

TESLA MOTORS, INC

CONSUMER GOODS

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COMPANY REPORT

05 DECEMBER 2014

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Emotionally Charged?

Profitability is determined by mass-market entrance

- **As of today the company is serving a luxury niche market.** The successful exit into the mass-market lies at the very heart of Tesla's profitability. Therefore the share price will highly depend on the acceptance of electronic vehicles as a substitute for conventional cars.
- **EV market growth is driven by technological breakthroughs as well as governmental incentives.** The latter is still lacking sufficient engagement in many countries. Our model expects the company to be profitable after taxes only in 2016, despite perceptible revenue growth, implying negative EPS until then. R&D expenses are as high as 13.79% of revenues in 2014 demonstrating the firm's intentions to tackle technological innovations.
- **High CAPEX will diminish cash flow** to investors over years to come with projected positive cash flows in 2018. Dividend payments are not in sight since we expect the company to reinvest its eventual profits. Relevant multiples indicate a manifold of Tesla's book value and current sales based on the markets expectations of Tesla's future success.
- **Valuation:** Because we expect the company to change its D/E ratio we model the YE15 target price based on a combination of APV and WACC. We combine a set of three EV market scenarios (70:20:10 split). The EUR 249.22 target price illustrates an upside of 38.38% to the current market price of EUR 180.10 leading us to a buy recommendation.

Company description

Tesla Motors, Inc., founded in 2003 and headquartered in Palo Alto (California), develops, designs, manufactures and sells fully electric vehicles and electric vehicle powertrain components. Furthermore the company provides services regarding the development of electronic powertrain systems. Tesla Motors distributes its vehicles through Tesla stores and over the internet. As of today the company operates a network of 102 stores and galleries in North America, Europe and Asia.

Recommendation: BUY

Vs Previous Recommendation Buy

Price Target FY15: 249.22 €

Vs Previous Price Target 221.71€

Price (as of 02-Jan-2015) 180.10 €

Reuters: TSLA.OQ, Bloomberg: TSLA:US

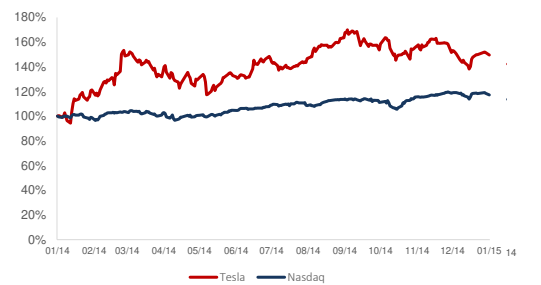
52-week range (€) 103.71 – 221.04

Market Cap (€m) 23.443,97

Outstanding Shares (m) 124.62

50 day moving average 186.78

Source: Bloomberg



Source: Bloomberg

(Values in € millions)	2013	2014E	2015F
Revenues	1,450	2,149	2,639
EBITDA	33	-97	-80
Net Profit	-55	-198	-192
EPS	-0.44	-1.59	-1.54
Sales per Share	12.03	17.24	21.17
EV/Sales	20.06	11.25	12.46
Price/Book	30.01	75.15	304.30
Price/Sales	30.22	10.44	11.77
Gross Margin	22.7%	22.9%	23.2%
Current Ratio	0.68	3.18	2.41
Cash per share	0.24	10.71	9.06

Source: Company Data, Analyst's Estimates

THIS REPORT WAS PREPARED BY "STUDENT'S NAME", A MASTERS IN FINANCE STUDENT OF THE NOVA SCHOOL OF BUSINESS AND ECONOMICS, EXCLUSIVELY FOR ACADEMIC PURPOSES. THIS REPORT WAS SUPERVISED BY ROSÁRIO ANDRÉ WHO REVIEWED THE VALUATION METHODOLOGY AND THE FINANCIAL MODEL. (SEE DISCLOSURES AND DISCLAIMERS AT END OF DOCUMENT)

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Company overview

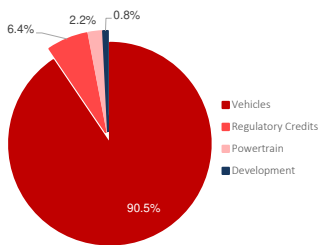
Company Description

Still relatively young, Tesla went public only in early 2010

Founded in 2003 Tesla Motors is a designer, developer and manufacturer of fully electronic vehicles and powertrain components headquartered in Palo Alto, California. In addition to its production business the company offers development services concerning electronic powertrain components. Tesla Motors, employing more than 5.800 employees as of today, went public in January 2010 and is listed on the NASDAQ stock exchange.

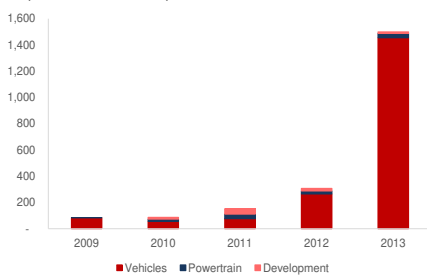
As of today the company has introduced two fully electronic vehicles, namely the Roadster and Model S, whereas the Roadster was limited to a number of 2,600 units which have been sold between 2010 and 2012. Currently Tesla distributes its products within 37 countries mainly focusing on North America, Europe and Asia. In these markets the company provides a growing supercharger network designed to charge its cars. Vehicles are sold through company owned stores as well as over the internet. In 2013 Tesla generated 90.5% of its total revenues through the sale of electronic vehicles whereas 2.2% originated from powertrain components and 0.8% are attributed to development services. Powertrain components have been manufactured mainly for partnerships with Toyota and Daimler. Besides its core operations the firm created 6.4% of its total revenue in consequence of the sale of regulatory credits which have been awarded by certain U.S. states.

Figure 1 – Revenues as of business segment (2013)



Source: Company Data

Figure 2 – Total Revenues 2009 - 2013 (in million EUR)



Source: Company Data

Within the next three years Tesla is going to commercialise two additional fully electronic vehicles which will be the Model X in late 2015 and Model 3 in 2017. In contrast to its luxury predecessors the Model 3 will be targeting the mass market. Furthermore the company, in cooperation with two partners¹, is building a so called “Gigafactory” in Storey County, Nevada. The Gigafactory will enable Tesla to produce the necessary lithium-ion batteries used in the electronic vehicles engine. As a result of this project the company expects to minimise its production costs for car batteries significantly.²

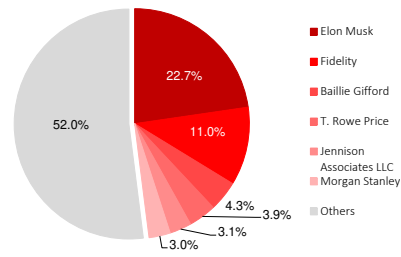
Shareholder Structure

Tesla Motors presents a rather scattered shareholder structure. With 22.7% Elon Musk (Tesla’s CEO and Chairman of the Board) holds the largest stake of Tesla shares due to the fact that the serial entrepreneur invested significant amounts of

¹ Partners are Panasonic and a third, yet to be disclosed company

² Currently Tesla produces batteries at around 214 Euro per kWh. The expected decrease in costs projects a value of about 150 Euro per kWh

Figure 3 – Current Shareholder Structure as of % of Total Shares Outstanding



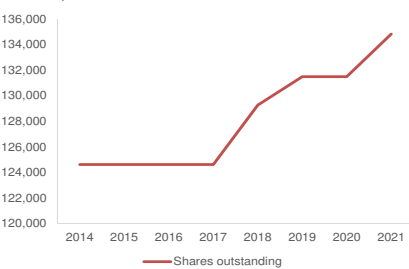
Source: Bloomberg, 01.12.2014

Table 1 – Major Position Changes in Shareholder Structure (2014)

Company	Position Change	Stake
Fidelity	-589,150	0.47%
Columbia	-713,427	0.57%
Capital Group	-958,945	0.77%
Highfields	-514,600	0.41%

Source: Bloomberg

Figure 4 – Shares Outstanding (2014 – 2021) Based on Convertible Debt



Source: Company Data

his own money into the founding and capitalisation of the company. Certainly this stake shows Mr. Musk’s confidence in the success of the company but also bears risks in terms of power concentration, especially in the case of unforeseen events that imply rescission of Mr. Musk. Second largest shareholder is Fidelity Investments, the American multinational financial services firm holds 11.0% of outstanding shares via several issued funds. Other major shareholders consist mainly of various financial service firms as well. Among those companies are Baillie Gifford, T. Rowe Price, Jennison Associates LLC and Morgan Stanley with stakes of 4.3%, 3.1%, 3.0% and 2.9% respectively. Notable strategic shareholders are Panasonic with 1.14% and Toyota with around 2.0% besides partnering with Tesla these companies bet on the eventual success of Tesla’s business model.

In 2013 the shareholder structure has been altered mainly because of insider transactions. Here Elon Musk’s purchase of over 1 million additional shares, which elevated his stake to its current 22.7%, is the most notable event. On the contrary Ira M. Ehrenpreis (board member of Tesla and general partner at Technology Partners) sold a substantial package of nearly 1 million shares. Reasons for the Mr. Ehrenpreis sale have not been disclosed by himself nor the company and remain subject to speculation. A disagreement of the board does not seem to be apparent as the board composition is unaltered and appears to be cohesive.

Only recently the German carmaker Daimler sold its 3.9% stake for more than 600 million Euro. Daimler had invested in Tesla even before the company’s IPO in 2010 but had sold 40% of its stake to Aabar Investments which has been formed by the Abu Dhabi government. Despite this divestiture Daimler will still buy powertrain components for its electronic B-Class. Daimlers move can be explained by the firm’s intention to use the generated cash flow to strengthen its operational business³ and additionally build a battery production venture in Germany. Toyota, another partner of Tesla, has sold an undisclosed amount of shares. The Japanese car maker had invested over 40 million Euro in 2010 and was most likely looking to benefit from Tesla’s risen share price. Furthermore Toyota’s expectation of future emission free vehicles rather involves the usage of fuel cells instead of Tesla’s technology, therefore the Japanese company is betting on a different industry evolution than Tesla. Otherwise the shareholder structure has been affected marginally by investment companies such as Fidelity seeking profit from Tesla’s favourable share price.

The number of outstanding shares is set to change over the next years based on Tesla’s issuance of convertible senior notes which will be used primarily to fi-

³ Daimler: <http://www.daimler.com/dccom/0-5-7153-1-1753280-1-0.html>

Growth of the global EV market is fundamental for Tesla's success

EV market growth is determined by a multitude of independent variables

nance the construction of the Gigafactory. In 2018, 2019 and 2021 Tesla will convert those senior notes into 4.65 million, 2.22 million and 3.33 million new shares respectively. Hence the number of outstanding shares will rise from 124.62 million as of today to 134.83 million in 2021 with the converted shares accounting for 7.57% of total shares.

The Global EV Market

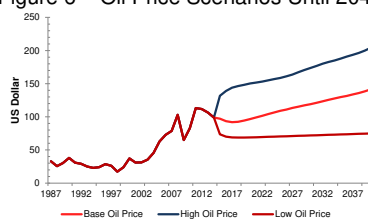
Due to the fact that Tesla is still a relatively young company in a rather immature market the underlying report will investigate a period from 2014 as far as 2040. By then the company is expected to have stable growth factors which are essential in terms of the final valuation.⁴

Today the global EV market, with a 0.3% stake of cars sold worldwide, is nothing but a fraction of automobiles sold on a yearly basis.⁵ However, with the years to come the worldwide EV market is anticipated to grow substantially. Our analysis builds the evolution of the global EV market upon nine various variables. All variables are modelled taking a base, best and worst case scenario with probabilities of 70%, 20% and 10% respectively into account. Every variable is first modelled as if it was the only driver affecting the EV market. Subsequently we attributed percentages, as of a 100% total, according to the stake of expected influence of the respective variable. We expect the EV market to demonstrate stronger growth over the short and medium term and therefore redistributed the linear growth line towards an upward sloping growth curve.

Oil Prices

The progression of the global oil price is a fundamental influence regarding the success of EV's. The underlying model considers an average of a BCG study and our own analysis based on oil price projections conducted by the U.S. Energy Information Administration (EIA).^{6 7} BCG projects EV's to represent 8.67% of global car sales in 2021 regarding high oil prices, 5.67% and 3.33% considering medium and low oil prices. Our own analysis synthesises on three different oil price progressions. The EIA projects oil prices to decrease and stay relatively low over the medium term in all three scenarios. Therefore we expect 2021's EV market to be 0.37%, 0.58% and 0.27% in terms of medium, high and low oil prices respectively.

Figure 6 – Oil Price Scenarios Until 2040



Source: EIA

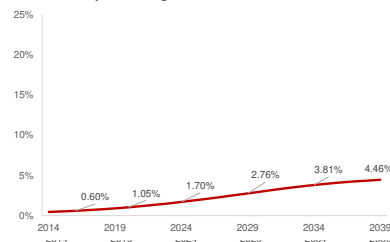
⁴ A rather stable growth rate is important especially regarding the calculation of the perpetuity which has an tremendous impact on the final equity value.

⁵ 0.3% accounts for a total of 208.454 purely electronic vehicles which have been sold throughout 2013

⁶ The Boston Consulting Group: Powering Autos to 2020

⁷ U.S. Energy Information Agency: AEO2014 Early Release Overview

Figure 5 – EV Sales as % of Global Car Sales Depending on Oil Prices



Source: BCG, EIA, Own Estimations

Even though the governments in Tesla's North American market segment have incentivized EV's in the past much needs to be done to assure sustainable EV market growth

Especially the Canadian government needs to encourage more of its states to provide more incentives

We model the average EV market of those scenarios, adapted for higher short term growth, to account for 0.91%, 1.03% and 0.7% of global car sales in 2020. Taking into consideration the probabilities of the base, best and worst case scenario we expect EV's to constitute 0.89%, 2.64% and 4.23% of 2020's, 2030's and 2040's global car sales correspondingly. Conclusively we believe that future oil prices will not be among the most robust drivers of the EV market and attribute a stake of 10% influence. Important to note is the risk that further declining oil prices will diminish EV market growth and push customers towards conventional or hybrid vehicles.

Government Incentives

Governmental incentives play an important role in the development of an EV market. Many governments worldwide have set up encouragements to make the purchase of an EV cheaper and easier. Main aim is to raise awareness towards environmental sustainability among the population. Apart from monetary incentives such as tax benefits and direct bonuses there are regulatory issues like emission regulation and signage.

Investigating Tesla's main markets it becomes obvious that governments here already have grasped the importance of incentives for EV's to some extent. Especially the North American market including the United States and Canada has put several incentives into place. On a national basis the United States pay up to 5,500€ (32,807 Euro average retail price without tax credit in the U.S.)⁸ of tax credit for the purchase of so called plug in electronic vehicles under the "American Clean Energy and Security Act of 2009."⁹ More incentives are presented on a state basis in the form of purchase rebates, income tax credits and sale tax exemptions within the range of 375€ to 5,600€ depending on the particular state.¹⁰ In Canada EV's enjoy one-time purchase grants in two different states with amounts of 6,750€ to 7,000€. Overall the North American market welcomes any kind of plug in electronic vehicle and has appeared to foster their market share.

European governments are rather imbalanced regarding their EV incentives. Some countries such as Norway with tax incentives of up to 7,000€ (average retail price in Norway is around 75k Euro) appear to be highly supportive of a change towards an EV dominated market. Whereas other countries such as the Czech Republic only offer up to 200€ road tax exemption or even nothing as for example Finland. Clearly the differences are salient which calls for revised incentives in various EU member states. Otherwise the EV market in Europe will be off

⁸ See Appendix 1 for a detailed list of currently available EV and their respective retail prices

⁹ Originally the tax incentive was introduced under the "Energy Improvement and Extension Act of 2008". In addition the "American Recovery and Reinvestment Act of 2009" is authorising those tax credits for converted plug-ins.

¹⁰ Appendix 2 displays a detailed overview of global EV incentives

On average most European governments need to provide more EV incentives

China is already offering a variety of incentives, but mostly for vehicles produced within the country

Other prosperous EV markets could be India and some South/Central American countries

to a rather bumpy start. Norway is the best example of how incentives promote EV sales – in 2013 Tesla sold over 1,900 Model S in Norway.¹¹

As regards incentives in China, the government is offering a 10% sales tax exemption of up to 7,500€ for all plug in electronic vehicles regardless of country of original production. Additionally the country provides further tax incentives for vehicles build by Chinese manufacturers to stimulate the national industry. For that reason Tesla is considering to build a manufacturing plant in mainland China in correspondence with a joint venture.¹² As a result of this facility the company anticipates to benefit from increasing demand due to further tax incentives and cheaper prices through the avoidance of the 25% import tariff on foreign goods. This step seems to be inevitable since Tesla is competing against Chinese manufacturers mostly.

Other markets are determined by Japan, Australia, India and potentially particular South/Central American Markets as well as India. EV incentives in Japan have been around as early as 1996 and amount to a grant of 8,500€ today. Tesla started its distribution in Japan only in September 2014 and is fairly optimistic that the country will contribute a decisive amount to its sales.¹³ Australia seems to be far behind in terms of incentives. The only encouragements so far are a higher luxury car threshold and the exemption from stamp duty in the Australian Capital Territory. For the future India appears to be a viable market. So far the Indian government has implemented subsidies of up to 2,000€ for the purchase of an EV. The market looks prosperous, especially when the economy maintains its current growth factor.¹⁴ Furthermore it is viable that Tesla expands its distribution into particular South/Central American countries for example Brazil. It is predicted that Brazil will introduce a number of tax and regulatory incentives spurring the national EV market substantially.¹⁵ Depending on economic growth and implemented incentives the South/Central American market appears to be an attractive target. Countries in the Middle East/Western Asia do currently not seem as interesting markets for EV manufacturers. First of all there is little information about implemented incentives, second is that it will be hard to predict future EV demand especially on oil price scenarios since many of those countries have rather low gasoline prices. Finally a number of countries are indicating somewhat

¹¹ Precisely 1,983 Model S have been sold in Norway. This number accounts for 8.8% of Tesla's global EV sales and for 51.3% within Europe

¹² In April 2014 Tesla CEO Elon Musk announced that he expects the company to manufacture vehicles in China within three to four years

¹³ The Japanese car market has effectively remained closed with nearly 96% of car sales coming from Japanese companies, while the remaining 4% are attributed to international automakers. Among international car makers Japan is known as the most closed automotive market in the world with foreign cars being on average 20% more expensive than local vehicles

¹⁴ Average GDP growth over the last four years was 6.6%, <http://data.worldbank.org/country/india>

¹⁵ Until 2020 an estimated 35 EV models will be launched in Brazil, driving the market up to 80.877 units

unstable political conditions, hence the Middle East/Western Asia is unlikely to be an attractive market in the future.

Overall governmental budgets need to be augmented in order to ensure incentives to stay in line with a growing EV market

Governmental Budgets

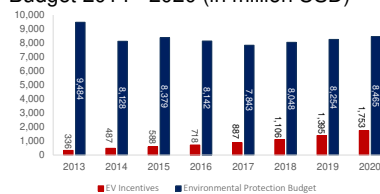
Based on the fact that governmental incentives play a major role considering future EV demand it is essential to assess if governmental budgets provide sufficient capacity. Therefore we examine prospective environmental protection budgets incorporating the EV incentives in relation to total annual governmental expenditures. Due to the focus of the underlying research only fully electronic vehicles have been taken into account.

An investigation of the North American market consisting of the United States and Canada results with the conclusion that environmental budgets need to be increased in the future to meet EV incentive expenditures. In 2013 9.5 billion USD have been assigned to environmental protection in the United States. Multiplying the about 45k EV's¹⁶ sold with the average incentive of \$7,500 the budget allocated to EV's was 336 million USD accounting for 4.7% of the total environmental expenditures.¹⁷ Applying the same methodology considering forecasted environmental budgets the stake of EV incentives will rise up to 20.71% of the total budget. Bearing in mind that incentives for other forms of electronic vehicles still have to be added it becomes obvious that the projected budget is not close to be adequate. Clearly this implies a re-allocation of scheduled budgets in order to allow for the feasibility of EV incentives. Because environmental expenditures are predicted to account for only 0.17% of total governmental expenditures a re-allocation or an augmentation of environmental expenditures seems realistic.¹⁸ Candidates for a re-allocation could be the budgets for transportation or energy.

As for Canada the forecast looks quite similar. In 2013 the amount of EV incentives, with around 26 million CAD, amounted to 1.6% of the aggregate environmental budget. Until 2020 the stake is predicted to increase up to 47.8% of total 1.2 billion USD environmental protection budget.¹⁹ Comparable to the United States the Canadian environmental expenditures will account for only 0.55% of overall governmental expenditures in 2020, hence there should be considerable space for redistribution or augmentation.

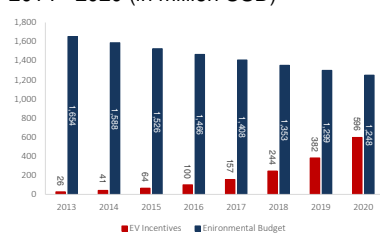
Overall European governments allocate more money to environmental budgets compared to the North American administrations – environmental budgets account for 1.37% of total expenditures on average for the Euro 28 countries in

Figure 7 – U.S. EV Incentives in Comparison to Overall Environmental Protection Budget 2014 - 2020 (in million USD)



Source: Own Estimations, U.S. Office of Management and Budget

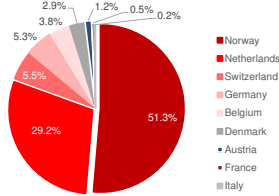
Figure 8 – Canadian EV Incentives in Comparison to Overall Env. Prot. Budget 2014 - 2020 (in million USD)



Source: Own Estimations, Treasury Board of Canada

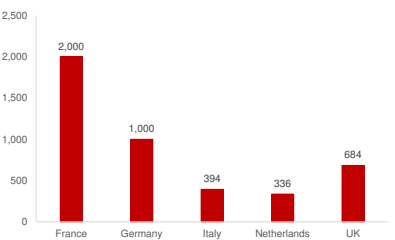
¹⁶ Annual Reports of the respective car manufacturers
¹⁷ The White House, Office of Management and Budget, Outlays by Agency 1962 - 2019
¹⁸ The White House, Office of Management and Budget, Outlays by Agency 1962 - 2019
¹⁹ Government of Canada, Treasury Board of Canada Secretariat, Expenditures by Program

Figure 9 – Main European Markets According to 2013 Model S Sales (in % of Total Sales)



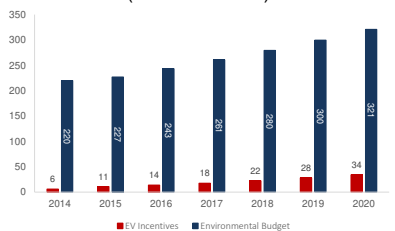
Source: Clean Technica

Figure 10 – Projected EV Sales of Major European Markets until 2029 (in '000 units)



Source: Own Estimations, Chinese Ministry of Finance, Wall Street Journal

Figure 11 – Chinese EV Incentives in Comparison to Overall Env. Prot. Budget 2014 - 2020 (in billion RMB)



Source: Own Estimations, Chinese Ministry of Finance, Wall Street Journal

2013.²⁰ Until 2020 this figure is expected to increase to 1.42% indicating environmental expenditures of about 92 billion Euro.²¹ Analysing the stake of EV incentives as of total environmental expenditures it becomes obvious that the European countries have far more room for EV incentives than their transatlantic counterparts – on average the considered European countries are assumed to spend 4.81% of their total 2020 environmental expenses for EV incentives.²² As a consequence Tesla’s European target market appears to be favourable in terms of potential incentives to drive the EV market growth. Nevertheless, incentives for other forms of electronic vehicles have to be added which decreases the budget buffer. It is however apparent that even then the European governments should have sufficient funds allocated. Yet most governments in Europe lack of adequate incentives as of today.

With 190 billion RMB and a stake of 4.82% of overall governmental expenses in 2013 the Chinese government seems to have sufficient funds distributed towards environmental expenses.²³ We expect the environmental expenses to increase to 5.13% of the total expenses in 2014 which implies a growth rate of 3.2%.²⁴ This growth rate is assumed to continue until 2020. Adding the 10% tax exemption – based on an average retail price – of over 40,000 RMB to the additional 60,000 RMB given to vehicles produced in China, and multiplying this figure with the expected cars sold, we assume the EV incentives to take up 2.78% (6 billion RMB) of total environmental expenses in 2014. In 2020 EV incentives are predicted to be 10.69% of aggregate environmental outlays. In conclusion it appears that China is well positioned to handle future EV demand. Here as well we need to bear in mind that incentives other electronic vehicles still have to be added. Comparable to the European market it seems that even then China still has adequate funds assigned. Considering hybrid EV’s the budget buffer however becomes decidedly lower. As a result of this a redistribution of budgets could be required.

Government Incentives Influence

Bottom line we believe that incentives created by governmental agencies are able generate significant EV demand spurring growth. Therefore we ascribe a stake of 20% influence making it a major driver of EV market growth. We project that the right incentives combined with augmented governmental budgets are able to increase EV sales to 10%, 14% and 8% of global car sales accordingly to

²⁰ Eurostat, Environmental Expenditure & Total General Government Expenditure of Euro 28 countries

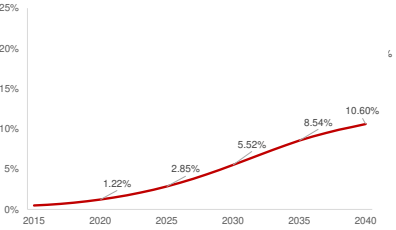
²¹ Eurostat, Environmental Expenditure & Total General Government Expenditure of Euro 28 countries

²² See Appendix 3 for a detailed overview of EV incentives as of total environmental expenses for each regarded European country individually

²³ Ministry of Finance, People’s Republic of China, Annual Report 2013

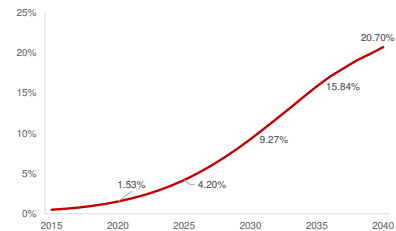
²⁴ The Wall Street Journal, <http://blogs.wsj.com/chinarealtime/2014/03/05/beijing-plans-to-spend-2-45-trillion-this-year-heres-how/>

Figure 12 – EV Sales as % of Global Car Sales Depending on Government Incentives



Source: Own Estimations

Figure 13 – EV Sales in % of Global Car Sales Depending on Environmental Awareness



Source: Own Estimations

the base, best and worst case scenario. In combination we expect the EV market to account for 1.22%, 5.43% and 10.4% of worldwide car sales in 2020, 2030 and 2040 respectively.

Environmental Awareness

Within the last decade environmental awareness has started to change humanities actions pushing the world towards sustainability. Due to the fact that CO² remains the largest contributor to global greenhouse gas emissions, and the transport sector is the largest contributor to CO² emissions (23% of total CO² emissions)²⁵, we believe there is sufficient potential for environmental awareness to stimulate sustainable EV sales.²⁶ To substitute awareness governments need to introduce stricter regulations limiting carbon emissions. Furthermore it is the task of EV manufacturers as well as governments to increase awareness of the positive long term effects ascribed to EV's. Due to the importance of environmental awareness we model its influence with 20% making it another major driver of our EV market growth projections.

We expect EV sales to be 20.40% of global car sales in 2040 under consideration of the combination of our scenarios. 2020 and 2030 are indicated with EV sales stakes of 1.52% and 9.17% respectively. However, growth is threatened by insufficient governmental regulations on national and global basis. Lately the United Nations Climate Change Conference for instance has failed to implement efficient goals and regulations due to discrepancies among its participants. These issues have to be eliminated in order for the EV market to grow adequately and in line with our projections.

Electricity Prices

As the equivalent of fuel electricity prices affect customers decisions whether to opt for a regular fuel powered vehicle or an EV. High electricity prices would therefore be counteractive for EV market growth. Based on an analysis by the U.S. Energy Information Administration (EIA) we project electricity prices to increase by 0.39% annually until 2040. Although this growth is marginally it increases current electricity prices from 11.93 cents (US \$) to 13.25 cents in 2040²⁷ considering our base case scenario. Within the best case scenario we project electricity prices to decrease by 0.39% yearly whereas the worst case scenario models an increase of 0.78% annually. Conclusively we expect the combination of electricity price scenarios to result in a diminished EV sales stake in 2040

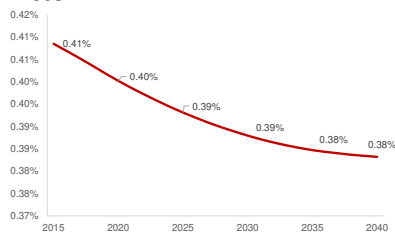
We expect environmental awareness to be among the major drivers of global EV growth

²⁵ OECD Green Growth Papers, Market Development for Green Cars (2012)

²⁶ OECD Environmental Outlook to 2050, Chapter 3 – Climate Change (2011)

²⁷ U.S. Energy Information Administration, AEO 2014 Early Release Overview (2013)

Figure 14 – EV Sales as % of Global Car Sales Depending on Global Electricity Prices



Source: Own Estimations, EIA

amounting to 0.38% of global car sales, down from 0.41% in 2014. U.S. prices have been taken as benchmark for global electricity price evolution.

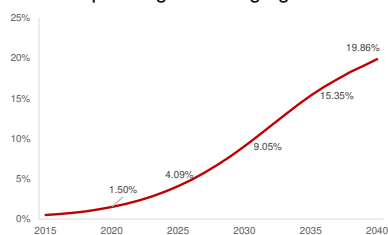
As regards energy generation Exxon Mobile projects the global energy production mix to shift noticeably towards renewable energies in 2040.²⁸ The analysis expects 17.45% of globally produced energy to be generated out of renewable sources such as Hydro or Wind. This implies a substantial increase up from 11.0% in 2010. The expected shift towards renewable energy sources supports the promise of EV's to promote sustainable transport. Nevertheless the amount of coal, gas and oil will yet still be too high in 2040 to enable emission free EV charging. We attribute a stake of 10% influence towards electricity prices since we don't believe this factor to be among the major drivers of EV market growth.

Charging Network

“Range Anxiety” is a vital restriction within the consumers decision making process of buying an EV. To provide long range travels EV manufacturers need to provide an adequate charging network, either by building their own network or by cooperating with existing providers. As of today most manufactureres of EV's have opted for the alternative of cooperation. Navigant Research states that currently there are more than 60,000 EV charging stations available worldwide.²⁹ We assume that EV market growth is directly correlated with EV charging stations growth. The combination of scenarios projects 3 million EV charging stations, this accounts for actual charging units, to be available worldwide in 2040 implying a growth rate of 15.85% yearly. Compared to around 500.000 petrol stations available at the moment worldwide the amount of EV charging stations seems feasible.³⁰ The combination of our scenarios implies a stake of 19.22% EV sales of global car sales in 2040.

Important here is the appropriate technology that allows for fast charging processes. Overnight charging stations available mainly in metropolitan areas are not feasible regarding the placement of charging stations among highways. Highway charging stations are the most important factor to overcome the issue of range anxiety and need to provide fast charging possibilities. We attribute a stake of 10% influence towards the evolution of the global charging network.

Figure 15 – EV Sales as % of Global Car Sales Depending on Charging Network



Source: Own Estimations

Another important factor is the global charging network to overcome range anxiety

²⁸ Exxon Mobile – The Outlook for Energy 2015: A View to 2040 (2014)

²⁹ Navigant Research: <http://www.navigantresearch.com/newsroom/nearly-64000-public-charging-stations-for-electric-vehicles-have-been-installed-worldwide>

³⁰ Considering around six charging units per station there would be around 500.000 EV charging stations available in 2040

Battery Prices

Table 2 – Battery Technology Used by Major

Company	Battery type
GM	Li-ion, Ni-MH
Ford	Li-ion, Ni-MH
Toyota	Ni-MH
Honda	Ni-MH
Hyundai	Lithium polymer
Chrysler	Ni-MH
BMW	Li-ion, Ni-MH
BYD	Li-ion
Daimler	Li-ion, Ni-MH
Mitsubishi	Li-ion
Nissan	Li-ion, Ni-MH
Tesla	Li-ion

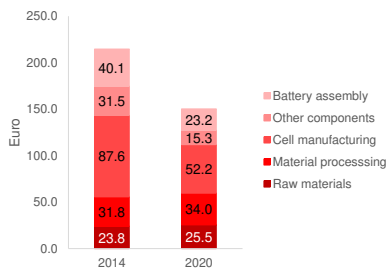
Source: Car Companies

Considered to be the most vital factor for the profitability of EV manufacturer’s, battery technology consumes a considerable amount of Tesla’s R&D expenses. As of today the dominating battery types are super capacitors, lead acid, nickel-cadmium (Ni-Cd), nickel-metal hybrid (Ni-MH), lithium-polymer and lithium-ion (Li-ion) with the later offering clear advantages in terms of range and acceleration. As a consequence most electric car manufacturers rely on Li-ion technology. Nevertheless many EVs only provide driving ranges of up to 150km which introduced the infamous term “range anxiety” among customers. One of Tesla’s competitive advantages is that its cars offer a driving range of more than 335km up to 500km depending on the integrated powertrain. For EV’s to become competitive with regular cars, implying EV market growth, the issue of low range has to be overcome not only by Tesla but also its challengers. Perceptions regarding the safety and reliability of EV’s also remain an issue throughout the market since fire related incidents in China and the United States attracted high profile media attention. As a consequence EV manufacturers have to further improve such risk factors and educate their customers in regard of the technologies safety.

To tackle the issue of battery costs Tesla is building the Gigafactory to achieve high volume and lower costs through integrating battery manufacturing from raw materials through completed cells and battery packs. Even though Tesla’s battery costs of 214 Euro per kWh are on average 50.7% lower compared to its competitors, the company is eager to cut these costs by 30% to around 150 Euro in 2020³¹. Since the variety of depleted raw materials such as graphite, lithium, cobalt, nickel, aluminium, copper and steel are expected to actually increase the cost improvements will be attributed to cell manufacturing, battery assembly and other components. Other EV manufacturers are expected to decrease their battery costs by 37.36% to 272 Euro per kWh in 2020.³² Since decreasing battery costs will most likely lead to lower vehicle prices the direct impact of cheaper batteries on EV sales will be rather marginal and limited mostly to battery replacement costs. We expect EV sales to account for 1% of worldwide car sales in 2040 considering our base scenario. Analysing the combination of our scenarios we project the stake of EV sales to be 1.15% of global car sales in 2040. We model the influence of battery prices to be 5% and therefore place it among the minor EV market drivers.

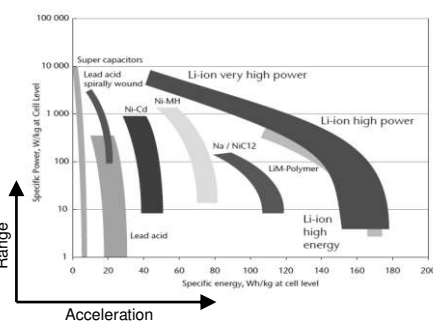
Despite its present technological edge Tesla has to observe and also develop technology evolutions and adapt its powertrains to eventually upcoming

Figure 16 – Li-ion Battery Cost Reduction as a Result of the Gigafactory (in EUR)



Source: Own Estimations, Roland Berger

Figure 17 – EV Battery Comparison

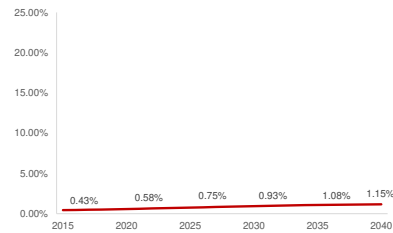


Source: Electric Vehicle Integration

³¹ Roland Berger: Powertrain 2020: The Li-ion Battery Value Chain – Trends and Implications

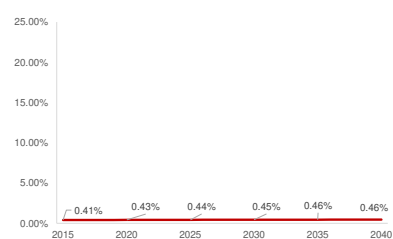
³² Roland Berger: Powertrain 2020: The Li-ion Battery Value Chain – Trends and Implications

Figure 18 – EV Sales in % of Global Car Sales Depending on Battery Prices



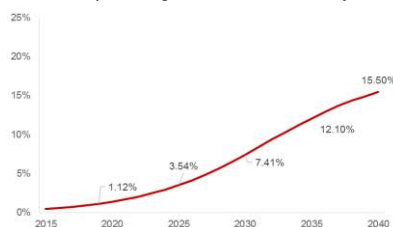
Source: Own Estimations

Figure 19 – EV Sales as % of Global Car Sales Depending on Vehicle Prices



Source: Own Estimations

Figure 20 – EV Sales in % of Global Car Sales Depending on Model Diversity



Source: Own Estimations

improvements.³³ Recently the company stated that they are working on a metal air Li-ion battery which would enable vehicles to drive up to 640km without charging.³⁴ Technological evolutions that are being worked on today include lithium sulphur carbon nanofiber, lithium silicon polymer and copper nanowire cathode lithium. According to expectations new technologies could enable EVs to increase their driving range to about 800km.

Vehicle Prices

Vehicle prices are a tempting motivator for consumers thinking about the purchase of an EV. Currently the average price for an EV is 27.807 Euro after governmental incentives. We project average EV prices to approach the current average price of petrol fuelled vehicles in 2040 which is 22,500 Euro.³⁵ This however only accounts for the best scenario, the base scenario models an average price of 25k Euro and the worst case scenario 30k in 2040. Obviously the average EV price after incentives is not too far away from conventional vehicles. EV market growth is projected to be correlated with the decrease in vehicle prices. The combination of scenarios projects EV sales to account for 0.46% of worldwide car sales in 2040.

This implies an annual EV market growth of around 0.42%. We model the price decline with an influence of 10% of overall EV market growth. Consequently the price of EV vehicles plays a rather minor role. Should government incentives at one point be discontinued EV manufacturers could be forced to react with price declines. This requires an efficient production process in order to stay profitable over the long term.

Model Diversity

As of today the selection of pure EV is still rather limited with 36 EV's available globally, which is one of the reasons the market is branded as a niche. The expansion of the range of available EV's is vital for EV manufacturers in order to receive customer attention. In order for EV's to compete with conventional vehicles this number is obliged to increase in the future. We expect model diversity to have a significant influence on total EV sales since customer tastes are more likely to be met with greater variety of vehicles.

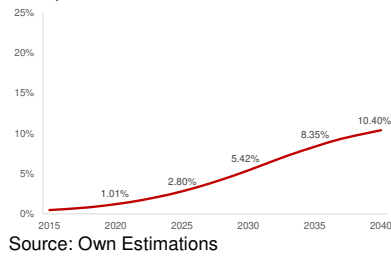
Overall we model diversity to spur EV sales to 15% of global car sales within the combination of scenarios. This implies a yearly growth rate of about 14.93%. Our

³³ During 2014's annual shareholder meeting Tesla's CEO stated that the Gigafactory could be quickly adapted to new battery technologies

³⁴ <http://cleantechnica.com/2013/09/19/new-tesla-patent-400-mile-battery-pack-using-metal-air-lithium-ion-batteries/>

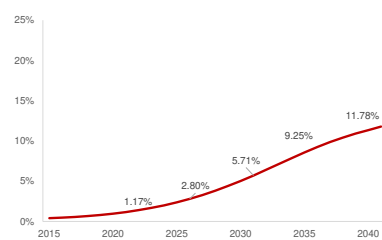
³⁵ Forbes: Average Price of a New Car. <http://www.forbes.com/sites/moneybuilder/2012/05/10/average-price-of-a-new-car/>

Figure 21 – EV Sales in % of Global Car Sales Depending on Total Cost of Ownership



Source: Own Estimations

Figure 22 – Overall EV Sales as % of Global Car Sales



Source: Own Estimations

assumptions attribute 12.5% of influence regarding total EV market growth towards model diversity. Therefore we expect this variable to be among the major EV market drivers.

Total Cost of Ownership

The term total cost of ownership refers to the actual cost evoked by owning a vehicle. Among these particular costs are fuel costs, depreciation, maintenance and repair costs, in other words operating costs. For our model we computed the 5 year cost of ownership for an average price EV and compared the result to an average of comparable conventional vehicles. Fuel costs are computed by multiplication of battery recharging costs of 5.36 Euro (average 60kWh battery times 8.94 Euro cents per kWh) with total recharging's which amount to 626 (average 120,000 km driven in five years divided by average EV range of 192km). For maintenance, deprecation and repairs we incorporate respective average costs for the conventional reference group which are 3,901 Euro, 17,339 Euro and 933 Euro respectively. Conclusively we compute that the ownership of an EV has potential cost savings of about 10,524 Euro.³⁶

Overall the model projects total cost of ownership to be able to spur EV sales to 10% of worldwide car sales in 2040 within the combined scenario approach. Due to the obvious cost savings we project this variable to account for 10% of influence regarding total EV growth.

Overall EV Market Growth

The combination of the identified main market drivers multiplied with their specific stakes of influence leaves us behind with 11.49% EV sales of global car sales in 2040 within the combined scenario. Examining the scenarios individually we can determine 11.33%, 15.04% and 8.40% for the base, best and worst case scenario respectively. It becomes obvious that EV market growth depends on a number of different independent variables and is therefore rather fragile.

Because it is in Tesla's best interest to bolster up the EV market the company has made its distinctive patents public hoping to speed the adoption of EVs and thus grow the market considerably.³⁷ Certainly Tesla's competitive position will be weakened once existing car makers use their funds, economies of scale and widespread dealer network to challenge Tesla's position. Nevertheless the company is betting that the advantages of broader customer adoption of EV's will offset the threat of greater competition. Tesla believes that a smaller fraction of a

Table 3 – EV Market Drivers According to Their Influence on Overall EV Market Growth

EV Market Main Driver	Model Diversity
EV Market Drivers	
Oil Prices	10.00%
Government Incentives	20.00%
Environmental Awareness	20.00%
Power Prices	7.50%
Charging Network	10.00%
Battery Prices	5.00%
Vehicle Prices	5.00%
Model Diversity	12.50%
Total Cost of Ownership	10.00%

Source: Own Estimations

³⁶ See Appendix 4 for an explicit overview of the reference group as well as the computed average costs

³⁷ On 12th June 2014 Tesla opened it's over 200 technological patents for everyone intending to use them in good faith.

Table 4 – Market Share of Major EV Manufacturers (Combined Scenario)

	2015	2020	2030	2040
Nissan	22.00%	20.08%	16.73%	13.93%
Chevrolet	13.67%	13.30%	12.60%	11.94%
Mitsubishi	11.95%	11.52%	10.71%	9.95%
Toyota	9.69%	6.15%	2.47%	1.00%
Tesla	11.43%	13.30%	13.84%	14.40%
Renault	8.82%	8.41%	7.66%	6.97%
Ford	7.38%	7.29%	7.13%	6.97%
Volvo	3.28%	2.58%	1.60%	1.00%
Chery	2.25%	1.91%	1.38%	1.00%
Daimler	2.12%	2.52%	3.54%	4.98%
BYD	1.52%	1.99%	3.45%	5.97%
JAC	1.35%	1.82%	3.30%	5.97%
Volkswagen	0.85%	1.36%	3.49%	8.96%
BMW	0.75%	1.10%	2.34%	4.98%
Honda	0.58%	0.74%	1.22%	1.99%

Source: Own Estimations

bigger EV market is worth more than its current position in a rather minute EV market.

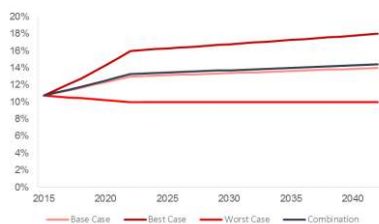
Market Share

The global EV market was divided between 15 major manufacturers in 2013 with Tesla taking 10.78% of it. Other major EV sellers were Nissan (with its commercially successful Leaf model) taking 22.82%, Chevrolet (as a daughter of GM) with 13.81%, Mitsubishi with 12.12% and Toyota with 11.63% of global EV sales. Noticeable is the high concentration of Japanese EV manufacturers, accounting for almost half of global EV sales. More conservative car companies have not yet applied much of their resources towards the EV market, which explains that established manufacturers such as VW, Renault or Ford only account for around 17% of global EV sales combined.

Over the long term our model expects the EV manufacturers landscape to change substantially though. Due to Toyota’s strategy to solely focus on fuel cell technology we project the company to almost completely exit the EV market by 2040. On the other hand we expect a significant amount of EV sales to be generated by Chinese manufacturers in 2040. Due to their cheaper production costs and with the gigantic Chinese market at their doorstep we expect them to capture around 12% of worldwide EV sales in 2040. Furthermore we believe that established companies such as GM, Ford, Renault, BMW, Daimler and VW will start to focus on EV as they will gain customers attention. Those manufacturers are expected to make up over 33% of global EV sales.

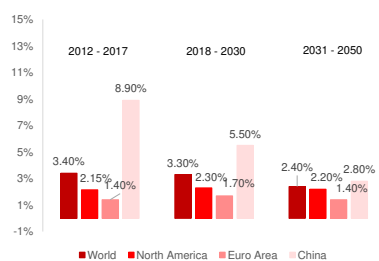
As for Tesla we believe that the company will be able to slightly increase its market share and serve 14.4% of the global EV market by 2040 in our combined scenario approach. Over the short term we expect the market share to decrease, since more companies with greater resources, production and distribution capabilities will enter the market.

Figure 23 – Tesla Market Share Until 2040



Source: Own Estimations

Figure 24 – GDP Growth in Real Terms of Tesla’s Main Markets until 2050



Source: OECD

Global Macroeconomic Outlook

As stated by the OECD annual global growth will amount to 3.4% in real terms until 2017 and is expected to decline to 3.3% between 2018 and 2030 and 3.2% between 2030 and 2050.³⁸ For the North American market annual real growth rates are expected to be slightly lower with 2.2%, 2.3% and 2.2% respective the prior indicated periods. Concerning the Euro area real term growth is anticipated to be 1.4%, 1.7% and 1.4% respectively, leaving this market behind with the lowest growth of Tesla’s core markets. Lastly the Chinese economy is projected to

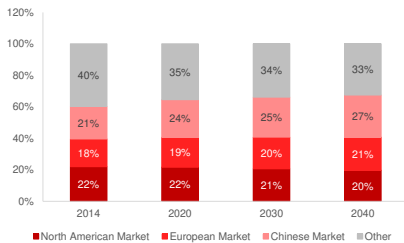
³⁸ OECD Economic Outlook (2012), Chapter 4, Medium and Long-Term Scenarios for Global Growth and Imbalances

Table 5 – Expected Inflation (in %) of Tesla’s Core Markets (2014 - 2019)

Region	2014	2015	2016	2017	2018	2019
World	3.5%	3.4%	3.6%	3.5%	3.4%	3.4%
European Union	1.1%	1.4%	1.6%	1.7%	1.7%	1.8%
China	2.7%	2.6%	3.0%	3.0%	3.0%	3.0%
United States	2.1%	1.5%	1.4%	1.6%	1.8%	2.0%

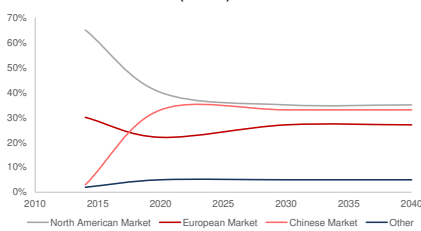
Source: IMF

Figure 25 – Geographical EV Sales Allocation (in %)



Source: Own Estimations, EIA, BCG

Figure 26 – Geographical Vehicle Sales Allocation Tesla (in %)



Source: Own Estimations, Management Statements

grow 8.9%, 5.5% and 2.8% respectively. It becomes obvious that global growth is pushed primarily by China, India as well as numerous emerging countries.

Global GDP composition in 2013 was aggregated through 22.1% United States, 6.4% Japan, 16.1% Euro area, 17.5% other OECD, 11.2% other non-OECD, 18.4% China and 7.5% India.³⁹ The current composition however is expected to change significantly over the next decades. Due to shifting economic powers the GDP composition of 2040 is anticipated to be compounded by 17.3% United States, 3.6% Japan, 10.9% Euro area, 14.7% other OECD, 12% other non-OECD, 28% China and 13% India. The re-allocation of global GDP drivers will be considered within the present valuation model.

Inflation in Tesla’s core markets is predicted to be lower than global inflation over the entire valuation cycle. Average inflation between 2014 and 2019 is assumed to be 1.72% for the United States, 2.88% for China and 1.56% in Europe whereas global inflation denotes 3.47%.⁴⁰ For the valuation model we integrate an average inflation of Tesla’s primary markets which amounts to 2.05%.

Geographical EV Sales Dispersion

Geographically worldwide car sales are expected to shift distinctively based on alternating global market powers. Thus we expect current global car sales allocations to change from 22.00% in North America, 17.61% in Europe, 20.66% in China and 39.73% in other countries to 21.60%, 19.00%, 23.93% and 35.47% in 2020 respectively.⁴¹ In 2040 we project a further shift that will attribute 19.62% to North America, 21.12% to Europe, 26.74% to China and 32.53% to other countries. In 2014 the North American market is projected to account for 65% of Tesla’s sales followed by the European market with 30%, the Chinese market with 3% and others with 2%. Additionally we take statements regarding the expected geographical allocation of Tesla’s sales made by the top management into account.⁴²

Global Lithium-Ion Battery Market

The global lithium-ion battery market is forecasted to experience considerable growth contemplating the upcoming years. Based on the assumption that EV production will increase the demand for mostly used lithium-ion batteries will rise accordingly. Outside the EV industry lithium-ion batteries are expected to find use in the grid, renewable energy storage, mobile phone, satellite and consumer

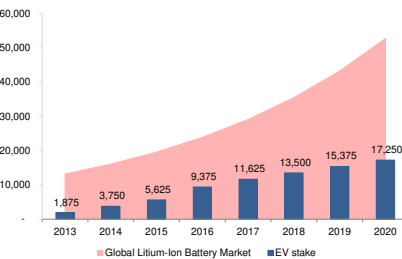
³⁹ OECD Economic Policy Papers (2012), Looking to 2060: Long-Term Global Growth Prospects

⁴⁰ World Economic Outlook (2014), International Monetary Fund

⁴¹ KPMG, Global Automotive Retail Market Study Part 1 (2013)

⁴² During Tesla’s 2nd quarter earnings call management executives made assumptions regarding the company’s future geographical sales allocation

Figure 27 – Projected Stake of Li-Ion Batteries used within EV’s as of Total Li-Ion Battery market (in million EUR)



Source: Own Estimations, Statista

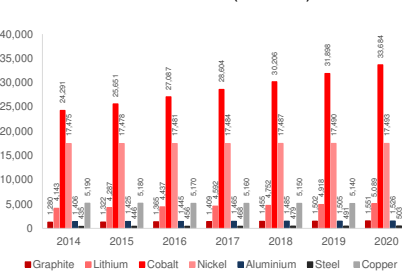
electronics segment. In addition many utility companies will continue to seek smart grid solutions for which lithium-ion batteries seem just perfect.

Whilst the total lithium-ion battery market was at 10.3 billion Euro in 2012 it grew to over 16 billion Euro in 2013 already. Until 2020 the market is predicted to increase to over 52.7 billion Euro implying a CAGR of about 21.9%.⁴³ Interesting to notice is that the stake allocated to EV’s was only around 1.4 billion Euro or 14.2% of total lithium-ion battery sales in 2013. Yet according to an increasing EV demand and production this figure is assumed to grow up to 17.3 billion Euro or 32.2% of the total market in 2020.⁴⁴ With the construction of its Gigafactory Tesla is betting on a promising lithium-ion battery market. Should the company produce an overcapacity of lithium-ion batteries it would be able to sell those overheads due to increased demand in a thriving market.

Commodity Price Forecast

As already mentioned the decrease in battery costs will most likely not be ascribed to diminishing commodity prices. Graphite which amounts to 15%⁴⁵ of material used for the production of lithium-ion batteries for EV’s is currently trading at 1,280€ per ton and is projected to surge by 3.24% annually to 1,551€ per ton in 2020.⁴⁶ With 33% lithium is the main component of Li-ion batteries. Its price is presently at 4,140€ and is anticipated to rise by 3.49% yearly to around 5,100€ in 2020.⁴⁷ Aluminium which makes up 19% of a Li-ion battery and is currently trading at 1,400€ is projected to increase its market value by 1.37% annually up to 1,520€ in 2020.⁴⁸ Further major components of Li-ion batteries, namely cobalt, nickel, copper and steel are anticipated to grow by 5.60%, 0.02%, -0.19% and 2.43% respectively on a yearly basis.⁴⁹

Figure 28 – Expected Commodity Price Evolution 2014 – 2020 (in EUR)



Source: World Bank, Ecorys

The indicated increase in commodity prices is already incorporate within the model and are not able to challenge the viability profitable EV production. Highly increasing commodity prices would be able to diminish profitability and therefore threaten EV manufacturers. As a consequence it seems advisable for EV manufacturers to protect themselves against rising commodity prices through future contracts for example. Stable partnerships with suppliers are another step towards secure raw material provision. Here there is potential for acquisition activities. Especially Tesla’s new Gigafactory is projected to create great demand for

The price evolution of commodity prices is crucial for the profitability of EV manufacturers. Producers should engage into measures to ensure stable prices and supply

⁴³ Frost & Sullivan, Analysis of the Global Lithium-Ion Battery Market: Growth Opportunities and Market Outlook

⁴⁴ Pike Research, Total Lithium Ion Battery Revenue by Region, World Market 2012 – 2020

⁴⁵ U.S. Department of Energy, Argonne National Laboratory: Material and Energy Flows in the Materials Production, Assembly, and End-of-Life Stages of the Automatic Lithium-Ion Battery Life Cycle

⁴⁶ Ecorys (2012): Mapping Resource Prices – The Past and the Future

⁴⁷ Ecorys (2012): Mapping Resource Prices – The Past and the Future

⁴⁸ World Bank Group (October 2014): Commodity Markets Outlook

⁴⁹ World Bank Group (October 2014): Commodity Markets Outlook

raw materials since it will be able to nearly double the worlds output of EV batteries.

Business Specifics

Supercharger Network

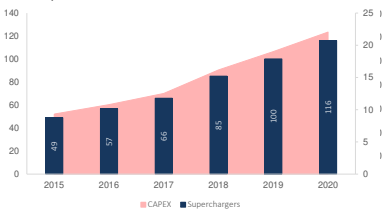
In order to create to provide adequate charging opportunities for its vehicles Tesla is establishing a supercharger network in its core markets. The 480-volt fast solar powered charging stations enable Tesla owners to charge their vehicles with an additional 240km of range in just about 20 minutes. Through this network the company is tackling the issue of limited range in addition to its powerful batteries.

As of today there are 132⁵⁰ superchargers available in North America making it Tesla most extensive network considering its targeted markets. Considering the around 44,000 vehicles sold in the U.S. until today there is a ratio of 331 vehicles per installed supercharger. For valuation purposes we expect the vehicles per supercharger ratio to be at 500 and the construction cost of a supercharger to be 190,000€.⁵¹ Based on the underlying sales estimate for Tesla’s North American market we assume that Tesla will build 49 new superchargers in 2015 and an additional 424 until 2020. In total these figures will result in over 89 million Euro of CAPEX until 2020 alone.

In Europe there are 99 superchargers installed at the moment. Since there have been over 16,000 vehicles sold on the European market the cars per supercharger ratio amounts to a value of 170. Just as for the North American market we assume the future ratio to be 1.000 which results in 25 new superchargers in 2015 and an additional 224 until 2020 accounting for over 47 million Euro of CAPEX until 2020.

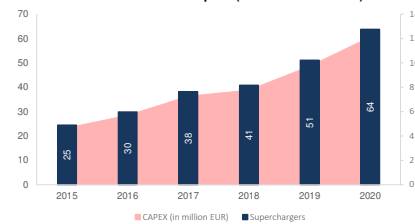
The construction of a supercharger network within China will be achieved through a partnership with China Unicom – China’s second largest mobile phone company. So far the agreement foresees the creation of 400 charging points in 120 cities with Tesla providing the technology and China Unicom the land.⁵² Overall there have been 23 superchargers installed already leading to a car per super-

Figure 29 – Projected Superchargers to be installed in North American (2014 - 2020)



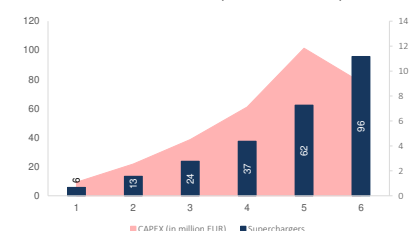
Source: Own Estimations

Figure 30 – Projected Superchargers to be installed in Europe (2014 – 2020)



Source: Own Estimations

Figure 31 – Projected Superchargers to be installed in China (2014 - 2020)



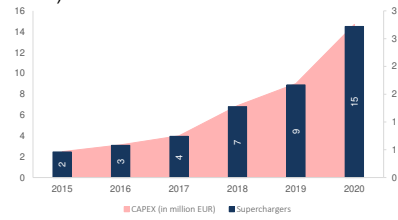
Source: Own Estimations

⁵⁰ Tesla Motors, Supercharger Network, <http://www.teslamotors.com/supercharger>

⁵¹ Bloomberg, Businessweek, Tesla Builds \$250.000 Fast Chargers for Model S, <http://www.businessweek.com/news/2012-09-24/tesla-building-250-000-chargers-for-model-s-drivers-in-highways>

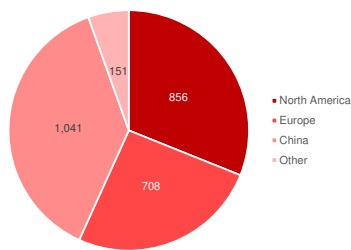
⁵² Bloomberg News, Tesla Signs Deal With China Unicom on Charging Points, <http://www.bloomberg.com/news/2014-08-29/tesla-signs-deal-with-china-unicom-on-charging-points.html>

Figure 32 – Projected Superchargers to be Installed in Other Markets (2014-2020)



Source: Own Estimations

Figure 32 – Geographical Total Super-charger CAPEX 2014 - 2040 (in million EUR)



Source: Own Estimations

The expansion of its Super-charger Network is vital for the company's success

charger ratio of 42. Implying a ratio of 500 there will be 6 new superchargers build in 2015 and an extra 233 until 2020 amounting to 45 million of CAPEX.⁵³

So far the company has installed 2 supercharges in Japan which accounts for all superchargers in Tesla's other markets resulting in a cars per supercharger ratio of 324. Applying the same methodology as before we assume Tesla to build 2 new superchargers in 2015 and 37 supplementary until 2020 which marks CAPEX of over 7 million Euro. Conclusively we can determine that the extension of the supercharger network will come with significant expenditures for the company. Since Tesla has to provide sufficient charging capacity for its growing customer base the increase in CAPEX for superchargers are directly related to vehicle sales. We expect the company to spend 2.7 billion Euro until 2040 for the construction of superchargers worldwide. Thereof 31.1% are spend in North America, 25.7% in Europe, 37.8% in China and 5.5% in other markets.

As of today the existing supercharger network is not yet sufficient to overcome range anxiety. Merely the existing network within the U.S. is coming close to provide something close to an adequate network. Especially in its other core markets as well as in the U.S. the company needs to expand its supercharger network to satisfy its customers. So far this network is only available for Tesla vehicles but management has repeatedly stated that the company is willing to open its chargers for other EV's. Since Tesla would charge a fee for recharging this appears to be an additional revenue which the company needs to evaluate. So far the company has, except in China, not announced a partnership to build the global supercharger network. A partnership is yet another option Tesla could reflect on since this could accelerate the velocity of implementation and reduce construction costs.

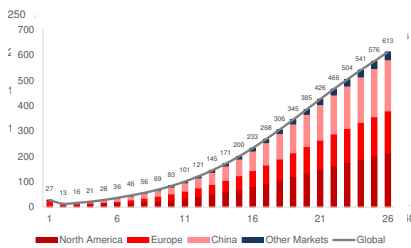
Such a partnership with existing petrol stations could be imaginable since these facilities offer widespread networks throughout the respective countries which Tesla could profit from. If charging for Tesla vehicles would still be for free remains to be unanswered but petrol station would most likely charge the company for the provision of superchargers. Should Tesla not live up to its promise of implementing a global supercharger network within the near future the firm's reputation could be severely damaged. Existing customers could rethink their decision and switch to a competitive vehicle.

Company Owned Galleries and Service Centres

As indicated Tesla Motors sells its vehicles solely through its own galleries and via the internet. Unfortunately the company does not disclose the amount of cars

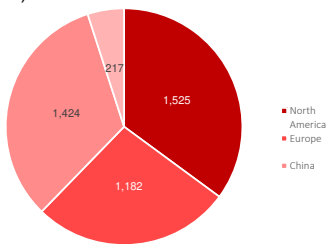
⁵³ See Appendix 5 for a detailed overview of Tesla's overall CAPEX until 2040

Figure 33 – Expected Galleries/Stores to be built Geographical Breakdown (2015 - 2040)



Source: Own Estimations

Figure 34 – Geographical Total Galleries/Stores CAPEX 2015 - 2040 (in million EUR)

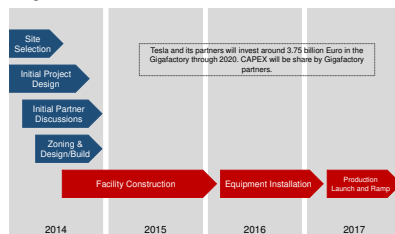


Source: Own Estimations

sold through each respective channel. Furthermore the company is offering repairing services on the basis of its own service centres which can be connected with the galleries. The unique approach implicates substantial CAPEX, around 750,000€ per gallery/service centre, as well as regulatory issues in specific areas. Momentarily the five U.S. states Arizona, Texas, New Jersey, Virginia and Ohio forbid Tesla to sell its vehicles directly to customers. Most of these restrictions trace back to lawsuits of third party car dealers trying to prevent Tesla from implementing its direct sales model. The claims are that Tesla's direct sales approach violates certain state specific automotive franchise rules. So far a number of those lawsuits have been successful and seem reasonable but remain to be topic of eventual countersuit by Tesla. Nonetheless the company is operating 59 galleries and service centres in North America as of today.⁵⁴

For 2015 we expect Tesla to build a number of new galleries/stores according to its website. We predict that from 2016 on Tesla will have a cars per gallery/service centre ratio of 4.000. This number only applies for service centres operated by Tesla, but we expect third party service stations to focus on Tesla as soon as there is an appropriate number of vehicles on the roads. Therefore we expect around 2.000 cars per service centre in the long term. As comparison we examined the number of vehicles per car repair shop in Germany which results in 1,323 cars per repair shop.⁵⁵ Applying this assumption to our model we expect the company to build over 5.700 additional stores/galleries which results in CAPEX of over 4.3 billion Euro until 2040. Geographically 35.08%, 27.18%, 32.75% and 4.98% are allocated to North America, Europe, China and other markets respectively. We observe that the company will be spending a considerable amount of funds due to its unique customer approach of creating its own supercharger and gallery/service centre network.

Figure 35 – Gigafactory Projected Timeline



Source: Company Data

Gigafactory

As already mentioned Tesla is constructing its own factory to manufacture Li-ion batteries. The motive behind this initiative is not only an anticipated reduction of cost of sales but also a wager by Tesla betting on increasing Li-Ion battery demand. Therefore the underlying model treats the Gigafactory as a separate business unit of Tesla which is able to create revenues in times when the company has overcapacities of batteries.

⁵⁴ Tesla Motors, Galleries & Stores, <http://www.teslamotors.com/findus/list?types=store.service®ions=northamerica.europe.asia>

⁵⁵ Calculation: (43 million cars / 32,500 repair shops). Source: Statista.com <http://de.statista.com/statistik/daten/studie/12131/umfrage/pkw-bestand-in-deutschland-seit-dem-jahr-1955/>, <http://de.statista.com/statistik/daten/studie/168124/umfrage/anzahl-der-betriebe-im-kfz-handwerk-in-deutschland/>

The Gigafactory is Tesla's key facility to ensure profitability and overcome shortages regarding EV demand

Altogether the facility, with its expected operation start in 2017, is assumed to cost 3.75 billion Euro which will be split between Tesla, Panasonic and a third yet to be announced partner. Tesla states that the company will invest around 1.5 billion Euro⁵⁶ considered as CAPEX whereas Panasonic will devote about 750 million Euro⁵⁷ of its own funds throughout 2020. For the valuation we assume that the company will spend 215 million Euro annually until 2020. The firm raised the necessary funds for the Gigafactory investment through the issuance of 1.5 billion Euro convertible debt in February 2014. Other partners are rumoured to be either Apple or Foxconn. By 2020 the Gigafactory is projected to achieve a production capacity of 35 GWh per year and employ approximately 6.500 people.

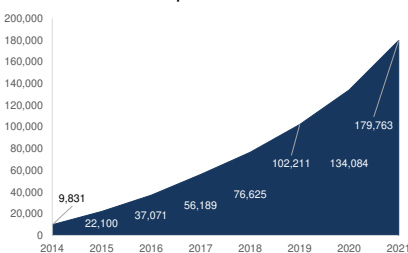
Chinese Manufacturing Plant

A manufacturing plant in China would ease the access to the market substantially. Consequently Tesla would be able to avoid import tax charged on foreign products

According to Tesla CEO Elon Musk the company will establish a local manufacturing plant in China during the next three to four years.⁵⁸ So far the company has not disclosed a location neither if it is going to establish a joint venture. Considering the business environment in China a partnership is very likely though. We expect the manufacturing plant to be built at the end of the forecasted timespan in 2018 and predict it to be finished in 2021. Expenditures for Tesla are projected to be around 600 million Euro although time has to show if the company will engage in a partnership model similar to the Gigafactory project. Therefore our model includes the assumption that Tesla will spend around 150 million Euro of CAPEX annually to construct the manufacturing plant. Additionally we model a conservative 0.5% increase in revenues due to improved distribution premises.

European Facilities

Figure 36 – Expected Total Tesla Vehicles Sold in Europe until 2019



Source: Own Estimations

In addition to the Chinese manufacturing plant the company has announced to build a second plant outside of the United States. This manufacturing plant will be situated in Europe, most likely in Slovakia since the company is already in negotiations with the Slovakian government.⁵⁹ Tesla has set itself a threshold of 160.000 vehicles sold in Europe before it will start the construction of the manufacturing plant. If it will be another partnership model is also indistinguishable as of today. Due to the assumptions of our market forecast the company will have sold specified amount of cars in 2021 and will start constructing the plant in 2022. Equal to the Chinese manufacturing plant we project the total cost of the plant to be 600 million Euro split into four years of construction and CAPEX of 150 million

⁵⁶ Tesla Motors, Gigafactory: http://www.teslamotors.com/sites/default/files/blog_attachments/gigafactory.pdf

⁵⁷ Forbes: <http://www.forbes.com/sites/markrogowsky/2014/07/29/all-in-tesla-panasonic-could-announce-nevada-gigafactory-deal-this-week/>

⁵⁸ Bloomberg News: <http://www.bloomberg.com/news/2014-04-20/tesla-to-start-model-s-sales-to-china-s-elusive-motorists.html>

⁵⁹ Reuters: <http://www.reuters.com/article/2014/06/12/us-tesla-plant-europe-idUSKBN0EN17M20140612>

A European Research and Development Centre would further emphasize the companies approach to benefit from technological advantages

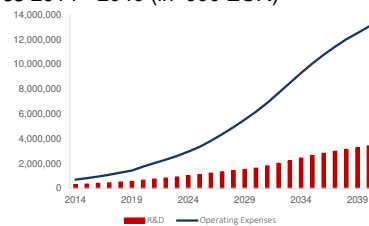
Euro annually. These costs are included in our model, also we predict revenue increases of 0.5% for the European market.

Beyond that the valuation considers a statement made by Tesla’s management regarding the construction of a research & development centre placed in the Midlands (UK). The facility is predicted to be constructed from 2016 until 2017 with annual CAPEX of 100 million Euro. Another facility that is considered in our valuation is the battery assembly plant in Tilburg (Netherlands) which opened in 2013. According to Tesla’s CEO Elon Musk the company is planning on expanding the capacity of the plant in the near future.⁶⁰ We anticipate the expansion to take place from 2016 until 2017 amounting to yearly CAPEX of 100 million Euro. Overall the company is projected to spend over 690 million Euro of CAPEX attributed to the expansion and construction of its European facilities.

Research & Development

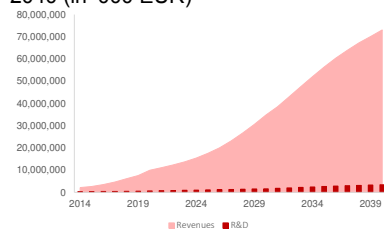
Research & development is indisputably Tesla’s most important expense position. The company benefits from its singular focus on all electric vehicles, with the ability to concentrate R&D expenses in comparison to other car manufacturers who have to spend their budgets across a wide of propulsion technologies. Since the company is working on various new models, battery and charging technologies it is obvious that those expenses have a significant impact on Tesla’s income statement. This is underlined by Tesla’s R&D intensity which relates R&D expenses to sales and was at 11.52% in 2013. Compared to other manufacturers of cars it becomes evident that the company has the highest R&D intensity among those companies. Other car manufacturers exhibit a range of 3% - 6% which is only half of Tesla’s value in the best case. Until 2020 the firm is projected to spend about 2.74 billion Euro on research & development alone continuing to spend another 42 billion Euro until the end of the projection framework in 2040. Compared to 2013 the R&D intensity is expected to even increase in 2014 to a value of 13.79%. Basic assumption of the valuation is that this ratio will approach an industry average until 2035 where the company is projected to be among a peer group of established automobile manufacturers.

Figure 37 – Projected R&D Expenses Compared to Overall Operating Expenses 2014 - 2040 (in '000 EUR)



Source: Own Estimations

Figure 38 – Projected R&D Expenses Compared to Total Revenues 2014 - 2040 (in '000 EUR)



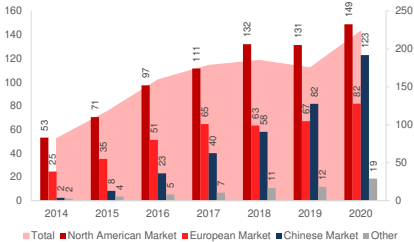
Source: Own Estimations

Customer Deposits

Refundable customer deposits consist of payments that allow future customers to successfully place an order for the purchase of a Tesla vehicle. These amounts are recorded as a liability until the vehicle is delivered, we assume that on average the vehicles do not take longer than one year for delivery. Therefore the projection of customer deposits depends only on the amount of vehicles pre-ordered

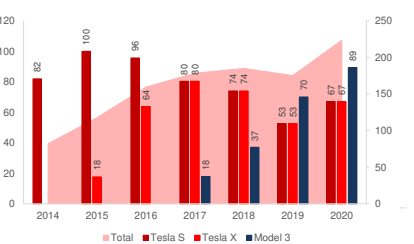
⁶⁰ Reuters: <http://www.reuters.com/article/2014/06/12/us-tesla-plant-europe-idUSKBN0EN17M20140612>

Figure 39 – Projected Customer Deposits Geographical Breakdown 2014 - 2020 (in million EUR)



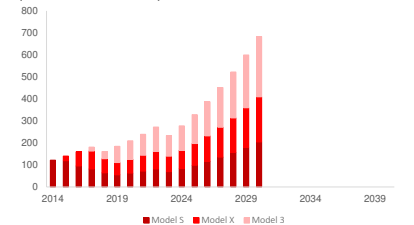
Source: Own Estimations

Figure 40 – Projected Customer Deposits by Model 2014 - 2020 (in million EUR)



Source: Own Estimations

Figure 41 – Sales Generated Through Regulatory Credits by Model until 2040 (in million EUR)



Source: Own Estimations

per year. Our model projects Tesla to scale up its production to a maximum in 2025 steadily decreasing pre-orders and therefore deposits over this timeframe. From 2025 on we expect only 10% of vehicles sold per year to be pre-ordered. We assume that on average there is an amount of about 2,500€ deposited for each Model S.⁶¹ The deposit for Tesla Model X amounts to 5,000€ and we expect the Model 3 deposit to be around 1,500 Euro. It is common among car manufacturers to charge a pre-order deposit, although Tesla charges the highest deposit as of today. So far this hasn't turned out to be a disadvantage yet since demand was very high. Over the time the amount of deposits could be disadvantageous for the company though and reduction could be advisable, as it has already happened with Model S.

On the basis of those assumptions the amount of total deposits will decrease to 81 million Euro in 2014. The decrease is due to the decreased deposit the company is charging for its Model S. Until 2020 we project that Tesla Motors will have an amount of 223 million Euro. Interesting to note about the deposits is the fact that the company is basically raising further funds without accessing the capital market. Hence, the deposits can be considered as free short term capital until it is converted into actual revenues.

Regulatory Credits

Portions of Tesla's revenue descend from regulatory credits that are awarded by several U.S. states in connection with the production, delivery and placement of zero emission vehicles.⁶² Due to the firm's zero emission EV it has earned and will continue to earn those tradable regulatory credits that can be sold to other manufacturers. In 2013 the company was able to sell credits worth more than 96 million Euro which accounts for 6.5% of total revenues. We project that the company will continue on generating revenues based on the sales of regulatory credits. Our assumptions restrict those credits upon the North American market since there are no comparable credits given out by either European or Chinese governments to Tesla yet.

Based on the assumption that each car sold in the U.S. is worth around 5,730€⁶³ of regulatory credits we project the company to generate around 120 million Euro of revenues related to regulatory sales in 2014. This implies a slight increase compared to 2013 but is explained by rising car sales of the North American market. Until 2020 this value is expected to rise up to 209 million Euro or 1.88% of total revenues. Overall Tesla will sell regulatory credits worth around 1.1 billion

⁶¹ The company only recently lowered the amount to be paid from 5k Euro to 2.5k Euro

⁶² Tesla Motors, Annual Reports

⁶³ The value is derived by the division of 97 million Euro of regulatory sales in 2013 by 16.585 cars sold in the same market in 2013

In the future we expect the company to depict general ratios aligned to the industrial average

Especially R&D which is extraordinarily high as of today is expected to decrease down to a comparable average over the years

Euro until 2020. Due to several insinuation by governmental agencies we expect the monetary reward given out for those credits to decrease by 30% of its original value in 2017 and 50% in 2027. From 2036 we project the credits program to be run out. Based on revenues attributed to each of the different models⁶⁴ we project Model S to generate 1.8 billion Euro of revenues related to regulatory credits whereas Model X will account for 1.5 billion Euro and Model 3 for 1.8 billion Euro.

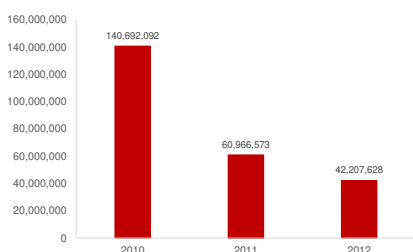
Business segments

Underlying assumptions of the following individual income statement predictions are an increasing gross margin up to 25% in 2021 (finished construction of the Gigafactory) from its current value of 22.66% in 2013. Even today the company has displays one of the highest gross margins among car manufacturers which represents a distinctive competitive advantage. Research and development is projected as a ratio of revenues excluding the Gigafactory and is expected to approach an industry average of 4.68% in 2030 implying a decrease from its 13.96% 2014 figure. Selling, general and administrative (SG&A) is linked to revenues excluding the Gigafactory as well and is estimated to decrease to an industry average of 13.24% in 2025, down 5.32% from its 2014 value of 18.56%. Noteworthy is the fact that Tesla does not spend money on marketing and advertising campaigns and rather tries to benefit from word-of-mouth and its distinctive business model. All values are allocated according to the particular's business stake of overall revenues excluding eventual revenues generated through the Gigafactory.

Roadster

The Roadster was Tesla's first marketed product and helped the company to gain considerable attention because of its design, highway eligibility and exclusivity due to a limited production of only 2.600 units. During its sales period the Roadster generated revenues of approximately 244 million Euro.⁶⁵ ⁶⁶ Even though the revenue proportion seems rather marginal compared to expected future revenues it is important to note that only a small amount of cars have been sold to reach this level. Because of that it is not surprising that many experts expect Tesla to launch another enhanced model of the Roadster. Within the underlying valuation we concentrate on subsequent models which target a broader market.

Figure 42 – Roadster Sales 2010 - 2012 (in EUR)



Source: Company Data

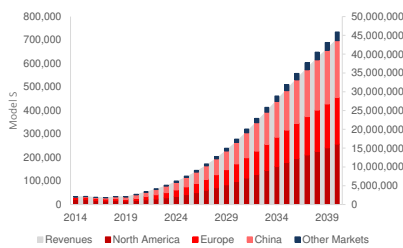
⁶⁴ Distribution of revenues is allocated according to statements of Tesla's management in the 2nd quarter earnings call of 2014.

⁶⁵ 244 million originate from the multiplication of the Roadsters average sales price of 93.795 Euro with its 2.600 units distributed

⁶⁶ See Appendix 6 for a detailed overview of directly competing vehicles to the Roadster

Model S

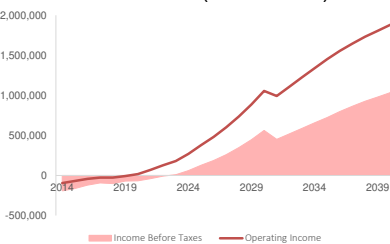
Figure 43 – Projected Model S Sales by Region in Comparison to Overall Model S Revenues (in '000 EUR)



Source: Own Estimations

The first Model S sedan was delivered in June 2012 and has been sold around 50,000 times as of today. The vehicle is sold in two different performance classes, more precisely a model with a 60kWh battery (range 335km) and a superior model with a 85kWh battery (range 500km). Naturally these models show a noticeable price difference. For our valuation model we assume an average retail price of 60,000€ per vehicle. Based on our assumptions Tesla will sell around 32k Model S in 2014 allocated over its core markets mainly. Until 2040 the company is expected to sell more than 7 million Model S in total with 35.58% in North America, 26.97% in Europe, 32.5% in China and 4.95% in other markets. This accounts for revenues of almost 420 billion Euro.⁶⁷

Figure 44 – Projected Model S Income before Taxes in Comparison to Operating Income 2014 – 2040 (in '000 EUR)

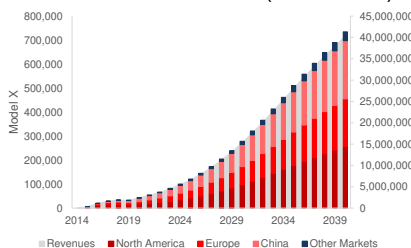


Source: Own Estimations

Interesting to note is the fact that after the deduction of cost of sales, research & development and selling general & administrative, depreciation as well as other income and costs the Model S fails to convince with a profit before tax until 2023. Despite the fact that Model S is able to show a positive operating income in 2022 already increasing depreciation is responsible for continuing losses. Depreciation is allocated according the each segments stake of total revenue. The increase in depreciation can be traced back to Tesla's expansion of its supercharger network, galleries and the construction of the various factories and research centres around the globe. Eventually Model S knows to impress with consistent profits from 2023 onwards showing an individual profit of over 1 billion in 2040 alone.

Model X

Figure 45 – Projected Model X Sales Geographical Breakdown in Comparison with Overall Model X Sales (in '000 EUR)



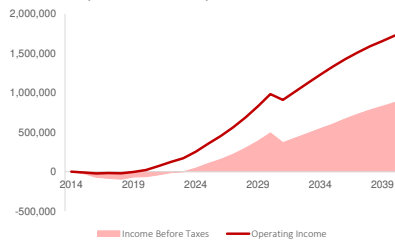
Source: Own Estimations

Unveiled in February 2012 the Model X, a 4 door SUV, is anticipated to start its delivery with the beginning of the third quarter of 2015. Introduced as a more family friendly and more inexpensive alternative to the Model S the vehicle is expected to target another segment than both of its predecessors. Comparable to the Model S the vehicle is available in two different electric ranges which are 60kWh and 85kWh. Here again our model assumes an average sales price for both classes amounting to 55,000€ per vehicle. We predict the company to sell around 6,100 units in 2015, a number that is expected to increase significantly to over 20k vehicles in 2016 already. Worldwide we assume Tesla to sell more than 6.9 million Model X until 2040 with stakes of 35.31% in North America, 26.94% in Europe, 32.78% in China and 4.97% in other markets. Overall this amounts to revenues of over 381 billion Euro generated until 2040 through this model.⁶⁸

⁶⁷ See Appendix 7 for an explicit overview of vehicles competing with Model S

⁶⁸ See Appendix 8 for a detailed overview of vehicles comparable to Model X

Figure 46 – Projected Model X Income before Taxes Compared to Operating Income (in '000 EUR)



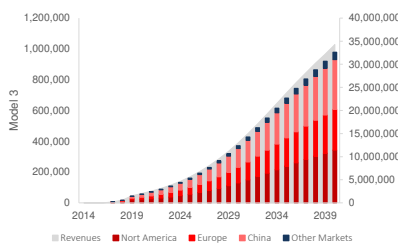
Source: Own Estimations

Investigating the Model X’s individual income statement we can recognise commonalities with its Model S counterpart. First of all it is striking that Model X as well is not able to generate a profit before tax until 2024 even though its operating income is positive as early as 2022 already. From 2024 on the profit before tax is steadily increasing resulting in a value of over 800 million in 2040. The slightly lower profit compared to Model S can be explained by the vehicles lower retail price since otherwise both models are expected to have the same stake of overall cars sold in 2040. This stake is expected to be 30% for both models.

Model 3

Tesla’s final entrance into the mass-market is supposed to be achieved with the distribution of the firms Model 3. The company states that this vehicle will have a shorter range (about 320km) than its previous models. Deliveries of Model 3 are anticipated to begin in 2017⁶⁹ at a price of 35,000€. According to management statements the vehicle will be similar to Model S but scaled down. To make the production of this lower cost vehicle possible and economically feasible the success of Tesla’s cost improvements is essential. The Gigafactory plays a significant role in this scenario. In its year of initiation we expect Model 3 to be sold around 6,500 times generating revenues of over 230 million Euro. Following a strong increase in sales the vehicle is projected to sell more than 9 million units on a global basis with stakes of 35.13% in North America, 26.94% in Europe, 32.94% in China and 4.99% in other markets. The number of vehicles sold amounts to revenues of over 320 billion Euro until 2040.

Figure 47 – Projected Model 3 Sales Geographical Breakdown Compared to Total Model 3 Revenues (in'000 EUR)



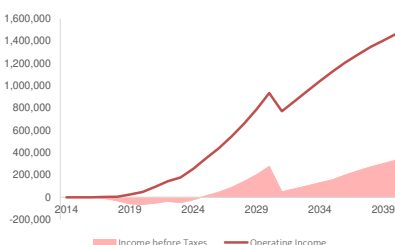
Source: Own Estimations

A look at Model 3’s individual income statement reveals a similar pattern to the firms other models. Here as well profit before tax is only generated in 2025. What is striking is the fact that from its introduction in 2017 the operating income of Model 3 is expected to be positive already. Towards the end of the projection period in 2040 the profit before tax is predicted to increase up to almost 333 million Euro. Compared to its presumed competitors the Model 3 is expected to have a market share among comparable cars of 2.79% in 2020.⁷⁰

Powertrain Components

Electric powertrain components, basically the engine of an EV, are not only produced to be used inside Tesla’s own vehicles but are also for sale to third party companies. The company has been able to arrange valuable partnerships seeing its powertrain revenue increase from 289.000 Euro in 2009 to over 33 million Euro

Figure 48 – Projected Model 3 Income before Taxes Compared to Operating Income (in '000 EUR)

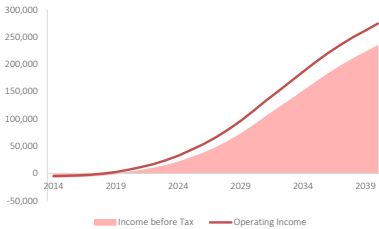


Source: Own Estimations

⁶⁹ Bloomberg: <http://www.bloomberg.com/news/2013-05-23/tesla-pays-back-u-s-early-as-musk-aims-for-affordability.html>

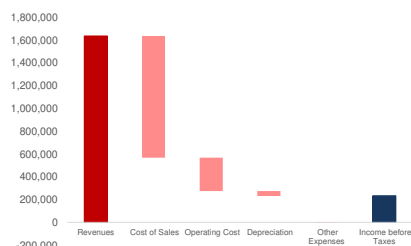
⁷⁰ See Appendix 9 for an overview of Model 3 comparables and their expected sales

Figure 49 – Powertrain Components Income before Taxes Compared to Operating Income 2014 – 2040 (in '000 EUR)



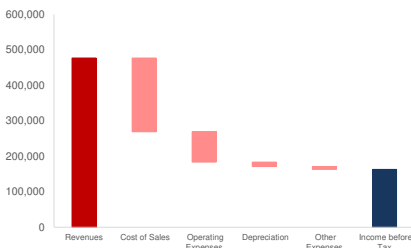
Source: Own Estimations

Figure 50 – Powertrain Components Income before Taxes Breakdown 2040 (in '000 EUR)



Source: Own Estimations

Figure 51 – Development Services Income before Taxes Breakdown



Source: Own Estimations

ro in 2013 implying an annual growth rate of 228.35%. In 2013 powertrain components displayed a ratio of 2.31% to revenues generated by vehicles. Since 2013 was the Tesla's first year where the company sold a significant amount of vehicles we estimate future powertrain revenues to remain at a ratio of 2.31% of overall revenues related to vehicle sales. Furthermore we expect the powertrain segment to grow accordingly to the global EV market. Hence, the chosen ratio reflects this growth appropriately.

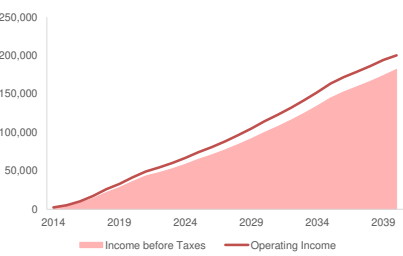
Our estimate predicts powertrain components to create revenues of over 1.6 billion Euro in 2040 indicating an annual growth rate of 15.48%. Short term annual growth is estimated to be 23.42% yearly until 2020 leading to powertrain revenues of around 146 million Euro. Based on an allocation of cost based on its individual stake of overall revenues and a gross margin equal to vehicle segments the powertrain business is able to demonstrate a profit before taxes in 2020 already. Until the 2040 this value is estimated to increase up to 234 million Euro. Geographical allocation of powertrain revenues is hard to estimate since it depends on to be established partnerships. Due to the dispersion of global car manufacturers main markets appear to be the United States, France, Germany and Japan. It can be assumed that Chinese EV manufacturers will be able to produce powertrain components more cost effective and are therefore not a potential partner for the company but rather a threat in terms of competition.

Development Services

Development services are offered by Tesla to other automobile manufacturers consisting of the development of electric vehicle powertrain components and systems including the design and development of battery packs, drive units and sample vehicles. On average revenues of development services have been 22 million Euro over the last four years. As of 2013 those services exhibited a ratio of 0.80% of total revenues attributed to vehicle sales. The 2013 ratio is chosen for the same reasons as we did for powertrain components. We estimate development services to grow hand in hand with the global EV market. Therefore, similar to the powertrain segment, the selected ratio is predicted to reflect an adequate measure.

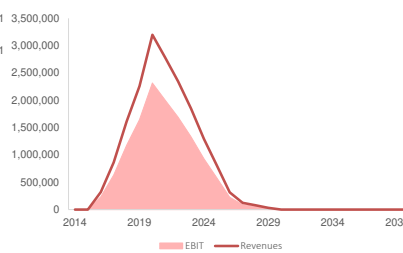
At the end of our prediction period development services are expected to generate revenues of almost 570 million Euro with an income before taxes of over 196 million Euro. According to our estimates development services impress with an income before taxes of around 1.6 million as early as 2014 and keep showing positive values for this position over the entire valuation period. Geographical revenue allocation is difficult to assess but due to existing partnerships with Daimler and Toyota we can assume that most of the revenue will be generated in

Figure 52 – Development Services Income before Taxes Compared to Operating Income 2014 - 2040 (in '000 EUR)



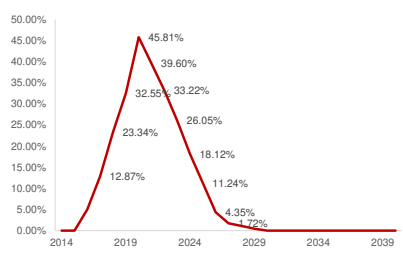
Source: Own Estimations

Figure 53 – Projected Gigafactory Income before Taxes in Comparison to Gigafactory Revenues (in '000 EUR)



Source: Own Estimations

Figure 54 – Market Penetration Tesla Li-Ion Sales as of Total Li-Ion Market



Source: Own Estimations

Europe, Japan and eventually the United States. In terms of development services Tesla seems to have a unique market leader position. Its advanced technology and innovation position the company in an ideal consulting position.

Gigafactory

As already indicated the Gigafactory is expected to not solely produce Li-ion for Tesla but also to distribute on the open market in case the company has no sufficient use for the capacity of batteries manufactured. As a result of this the Gigafactory appears to be a revenue generator in terms of lower than expected demands for Tesla's vehicles with the underlying assumption of a thriving Li-ion battery market.

Basic assumption regarding revenues created through the Gigafactory are that a Tesla vehicle requires a capacity of 72.5 kWh and 1kWh is worth almost 91 batteries⁷¹ The retail price for one battery is estimated to be 4€. Furthermore the company only rakes in 40% of the total revenues according to its stake of invested funds. The Gigafactory is estimated to produce batteries to the extent of 6 million kWh in 2016, 11 million in 2017, 18 million in 2018, 25 million in 2019 and finally reach its maximum capacity of 35 million in 2020. Combining our three different scenarios according to their probabilities we expect the Gigafactory to generate revenues of over 17 billion Euro until 2040 based on the sale of Li-ion batteries. Cost of revenues is expected to be equal to the company's vehicle production. Other costs such as research & development, depreciation and sales, general & administrative are not deducted since they are already allocated towards the more stable revenue positions like Tesla's vehicle portfolio, development services as well as powertrains. This is owed to the fact that the Gigafactory revenues vary widely over the various scenarios and their underlying car sales assumptions.⁷²

Open market clients could be manufacturers of mobile phones, laptops and tablets, digital cameras, power tools, aircrafts, electronic vehicles, hybrid vehicles and satellites. In 2011 the Li-Ion market was divided between nine companies with Panasonic (Tesla's supplier and future Gigafactory partner) and Samsung grasping almost half of the market. The other half has been split up between LG,

⁷¹ Based on Tesla statements that the company expects to produce 11 million kWh accounting for 996 million batteries in 2017 – (996 million/11 million = 90.55 batteries per kWh)

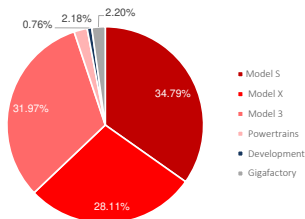
⁷² Under the worst case scenario Tesla is generating a significant amount of its revenue through the sale of batteries since it is not able to scale up their production due to lack of EV demand. Whereas under the base and best case scenario the company hardly only sells batteries between 2018 and 2022. To measure the impact of the Gigafactory we think it is important to combine the revenues of the different scenarios according to their probabilities even when total car sales would technically not allow for overcapacities of batteries. This approach underlines the importance of the Gigafactory in terms of weak demand for the firm's vehicles.

Sony, Lishen, ATL, BAK, Hitachi and BYD. Merely 4% of the market is allocated to various smaller manufacturers.

Financial Outlook

Revenue Outlook

Figure 55 – Projected Total Revenue Breakdown until 2040

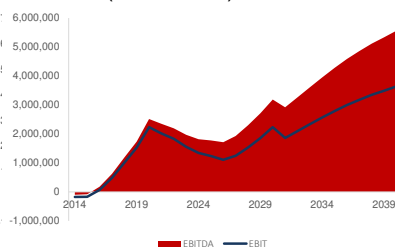


Source: Own Estimations

We model Tesla generating 1.5 billion Euro of revenue in 2013 increasing to 2.1 billion Euro in 2014 on ramp-up of Model S. Based on the underlying segmental assumptions we predict total revenue to climb towards 9.9 billion Euro in 2020 and 73 billion in 2040 which we believe is representative of the full potential of currently an announced future programs. We believe that Model X and Model 3 have the potential to propel annual production to over 144K units in 2020. According to management statements the company expects to produce over 500K vehicles by 2020.⁷³ Our model however does not believe that the EV market will be big enough by then to absorb 500k vehicles indicated by Tesla. Until 2040 we predict that Tesla’s vehicle portfolio will account for 94.87% of total revenues whereas powertrain components account for 2.18%, development services for 0.76% and the Gigafactory for 2.2%.

EBITDA Outlook

Figure 56 – Total Projected EBITDA in Comparison with Total Projected EBIT until 2040 (in '000 EUR)



Source: Own Estimations

Only in 2013 the company was able to disclose a positive EBITDA figure. Due to Tesla’s 2014 3rd quarter earnings call we expect R&D as well as SG&A expenses to increase significantly compared to the previous year. Therefore we project EBITDA to be -107 million Euro in 2014 and believe it will slightly increase 2015 to a value of -100 million Euro. EBITDA will normalise to 160 million Euro in 2016 and exhibit a positive value. We expect EBITDA to grow quickly thereafter to 2.4 billion Euro in 2020 which can be traced back to the introduction of Tesla’s subsequent models but mostly to the projected battery sales through the Gigafactory. Due to high depreciation predicated by Tesla’s expansion program the company will only generate a small profit after tax in 2016 even though EBITDA figures will already be noticeably positive by then.

⁷³ Tesla Motors: http://www.teslamotors.com/sites/default/files/blog_attachments/gigafactory.pdf

Valuation

We project the company to change its debt-to-equity ratio up to an industry average of around 75%⁷⁴ until 2035. Therefore we apply the APV method until 2035 and continue to model with WACC until perpetuity.

APV Approach

To compute the necessary cost of equity we apply the CAPM⁷⁵ model. The risk free rate is assumed to be 2.31% and is derived from a 10yr U.S. government bond (2.48%) considering respective local inflation.⁷⁶ Furthermore we model a 6% market risk premium⁷⁷ and an unlevered industry beta of 1.14.⁷⁸ In order to compute this value a peer group has been built with comparable companies – in terms of D/E ratio, sector, beta – taken out of the S&P Global Luxury Index. Companies taken into consideration are Porsche, Audi, Ascent Solar, Hugo Boss, Burberry, Coach Inc. and Polaris. To compute the essential levered beta the peer group excess returns of the peer group have been correlated with the excess returns of the MSCI World Index over a period of 3 year monthly returns.⁷⁹ These assumptions result in a cost of equity of 9.17% which is applied to discount the unlevered free cash flows and eventual tax shields until 2035.

Table 6 – APV Assumptions

APV Approach					
Industry unlevered Beta	1.14				
Risk Free Rate	2.31%				
Market Risk Premium	6.00%				
Cost of Equity	9.17%				
Peer Group	unlevered Beta	levered Beta	SEE	Upper Bound	Lower Bound
Tesla	1.0249	1.1088	0.1654	1.4395	0.7780
Porsche	1.4142	1.4142	0.0668	1.5477	1.2807
Audi	0.3873	0.3934	0.0277	0.4489	0.3380
Ascent Solar	1.9104	2.0246	0.2292	2.4831	1.5661
Hugo Boss	1.0834	1.1045	0.0631	1.2306	0.9784
Burberry	1.1063	1.1063	0.0812	1.2687	0.9439
Coach Inc.	0.9986	0.9986	0.0889	1.1763	0.8209
Polaris	1.2164	1.2232	0.0678	1.3588	1.0875

Source: Own Estimations, Bloomberg

WACC Approach

Our model anticipates Tesla to be among a peer group of more established car manufacturers, namely Daimler, BMW, Volkswagen, GM, Toyota, Nissan and Honda. To estimate the cost of equity we use former mentioned risk free rate and market risk premium but compute a new unlevered industry beta based on the changed peer group but same methodology as for the APV method. The unlevered betas are computed through the same approach as mentioned above correlating the peer group with the MSCI World Index. After re-levering the beta with its target D/E ratio of 80% which leads to a levered beta of 1.072 the CAPM results in a cost of equity of 8.75%. The cost of debt is computed to be 4.79%⁸⁰ implying Tesla's S&P B- rating⁸¹, the appropriate probability of default⁸² and

Table 7 – WACC Assumptions

WACC Approach					
Industry unlevered Beta	0.80				
Target D/E	75%				
Levered Beta	1.072				
Risk Free Rate	2.31%				
Market Risk Premium	6.00%				
Cost of Equity	8.75%				
Cost of Debt	4.79%				
Target E/V	57.14%				
Target D/V	42.86%				
WACC	6.33%				
Peer Group	unlevered Beta	levered Beta	SEE	Upper Bound	Lower Bound
Tesla	1.0249	1.1088	0.1654	1.4395	0.7780
Daimler	0.7240	1.5721	0.0708	1.7137	1.4304
BMW	0.6897	1.5236	0.0636	1.6507	1.3964
Volkswagen	0.6274	1.4060	0.0656	1.5371	1.2749
GM	1.5946	1.5946	0.0702	1.7351	1.4541
Toyota	0.5892	0.9304	0.0611	1.0527	0.8081
Nissan	0.4275	0.9197	0.0644	1.0485	0.7908
Honda	0.7547	1.3708	0.0631	1.4969	1.2447

Source: Own Estimations, Bloomberg

⁷⁴ The D/E ratio is derived from a peer group of established automobile manufacturers which we expect Tesla to be among in 2035

⁷⁵ CAPM: Risk Free + Beta_{unlevered} X (Market Risk Premium)

⁷⁶ The value is derived through: (1+ risk free foreign) x (1+exp. Inflation local)/(1+exp. Inflation foreign) -1

⁷⁷ The average market risk premium in mature markets widely applied by professionals lies between 5.5% and 6%. Source: Fernandez, Pablo – Market Risk Premium used in 82 countries in 2012 a survey with 7,192 answers. IESE Business School

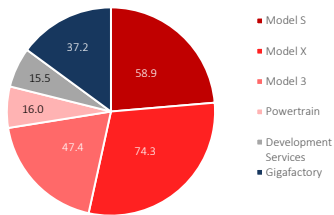
⁷⁸ Unlevered beta is computed through: Equity Value/(Debt + Equity) x unlevered beta

⁷⁹ Excess returns implies deduction of a risk free investment from the actual returns

⁸⁰ Tesla's S&P B- rating - (Probability of default for B- rating x (1 – Recovery rate), 7.25% - (7.18% x (1 – 65.77%))

⁸¹ NYU Stern (January 1014): Ratings, Interest Coverage Ratios and Default Spread

Figure 57 – Projected Stakes Business Segment of Total Share Price (in EUR)



Source: Own Estimations

recovery rate⁸³. Applying the WACC formula⁸⁴ with consideration of the targeted capital structure and a tax rate of 35% we project a discount rate of 6.33%. This percentage is used to discount the firms' free cash flow from 2035 onwards including the perpetuity. Ultimately we include expected global growth of nominal 4.45%⁸⁵ as growth rate into the perpetuity.

Valuation Outcome

Our model assigns a buy recommendation to Tesla shares at a price of 249.22€ which displays an 38.38% upside to its current share price. The outcome is based on a combination of a base, best and worst case scenario with probabilities of 70%, 20% and 10% respectively. The total predicted share price is the sum of Tesla's multiple business segments with Model S contributing 58.9€, Model X with 74.3€, Model 3 with 47.4€, powertrain components with 16.0€, development services with 15.5€ and finally the Gigafactory with 37.2€.^{86 87}

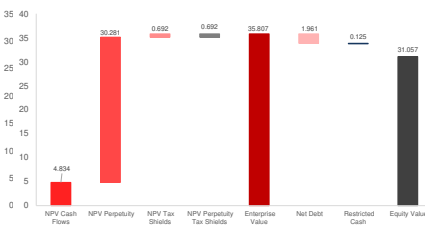
Evaluating Tesla on a multiple basis precludes ratios based on EBIT, EBITDA or net income due to the fact that those figures are still negative. Therefore we concentrate on EV/Sales and Price/Book (P/B). Both ratios exhibit unusually high values leading to the conclusion that the company is extremely overvalued for its current sales and book value. Currently the company trades at 11.25x its sales and our model expects this figure to increase to 12.46x in 2015 which is still well above the 1.94x average of comparable companies we used.⁸⁸

The P/B ratio exhibits even more remarkable results. Currently the company is trading at 75.15x its equity book value. Since we expect Tesla to accumulate a further deficit due to its expected loss in 2014 we compute a P/B ratio of over 304.3x for 2015. Needless to say that this is heavily above the comparable average of 2.42x. Conclusively we can underline that the company's market value stems from the markets expectations about the future of the EV market with Tesla playing a significant role.

Alternative Scenarios

Several alternative scenarios need to be evaluated conducive to understand the underlying fundamentals of our valuation. Evaluating the company on our base

Figure 58 – Projected Equity Value Breakdown (in billion EUR)



Source: Own Estimations

Table 8 – Modelled Base Case Scenario (in EUR)

Share price	217.2
Upside/downside	20.59%
Business Units	217.2
Model S	50.8
Model X	67.2
Model 3	43.5
Powertrain	3.5
Development Services	14.2
Gigafactory	38.1
Difference to our projection	-12.85%

Source: Own Estimations

⁸² Damodaran, Aswath: Valuing Firms in Distress, <http://people.stern.nyu.edu/adamodar/pdfiles/Seminars/AIMR3.pdf>
⁸³ Moody's Global Corporate Finance, Corporate Default and Recovery Rates 1920 – 2007: <https://www.moodys.com/sites/products/DefaultResearch/2007000000474979.pdf>
⁸⁴ WACC: $E/V \times R_E + D/V \times R_D (1 - \text{Tax Shield})$
⁸⁵ OECD Economic Policy Papers (2012), Looking to 2060: Long-Term Global Growth Prospects
⁸⁶ See Appendix 10 for an overview of the valuation outcome
⁸⁷ Please note that all costs are allocated according to each business segments stake of revenue in each respective year. Since the company does not disclose a segmental overview of its business sections we took the mentioned simplified allocation of costs in order to indicate where the company's value is coming from.
⁸⁸ See Appendix 11 for a detailed overview of comparable companies and their respective ratios

Table 9 – Modelled Best Case Scenario

Share price	427.3
Upside/downside	137.26%
Business Units	427.3
Model S	113.5
Model X	121.9
Model 3	74.5
Powertrain	66.8
Development Services	24.0
Gigafactory	26.8
Difference to our projection	71.46%

Source: Own Estimations

case assumption only, we obtain a share price of 217.18€ only which indicates an upside of 20.59% leading to a hold recommendation. Although the base case scenario almost replicates the result of our combined scenario the slower growth of the EV has its impact on the projected share price. This scenario implies a Tesla market share of 13% with 139K vehicles sold in 2020. On the other side if we model Tesla with our best case approach the estimated share price surges to 427.31€ indicating an upside of 137.26%. The possibility of this scenario however is correlated with sufficient government incentives and the ascent of EV's into the mass market. We estimate a Tesla market share of 16% in 2020 and 18% in 2040 inferring 188k vehicles sold in 2020 already. Furthermore the proportions of Tesla's business segments in relation to the company's overall share price change evidently. Due to ample EV demand the Gigafactory is not generating as much revenues, what conclusively results in a 26.8€ value whereby the remaining business segments intensify their contribution – Model S with 113.5€, Model X with 121.9€, Model 3 with 74.5€, powertrain components with 66.8€ and development services with 24€. The total share price exhibits an upside of xx% compared to our combined valuation approach.

Table 10 – Projected Worst Case Scenario

Share price	117.6
Upside/downside	-34.72%
Business Units	117.6
Model S	7.0
Model X	28.6
Model 3	20.2
Powertrain	1.5
Development Services	7.5
Gigafactory	52.8
Difference to our projection	-52.83%

Source: Own Estimations

Finally the worst case scenario leads to a projected share price of 117.57€ representing a downside of -34.72% to Tesla's current market share price. This scenario models a reality where governments fail to bring the right incentive into effect in combination with low oil prices. Therefore EV's remain in a niche market position. Tesla's more exclusive vehicles experience a major incursion in overall share value contribution – Model S with only 7€ and Model X with 28.6€. Development services and powertrain components slump in relation with low EV demand as well. Here the eventual importance of the Gigafactory demonstrates a share value contribution of 52.8€ which makes up 44.87% to the estimated overall share price. Underlying assumption of the worst case scenario is a Tesla market share of 10% in 2020 with no changes to 2040. Accordingly Tesla sells around 95k vehicles in 2020. Compared to our combined valuation the worst case scenario depicts a downside of -52.83%.⁸⁹

Table 11 – Projected Liquidation Scenario in 2020

Liquidation Approach	
Year	2020
Discount Assets to be Sold	40%
Tesla Bond Rating	B-
Probability of Distress	35.11%
Assets to be Sold (in '000 EUR)	4,088,373
Liabilities to be Served (in '000 EUR)	6,531,331
Paid out to Shareholders	0
Share Price	161.71
Downside	-10.21%

Source: Own Estimations

Outside our delineated scenarios we model a potential liquidation of the company in 2020. This approach projects its outcome based on similar market conditions to the indicated worst case scenario. This scenario is independent from our regular scenarios since we expect the company to continue its business even in the worst case scenario. We model this approach by taking probability of distress and an eventual liquidation value into account when computing our final equity value.⁹⁰ Therefore we model a liquidation value based on 2020's worst case sce-

⁸⁹ See Appendix 12 for an overview of our respective scenarios⁹⁰The distressed value is computed via: Equity Value x (1 – Prob. Of Default) + (Prob. Of Default x Liquidation Value)

Figure 59 – Sensitivity Analysis Lithium/Aluminium Prices (in EUR)

		Lithium Prices				
		2.29%	2.89%	3.49%	4.09%	4.69%
Aluminium Prices	0.57%	325.86	302.84	279.81	256.75	233.68
	1.07%	306.68	283.65	260.59	237.52	214.43
	1.37%	295.17	272.12	249.06	225.98	202.88
	1.67%	283.65	260.59	237.52	214.43	191.32
	2.17%	264.44	241.37	218.28	195.18	172.05

Source: Own Estimations

nario balance sheet and assume a 40% discount for its assets to be sold. Based on these assumptions Tesla will have liabilities of 6.5 billion Euro against assets of 4.08 billion Euro leading the conclusion that shareholders will not be served. We apply a risk of default based on Tesla’s S&P B- rating for a six year interval which amounts to 35.11%.⁹¹ As a result of those inputs the company the share price is modelled to be 161.71€ exhibiting a clear downside of -10.21% to its current share price, leading us to a sell recommendation.

Sensitivity Analysis

Supplementary to our alternative scenarios we model various repercussions of fundamental assumptions to highlight the sensitivity of our valuation. Commodity prices are essential for Tesla’s ability to increase its gross margin and achieve profitability. Conducting a sensitivity analysis involving various changes in lithium and aluminium prices it becomes obvious that the projected share price is highly sensitive to the future price of those major production materials. Different prices on a range of +1.2%/-1.2% lead to a projected share price range of 325.86€ to 172.05€ signalling substantial sensitivity. A similar outcome reveals the combination of sensitivities for lithium and graphite prices. Here the projected price range lies between 341.45€ and 156.32€ on a price change range of +1.2%/-1.2%. The gross margin in general appears to be the most important factor determining Tesla’s profitability. A decline of up to 8% in gross margin over a time span of 2020 – 2032 leads to a range of 417.05€ to -40.49€ indicating the absolute significance of a successful gross margin implementation.

Figure 60 – Sensitivity Analysis Gross Margin/Year (in EUR)

		Gross Margin				
		28.00%	26.00%	24.00%	22.00%	20.00%
Year	2020	417.05	305.24	193.37	78.87	-44.05
	2023	416.22	304.72	193.16	78.97	-43.61
	2025	415.35	304.18	192.95	79.08	-43.19
	2029	412.73	302.57	192.31	79.70	-41.87
	2032	410.12	300.97	191.68	80.00	-40.49

Source: Own Estimations

⁹¹ Damodaran, Aswath: Valuing Firms in Distress, <http://people.stern.nyu.edu/adamodar/pdfiles/Seminars/AIMR3.pdf>

Appendix

Appendix 1 –List of Currently Available EV’s

Model	Manufacturer	Price	Range	Own Charging Network	Speed (in km/h)	Acceleration
BEV Electron	BMW	32,000	120	Planned	110	7
BMW i3	BMW	34,950	160	Planned	150	8
BMW Brilliance Zinoro 1E	BMW	-	150	Planned	130	5.5
BYD e6	BYD Auto	26,250	300	Under Construction. Network density 90 Cities in China	140	8
Chery QQ3 EV	Chery Automobile	6,000	100	No	153	18.5
Chevrolet Spark EV	GM	12,401	132	Around 4,300 Charging Points at Dealerships within the US	144	11
Citroën C-Zero	Citroen	27,200	150	Planned	130	15.9
Fiat 500e	Fiat	24,225	140	No	142	8.5
Ford Focus Electric	Ford	22,283	122	Workplace Charging Available	135	10.2
Honda Fit EV	Honda	27,469	132	National Charging Network within Japan installed by Toyota, Honda, Mitsubishi, and Nissan	148	9.5
JAC J3 EV	JAC Motors	20,733	130	No	170	13
Kia Soul EV	Kia	25,275	150	Under Construction in Europe and the US. Around 500 stations available	140	11.2
Lightning GT	Lightning Car Company	225,000	240	No	200	5
Mitsubishi i-MEV	Mitsubishi	17,246	170	National Charging Network within Japan installed by Toyota, Honda, Mitsubishi, and Nissan	130	10
Morgan Plus E	Morgan Motor Company	45,000	190	No	185	6
Nissan Leaf 2011/2012 model	Nissan	24,585	175	National Charging Network within Japan installed by Toyota, Honda, Mitsubishi, and Nissan	150	10.1
Nissan Leaf 2013 model	Nissan	24,585	200	National Charging Network within Japan installed by Toyota, Honda, Mitsubishi, and Nissan	150	10.1
Renault Fluence ZE	Renault	27,496	135	No	135	13.9
Renault Zoé	Renault	20,700	210	No	135	13.5
Smart electric drive first generation	Daimler	21,563	110	Yes. More than 500 Chargers in Germany	120	14.3
Smart electric drive second generation	Daimler	21,563	135	Yes. More than 500 Chargers in Germany	100	14.3
Smart electric drive third generation	Daimler	21,563	145	Yes. More than 500 Chargers in Germany	120	11.5
Tesla Model S P85 kW-h	Tesla	60,000	483	Yes. Globally	214	4.2
Tesla Model S 85 kW-h	Tesla	60,000	483	Yes. Globally	201	5.6
Tesla Model S 60 kW-h	Tesla	60,000	370	Yes. Globally	193	5.9
Venturi Fétish	Venturi	300,000	340	No	200	4
Volkswagen e-Golf	Volkswagen	27,469	190	No. Only in Cooperation with ChargePoint	145	8.9
Volkswagen e-Up!	Volkswagen	17,628	160	No. Only in Cooperation with ChargePoint	130	14.4
SLS AMG Electric Drive	Daimler	416,500	250	No	317	3.9
Active E	BMW	10,651	151	No	145	9
B-Class Electric Drive	Daimler	31,088	200	No	150	6.8
RAV A4 EV	Toyota	37,500	160	National Charging Network within Japan installed by Toyota, Honda, Mitsubishi, and Nissan	160	8
e-NV200	Nissan	16,238	170	National Charging Network within Japan installed by Toyota, Honda, Mitsubishi, and Nissan	120	10.5
C30	Volvo	19,125	150	No	130	7.7
ThinkCity	Think	27,371	160	No	110	14
Coda	Coda Automotive	22,500	142	No	137	19
Average		27,807	192		152	10

Appendix 2 – Global EV Incentives

Country	Europe, China, Other Markets		United States		
	Tax Scheme	One-time subsidy	State	Incentive	Amount
Australia	Higher luxury car threshold - A\$75k instead of A\$60k (applies for Tesla S)	Exempt from stamp duty in Australian Capital Territory	Arizona	Lower licensing fees. Depending on the extent of which the vehicle is powered by electricity	
Austria	EVs are exempt from the fuel consumption tax and monthly vehicle tax. Around 500€	-	California	Purchase rebate of up to €2,250	2,250
Belgium	Lowest rate of registration. Road tax only €74 instead of €1,900. Around 2,400€	-	Colorado	Income tax credit of up to €4,500	4,500
Bulgaria	Around €2,400	-	District of Columbia	Excise tax exemption and reduced registration fees	
Canada	-	Ontario offers up to €7,000 and Quebec offers up to €6,750 as a grant	Florida	Exempt from most insurance charges	
China	10% sales tax exemption. Up to €7,500	-	Georgia	Income tax credit of up to €3,750	3,750
Croatia	-	-	Hawaii	Purchase rebate of up to €3,750	3,750
Cyprus	-	€2,200 premium granted	Illinois	State rebate of up to €3,000	3,000
Czech Republic	Exempt of road tax. Around €200	-	Louisiana	Income tax credit of up to €2,250	2,250
Denmark	Exemption from environment tax and car tax. Around €2,000	-	Massachusetts	Purchase rebate of up to €1,875	1,875
Estonia	-	Grants towards the purchase of EVs of up to €18,000	Montana	Income tax credit of up to €375	375
Finland	-	-	New Jersey	Sales tax exemption of up to €3,000	3,000
France	-	€6,300 Eco bonus at time of purchase	New York	10% discount on E-ZPass	
Germany	Exempt from annual circulation tax. Around €500	-	Oklahoma	Income tax credit of 50%	
Greece	Exempt from registration tax. Around €1,000	-	Oregon	Income tax credit of up to €1,125	1,125
Hungary	-	-	Pennsylvania	Purchase rebate of up to €2,000	2,000
Iceland	All EVs are exempt from VAT up to €6,300	-	South Carolina	Income tax credit of up to €1,125	1,125
Ireland	Exempt from registration tax. Around €5,000	-	Tennessee	Tax rebate of up to €1,875	1,875
Italy	Exempt from annual circulation tax for five years. Thereafter 75% tax reduction. Around €5,000	-	Texas	Purchase rebate of up to €1,875	1,875
India	-	Subsidies of up to €2,000 for EVs	Utah	Income tax credit of up to €1,875	1,875
Japan	-	Grant of €8,500	Washington	Sales tax exemption of up to €3,000	3,000
Latvia	Exempt from registration tax. Around €500	-	West Virginia	Income tax credit of up to €5,600	5,600
Lithuania	-	-			
Luxembourg	-	Grants towards the purchase of EVs of €1,500			
Monaco	-	Grant of €9,000 for EVs			
Netherlands	Exclusion of vehicle tax until 2015, exempt of BPM tax. Around €5,300	-			
Norway	Exemption from initial car tax and VAT. Around €7,000	-			
Poland	-	Grant of €250 for the purchase of an EV			
Portugal	Exempt from vehicle tax upon purchase and annual circulation tax. Around €800	-			
Romania	-	Grant of up to 25% of the purchase price. Maximum €5,000			
Slovakia	-	-			
Slovenia	-	-			
Spain	-	Grant of up to €6,000			
Sweden	Exemption of annual circulation tax	Super Green Car subsidy. Around €5,000			
Switzerland	Tax incentives depending on each Kanton. Around €2,400	-			
United Kingdom	No road tax	Grant for every Model S. €6,300			
United States	Federal tax credit. Around €5,500	-			

Appendix 3 – European EV Incentives⁹²

	EV Incentive Expenditures as of Total Environmental Budget								Environmental Budget as of Total Expenditure European Countries								
	2014	2015	2016	2017	2018	2019	2020	2021	2013	2014	2015	2016	2017	2018	2019	2020	2021
Belgium	0.086%	0.170%	0.288%	0.389%	0.664%	1.134%	1.936%	3.306%	1.15%	1.16%	1.17%	1.19%	1.20%	1.22%	1.23%	1.24%	1.26%
Bulgaria	0.016%	0.032%	0.055%	0.075%	0.128%	0.220%	0.378%	0.651%	1.91%	1.92%	1.93%	1.94%	1.95%	1.96%	1.97%	1.98%	1.99%
Czech Republic	0.030%	0.059%	0.101%	0.137%	0.236%	0.406%	0.698%	1.200%	1.36%	1.37%	1.38%	1.39%	1.39%	1.40%	1.41%	1.41%	1.42%
Denmark	0.151%	0.297%	0.502%	0.679%	1.160%	1.981%	3.382%	5.775%	0.92%	0.93%	0.94%	0.95%	0.96%	0.97%	0.99%	1.00%	1.01%
Germany	0.057%	0.113%	0.191%	0.258%	0.441%	0.752%	1.285%	2.193%	0.70%	0.71%	0.72%	0.73%	0.74%	0.75%	0.76%	0.76%	0.77%
Estonia	3.463%	6.927%	11.876%	16.283%	28.191%	48.808%	84.501%	146.298%	0.73%	0.73%	0.74%	0.74%	0.75%	0.75%	0.76%	0.76%	0.76%
Ireland	0.539%	1.070%	1.822%	2.480%	4.263%	7.328%	12.595%	21.650%	0.98%	0.98%	0.99%	0.99%	1.00%	1.00%	1.01%	1.01%	1.02%
Greece	0.001%	0.002%	0.003%	0.004%	0.007%	0.012%	0.021%	0.037%	13.28%	13.35%	13.42%	13.48%	13.55%	13.62%	13.69%	13.76%	13.83%
Spain	0.457%	0.901%	1.524%	2.061%	3.519%	6.008%	10.259%	17.517%	0.62%	0.62%	0.63%	0.64%	0.65%	0.65%	0.66%	0.67%	0.68%
France	1.037%	2.046%	3.459%	4.678%	7.987%	13.639%	23.289%	39.766%	1.02%	1.03%	1.04%	1.06%	1.07%	1.08%	1.09%	1.11%	1.12%
Italy	0.136%	0.269%	0.454%	0.615%	1.049%	1.792%	3.059%	5.224%	1.81%	1.83%	1.85%	1.87%	1.89%	1.91%	1.94%	1.96%	1.98%
Cyprus	0.085%	0.170%	0.289%	0.393%	0.675%	1.161%	1.995%	3.429%	0.73%	0.73%	0.73%	0.74%	0.74%	0.75%	0.75%	0.75%	0.76%
Latvia	0.011%	0.022%	0.037%	0.050%	0.087%	0.149%	0.256%	0.439%	1.73%	1.74%	1.75%	1.76%	1.77%	1.78%	1.78%	1.79%	1.80%
Lithuania	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	2.52%	2.53%	2.54%	2.56%	2.57%	2.58%	2.59%	2.61%	2.62%
Luxembourg	0.180%	0.357%	0.607%	0.826%	1.420%	2.441%	4.196%	7.213%	1.97%	1.98%	1.99%	2.00%	2.01%	2.02%	2.03%	2.04%	2.05%
Hungary	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.84%	0.84%	0.85%	0.85%	0.86%	0.86%	0.86%	0.87%	0.87%
Netherlands	0.198%	0.391%	0.660%	0.893%	1.525%	2.603%	4.445%	7.591%	2.96%	2.99%	3.03%	3.06%	3.10%	3.13%	3.17%	3.21%	3.24%
Austria	0.033%	0.066%	0.111%	0.150%	0.257%	0.438%	0.748%	1.278%	0.92%	0.93%	0.94%	0.95%	0.97%	0.98%	0.99%	1.00%	1.01%
Poland	0.017%	0.034%	0.058%	0.079%	0.136%	0.234%	0.402%	0.691%	1.14%	1.14%	1.15%	1.15%	1.16%	1.17%	1.17%	1.18%	1.18%
Portugal	0.024%	0.048%	0.081%	0.109%	0.187%	0.319%	0.545%	0.930%	0.86%	0.87%	0.88%	0.89%	0.90%	0.91%	0.92%	0.93%	0.94%
Romania	0.087%	0.173%	0.295%	0.401%	0.690%	1.186%	2.038%	3.503%	1.60%	1.60%	1.61%	1.62%	1.63%	1.64%	1.64%	1.65%	1.66%
Slovenia	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	1.65%	1.66%	1.67%	1.68%	1.69%	1.70%	1.70%	1.71%	1.72%
Slovakia	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.82%	0.83%	0.83%	0.84%	0.84%	0.84%	0.85%	0.85%	0.86%
Finland	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	1.01%	1.03%	1.04%	1.05%	1.06%	1.08%	1.09%	1.10%	1.11%
Sweden	0.479%	0.945%	1.597%	2.160%	3.689%	6.299%	10.755%	18.365%	0.63%	0.64%	0.64%	0.65%	0.66%	0.67%	0.67%	0.68%	0.69%
United Kingdom	0.238%	0.469%	0.793%	1.072%	1.830%	3.126%	5.337%	9.113%	2.00%	2.02%	2.05%	2.07%	2.10%	2.12%	2.14%	2.17%	2.20%
Iceland	0.090%	0.177%	0.299%	0.404%	0.690%	1.178%	2.012%	3.435%	1.90%	1.92%	1.95%	1.97%	1.99%	2.02%	2.04%	2.06%	2.09%
Norway	0.354%	0.698%	1.181%	1.596%	2.726%	4.655%	7.948%	13.571%	1.62%	1.64%	1.66%	1.68%	1.70%	1.72%	1.74%	1.76%	1.78%
Switzerland	0.087%	0.172%	0.291%	0.394%	0.673%	1.148%	1.961%	3.349%	1.92%	1.94%	1.96%	1.99%	2.01%	2.03%	2.06%	2.08%	2.11%
Average	0.271%	0.538%	0.916%	1.248%	2.146%	3.690%	6.346%	10.915%	1.37%	1.38%	1.39%	1.39%	1.40%	1.41%	1.41%	1.42%	1.43%

Appendix 5 – Detailed CAPEX Overview 2014-2040

CAPEX (in million EUR)	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Gigafactory	215	215	211	206	202	198	194	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Manufacturing Plant China	0	0	150	147	144	141	138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Manufacturing Plant (Slovakia)	0	0	0	0	0	0	0	0	150	147	144	141	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Research Center (Midlands)	0	0	100	98	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Extension Assembly Plant (Netherlands)	0	0	100	98	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Superchargers	22	16	19	24	30	39	50	61	64	66	69	71	74	77	80	83	86	89	93	96	100	104	108	113	117	122	127
Galleries	15	20	9	12	15	19	24	29	35	42	50	59	70	82	95	109	124	140	156	172	189	204	219	232	244	254	265
Other Capex	436	226	240	239	412	337	641	692	732	869	1,004	1,155	1,306	1,461	1,605	1,733	1,886	1,991	2,032	2,050	2,018	1,946	1,811	1,603	1,509	1,286	1,341
Total	688	477	829	824	803	734	1,046	782	981	1,124	1,267	1,427	1,450	1,620	1,779	1,924	2,095	2,220	2,281	2,319	2,306	2,254	2,138	1,947	1,870	1,662	1,733

Appendix 6 – Tesla Roadster Directly Competing Vehicles

Model	Manufacturer	Price (in Euro)	Speed	Acceleration
Acura NSX	Honda	75,000	307	4.5
Audi R8	Audi	117,000	314	3.6
Chevrolet Corvette	GM	50,000	290	3.8
Dodge Viper	Chrysler	100,000	325	3.6
Jaguar F-Type	Jaguar	65,000	260	5.3
Jaguar XK	Jaguar	80,000	253	4.4
Lotus Elise	Lotus	80,000	234	4.6
Lotus Evora	Lotus	80,000	275	4.3
Maserati GranCabrio	Maserati	130,000	285	5.2
Mercedes Benz SL	Daimler	85,000	254	4.1
Porsche 911	Porsche	85,000	291	4.2
Porsche Cayman	Porsche	55,000	277	4.1
Audi TT	Audi	40,000	205	5.7
Z4	BMW	40,000	220	5.6
Mazda MX-5	Mazda	35,000	203	6.9
Average		74,467	266	4.7

⁹² Eurostat, Environmental Expenditure & Total General Government Expenditure of Euro 28 countries

Appendix 7 – Expected Units of Model S Competitors Until 2020

Model	Manufac:	2013	2014	2015	2016	2017	2018	2019	2020
Alfa Romeo 169	Alfa Romeo			4,000	12,100	10,400	9,300	8,750	8,600
Audi A6	Audi	240,000	240,000	250,000	240,000	235,000	240,000	290,000	280,000
BMW 5-Series	BMW	308,000	298,000	280,000	260,000	290,000	350,000	333,000	334,000
Cadillac XTS	GM	62,000	65,000	54,000	54,000	54,000	51,000	53,000	57,000
Fisker Atlantic	Fisker Automotive		4,300	12,400	12,800	11,500	10,400	10,400	11,000
Fisker Karma	Fisker Automotive		5,400	6,100	7,100	7,700	8,200	10,400	9,900
BMW 6-Series	BMW	11,000	11,900	11,600	11,300	11,100	9,900	8,500	21,600
Infiniti E-Sedan	Nissan	1,800	2,600	2,400	1,800	1,600	1,400	2,200	2,800
Infiniti M	Nissan	19,600	24,200	22,500	20,100	24,600	28,800	28,400	28,500
Jaguar XF	Jaguar	41,000	44,000	30,600	40,700	42,000	42,000	38,000	37,000
Lexus GS	Lexus	53,500	52,000	48,000	46,000	49,100	54,000	52,000	50,000
Mercedes Benz CLS	Daimler	45,300	41,700	35,600	32,300	29,500	39,500	49,500	48,800
Mercedes Benz E-Class	Daimler	215,100	223,300	226,200	240,000	301,100	291,000	276,000	268,200
Porsche Panamera	Porsche	22,500	21,300	26,900	32,100	31,800	32,200	33,300	32,900
Tesla S	Tesla	22,477	32,769	34,762	30,976	29,666	34,060	33,372	43,463

Appendix 8 – Expected Units of Model X Competitors Until 2020

Model	Manufacturer	2013	2014	2015	2016	2017	2018	2019	2020
Acura MDX	Honda	69,800	72,100	74,300	72,750	71,700	71,400	70,000	75,500
Alfa Romeo D-CUV	Alfa Romeo	0	0	29,000	25,500	25,800	20,200	19,500	15,200
Audi Q7	Audi	54,400	22,500	0	0	0	0	0	0
BMW X5	BMW	102,500	113,500	116,400	115,500	115,100	113,400	110,900	109,700
BMW X6	BMW	43,100	37,900	40,800	41,300	40,100	38,800	37,800	37,600
Cadillac E-CUV	GM	0	0	0	0	13,500	27,900	29,300	31,000
Cadillac SRX	GM	92,200	90,300	76,100	82,300	94,800	90,900	92,100	89,800
Fisker C-CUV	Fisker Automol	0	400	4,200	4,300	3,800	3,300	2,800	3,900
Infiniti FX	Nissan	20,600	29,200	32,800	36,200	34,800	34,200	33,800	32,600
Lexus RX	Lexus	148,300	143,300	141,100	163,800	158,100	148,700	137,800	157,600
Maserati D-CUV	Maserati	0	0	0	15,000	15,200	14,700	13,500	11,400
Maserati Levante	Maserati	0	0	5,300	6,500	7,600	8,500	8,400	7,500
Mercedes Benz ML-Class	Daimler	106,300	104,200	103,600	107,800	106,000	104,100	112,600	114,100
Porsche Cayenne	Porsche	63,300	58,000	55,200	53,900	57,700	65,800	63,400	62,300
Porsche Macan	Porsche	36,500	69,000	69,800	66,900	63,200	59,500	58,900	44,000
Tesla X	Tesla		6,134	20,650	29,666	34,060	33,372	43,463	54,815

Appendix 9 – Expected Units of Model 3 Competitors Until 2020

Model	Manufacturer	2013	2014	2015	2016	2017	2018	2019	2020
Acura RL	Honda	10,300	11,300	10,200	9,100	10,400	10,100	11,000	10,400
Acura TL	Honda	40,400	46,600	52,900	52,000	51,500	52,000	56,900	56,100
Audi A4	Audi	291,200	269,600	318,800	379,300	371,500	360,600	332,900	374,400
BMW 3-Series	BMW	493,900	519,100	46,300	443,000	445,700	439,100	480,200	524,300
Cadillac ATS	GM	59,900	77,900	95,400	93,900	94,500	96,700	105,200	103,800
Cadillac CTS	GM	24,100	63,900	57,000	54,958	53,400	55,600	58,300	59,900
Infiniti EV	Nissan	1,300	6,800	8,600	11,000	11,700	12,800	15,200	15,400
Infiniti G	Nissan	63,400	81,500	105,700	133,500	116,200	114,900	120,600	124,900
Lexus IS	Lexus	67,200	84,700	93,200	85,200	79,800	84,300	103,000	102,600
Lexus ES	Lexus	100,500	104,900	103,900	104,900	112,600	120,000	11,200	107,700
Mercedes Benz C-Class	Daimler	295,400	322,200	365,000	352,000	350,300	344,300	323,200	309,700
Model 3	Tesla	0	0	0	0	6,592	17,030	44,497	57,951

Appendix 10 – Valuation Model (in million EUR)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
EBIT	-172	-165	67	483	1,008	1,527	2,233	2,017	1,833	1,558	1,347	1,239	1,111	1,249	1,536	1,859	2,233	1,862	2,098	2,334	2,567	2,791	2,998	3,179	3,349	3,491	3,640
less adjusted tax	0	0	24	-169	-353	-534	-782	-706	-642	-545	-472	-434	-389	-437	-538	-651	-782	-652	-734	-917	-898	-977	-1,049	-1,113	-1,172	-1,222	-1,274
plus tax adjustments	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NOPLAT	-172	-165	44	314	655	992	1,451	1,311	1,191	1,013	876	806	722	812	998	1,208	1,452	1,210	1,363	1,517	1,669	1,814	1,948	2,066	2,177	2,269	2,366
Depreciation	74	85	114	141	179	209	283	334	382	413	472	538	605	680	764	855	954	1,058	1,166	1,275	1,384	1,490	1,590	1,680	1,767	1,843	1,922
Gross Cash Flow	-97	-80	158	454	835	1,202	1,734	1,645	1,553	1,426	1,347	1,343	1,327	1,492	1,762	2,063	2,405	2,268	2,529	2,793	3,053	3,304	3,538	3,747	3,944	4,112	4,288
Net Capital Expenditure	-688	-477	-818	-800	-767	-690	-995	-723	-1,022	-1,079	-1,221	-1,381	-1,404	-1,579	-1,742	-1,888	-2,061	-2,178	-2,244	-2,278	-2,262	-2,204	-2,080	-1,880	-1,796	-1,576	-1,644
Change in NWC	-1,408	241	235	203	179	161	195	-16	12	-49	5	-90	-123	-40	-47	-50	-55	-42	-57	-57	-56	-53	-49	-43	-40	-34	-35
Operating current asse	-1,496	91	66	44	-13	-10	-196	-384	-372	-482	-570	-658	-745	-840	-925	-998	-1,086	-1,131	-1,168	-1,177	-1,158	-1,116	-1,039	-919	-855	-737	-769
Operating current liab	78	149	168	159	192	170	291	378	384	443	575	568	621	796	878	947	1,031	1,089	1,111	1,120	1,103	1,063	990	876	855	703	733
Change in capitalised op	207	-18	-20	-22	-29	-29	-54	-59	-62	-74	-85	-98	-111	-124	-136	-147	-160	-169	-172	-174	-171	-165	-153	-136	-128	-109	-114
Change in deferred rever	-64	16	18	20	27	26	49	54	57	67	77	89	101	113	124	134	145	153	157	158	155	150	139	123	116	99	103
Change in resale value g	183	212	84	82	84	-1	25	33	113	151	193	243	422	502	595	0	0	0	0	0	0	0	0	0	0	0	0
Gross Investment	-1,769	-26	-321	-537	-527	-533	-779	-711	-902	-984	-1,030	-1,237	-1,559	-2,133	-2,396	-1,952	-2,130	-2,235	-2,316	-2,351	-2,333	-2,272	-2,143	-1,935	-1,848	-1,620	-1,690
Other assets	-21	27	0	-2	-2	0	-2	-2	-2	-2	0	-2	0	-2	0	-2	2	2	4	2	0	2	0	8	0	0	0
Change in other long terr	21	13	15	16	22	21	40	43	46	54	63	72	82	91	100	108	118	125	127	128	126	122	113	100	94	80	84
Interest income	3	4	3	3	4	5	5	8	9	11	13	16	18	21	25	29	33	37	41	45	50	54	58	61	65	67	70
Other expenses	-10	-11	-8	-11	-14	-17	-21	-25	-31	-36	-43	-51	-60	-71	-82	-94	-107	-119	-133	-147	-161	-174	-186	-197	-208	-216	-226
Non-operating cash flo	-7	33	10	7	9	9	24	23	27	33	35	40	41	44	42	46	46	37	27	17	2	-7	-35	-48	-68	-71	
Cash Flow to investors	-1,874	-74	-354	-76	317	677	979	957	674	469	350	141	-592	-600	-590	153	322	80	250	468	737	1,034	1,388	1,776	2,048	2,423	2,527
Tax Shield (APV)	0	0	7	9	15	16	26	35	48	65	82	102	121	144	166	192	214	231	245	259	271	0	0	0	0	0	0
Discount Factor	0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Discounted Cash Flow	0	-74	-324	-64	244	477	631	565	365	233	159	59	-225	-209	-189	45	86	20	56	97	139	303	382	460	499	555	545
Discounted Tax Shield	0	0	6	8	11	13	17	20	26	32	37	42	46	50	53	56	57	57	55	53	51	0	0	0	0	0	0
NPV Cash Flows	4,834																										
Perpetuity	30,281																										
NPV Tax Shields	692																										
Perpetuity Tax Shield	0																										
Enterprise Value	35,807																										
Net debt	-1,951																										
dcash/mark. Securities	-125																										
Equity Value	31,057																										

Appendix 11 – Multiples of Comparables Analysis⁹³

	EV/Sales			Price/Book		
	2013	2014	2015	2013	2014	2015
Disruptive Technology						
Apple	3.71	3.05	2.64	6.07	6.07	5.13
Google	5.37	4.74	5.80	3.69	3.72	3.66
Average	4.54	3.90	4.22	4.88	4.90	4.40
Clean Technology						
Enemoc	0.86	0.69	0.69	1.29	1.40	1.73
First Solar	1.49	1.20	1.04	0.98	0.98	0.97
SunPower	1.36	1.46	1.41	2.46	2.46	2.70
Average	1.24	1.12	1.05	1.58	1.61	1.80
Auto Tech / Innovation						
Borgwarner	1.61	1.68	1.65	3.54	3.54	3.40
Gentex	4.08	3.95	3.83	3.69	3.69	3.57
Harman	1.31	1.32	1.24	3.98	3.98	3.62
Average	2.33	2.32	2.24	3.74	3.74	3.53
Luxury Automakers						
BMW	0.76	1.58	1.55	1.61	1.63	1.53
Daimler	0.57	1.20	1.20	1.63	1.67	1.55
Average	0.67	1.39	1.38	1.62	1.65	1.54
High Growth Automakers						
BYD	-	2.43	2.49	-	3.28	3.10
Geely	-	0.71	0.74	-	1.30	1.19
Great Wall	-	3.99	1.94	-	5.90	2.92
SAIC	-	-	0.37	-	-	1.54
Average	-	1.11	0.83	-	1.60	0.82
Overall Average		1.97	1.94		2.70	2.42
Tesla	20.06	11.25	12.46	30.01	75.15	304.30

⁹³ Source: Bloomberg, Analysts Estimates

