

**Collaboration with future competitors and
partners beyond your current industry**
"A case study on Tesla Motors"

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Executive Summery

The purpose of this thesis has been to look at the challenges of collaboration with partners inside and outside your own industry. This has been done through a case study on Tesla Motors.

An analysis of Tesla Motors' business model has been made in order to discover the barriers and evolvement of Tesla Motors. One of the main theorists on business models, Afuah, has been used for this analysis. During the production of this thesis, it was discovered that Tesla Motors has two main products – The well known Tesla Roadster and their core innovation, the battery pack.

In order to answer the research questions, the conclusion had to be made on both products.

The main issue in the conclusion is collaboration and the barriers of collaboration. But also the evolvement and future of Tesla Motors is important.

The main challenge of the thesis has been to gather reliable empirical data for the analysis. There has been much secrecy from Tesla Motors, so the use of secondary data sources has been necessary many times.

Collaboration with future competitors and partners beyond your current industry

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LIST OF ABBREVIATIONS

<i>BM</i>	<i>Business Model</i>
<i>Co-dev</i>	<i>CO-Development</i>
<i>ESS</i>	<i>Energy Storage System</i>
<i>EV(s)</i>	<i>Electric Vehicle(s)</i>
<i>IP</i>	<i>Intellectual Property</i>
<i>OPEC</i>	<i>The Organization of the Petroleum Exporting Countries</i>
<i>PG&E</i>	<i>Pacific Gas and Electric Company</i>

1. Introduction

The CO₂ emission has become a bigger and bigger problem around the world today. It's hard to open a newspaper without reading about the polar ice is melting or that it's getting warmer. In Denmark the transportation sector stands for 29% of the CO₂ emission. Over half (55%) of those 29% comes from cars.

American Tesla Motors doesn't just want to save the climate; they also want to retain the joy of driving. Tesla Motors Roadster is one of those cars where you normally would have a lot of fun, but at the same time have a "dark conscience" and a large CO₂ emission. You can still have all the fun and if the power comes from green energy, you don't have to worry about the last part.

1.1 Background

The interest of the topic "Collaborating with competitors" was brought to me by my supervisor Dr. Sigvald Harryson. He told me about this company, Tesla Motors, who produced the world's fastest accelerating electric vehicle (EV) and how collaboration with different partners lead to the production of this vehicle. At that point I found it very interesting how large companies collaborate even though they are or can become competitors. In this case I find it very important that Tesla Motors collaborate with other EV manufactures in example making the right infrastructure come through. But also collaborating with partners outside you own industry, such as the battery industry.

Beside from that, I will look at Tesla Motors business model. The business model is one of the key elements of the Tesla Motors success on the EV market. In this thesis the business model theory from Afuah (2004) will be linked with Tesla Motors business model.

Tesla Motors has succeeded to produce an EV by collaborating with all kind of partners and possible future competitors (Lotus).

Positives and negatives

There are both pros and cons of the implementation of the EV such as the Tesla Roadster. Many environmentalists are only speaking of all the positive sides of the EV and are not looking at the needs and the negative sides. The same positive view is seen in many articles. Among them is the newsletter from Tesla Motors which describes how well it is going for Tesla Motors and how it has become a great success.

The following citations are examples of these different views of the Tesla Roadster.

Due to our order backlog, it seems that owning a Roadster can be a good investment. Last September, as the financial and real estate markets began crashing, a Roadster was sold at the Sonoma Paradiso in California wine country for \$160,000, well above the current list price of \$109,000. Many Roadster owners who have taken delivery of their cars have already decided to purchase a second Roadster or Roadster Sport because they like the first one so much. (Elon Musk Newsletter 2009 – appendix 2)

The interesting thing would now be to look at some of the more objective tests and views of the Tesla Roadster. One of them has been made by the famous BBC programs “Top Gear” and their host Jeremy Clarkson (Times Online Jan. 11, 2009).

But if it's running costs you are worried about, consider this. The £60,000 or so you save by buying an Elise would buy 15,000 gallons of fuel. Enough to take you round the world 20 times.

Not only the green aspect is important if the Tesla Roadster, as well as other EVs, should become a successful competitor to the ordinary car.

Already, the Tesla Roadster is the car of choice among the technology, business and Hollywood A lists – this year's Academy Awards will be a lineup of Teslas – and we have never had to give a discount to anyone. (Elon Musk Newsletter 2009 – appendix 2)

Publicity is important for a new firm / technology, when they want to enter a new market. But the product also needs to be working properly when doing so.

The problem is, though, that really and honestly, the US-made Tesla works only at dinner parties. Tell someone you have one and in minutes you will be having sex. But as a device for moving you and your things around, it is about as much use as a bag of muddy spinach. (Times Online Jan. 11, 2009)

This is why I as the writer find it interesting to look at where Tesla Motors has succeeded, where there should be cautious and where they should leave it to someone else. This thesis will look at the past, the present and the future of Tesla Motors.

Tesla Motors have and will face some serious challenges that will be identified and analyzed in his thesis.

1.2 The Market

Political influence at the market

"For much of the past century, the automobile sector has been dominated by a handful of oligopolistic firms, protected through path dependencies and the build up of complementary assets" (Alan P. 2004, p. 339)

In the US, laws and regulations have influenced the car industry a lot. Especially California has been the vanguard of new car emission regulations, which are much stricter than the rest of the US. There is a large pressure on the automobile industry for stating to manufacture electric powered vehicle. Many US politicians are now in favor of alternative fuel such as power, hybrid and ethanol, which are less polluting. Many car manufactures have also started developing their own EV or hybrid car, which is an effect of the political pressure.



Source: Tesla Founders Blog, 25/3-2008

Many things are affecting the political influence on the automobile and EV industry. Topics like Global warming, Oil independency and job security are pros and cons for both industries.

1.3 Collaborating with competitors

“Collaborating with competitors is in fashion” (Hamel et al. 1989)

Even though this citation is old it still counts. Many competing firms in all kind of industries are collaborating on various levels today. These collaborations can be executed in many ways such as:

- Joint ventures
- Outsourcing
- Licensing
- Cooperative research
- Franchise

There are many reasons for Tesla to collaborate with competitors. One is the EV market is competing with automobile- and oil industry, which both are massive compared to new evolving markets such as the EV. So if Tesla Motors and the EV market should stand a chance, they should work together in competing.

Collaboration is taking place in all industries, whether it is within the industry or with partners outside the industry. An obvious example of that is how the auto industry makes different parts for each other or collaborates in building cars together.

Tesla Motors is currently collaborating with partners inside and outside their own industry. Some of the main partners are Lotus, who currently is producing the Tesla Roadster, and the unknown battery supplier. This collaboration will be highlighted and analyzed.

1.4 Dilemmas of collaborating with competitors

There are dilemmas when choosing to collaborate with competitors, whether they are future or current competitors. The most obvious would be protecting your intellectual property and making the most out of the collaboration.

Collaboration is all about learning and being innovative – developing new products or work methods. It is about joining forces, so both parties can become strong within their industry. But when collaborating with your competitors, you're helping them to become stronger as well.

Other dilemmas of collaboration could be:

- Different aim of the collaboration
- Sharing problems
- Lack of trust
- Ambiguity, complexity and different understanding of the paradigm
- Leadership – who are leading the collaboration

These dilemmas have to be considered before starting collaboration. Depending on which kind of collaboration any of these can occur. By predicting them and solving them early, both partners can save money and time.

1.5 Research object

The purpose of this thesis is to explore how collaboration with future competitors and partners outside your own industry, can affect your own company. I will look into the barriers of collaboration and which difficulties can arise during such collaboration. The start of a new market, such as the EV market, can be very difficult for a single company. The barriers of becoming an EV manufacturer are both expensive and hard. Therefore I find it very important to collaborate and include open innovation into the process of becoming a major player on the EV market.

This research is done through a case study on Tesla Motors which will analyze their business model, look at the barriers which they have encountered through their partnerships. Finally an analysis on Tesla Motors' future will be made.

1.6 Definitions

1.6.1 Open Innovation

The central idea behind open innovation is that in a world of widely distributed knowledge, companies cannot afford to rely entirely on their own research, but should instead buy or license processes or inventions (i.e. patents) from other companies. In addition, internal inventions not being used in a firm's business should be taken outside the company (e.g., through licensing, joint ventures, spin-offs). In contrast, closed innovation refers to processes that limit the use of internal knowledge within a company and make little or no use of external knowledge.

1.6.2 Business Model

According to Afuah, a business model is a framework for making money (Afuah 2004, p. 2). It is a broad range of informal and formal descriptions that are used to represent various aspects of its business. That includes purpose, offerings, strategies, infrastructure, organizational structures, trading practices, and operational processes and policies (Wikipedia.com). It is also the set of activities which a firm performs, how to perform them, and when it performs them.

1.7 Problem statement

1.7.1 Research questions

- 1. How did Tesla address the need for collaboration with future competitors, and collaborations beyond their own industry? In this context, what barriers were confronted in the early phases, what barriers are confronted today, and what barriers can be anticipated in the future?**
 - a. How were the required resources defined, identified, acquired and transformed into a revolutionary product?
 - b. How have these barriers been addressed so far, and how are they likely to be addressed moving forward?
- 2. What are the key-learning's in terms of (A) entrepreneurship, (B) mobilizing complementary assets and (C) Open Innovation - with future competitors and partners beyond the current "industry home-turf"?**
 - a. What was the original intent and design of Tesla Motors' Business Model (BM) (Why, how and when did the Tesla founders envision a potential value for an electric sports car, and what kind of potential customers/early adopters did they target).
 - b. How did Tesla Motors BM evolve
 - c. What are the distinct competitive elements and dimensions of Tesla Motors BM
- 3. Will Tesla Motors create a new market need and shape the customer preferences (like Sony once did with the Walkman), or will customer preferences, and/or environmental legislation, shape the future development of Tesla Motors?**

1.8 Delimitations

- The main geographical focus in this thesis will be US market and Denmark. This will limit the view of which possibilities Tesla Motors have with their products. Legislations outside USA and Denmark will not be taken into consideration.
- The green / environmental aspect will only be discussed in a very small scale. This is an interesting aspect, but also a large topic to discuss. The green aspect will only be used in term of how Tesla Motors position themselves.
- The overall financial situation of Tesla Motors is not an issue which will be discussed. This includes:
 - Manufacturing costs
 - Establishing costs
 - Spending on R&D

The only economy which will be analyzed is the price setting in order to analyze the business model. The reason why pricing is included is because it's an important part of the business model in term of competitiveness.

- The engine partnership – The engine partnership is mentioned in the thesis. But because of the lack of empirical data, it hasn't been possible to use it for the analysis.

2. Methodology

2.1 Introduction

In this chapter I will discuss and give an overview of the methodology used in this thesis. Initially I will discuss the choice of research strategy I've chosen to use. Then I'll go through the empirical approach which will include the data collection. Thereafter I will discuss the theoretical approach and at last I will make an analysis using the empirical data.

2.2 Research Process

It was Dr. Sigvald Harryson who introduced me to project about Tesla Motors and the challenges they have with collaboration. I've had an interest about collaboration and knowledge sharing for a long time.

My first introduction to the alternatives to the gasoline-powered car was in the course "Strategy and Market Development" with Lee Davis. Here the question was why it has taken so long for EV to become a reality and why it still hasn't succeeded. When I then got introduced to the Tesla Motors project by Dr. Sigvald Harryson the opportunity for looking at their success was quite interesting.

2.3 Research Strategy

Before starting a research it's important to make a research strategy. Such a strategy will influence the way data is collected and the validity of the data collected. According to Yin (2002) there are five ways of doing social science research:

- Experiments
- Surveys
- Histories
- Analysis of archival information
- Case study

Choosing one of these ways depends on which form research question is asked, the control of the behavioral events and the focus on the contemporary event. To get an overview, see the table below:

Strategy	Form of Research Question	Requires Control of Behavioral Events?	Focuses on Contemporary Events?
Experiment	how, why?	Yes	Yes
Survey	who, what where how many, how much?	No	Yes
Archival analysis	who, what where how many, how much?	No	Yes / No
History	how, why?	No	No
Case study	how, why?	No	Yes

Source: Yin (2002, p. 5)

Relevant situations for different research strategies

Yin (2002) claims that different research strategies can be used on the same study or event. Each of the strategies advantages and disadvantages and before choosing a strategy, these differences need to be considered.

The choice of research strategy was clear very early in this master thesis process, since Dr. Sigvald Harryson introduced me to the Tesla Motors project, that this should be a case study. The **how** and **why** were obvious in terms of what form of research question I wanted to ask. I didn't have any control over the event (Tesla Motors and its surroundings) and I will definitely have focus on the contemporary event (as well as the past). This is the reason why the case study is the best strategy for this master thesis.

2.3.1 A Case Study

My goal is to design a good case study and to collect, present, and analyze data fairly. A further goal is to bring the case study to closure by writing a compelling thesis

(Adapted from Yin 2002, p. 1)

According to Yin (2002) the case study as a strategy is used in many situations and the need for a case study arises out of the desire to understand complex social phenomena.

There are five very important components when choosing a case study strategy design (Kruuse 1996, p. 64):

- The study question(s) – as mentioned earlier, these questions should (primarily) consist of how and why.
- Study plan – A purpose of the study should be conducted (research question), whereas a plan isn't as necessary in a qualitative research.
- The units of analysis – In this case the unit of analysis is Tesla Motors
- Linking hypotheses with data – linking the imperial finding with the theory about the questions.
- Criteria for interpretation the findings.

Each of these components has or will be presented during this thesis.

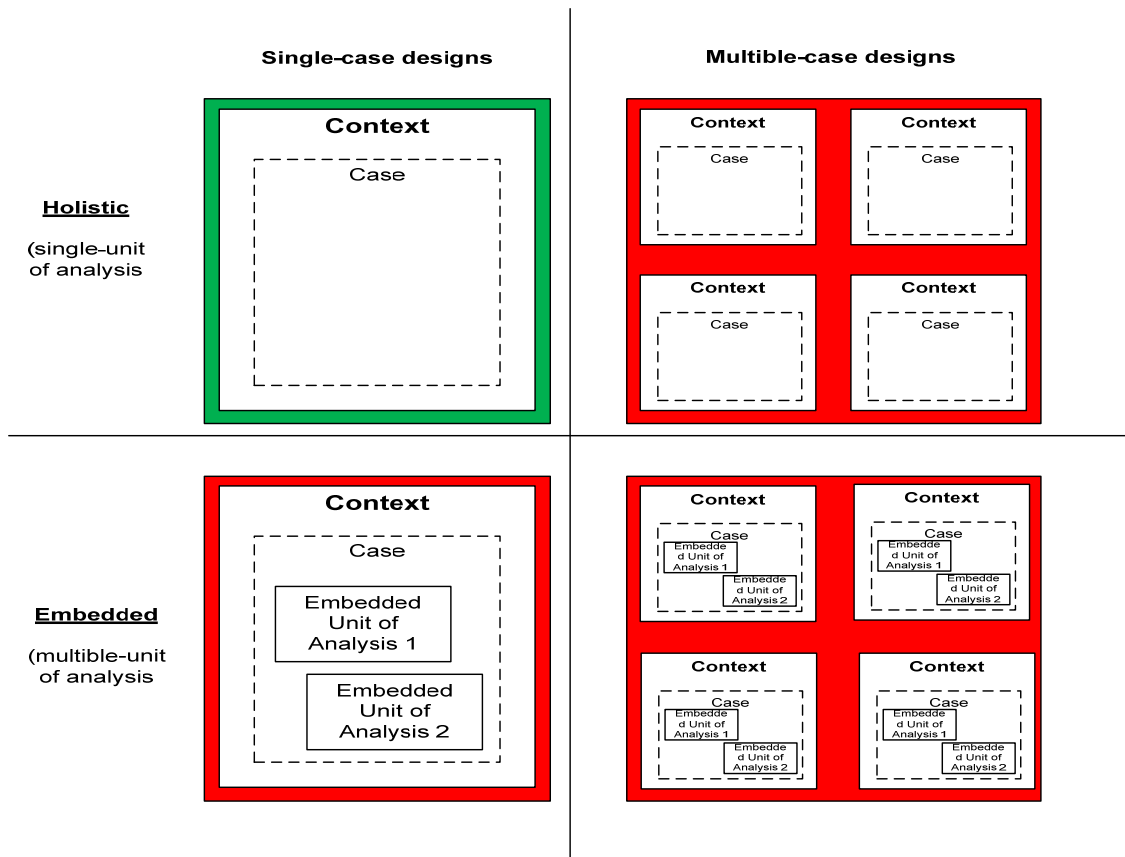
We can describe a case study as an empiric research (Andersen 1990, p 122):

- Which examines a contemporary phenomenon within the real world
- Where the boundaries between the phenomenon and the situation in which needs to be studied isn't clear
- And where there is an opportunity to use multiple information sources to examine the phenomenon

The phenomenon here is the evolvement of Tesla Motors and why it is so important for them to collaborate around the industry, as well as outside the industry. Since this is just the beginning of a new industry, the future is very unclear.

2.3.2 Case Study Design

Depending on how man units there to be analyzed, the case study will be either a single-case study or a multiple case study. Additionally to that, the case study can have either a holistic or embedded view (Yin 2002, p. 39). To get an overview see the matrix below



Source: Yin (2002) p. 40

The basic types of designs for a case study

I've made a single case study in this thesis, which will make this case a single-case with a holistic view (top left corner of the matrix). The reason for this choice is to get a deeper view into the success of Tesla Motors. I've had the impression that Tesla Motors is much ahead on the development of a competitive EV compared to other manufactures. They will be compared to their competitors but the main study subject is Tesla Motors. Tesla Motors is a very young EV manufacture compared to others in market and it is therefore interesting to have a look at why they are so much more ahead.

2.4 Empirical Approach

2.4.1 Data Collection

Gathering data is an important element of the case study. It affects the final outcome of the project. Depending on how reliable and from which sources they come, the final product can turn

out in many directions. According to Yin (2002, p. 83) the six most important sources of data (or evidence) are:

<u>Source of Evidence</u>	<u>Strengths</u>	<u>Weaknesses</u>
<i>Documentation</i>	<ul style="list-style-type: none"> • Stable – can be reviewed repeatedly • Unobtrusive – not created as a result of a case study • Exact – contains exact names, references, and details of an event • Broad coverage – long span of time, many events, and many settings 	<ul style="list-style-type: none"> • Retrievability – can be low • Biased selectivity, if collection is incomplete • Reporting bias – reflects (unknown) bias of author • Access – may be deliberately blocked
<i>Archival Records</i>	<ul style="list-style-type: none"> • (Same as above for documentation) • Precise and quantitative 	<ul style="list-style-type: none"> • (Same as above for documentation) • Accessibility due to privacy reasons
<i>Interviews</i>	<ul style="list-style-type: none"> • Targeted – focuses directly on case study topic • Insightful – provides perceived causal inferences 	<ul style="list-style-type: none"> • Bias due to poorly constructed questions • Response bias • Inaccuracies due to poor recall • Reflexivity – interviewer wants to hear
<i>Direct Observations</i>	<ul style="list-style-type: none"> • Reality – covers events in real time • Contextual – covers context of event 	<ul style="list-style-type: none"> • Time-consuming • Selectivity – unless broad coverage • Reflexivity – event may proceed differently because it is being observed • Cost – hours needed by human observers
<i>Participant Observation</i>	<ul style="list-style-type: none"> • (Same as above for direct observations) • Insightful into interpersonal behavior and motives 	<ul style="list-style-type: none"> • (Same as above for direct observations) • Bias due to investigator's manipulation of event
<i>Physical Artifacts</i>	<ul style="list-style-type: none"> • Insightful into cultural features • Insightful into technical operations 	<ul style="list-style-type: none"> • Selectivity • availability

Source: Yin 2002, p. 86

Six sources of evidence: Strength and weakness

To get the best product to work, one must choose which sources to use. But it is not always possible to choose. The sources which are used in this thesis are the ones which were possible to get and they are: Documentation, Archival record, and indirect interviews. By indirect interviews I mean interviews performed by others and then told or written down.

Documentation

Documents are the main source of data in this thesis. According to Yin (2002, p. 85) documents comes in many forms. The documents used in here are:

- Testimonies by Tesla employees
- Newspaper / Magazine articles written about Tesla Motors
- Blogs
- Previous papers about Tesla Motors

To get some direct information about Tesla Motors, two testimonies to the US Senate are used. These testimonies are from co-founders Elon Musk and Martin Eberhard. Since it hasn't been possible to get in direct contact with either of them or employees at Tesla Motors, these testimonies are important for getting an insight view and statements of the company.

Data from newspapers and magazines are the second source of information. It's not as a reliable source, but most of the information comes from them. The reason why they have been used in such a large scale is because of the lack of direct information from Tesla Motors.

Good sources of evidence which have been used in this thesis are blogs. Depending on who the blogger is, the validity of this source is very high.

The last document source is a previous paper written about Tesla Motors. This paper has only been used to gather empirical data about Tesla Motors and the EV market.

Archival records

- Data and statistical information from official administrations
- Data collected by industry association

To get an overview of the EV market, the surroundings and its complementors, such as the oil- and electricity industry, it is necessary to collect statistical data. The most efficient way to do that is through official administrations and industry associations. They are usually the most reliable sources for that kind of data even though Yin (2002, p. 89) argues that numbers from any source shouldn't be considered accurate.

Interviews

- Interviews performed by others

Since it hasn't been possible to get personal interviews, this thesis had to be made on interviews which were performed by others. Dr. Sigvald Harryson has personally been in contact with managers and employees at Tesla Motors and has performed interviews. The information which were gathered, were then presented to me and used for this thesis.

2.4.2 Primary and Secondary Data

Andersen (2005, p. 151) divides the collection of data into primary and secondary data. The primary data collection is collected directly from the source (Tesla Motors etc.) by the investigator people who help (the supervisor). The secondary data is collected through other sources such as previous papers where the writer has collected the data and the passed it on through the paper.

Primary Data

The primary data in this thesis has been collected through interviews, blogs and transcripts of testimonies. The transcripts can be discussed whether they are primary or secondary data, since they are not directly heard/written by the investigator. But if the transcripts haven't edited and are an exact writing of the original speech, it can be seen as the same as blogs.

A blog is an exact writing from whoever has the blog and can therefore be counted as citations from the writer. In this case, the Tesla Founders Blog is writings by Martin Eberhard (co-founder of Tesla Motors).

Secondary Data

The secondary data plays a large role in this thesis. According to Andersen (2005, p. 158) the collection secondary data can be divided into three methods:

- Process data
- Bookkeeping and statistics
- Research data

The process data and bookkeeping are the two methods which are used in this thesis, where as research data hasn't. It is especially process data in form of documents, newspapers, magazines, websites and the previous paper which have been used as empirical data. But also statistical data has been used as secondary data.

2.4.3 Triangulation

"The triangulation metaphor is from navigation and military strategy that use multiple reference points to locate an object's exact position" (Jick 1979, p. 602)

Yin (2002, p. 97) advocates the importance of multiple sources of evidence when conducting a case study. It might only be possible to rely on one source of evidence for a case study, but if possible multiple sources are recommended for a case study. This is what Yin refers to a triangulation. The reason for triangulation is to verify the validity of the sources.

Triangulation can be traced back to Campbell and Fiske in 1959 (Jick 1979, p. 602) who developed the idea of "multiple operationism". They argued that more than one way should be used in the validation process.

According to Denzin (1989, p. 237) there are four basic types of triangulation:

1. Data triangulation
 - a. Time
 - b. Space
 - c. Person
 - i. Aggregate
 - ii. Interactive
 - iii. collectivity
2. Investigator triangulation
3. Theory triangulation
4. Methodological triangulation

Data triangulation, theory triangulation and methodology triangulation are the three types of triangulation used in this thesis. Theory triangulation will be used in the next chapter regarding the theoretical framework.

The Benefits of Triangulation

Triangulation provides researchers with several important opportunities. The first one would be the confidence of the results which are found during the study. There are many reasons for using triangulation when conducting a case study. Some secondary sources may have been interpreted incorrect, which will give a wrong understanding of what the source really mean. The use of multiple sources can then give the investigator the correct meaning. Triangulation can change the perspective in which a problem is seen.

The Challenges of Triangulation

The largest challenge of triangulation is to collect the data on the same topic from multiple sources. In order to triangulate, multiple sources of evidence is needed. This has been the largest challenge in this thesis, since it's been hard to collect the necessary data.

3. Theoretical Framework

The point of this chapter is to go through the different theoretical terms used throughout this thesis. The theory will be presented as well as criticized. The main topics used for this thesis are:

- Open Innovation
- Collaboration (with future competitors and partners outside your own industry)
- Business Models

Each of these topics will be analyzed so they can be understood when using them in the analysis (chapter 5).

3.1 Introduction

In order to start up a new firm in a new and evolving market such as the EV market can have a lot of barriers and many considerations have to be done. This thesis will enlighten some of the in terms of collaboration, open innovation and what a business model for such a firm should contain. The main title of the thesis indicates that collaboration is the main topic. But to understand how and why Tesla Motors has collaborated in the past and also need to in the future, an overview of their business model must be analyzed.

3.2 Open Innovation

Chesbrough (2007, p. 55) describes open innovation as “... the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively”

3.3 Collaboration and partnerships

“One of the most important trends in the industrial organization of the past quarter century has been the growth of collaboration between independent companies” (Grant et al. 2004, p.

3.3.1 Introduction

Companies today are on a never ending search for new technologies. To find those, companies often have to look outside the own walls. Even the leading companies can no longer survive on their own R&D, but must open for collaboration with others (Clark 2007, p 46).

3.3.2 Forms and Objectives of collaboration

Grant et al. points out a diversity of collaborative forms (Grant et al. 2004, p. 62). These forms include:

- Supplier-buyer partnership
- Outsourcing agreements
- Technical collaboration
- Joint research projects
- Shared new product development
- Shared manufacturing arrangements
- Common distribution agreements
- Cross-selling arrangements
- Franchising

Before starting a partnership both parties has to agree on which form of collaboration it should be as well as the objective of the collaboration. Chesbrough & Schwartz (2007, p. 56) advocate that before any co-development partnership an objective (or multiple) has to be defined. Since Tesla Motors has many different partnerships, a range of forms and objectives will be analyzed. More of the theory from Chesbrough & Schwartz will be presented during the analysis.

3.3.3 Barriers

“Although recent research on basic drivers of human action suggests that cooperation may be a natural human tendency, collaboration at multinationals does not just happen on its own” (Hansen & Nohria 2004, p. 24)

One of the purposes of this thesis is to highlight which barriers Tesla motors has experienced in the past, which they can experience now, and which might come in the future. One thing is clear;

it's hard to collaborate with partners, whether they are within your own industry or outside, without running into some kinds of barriers.

Hansen & Nohria describes four barriers to interunit collaboration:

1. Unwillingness to seek input and learn from others
2. Inability to seek and find expertise
3. Unwillingness to help
4. Inability to work together and transfer knowledge

For some reason employees may be unwilling to seek input or learn from others, even though the firm tries to enforce it. It's important to motivate the employees to learn. This part has to do with the human resource management. Different reward systems can be implemented in order to encourage collaboration between the two (or more) department / companies.

The ability to seek and find expertise is in this case a job for the management in collaboration with the employees. Hansen & Nohria (2004, p. 24) are explaining the barrier when it happens within the same company. But in this case the theory will be used in an inter-firm context. This means that some of the suggestions are not feasible in this context. But the idea behind the need to seek and find expertise is still there. When a knowledge gap is discovered there is a need to seek and find help. The different here is whether the help is found inside or outside Tesla Motors.

The third barrier is the unwillingness to help. Competition and unwillingness to reveal company secrets are reasons not to collaborate. It's important to convince a possible partner which possibilities they have by collaborating. If they can't see which advantage they have from a partnership, the unwillingness to help is possible larger.

The fourth barrier is the inability to work together and transfer knowledge. Again a crucial one to overcome if a partnership is to become a success. There can be many reasons why this barrier is so hard to overcome. This could be:

- Tacit vs. explicit knowledge – Tacit knowledge is very hard to transfer on to others and can therefore be an impediment to the partnership.
- Linguistic difficulties – The understanding of each other is important in order to collaborate

In order to break down this barrier a close relationship between the two parties should be established. This can be done by having the employees working close (geographically) together for a longer time.

Critics of the theory

The theory used to analyze the barriers of collaboration is originally used within large multinational corporations and not as a theory for collaboration between different companies. The theory is therefore adapted for this thesis which may affect the result of the analysis.

3.4 Business Models

*"A business model is at set of activities **which** a firm performs, **how** it performs them and **when** to perform them so as to offer customers benefits they want and to earn a profit."* (Afuah 2004, p. 3)

Afuah is one of the main theorists who talks about business models and will be included many times in this thesis when talking about business models.

Afuah has been used as the main theorist for the chapter on the BM. The theory from Afuah (2004) is a sort of a guide on what should be included in a BM. The topics which this thesis has analyzed are:

- The industry factors
- The firm-specific factors
- Positioning
- Revenues and the cash-flow
- Targeting customers

For each of these topics different theorist has been included in order to criticize and complement the theory from Afuah.

4. Case studies

The aim of this chapter is to get an overview of the empirical findings and the data collected for this thesis. The data is based on interviews, information from the news, articles on the internet and statements from people inside Tesla Motors. The main focus will be on Tesla Motors, but there will also be looked at partners and future competitors. One focus topic will be the past collaborations. Much of the empirical findings will be presented during the analysis. This chapter will have a brief introduction to the findings as well as the background and future plans of Tesla Motors.

4.1 The Tesla Motors history and announced plans of the future

The company, Tesla Motors Inc., is a brainchild of Martin Eberhard, Marc Tarpanning (both Eberhard and Tarpanning are co-founders of the electronic book company NuvoMedia) and Elon Musk (founder of PayPal). Sergey Brin and Larry Page (the founders of Google) are investors. This just gives a perspective of the forces, both financial and the knowledge, which are behind the company. The company was established in the summer of 2003. In 2006 Elon Musk came with following statement:

“So what’s Tesla’s gameplan?” - “The starting point is a high performance sportscar, but the long term vision is to build cars of all kinds, including low cost family vehicles. Tesla is one of those rare opportunities to change the world in a positive way and build a valuable company in the process.”
(Clean Break 2006)

Both Eberhard and Tarpanning had a great passion for high performance cars and they both wanted to create a vehicle which was running on alternative fuel. The big hurdle, but at the same time opportunity, was the history of the EV. Nobody had yet built an EV worth buying. This was the opportunity to change history as well as having first movers' advantage.

Tesla Motors officially presented their first electric vehicle July 19, 2006 in Santa Monica CA - The Tesla Roadster. The Roadster was developed by Tesla Motors with design help from Lotus. When Tesla Motors decided to build an electric vehicle, the founder of Tesla Motors, Martin Eberhard, chose not to build it all from nothing. Instead he outsourced the design of this new vehicle, by

having a design competition. Four different design teams attended this competition and one of them was the Lotus design team. They were also the winners of the competition.

Presenting new EV manufactured at new production facility

In February 2007 Tesla announced that they will be making a sports sedan known as Model S or WhiteStar. This EV will be produced at a new \$250 million production facility in San Jose (CA), which hasn't been build yet. The production rate of this new EV will be 10,000 a year and the cost of such an EV will be between \$50,000 and \$60,000.



Source: eXpertMotor.com

First illustrations of the Tesla Model S

The new Model S will be a 5 doors sedan, which can be used as a family EV. Unlike the Roadster, which is build in collaboration with Lotus on a Elise platform, the Model S is build on their own platform (eXpertMotors.com, Oct. 25, 2008). It is expected that the Model S will be on sale in the late 2010.

4.2 Past collaboration with partners and competitors

Since one of the main focus areas of this thesis is collaboration, it is important to look at what has happened in the past. This part of the case study will briefly go through the some of the main past collaborations which also will be analyzed in the next chapter.

The Lotus Partnership

The Lotus partnership was initially started by a design competition from Tesla Motors where the Lotus design team won. The outcome of this competition was a vehicle very similar to the Lotus Elise. Another outcome of this competition was a close partnership between Tesla Motors and Lotus. Today the Tesla Roadster is manufactured at the Lotus plant in Hethel in the UK. There are many reasons for this collaboration. In the beginning of the partnership Tesla Motors were a small newly established company and setting up a manufacturing plant would have been very costly. The Lotus plant was already established and fitted the production rate which was needed from Tesla Motors. A second factor was the supply chain. Lotus had already established a supply chain for their own production and in some cases this supply chain can be reused for the Roadster production.

The battery partnership

The partnership with the battery cell manufacture is along with Lotus probably the most important partnership which Tesla Motors has. The product they provide is one of the most important components for the core innovation at Tesla Motors – the battery pack.

There has been much secrecy about who the manufacture is and there isn't any reliable source who could reveal who the manufacture is. But by listening to rumors and searching the internet, many indicate that the manufacture is either Sanyo or Sony.

The structure of the partnership is just like other large partnerships Tesla Motors have – they hire employees at the partners' location. This collaboration structure is very important for Tesla Motors and will be analyzed.

The engine partnership

The engine partnership is the last interesting partnership. Unfortunately there isn't much data on the partnership with electric engine manufacture. The engine is, along with the battery (pack), one of the most important parts of the EV.

4.3 The Market and its surroundings

Political influence and legislations

We have briefly been introduced to the political influence and interest in the introduction of this thesis. It has become very popular by politicians all over the world to have strong environmental stance. Even though it isn't a focus area of this thesis it's important to highlight it, since it will affect the EV market and Tesla Motors' BM.

Examples of political influenced advantages are:

- No tax on EVs (DK)
- No parking fee in some cities (DK)
- High tax on gasoline and diesel
- Restrictions on emissions from newly produced ordinary vehicles (US)
- Electric vehicles purchased new are eligible for a one-time federal tax credit of up to \$4,000 (US) (Fueleconomy.gov)

Other collaborations in the EV industry

Another example of collaboration within the EV industry is the Better Place project (www.betterplace.com). This project was started by Shai Agassi, who imagined a world without the need for oil. The project was founded in 2007 on \$200 of venture capital.

And the evolution of the car means the evolution of the entire transportation model. When we eliminate the dependence on oil, we eliminate the environmental and economic damage that came with it (betterplace.com)

Today the partnership involves Better Place, Dong Energy and Renault-Nissan. The idea is build on the same model as the mobile phone is today. The plan is to build an infrastructure for the EV. Customers own their own EV but sign up to a service with recharging stations for everyday use (100 miles or less). If you need to go further than that, changing stations is available for fast battery changes.

Think of it like this: we pay mobile providers for minute-by-minute access to cell towers connected together in cellular networks. Truth is, we pay comparatively little - or next to nothing - for the phones themselves. After all, what you're really buying is air time, not a box with buttons.

The same model works for transportation. Just replace the phone with an electric car, replace the cell towers with battery recharge stations, and replace the cellular networks with an electric recharge grid. Now you're buying miles, not minutes. (betterplace.com)

Better Place is aiming for new standards within the EV industry, by collaborating with different partners inside and outside the industry. The bullet points of the Better Place idea is:

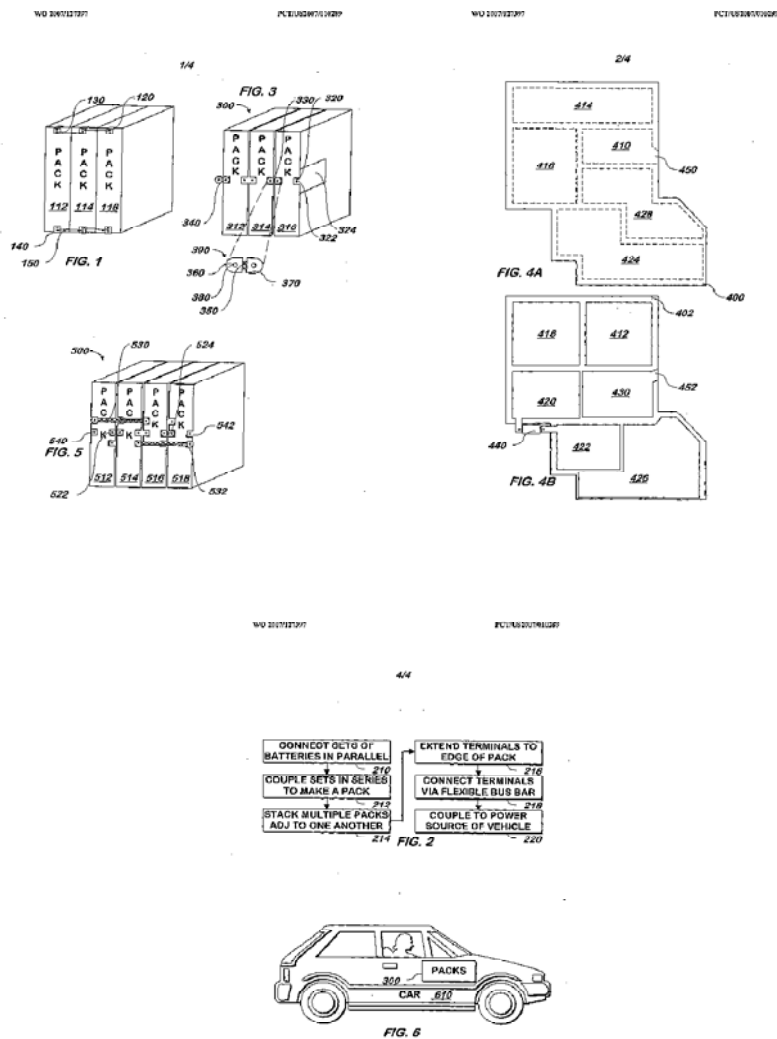
- Drivers pay to access a network of charging spots and conveniently located battery exchange stations powered by renewable energy.
- Drivers pay for the miles they drive.
- Cars are made much more affordable - even free in some markets - by the business model's financial and environmental incentives to add drivers into the network.
- Better Place operates the electric recharge grid that brings it all together

4.4 Patents

The patent is a tool in which Tesla Motors can protect their innovations / inventions from being copied or stolen by other companies. At the moment Tesla Motors has registered 20 patents worldwide (see appendix 1).

All of the patents have to do with the electric system of the vehicle and most of them are components of features of the battery pack. This is an indication of where the core value of Tesla Motors is.

Because partnerships and collaboration has such an important part of Tesla Motors business plan, these patents are even more important.



Source: Patent og Varemærkestyrelsen – Espacenet

System and method for interconnection of battery pack

Another reason for patenting the innovations is for future possibilities of licensing and royalties of the product production. If the battery pack should become a new standard in the EV industry, Tesla Motors would stand very strong with these patents.

5. Analyses

5.1 Introduction

The Analysis will try to answer the research questions by using the theory presented in the theoretical framework and the data from the case study. The analysis will also use new theory in a minor scale, which hasn't already been presented.

5.2 Working with future competitors and partners beyond your own industry today

“Co-development partnerships are an increasingly effective means of innovating the business model to improve innovation effectiveness” (Chesbrough & Schwartz 2007, p. 55)

As previously mentioned; collaboration is already taking place within the EV industry. For Tesla Motors to maintain their position on the EV market, they also have to collaborate – both inside and outside the industry. This chapter will go through some of the partners Tesla Motors has and analyze what it has brought to Tesla Motors and how these partnerships has worked out in accordance to the problem statement.

5.2.1 Partnerships and collaboration

One of the main purposes of this thesis is to look into the collaborations and partnerships Tesla Motors has or could have. As mentioned in the previous part about business models; Lotus is closest partner to Tesla Motors. The other partnerships which will be analyzed are the Vehicle-to-grid partnership, the battery cell partnership, and the engine partnership.

The first thing when planning a partnership is to define the objective of the partnership or co-development (co-dev) (Chesbrough & Schwartz 2007, p. 56). This table clearly indicates some of the different objectives Tesla Motors has with the partnerships.

Objectives of co-development		
Objective	Business requirement	Implication for co-dev design
Increase profitability	Lower cost	Increase volume to spread fixed costs; partner for less-critical components
Shorten time to market	Incorporate already-developed components or subsystems	Seek partners with proven capabilities
Enhance innovation capabilities	Increase the number and variety of front-end technologies	Create strategic research partnerships with universities, research labs
Create greater flexibility in R&D	Share risks with partners	Develop research partnerships in bottleneck areas
Expand market access	Broaden the pathways to market for products and service	Leverage partner's complementary R&D to tailor offerings for new markets

Source: Chesbrough & Schwartz 2007, p. 56

5.2.2 The Lotus partnership

As mentioned earlier, the Lotus partnership is a spin of a design competition which led to collaboration. There are many reasons why this partnership was needed and why it became a success for both partners. The first reason would be that Tesla Motors was a newly started EV company trying to enter a market with very high entrance barriers. Establishing production facilities, storage, supply chain etc. would be extremely expensive for them. Another reason was the possibility for open innovation. In order to stay in the market a continuous innovation process is needed.



Lotus Elise



Tesla Roadster

The Lotus production in England fits very well to the small amount of cars that Tesla Motors' needs. This also means that Tesla Motors doesn't need to spend money on storage of cars that they haven't sold. At the moment Lotus is producing what is ordered. Another good reason for the partnership on production is the similarity between the Tesla Roadster and the Lotus Elise. Therefore Tesla Motors is able to save money on material storage, because they can use the same platform as Lotus. At the same time; Tesla has employed some of the workers on the factory in England. That way they have a good overview of the production.

Another advantage, which Tesla Motors gain by the collaboration with Lotus is the supply chain. By having the EV manufactured at the Lotus plant and having similarities to the Lotus Elise, they can reuse some of the parts from Lotus' own production.

"Having chosen to work with Lotus as the contract manufacturer, we decided that there was no point in reinventing the wheel. We're using the Elise structural concept, so anything we can carry over from the Elise makes a lot of sense. We at Tesla have enough to worry about with the new technology, without having to also worry about a lot of the other stuff that goes into making a car." (Mac Powell 2009)

Mac Powell also divides the parts for the Tesla Roadster into three categories:

1. Parts that are 100% carryover. These parts are the same as the Lotus Elise which gives the advantage of just ordering larger quantities for both productions.
2. The second category comprises new designs or modified parts where it still makes sense to use the Lotus supplier. It is Tesla Motors who designs the parts and the Lotus supplier who produce and deliver them directly to Lotus. Again Tesla Motors gain advantage from Lotus and their supply chain.
3. The last category is the parts which are unique for Tesla Motors and also produced by them or their own suppliers. These parts include engine and battery (pack).

Because Tesla Motors only plans to produce a very small amount of the Roadster on a yearly basis, the collaboration with Lotus has more advantages than disadvantages.

Objective and Barriers

Before reaching the objective of a partnership, different barriers have to be overcome. One of the objectives of the partnership with Lotus was to co-develop the Tesla Roadster. It was important for Tesla Motors to have a knowledge flow back and forth between Tesla in the US and Lotus in UK. To overcome the barrier of knowledge sharing, Tesla Motors hired employees at the Lotus plant. That way Tesla Motors could keep the gained knowledge within the company, they had closer contact with the actual production, they could learn from Lotus.

Where some of the initial objectives for collaborating with Lotus were to save money, gain from Lotus' supply chain, and open innovation; the objective now is more to optimize production rate and still practice open innovation. Some of the barriers are the same and some new ones will occur.

5.2.3 Collaboration with the power companies

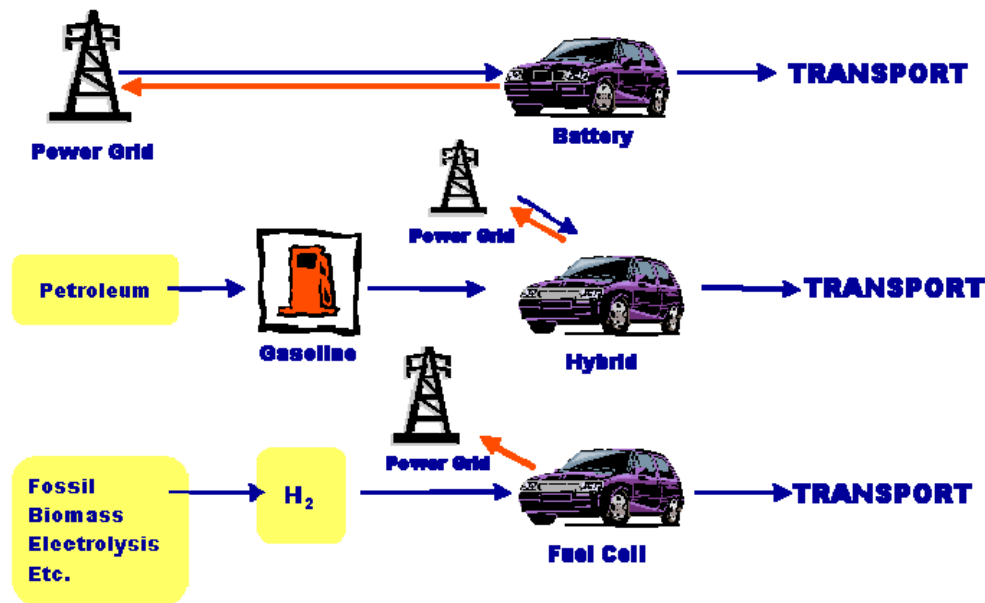
An obvious partner would be the power companies around the world. A lot of electricity produced during nighttime is wasted because it still isn't possible to store large amount of energy. Most of the power production during nighttime is from windmill production which can't be turned up or down (it can be shut off, but not regulated). One way of storing this power is in batteries of the EVs. If the EV owners could recharge their vehicles at night when there is an over production and then use it during daytime, the owners might be able to save money and the power companies could sell more power.

Vehicle-to-grid collaboration

One example of such a partnership is the collaboration with Pacific Gas and Electric Company (PG&E) (Green Car Congress 2007) and the Vehicle-to-Grid project (V2G). The V2G project is about storing power in the vehicles when there are not needed for transportation (see picture below).

This collaboration is a winning situation for both the power companies and the EV owners. This is also a way EV manufactures can join forces with the power companies against the massive

automobile- and oil industry. This collaboration can become very important for the EV industry if they should have a chance competing with the automobile industry.



Source: <http://www.udel.edu/V2G/V2GConcept.html>

Vehicle-to-grid concept

The problem for the power companies today is that they can't store large quantities of power today and they can't turn up or down for the production of windmill power. This means they have a large over production during nighttime and a need of power during daytime which means they have to complement the power supply with "not-green" energy sources.

As illustrated on the picture above; the V2G system is a system of multiple advantages. Not only for EVs, but also vehicles such as hybrid cars and fuel cells. It can be used for both storing energy and being an extra energy source. For Tesla Motors, and their customers, the advantage would be storing energy and recharging energy while it is cheap during nighttime.

Objective and Barriers

The main objective of this collaboration would be to provide an extra service for the Tesla Motors customers and to promote Tesla Motors as a "green product". The partnership will enforce the publicity of both parties. They are not competing in any ways and will not in the future. On the contrary they can only help each other's business area by providing more and better customers.

The initial barriers would be how to implement this technology into the EVs and get more EV manufactures into the collaboration. This is needed if both parties want this technology to become a standard in the EV business.

5.2.4 Partnership with battery-cell manufacture in Japan

The battery pack is one of the key elements of the Tesla Motors project. This battery pack is also known as the *Energy Storage System* (ESS) (teslamotors.com). It is comprised of 6831 individual Li-ion batteries. These batteries are very similar to the batteries (cells) we know from our everyday use (see picture below)



Source: www.teslamotors.com

The Tesla Motors battery pack

The largest problem with batteries today is their life span and capacity. The life span can be divided into two kind of aging: Aging over time and aging from use. Over time the batteries will lose capacity, just like the use of them will decrease the capacity. Another thing which affects the batteries is the environmental factors such as temperature and humidity. The Tesla Motors battery pack is heated before charging when the temperature is below 0 degrees.

It is the small cells within the ESS which is produced by a collaboration partner in Japan. It is very important for Tesla Motors that they have the right partner to produce these cells in order to obtain the best quality and to make sure that the cells live up to the standard required for the ESS.

“We looked what were available in the market at the moment. That is why we could go into production while other companies are still researching who will be their suppliers producing the batteries. We were looking what were possible with those types of cells and that influenced the specifications of the car” (Interview Straubel 2008)

The main difference between outsourcing and what Tesla Motors are doing is that Tesla Motors are employing people at the collaborating partner. This gives Tesla Motors an insight into the processes and innovation at their partners. The advantage of this is the content flow of information from the partners to Tesla Motors in order to continue the R&D at Tesla Motors.

It is naturally not possible for Tesla Motors themselves to produce these cells, since the development and production of them is very costly. But collaborating with a battery manufacture is an ideal solution since the key innovation at Tesla Motors is the ESS.

Who Tesla Motors are working with on these battery cells is a company secret, which has been kept very close. A statement issued by Tesla Motors reveals that the battery suppliers are reputable Fortune 500 battery suppliers (Gene B. et. Al 2006, p. 2). But by searching the internet, many sources indicate that it could be Sanyo and/or Sony (e.g. <http://www.teslamotors.com/blog2/?p=39>). Both of them are very large players on the electric market and are therefore able to provide a security for Tesla Motors.

Objective and Barriers

The clear objective of this partnership was to provide the best battery pack on the market. For that to happen, Tesla Motors had to find a stable battery cell provider. It was important that they were economical strong and were interested in a strong partnership with Tesla Motors. By strong partnership is meant, a willingness to provide Tesla Motors with knowledge which could endanger their Intellectual property (IP).

But because of the secrecy behind the partnership with the battery cell manufacture, it has been hard to clarify which barriers there has been and will be.

In terms of barriers, Hansen and Nohria (2004, p. 24) refers to four barriers when collaborating:

1. *Unwillingness to seek input and learn from others*

What if the employees Tesla Motors's hiring aren't willing to seek input or learn from either the partner or Tesla Motors.

2. *Inability to seek and find expertise*

What if Tesla Motors isn't able to find the necessary expertise. Finding a battery supplier might be easy, but finding the right one isn't.

3. *Unwillingness to help*

The next problem might come if they found the right one, but the right one is unwilling to help Tesla Motors. This can happen on two levels – the managing and the employee level.

4. *Inability to work together and transfer knowledge*

Commutations, linguistic difficulties or other reason could resolve in the inability to work together.

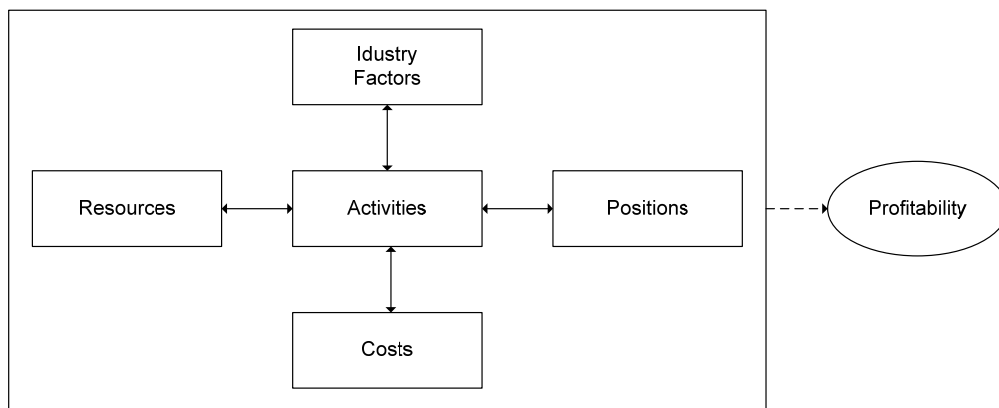
5.3 Exploring the business model of Tesla Motors

One of the key elements of the success of Tesla Motors is their business model. In this chapter we'll look at what Tesla Motors has to offer its customers and which hazards they should be aware of. As stated by Afuah (2004, p. 3), a business model is a framework for making money. It's an overview of which activities a firm perform, how to perform them and when to perform them. This is why it's so important to look at.

5.3.1 Components of a business model

A good business model can be divided into two key points.

The first key point is about making a firm profitable. The two factors that determine whether a firm is profitable or no are the *industry factors* and the *firm-specific factors* (position, activities, and resources) (Afuah 2004, p. 9). These factors – industry factors, position, activities and resources – are seen in the figure 7.1 along with cost. All action performs costs, which makes important to include when looking at firms profitability.



Source: Afuah (2004, p. 11)

Figure 7.1: Components of a Business Model

The second key point is that the firm can make money from its activities it performs within its own industry. These activities should also create superior customer value and position the firm well in the market.

5.3.2 Industry factors

According to Afuah (2004, p. 4), there are three primary industry factors that influence the profitability of firms:

- The competitive force in the industry
- The influence of the overarching macro environment on the industry
- The cooperative forces between the firms and their suppliers, customers, rivals, and potential new entrants

The competitive force

The competitive force in the EV industry is exerted by many factors such as suppliers, customers, rivals, potential new manufactures, complementors (the power industry as well as the oil industry) and substitute products (the car industry as well as the hybrid car industry).

Since there aren't that many EV manufactures on the market yet, the competitive force exerted by rivals are low. This scenario can change fast. Many car manufactures are thinking of making EVs. Even though the entry barriers are very high, there are still car manufactures that got a lot of the same technology to manufacture EVs. The big difference, and also the key to EVs, is the batteries and the electric engine. The batteries need to be able to hold a lot of energy as well as being recharged fast. The electric engine has been on the market for a long time and the technology can be bought from many different manufactures. It is of course important to get an engine with high performance and which is able to use the power as well as possible. Here is a matrix of some of the direct and indirect competitors to Tesla Motors:

Product	Major players (or upcoming)	Competitiveness
EV manufactures	Think, GM Volt	Direct
Hybrid cars	Toyota Prius, Lexus, Fisker	Direct
Conventional cars	GM, Chrysler, VW, Porsche etc.	Indirect

The competitiveness is defined as either direct or indirect. The direct can for the most cases compete on the same level as Tesla Motors, which means green technology, economical consumption etc. The indirect can compete on being a vehicle for transportation, cost and branding. To get an overview of how the EV can differentiate them from the conventional cars (gasoline/diesel), the matrix below shows some of the key differences:

	Cars	EVs
Energy efficiency	20-30%	80-95%
Transmission	Yes	No
Noise	Yes	No
Brake energy	Lost	Reused

Construction	Complex	Simple
Environmental effect	High	Low
Maintenance	High	Low
Operating costs	High	Low
Initial cost¹	Low	High

Source: Dansk Elbil Komite

Cars vs. EVs

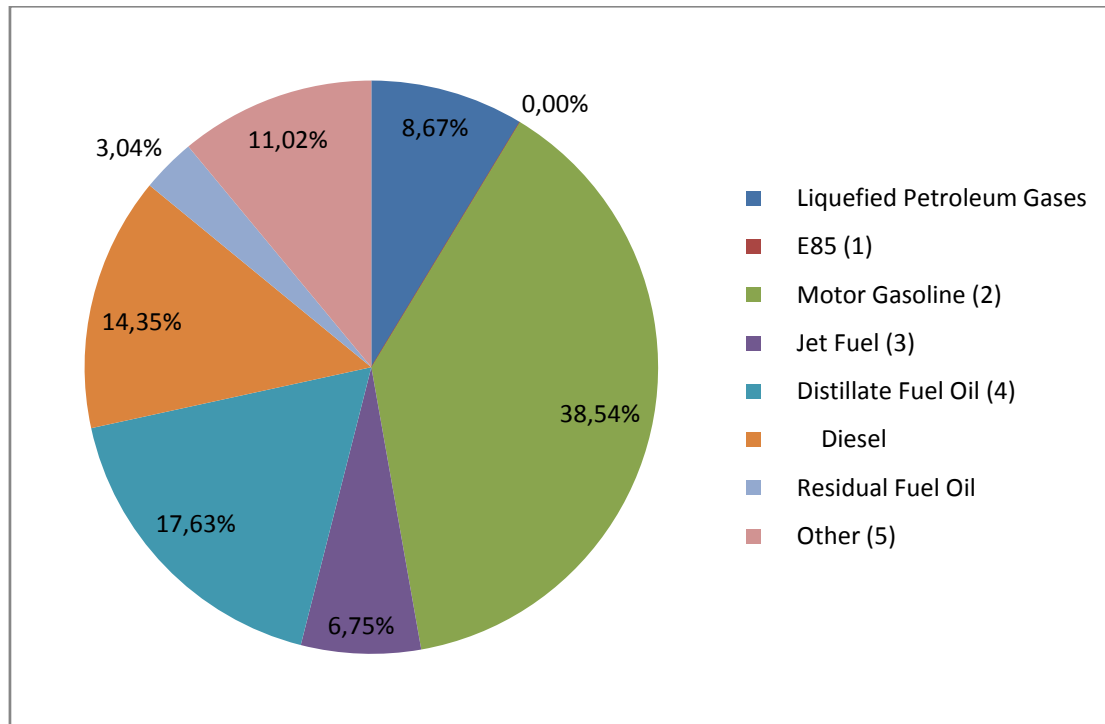
These factors can differentiate depending on which car and EV we are talking about. Also the country in which they are sold plays a role because of the tax system. But the overall impression which we get from this matrix is more or less correct.

The suppliers are another factor who can have an effect on the competitive force. Since some of the technology is very new and innovative, the suppliers of these parts have a strong bargaining power over the EV manufactures. If the suppliers of batteries, engines and other important parts raise their prices; it can easily affect the whole market. It is especially the battery manufactures who can affect the market. Establishing some kind of partnership with these critical suppliers could be a wise choice to make.

Even though the customers are the ones who bring the money, their bargaining power is still low. The EV market is still at very small niche market and only people that are very much into being "green" or people with plenty of money are thing of buying an EV now. Tesla Motors are also one of the few who has presented a real competitive EV on the market. By competitive I mean driving range, design, speed and acceleration combined. Their bargaining power is therefore not high, but if the industry is evolving as fast as it has been the last few years; this market will become very large and the bargaining power from customers will also go up. It is important for Tesla motors to be able to adapt to a higher demand from the customers. If Tesla Motors want be an exclusive they have to expect the customers to become more demanding as this market turns from being a niche market into a real market. This is just like Porsche or Ferrari customers are having a higher expectation to the product than a normal car a customer has.

¹ In Denmark there are no tax (besides VAT) on EVs, which means they can be sold cheaper than conventional cars.

The complementors of the EV industry are the power industry as well as the oil industry. The power industry has a great interest in the EV becoming a success – this will sell more power. On the other hand is the oil industry not that interested in this new vehicle. This will affect one of their main sources of income. To get an impression of how important the auto industry is for the oil industry, the chart below shows how large a share of the oil that is used for gasoline compared to other oil products. This chart is only from the USA. The numbers are in million barrels a day.



Source: EIA, report no. DOE/EIA-0383 (2008)

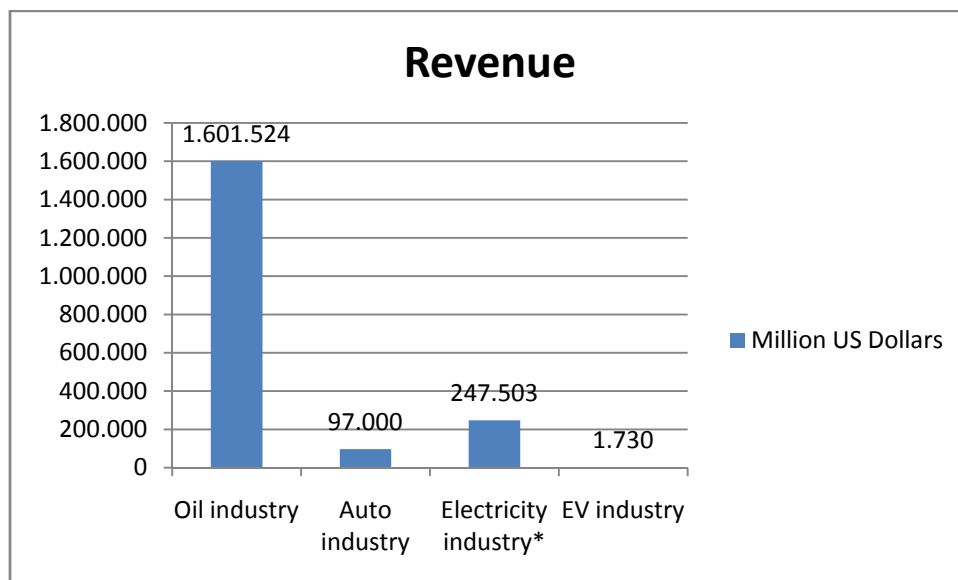
Oil products 2007

1. E85 refers to a blend of 85 percent ethanol (renewable) and 15 percent motor gasoline (nonrenewable). To address cold starting issues, the percentage of ethanol varies seasonally. The annual average ethanol content of 74 percent is used for this forecast.
2. Includes ethanol and ethers blended into gasoline.
3. Includes only kerosene type
4. Includes distillate fuel oil and kerosene from petroleum and biomass feedstocks.
5. Includes aviation gasoline, petrochemical feedstocks, lubricants, waxes, asphalt, road oil, still gas, special naphthas, petroleum coke, crude oil product supplied,

The last force which is very strong is the substitute products. The largest industry is the car industry, but other alternative vehicles like the hybrid car are also substitutes. Most people still choose to buy a normal car, which of course makes the car industry the largest competitor. It is because of the substitute products that the competitive force all together is high and still makes the industry less attractive. Firms in the industry should at all times pay attention to the competitive force, since it can change at all times.

The macro environment

The macro environment has a large saying in the EV industry. One of the criteria's for the EV to become a success is the regulations and what kind of tax system the governments are making for the EV. Also the infrastructure, such as charging stations and special parking spots for EVs, has a large influence on the success of the EV. All these matters are different from country to country (or from state to state), which could be one of the reasons for the different EV manufactures to cooperate. It would be too hard for Tesla Motors alone to start this lobbyism all over the world. If they joined forces with other manufactures, they could all save money and they would be stronger together.



Source: Marketresearch.com, EIA.com, Oil industry profit report 2007

* Electric industry is the revenue from 2006, since 2007 report hasn't come out yet.

Revenue from the different industries in 2007 (2006)

The largest player in the oil industry is the OPEC collaboration. OPEC is a collaboration between some of the largest oil providing countries in the world. They have a really large influence on the world oil market. In 1973 they started an oil boycott to the western world, which meant that many had to use alternative transportation instead of cars. In Denmark we had the car-free Sundays. But the OPEC countries also have a large interest in the western countries. A full American independence from OPEC would mean a loss of \$700 billion a year (Human Events.com, 27/10/08). This gives an impression of how important the western world and the automobile industry are for the oil industry and the OPEC countries. The oil industry is also paying of politicians during

elections so they in return can get influence on what happens on this market – this market of cause includes the automobile- and EV industry.

The cooperative force

As mentioned above; cooperation could become an important factor for Tesla Motors to become a financial success. But it's not only cooperation with competitors that is important – also working close together with their suppliers could lead to a better and more successful product. Tesla Motors is already collaborating close together with their supplier Lotus. Lotus is assembling the EV at their factory in the UK. It is also the Lotus design team who come up with the design of the Tesla Motors Roadster. This partnership has been described in the previous chapter.

5.3.3 Firm-Specific Factors

Just like the industry factors, we also have firm-specific factors. These determine whether a firm is more profitable than its industry rivals. These factors are:

- The positions that it attains and maintains within the industry and the market in which it competes.
- The activities that it performs to attain and maintain these positions.
- The resources that enable it to perform the activities

The **position** the firm has within its own industry is a key element which should be looked upon when discussing the business model. The positioning include what to offer its customers, the market segment to which it offers value, the sources of revenue, the firms relative positioning vis-à-vis its suppliers, customers, rivals, potential new entrants, substitute products and complementors and the price it charges its customers. These elements will be looked upon in the following sub-chapters.

The next factor is the **activities** the firm wants to perform within their market. For a firm to do well and position themselves on the market they have to perform activities that underpin these positions. Tesla Motors has to know what to offer their customers and which customers segment to target. Just like the car industry; there are many different segments within the industry. BMW is

targeting one segment and Ford is targeting another. Not saying they aren't overlapping each other but it is two different kind of customers they are targeting. The key phrase for this factor is:

*"The extent to which a firm can attain and maintain a profitable position is a function of **which** activities it chooses to perform, **how** it performs them, and **when** it performs them"* (Afuah 2004, p. 9).

Which: For Tesla Motors to maintain and attain their position on the EV market, they have to choose which activities to perform and just as important; which they have to cut away or outsource. At this moment many activities are already partly outsourced, such as the manufacturing to Lotus. Even though the manufacturing takes place at the Lotus factory in the UK, they still have people hired there. That way they have some control over the production and can get important knowledge back to the main office. At the same time Tesla has plans of building a facility in Silicon Valley (CA) for manufacturing the new 5-doors luxury sedan - Model S (www.teslamotors.com). When fully functional, the plant will employ approximately 1000 workers. With these plans Tesla are moving away from outsourcing and into doing a lot more in-house. This is also a lot more risky, since they are building up capital into buildings and production facilities instead of R&D and marketing. But it's also activities such as payment methods, service methods and which customers to target that has to be decided by the strategic management of Tesla Motors.

How: After deciding which activities to perform, Tesla has to decide how to perform them. An example at Tesla is their payment method and keeping a positive cash-flow. When customers order a new vehicle from Tesla today, they have to make a deposit. This is one of the ways Tesla Motors have a positive cash-flow.

But it is also decisions like how to manufacture, how to work with partners, how to work with customers and how to work with suppliers are decisions Tesla has to make.

Now they have already chosen to partly outsource the manufacturing part to Lotus. The reason for "partly" is that they have hired people to work at the facility in the UK. That way they make sure that the knowledge stay in Tesla Motors.

Tesla is planning to open a manufacturing facility in the US for the manufacturing of the new sedan, which is planned to arrive in 2010.

When: The timing of the different activities in the firm is very important. Introducing a new EV too early or too late could mean the difference between failure and success. Being first-movers are not always an advantage. Competitors can be looking over Tesla Motors' shoulders and then gain from what they have spent lots of money on finding out.

Also the decision of building a new manufacturing facility in the US now instead of earlier, was a strategic decision in term of when to do the right thing. When to spend money on new production facilities, distribution channels, supply chain, storage, and R&D, are important decisions to make. Moving money from the R&D budget into new distribution channels around Europe, could mean the loss of being the best product on the market.

5.3.4 Positioning

"For a firm to make money, customers must prefer its product over competitor's product"

(Afuah 2004, p. 19)

It is always important for a firm to position themselves on their market. That can be done by differentiating themselves from their competitor's products, as well as offering customers better value than their competitors. A product is differentiated if the customers perceive it as offering benefits that are superior to those of competing products or as having benefits that competing products do not have. That can be done in many different ways such as:

- Better performance (Speed, acceleration etc.)
- Different design
- Quality (quality of parts such as brakes, material etc)
- Price
- Brand reputation / exclusivity
- Service
- Running expenses

Chairman of Tesla Motors, Elon Musk, wants Tesla to become the Apple (Apple computers) of electric cars (Business Week Oct. 23, 2008). Apple is known for a distinct design and good performance. Thru those two factors they have developed an exclusive product. Tesla is trying to do the same thing with their Tesla Roadster. The design is very similar to the Lotus Elise, which is a upper class designer sports car. The performance is excellent – it is the fastest accelerating EV on the market with 0-60 mph in less than 4 seconds.

Branding is also about being first movers and being among those who establish the marked. That way the firms promote their brand as being front runners. From 2010, General Motors, Toyota Motors, Nissan Motors and Daimler expect to launch their own electric vehicle and it can become hard to compete with firms of such a size as those. They also have the advantage of already knowing the car marked which is very similar to the EV marked. They have a well organized distribution channels and an established name across the world. This is why it's important for Tesla Motors to establish them on the marked and getting their name known around the world as a quality product. It is not only the distribution channels where those future competitors have an advantage. Also the after sales service can become a challenge for Tesla Motors if they want people to buy their product. Many of the big car manufactures already have service stations around the world which is a security for the customers if or when their vehicle brakes down. Many possible customers might reconsider buying a Tesla EV because of the lack of service stations. This is where Tesla Motors should look for partners that can fill out this role for them. It would become very expensive for them to build up this network themselves.

5.3.5 Brand / Fame Positioning

"Brands are products that are known for being well-known"

(Moeran 2001, p. 11)

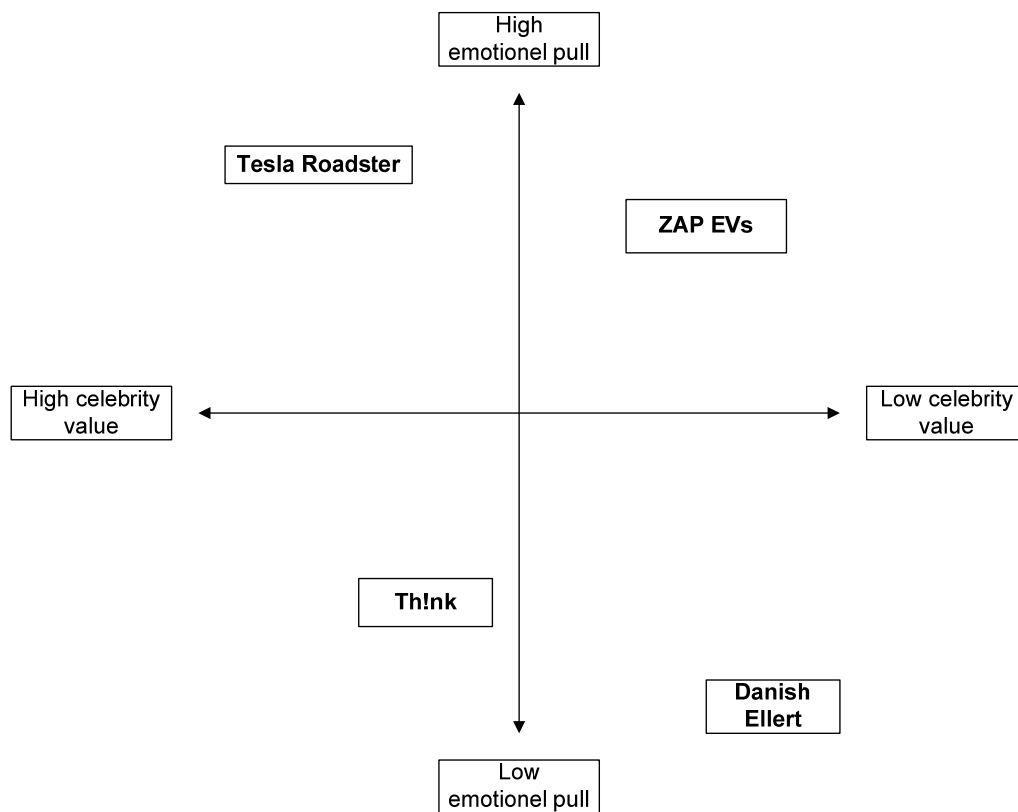
The brand / fame positioning is the way where the firm chooses to position themselves through celebrities, the media, at big and well covered events, so the product is seen together with rich and famous people. Afuah (2004, p. 21) refers to this kind of positioning as *"Brand-Name Reputation"*.

Celebrities

Celebrities form a crucial part of the promotional industry. They are “household names” whose reputations join together producers and consumers by means of the products with which they are associated (Brian Moeran, 2001).

Even if there were a very similar EV, the customer would still choose the Tesla over competitors EV because they see celebrities drive around in one. Customers associate themselves with the celebrities who drive this EV. This kind of positioning is seen with many other products, such as Gillette shaver, Pepsi cola and especially the clothing industry are using celebrities to promote their brand. Often famous TV hosts and other celebrities are given free cloth to be seen in.

To get an idea of how brand / fame positioning works for Tesla, I've made a brand positioning map (Morgan et. Al. 2002, p. 24). This map is originally used for placing travelling destinations, but it can just as well be used for other products such as EVs.



Brand positioning map

Positioning your firm through celebrities and high profiled events can be very effective for the advertisement of the product. But it can also be very expensive. Many firms pay the celebrities for wearing their cloth or drinking their beverages.

When using celebrities for positioning the product, it can be done in 2 ways. The first way is to make a product which is very popular and that way a lot of celebrities buy or use the product. The fact that Matt Damon (famous actor - see picture below) or Bono (member of the band U2) are signed up for a Tesla Roadster could endorse other potential customers to sign up for one as well. It also has the effect that people who doesn't know about the Tesla Roadster get an insight of the EV because Matt Damon is seen in one of the on the front cover of a magazine. This way is much harder because it's hard to make sure that the product will become popular. For that to happen the product often need to be much differentiated from similar products or alternative products (like the car). This is the case for Tesla Roadster. The Roadster is the fastest accelerating EV, it can drive the longest before re-charge, and it has a design like a normal sports car. Many EVs has a very distinct design, which differentiate them from normal cars. This design can make them very unattractive.



Source: <http://www.ecorazzi.com> (June 2, 2008)

Matt Damon is signed up for a Tesla Roadster

The second way to position a product through celebrities is by paying the celebrities for using or promoting the product. It's not only celebrities who are paid to be seen with the product. The product could also be seen at different events or in a movie (e.g. The BMW in James Bond). This kind of promotion has often been used. A variety of this is "product placement".

It's very hard for the customer to see if a company has paid for the product placement or if it is a celebrity who has chosen to buy the product themselves.

Another point of using this kind of positioning is what signal these celebrities or events are sending out to the customers. What kind of brand is the Tesla Roadster when Matt Damon, Bono or Arnold Schwarzenegger are driving one? One really popular signal to send is whether the product is environmentally correct or not. The next sub-chapter about "Green Technology Positioning" looks into this kind of positioning. If possible, it's important to choose which celebrity endorser to use and which signs to send out through this celebrity. It is clear that credibility and expertise are two driving factors in the celebrity-product marketing process (Moeran 2001, p. 5).

The fact that celebrities grab attention can also have a negative effect on the endorsed product. If the celebrity is caught driving around in a Tesla under influence to many times, the linkage between the Tesla and the celebrity turns out negative. This leads to the value each chosen celebrity gives. The choice of being seen in association with Arnold Schwarzenegger and Bono is very valuable in comparison to Paris Hilton. Paris Hilton might be seen more places and has a higher exposure value but the linkage between Paris Hilton and doing something for the environment isn't high. On the other hand, Schwarzenegger and Bono are known for their involvement in green technology. They give high value in positioning Tesla Motors as a environmental brand, which is discussed in the following sub-chapter.

Flag Store

Just like many other large brands, such as Apple, Tesla Motors has also just opened a flag store in Santa Monica (CA).

"The Apple Stores have worked out well. It's a fantastic consumer experience," Musk said. "We wanted a nontraditional automotive experience, and we have it." (Autoweek May 2, 2008)



The Tesla Factory Store in Santa Monica (CA)

This store is not only a place where customers can come to buy a new Tesla vehicle or get question about Tesla answered. It's also a face and an image toward its customers of what Tesla stands for. This image can signal good quality and a prestige product, just like Apple and Luis Vuitton has their flag stores around the world. These stores are not the primary sales channel and some of them are not even making money compared to what they cost to run and build. The 10,000 square-foot Tesla store has cost about \$2 million to create and it's a secret how much it cost to rent for Tesla (Autoweek 2008).

5.3.6 Green Technology Positioning

The Green Technology positioning is closely connected to the Brand / Fame Positioning and can often be combined. Bono, who's both an endorser of green technology as well as being a celebrity, is a great example of this. The greenhouse gas emission has come more and more in focus all over

the world. From 2000 till 2006 the greenhouse gas emission in the US has gone from 6978 mill. metric tons to 7075 mill. metric tons (EIA Nov. 28, 2007).

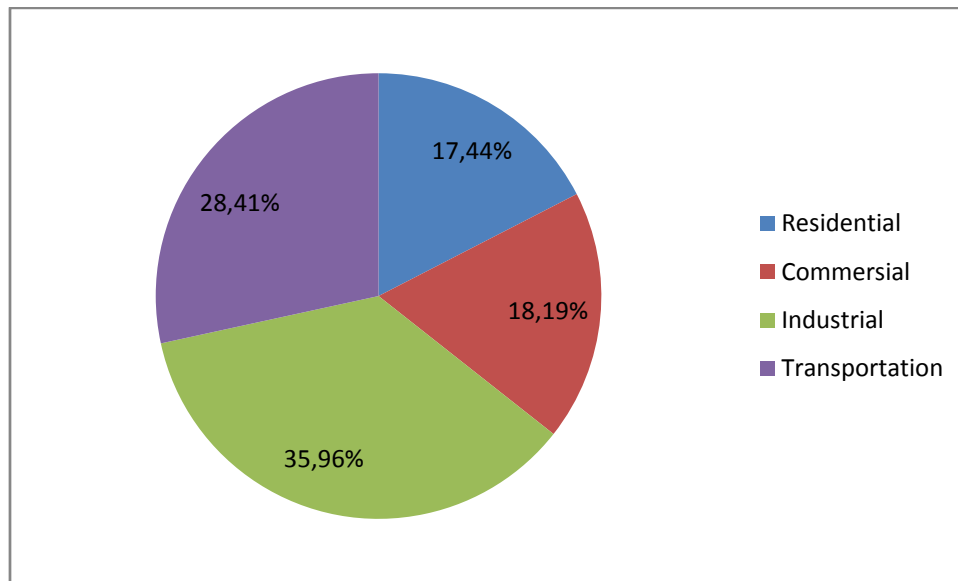


But even more interesting is seeing how much of this comes from the transportation industry. The pie chart below shows how large a share the transportation industry provides to the overall greenhouse gases emission.

“Positioning a brand as a “green brand” entails an active communication and differentiation of the brand from its competitors through its environmentally sound attributes”

(Hartmann et al. 2005, p. 9)

This phrase is partly correct for Tesla Motors when looking at competitors as the auto industry as we know it today.



Source: <http://www.eia.doe.gov/oiaf/1605/ggrpt/flowchart.html>

Emissions of Greenhouse Gases in the United States 2006

Hartmann et al. (2005) are dividing green brand positioning into functional and emotional positioning. The functional brand positioning is based on the production processes, product use and/or product elimination. For Tesla the primary focus should be on the use of the vehicle. There are no indications that the production and/or the elimination of the vehicle is “greener” than other vehicles (normal or EV). But the fact that the vehicle uses power instead of fuel has many advantages. First of all it's better for the environment – especially if the power comes from renewable energy such as windmills. Secondly, it's much more economical. It's much cheaper to use electrical power instead of gasoline or diesel.

The emotional positioning strategy, which can be an alternative or complementary to the practical, is based on at least three different types of emotional benefits (Hartmann et al. 2005, p. 11):

- A feeling of well-being.
- Auto-expression benefits through the socially visible usage of green brands.
- Nature-related benefits stemming from the sensations and feelings normally experienced through contact with nature.

The feeling of well-being is one most of us can relate to. Most car users would choose an EV over a normal car if it could perform the same features². Most of us are feeling good when doing something for the environment and being able to reduce the emission of greenhouse gases would intimidate many into considering an EV as their next EV – just because it would help the environment. This is very similar to reason why so many eat organic – it doesn't taste better or make you feel different afterwards. But it gives you a feeling of doing something good for the environment and yourself.

Being "Green" and Sexy

The big question is if it's possible to be green and sexy at the same time. One way to endorse the sexyness was to have the celebrities to endorse the product. At the same time many celebrities are "going" green and are doing a lot for the environment. Also many popular products such as Levi's and Apple are on the green wave. Levi's has introduced a pair of 100% organic cotton jeans and Steve Jobs from Apple has promised a "Green Apple" (Montgomery 2008).

The fact that being green and being sexy at the same time can be an advantage for Tesla Motors. It is two very popular ways of promoting products today and in many cases it has been hard to combine them.

5.3.7 Innovation Leadership positioning

"Globalization of markets, technologies and products have made it necessary that organizations have to weave innovation and brand reputation delicately to ensure that the customer remains dedicated to the brand" (Bhat et al 2001, p.26)

Being an innovation leader is a great advantage when trying to position a company in an upcoming market like the EV market. But there are also a number of hazards when being so. In this sub-chapter I will list a number of pros and cons of being an innovation leader and how these can be used for positioning Tesla Motors.

² Features = driving distance, acceleration, speed, refill / recharge-time, space, safety etc.

“Yes, we love innovation, but only if we can control it in such a way that nothing is going to change” (Buijs 2007, p.203)

Tesla Motors face a situation where they have to create a competitive position in a highly dynamic market. They are having two kinds of competitors – Those in the EV industry and those in the auto industry. Some of them are overlapping each other, since some of the auto makers also have started making EVs. It is therefore important for Tesla Motors to be innovative in many ways. It is not only about making an innovative product or parts³, but also about having an innovative strategy and brand. Apple managed to do so with their iPod.

The Brand Positioning Process		
<p><u>Innovation</u> Opportunity identification for sustained brand leadership and growth</p> <p>Brand vision Inspire the future consumer and marketplace</p> <ul style="list-style-type: none"> • Core Innovation • Product Innovation • Commercial Innovation 	<p><u>Strategy</u> Unique and meaningful brand promise</p> <p>Brand meaning Understand consumer, shopper, market and brand</p> <ul style="list-style-type: none"> • Establish Brand Promise • Establish Brand Positioning • Establish Brand Architecture 	<p><u>Design</u> Express of brand strategy through experiential brand assets</p> <p>Brand expression Create identity interface</p> <ul style="list-style-type: none"> • Establish Individual equity assets • Integrate through holistic execution across franchise • Create Guidelines for allegiant implementation

Source: Best (2008)

All three major types of innovation identify opportunities to sustain and grow brand leadership by delivering positive, discontinuous business results.

An EV manufacture like Tesla Motors have to decide whether they want to innovate and brand themselves as innovation leader or buy the parts for their EV. It is obvious that Tesla Motors have to focus on one or a few innovations and then outsource or collaborate on the rest. The main innovation at Tesla Motors is their battery pack, which is a combination of their own innovations and parts from collaboration partners.

5.3.8 Early Mover Positioning

“The commonly accepted view is that the first entrant makes use of its “first-mover” status to choose the most attractive location in the market” (Tyagi 2000)

³ Batteries (packs), breaks, engines etc.

Being the “first-movers”, or in some cases just “early-movers”, in a new market gives a firm an extra way of positioning themselves. If the “second-movers” doesn’t choose to use the copycat strategy, they have to differentiate by either making a better (often more expensive to produce) product or lower the price of the product.

But there is an exception to this. If the later entrant is inherently stronger, it will not be afraid of competing head on with the “first-mover”. This can very much be the case for Tesla Motors. Many of the upcoming competitors to Tesla are well established car manufactures, who have the advantage of a well know brand, good distribution and sales channels, and large manufacturing facilities. These factors will give them the advantage to compete head on with Tesla Motors. Tyagi (2000, p. 929) claims that if the first mover knows that the next movers will have a marginal cost lower than its own, its positions away from the most attractive locations⁴ on the market. This could very well be essential for Tesla Motors. Even though they are well positioned and have established a brand on their own, they are still weak compared to the “big” upcoming players. In one way, Tesla has already done that with the Roadster. The Roadster is not an EV which appeals to the mass market within the EV market. It is very similar to the Lotus or Porsche on the auto market. This might be harder when Tesla introduce their new 5 door sedan. They might have the “first-mover” advantage and they might have to differentiate from others if they want to position themselves in the EV market. This is again where the innovation comes into the picture. If Tesla can produce and keep innovating a better EV, in terms of better batteries, performance, design and cost, they have a great chance of being well positioned in the EV market.

Being too early

There is also a risk of being too early on the market. Before starting a mass production of a new EV, Tesla has to make sure that there is a market for the product. Tesla has to look at many factors before expecting the EV to become a product for everybody. These factors are:

- Infrastructure – People have to be able to recharge their EV other places than home or private parking lots with power. “Charging-station” or parking lots for EVs has to be established.

⁴ Locations can be both geographical and product characteristic

- Better batteries – It's hard to believe that many people will buy an EV before the batteries becomes better. With a charging time of 5+ hours and a maximum driving range of about 350 km, many will still choose to buy a normal car.
- More space – Most of the EVs today are small and use a lot of space for the batteries. This means that it is inappropriate as a family vehicle. With the new sedan from Tesla, this problem might be solved. But there is no news about space in the trunk. Batteries needs to be smaller and/or large EVs are needed.

These are some of the factors which need to be improved before the EV can go from being a niche product to becoming a competitive product to the normal car as we know it today.

Being too early can very much be a downside for Tesla Motors. It was seen in the windmill industry in the 1980th when their products weren't good enough for the market. It wasn't before the 1990th that this industry got their success even though they had an interesting green product – just like the EV. It is therefore important for Tesla Motors to make sure they have a product that is ready for the market as well as the market being ready for the product (infrastructure). Another example of being too early was the computer. The computer was invented in the 1940th, but didn't become a success before the 1980th. (About.com : Inventors) The last example of being too early was the Danish Ellert (www.ellert.info). The Ellert was introduced in 1985, when there wasn't any infrastructure for electric powered vehicles at all.

Protection of the resources

When a firm position themselves as a first mover, it is very important for them to protect themselves if they want to have a first mover advantage. Finney et al. (2008, p. 926) link the first-mover advantage together with the resource-based view and how it is important to protect the resources⁵ within the firm if they want to maintain first-mover advantage.

5.3.9 Revenue model and Cash-flow

One of the key elements of the Tesla Motors BM is being able to have a positive cash-flow. This is a very hard element for new and evolving companies – especially in a new and evolving industry. This is not only a new industry but also an industry with very high entrance barriers. Developing an

⁵ Resources are tangible or intangible assets. It is both things which can be traded as well as employees.

EV is a very costly process which means you either have to have extremely wealthy investors, people or bank that are willing to give high risk loans or have a positive cash-flow very early in the process. Tesla Motors has two out of these three options. The investors behind Tesla Motors are very wealthy and it seems like Tesla Motors actually manage to have a positive cash-flow.

In this sub-chapter the sources of revenue and the positive cash-flow will be discussed.

5.3.10 Sources of revenue

Profit is the difference between revenues and the costs of generating the revenue (Afuah 2004, p. 67). It is therefore important for a firm to discover the sources of revenue and look at which revenues cost the most. In the EV industry there are three main sources of revenue:

- Selling EVs
- Service on the EVs in the following years
- Selling spare parts

These sources are the most obvious sources, but within such a new and innovative industry there are also other sources of revenue. These are:

- Royalties on intellectual property
- Licensing
- Indirect content sales (link Tesla Motors to Dong Energy)

Evaluating the revenue sources

It is especially the indirect sources of revenue which are interesting for this thesis. Being innovative and an early mover on the market also present the possibility that others want to pay a large amount of money for using these inventions.

5.3.11 Cash-flow and pricing

In an evolving business like the EV, it is very hard to have a positive cash-flow. If you don't have some very strong investors behind the firm, it can become hard to keep the business running. One

of the ways to overcome this barrier is to let the customers pay for the EV when ordering it. That is what Tesla Motors are doing to keep a positive cash-flow. Even though they have some very strong investors, such as Google and Michael Dell, they still manage to have a positive cash-flow. But this payment model also has a down-side to it. It is not all customers who want to pay for the product before they get it. Some might feel insecure – especially with such a new industry as the EV. What happens if Tesla Motors go bankrupt? There are many things that can go wrong. It helps of course that they have some strong investors behind them, but it is still not a guaranty.

Pricing

Setting the right price on a new product is important when introducing it on the market. If the product is too expensive, no customers will buy it. By setting the price too low, the company will lose a possible income as well as the customers might see the product as a cheap product.

The price of the Tesla Roadster is very high in comparison to what the alternative is. This is where we again look at the citation from Jeremy Clarkson (Times Online Jan. 11, 2009).

But if it's running costs you are worried about, consider this. The £60,000 or so you save by buying an Elise would buy 15,000 gallons of fuel. Enough to take you round the world 20 times.

If the customers can buy a similar product at a much lower price, it will become very hard to compete on that market. But then again we have to remember that Tesla Motors are competing on two markets with the Roadster – the transportation market and the EV market. We also have to remember that it is a very early phase of the EV market. When the production and demand for EVs increase, the price will most likely be lowered as well.

5.3.12 Targeting Customers

Before entering a new market, it is important to decide which customers to pursue within the market. According to Afuah (2004, p. 76) there are three kinds of markets:

- The market where all customers have the same needs
- The market with individual customers
- The market divided into segments

As for the EV market, I would divide the customers into segments. The market is very similar to the automotive market. The customers like different designs, different performance, different brands, functionality etc. It is therefore not possible to target the whole EV market. Tesla Motors had to define which segment they were targeting with the Tesla Roadster. The customers of the Tesla Roadster segment are looking for a vehicle which is:

- A low emission vehicle
- A vehicle which has a fancy design
- Doesn't need a lot of space for transporting good or other people
- Like to be noticed – The Tesla Roadster has been brand with celebrities in order to get the “wow” effect.
- Doesn't have the need for long distance driving. Otherwise they need a second vehicle for that.

Afuah (2004, p.78) divides the market segment into two segments – the business segment and the consumer segment. The Tesla Roadster is targeting the consumer segment, whereas the battery pack targets the business segment.

Business segment (The Battery Pack)

The businesses can be segmented as a function of benefits that customers in the industry wants, the time that customers want the benefit, the industry demographics of customers, customer size and customers' geographic locations

Benefits: Tesla Motors is at the moment producing one of the best performing battery packs on the market. This will give the customers an advantage of better performance. Beside from that they can save money on their own R&D in battery technology

Timing of Needs: Most of the possible customers of the battery pack are in the same industry as Tesla Motors' and most of them could be **Lead users**. This could possibly help Tesla Motors in their future R&D and discover future needs.

- Industry:* Since Tesla Motors is in the same industry, they have the understanding of the usage and interactions of the battery pack.
- Customer size:* There are only few but extremely large customers for the battery pack if focusing on the EV industry.
- Geography:* Afuah (2004, p.78) argues that geography has great importance for the business segment in term of business practice, culture, politics, law etc. Some of these factors can also affect Tesla Motors. This is a barrier Tesla Motors could run into.

Consumer segment (the Tesla Roadster)

Just like the business segment, the consumer segment is a function of different factors. These are:

- Demographics:* The demographics have just been described. The demographics of the Tesla Roadster customer could be a middle aged man with high income, well educated and upper class. Not saying that people outside these criteria's couldn't be customers.
- Psychographics:* Also the psychographics are helping to describe possible customers. Like said earlier; the customers are environmentally aware and possibly frontrunners in term of trends.
- Behavior:* The behavior of the customers is very much affecting the way Tesla Motors should target their customers. Just like Apple; Tesla Motors want loyal customers. Also the fact that the Roadster is a topic to talk about a dinner parties etc. is affecting who wants to buy it.
- Geography:* Again we have geography and some of the same factors are affecting where the Roadster should be sold. Initially the Roadster was only sold in the US and now Europe has been included. The reasons for that are production rate, service, distribution channels, safety issues etc.

This analysis of how Tesla Motors previously has, and how they should, target their customer's gives a better understanding of the two markets Tesla Motors are on.

5.4 Transforming a disruptive technology into a new standard

As the world looks today and the way it is changing it is hard to predict what the future will bring. The possibility of the EV becoming the new standard is there, but patience is needed. It is important not to rush this process.

5.4.1 Patience

It is hard to find an industry which has become a success in just a few years. One of the fastest growing industries is the internet. The internet, which was originally conceived by the Department of Defense as a way to protect government communications systems in the event of a military strike, started out in the 1980th. But it still wasn't before the middle of the 1990th that the World Wide Web (WWW) was introduced as we know it today. Since then a lot of things has changed and today the internet is an everyday use for most people. But this process has still taken around 20 years to become the success which it is today.

It is therefore hard to believe that the EV can become a new standard in just a few years. Not saying that it hasn't been on the way for many years. A lot has happened on the EV market the last five years but before then the development of the EV has been very slow.

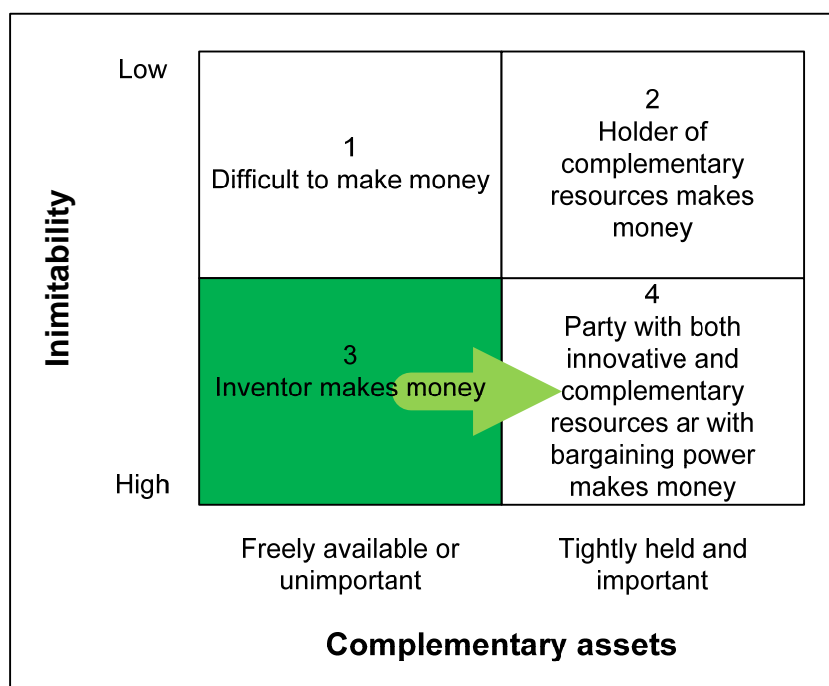
5.4.2 Profiting from Innovation

As we previously highlighted; one of the ways to measure success is to look if the company is profiting from the innovation. Not all companies are making money from their innovations or inventions. We have just look at the fact that patience is needed, but which other factors could affect the profiting from an innovation? According to Teece (Afuah 2004, p. 157), two things can determine the extent to which a company can profit from an innovation:

- **Inimitability** – The extent to which an invention / innovation cannot be copied or leapfrogged. High inimitability can be the result of intellectual property protection in order to protect the invention / innovation from imitators.

- **Complementary assets** – All the other resources, apart from the invention, which the company needs to, enable it to offer customer value and appropriate the value. These assets include shelf space, distribution channels, brand, manufacturing marketing, service, reputation, installed base of products, relationships with clients or suppliers, relationships with governments, and complementary technologies. In this case also infrastructure especially for EVs.

The matrix below shows how these two factors combined affects the way a company makes money.



Source: Afuah 2004, p. 157

Inimitability / Complementary Assets Framework

The real innovation at Tesla Motors is their battery system and not the EV. The question is if Tesla Motors can turn their innovation into a new standard for the EV market. At the moment Tesla Motors are placed in square three but are moving toward square four which is essential if they want to become the new standard. The Inimitability of the battery pack is high (if not very high). This is partly because of patents, high development barriers and secrecy. The complementary assets are not as tightly held but they are important. Tesla Motors has started to make a well known name within the industry and has also initialized contact to other EV manufactures to sell

their battery pack. They still need distribution channels, a manufacturing plant which can handle the quantity and the infrastructure.

5.4.3 Patents

The fact that Tesla Motors has 20 worldwide registered patents indicates that they want to protect their innovations from possible competitors and they believe they have a radical new innovation. When looking at what their patents are about, it comes back to the battery pack.

But having patents could also impede the evolvement of a disruptive technology. By overprotecting their product with patents, the lack of involvement from other parties could affect the future possibilities of the product. By narrowing the product down to the battery pack and its abilities, Tesla Motors should consider how open they should be to the other players on this market. Collaboration is indeed one very important factor when developing a new product for a new market. Let there be no doubt that Tesla Motors have to protect their innovations, but by collaborating with others they could win more than they could lose. If a competitor's product should win the race of becoming the new standard of EV batteries, Tesla Motors would either have to look elsewhere for business or close their business. This conclusion might sound very hard, but this will bring me into the next sub-chapter about "Better Place"

5.4.4 Better Place

At the moment, Better Place is collaborating with the French Renault-Nissan and Danish DONG Energy. But imagine if Tesla Motors could become involved in this partnership to promote their battery pack and maybe make it the new standard of EV battery packs. There is no doubt that the race for developing new standard products for the EV industry has started. Tesla Motors are also involved in this race and just like the other manufactures, they want to be the inventor and have the rights of these new products. But if Tesla Motors want to be a winner of this race they need to collaborate around the industry – also with possible future competitors.

6. Discussion and Recommendations

This thesis has looked upon and analyzed how Tesla Motors is able to compete, collaborate and still have a innovative advantage on the EV market. But one thing which hasn't been discussed is the current finance crisis. The US auto industry has been near bankruptcy, many has been fired and large loans has been given by the government. Tesla Motors has also been given a \$40 million loan, but is it enough for Tesla Motors to keep their business running. How about their partners – how are they affected by the crisis. What will happen if Lotus doesn't survive it? Then Tesla Motors can't manufacture the Roadster for the waiting customers, who have made the down payment.

Battery vs. EV

Another question would be if it wasn't safer and more profitable for Tesla Motors to focus on research and manufacturing the battery pack. During the analysis many factors indicated that it was the battery pack that was Tesla Motors' core innovation. Most of the patents which Tesla Motors have are also parts or in connection with the battery pack. That is why my question is not to drop the EV production and focus on the battery.

Payment method

The last thing I wanted to discuss is the payment method. This method is working well now when the market is still a niche market, but couldn't it become an impediment when it turns into a larger market. Will Tesla Motors keep this payment method for the new Model S which appeals to a larger segment?

7. Conclusion

The conclusion will be divided into the three overall questions from the problem statement

7.1 The past, present and future collaboration

How did Tesla address the need for collaboration with future competitors, and collaborations beyond their own industry? In this context, what barriers were confronted in the early phases, what barriers are confronted today, and what barriers can be anticipated in the future?

The need for collaboration was addressed during the development of the battery pack, where Tesla Motors had to collaborate with the battery cell supplier. Also after the design contest, Martin Eberhard saw the advantage for collaboration with Lotus, even though they could become competitors in the future.

7.1.1 Resources

In order to define which resources the founders of Tesla Motors had to look at the market and saw a need for an EV could compete with the automotive- and oil industry. In order to do that they had to build an EV which had an attractive design, had a long driving distance before a recharge were needed, high cruising speed. In order to build such an EV, Tesla Motors had to mix their core innovations (the battery pack) with different partnerships. Tesla Motors knew they didn't have the resources and capabilities to produce and manufacture an EV by themselves.

7.1.2 Barriers

The first question of the problem statement wanted to look at how Tesla Motors addressed the need for collaboration with future competitors and partner beyond their own industry. In the same context, this part should also look at the barriers of collaboration.

The need for collaboration with both future competitors and partners beyond their own industry were discovered early in the development process. It was very clear to Martin Eberhard that Tesla Motors couldn't develop every part of the EV by themselves. In order to solve this problem, Tesla Motors opened up for different partner inside and outside their industry.

One of the main barriers for Tesla Motors was to transfer knowledge from the partnerships back to Tesla Motors. To solve this problem this problem, Tesla Motors hired their own employees around at their partners' locations.

7.2 The Key-Learning

What are the key-learning's in terms of (A) entrepreneurship, (B) mobilizing complementary assets and (C) Open Innovation - with future competitors and partners beyond the current "industry home-turf"?

The key-learning's are:

Entrepreneurship – In term of entrepreneurship, Tesla Motors has learned the importance of outsourcing, collaboration and knowledge sharing. Tesla Motors was able to see the need for collaboration very early in both their development processes (battery first, then EV).

Mobilizing complementary assets - One of the key elements of the Tesla Motors BM was the payment method. An important way to raise capital for keeping the business running has been through the down payment.

Another thing is the possibility of outsourcing. If Tesla Motors didn't outsource, the start-up costs would have been much higher.

Open Innovation - It has been important for Tesla Motors that knowledge was channeled from the partners and back to Tesla Motors. This has been done through the employees locally at the partners

7.2.1 Original intent and design

The original intention of Tesla Motors was to build a vehicle which wasn't depending on oil.

Eberhard and Tarpanning, who both had a passion for high performance vehicles, combined this passion with their fight for a better planet. At that time no EV has yet been worth buying, so they saw their opportunity in building an EV which had the necessary qualities. A combination of R&D

and a good economy from themselves and investors, led to the development of the Tesla Roadster and the battery pack.

In the chapter “targeting customers”, a presentation of potential customers were made for the two market segments Tesla Motors are in.

In the EV market, the customers are presented as middle aged, high class, and well educated people who have a high income. They are environmentally aware and like a showoff vehicle.

The battery is targeted the same industry as the one Tesla Motors is already with the EV. It is the EV manufactures who doesn't want to do their own R&D on battery technology or have seen the advantage of buying technology instead of making it themselves.

7.2.2 The evolvement of the Tesla Motors' Business Model

Tesla Motors went from being a vision of a better and greener planet to a fully functional and competitive EV with a ground-breaking battery technology. Tesla Motors has not only developed one of popular EVs, but also opened up for a second product – the battery pack. Tesla Motors is a combination of their own R&D in important parts and collaboration with various partners inside and outside their core industries (EV & Battery).

Where Tesla Motors initially were depending a lot on their partners' supply chain, manufacturing plants, R&D etc., they are now working toward becoming more independent. The plans for the future shows a new EV build on their own platform and their own new manufacturing plant.

7.2.3 The diversity of the Tesla Motors business model

The distinct competitive element of Tesla Motors' business model is the way they are able to collaborate with partner inside and outside their own industry. By dividing the BM into the five factors from the analysis, a better answer can be made:

- The industry factors – Because Tesla has been able to collaborate as well as compete, they are standing strong toward they direct and indirect competitors.
- The firm-specific factors – The strength for Tesla Motors is their position on the current EV market and advantage they have on the battery pack. Tesla Motors has made an EV for a market segment which hasn't yet been offered an EV.

- Positioning – Tesla Motors has been able to position themselves in many ways. The massive media publicity through celebrities, being the best performing and being first runners, have given Tesla Motors an advantage in term of positioning. Because of that they have one of the best know brand within the EV industry.
- Revenues and the cash-flow – Since Tesla Motors are presented in two markets – the EV and the battery pack – there are multiple sources of revenue. Along with that, Tesla Motors' payment method has given them an economical advantage.
- Targeting customers – Tesla Motors has been able to target customer for the EV, which haven't yet been attracted to the EVs on the market.

All together Tesla Motors has initially been able to divert from the rest of the EV market and become innovative leaders.

7.3 Becoming a new and preferred standard

Will Tesla Motors create a new market need and shape the customer preferences (like Sony once did with the Walkman), or will customer preferences, and/or environmental legislation, shape the future development of Tesla Motors?

The question whether Tesla Motors will become the preferred product on the EV market, like Sony did on the walkman market, is a hard question to answer. The market is still very young even though the EV has existed for more than a hundred years. Trough out this thesis, Tesla Motors has been divided into two products – the EV and the battery pack.

The EV

It is very hard to believe that the Tesla Roadster or any other EV should become a customer preference, since the market is most likely to become similar to the automotive market. Just like in the automotive market, the customers in the EV market will have different preferences in terms of design, usage, and performance. If we then break the EV market down into segments of sports EVs, ordinary EVs, sports utility EVs etc. Tesla Motors might have a better chance of becoming a preferred brand in terms of popularity. Just like Porches, Ferrari and Lotus, which are very popular cars in the sport car segment, Tesla could be the front runners of the sports EV. They have branded themselves as being innovative, popular among celebrities, a green brand working

toward zero emission. They are also working toward becoming the Apple of EVs, which also is a popular brand.

But the chance of customer preferences and legislations are shaping the market is much larger. There are too many interests in the development of the EV market for Tesla Motors to become dominant on the market.

All together, Tesla has a chance of becoming a preferred brand within their segment.

The Battery Pack

One product where Tesla Motors might be the pioneers is the battery pack. The battery pack is one of the most important parts on the EV. Beside from the engine, most parts can be used from the ordinary car. It has also been the batteries which has prevented the EV in becoming a technological success.

If Tesla Motors is able to collaborate around the industry with partners who also could become (or are) future competitors, they might have a chance of becoming the new standard of EV batteries. It is important for the whole industry to work together in finding standards for the EV infrastructure. That is charging systems, batteries, and battery changing systems etc.

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9. Appendix 2 – Tesla Motors Newsletter from Elon Musk

The following pages are a newsletter from Elon Musk.

10. Appendix 3 – Testimonies

TESTIMONY OF MARTIN EBERHARD CEO AND COFOUNDER TESLA MOTORS INC.

BEFORE THE SENATE FINANCE COMMITTEE MAY 1, 2007

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 Reinstatement of the electric vehicle (EV) tax credit and increase 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.

**Elon Musk - Testimony before the Senate Committee on Environment and Public Works
“Green Jobs from Action on Global Warming”**

August 14, 2007

Madame Chairman (and Members of the Committee), welcome to Silicon Valley and thank you for the opportunity to testify before the Committee today on the subject the creation of so-called “green jobs” in the high tech and industry. As the Chairman of two clean tech companies that are focused on combating global warming, I enjoy a front row seat from which to view the rapid creation of new jobs and in one case - a wholly new industry.

While the number of jobs created by Tesla Motors, Solar City and other players in the Clean Tech arena is impressive, and the rate of job growth is even more so, perhaps the most striking aspect of the jobs we are creating is embodied in their diversity. As has often been the case in Silicon Valley, we have created a wealth of new jobs for holders of advanced technical and management degrees. However, the truly notable aspect of the Clean Tech revolution is its ability to create high quality “green collar” jobs in addition to those high end technical positions. Tesla Motors and Solar City are both exemplars of this phenomenon

As I believe you are aware, Tesla Motors’ initial product is a high-performance electric sports car called the Roadster. However, the intent is to build electric cars of all kinds, including low-cost family vehicles.

As our unveiling of the Tesla Roadster has demonstrated, reports of the death of the electric car have been greatly exaggerated. The Roadster defies all conventions associated with environmentally friendly

cars, particularly those of a purely electric nature. My apologies for the brief commercial, but to understand what is possible, I must present the key facts of the vehicle:

- 0 to 60 mph in 3.9 seconds
- 135 MPG equivalent
- Over 200 mile driving range on a single charge
- Fully DOT-compliant: crash tested, with airbags, crash structures, etc.

The Tesla Roadster is designed to beat a gasoline sports car like a Porsche or a Ferrari in a head-to-head showdown, but it has more than twice the energy efficiency of a Prius. In other words, it is a great sports car without significant compromises. Now, some may question whether this really does any good for the world. Are we really in need of another high-performance sports car? Will it actually make a difference to global carbon emissions and our oil dependence?

Well, the answers are no and not much. However, that misses the point. Almost any new technology initially has high unit cost before it can be optimized. This is no less true for electric cars. Tesla’s strategy is to enter at the high end of the market, where customers are prepared to pay a premium, and then drive down market as fast as possible to higher unit volume and lower prices with each successive model.

Tesla’s second model will be a large four door family car starting at \$50,000 and the third model will be a smaller, more affordable four door. In keeping with a fast-growing technology company, all free cash flow is plowed back into R&D to drive down the costs and bring the follow-on products to market as quickly as possible. When someone buys the Roadster sports car, they are actually helping to pay for the development of the low cost family car.

Since the Tesla Motors’ birth in 2003, the company has grown from 2 employees to over 300, with a headquarters and R&D center here in Silicon Valley, a vehicle development center outside of Detroit and plans to break ground on a vehicle assembly plant (in New Mexico) that will employ an additional 400 employees later this year. While the early employees of the company were, not

surprisingly, engineers and technical experts, as we have move into a manufacturing phase, we will be aggressively adding high quality high paying hourly jobs. It is worth noting that every one of our employees enjoys a full benefits package, is an equity shareholder in the company and will share in the success of the enterprise.

Vehicle manufacturing is a supplier intensive business and so while the aforementioned direct employment numbers are impressive enough, it is safe to say that the indirect job creation that Tesla is and will continue to catalyze, while difficult to quantify can safely be assumed to be a significant multiple of the direct labor pool.

Our second company, SolarCity, is focused on bringing solar power to every home and business and in so doing it is measurably reducing the carbon footprint of the growing number of communities where SolarCity operates. By creating a trusted brand and bringing cost-reducing innovations to the market, SolarCity has become the largest residential solar installer in California.

In contrast to Tesla Motors, Solar City is neither a manufacturing company nor a developer of high technology. Rather, it is a service company focused on the installation of residential solar systems. Since solar installation is a labor intensive enterprise and because the number of systems installed drives the success of the enterprise as a whole, Solar City's success to date and its future prospects are fundamentally dependent on the creation of a high quality "green collar" labor pool. In other words, the more jobs that SolarCity can create, the more the company will succeed.

In less than a year of operation, SolarCity has created 160 new jobs and has plans to hire an additional 1200 well-paid "green collar" workers by the end of 2009. These "green collar" jobs are high-quality jobs that enable individuals with limited experience and limited advanced education and training to learn a skilled trade and develop valuable skills and experience. These jobs pay well (\$15-22/hour), include benefits and stock options and offer the opportunity for career advancement: from installer to senior installer to team lead to regional supervisor. As SolarCity extends its business from California across the country, the company and the industry will prosper in direct relation to the number of jobs that the company can create.

As your committee and the Congress as a whole consider legislation to address Climate Change and Global Warming in the fall, I am hopeful that you will to drive for policies and legislation that will support the continued development of promising new technologies like Tesla Motors' performance electric cars and to encourage companies that are applying new business models to expand renewable energy generation like Solar City. You can do so by encouraging incentives for consumers to adopt these technologies – in particular by creating tax policies that pull larger unit volumes into the market and help to accelerate our ability to get to economies of scale and effort on the supply side. You can also encourage job training programs that will increase the available labor pool for the green work force that our continued success will demand.

In conclusion, I believe that we are just now beginning to understand the promise of job and wealth creation that is embodied in the drive to develop the alternative technologies and business models that will address the twin crises of petroleum dependence and global warming. But I am certain beyond a shadow of a doubt that if we as a nation commit to supporting these industries we will be laying the groundwork for America's economic prosperity and competitive advantage for decades to come.

Thank you for your time. I will be happy to address your questions.

Frederik Lehmann

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Sendt: 12. februar 2009 18:22
Til: Frederik Lehmann
Emne: Tesla Motors Update

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Tesla to be Profitable by Mid Year

Although extraordinarily difficult to close, the \$40M financing round completed in December was twice the amount Tesla needed to reach profitability. Moving forward two months later, we remain on track with our cost reductions and production ramp, so it appears highly likely that Tesla will meet the goal promised to those investors of becoming profitable by mid year.

The main reason for this confidence is that Tesla is already in the fortunate position of being sold out until early November, something few automakers can claim, and will soon be sold out of all 2009 production. While we have had some cancellations due to buyers experiencing personal financial difficulties, new orders continue to flow in every week from the United States and Europe. We have now produced over 200 Roadsters for customers and there are more than 1,000 customers still awaiting delivery.

Due to our order backlog, it seems that owning a Roadster can be a good investment. Last September, as the financial and real estate markets began crashing, a Roadster was sold at the Sonoma Paradiso in California wine country for \$160,000, well above the current list price of \$109,000. Many Roadster owners who have taken delivery of their cars have already decided to purchase a second Roadster or Roadster Sport because they like the first one so much.

The continued strong demand is driven by the fact that the Tesla Roadster has no direct competitors in the marketplace. It is faster than almost any sports car on the market (our Roadster beat a Porsche GT3 on the Top Gear test track) and yet uses less energy and has a smaller carbon footprint than a Toyota Prius, even if you assume the worst possible case where all electricity comes from coal.

I expect sales demand to strengthen further as this awareness grows. After all, what's the point of driving another exotic sports car when it is slower than a Tesla and damages the environment? Already, the Tesla Roadster is the car of choice among the technology, business and Hollywood A lists – this year's Academy Awards will be a lineup of Teslas – and we have never had to give a discount to anyone.

Many customers also appreciate the fact that profit from their purchase goes towards helping Tesla develop more affordable, mass market electric cars. The same cannot be said for those who buy gas-guzzling sports cars from other automakers.

And owners aren't the only ones impressed with the Roadster. [Road & Track](#) was the first auto enthusiast magazine to perform third-party, instrumented testing of the Roadster; they were "pleased to see its

extravagant claims confirmed.” The Washington Post’s [Warren Brown](#) gushed, “Wheeeeeee! If this is the future of the automobile, I want it.” [Dan Neil](#) of the Los Angeles Times had perhaps the most colorful description we’ve ever seen to describe the Roadster’s scorching acceleration: “God has grabbed me by the jockstrap and fired me off his thumb, rubber band-style. Wow.” And we’ve also had a torrent of positive reviews in Europe, where deliveries begin this summer – including a Le Monde story with our favorite headline: “Le chic électrique.”

Unveiling the Model S and DOE funding!

On March 26th, at the Tesla design studio located within the SpaceX rocket factory, we will unveil a street-drivable prototype of the Model S four door sedan. Our objective with the Model S was to create one of the most functional, intuitive and beautiful vehicles on the road. Tesla Roadster customers and select VIPs invited to the event will have an opportunity to judge for themselves firsthand whether we have succeeded.

Regarding funding, I am excited to report that the Department of Energy informed Tesla last week that they may disburse funds from our \$350M Model S loan application within four to five months. The Obama administration has thankfully made it a top priority to move quickly on the Advanced Technology Vehicles Manufacturing loan program, as this will both generate high quality jobs in the near term and lay the groundwork for a better environment in the future.

This will keep us on track for production to start in 2011. As a gesture of gratitude for their early support, Roadster owners will receive a \$10,000 discount off the price of the Model S Signature series and automatically be first in line for the sedan.



Daimler Partnership

We announced last month at the Detroit auto show that we have been working with Daimler (maker of Mercedes) for over a year to create an electric version of the Smart car. Daimler has contracted with Tesla to build the battery packs and chargers for an initial run of 1,000 cars. Pending the results of that test fleet, the relationship could expand to tens of thousands of cars per year.



This is a very significant endorsement of both Tesla's technology and our financial strength by one of the world's most respected automotive companies. Daimler would not feel comfortable depending on us for this program if they felt that either our technology was easily replicated or that we were in financial danger.

Daimler was the first company to commercialize the internal combustion engine and has become a benchmark for automotive quality and reliability. It is an honor that they chose to work with Tesla after a thorough investigation of other options. The deal is likely to be the first in a series of strategic partnerships between Tesla and other auto manufacturers to engineer and produce electric cars.

My goal for Tesla from the beginning was to do whatever we can to help end the world's addiction to oil. We'll do that by making cars directly, helping other automakers develop cars, and serving as an example to the rest of the industry. Although the Roadster is still the only highway capable production electric car for sale in the United States, it was very encouraging to see that the central theme of the Detroit auto show this year was electric transportation.

New Tesla Sales & Service Centers to Open

We have reached agreement on Tesla store leases in Chicago and London's Knightsbridge district, and we are close to finalizing locations in Manhattan, Miami, Seattle and Munich. All six facilities will open this year, and in the following months we'll provide details about individual store opening parties. These new stores will offer prospective customers the chance to see and drive the Roadster in person – and they underscore Tesla's commitment to looking at the auto industry with fresh eyes. Unlike traditional franchise dealerships, Tesla owns its stores and controls the customer experience. We think you'll agree that our stores are a refreshing change from the way most people have bought cars for the last 50 years.

Roadster Sport

Tesla is now taking orders for the Roadster Sport, an even higher performance car that does 0 to 60 mph in 3.7 seconds. It comes with a hand-wound stator and increased winding density for lower resistance and higher peak torque. The tires are upgraded to Yokohama Ultra High Performance and the suspension features adjustable dampers and anti-roll bars tuned to the driver's preference – allowing for both softer and firmer rides than the standard Roadster. Deliveries are expected to begin in late June.



Upgraded Roadster Interior and Other Options

Tesla will soon offer an Executive Leather Interior that raises the level of luxury in the Roadster's cabin. We are also offering a Clear Carbon Fiber Exterior Package to add an additional level of sportiness and highlight the lightweight material that makes up the Roadster's body. Currently, the only exterior clear carbon fiber touch on the base model is the roll bar cover – but many customers and fans have asked if we could reveal more of this exotic, braided material. These packages will be available starting in June.



Prototype with executive leather interior.

Battery Replacement Program

One of the top questions customers ask about the Roadster is, “How long will the battery last and what will it cost to replace?” Tesla engineers have determined that a Tesla battery pack should last approximately seven years or over 100,000 miles under normal use.

Customers may pay \$12,000, €10,000 or £9,000 up front and in return receive a replacement battery pack after seven years. Customers will also have the option of replacing the pack earlier at a premium or later for

a partial refund. With the low production volume of the Tesla Roadster, the current replacement price of the pack is almost three times that number. The main reason for the relatively low cost up front -- and why this is a smart purchase -- is that we are arbitraging the relative cost of capital between Tesla and our typical customer.

Extended Warranty to Double Standard Period

Many customers have also asked to purchase an extended warranty. We now offer a doubling of the standard warranty, which means an additional 3 years and 36,000 miles or 60,000 kilometers, for \$5,000, €4,000 or £3,800. This covers everything on the car except the battery pack. Should the motor, power electronics, HVAC or any other major system need to be replaced, this will be money well spent, and it provides peace of mind to many customers.

Thanks for your support!

Elon Musk
CEO & Product Architect

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