Tesla Motors

In 2015, Tesla Motors was a $3.2 billion company on track to set history. It had created two cars that most people agreed were remarkable. Consumer reports had rated Tesla's Model S the best car it had ever reviewed. Though it was not yet posting profits, sales were growing rapidly and analysts were hopeful that profits would soon follow. It had repaid its government loans ahead of the major auto conglomerates. Most importantly, it looked like it might *survive*. Perhaps even thrive. This was astonishing as there had been no other successful auto manufacturing start-up in the United States since the 1920s.

The road leading up to Tesla's position in 2015 had not always been smooth, and there were many doubts that still lingered. Tesla had benefited from the enthusiasm of the "eco-wealthy"—a rather narrow portion of the market. How would Tesla fare when it was in direct competition with General Motors, Ford, and Nissan for the mass market? Would it be able to turn a sustainable profit on its auto-making operations? Furthermore, some questioned whether Tesla's goals to sell to the mass market even made sense. In the niche market, it had a privileged position with customers that were relatively price-insensitive and were seeking a stylish, high-performance car that made an environmental statement. To compete for the mass market, the car would have to provide good value for the money (involving trade-offs that might conflict with Chairman Elon Musk's ideals), and the obstacles to charging would have to be overcome.

History of Tesla

In the year 2003, an engineer named Martin Eberhard was looking for his next big project. A tall, slim man with a mop of gray hair, Eberhard was a serial entrepreneur who had launched a number of start-ups, including a company called NuvoMedia, which he sold to Gemstar in a $187 million deal. Eberhard was also looking for a sports car that would be environmentally friendly—he had concerns about global warming and U.S. dependence on the Middle East for oil. When he didn't find the car of his dreams on the market he began contemplating building one himself, even though he had zero experience in the auto industry. Eberhard noticed that many of the driveways that had a Toyota Prius hybrid electric vehicle (or "dork mobile" as he called it) also had expensive sports cars in them— making Eberhard speculate that there could be a market for a high-performance environmentally friendly car. As explained by Eberhard, "It was clear that people weren't buying a Prius to save money on gas—gas was selling close to inflation– adjusted all-time lows. They were buying them to make a statement about the environment."

Eberhard began to consider a range of alternative fuel options for his car: hydrogen fuel cells, natural gas, and diesel. However, he soon concluded that the highest efficiency and performance would come from a pure electric vehicle. Luckily for Eberhard, Al Cocconi (founder of AC Propulsion and one of the original engineers for GM's ill-fated EV-1) had concluded the same thing and had produced a car called the tzero. The tzero could go from zero to 60 miles per hour in 4.1 seconds, but it was powered with extremely heavy lead-acid batteries, limiting its range to about 60 miles between charges. Eberhard approached Cocconi with the idea of using the lighter lithium ion batteries, which offered six times more energy per pound. Cocconi was eager to try out the idea (he had, in fact, been experimenting with lithium ion batteries himself), and the resulting lithium ion-based tzero accelerated to 60 miles per hour in 3.6 seconds, and could travel more than 300 miles. Eberhard licensed the electric-drive-train technology from AC Propulsion, and founded his company, Tesla Motors (named after Nikola Tesla, a late nineteenth-century and early twentieth-century inventor who developed, among other things, the AC electrical systems used in the United States today).[i] Meanwhile, there was another entrepreneur—one with much deeper pockets—also interested in developing electric vehicles based on the tzero: Elon Musk. In 2002, Elon Musk was a 31-year-old South African living in California, who had founded a company that ultimately became PayPal. After selling PayPal to eBay in 2002 for $1.5 billion, he started a company called SpaceX with the ambitious goal of developing cheap, consumer space travel. (SpaceX's Dragon spacecraft ultimately made history in May of 2012 by becoming the first commercial vehicle to launch and dock at the International Space Station.) Musk was also the chairman of a high profile clean tech venture in Northern California called Solar City.

Musk's assertive style, and his astonishing record of high-tech entrepreneurship, made him one of the inspirations for the Tony Stark character in Jon Favreau's Iron Man movies.

Like Eberhard, Musk thought electric cars were the key to the United States achieving energy independence, and he approached Cocconi about buying the tzero. Tom Gage, who was then AC Propulsion's CEO, suggested that Musk collaborate with Eberhard. After a two hour meeting in February of 2004, Musk agreed to fund Eberhard's plan with $6.3 million. He would be the company's chairman and Eberhard would serve as CEO.

The Roadster

The first Tesla prototype, named the Roadster, was based on the $45,000 Lotus Elise, a fast and light sports car that seemed perfect for the creation of Eberhard and Musk's grand idea. The car would have 400 volts of electric potential, liquidcooled lithium ion batteries, and a series of silicon transistors that would give the car acceleration so powerful the driver would be pressed back against their seat.[ii] It would be about as fast as a Porsche 911 Turbo, would not create a single emission, and would get about 220 miles on a single charge from the kind of outlet you would use to power a washing machine.

After a series of clashes between Musk and Eberhard that led to delays in launching the Roadster, Eberhard was pushed out of the company. The Roadster missed its deadline for beginning production at the Lotus facility, triggering a penalty built into the manufacturing contract Eberhard had signed with Lotus:
a $4 million fee. However, when the car finally launched in 2008, the enthusiastic response it received was astonishing—it boasted an all-star list of celebrities with reservations to buy, and everywhere the Roadster drove, people stopped to stare.

The Model S

Musk's ambitions did not stop at a niche high-end car. He wanted to build a major U.S. auto company—a feat that had not been successfully accomplished since the 1920s. To do so, he knew he needed to introduce a less-expensive car that could attract a higher volume of sales, if not quite the mass market. In June of 2008, Tesla announced the Model S—a high-performance all-electric sedan that would sell for a price ranging from $57,400 to $77,400 and compete against cars like the BMW 5-series. The car would have an all-aluminum body, and a range of up to 300 miles per charge.[g] The Model S cost $500 million to develop, however offsetting that cost was a $465 million loan Tesla received from the U.S. government to build the car, as part of the U.S. government's initiative to promote the development of technologies that would help the United States to achieve energy independence.

By May of 2012, Tesla reported that it already had 10,000 reservations for customers hoping to buy the Model S, and Musk confidently claimed that the company would soon be producing—and selling—20,000 Model S cars a year. Musk also noted that after ramping up production, he expected to see "at least 10,000 units a year from demand in Europe and at least 5,000 in Asia." The production of the Model S went more smoothly than that of the Roadster, and by June of 2012, the first Model S cars were rolling off the factory floor. The very first went to Jeff Skoll, eBay's first president, and a major investor in Tesla. On the day of the launch, Skoll talked with Musk about whether it was harder to build a rocket or a car (referring to Musk's SpaceXcompany): "We decided it was a car. There isn't a lot of competition in space."

To build the car, Tesla bought a recently closed automobile factory in Fremont, California, that had been used for the New United Motor Manufacturing Inc. (NUMMI) venture between Toyota and General Motors. The factory, which was capable of producing 1,000 cars a week, was far bigger than Tesla's immediate needs and would give the company room to grow. Furthermore, though the plant and the land it was on had been appraised at around $1 billion before NUMMI was shut down, Tesla was able to snap up the idled factory for $42 million. Tesla also used the factory to produce battery packs for Toyota's RAV4, and a charger for a subcompact Daimler AG electric vehicle. These projects would supplement Tesla's income while also helping it to build scale and learning curve efficiencies in its technologies.

In the first quarter of 2013, Tesla announced its first quarterly profit. The company had taken in $562 million in revenues and reported an $11.2 million profit. Then more good news came: The Model S had earned Consumer Reports' highest rating and had outsold similarly priced BMW and Mercedes models in the first quarter. In May of 2013, the company raised $1 billion by issuing new shares and then surprised investors by announcing that it had paid back its government loan. After repaying the loan, Tesla had about $679 million in cash. Musk had announced confidently that he felt it was his obligation to pay back taxpayer money as soon as possible and that the company had sufficient funds now to develop its next generation of automobiles without the loan and without issuing further shares.

The Future of Tesla

By 2015, Tesla Motors was also in the process of developing a sport utility vehicle that seats seven, the Model X, which cost $250 million to develop and would be available in 2016.[n] This car was part of Musk's longer-term ambition to tap a more mainstream market for the cars. Though Tesla's moves had been bold and risky, its success thus far was inspiring. The company had survived its infancy, appeared to be solvent, and was meeting its sales objectives even though serious obstacles remained for electric vehicles. It was also competing against companies with far greater scale. As noted by O'Dell, a senior editor at auto information site Edmunds.com, on Tesla's success, "A lot of people have been very, very skeptical . . . when you want to be an automaker, you are competing with multibillion-dollar conglomerates . . . It's entrepreneurism on steroids . . . They had a huge learning curve but they've powered through it." Theo O'Neill, an analyst at Wunderlich Securities adds that "It's going to prove everybody in Detroit wrong . . . They all say what Tesla is doing isn't possible."

Discussion Questions

1. Is the Tesla Model S a radical innovation or an incremental innovation? Competence enhancing or destroying, and from whose perspective? Is it a component or an architectural innovation?
2. What factors do you think influence the rate at which consumers have adopted (or will adopt) the Tesla Model S?
3. Where do you think electric vehicle battery technology is on the technology s curve?
4. Do you think Tesla Motors will be profitable? Why or why not?