will soon discover a new energy dependence if we don't do something about it.

I do not have a specific recommendation for you here – I am simply pointing out an impending problem. I believe it is in all of our interest to encourage domestic production of competitive, commodity cells – cells that can be used by American electronics manufacturers like Dell Computer just as they can be used by American car companies. The key words here are competitive and commodity.

Tesla is not in the business of making cells, though I have thought about it a lot. If no one else steps up to the plate and if I can figure out how to finance such a venture, I might take a swing at it. Now if you are looking to invest about \$500M, please let me know...

Note that the Energy Policy Act of 2005 provides incentives for practically every type of alternative automotive technology *except* electric cars. Why? Did somebody really kill the Electric Car? I am here to inform you that rumors of the Electric Car's demise have been greatly exaggerated.

To quote Rick Wagoner, CEO of General Motors, at the opening of the most recent LA Auto Show,

Why electricity?

- First, electricity offers outstanding benefits... beginning with the opportunity to diversify fuel sources “upstream” of the vehicle. In other words, the electricity that is used to drive the vehicle can be made from the best local fuel sources – natural gas, coal, nuclear, wind, hydroelectric, and so on. So, before you even start your vehicle, you’re working toward energy diversity.
- Second, electrically driven vehicles... are zero-emission vehicles. And when the electricity, itself, is made from a renewable source, the entire energy pathway is emissions free.
- Third, electrically driven vehicles offer great performance... with extraordinary acceleration, instant torque, improved driving dynamics, and so on.

I could not agree with Mr. Wagoner more. Electric cars are far from dead, and need to be included – even highlighted – in every government program that promotes energy independence and minimizes global climate change. They are our best hope.

Once again, thank you very much for inviting me here today. I hope you will find my testimony to be helpful.