LISBON SCHOOL OF ECONOMICS & MANAGEMENT
UNIVERSIDADE DE LISBOA

MASTER IN FINANCE

MASTERS FINAL WORK
PROJECT

EQUITY RESEARCH: TESLA, INC.

NUNO FILIPE RODRIGUES GOMES

OCTOBER 2017

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ORIENTAÇÃO: PEDRO NUNO RINO CARREIRA VIEIRA

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Abstract

The purpose of this project is to determine the value of Tesla stock as of December 31, 2018. We start by explaining Tesla's business and its products. Then, we focus on the firm's management and board of directors. This is followed by the analysis of the three industries where Tesla operates: automotive, energy storage and solar energy. Next, we identify Tesla's competitive advantages, which are many in the automotive industry. A simpler product portfolio and a business model that allows it to sell vehicles directly to consumers through the internet are two examples. We also do a SWOT analysis in order to identify its internal strengths and weaknesses, as well as its external opportunities and threats. After we get to know the company, we move to the financial analysis phase to see how the company has performed in the last years. We discovered that Tesla has been reporting negative free cash flows for nearly every year since its IPO in 2009. To give an example of the magnitude, the company invested $1.4 billion and lost $124 million with its operations in 2016.

Despite this, the company has not had any problems getting money in the markets. On August 11, 2017, Tesla sold $1.8 billion of 5.3% Senior Notes, more $300 million than expected due to "overwhelming" demand. In addition, Tesla has an extraordinary market capitalization, which is higher, by $9 billion, than Ford's, a carmaker with a production volume 75 times greater.

Next, we forecast Tesla' s future performance, which mostly based on regression analysis of the historical financials, and with the results, we value Tesla stock. We derive our December 31, 2018 price target of $321 using a blended approach that gives equal weightage to three different valuation methods, and then gives a probability of 70% to our base scenario results, and 15% each to the other two scenarios (upside and downside).

We culminate by recommending to sell/short Tesla stock and identifying the catalysts that will decrease the stock value to our target price.

Keywords: Company Valuation, Discounted Cash Flow, Enterprise Value, Tesla

To access financial statements and prevision assumptions and operations click on the link: https://www.dropbox.com/s/9juim7ufutgibmk/TESLA_Appendix.pdf?dl=0

Resumo

O objetivo deste projeto é determinar o valor da ação da Tesla em 31 de dezembro de 2018. Começamos por explicar o negócio da Tesla e os seus produtos. Depois damos a conhecer os administradores executivos e não executivos da empresa. A isto segue-se a análise das três indústrias onde a Tesla opera: automóvel, armazenamento de energia e energia solar. Em seguida, identificamos as vantagens competitivas da Tesla, que são muitas na indústria automóvel. Um portfólio de produtos mais simples e um modelo de negócio que lhe permite vender veículos diretamente aos consumidores através da internet são dois exemplos. Fazemos também uma análise SWOT para identificar os seus pontos fortes e fracos, bem como as oportunidades e ameaças que a rodeiam. Depois de conhecer a empresa, passamos para a fase de análise financeira. Descobrimos que a Tesla relatou fluxos de caixa livres negativos em quase todos os anos desde que se tornou uma empresa cotada em 2009. Para dar um exemplo da magnitude, a empresa investiu 1,4 biliões de dólares e perdeu 124 milhões de dólares com as suas operações em 2016.

Apesar disso, a empresa não teve problemas em financiar-se nos mercados. Em 11 de agosto de 2017, a Tesla vendeu 1,8 bilião de dólares de obrigações com 5,3% de taxa de juro, mais 300 milhões do que o esperado devido à procupa "extraordinária". Além disso, a Tesla possui uma capitalização de mercado elevadíssima, que é superior, em 9 biliões de dólares, à da Ford, uma fabricante que produziu 75 vezes mais carros que a Tesla em 2016.

De seguida, prevemos o desempenho futuro de Tesla, principalmente com recurso à análise regressiva dos resultados financeiros passados. Nós derivamos o preço target de 321 dólares para 31 de Dezembro de 2018 usando uma abordagem que dá uma peso igual a 3 métodos de avaliação diferentes, e uma probabilidade de 70% ao cenário base, e 15% a cada um dos outros dois cenários considerados (otimista e pessimista).

Nós acabamos recomendando a venda da ação da Tesla e identificando os catalisadores que irão diminuir o valor das ações para o nosso preço-alvo.

Palavras-chave: Avaliação de empresas, Fluxo Financeiro Descontado, Valor da Empresa, Tesla

Para aceder às demonstrações financeiras e aos pressupostos das previsões, clique no link: https://www.dropbox.com/s/9juim7ufutgibmk/TESLA_Appendix.pdf?dl=0

Acknowledgments

Writing this thesis was a very difficult experience, with ups and downs, but now that it is finished I am very pleased with the result. This would have not been possible without the support of my family, friends and mentors.

Thank you for always being there, for the strength and making sure I make it through.

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Abbreviation Index

LDV: Light duty vehicle

PHEV: Plug-in hybrid electric vehicle

BEV: Battery electric vehicle

FCEV: Fuel cell electric vehicle

ICE: Internal Combustion Engine (vehicle)

PEV: Plug-in electric vehicle

EV: Electric vehicle

GW: Gigawatt

MW: Megawatt

MWh: Megawatt-hour

BNEF: Bloomberg new energy finance

OEM: Original equipment manufacturer

kWh: Kilowatt-hour

R&D: Research and development

SG&A: Selling, general and administrative

DCF: Discount cash flow

PV: Present Value

FCF: Free cash flow

CAGR: Compound annual growth rate

WACC: Weighted average cost of capital

Research Snapshot

RECOMMENDATION: SELL
PRICE (OCT 11, 2017): $355
TARGET PRICE (DEC 31, 2018): $321
RISK: MEDIUM

Tesla, Inc.

Tesla designs, manufactures, leases, and sells high-performance fully electric vehicles, solar energy generation systems and energy storage products. Tesla also offers maintenance, installation and financial services related to its products.

Tesla vehicle fleet includes the Model S premium sedan and the Model X sport utility vehicle, which are its highest-performance vehicles, and beginning in July 2017, the Model 3, a lower priced sedan designed for the mass market. In addition, the company offers energy storage products, such as rechargeable lithium-ion battery systems for use in homes, commercial facilities, and utility sites. Further, the company designs, manufactures, installs, leases, and sells solar energy systems.

The company was formerly known as Tesla Motors, Inc. and changed its name to Tesla, Inc. in February 2017. The company was founded in 2003 and had its IPO on June 29, 2010. On the first day of trading, Tesla's shares closed at $23.89.

*Figure 1: **Stock price performance ($)***

Source: Yahoo Finance

Share information	
Tycker symbol:	**TSLA**
Exchange:	**Nasdaq**
Avg 10-day Vol:	**6,75M**
Shares outstanding:	**166,89M**
% Held by Insiders:	**25,61%**
% Held by Institutions:	**59,07%**
Nº of Institutions holding:	**974**
Float:	**124,12M**
Short % of Float:	**26,78%**

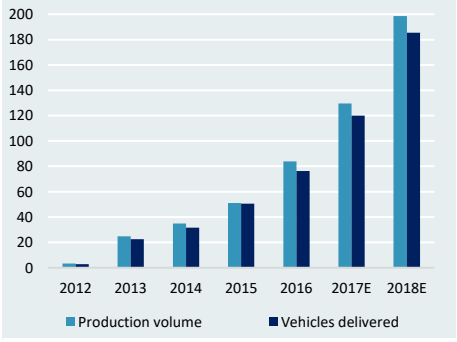
Source: Yahoo Finance

Valuation Measures	
Market Capitalization (mill):	**$58 583**
Enterprise Value (mill):	**$64 968**
Equity Book Value (mill):	**$5 106**
Market Cap/Revenue:	**5,8x**
Market Cap/Book Value:	**11,5x**
EV /Revenue:	**6,5x**
Enterprise Value/EBITDA:	**87,3x**

Source: Our calculations based on company reports

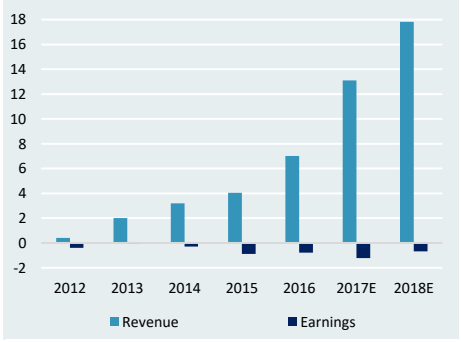
Operational and Financial Highlights (*with base scenario projections*)

*Figure 6: **Vehicle production & deliveries (000)***



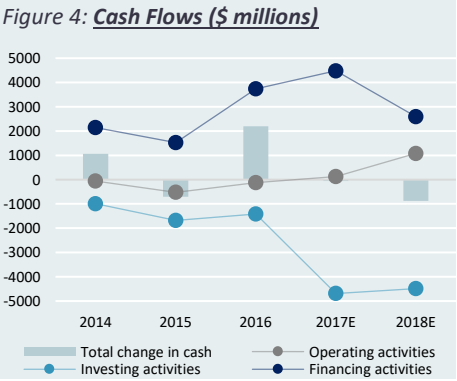
Source: Company reports; Our estimates

*Figure 5: **Revenue and Earnings ($ billions)***



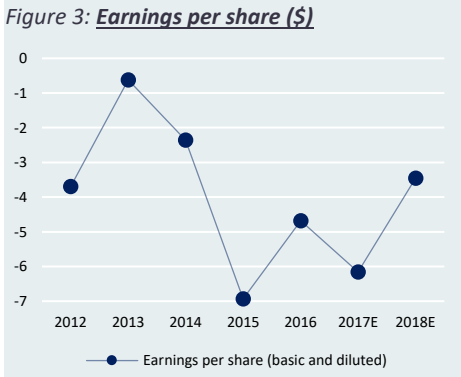
Source: Company reports; Our estimates

*Figure 4: **Cash Flows ($ millions)***



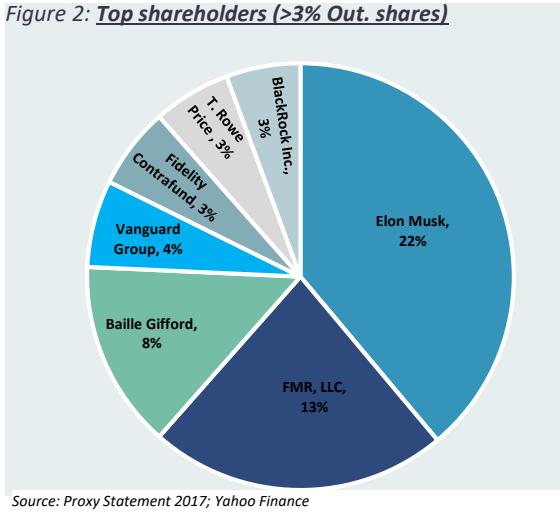
Source: Company reports; Our estimates

*Figure 3: **Earnings per share ($)***



Source: Company reports; Our estimates

*Figure 2: **Top shareholders (>3% Out. shares)***



Source: Proxy Statement 2017; Yahoo Finance

Key Executives

Name	Title	Since	Pay	Age
Elon Musk	CEO, Chairman	2008; 2004	0	45
Jeffrey Straubel	Chief Technology Officer	2005	250,56k	41
Jonathan McNeill	Pres of Global Sales & Service	2016	1,27M	49
John Douglas Field	Sr. VP of Engineering	2015	301,15k	51
Deepak Ahuja	Chief Financial Officer	2017	N/A	54

Source: Proxy Statement 2017; Yahoo Finance

Investment Summary

Tesla Inc. - *SELL; Target price (DEC 31, 2018): $321*

Valuation summary

We recommend *SELLING* Tesla stock. We derive our December 31, 2018 price target of $321 using a blended approach that gives equal weightage to three different valuation methods, and then gives a probability of 70% to our base scenario results, and 15% each to the other two scenarios.

Two of the valuation methods are based on the discounted cash flow approach – they are different regarding the terminal value calculation method; one (the Multiple method) is based on an enterprise value multiple, and the other (the Perpetuity method) is based on a perpetual free cash flow growth rate - and the other is a comparable companies' multiple based approach.

The three scenarios are based on different projections regarding model 3 production volume.

We chose to value the company to 31/12/2018, because there are not enough catalysts to our 31/12/2017 price target of $260.

Investment Thesis

Our *SELL* recommendation considers noteworthy positive aspects, including appealing product portfolio, leading-edge technology, and a highly differentiated business model. Its products are revolutionary, distinctive, stylish, and very capable. In addition, the company is led by visionary leadership, backed by a management team with solid knowledge and experience.

However, expansion into higher volume segments with Model 3 entails greater risk than before, relative to execution and competition. In our view, current stock price appears to be pricing in upside related to expansion into mass-market segments well beyond our volume forecasts for the Model 3.

Catalysts to Target Price

(1) Production delays
(2) Product recalls
(3) Announcement of new products from competition
(4) Lower than expected Earnings per share

Risks to Target Price

(1) Demand for Tesla vehicles could rise materially as awareness builds
(2) Announcement of a new EV model, a semi-truck
(3) Everybody loves Tesla

Bottom Line

We do not believe there are enough upside risks to offset the catalysts that, in our view, will lead Tesla stock to our December 31, 2018 target price. Since the announcement of the semi-truck is very close to happen (November 16th), we recommend to sell/short one week after it, to avoid the most likely stock price increase. We believe that the love for Tesla is the biggest risk to our target price, but it is not enough to avoid the decrease of the stock price in 2018. With not enough fundamental reasons that could offset the plausible catalysts identified by us, and with a 72% probability of the stock price being lower than the current stock price (as of 11/10/2017) in 31/12/2018, we consider a trade based on our sell/short recommendation a medium risk investment.

Business Description Overview

Tesla designs, manufactures, leases, and sells high-performance fully electric vehicles, solar energy generation systems and energy storage products. Tesla also offer maintenance, installation and financial services related to its products.

Automotive business

Tesla vehicle fleet includes the Model S premium sedan, the Model X sport utility vehicle, which are its highest-performance vehicles, and beginning in July 2017, the Model 3, a lower priced sedan designed for the mass market. The company sells its vehicles directly to consumers through internet and an international network of company-owned stores and galleries. As of June 2017, Tesla operated 300 locations, including all stores, galleries, and service facilities.

The company makes most of the components used in its vehicles, in contrast to the industry standard, where components are sourced from third-party suppliers[1]. It conducts vehicle manufacturing in Fremont and Lathrop, California; and Tilburg, Netherlands. In partnership with Panasonic, the company has a cell and battery manufacturing facility, the Gigafactory 1[2].The company is also building a network of Superchargers in the US, Europe, and Asia to provide fast charging that enables convenient long-distance travel. As of June 2017, the company had 884 Supercharger stations open.

Energy Storage business

Tesla's energy storage products, which are lithium rechargeable batteries, consist of Powerwall 2 for residential applications and Powerpack 2 for commercial, industrial, and utility-scale applications. Production and deliveries of these second-generation products began in the fourth quarter of 2016. Tesla's energy storage products are manufactured at Gigafactory 1. The battery architecture and many of the components used in the energy storage products are the same or similar to those used in vehicles' battery pack, enabling Tesla to take advantage of manufacturing efficiencies and supply chain economies of scale.

Solar Energy business

Tesla entered in the solar energy business by acquiring SolarCity[3] for 2.6 billion in an all-stock transaction[4], in November 21, 2016. Also in last quarter of 2016, Tesla/SolarCity revealed the solar roof. The company plans to transition to production before the end of the year. Tesla sells its storage and solar products through a variety of channels, beyond its own stores, such as: sales organizations, a channel partner network and a customer referral program.

Segment Reporting and Information about Geographic Areas

The company classifies its business operations into two segments: Automotive, and Energy Generation & Storage.

The automotive segment includes the design, manufacturing, leases, and sales of electric vehicles. Additionally, the automotive segment is also comprised of services and other, which include after-sales vehicle services, used vehicle sales, powertrain sales and services by Grohmann.

The energy generation and storage segment includes the design, manufacture, installation, leases, and sales of stationary energy storage products and solar energy systems, or sale of electricity generated by its solar energy systems to customers.

In 2016, the Automotive segment reported revenue of $6,8 billion, which accounted for 97.4% of the company's total revenue, while the Energy Generation and Storage segment reported revenue of $181 million, which accounted for 2.6% of the company's total revenue.

Tesla's main markets are USA, China and Norway. In 2016, these segments accounted for 60.0%, 15.2%, 4.8% of the company's total revenue, respectively.

[1] Capgemini Consulting – "Tesla Motors: A Silicon Valley Version of the Automotive Business Model"
[2] Facility where Tesla works with its suppliers to integrate production of battery material, cells, modules, battery packs and drive units in one location for vehicles and energy storage products. Gigafactory 1 is being built in phases so that Tesla, Panasonic, and other partners can begin manufacturing inside the finished sections and continue to expand thereafter, and it is expected to attain full production capacity by 2020.
[3] The #1 provider of residential and commercial solar in US in 2016 (see solar industry analysis).
[4] Under the terms of acquisition, Tesla Motors acquired all of the outstanding shares of common stock of SolarCity with an equity value of $2.6 billion. More than 85% of shareholders voted in favour of the acquisition.

Products

Vehicles

Model S

Model S is a fully electric, four-door, five-adult passenger sedan introduced on June 22, 2012. Made of lightweight aluminium, the car achieved the highest safety rating in history. It can be recharged *for free* at Tesla's stations. The Autopilot system lets the car stay in its lane and adjust speed according to traffic.
Consumer Reports gave the Model S its highest car rating in history—99 out of 100—while proclaiming that it was likely the best car ever built. The Tesla Model S was the best-seller plug-in electric car worldwide in 2015 and 2016.

Model X

Model X is the longest range all-electric production sport utility vehicle in the world and can seat up to seven adults. On November 8, 2016 the Model X was awarded the Golden Steering Wheel, one of the most prestigious automotive awards in the world[5]. According to Car and driver, Model X's performance and efficiency can't be matched. First deliveries began in September 2015. After just one full year on the market, the Model X ranked seventh best-selling plug-in car in the world.

Model 3

Model 3 is the latest model to join Tesla's portfolio. The standard Model 3, starts at $35k and has 220 miles of range. The best version starting at $44k, with premium upgrades for an additional $5k, offers a range of 310 miles. Production of the Model 3 began in July 2017. By August 2017, there were 455k net reservations.

Energy Storage systems

Powerwall 2

Powerwall 2 is a 13,5-kWh rechargeable lithium-ion battery designed to store energy at a home or small commercial facility and can be used for reducing demand, self-consumption of solar power generation and as backup power.

Powerpack 2

Powerpack 2 is a 200-kWh battery system which can be used by commercial and industrial customers for peak shaving, load shifting, self-consumption of solar generation and demand response. For grid-scale applications, 200 kWh battery blocks can be grouped together to offer MWh and GWh installations. These can be used by utilities to smooth and firm the output of renewable power generation sources, defer or eliminate the need to upgrade transmission infrastructure and also provide for a variety of grid services for utilities.

Production and deliveries of these second-generation products began in the fourth quarter of 2016.

Solar Energy Systems

Solar roof

Solar Roof complements a home architecture while turning sunlight into electricity. In a blog post, Tesla explain that Solar Roof tiles are more than three times stronger than standard roofing tiles. They do not degrade over time like asphalt or concrete. The roof comes with a warranty for the lifetime of the house, or infinity, whichever comes first.
According to Consumer Reports, a Solar Roof, to be competitive with a regular roof, needs to cost less than $24.50 per square foot. Tesla Solar Roof costs less. According to Tesla, the typical homeowner can expect to pay $21.85 per square foot for Solar Roof[6] and benefit from a beautiful new roof that also increases the value of their home. With an integrated Powerwall, energy collected during the day is stored and made available any time.
Tesla plans to start production at its Gigafactory 2 in Buffalo, New York before the end of the year.

[5] Tesla Q4 current report.
6 https://www.tesla.com/blog/solar-roof

Executive officers

Executive Officers	Biographical Information
Elon Musk, 45 years *CEO, Chairman* Since: 2008;2004 Salary: $46k Other compensation: 0	Tesla CEO since October 2008 and Chairman since April 2004. Musk is also CEO, CTO and Chairman of SpaceX, a company which is developing and launching advanced rockets for satellite and eventually human transportation, since May 2002. Prior to this, Mr. Musk co-founded PayPal, an electronic payment system, which was acquired by eBay in October 2002, and Zip2 Corporation, a provider of Internet enterprise software and services, which was acquired by Compaq in March 1999. Mr. Musk holds a B.A. in physics from the University of Pennsylvania and a B.S. in business from the Wharton School of the University of Pennsylvania.
Jeffrey Straubel, 41 years *Chief Technology Officer* Since: 2005 Salary: $250k Other compensation (2016): $7.7M	Previously served as Tesla Principal Engineer from March 2004 to May 2005. Prior to joining Tesla, Mr. Straubel was the Chief Technical Officer and co-founder of Volacom Inc., an aerospace firm which designed a specialized high-altitude electric aircraft platform, from 2002 to 2004. Mr. Straubel holds a B.S. in energy systems engineering from Stanford University and a M.S. in engineering, with an emphasis on power electronics and energy conversion, from Stanford University.
Jonathan McNeill, 49 years *Pres. of Global Sales & Service* Since: 2016 Salary: $1.27M Other compensation (2016): $5.9M	Prior to joining Tesla, Mr. McNeill was the Chief Executive Officer of Enservio, Inc., a property insurance software provider, from January 2006 to August 2015. Mr. McNeill was a founder of Sterling Collision Centers, a national chain of vehicle body repair centers, and First Notice Systems, a 24-hour insurance claim services firm, and served as their Chief Executive Officer from 1997 to 2003 and from 1993 until 1997, respectively, until their respective acquisitions. Mr. McNeill is a director of Lululemon Athletica Inc., and continues to serve as the chair of Enservio's board of directors. Mr. McNeill holds a B.A. in economics from Northwestern University.
John Douglas Field, 51 years *Sr. VP of Engineering* Since: 2015 Salary: $301k Other compensation (2016): $2.2M	Doug Field has served as Tesla Senior Vice President, Engineering since September 2016. Prior to joining Tesla, Mr. Field was Vice President, Macintosh Hardware Engineering, at Apple Inc. from October 2011 to September 2013, and its Vice President, Product Design, from July 2008 to October 2011. Mr. Field's experience with vehicle engineering also includes previous roles as the Chief Technical Officer and Vice President, Design and Engineering of Segway Inc., a manufacturer of electric personal transport vehicles, and as a development engineer for Ford Motor Company. Mr. Field holds a M.S. in mechanical engineering and a M.B.A. from the Massachusetts Institute of Technology, in addition to a Bachelor of Science degree in mechanical engineering from Purdue University.
Deepak Ahuja, 54 years *Chief Financial Officer* Since: 2017 Salary: N/A	Previously served as Tesla Chief Financial Officer from July 2008 to November 2015. Prior to joining Tesla in July 2008, Mr. Ahuja served in various positions at Ford Motor Company from August 1993 to July 2008, most recently as the Vehicle Line Controller of Small Cars Product Development from July 2006 to July 2008, and as Chief Financial Officer for Ford of Southern Africa from February 2003 to June 2006. Mr. Ahuja also served as the Chief Financial Officer for Auto Alliance International, a joint venture between Ford and Mazda, from September 2000 to February 2003. Mr. Ahuja also serves as a director of FireEye, Inc. Mr. Ahuja holds an M.B.A from Carnegie Mellon University, a M.S. in materials engineering from Northwestern University and a Bachelor's degree in ceramic engineering from Banaras Hindu University in India.

Source: Proxy Statement 2017

Executive Compensation Program: Tesla's executive compensation program consists primarily of salary and equity awards, with most of the compensation weighted towards equity awards, the value of which is dependent upon the achievement of significant company milestones. This program strongly aligns the interests of the executive officers with those of the stockholders, on a sustained long-term basis. The compensations are established by non-executive board directors. Every three years, the stockholders can express their views about the executive compensation. In the last two times, the compensation program was approved by over 94% of the stockholders.

Board of directors

Name	Title	Since	Pay	Aggregate Number of Shares underlying Options Outstanding	Age
Elon Musk[7]	CEO and Chairman	2008; 2004	$0	N/A	45
Brad W.Buss	Director	2009	$20 000	131 748	53
Robyn M. Denholm	Director; Member of Audit Committee; Member of Compensation Committee; Member of Nominating and Corporate Governance Committee	2014	$45 000	122 333	53
Ira Ehrenpeis	Director; Member of Compensation Committee; Member of Nominating and Corporate Governance Committee	2007	$37 500	82 492	48
Antonio J. Gracias	Director; Member of Audit Committee; Member of Compensation Committee; Member of Nominating and Corporate Governance Committee; Lead Independent Director	2010	$37 500	235 332	46
Stephen T. Juvertson	Director; Member of Audit Committee	2009	$27 500	62 000	50
Kimbal Musk	Director	2004	$20 000	75 000	44

Source: Proxy Statement 2017

Board structure: The board is divided into three classes and each class serves staggered three-year terms. Shareholders may only vote on roughly one-third of the directors each year. Despite there are good arguments against this structure, advocating that shareholders should have the opportunity to vote on the performance of the entire Board of Directors each year, we believe this structure is the right one. With staggered three-year terms, the directors can focus on doing their job, without being distracted by special interests that seek only very short-term returns.

Director Independence: With the exception of Elon Musk, who is both Tesla CEO and Chairman of the board, and Kimbal Musk, who is Elon Musk's brother, all of its current members are "independent directors" as that term is defined in the listing standards of NASDAQ. However, it is important to state that all of the "independent directors" had or have connections (ex-employee, stockholder, supplier) to Tesla, SolarCity or SpaceX (other company founded by Elon Musk).

Succession Plan: There is no succession plan for CEO Elon Musk, but, with Musk only 46 and will to continue in the position for years to come, Tesla can be forgiven for not planning much.

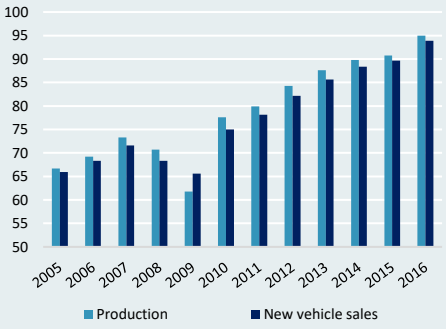
[7] Elon Musk, who is also Chief Executive Officer, does not receive additional compensation for his services as a director.

Automotive Industry

Global Sales

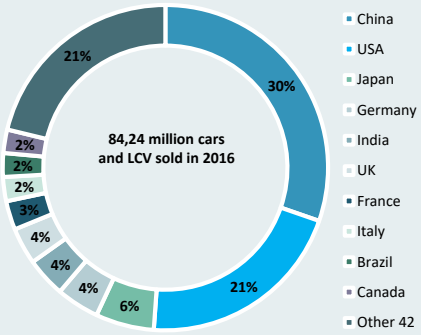
Worldwide sales of new Light Duty Vehicles (LDV)[8] grew by 5.6 % to 84.24 million units[9] in 2016. Strong momentum from China (25.5 million units; + 14.2 %) and Europe (17.1 million units; + 7 %) made significant contributions to growth. By contrast, the USA recorded only a slight increase (17.6 million units; + 0.4 %).

*Figure 9: **Vehicle production and new sales (mill)***



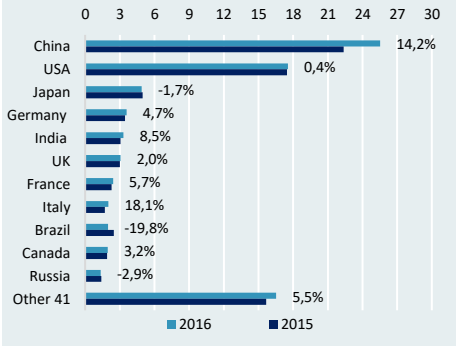
Source: OICA

*Figure 8: **Automotive market shares by Country***



Source: JATO

*Figure 7: **Car sales growth by Country***

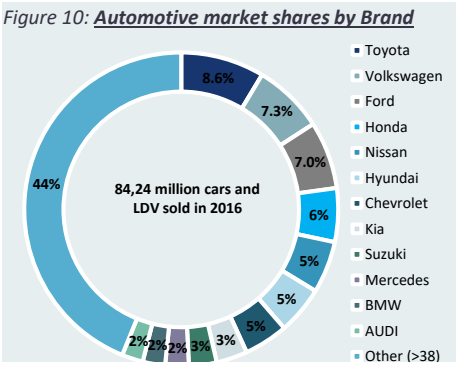


Source: JATO

Best-Selling Brands

Toyota maintained its leading position as the world's best-seller car brand, with 7.25 million vehicles sold in 2016 (+2.8% vs 2015). Despite the emissions scandal, the Volkswagen brand increased its sales by 2.9% during 2016, and held the position as the second biggest car seller. Ford completed the top 3 with 5.86 million cars sold (+2.3% vs 2015). Mercedes, Kia, and Honda were the best performers in the top 10. The 10 best seller's brands were responsible for 56.1% of total units sold in 2016. Mercedes, BMW and Audi (Tesla's main competitors as we will see further) sold 2.04, 1.94, and 1.84 million cars in 2016, respectively. Their market shares were 2.4%, 2.3% and 2.2%, respectively.

*Figure 10: **Automotive market shares by Brand***



Source: JATO

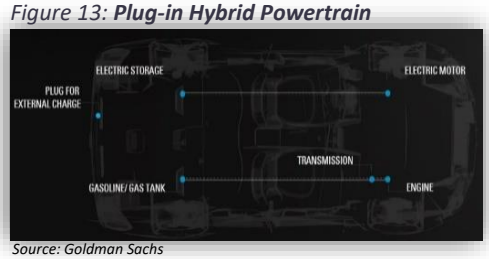
Industry Transformation

Concerns about greenhouse gases and pollution are driving an industry-wide change in the way cars are powered. Regulations on fuel economy and CO2 emissions are forcing carmakers to make engines more efficient. According to Goldman Sachs, 25% of cars sold will have electric engines by 2025, up from 5% today. There are 3 types of electric vehicles:

- *Plug-in hybrid (PHEVs)*: type of EV with batteries that can be charged externally to displace some or all of their internal combustion engine power and gasoline fuel. They run as BEVs while they have energy from the battery pack.
- *Battery electric vehicles (BEVs)*: type of EV that is powered only by an electric motor that uses energy stored in a rechargeable battery pack, instead of internal combustion engines (ICEs) for propulsion.
- *Fuel-cell electric vehicles (FCEVs)*: they produce their electric power from fuel cells that use hydrogen. They produce no emissions other than water while driving.

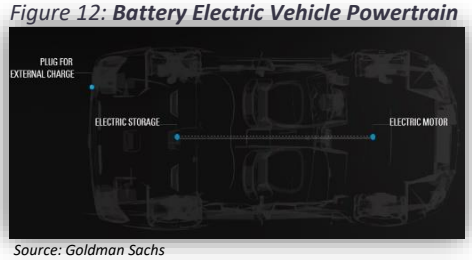
Given their much wider diffusion, the scope of our analysis is limited to BEVs, and PHEVs, which we call by Plug-in Electric Vehicles (PEVs). The engineering complexity of PHEV vehicle platforms, their cost and dual powertrains make BEVs, such as Teslas, more attractive over the long-run.

*Figure 13: **Plug-in Hybrid Powertrain***



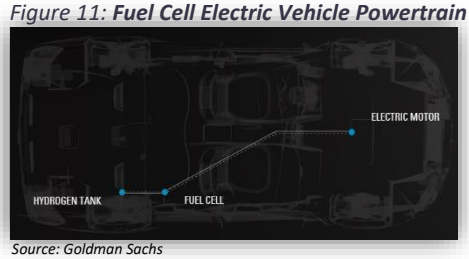
Source: Goldman Sachs

*Figure 12: **Battery Electric Vehicle Powertrain***



Source: Goldman Sachs

*Figure 11: **Fuel Cell Electric Vehicle Powertrain***



Source: Goldman Sachs

[8] Includes passenger cars and light commercial vehicles.
[9] According to JATO Dynamics figures, based on their data of 52 markets.

Plug-in Electric Vehicle Market

Overview

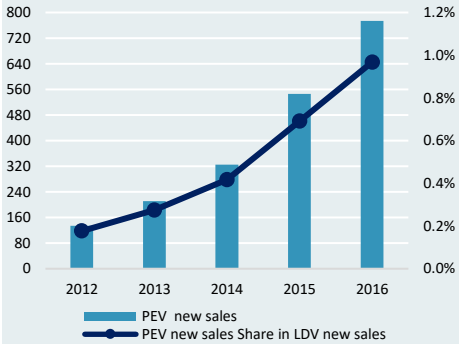
The global electric car stock surpassed 2 million units in 2016 after crossing the 1 million vehicle threshold in 2015[10]. There were 1.05 billion light duty vehicles on the road, which means that PEVs only represented 0.19% of all LDVs as of 2016. BEVs account for the majority of the electric car stock at 60%[11].

Benefits for local pollution reduction, energy diversification and climate change mitigation, as well as the encouraging signs observed in cost and performance developments in the recent past, are driving the deployment of a variety of policy mechanisms supporting the market uptake of electric cars. The most significant ones are the financial incentives to encourage the purchase of EVs: $5k to $8,5k in China; $7,5k in US, $11,6k in Norway, $7.7k in Japan.

Key barriers to EV market penetration include battery costs and ranges, both areas where recent developments provide encouraging signs. From 2010 to 2016, battery packs prices fell 73% from $1000/kWh to $273/kWh. In parallel, battery energy density has been increasing and enabling longer ranges for lower prices. For example, base models of the Nissan Leaf and Tesla Model S grew from 75 and 208 miles per charge in 2013 to about 107 and up to 249 miles in 2017, respectively[12].

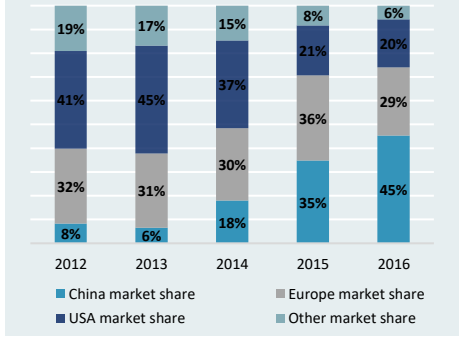
Also helping to set the stage for greater EV growth is an accelerating rollout of charging infrastructure in the US, Europe and China.

*Figure 14: **Plug-in electric vehicles new sales (000)***



Source: EV-volumes.com

*Figure 15: **PEV market shares by Region***



Source: EV-volumes.com

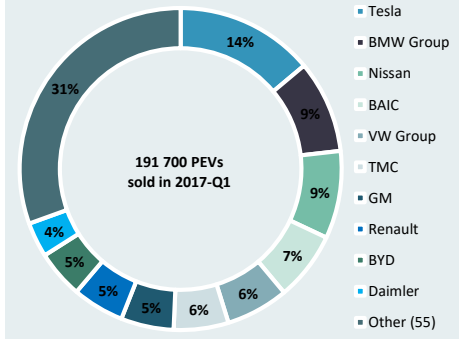
Global Sales

In 2016, PEV sales increased 42% to 774k units (vs 68% growth in 2015). Plug-in vehicle sales grew 7,5 times the overall market relative growth, but still captured a world market share of just 0,86 %. BEV sales stood for 63% in the global mix, higher from 60% in 2015. The biggest markets are China, Europe and USA, responsible for 45%, 29% and 20% of PEV sales, respectively. Since 2013 that China has been gaining significant share, passing to 45% from 6%, while US has been losing share, passing to 21% from 45%. Europe and other markets have remained relatively flat in terms of market share.

Sales by manufacturer

As of December 2016, there were 49 manufacturers of PEVs, and the 6 biggest ones were responsible for 52% of the sales. The three biggest manufacturers of plug in vehicles in 2016 were BYD, Tesla and the VW Group, responsible for 13%, 10% and 8% of global PEV sales, respectively. Counting only BEVs, Tesla is the undisputed top seller, followed by Nissan, BYD and Chinese BAIC. In the first quarter of 2017, Tesla was the clear leader with more than 25k units sold, its highest single quarter sales volume ever, equivalent to 14% of total sales worldwide.

*Figure 16: **Automotive market shares by Brand***

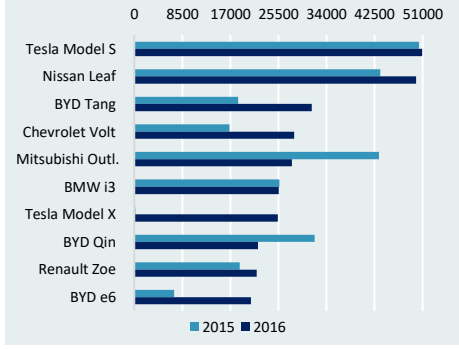


Source: EV-volumes.com

Sales by model

In 2016, Tesla Model S was the world's best-selling plug-in vehicle for the second-year consecutive, despite sales only grew by 1.2%. With 51k units sold worldwide, Model S was responsible for 6.6% of global PEV sales. The second-best seller was Nissan Leaf, with 49.8k units sold (more 14.5% than in 2015), equivalent to 6.4% of global PEV sales. In the end of the top 3 was BYD Tang, with 31.4k units sold (more 70.9% than in 2015), and a market share of 4%. The Model X, in its first full year of sales, was the seventh best seller PEV vehicle worldwide, with 25.4k units sold, equivalent to 3.3% of the market.

*Figure 17: **Best seller PEVs sales***



Source: EV-volumes.com

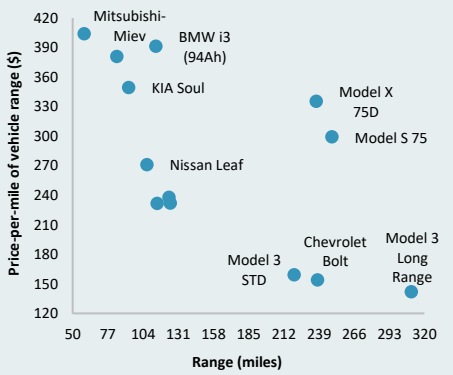
[10] BNEF data.
[11] International Energy Agency (IEA); Global EV Outlook 2017.
[12] Department of Energy (www.FuelEconomy.gov), EPA.

Competitive Positioning

Plug-in electric vehicle market

Based on the 38 PEV models available in the US in 2016, Tesla vehicles are more expensive than the median, but they offer the highest ranges and the lowest prices per mile of range. The new model 3 Long Range with a price of $44k and a range of 310 miles offers the best price per mile of vehicle range, beating the $37.5k and 238 miles-range Chevy Bolt, the previous record holder. The standard version of Model 3, with a price of $35k and range of 220 miles offers the third lowest price per mile of range. Only the most expensive versions of Tesla's Model S, that cost $99k and $135k or more, respectively, have broken the 300-mile range barrier. Based on the analysis of PEV sales in the US in 2016, consumers give much more importance to the range than to the price of the vehicle.

*Figure 18: **Price per mile of range VS Range***



Source: wattev2buy.com
(Based on the 38 EV models available in the US in 2016)

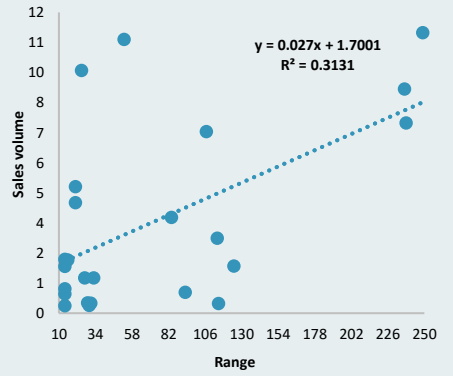
Luxury car market

Tesla models also compete in the market based on their traditional segment classification.

Model S

Model S competes in the midsize luxury car market[13] and its main competition is: Mercedes E-class, Audi A6 and BMW 5-Series. These models sold 304k units, 276k and 331k units worldwide in 2016, while Tesla Model S sold 51k units. The average base price of the comparable models is $51.7k, while Model S base price is $74.5k[14]. If we consider the federal tax credit of $7.5k[15] and the $5.5K gas savings over 5 years[16], the price of the model drops to $61.5k[17], which is still 19% higher. We consider Model S a better vehicle, but the gap is too much to justify. Based on this analysis, we do not see Model S sales achieve its comparable models, but there is certainly room to grow.

*Figure 19: **Sales Volume VS Range***

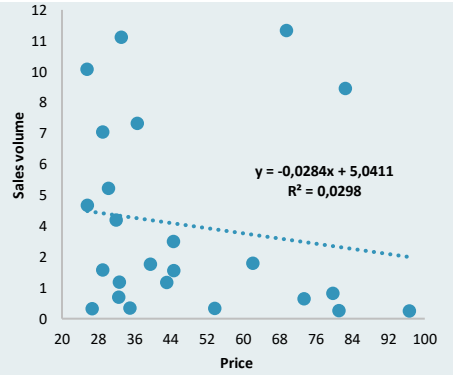


Source: EV-volumes.com; wattev2buy.com

Model X

Model X competes in the midsize luxury SUV market and its main competition is: Audi Q7, and BMW X5. These models sold 103.5k and 166k units worldwide in 2016, while Tesla Model X sold 25.4k units. The average base price of the comparable models is $60.4k, while Model X base price is $79.5k. If we consider the federal tax credit of $7.5k and the $5.4K gas savings over 5 years[18], the price of the model drops to $66.6k, which is only 10% higher. Considering that Model X is much more technology advanced[19], has lower maintenance costs[20], better acceleration[21], more storage space[22] and it is much safer than the comparable models[23], we definitely see Model X sales achieve its rivals' numbers.

*Figure 20: **Sales Volume VS Price***



Source: EV-volumes.com; wattev2buy.com

Model 3

Model 3 will compete in the small luxury car market and its main competition is: Mercedes C and B-class, Audi A5, A4 and A3, BMW 2, 3 and 4-series, and BMW i3. BMW, Audi, and Mercedes sold 770.6k units, 785k and 664k units of Model 3 comparable models in 2016. The average base price of the comparable models is $38.3k, while Model 3 base price is $35k. If we consider the federal tax credit of $7.5k and the $5.5K gas savings over 5 years, the price of the model drops to $22k, which is 42.5% lower. Based on this analysis, we see Model 3 sales outnumber rivals' numbers, and we understand the reason for the more than 455k reservations.

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[13] American vehicle classification, which is the equivalent to the E-Class segment in the European classification.
[14] These are base prices in the US market. We focus in the US market because is Tesla's main market.
[15] Under current regulations, a $7,5k federal tax credit is available in the United States for the purchase of qualified electric vehicles with at least 17 kWh of battery capacity, such as Tesla vehicles. There are different financial incentives in other countries, but we focus on the US market.
[16] Number disclosed by Tesla when you are placing an order for the Model.
[17] We do not include the $1.2k destination and document fee in the final price, because comparable models' prices do not include too.
[18] Number disclosed by Tesla when you are placing an order for the Model.
[19] Tesla's cars are connected wirelessly to a remotely managed central corporate office. This allows Tesla to be the only one able to examine its cars via internet connection and solve most of the problems through software updates remotely while their customers' cars are in their garages.
[20] A Tesla powertrain (i.e. battery, motor, power electronics, charger) "has about a dozen moving parts". "Traditional cars and hybrids have anywhere from hundreds to thousands of moving parts." "Tesla owners not only dodge gas stations; they mostly get to skip out on visits to mechanics. A traditional vehicle needs oil and transmission fluid changes to deal with all the friction and wear and tear produced by its thousands of moving parts. The simpler electric car design eliminates this type of maintenance." Tesla models "also take advantage of what's known as regenerative braking, which extends the life of the brakes." – on Ashlee Vance's biography about Elon Musk
[21] Model X 75D (base version) goes from 0-60 mph in 4.9 seconds. BMW X5 base version takes 6.1 seconds. Audi Q7 takes 5.7s.
[22] This is due to the ability to store luggage in the front (where the engine normally is) as well as the lack of exhaust system which makes for a lower floor in the rear cargo space. This also applies to Model S.
[23] Model X is the first SUV to achieve 5-star Safety Rating in Every Category.

Energy storage industry

Overview

Energy storage is the capture of energy produced at one time for use at a later time.

There are multiple energy storage technologies currently available. The most known are pumped hydro, compressed air, flywheel, thermal and batteries. The most known battery types are sodium-sulphur, lead-acid, lithium-ion and flow batteries.

As of 2016, the global energy storage capacity was 148 GWh. Pumped hydro storage accounts for the vast majority, with up to 145 GW in operation. After pumped storage, batteries are the next most used option with up 1.3 GWh in operation.

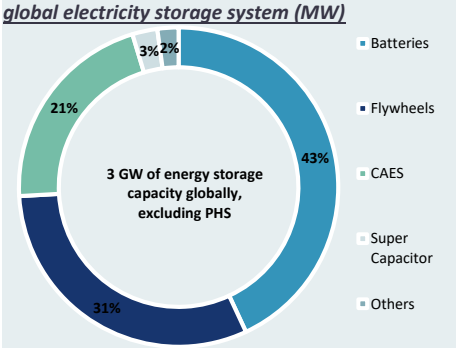
In the battery storage market, lithium-ion batteries are the number one technology with a 74% share of the global battery storage system. The reasons for this dominance are: its cost and weight, its ability to charge and discharge repeatedly, its safety and its durability[24].

Due to rising demand, fierce competition, expanding manufacturing capacity and technology improvements, battery costs have been decreasing significantly.

According to BNEF, an additional 154 GWh of capacity will get built in the next five years, bringing global capacity to 273 GWh by 2021. Tesla/Panasonic will become the biggest lithium-ion battery manufacturer in 2018, and it will remain as it, at least until 2021.

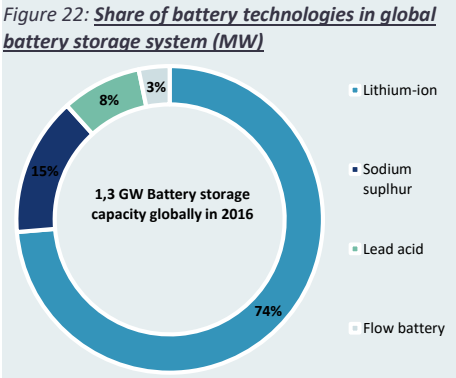
Lithium-ion batteries are used in small portable electronic devices such as computers and mobile phones, electric vehicles (EVs) and stationary energy storage. We focus on the stationary battery market, since Tesla only sells stationary batteries.

*Figure 21: **Share of storage technologies in the global electricity storage system (MW)***



Source: IRENA

*Figure 22: **Share of battery technologies in global battery storage system (MW)***



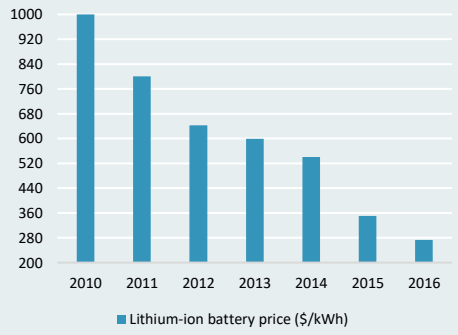
Source: IRENA

Competition in stationary battery markets

Residential market

Tesla's Powerwall 2 home battery storage unit is 30% cheaper than its next closest competitor. Powerwall 2 has the most favourable cost to store each kWh of energy in the battery, as warrantied by the manufacturer. Taking into account that Tesla offers the Powerwall 2 with built-in battery-inverter, while its closest competitors on cost per stored kilowatt-hour do not offer comparable inverters, Powerwall 2 becomes even more appealing .

*Figure 23: **Lithium-ion battery price ($/kWh)***

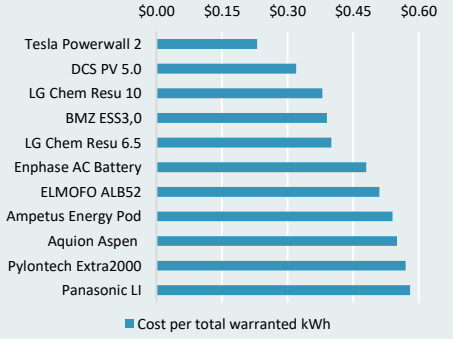


Source: BNEF

C&I and Utility markets

For these market segments Tesla has Powerpack 2. In July 2017, Tesla was selected to provide 100 MW/129 MWh Powerpack system in Australia. Tesla was selected among 90 initial bidders. This says a lot about Tesla's competitive offering when it comes to large-scale energy storage. This system will be the largest lithium-ion battery storage project in the world, and it will provide enough power for more than 30,000 homes. In addition, Tesla recently started Powerwall 2 installations in the country and it won another contract with a major Australian electric grid to deploy Powerpacks across several sites.

*Figure 24: **Powerwall 2 competition***



Source: RenewEconomy

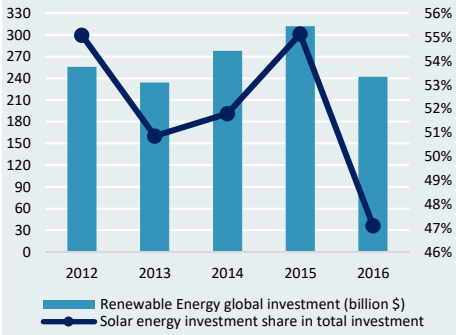
[24] The Economist August 12th, 2017; Electrifying everything, p.16.

Solar energy industry

Overview

Global demand for energy continues to rise, reflecting an expanding global economy, population growth, urbanisation, and improved energy access. At the same time, global warming that result from heavy reliance on fossil fuels is driving governments to seek more sustainable energy sources. Global new investment in renewables excluding large hydro fell by 23% to 242 billion in 2016. Approximately $114 billion of investments went into solar industry.

*Figure 25: **Global Renewable Energy Investment***

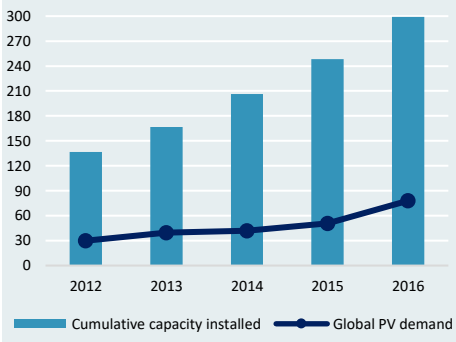


Source: U.S. DOE

Solar Photovoltaic Global Market

In 2016, global PV installations reached 299 GW (+33% vs 2015). In 2001, there was only 1 GW of cumulative installations, which means the industry has grown by a factor of 299. The top ten markets represented 92% of annual PV installations in 2016. China represented 46% of annual global installations in 2016. Despite a large concentration of installs in a few markets, many new markets are expanding around the world. From 2012 to 2016, Asian countries (other than China, Japan, and India) installed 8.6 GW, African countries installed 2.1 GW and South America countries installed 1.8 GW[25].

*Figure 26: **Solar PV global market (GW)***

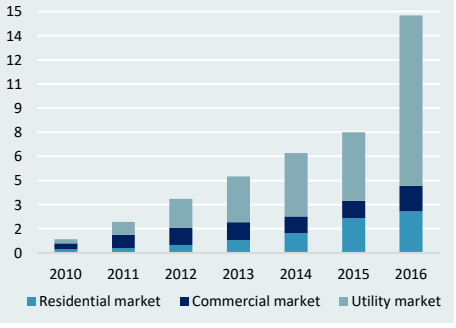


Source: U.S. DOE

U.S. solar PV market

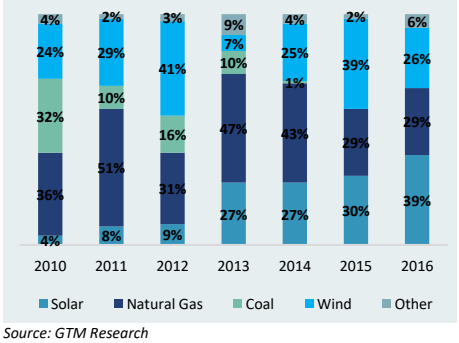
Solar energy in the United States is "booming". In 2016, a record year for solar, the PV market grew 97% over 2015, installing 14.8 GW. Growth was primarily driven by the utility segment, which installed more in 2016 than the entire market in 2015. In 2016, Solar installed 39% of all new electric generating capacity in the country, topping all other technologies for the first time. Solar's increasing competitiveness against other technologies has allowed it to quickly increase its share of total U.S. electrical generation, from just 0.1% in 2010 to 1.4% in 2016[26]. The growth in solar has been led by falling prices. The blended average cost to install solar has dropped 49% in the last 4 years, leading the industry to expand into new markets and deploy thousands of systems nationwide[37].

*Figure 29: **Solar PV capacity additions by market segment in US (GW)***



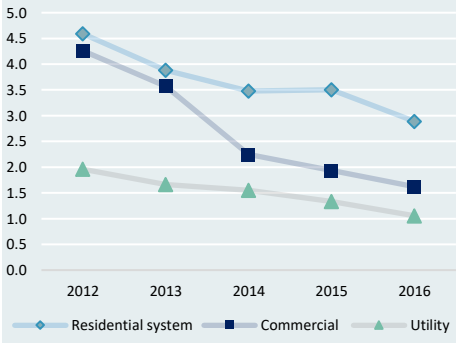
Source: GTM Research

*Figure 28: **US Electricity Generating Capacity Additions by technology***



Source: GTM Research

*Figure 27: **Solar System Average Price in US ($/W)***



Source: GTM Research

Competition

Tesla/SolarCity focuses essentially in the residential and commercial segments of the US market, where it is market leader, with 26% and 9% market share respectively. In the residential market, Tesla's big competitors are Sunrun and Vivint Solar among at least 287 companies; and in the commercial segment, where there are 154 solar commercial-scale solar contractors, its big competitors are Catsink and Brahma hunt.

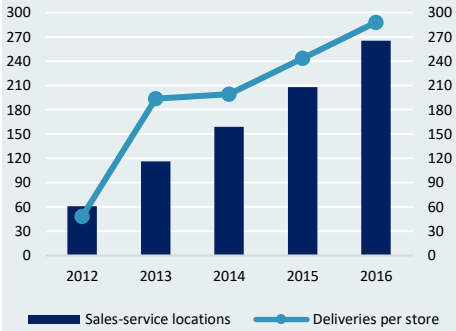
[25] United States Department of Energy (U.S. DOE), Q4 2016/Q1 2017 Solar Industry Update.
[26] GTM research, US Solar Market Insight, 2016 Year in Review.

Competitive advantages

We believe Tesla has many competitive advantages, mainly in the automotive industry. They are the following:

1. ***Simpler, more resource-efficient product portfolio***: While traditional automakers have a very diverse product portfolio (Audi offers 27 different models under two brands[27]; BMW offers 20 models under three brands[28], to give some examples) and multiple powertrain configurations (ICE, PHEV, HEV, BEV) to support, Tesla just offers three models, all BEVs. Moreover, according to Goldman Sachs, electric vehicles have just 1/3 the parts of gasoline vehicles (11k vs 30k). This translates in less engineering and sales teams, in less plants, less individual tooling & machinery investments, and less marketing expenses than the competition.
2. ***No fuel economy regulations to meet*:** The need for more fuel-efficient automobiles - imposed by government regulations to lower CO2 emissions and fight climate change - will increase the cost of gasoline cars by more than $2500 per vehicle in 2025[29]. With an all-electric product portfolio, Tesla's only exposure to that is the benefit of generating and selling credits[30].
3. ***Direct-to-consumer business model*:** Due to no legacy arrangements with a dealer network, Tesla can sell vehicles directly to the end consumer through its company-owned stores and the internet. We believe this distribution model will allow Tesla to delivered 1.5k units per store in 2025, which is 2.5x of its main competitor[31]. Moreover, OEM's give up about 18 -19 points of margin to a dealer[32]. Assuming Tesla will spend the same as the industry average, this distribution model gives it a 4.7 - 5.2 point advantage to traditional OEM's. Besides the financial benefits, this distribution model allows a direct relationship with the end customer, enabling Tesla to better manage warranty service and pricing, obtain faster customer feedback, and offer a superior customer experience.

*Figure 30: **Tesla distribution network***



Source: Company reports

4. ***Leadership in battery cost*:** On early 2016, Tesla´s vice president of Investor Relations stated that Tesla´s battery pack cost was below $190/kWh, which is 30% less than the industry average in that year[33]. This leadership allows Tesla to offered the vehicle with the lowest price per kWh (*Model 3*)[34] and the stationary battery with the lowest cost per kWh warranted (*Powerwall 2*)[35]. We believe that this cost advantage will remain as the production at the Gigafactory will increase significantly in the next few years. The vast $5bn gigafactory Tesla is building with Panasonic in Nevada is thought to already be producing about 4GWh a year[36] and by the end of 2018, it will produce 12.5 GWh/year. By the end of 2021, it will produce 35 GWh/year, turning Tesla the biggest manufacturer of lithium-ion batteries[37].
5. ***Superior owner experience*:** Tesla's cars are connected wirelessly to a remotely managed central corporate office. This allows Tesla to be the only one able to examine its cars via internet connection and solve most of the problems through software updates remotely while their customers' cars are in their garages. The company also uses the capability to improve their customer's cars with new features, such as new traction controls, faster charging, range extension, and many others, making Tesla cars the only ones that improve after being bought. Most recently, Tesla extended the range of some Florida vehicles for drivers to escape Hurricane Irma[38]. If the car needs to be "physically" repaired, Tesla sends a Tesla ranger to the client's house. If the problem is more serious, Tesla picks up the car at the client's house, and lend another during the repair period. In December 2016, a Consumer Reports survey ranked Tesla as having the best owner satisfaction, with 91% of customers saying they would purchase from Tesla again. This result was seven percentage points ahead of its closest competitor, Porsche[39]. The main reason was because Tesla offers the option to deliver its cars at clients' homes. No other automaker offers this.

[27] Audi's 2016 annual report.
[28] BMW's 2016 annual report.
[29] Goldman Sachs – CARS 2025.
[30] For example, under California's Zero- Emission Vehicle Regulation and those of states that have adopted California's standard, vehicle manufacturers are required to earn or purchase credits for compliance with their annual regulatory requirements. These laws provide that automakers may bank excess credits, referred to as ZEV credits, if they earn more credits than the minimum quantity required by those laws. Similar regulations exist at the federal level that require compliance related to greenhouse gas emissions and also allow for the sale of excess credits by one manufacturer to other manufacturers. As a manufacturer solely of zero emission vehicles, Tesla have earned emission credits, such as ZEV and GHG credits on vehicles, and expects to continue to earn these credits in the future. Tesla enters into contractual agreements with third parties to sell them its excess regulatory credits.
[31] Tesla number seems too high, but if we consider just the 455k reservations for Model 3 as sales in 2017, Tesla would have sold 1.5k units per store, while BMW sold 589 units per dealership in 2016, its record level.
[32] We use values from the Damodaran's database (http://pages.stern.nyu.edu/~adamodar/) to determine Automotive Retail gross profit margin.
[33] See figure "Lithium-ion battery price" on page 12.
[34] See figure "Plug-in electric vehicle market" on page 14.
[35] See figure "Powerwall 2 competition" on page 17.
[36] The Economist August 12th, 2017; Electrifying everything, p.16.
[37] See figure "Lithium-ion battery manufacturing capacity by manufacturer" on page 17.
[38] www.theverge.com/2017/9/10/16283330/tesla-hurricane-irma-update-florida-extend-range-model-s-x-60-60d.
[39] Tesla's Fourth Quarter 2016 Current report.

SWOT Analysis

Strengths

1. ***Strong Revenue Growth***: Tesla has been growing at a rapid pace over the last few years. Revenue increased 73% in 2016, after jumping 27% and 60% in 2015 and 2014, respectively. In 2017 revenue is expected to increase 70.1% and 65.9% in 2018 (*Street's average estimates, Yahoo Finance*).
2. ***Excellent Gross Profit Margin***: The last 3-years Tesla's gross profit margin average was 35%, while the other premium manufacturers' was 30%.
3. ***Robust Powertrain Technology*:** Tesla's powertrain[43] is the result of 14 years of experience, the highest in the EV industry. Moreover, the company makes most of the components used in its vehicles, in contrast to the industry standard, where most components are sourced from third-party suppliers. This approach allows Tesla a better control over quality and costs. It also allows Tesla to innovate and make changes faster than the others.

Revenue Growth

	2014	2015	2016	2017E	2018E
Tesla	***59%***	***26%***	***73%***	***70%***	***66%***
Audi	*8%*	*9%*	*2%*	*5%*	*3%*
BMW	*6%*	*15%*	*2%*	*5%*	*3%*
Ford	*-2%*	*4%*	*1%*	*1%*	*0%*
GM	*0%*	*-2%*	*9%*	*-11%*	*-4%*
Daimler	*10%*	*15%*	*3%*	*6%*	*3%*
Industry Av.[40]	*-2%*	*-3%*	*5%*	-	-

Source: Companies reports for historical data; Yahoo Finance for estimates

Gross Profit Margin[41]

	2014	2015	2016	2017E	2018E
Tesla	***35%***	***33%***	***36%***	***37%***	***36%***
Audi	*27%*	*29%*	*29%*	*29%*	*29%*
BMW	*34%*	*32%*	*32%*	*31%*	*31%*
Ford	*18%*	*22%*	*21%*	*21%*	*21%*
GM	*18%*	*22%*	*24%*	*24%*	*24%*
Daimler	*28%*	*28%*	*28%*	*28%*	*28%*
Industry Av.[42]	*19%*	*19%*	*19%*	-	-

Source: Companies reports; Our estimations

4. ***Strong brand*:** According to the BrandZ report[44] based in data drawn from interviews with more than three million consumers worldwide, Tesla is the 8th most valuable car brand. Moreover, Tesla was included in The Harris Poll[45] for the first time this year, and It had a tremendous result, with respondents awarded it an "excellent" reputation rating, and ranked it 9th among all companies in the world. That's the highest of any automaker (Toyota earned the second-best ranking at 16th, and emissions cheater Volkswagen came in last at 91st).

Weaknesses

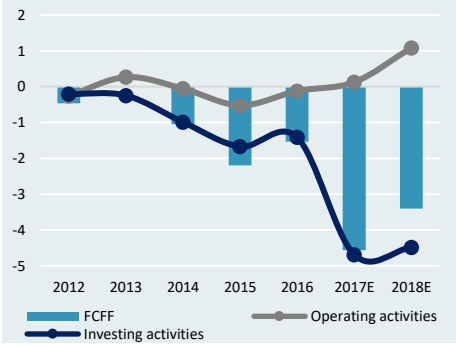
1. ***High operating expenses***: In 2016, Tesla spent an amount equivalent to 32% of its revenues in operating expenses, while the industry average was 13%[47]. In some of the previous years, the gap was even wider. These expenses are the reason Tesla has not been able to achieve a positive net profit yet.
2. ***Negative Free Cash Flow***: Tesla has been spending significant amounts of cash over the years. In 2016, the company invested $1.4 billion and lost $124 million with its operations. In 2015, the scenario was even worse. This is largely due to the significant investments it has made in research and development for the transformative technology in its cars, and in its network of stores and service centers. Tesla is also investing heavily for the construction of the Supercharger network and the Gigafactory. Because of these large cash outflows, Tesla has reported negative free cash flows for nearly every year since its IPO in 2009. As a result, Tesla has been forced to raise more debt and sell more shares.
3. ***Limited supply chain***: Most of the purchased parts included in Tesla products are sourced from single suppliers. For example, Panasonic is the only battery cell supplier of Tesla[48]. This limited supply chain exposes the company to potential component shortages for the production of its products.

Operating expenses

	2014	2015	2016	2017E	2018E
Tesla	***33%***	***41%***	***32%***	***30%***	***24%***
Audi	*15%*	*16%*	*15%*	*15%*	*15%*
BMW	*13%*	*13%*	*13%*	*13%*	*13%*
Ford	*13%*	*12%*	*12%*	*13%*	*13%*
GM	*13%*	*14%*	*12%*	*11%*	*11%*
Daimler	*14%*	*12%*	*13%*	*13%*	*13%*
Ind Av.[46]	*12%*	*12%*	*13%*	-	-

Source: Companies reports; Our estimations. As % of revenue.

*Figure 31: **Tesla Cash Flows ($ billions)***



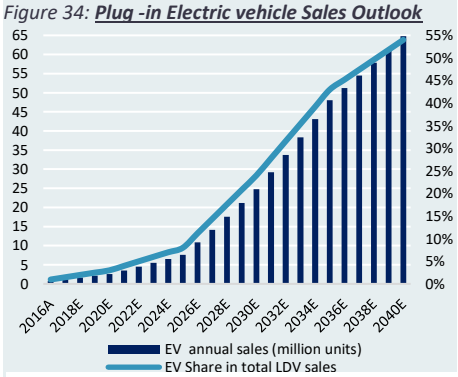
Source: Company reports

[40] Wright Industry Averages Report – Automobiles & Components (Global) sector.
[41] These margins are different than the ones reported by the companies' financial reports. We subtracted depreciations to cost of revenues to find EBITDA. Most companies (all in this case) do not disclose neither depreciations nor EBITDA in their income statements. This adjustment increases gross profit but all accounts from EBIT remain the same.
[42] Wright Industry Averages Report – Automobiles & Components (Global) sector.
[43] Comprises the battery pack, power electronics, motor, gearbox, and control software.
[44] A popular annual research paper by Millward Brown group.
[45] Since the 1960s, The Harris Poll* has been publishing market research and consumer surveys on a wide variety of topics. The Harris Poll Reputation Quotient (RQ) ranks the 100 "most visible companies" in the US in terms of their corporate reputations. The 2017 Reputation Quotient is based on a survey of over 23,000 Americans, who ranked corporations according to six criteria: Social Responsibility, Emotional Appeal, Products and Services, Vision and Leadership, Financial Performance, and Workplace Environment. Scores about 80 mean excellent reputation.
[46] Wright Industry Averages Report – Automobiles & Components (Global) sector.
[47] Wright Industry Averages Report – Automobiles & Components (Global) sector.
[48] Company reports.

Opportunities

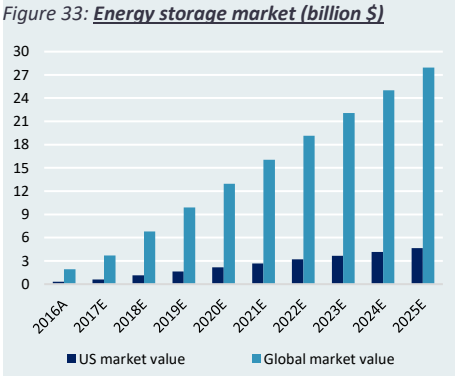
1. ***PEV market***: We estimate that 23 million PEVs will be sold worldwide until 2025. To give perspective, only 2 million were sold as of December 31, 2016. In 2040, cumulative sales will be 528 million, which is still only half of the number of light duty vehicles on the road as of the end of 2016[49].
2. ***Stationary Battery market***: We estimate that US energy storage market will worth $4.7B in 2025 (14.6x 2016's market value), which implies a CAGR of 35% in the next 9 years[50]. Global market will be worth $27.9B in 2025[51].
   We believe lithium-ion batteries will continue to be the dominant battery technology[52], because the characteristics that made it dominant "have all been achieved through an endless process of fine tuning, rather than eureka moments"[53].
3. ***Solar energy market***: We estimate Global solar PV market will be worth $169B in 2025 (1.4x 2016's market value), which implies a CAGR of 4% in the next 9 years[54]. Rising electricity prices[55] – which make solar more competitive in comparison -, falling solar costs[56], and policy support to mitigate climate change, will be the main drivers of this growth.

*Figure 34: **Plug -in Electric vehicle Sales Outlook***



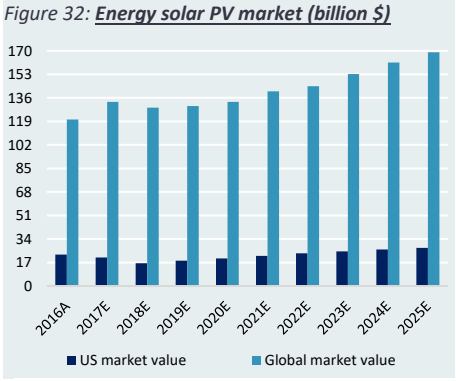
Source: BNEF

*Figure 33: **Energy storage market (billion $)***



Source: GTM Research

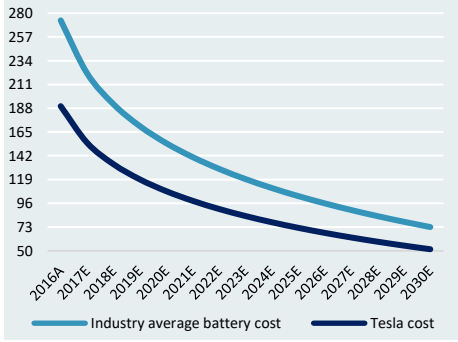
*Figure 32: **Energy solar PV market (billion $)***



Source: GTM Research

4. ***Decreasing Battery cost*:** BNEF forecasts lithium-ion battery pack prices will continue to fall to as little as $73/kWh in 2030. Assuming Tesla will keep the cost advantage verified in 2016[57], Tesla's battery cost per kWh will be $154.6/kWh at the end of 2017, $72.2/kWh at the end of 2025 and $52/kWh by the end of 2030.
   Mass manufacturing allowing economies of scale, design improvements lowering input requirements, and chemistry improvements are the factors that will decrease the cost of lithium-ion batteries[58].

*Figure 35: **Battery Cost Outlook ($/kWh)***



Source: BNEF for industry values; Our estimations for Tesla's

Threats

1. ***Increasing competition in the EV market:*** By April 2017, nine global OEMs had publicly announced their willingness to create or significantly widen their electric model offer over the next five to ten years. Several Chinese OEMs also announced very significant electric car production capacity scale-up plans[59]. In addition, at least 10 car startups are actively developing EV models for the global market[60]. Some examples are Google and Apple.

List of OEMs electric car plans, as of April 2017

OEM	Announcement
BMW	0,1 million electric car sales in 2017 and 15-25% of the BMW group's sales by 2025
General Motors	30k annual electric car sales by 2017
Daimler	0,1 million annual electric car sales by 2020
Ford	13 new EV models
Renault-Nissan	1,5 million cumulative sales of EVs by 2020
Volkswagen	2-3 million annual electric car sales by 2025
Chinese OEMs	4,25 million annual electric car sales by 2020

Source: International Energy Agency (IEA); Global EV Outlook 2017

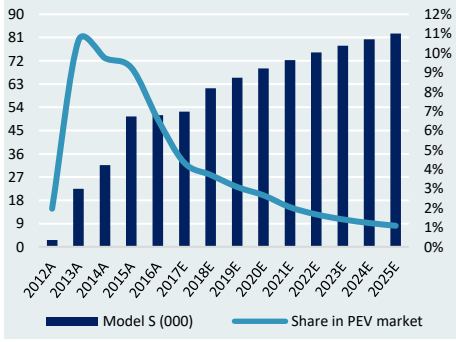
[49] All these numbers are based on BNEF forecasts. BNEF (Bloomberg New Energy Finance) is a research organization that helps energy professionals generate opportunities.
[50] We based these numbers, on GTM research forecasts and in results from the "forecast sheet" excel tool.
[51] We assume global market will be 6x the size of the US market. Morgan Stanley expects to the global market will be 7 to 8 times bigger than the U.S. market.
[52] See Energy storage industry-overview, p.16.
[53] The Economist August 12th, 2017; Electrifying everything, p.17.
[54] We based these numbers, on GTM research forecasts and in results from "forecast sheet" excel tool.
[55] The U.S residential average cost was 12.65 cents/kWh in 2015 and it is expected to increase to 13.31 cents in 2018 (EIA; Short-Term Energy Outlook). This trend applies to other markets. For example, the electricity price for household consumers in the E.U. 28, increased from slightly higher than 0.15€/kWh in 2008 to slightly higher than 0.20€ in 2016 (Eurostat).
[56] GTM research expects that the residential rooftop system cost in the U.S. will be 2.4$/W and 1.38$/W by 2020 and 2030, respectively. Utility-Scale Fixed Tilt cost is expected to decrease to 1.04$/W by 2020 and 0.93$/W by 2030.
[57] See competitive advantages, page 23, n.4.
[58] From LAZARD'SLEVELIZEDCOST OF STORAGE—VERSION2.0, December 2016.
[59] According to the International Energy Agency (IEA); Global EV Outlook 2017.
[60] Cairn ERA (Cairn Energy Research Advisors), EV and Transportation Battery Global Overview, October 19, 2016; p.18.

Vehicle Production and deliveries

In 2016, Tesla produced 83.9k vehicles (+64% YOY) and delivered 76.3k. In the first half of 2017, the company produced 51.1k vehicles (+51% than in the first half of 2016) and delivered 47.1k. We expect 72.9k deliveries in the second half of 2017.

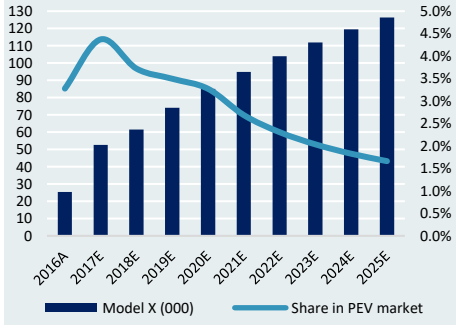
Model S sales (2018-2025): We expect sales will increase from 52.3k in 2017 towards 82.6k in 2025, which is significantly lower than its main competitors[61]. We assume that model S base price in 2018 will be equal to 2017´s last quarter ($74,5k) and then it will decrease towards $67k in 2025[62]. Considering the gas savings of $5.5k[63], the Model S price drops to $61.5k, which is 19% higher than the average price of main competition.

*Figure 36: **Model S deliveries***



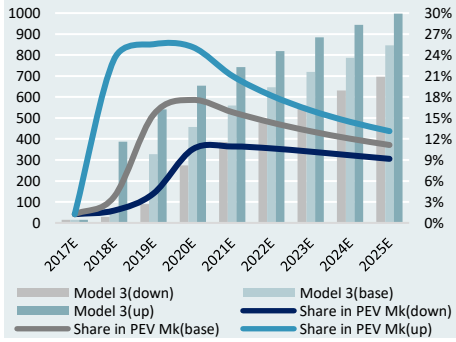
Model X sales (2018-2025): Model X deliveries started at the end of 2015 and they were 25.4k units in 2016. We expect sales will increase from $52.7k in 2017 to 126.3k in 2025, which is about the average of its main competitors[64]. We assume Model X base price will decrease from $79.5k towards $72k in 2025[6]. Considering the estimated gas savings (over 5 years) of $5.5k advantage over the ICE competitors, the Model X price drops to $66.5k, being only 10% higher than the average price of main competition [65]. This premium is easily justified[66].

*Figure 37: **Model X deliveries***



Model 3 production and sales (2018-2025): As of July 28, 2017, Tesla had 455k net reservations for Model 3. Tesla's goal is to have produced 430k Model 3 by the end of 2018, which implies an overall production volume growth of 325% YOY. In our view, this will be a very difficult target to accomplish. Therefore, we decide to consider 3 different scenarios regarding Model 3 production between 2018 and 2025[67]. In the *Upside scenario*, we assume Tesla will achieve its production goal, producing 414k Model 3 in 2018. Then the production will increase logarithmically until approximately 1 million units in 2025, of which 997k will be delivered. In the *Base scenario*, we assume that Tesla will only achieve that cumulative production level in 2019. Then we assume that the production will increase logarithmically until approximately 855k units in 2025, of which 846.5k will be delivered. In the Downside scenario, we assume that Tesla will only achieve cumulative production level of 430k model 3 units in 2020. Then we assume that the production will increase logarithmically until approximately 703k units in 2025. We do not see any problem in Model 3 deliveries achieve the projections in any of the scenarios. BMW, Audi and Mercedes sold 770.6k, 785.1k and 664.4k units of comparable vehicles in 2016. We assume Model 3 base price will decrease from $35k towards $31.8k in 2025[6]. Considering the estimated gas savings of $5.5k, the Model 3 base price will be 31% lower than the average of the comparable models in 2025 ($38.3k), which is tremendous, since the model is also more technologically advanced, safer, and faster[81].

*Figure 38: **Model 3 deliveries (000)***



Total production and sales (2018-2025): In the *Upside scenario:* Total production will increase from 545k units in 2018 to 1.22 million vehicles, while total deliveries will increase from 510k to 1.2 million, which implies a 16% share of the PEV market (vs 10% in 2016) and a 1.3% share in the total LDV market[68](vs 0.1% in 2016). *Base scenario*: Total production will increase from 197.7k units in 2018 to 1.07 million vehicles in 2025, while total deliveries will increase from 184.7k to 1.06 million, which implies a 14% share of the PEV market (vs 10% in 2016) and a 1.1% share in the total LDV market. Downside scenario: Total production will increase from 162.7k units in 2018 to 914k vehicles in 2025, while total deliveries will increase from 151.9k to 905k, which implies a 12% share of the PEV market (vs 10% in 2016) and a 1.0% share in the total LDV market.

[61] Comparable models, such as BMW 5-series ($52.4k), Audi A6 ($49.7k) and Mercedes E-class ($52.95k), sold 331k, 276k and 304k units in 2016, respectively.
[62] We consider this price reduction, because currently there is a $7,5k federal tax credit for BEV buyers in the US, and many other financial incentives in other countries - and they eventually will end up. For example, the credit available in US begins to phase out once a manufacturer has sold 200k qualified vehicles, which means that by 2019 it will probably not exist. Therefore, we think it is plausible that Tesla could drop the price as battery costs decrease to maintain price competitiveness.
[63] Number disclosed by Tesla when you are placing an order for the Model.
[64] Comparable models, such as BMW X5 ($56.6k) and Audi Q7 ($49.7k) sold 166.2k and 103.5k in 2016, respectively. Sales of these models have increased 11% and 18% annually, on average, respectively, in the last 4 years. Mercedes sales in the SUV segment increased by 31% to 712.1k units in 2016.
[65] The average base price of the comparable models is 60.4k.
[66] See competition analysis.
[67] We assume the company produces 16k units in 2017.
[68] Main competitors, Mercedes, BMW and Audi shares in the total light duty vehicle market were 2.4%, 2.3% and 2.2% in 2016, respectively.

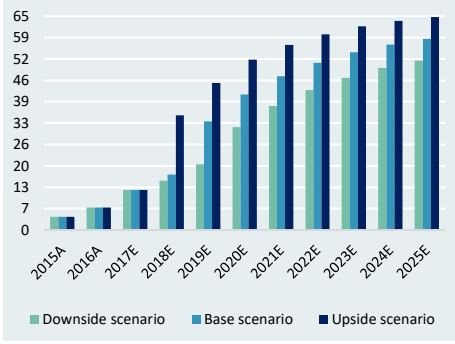
Revenues

Automotive segment

This segment includes revenues from: automotive sales; sales of regulatory credits; automotive leasing and services & other. In 2016, total automotive revenue was $6.8 billion (+69% YOY vs +26% and +59% in 2015 and 2014). In 2017, revenue will increase 78% to $12 billion. For the rest of the forecasted period:

- *Upside scenario*: Revenue will increase towards $64.7 billion in 2025, which implies a CAGR of 23%.
- *Base scenario*: Revenue will increase towards $58 billion in 2025, which implies a CAGR of 22%.
- *Downside scenario*: Revenue will increase towards $51 billion in 2025, which implies a CAGR of 20%.

*Figure 39: **Total Automotive Revenue ($billion)***

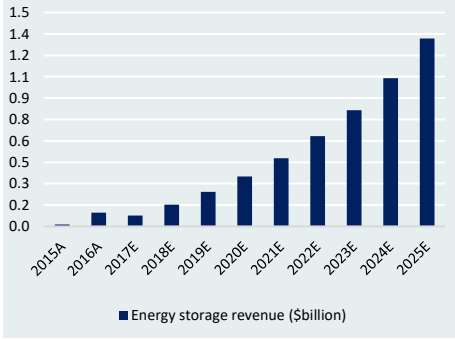


Energy segment

Energy Storage Revenue

In 2016, revenue from the storage business was $97 million (+572% YOY). In 2017, revenue will decrease 22% to $76 million. Revenue in the first half of 2017 was 22% lower than in the first half of 2016. To be conservative, we assume that the revenues in the second half of 2017 will be as much as good as the first half of 2017 revenues were compared to the homologous period. Thenceforth, revenue will increase towards $1.3 million in 2025, which implies a CAGR of 43%[69].

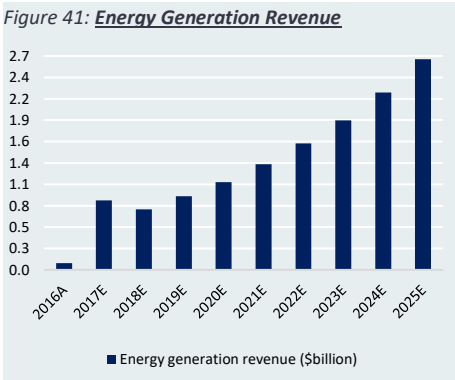
*Figure 40: **Energy Storage Revenue***



Energy Generation Revenue

In 2016, revenue from the solar business was $84 million, as a result of the inclusion of revenue from SolarCity from the acquisition date of November 21, 2016 through December 31, 2016. In 2017, revenue will be $878 million. In 2018, revenue will decrease to 13% to $765 million, due to the fact that new solar PV installations (in GW) in the US market (Tesla's main market) will decrease 17%. Thenceforth, revenue will increase every year towards $2.7 billion in 2025. The implied CAGR between 2017-2025 is 15%[70].

*Figure 41: **Energy Generation Revenue***

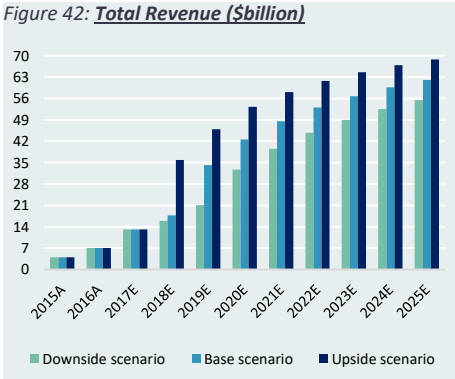


Total Revenue

In 2016, Tesla's total revenue was $7 billion dollars (+73% YOY vs +27% in 2015). In 2017, total revenue will increase 87% to $13 billion[71]. For the rest of the forecasted period:

- *Upside scenario*: In 2018, total Revenue will be $35.8 billion (+35% than the Street's high estimate of $26.2 billion). Thenceforth, revenue will increase every year towards $68.7 billion in 2025, which implies a CAGR of 23% (2018 included).
- *Base scenario*: In 2018, total Revenue will be $17.8 billion (-14% than the Street's average estimate of $20 billion). Thenceforth, revenue will increase every year towards $62 million in 2025, which implies a CAGR of 21%.
- *Downside scenario*: In 2018, total Revenue will be $15.9 billion (very close to the Street's low estimate of $15.44 billion). Thenceforth, revenue will increase every year towards $55 billion in 2025, which implies a CAGR of 20%.

*Figure 42: **Total Revenue ($billion)***



[69] These projections are the result of some assumptions, which can be seen in "storage revenue forecast".
[70] These projections are the result of some assumptions, which can be seen in "solar revenue forecast".
[71] Slightly higher than the Street's high estimate of $12.91 billion. (From Yahoo Finance: average analyst estimate is $11,88 B low estimate is $10,78 B high is $12,91B).

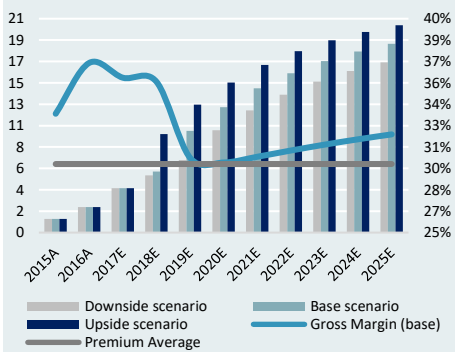
Gross Profit Margins

Automotive segment

Model S/X gross margin

In 2016, the Model S/X gross margin (adjusted for depreciations) was 28.3%. In the first two quarters of 2017, the margin was 31.2% and 32.3%. We estimate that 2017's total gross margin will be 31.9%, for an average sales price of $105.9k[72], a battery cost per vehicle of 16.2k[73] and other costs of 56k[74]. Thenceforth, Model S/X gross margin will increase towards 35.4% in 2022 and then it will decrease towards 34.7% in 2025. This improvement is due to lower battery cost per kWh[75], that more than offsets the average sales price decrease we assumed.

*Figure 43: **Automotive Gross Profit ($billion)***



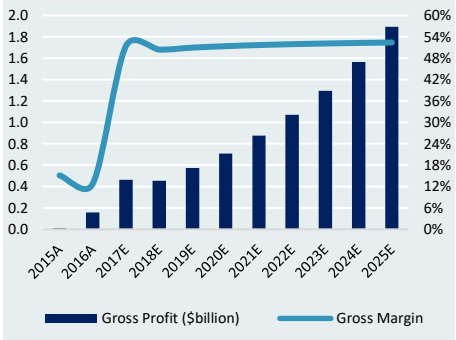
Model 3 gross margin

Model 3 is 6% smaller in length than Model S/X, it has half the cargo volume, it is made of aluminium and steel, which is a cheaper metal, while the others are entirely made of aluminium. It also has 15 times less configurations than Model S/X[76]. Based on this, we assume that Model 3 other costs are half model S/X's. Moreover, Model 3 base model has a 55-kWh battery, less 27% capacity than the Model S/X. We estimate that 2017's total gross margin will be 17.9%, for an average sales price of 48.7k[26], a battery cost per unit of 11.9k and other costs of 28k. Thenceforth, Model 3 gross margin per will increase towards 23.6% in 2025. This margin improvement is due to lower battery cost per kWh[29] , that more than offsets the average sales price decrease.

Automotive division gross margin

Gross margin was 36.9% in 2016 (vs 33.3% in 2015 and 34.9% in 2014). In the first two quarters of 2017, the margin was 37.3% and 35.7% (vs 36.0% and 36.5% in the first two quarters of 2016). The implied gross margin will be 36.7% and 34.5% in the next two quarters, which implies a total gross margin of 35.9% for 2017 (-0.1 points vs 2016). For the rest of the forecasted period: in the *upside scenario*, the average gross margin will be 30.2%; in the *base scenario*, 31.9%; and in the *downside scenario*, 33.5%.

*Figure 44: **Energy Gross Profit ($billion)***



Energy Segment

Gross margin was 12.8% in 2016 (vs 15.1% in 2015 and 4.9% in 2014). In the first two quarters of 2017, the margin was 53.1% and 51.0% (vs 20.3% and -106.6% in the first two quarters of 2016). We estimate gross margin will be 48.6% and 52.4% in the next two quarters, which implies a total gross margin of 51.5% for 2017 (+38.7 points vs 2016). This big jump is essentially due to the inclusion of SolarCity's results[77], which business has great gross margin – much higher than the Tesla's storage business. Moreover, Tesla stopper offering solar through the door-to-door sales channel, instead focusing on sales through Tesla stores and online channels[78], which are lot cheaper alternatives. In all scenarios, the average energy margin will be 52%.

Total gross margin

Gross margin was 36.3% in 2016 (vs 33.3% in 2015 and 34.8% in 2014). In the first two quarters of 2017, the margin was 38.4% and 37.5% (vs 35.7% and 36.1% in the first two quarters of 2016). Implied gross margin will be 37.4% and 35.5% in the next two quarters, which implies a total gross margin of 37.0% for 2017 (+0.7 points vs 2016). For the rest of the forecasted period: in the *upside scenario*, the average gross margin will be 31.1%; in the *base scenario*, 32.9%; and in the *downside scenario*, 34.5%.

[72] The Model S/X average sales price was equal to 1.4x the average base price in the last 6 quarters. We assume this multiple will remain, and we use it to achieve the average sales prices in the future, by multiplying it with the average base prices, assumed by us.
[73] To achieve battery cost per vehicle, we multiply base versions' number of kWh per battery by the cost per kWh and then we multiply by the "multiplier", which is equal to the division between average sales price and base price, and reflects premium versions of the models, which have batteries with more kWhs. The multiplier value in 2017 was 1.4x and we assume it will remain. Model S and X base versions have both a 75kWh battery, while Model 3 base version has a 55-kWh battery. We assume this will remain in the forecast period.
[74] "Other costs" were achieved by subtracting battery cost and gross profit to ASP in the past quarters. Then we assume Q2's other costs will remain in the next two quarters of 2017.
[75] We assume Tesla will keep the cost advantage verified in 2016 related to its lower battery costs (see competitive advantages).
[76] Tesla website.
[77] From the acquisition date of November 21, 2016 to December 31, 2016.
[78] Tesla Second Quarter 2017 current report.

Operating expenses

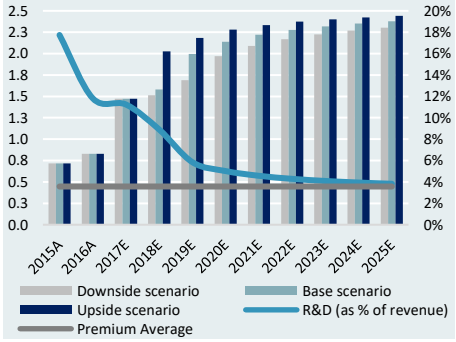
Research and development (R&D) and Sales, general and administrative (SG&A) expenses will continue to increase, as Tesla spends on creating new products and improving the current ones, and continues to build out the sales / service network to support expanding markets. The company expects these expenses to continue to increase in absolute dollars but decline as a percentage of revenue as It focus on increasing operational efficiency while continuing to expand its customer and corporate infrastructure.

Research and Development expenses

R&D expenses (adjusted for amortizations) as % of revenue was 11.8% in 2016 (vs 17.7% in 2015 and 14.5% in 2014). In the first two quarters of 2017, this percentage was 11.6% and 12.9% (vs 15.9% and 15.1% in the first two quarters of 2016). We estimate R&D as % of total revenue will be 10.8% and 10.3% in the next two quarters (vs 9.3% and 10.5% in the third and fourth quarter of 2016), which implies a total of 11.2% for 2017 (-0.6 points vs 2016). For the rest of the forecasted period: in the *upside scenario*, R&D as % of revenue will decrease towards 3.6% in 2025; in the *base scenario*, 3.8%; and in the *downside scenario*, 4.2%.

To give perspective, other premium manufacturers (Audi, BMW and Mercedes-Benz) spent in R&D an amount equivalent to 3.6% of revenue, on average, in the last 5-years[79].

*Figure 45: **Research and development ($billion)***

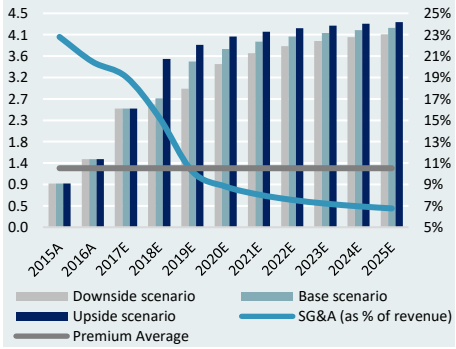


Selling, General and Administrative expenses

SG&A expenses as % of revenue was 20.5% in 2016 (vs 22.8% in 2015 and 18.9% in 2014). In the first two quarters of 2017, this percentage was 22.4% and 19.3% (vs 27.7% and 25.3% in the first two quarters of 2016). We estimate SG&A as % of total revenue will be 18.4% and 17.4% in the next two quarters (vs 14.7% and 20.0% in the third and fourth quarter of 2016), which implies a total of 19.1% for 2017 (-1.4 points vs 2016). For the rest of the forecasted period: in the *upside scenario*: SG&A as % of revenue will decrease towards 6.3% in 2025; in the *base scenario*, 6.8%; in the *downside scenario*,7.3%.

To give perspective, other premium manufacturers (Audi, BMW and Mercedes-Benz) spent in SG&A expenses an amount equivalent to 10.5% of revenue, on average, in the last 5-years[126], but on a much more diverse product portfolio and many more powertrain configurations to support and sell. As we saw in the competitive advantages section, Tesla has a simpler product portfolio, which translates in less engineering and sales teams, in less plants, and in less general and administrative expenses. Moreover, Tesla accumulated at least 455k net reservations for Model 3, with no advertising or paid endorsements, which means that Tesla does not have to spend billions in marketing to sell its vehicles[80], like the other OEMs.

*Figure 46: **Selling & Administrative ($billion)***

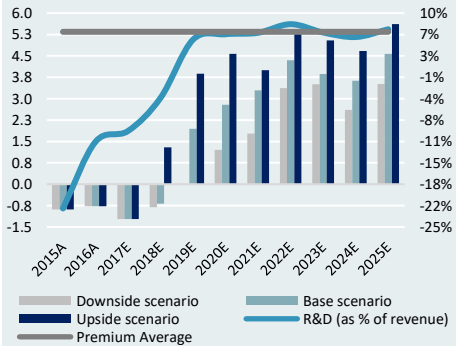


Net profit margin

This margin was -11% in 2016 (vs -22% in 2015 and -9.2% in 2014). In the first two quarters of 2017, the margin was -14.7% and -14.4% (vs -24.3% and -23.1% in the first two quarters of 2016). The implied gross margin will be -4.8% and -6.0% in the next two quarters (vs 1.0% and -3.6% in the third and fourth quarter of 2016), which implies a total net margin of -9.3% for 2017 (+1.7 pp vs 2016). The reason for the increase is the increase of the EBIT margin (+2.5 points). For the rest of the forecasted period: in the *upside scenario*, net profit margin will increase towards 8.2% in 2025; in the *base scenario*, 7.4%; in the *downside scenario*, 6.4%.

The last 5-year average net profit margin of the premium manufacturers we are using in this analysis was 6.9%, which is 0.5 points lower than Tesla's in the base scenario.

*Figure 47: **Net Profit ($billion)***

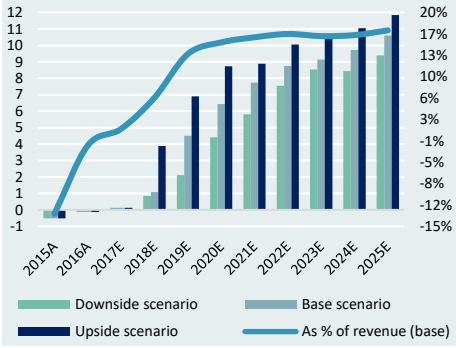


[79] We start by calculate the account as % of revenue for each company. Then we calculate the average % for each year, and then we calculate the average % in the last 5-years.
[80] Rothaermel, F. (2017), *Strategic Management*; page 77.

Cash Flow and Liquidity

Operating Activities

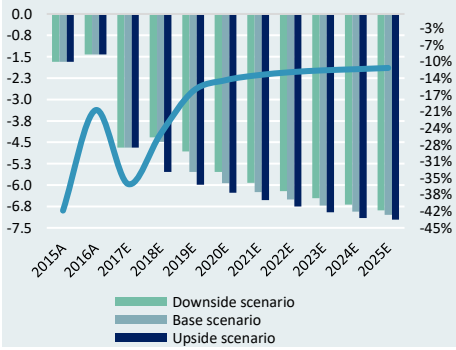
Figure 48: ***Operating Cash Flow ($billion)***



Cash flow from operating activities was -$124 million in 2016 (vs -$525 million in 2015 and -$57 in 2014). In the first two quarters of 2017, the cash flow was -$70 and -$200 (vs -$250M and $150M in the first two quarters of 2016). The cash flow will be $166M and $227M in the next two quarters (vs $424M and -$448M in the third and fourth quarter of 2016), which implies a total cash flow of $124M in 2017 (+$248M vs 2016). For the rest of the forecasted period: in the *upside scenario*, operating cash flow will increase towards $11.8B in 2025; in the *base scenario*, towards $10.6B; in the *downside scenario*, $9.4B.

Investing Activities

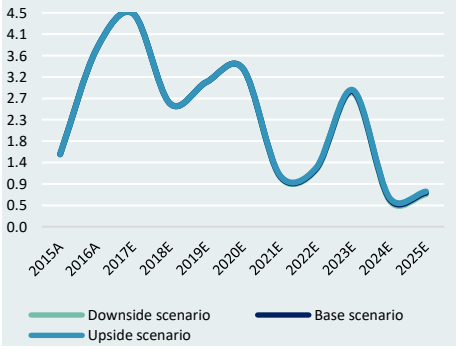
Figure 49: ***Investing Cash Flow ($billion)***



Cash flow from investing activities was -$1.4B in 2016 (vs -$1.67B in 2015 and -$990M in 2014). In the first two quarters of 2017, the cash flow was -$927M and -$1.2B (vs -$234M and -$320M in the first two quarters of 2016). We estimate cash flow will be -$1.1B and -$1.44B in the next two quarters (vs -$268M and -$595M in the third and fourth quarter of 2016), which implies a total cash flow of -$4.7BM in 2017 (+$3.27B vs 2016). The reason for the increase is the higher capital expenditure (purchase of PP&E and solar systems), which will increase from $1.4B to $4.3B.
For the rest of the forecasted period, in the *upside scenario*: net cash used in investing activities will increase towards to $7.2B in 2025; in the *base scenario*, towards to $7B in 2025; and in the *downside scenario*, towards to $6.9B in 2025.

Financing Activities

Figure 50: ***Financing Cash Flow ($billion)***

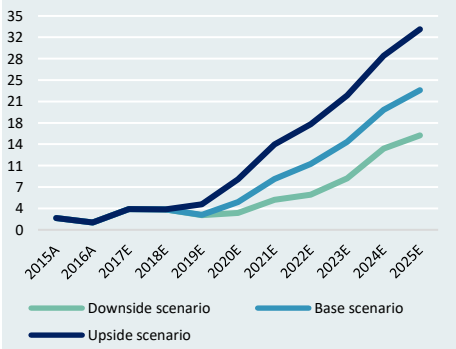


In 2016, 2015 and 2014, net cash provided by financing activities was $3.74 billion, $1.52 billion and $2.14 billion. In 2016 CFF consisted primarily of $1.70 billion net proceeds from the public offering of 7,915,004 shares of common stock, $995.4 million of proceeds from issuance of debt, net of repayments, and proceeds from collateralized borrowing of $769.7 million. During the six months ended June 30, 2017, net cash provided by financing activities was $2.0 billion, which consisted primarily of $966.4 million from the issuance of convertible senior notes and $400.2 million from a public offering of common stock. We estimate cash flow will be $2.45B (+$1.4B compared with the second half of 2016), which implies a total cash flow of $4.48BM in 2017 (+$738M compared with 2016). For the rest of the forecasted period: in the *upside scenario*: net cash provided for financing activities will decrease towards $741M in 2025; in the *base scenario*, towards $713M; and in the *downside scenario*: will decrease towards $683M in 2025.

As Tesla see its cash flow from operating activities increasing, the company will need less money from external sources.

Liquidity

Figure 51: ***Cash at the beg. Of Year ($billion)***



In 2017, 2016 and 2015 and 2014, cash at the beginning of the year was $3.4B, $1.2 billion and $1.9 billion. For the rest of the forecasted period:

- *Upside scenario*: cash at the beginning of the year will increase towards to $32.8B in 2025.
- *Base scenario*: cash at the beginning of the year will increase towards to $22.9B in 2025.
- *Downside scenario*: cash at the beginning of the year will increase towards to $15.5B in 2025.

Valuation Overview

To value Tesla stock, we use an approach that gives equal weightage to three different valuation methods, and then gives a probability of 70% to the base scenario, and 15% each for the other two scenarios.
Two of the valuation methods are based on the discounted cash flow approach – they are different regarding the terminal value calculation method- and the other is the "comparable companies" method.
We chose to value the company to 31/12/2018, because there are not enough catalysts to our 31/12/2017 price target of $259.

Discounted Cash Flow valuation method

The discounted cash flow method determines the value of a company by summing the net present value (PV) of the projected free cash flows and the present value of the company's terminal value.
Free cash flow (FCF) is the cash generated or lost by the company (with its business) before shareholders and lenders have been paid. It does not include cash flows related with financing activities.
The terminal value is the value of the company after the last year of the explicit forecast period.
To get the PVs, the cash flows and the terminal value are discounted at a rate that reflects the company's capital structure and its risk profile. The discount rate is the Weighted Average Cost of Capital (WACC).

Weighted Average Cost of Capital (WACC)

The **WACC** is the average expected rate of return of investors. It should be a current value, so it is appropriate to use the most recent data. It is calculated using the following formula[81]:

WACC = Debt /(Debt + Equity)*Cost of debt + Equity/(Debt + Equity)*Cost of Equity

Variable	Assumption	Description
Debt /(Debt + Equity)	**15%**	The market value of debt should be use, but we use the book value of the debt.We use the book value of the estimated Tesla's financial liabilities (only interest bearing debt) at the end of 2018 (the time the valuation takes place). ***Debt book value = long-term debt and capital leases, current & non-current + solar bonds issued to related parties + convertible senior notes***
Cost of debt	**5.3%**	The cost of debt is the expected return rate by debt lenders and it should be based on the most current interest rate. The most recent debt issuance was on August, 2017, and has an interest rate of 5.3%.
Equity/(Debt + Equity)	**85%**	As Equity value, should be used the market capitalization of the company, which is achieved by multiplying stock price ($354,6 as of 11/10/2017) with the diluted shares outstanding (165,21 million, as of 02/08/2017, the last time Tesla disclosed this number).
Cost of Equity	**6.83%**	This is the expected return rate by shareholders. Since this is not directly obtainable, especially for a public company, we must use an asset-pricing model. We use the Capital Asset Pricing Model (CAPM), the most common used in investment banking. According to CAPM: ***Cost of Equity= Risk free rate + Beta*Market Risk Premium + Country risk premium***
Risk Free Rate	**2.88%**	This is the expected rate from investing in securities free from credit risk, such as government bonds. In terms of geography, even though Tesla is a global business, it is U.S.–based. So, we use the US treasury rate as the risk-free rate. We chose the 30-year rate (2.88%, as of 11/10/2017), the biggest maturity, because the DCF valuation is a representation of a business value far into perpetuity.
Beta	**0.77**	Beta is the correlation coeficient between the stock returns and the general index returns of the country in which the company is listed. A beta < 1 declares that the investment entails less risk than the market as a whole.We use weekly (adjusted close) prices from the last 3 years and the S&P500 as the index. By applying the following formula: β=Cov(Rt,Rs)/Var(Rs), where Rt and Rs are Tesla's stock and S&P500 index weekly returns, we got a Beta for Tesla stock of 0,77. This means that if the S&P 500 is expected to return 5%, Tesla will be expected to return 3,85% (less risk --> less expected return).
Market risk premium	**5.13%**	This is the expected return on the market minus the risk-free rate. According to Damodaran's database, US equity market risk premium is 5,13% as of July,1 2017 (most recent data). To be more precise this is the equity risk premium of the S&P 500 (Trailing 12 month, including the reinvestment of dividends).
Country risk premium	**0%**	According to Damodaran's database, United States's (country) risk premium is 0%, as of July,1 2017 (most recent data).
WACC	**6.6%**	To give perspective, Capital IQ, a very reputable research and financial analysis company, uses a WACC of 5.3% to value Tesla stock, as of 18/09/2017.

[81] We do not consider the after-tax cost of debt (as the standard approach does), because we add net interest expense to net income when determining the free cash flow further ahead, instead the after-tax net interest expense (as according to the standard approach). That is, the tax deductibility benefit from interest expenses is included in the free cash flow calculation instead of in the WACC determination (as usual).

Net Present Value of projected cash flows

We projected free cash flows (FCFs) until 2025 because we believe Tesla will experience supernormal growth for more than the typical five-year horizon used in most DCF models[82]. To calculate FCFs, we use the bottom-up approach:

FCF = Net income + Net interest expense + Non-cash expenses – Net change in operating working capital – Net cash used in investing activities

Using the WACC, we discounted the projected free cash flows to 31/12/2018, assuming they occur at the middle of the year[83]. The net present value of the projected free cash flows between 2019-2025, is $13B in the base scenario, $21B in the upside scenario and $4B in the downside scenario.

Discounted Cash Flow Valuation -	***Base scenario***										
(in US$ millions)	**Actuals**		**Estimates**								
Period Ending December 31	**2015A**	**2016A**	**2017E**	**2018E**	**2019E**	**2020E**	**2021E**	**2022E**	**2023E**	**2024E**	**2025E**
Free Cash Flow											
Net income	-889	-773	-1,217	-685	1,940	2,790	3,291	4,349	3,869	3,632	4,569
Net interest expense	117	190	414	523	558	596	712	723	740	819	810
Provision for income taxes	13	27	96	123	249	314	360	0	0	0	0
Depreciation and amortization	423	947	1,676	2,027	2,694	3,406	4,181	4,968	5,871	6,839	7,870
Deferred tax liability	0	0	0	0	0	0	0	1,067	1,181	1,185	1,177
Other non-cash expenses, net of income	237	150	365	602	597	976	1,310	870	1,273	1,581	985
Net change in operational capital	-493	-694	-1,171	-1,388	-1,379	-1,443	-1,784	-2,188	-2,635	-3,112	-3,611
Net cash used in investing activities	-1,674	-1,416	-4,690	-4,484	-5,543	-5,935	-6,244	-6,501	-6,721	-6,926	-7,047
Free Cash Flow	**-2,266**	**-1,569**	**-4,527**	**-3,281**	**-883**	**704**	**1,826**	**3,288**	**3,578**	**4,018**	**4,753**
Net Present Value Calculation											
Period (mid-year convention)					*0.5*	*1.5*	*2.5*	*3.5*	*4.5*	*5.5*	*6.5*
Discounted Cash Flow (31/12/2018)				**6.6%**	-855	640	1,557	2,629	2,684	2,827	3,137
Net Present Value of Projected Free Cash Flows				**12,618**							

Terminal Value

Since we cannot estimate cash flows forever, we have to determine a value that reflects the cash flows the company will make after the explicit forecast period. That value is called Terminal Value and represents the value of the business after the last projected year, in our case, after 2025. We use two different methods to calculate the terminal value of the company: the "multiple method" and the "perpetuity method".

Multiple Method

This method assumes the company is worth a multiple of its last projected EBITDA (typically) after the explicit forecast period. We get the multiple (6.8x) from the comparable companies – we use the median Enterprise Value/EBITDA multiple estimated for 2018[84]. We achieve terminal value by multiplying the last projected EBITDA (in this case, 2025's EBITDA) by that multiple. Then, we discount it with the WACC (6.6%) to get its present value. In the *upside scenario*, the value of the company after 2025 (the PV of Terminal value) of the company is $74B; in the *base scenario*, $67B; and in the *downside scenario*, $59B.

Terminal Value	***Upside scenario***
EBITDA Multiple Method	
Last projected EBITDA	16,529.0
Terminal EV/EBITDA Multiple	**6.8x**
Terminal Value	112,772.6
NPV of Terminal Value	**74,436.6**

Terminal Value	***Base scenario***
EBITDA Multiple Method	
Last projected EBITDA	14,812.5
Terminal EV/EBITDA Multiple	**6.8x**
Terminal Value	101,061.5
NPV of Terminal Value	**66,706.5**

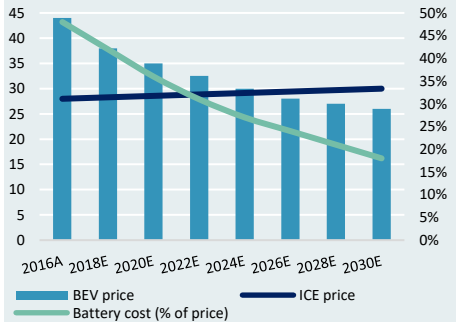
Terminal Value	***Downside scenario***
EBITDA Multiple Method	
Last projected EBITDA	13,117.5
Terminal EV/EBITDA Multiple	**6.8x**
Terminal Value	89,496.6
NPV of Terminal Value	**59,073.0**

[82] **The time horizon** for which we estimate the future FCFs (usually 5 years) must be long enough for the last year's growth rate to be less than or similar to the growth of the economy.
[83] The concept here is we know these cash flows come in during the year and not entirely at the end of the year, so we assume they come in in the middle of the year.
[84] Enterprise Value/EBITDA with estimated data for 2018. To get enterprise values we use the following formula: ***EV = Equity Value + Financial Liabilities + Preferred Securities + Non-Controlling interests + Pension Obligations – Cash & equivalents***, where Equity Value is the same as Market Capitalization (stock price*diluted shares outstanding) and Financial Liabilities are interest bearing debt or non-operating liabilities. *Source: "Paul Pignataro-Financial Modeling and Valuation_ A Practical Guide to Investment Banking and Private Equity-Wiley (2013)"*

Perpetuity Method

This method assumes the company will grow at constant rate forever after the explicit forecast period. We achieve the Terminal Value by applying the following formula ***FCF*(1+g)/(r-g)*** to the last projected FCF. In the formula, *r* is the discount rate (the WACC) and g is the perpetual rate of FCF growth, which should not exceed the growth rate of the economy. According to Damodaran, one simple proxy for the growth rate of an economy is its risk-free rate. Therefore, we use 2.88%, the risk-free rate used to determine our WACC as perpetual growth rate for the downside scenario. For the upside scenario and the base scenario, we use 1.4% and 2.1%, respectively[85]. We use a lower terminal growth rate as the scenario gets better, because there will be less room to grow after 2025. We support these perpetual growth rates, on the fact that BEVs will get cheaper than ICEs after 2025, which will cause the PEV market to grow at a CAGR of 15% between 2025 and 2040[86]. Then, we discount it with the WACC (6.6%) to get its present value. In the *upside scenario*, the value of the company after 2025 of the company is $71B; in the *base scenario*, $67B; and in the *downside scenario*, the PV of Terminal value of the company is $63B.

*Figure 52: **BEV and ICE pre-tax price in the US for medium segment ($000)***



Source: BNEF. This applies to all segments in a very similar way.

Perpetuity Growth Method	
Last projected FCFF	5,835.8
Terminal FCF Growth rate	**1.44%**
Terminal Value	114,729.6
NPV of Terminal Value	**71,039.8**

Perpetuity Growth Method	
Last projected FCFF	4,753.2
Terminal FCF Growth rate	**2.11%**
Terminal Value	108,064.4
NPV of Terminal Value	**66,912.7**

Perpetuity Growth Method	
Last projected FCFF	3,705.5
Terminal FCF Growth rate	**2.88%**
Terminal Value	102,483.6
NPV of Terminal Value	**63,457.1**

Implied Equity Value per Share

We start by adding the net present value of the projected cash flows with the present value of the Terminal Value, for each of the methods, to get the estimated Enterprise Value.

Since:

Enterprise Value = Market Capitalization+ Net Debt+ Noncontrolling Interests

Then:

Implied Equity Value = Estimated Enterprise Value - Net Debt - Noncontrolling Interests

Therefore, we subtract the net debt (financial liabilities minus cash[87]) and non-controlling interests to the Enterprise Value and achieve the implied Equity Value.

By dividing the implied Equity Value by the diluted shares outstanding[88] we achieve the implied Equity Value per share.

Base scenario

Discounted Cash Flow Total Valuation	EBITDA Method	Perpetuity Method
NPV of Free Cash Flows	**12,618**	**12,618**
Present Value of Terminal Value	66,706.5	66,912.7
Estimated Enterprise Value	**79,324.7**	**79,530.9**
Net Debt and Non-controlling interests	8,190.0	8,190.0
Implied Equity Value	**71,134.7**	**71,340.9**
Diluted Shares Outstanding (millions)	165.2	165.2
Implied Equity Value per Share (31/12/2018)	**$430.57**	**$431.82**
Model estimate/ Current Stock price	*21.4%*	*21.8%*
Recommendation	***BUY***	***BUY***

Upside scenario

Discounted Cash Flow Total Valuation	EBITDA Method	Perpetuity Method
Implied Equity Value per Share (31/12/2018)	**$529.70**	**$509.14**
Model estimate/ Current Stock price	*49.4%*	*43.6%*
Recommendation	***BUY***	***BUY***

Downside scenario

Discounted Cash Flow Total Valuation	EBITDA Method	Perpetuity Method
Implied Equity Value per Share (31/12/2018)	**$333.83**	**$360.37**
Model estimate/ Current Stock price	*-5.9%*	*1.6%*
Recommendation	***SELL***	***BUY***

[85] We get these rates by multiplying the growth rate we assume for the downside scenario (2.88%) by the division between the implied revenue growth rate in the last year projected by us for the other scenarios and the same rate for the worst scenario. For example, in 2025, revenue will increase 4.1% in the base scenario while it will grow 5.6% in the downside scenario. Therefore, our perpetual growth rate for the base scenario is equal to 2.88%*4.1%/5.6%.
[86] BNEF expects that BEVs to be up 15% cheaper than equivalent ICEs by 2030. This will create an inflection point in BEV adoption, which will account for the vast majority of PEV sales, due to its simpler engineering.
[87] It's because cash is not considered an operating asset; it is not an asset that will be generating future income for the business.
[88] Diluted shares outstanding is a count of all the shares outstanding in the market plus any stock options and warrants that are exercisable today (in-the-money).

Sensitivity Tables

A sensitivity analysis has been conducted to determine how different values of the WACC, of the terminal Enterprise Value/EBITDA multiple and of the terminal FCF growth rate impact the implied equity value per share.
The terminal EBITDA multiple range is based on values from the comparable companies table (see "comparable companies" valuation).
The WACC range is based on the values found in the "international valuation handbook, 2016[89]", for the automobile industry.
The terminal growth rate range is based on two increases and two decreases, all equal to 0.25 basis points, relative to the terminal growth rate used in the first place. Each scenario has its range of terminal growth rates because we assume different terminal growth rates, as explained in the "perpetuity method" section.

DCF results are very sensitive to the discount rate (WACC), the terminal growth rate and the terminal EBITDA multiple.
Values in red are lower than current price ($355); Value in green are superior.

Upside scenario

Sensitivity analysis- EBITDA Multiple vs. WACC

Terminal EV/EBITDA Multiple	Discount rate (WACC) 5.80%	6.20%	6.60%	7.80%	9.00%
2.5x	$253.18	$247.05	$241.07	$224.05	**$208.30**
4.6x	$398.98	$389.31	$379.90	**$353.14**	$328.42
6.8x	$556.29	$542.81	**$529.69**	$492.42	$458.03
9.5x	$741.36	**$723.39**	$705.92	$656.28	$610.51
11.2x	**$862.97**	$842.06	$821.72	$763.95	$710.71

Sensitivity analysis- Terminal FCF Growht rate vs. WACC

Terminal FCF Growth rate	Discount rate (WACC) 5.80%	6.20%	6.60%	7.80%	9.00%
0.94%	$563.80	$512.84	$469.20	$369.40	**$299.97**
1.19%	$591.12	$535.50	$488.24	**$381.35**	$307.98
1.44%	$621.57	$560.55	**$509.12**	$394.24	$316.53
1.69%	$655.73	**$588.37**	$532.12	$408.19	$325.65
1.94%	**$694.32**	$619.46	$557.60	$423.33	$335.43

Base scenario

Sensitivity analysis- EBITDA Multiple vs. WACC

Terminal EV/EBITDA Multiple	Discount rate (WACC) 5.80%	6.20%	6.60%	7.80%	9.00%
2.5x	$182.07	$176.92	$171.92	$157.67	**$144.51**
4.6x	$312.72	$304.41	$296.33	**$273.36**	$252.16
6.8x	$453.69	$441.97	**$430.57**	$398.17	$368.31
9.5x	$619.55	**$603.80**	$588.49	$545.02	$504.96
11.2x	**$728.53**	$710.15	$692.27	$641.51	$594.76

Sensitivity analysis- Terminal FCF Growht rate vs. WACC

Terminal FCF Growth rate	Discount rate (WACC) 5.80%	6.20%	6.60%	7.80%	9.00%
1.61%	$486.63	$433.73	$389.45	$291.56	**$226.18**
1.86%	$516.81	$458.13	$409.51	**$303.56**	$233.96
2.11%	$551.08	$485.52	**$431.80**	$316.61	$242.31
2.36%	$590.32	**$516.48**	$456.72	$330.87	$251.29
2.61%	**$635.72**	$551.74	$484.76	$346.49	$260.96

Downside scenario

Sensitivity analysis- EBITDA Multiple vs. WACC

Terminal EV/EBITDA Multiple	Discount rate (WACC) 5.80%	6.20%	6.60%	7.80%	9.00%
2.5x	$112.94	$108.80	$104.78	$93.34	**$82.80**
4.6x	$228.65	$221.70	$214.95	**$195.79**	$178.14
6.8x	$353.49	$343.52	**$333.83**	$306.32	$280.99
9.5x	$500.36	**$486.83**	$473.68	$436.36	$402.01
11.2x	**$596.87**	$581.01	$565.58	$521.81	$481.52

Sensitivity analysis- Terminal FCF Growht rate vs. WACC

Terminal FCF Growth rate	Discount rate (WACC) 5.80%	6.20%	6.60%	7.80%	9.00%
2.38%	$417.89	$359.97	$313.19	$215.06	**$153.36**
2.63%	$453.74	$387.78	$335.29	**$227.34**	$160.95
2.88%	$495.73	$419.78	**$360.35**	$240.87	$169.17
3.13%	$545.58	**$456.99**	$389.02	$255.85	$178.08
3.38%	**$605.74**	$500.79	$422.14	$272.52	$187.79

[89] Grabowski, Roger J._ Harrington, James P._ Nunes, Carla-2016 International Valuation Handbook_ Industry Cost of Capital-Wiley (2016)

Comparable Companies Valuation Method

Peer group and Multiple selection

The "comparable companies" valuation method determines the company's value, using prices or enterprise values multiples of similar companies operating in the same industry.

We focus in compare Tesla to other automakers. We do this because this analysis is supposed to be a "current" one and, with 97% of the firm's revenues coming from the auto business, we can say that Tesla is a car manufacturer.

We opted to include Audi, BMW and Daimler because we believe these companies are Tesla's main competitors, considering the quality and price of their cars, and their strong brands. Ford and General Motors were also included because they are the biggest carmakers in US, and they are also large competitors of Tesla.

We experimented various multiples, such as Enterprise Value/EBITDA, Enterprise Value/EBIT and Market Capitalization/Equity book Value and we end up by choosing the Enterprise Value/Revenue Multiple, based on estimated financials for 2018, to do the valuation.

Comparable Companies Valuation		As of October 11, 2017			
Company	Stock Symbol	Current Stock Price	Market Capitalization (Millions)	Enterprise Value (Mill.)	Equity Book Value (Mill.)
Tesla Inc.	TSLA	$354,60	$58 583	$64 968	$5 106
BMW	BMW	88,39 €	53 210 €	148 364 €	50 223 €
Daimler	DAI	68,09 €	72 843 €	192 479 €	59 581 €
Ford Motor	F	$12,38	$49 470	$172 832	$32 262
General Motors	GM	$45,47	$69 342	$140 816	$43 836
Audi	NSU	698,50 €	30 036 €	22 469 €	26 900 €

Comparable Companies Valuation	E.V. / Revenue				E.V. / EBITDA				Mk Cap. / B.V.
Company	16A x	LTM x	17E x	18E x	16A x	LTM x	17E x	18E x	LTM x
BMW	1,6x	1,5x	1,5x	1,5x	8,1x	7,9x	7,9x	7,7x	1,1x
Daimler	1,3x	1,2x	1,2x	1,2x	7,5x	7,0x	6,8x	6,7x	1,2x
Ford Motor	1,1x	1,1x	1,1x	1,1x	10,1x	11,3x	11,2x	11,2x	1,5x
General Motors	0,8x	0,8x	1,0x	1,0x	6,2x	5,7x	6,5x	6,8x	1,6x
Audi	0,4x	0,4x	0,4x	0,3x	2,8x	2,7x	2,5x	2,5x	1,1x
Maximum	1,6x	1,5x	1,5x	1,5x	10,1x	11,3x	11,2x	11,2x	1,6x
75th percentile	1,5x	1,4x	1,4x	1,4x	9,1x	9,6x	9,6x	9,5x	1,6x
Median	1,2x	1,2x	1,2x	1,1x	7,5x	7,0x	6,8x	6,8x	1,2x
25th percentile	0,9x	0,9x	1,0x	1,0x	4,5x	4,2x	4,5x	4,6x	1,1x
Minimum	0,8x	0,8x	1,0x	1,0x	2,8x	2,7x	2,5x	2,5x	1,1x

Implied Equity Value per Share

The estimated 2018's Enterprise Value/Revenue multiple varies between 1 and 1,5[90]. By multiplying Tesla's estimated revenue in 2018 for the different values of the multiple, we get the enterprise value range.
Then (as explained before) we subtract the net debt and non-controlling interests to achieve the equity value, and divide by the number of diluted shares outstanding to get the implied equity value per share.
In all scenarios for all values of the multiple, the recommendation is to **SELL** Tesla stock.

Comparable Companies Valuation -	*Base scenario*				
	Minimum	25th percentile	Median	75th percentile	Maximum
EV/Revenue Multiple (18E)	**1.0x**	**1.0x**	**1.1x**	**1.4x**	**1.5x**
Tesla Revenue (18E)	$17,772.9	$17,772.9	$17,772.9	$17,772.9	$17,772.9
Enterprise Value	$17,682.0	$18,250.5	$20,210.6	$24,479.2	$25,817.3
Net debt & other	$6,384.1	$6,384.1	$6,384.1	$6,384.1	$6,384.1
Equity value	$11,297.9	$11,866.4	$13,826.5	$18,095.2	$19,433.2
Shares outstanding	165.2	165.2	165.2	165.2	165.2
Implied equity value per share	**$68.39**	**$71.83**	**$83.69**	**$109.53**	**$117.63**
Model estimate/ Current price	*-81%*	*-80%*	*-76%*	*-69%*	*-67%*
Recommendation	*SELL*	*SELL*	*SELL*	*SELL*	*SELL*

Comparable Companies Valuation -	*Upside scenario*				
Implied equity value per share	**$177.03**	**$183.96**	**$207.87**	**$259.94**	**$276.26**
Model estimate/ Current price	*-50%*	*-48%*	*-41%*	*-27%*	*-22%*
Recommendation	*SELL*	*SELL*	*SELL*	*SELL*	*SELL*

Comparable Companies Valuation -	*Downside scenario*				
Implied equity value per share	**$57.44**	**$60.53**	**$71.18**	**$94.38**	**$101.65**
Model estimate/ Current price	*-84%*	*-83%*	*-80%*	*-73%*	*-71%*
Recommendation	*SELL*	*SELL*	*SELL*	*SELL*	*SELL*

[90] We do not include Audi.

Combined method valuation

To remember, we have:

- 3 scenarios (upside, base and downside);
- 3 valuation methods for each scenario:
  - Comparable method with Enterprise Value/Revenue Multiple
  - Discounted Cash Flow method with EBITDA Terminal Multiple
  - Discounted Cash Flow method with Perpetuity Growth Rate
- 3 stock price estimates for each valuation method (minimum, median and maximum)
  - The values are from the sensitivity tables and the comparable companies' tables.

The combined method valuation, gives an equal weightage to each valuation method, and then gives a probability of 70% to the base scenario, and 15% each for the other two scenarios.
The method gives us a stock price minimum of $151 (-57% than current price) and a maximum of $503 (+42%). The analysts' estimates range between $155 (+2.6% than ours) and 464$ (-7% than ours) - *Yahoo Finance data.*

Methodology	Tesla Stock price estimates		
	Minimum	Median	Maximum
Base scenario results			
EV/Revenue (18E) Multiple (**Comparables method**)	$68.39	$83.69	$117.63
EBITDA Multiple Method (**DCF method**)	$144.51	$430.57	$728.53
Perpetuity Growth Method (**DCF method**)	$226.18	$431.80	$635.72
Downside scenario results			
EV/Revenue (18E) Multiple (**Comparables method**)	$57.44	$71.18	$101.65
EBITDA Multiple Method (**DCF method**)	$82.80	$333.83	$596.87
Perpetuity Growth Method (**DCF method**)	$140.44	$360.35	$605.74
Upside scenario results			
EV/Revenue (18E) Multiple (**Comparables method**)	$177.03	$207.87	$276.26
EBITDA Multiple Method (**DCF method**)	$208.30	$529.69	$862.97
Perpetuity Growth Method (**DCF method**)	$299.97	$509.12	$694.32
Combined Method Valuation	$150.75	$321.35	$502.66
Model estimate/ Current Stock price	*-57%*	*-9.4%*	*42%*
Recommendation	*SELL*	*SELL*	*BUY*

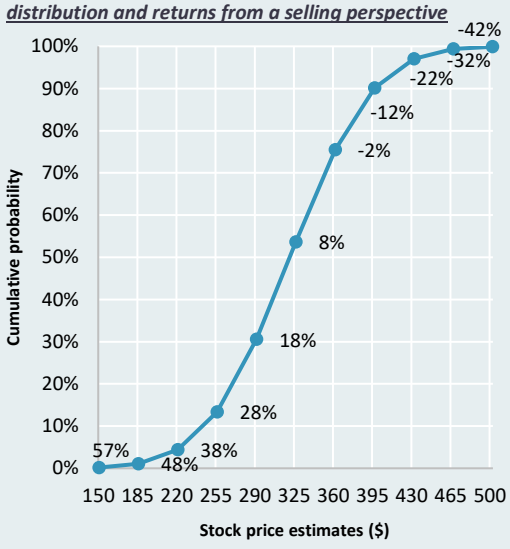
Risk Analysis

Using a normal distribution for the Tesla stock price estimates, with mean of $321 and a standard deviation of $59[91], we conclude there is 72% probability of the stock price being lower than or equal to the current stock price.

Moreover, the maximum potential gain from selling the stock is 57%, while in the case of buying is only 42%.

Based on these results, we recommend **selling/shorting** Tesla stock, and we consider it a medium risk investment.

*Figure 53: **Tesla stock price estimates cumulative distribution and returns from a selling perspective***



Target Price

We use the median price estimate from the combined method, which is $321, as the target price, which implies a 9.4% potential gain from shorting the stock.

To give perspective, the analysts' average price target for Tesla is $321 (the same as ours) - *Yahoo Finance*.

Tesla stock price	
52-week minimum	*$178.19*
52-week maximum	*$389.61*
Current price (11/10/2017)	**$354.60**
Target price (31/12/2018)	**$321.35**
Target price/Current price	*-9.4%*
Recommendation	*SELL*

[91] The median of a normal random variable is equal to its mean, and 99.7% of the possible values of a normal random variable *X* lie between 3 σ on the left and 3 σ on the right of the mean. Then since the range of stock price estimates lies between $150 (minimum) and $503 (maximum) we may assume that σ= (503-150)/6

Catalysts to Target Price

We have identified some plausible events that could drive Tesla stock to our target price. They are the following:

1. ***Production delays***: Tesla has set very ambitious targets regarding Model 3 production. For Tesla to hit all of its targets, Tesla would need to build about 430k Model 3 units by the end of next year. That's more than all of the electric cars sold planet-wide in 2015. We believe that the probability of missing those targets is very high and, consequently, the stock will take multiple hits, and they will most likely be higher than the previous ones. To give an example, On May 4, 2016, Tesla disclosed that delivered about 14.8k vehicles in the first quarter of 2016, missing the target of 16k units. The shares fell 8.9% between the close of the previous day and the close of the next day.
2. ***Product recalls***: We believe that there is a high probability of a product recall in 2018 and if so, the impact on the stock will most likely be higher since the number of vehicles involved will probably be higher, considering that the production volume will be more than double (in base scenario) than in 2016, and almost 4 times 2015's. To give an example, in November 20, 2015, Tesla announced a recall of 90k Model S units because of a front seat belt not being properly connected[92]. The shares fell 1.8% between the close of the previous day and the close of the next day.
3. ***Announcement of new products from competition***: We believe that many more EVs will announce during 2018, and Tesla stock will take multiple hits. To give an example, On September 5, 2017, Nissan unveiled its new 2018 all-electric Leaf[93]. Tesla stock fell 3.1% between the close of the previous day and the close of the next day.
4. ***Lower than expected EPS***: According to our projections, Tesla's earnings per share will be -$3.48 in 2018, while the Street's average estimate is -$1.88. This implies that Tesla will miss at least once, the quarterly EPS expectations during the year, and if so, the stock price will fall. To give an example, On May 3, 2017, Tesla reported an adjusted loss of $1.33 a share, exceeding the $0.81 loss per share that Wall Street expected. Tesla shares fell 7.3% between the close of the previous day and the close of the next day.

Risks to target price

1. ***Demand for Tesla vehicles could rise materially as awareness builds***: To give an example, during Q2, Tesla added more Model X cars to the test drive and display fleet. At the same time, Model X net orders in Q2 grew by over 20% both sequentially and as compared to Q2 2016, according to Tesla's current report.
2. ***Unveilment of a new Electric model***: Tesla plans to unveil its upcoming new all-electric truck, Tesla Semi, at November 16th. The expectations are already high. Morgan Stanley recently called the unveiling of Tesla Semi 'the biggest catalyst in trucking in decades' and they expect that the electric truck could be 70% cheaper to operate than a diesel-powered truck. We believe that this event can increase Tesla stock price by 13.9%[94] in the week following the event.
3. ***Everybody loves Tesla***: It is as if there is a worldwide commitment to helping this company succeed, from consumers - As of July 28, 2017, there was 455k net reservations for a vehicle that did not even existed until that day. This was all accomplished with no advertising or paid endorsements -, from suppliers - When the carmaker first built the Model S, suppliers assumed it would never sell more than 3k units and the company would eventually go bankrupt, according to Musk. That's changed. It "went from basically getting like the worst team on second-tier suppliers to getting the best team on first tier suppliers," he said in February 2017 -, and investors - Tesla is a losing money company with a market capitalization of $58.7B, more $9B than Ford's (as of 11/10/2017), an automaker that sold 5.89 million LCVs (vs Tesla's 76k) and had a net profit of $4.6B (vs Tesla's -$773M) in 2016.

Catalysts/Risks	Impact	Stock price
Current stock price (05/10/2017)		**$354.60**
Tesla truck unveilment	*13.9%*	$403.96
Production delay	*-8.9%*	$368.01
Product recall	*-2.8%*	$357.71
Announcement of a new EV from competition	*-3.1%*	$346.62
Lower than expected quarterly EPS	*-7.3%*	$321.31
Resulted stock price		**$321.31**
Target price (31/12/2018)		$321.35

Bottom line:

Based on the catalysts and risks identified by us, our target price is achievable[95].

[92] https://www.bloomberg.com/news/articles/2015-11-20/tesla-to-recall-90-000-model-s-cars-to-check-front-seat-belts.

[93] https://techcrunch.com/2017/09/05/the-new-2018-nissan-leaf-offers-150-miles-of-ev-range/.

[94] We multiply the increase related to Model 3 unveilment (+17%) by a measure which we believe gives a representation of the truck market size relative to Model 3 Segment market size. This measure consists on the division of the multiplication between truck units sold in 2014 (2.23 million according to McKinsey on "Future perspectives on the global truck market", May 2016) with truck's average sales price (about 120k based on data from "Truck Sales & Service, Inc.) and the multiplication between D-segment (Model 3 segment) units sold in 2015 (8.17 million according to JATO – see page 11) with D-segment's average sales price (about 40k based on Model 3 main competition prices).

[95] The impacts used are the same that these events (except the Tesla truck unveilment) had in the stock price in the past.

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To access financial statements and forecast assumptions and operations click on the link:
https://www.dropbox.com/s/9juim7ufutgibmk/TESLA Appendix.pdf?dl=0