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TESLA
–
Automotive manufacturer set to become a global player in the energy industry

MORITZ GRIPP
MASTER'S IN FINANCE (MSc)
51068

A Project carried out on the Master in (Economics/Finance/Management) Program, under the supervision of:

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Abstract

This analysis, as part of the equity research report for *Tesla*, focuses on the *energy generation and storage*, and *services and other* business segments. In addition to a general overview of the business segments, the reader is introduced to the industry, opportunities, challenges and competitive landscape. Based on the examined information, the reader is guided through the rationale behind the forecasted revenue, price, cost, and margin development. At a later stage, the historical and expected capital structure, cost of capital and beta of *Tesla* are presented. To conclude, *Tesla's* expected enterprise value, computed based on multiples, as of December 2023 is presented.

Keywords:

Tesla, Energy, Charging, Multiples

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This report is part of the “Tesla: Pioneering electric mobility & energy solutions” report (annexed), developed by Nicolas Johann Eggers and Moritz Gripp and should be read has an integral part of it.

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Introduction

This equity research report aims to provide a reliable recommendation regarding the expected price development of the Tesla share until the end of December 2023. Consequently, it requires a comprehensive analysis of the company, including the market environment in which it operates. Furthermore, to ensure a neutral valuation, it is essential to highlight any risks and hurdles in addition to potential opportunities and growth drivers.

Since Tesla sells solar products and energy storage systems in addition to electric vehicles, two core markets need to be analyzed. This part of the equity research report is dedicated to the energy generation and storage business division and the automotive subsegment services and others, which includes Tesla's aftersales services and charging infrastructure. At this point, it is essential to mention that Tesla acts highly intransparent and hardly publishes any data. This applies in particular to the energy and services segment.

Given a comprehensive analysis of the previously mentioned markets, key valuation drivers such as revenues, costs, and margins are forecasted.

However, to determine a company's intrinsic value, further financial indicators are required in addition to information on the operating business. Accordingly, this section of the report further provides essential information on Tesla's historical and expected capital structure, cost of capital, and share volatility.

In conclusion, a forecasted company value and share price, based on multiples for the above period, is presented. The usage of two different valuation methods (intrinsic and relative) allows an objective comparison and thus increases the validity of the final recommendation.

Market and Sector overview

Services and Other

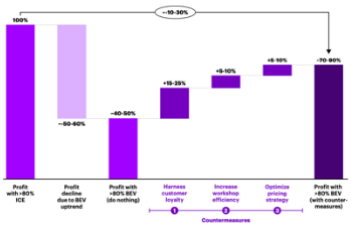

Exhibit 1: Annual customer-paid business profit for ICEs versus BEVs

Tesla's *Services and Other* business is considered a subsegment of its automotive division. The business unit captures products and services related to charging infrastructure and the vehicle aftersales market, which includes parts and used vehicle sales, non-warranty maintenance and repair services as well as access to supercharger stations.

The aftersales market for electric vehicles differs substantially from those powered by combustion engines. While combustion engines consist of approximately 2000 moving parts, electric engines have about 99% less. Additionally, overall parts quality tends to increase, resulting in significantly less required maintenance. For example, while combustion engines generate, on average, EUR 60 in oil and accessories revenue per vehicle, battery electric vehicles (BEVs) only return EUR 10. Although connectivity of vehicles and over-the-air software updates are expected to increase, they cannot offset this decline in revenues [1] [2].

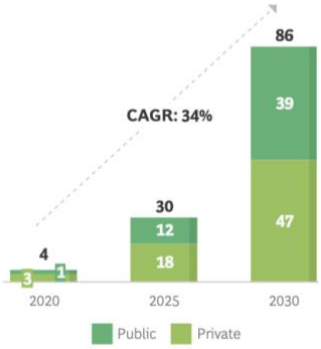

Exhibit 2: Projected Vehicle Charging Demand in Europe

Currently, the traditional original equipment manufacturers (OEMs) vehicle aftersales business generates profit margins of 30% and more [3]. However, according to *Accenture*, due to an increasing share of electric vehicles (EVs), profits will likely decline unless countermeasures are taken. Nevertheless, aftersales revenues decline can be capped at 10% to 30% given the right strategic actions. Furthermore, enhanced customer loyalty, improved workshop efficiency, and optimized pricing strategies enable OEMs to limit profit decreases (Exhibit 1).

Alongside a changing aftersales market, the refueling and charging infrastructure is also experiencing a significant transformation. Over the course of the significantly increasing share of electric vehicles, an extreme demand for charging infrastructure is predicted. As a Benchmark, the overall charging demand from passenger vehicles in Europe is expected to grow from 4 TWh in 2020 to 86 TWh in 2030 (CAGR 34%) (Exhibit 2). Likewise, the number of public charge points is forecasted to grow from 203,000 in 2020 to 1.838 million in 2030 (CAGR 25%) (Exhibit 3). Further, the amount of charged vehicles per charge point is expected to increase significantly.

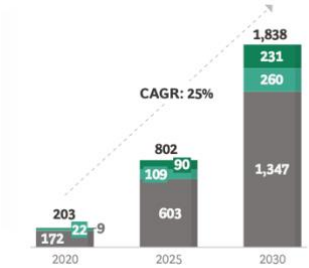

Exhibit 3: Projected Number of Public Charge Points in Europe

The competitive environment is set to change drastically going forward. Potential competitors include oil and gas companies, retailers, infrastructure investors and utilities. Especially oil and gas companies have a significant advantage, as they already operate sites at traffic hubs [4].

Energy Generation and Storage

Exhibit 4: Tesla Solar Panel

Since the company was founded in 2003, Tesla has pursued the goal of accelerating the world's transition to sustainable energy [5]. As a result, Tesla entered the *energy generation and storage* industry by acquiring *SolarCity* in November 2016, thus combining SolarCity's photovoltaics installations business with Tesla's battery storage know-how [6]. Tesla's energy division serves residential, commercial & industrial (C&I) and utility-scale projects [7]. Residential projects are typically small deployments for households, while utility-scale projects are defined as massive projects, producing more than 10 MW of energy. C&I Projects, on the other hand, target corporations and commercial applications in general, for example, solar carports at stadiums [8].

Tesla's product and service offering for energy generation includes solar panels, the *solar roof* and the solar inverter (Exhibit 4 to 6). Until 2021, conventional solar panels were not manufactured by Tesla itself. Tesla rebranded and marketed products from *Hanwha Qcells* [9].

Conventional solar panels can be retrofitted individually on existing buildings. The solar roof, in contrast, consists of unique roof tiles that can generate electricity similarly to a conventional solar panel. Moreover, the solar roof allows a fully functional solar system to be integrated without sacrificing significant aesthetic changes to the house. The design of both product types has a great importance for Tesla. The energy generation portfolio primarily targets residential markets, although both product types can be used in a commercial and utility-scale context. To utilize the generated electricity, Tesla offers its own inverter, which transforms incoming DC power to AC power [7].

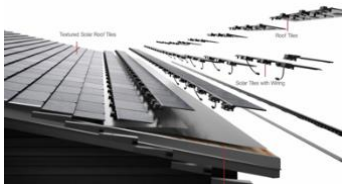

Exhibit 5: Tesla Solar Roof

Tesla's product and service offering for energy storage includes the Tesla Powerwall, a home energy storage system, and the *Powerpack* and *Megapack*, large-scale energy storage systems (Exhibit 6 and 7). The Tesla Megapack was introduced in 2019, replacing the older *Powerpack*, being 60% more energy-dense [10] [11] [12]. As with all of Tesla's products, the company is also very design-conscious with its storage offering. According to a principal research analyst at *Navigant Research*, Tesla's Powerwalls look like a piece of art hanging on the wall [13]. Further services of Tesla's energy and storage business segment include installation services and maintenance services for Megapacks [7].

Exhibit 6: Tesla Powerwall System Setup

Currently, Tesla's Powerwall is only sold as a bundle in combination with the company's solar products. This decision was made in April 2021 and is reported to be due to a Powerwall order backlog of 80,000 units worth USDm 500 (as of 07/2021). Tesla will likely keep both product types linked until its production capabilities are sufficient to meet demand. A similar scenario can be observed for the Megapack. As of March 2022, there is an order backlog extending into the first quarter of 2023. As way to cope with bottlenecks emerging due to global supply shortages, Tesla has continuously increased its prices for the Powerwall and Megapack [10] [14] [15].

Exhibit 7: Tesla Megapack

- Market overview

Currently, Tesla's energy and storage business segment still has a strong focus on the US market, although already operating in China (since June 2021), Europe (especially Germany), and other geographies. However, due to supply shortages, Tesla focuses on markets with high solar power penetration and energy costs [16].

In the United States, the solar industry is growing at a record pace, with a CAGR of 33% for the past decade [17]. Similar trends are emerging in global demand for energy storage. *BloombergNEF* expects battery storage capacities to increase from 17 GWh deployed as of 2018 to 2,850 GWh by 2040. Consequently, battery prices have already dropped 85% over the period of 2010 to 2018. According to BNEF, a further halving of prices per kilowatt hour by 2030 is possible. Shortly, the combination of battery storage and solar energy will be a strong driver for global battery production. Moreover, a geographical shift in the core markets will occur. While South Korea recorded the most storage installations in 2019, China and the U.S. are estimated to lead the statistics by 2040 (Exhibit 8). Falling costs for renewable energy and batteries will lead to a fundamental change in the energy and transportation sector. By 2040, it is expected that 40% of the world's electricity will be generated from wind and solar energy. In comparison, in 2019, the share was 7% [18].

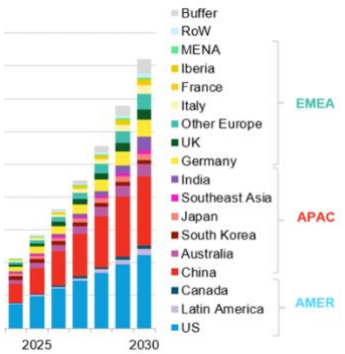

Exhibit 8: Cumulative Energy Storage Installations Worldwide

In addition to the rapidly increasing share of electric vehicles, the energy storage market is primarily driven by renewable energies. Compared to conventional power generation, electricity generated from renewable sources has the disadvantage that it cannot always be supplied at full capacity. Accordingly, there are substantial fluctuations. Electricity generated from solar panels

is dependent on sunlight and other non-controllable meteorological factors. Since electricity consumption does not correlate with electricity generation, there is a need for intermediate storage (Exhibit 9). Furthermore, decentralized energy storage systems can substitute the construction of new power grids when combined with PV systems or strengthen and relieve existing power grids. Similarly, numerous residential storage systems could be increasingly used for system services and individual applications [18]. In contrast, residential feed-in to the public grid could eliminate the personal benefits of having private energy storage. For example, battery life is likely to decrease, and feeding in just before an unexpected blackout might eliminate backup power for personal applications [19]. Moreover, the recent events in Ukraine and rapidly soaring electricity prices have led to increasing demand for independent energy supply, especially in Europe [20]. In conclusion, uninterruptable power supply (UPS) is not only essential for critical infrastructures but is also becoming increasingly relevant for multi-use applications [21].

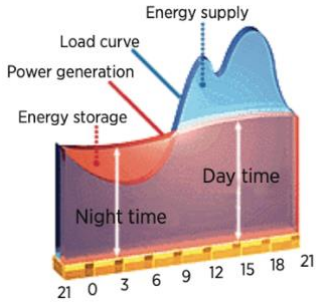

Exhibit 9: Graphical Representation of Energy Supply Fluctuation

Solar energy and battery storage systems greatly benefit from each other

As previously explained, the energy storage market is directly related to electricity generated from renewable sources, particularly solar energy. Accordingly, both markets show a very dynamic development. The global solar photovoltaics market grew by 25% in 2021 compared to the previous year, maintaining a solid growth trend [22].

The two most important markets are China, followed by the USA. China installed 54.9 GW in 2021 and exhibited the highest cumulative installation capacity of 305.9 GW as well as the most substantial growth. The USA added 26.9 GW in 2021, representing roughly half of China's newly installed capacity. As a result, Asia leads the ranking for the ninth consecutive year, with 51% of the world's installed solar capacity in 2021. Americas follow with 21%, and Europe is in third place with 17% [22].

In 2021, the US solar PV market grew by 19%, representing a total installed capacity of 121.4 GW. The capacity installed as part of utility-scale projects increased by 17 GW compared to the previous year. Even though the residential market is behind, residential demand recorded the most considerable annual growth since 2015 of 30% (4.2 GW) [22].

- Competitive Landscape

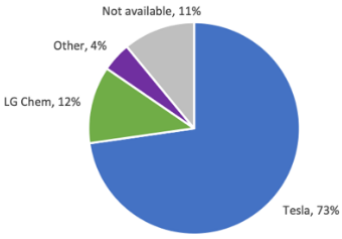

Exhibit 10: U.S. ESS market share by company

According to data on residential energy storage installations in 2020, Tesla has established a powerful market position in the U.S. market. Tesla accounted for 73% of installed storage systems, while *LG Chem* was in second place with 12%. The remaining 15% are attributable to more than 30 other competitors (Exhibit 10). Low prices and the strong reputation of the Tesla brand have contributed to this success. In addition, in-house cross-selling opportunities for energy storage in combination with solar systems and in-house installation technicians added to the achievement. Besides lower prices, Tesla's current Powerwall models offer more advanced features than competing systems, such as higher storage capacity and an integrated inverter. LG Chem as the most relevant competitor likewise scores with a strong brand and a global network. However, demand for its products dropped by 15% from 2018 to 2020.

Further, both Tesla and LG Chem continue to benefit from their role as battery producers for utility-scale projects and the automotive industry. Tesla benefits from the existing supply chain that was originally established for the automotive segment. The production of components that are useful in both industries and the know-how acquired over the years on technologies and production processes in the field of batteries are equally of great benefit. However, a diversified business model requires that, in case of doubt, one division has to be prioritized. Due to semiconductor shortages, both Tesla and LG Chem could not meet the US demand for energy

storage systems (ESS), as Tesla prioritizes the automotive sector and LG Chem focuses on the Asian market.

Competition in the market is growing steadily

Since the market for battery storage is just developing, Tesla's main challenge is to defy the growing competition alongside supply chain problems. In the USA, more and more established companies are including battery products in their portfolio. Moreover, global players from abroad are increasingly trying to serve the American market. Specifically, multinational companies entering the market have a variety of strengths. Typically, these companies have established brand names, international sales, installer networks, cross-selling opportunities, existing customer relationships, supply chain management experience, and financial resources to ensure rapid market entry.

By the second half of 2020, the competitive environment had already changed. Companies such as *Enphase*, a United States-based manufacturer of solar inverters, and *Generac*, a U.S. based manufacturer of generators, have entered the market. Reportedly, Enphase launched large-scale sales of battery storage systems produced in China. Generac, in turn, is pursuing a strategy of breaking into the market through acquisitions. Both Enphase and Generac realized significant sales increases shortly after entering the market. In addition, Generac's prices are very close to those of Tesla. Accordingly, the variety of manufacturers and products on the online marketplace *EnergySage* has already increased significantly in the fourth quarter of 2020 (Exhibit 11).

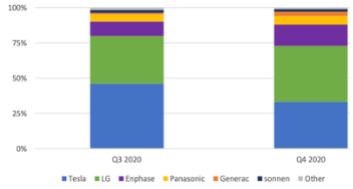

Exhibit 11: Share of price quotes on EnergySage by company

Besides established players, the number of start-up businesses is also growing, pressuring the market with new products and services. As a result, the number of U.S. imports attributable to battery storage increased by 700% between 2019 and 2020. Hence, small companies such as *Blue Planet Energy*, *NeoVolta*, and *SimpliPhi Power* experienced significant revenue increases.

In turn, the utility-scale battery storage market is primarily dominated by a few global players (Exhibit 12). 66% of the global utility-scale projects in 2021 are attributable to just seven companies. These companies include Tesla, with 7 GWh of installed capacity, the joint venture between *AES* and *Siemens* (6 GWh), *Powin*, *BYD*, *Sungrow*, *Wärtsilä*, and *Flexgen*. However, experts expect competition to increase sharply for utility-scale projects. By the end of 2022, the market share of the top seven companies is expected to decrease from 66% in the previous year to 32% [23].

Exhibit 12: ESS Competitive Landscape

Comparable trends are occurring in the solar PV market. Besides Tesla, companies such as *Heliene*, *Mission Solar*, *Seraphim*, *Silfab Solar*, *Solaria*, *SolarTech Universal*, *SolarWorld Americas*, and *SunSpark* offer solar panels made in the USA. Yet not all these companies are U.S.-owned. Some of them, such as SunSpark, are subsidiaries of foreign conglomerates that have set up production facilities in the U.S. to avoid tariffs. Other relevant players include *First Solar*, *Hanwha Q Cells*, *JinkoSolar* and *SunPower*. While Heline, for example, is focused on large-scale projects, *Mission Solar* and *Solaria* offer design-focused solar panels [24]. Compared to battery storage, the market for solar products is already much more fragmented. In any case, both industries are highly competitive with the Chinese market.

Chinese market demand and increasing imports of battery cells, ESS components, and solar modules from Asia to the U.S. will likely pose the most significant challenge for Tesla in the future. It remains to be seen whether Tesla can compete with production facilities located in low-wage countries like China and to what extent such products will spread to the U.S. market. However, the competitive situation for Tesla is certain to intensify [25].

- Challenges

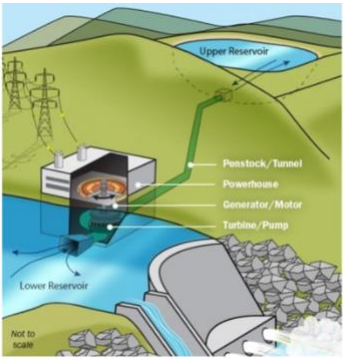

Exhibit 13: Pumped hydrogen storage

Energy can be stored not only by battery-based technologies. For over a decade, the energy storage market was led by only one technology: pumped hydrogen storage. (Exhibit 13) [26] [27]. However, a significant advantage of batteries is their versatility. Batteries can be manufactured in various sizes and placed right where the energy is needed. Furthermore, battery storage is far more space efficient [28]. While new projects for energy storage are almost exclusively based on battery storage, the ongoing development of hydrogen technologies poses risks for batteries, as an even more comprehensive range of possible applications could be covered (Exhibit 14).

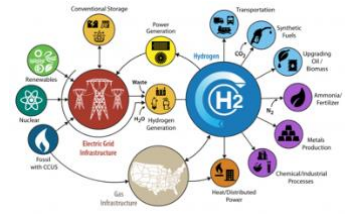

Exhibit 14: Range of applications for Hydrogen

While hydrogen is not yet commercially viable, significant investments are being made worldwide to improve production, transportability, and usability. In contrast to battery storage, hydrogen is additionally suitable for applications in industries where electrification is not practical or possible, such as the steel industry [29]. Besides the increased flexibility, hydrogen can also be stored cost-effectively in natural reservoirs (Exhibit 15) [28]. To meet the estimated demand of 660 million metric tons of green hydrogen by 2050, a further investment of USDbn 460 is required by 2030 (Exhibit 16). Alongside rapid market growth, hydrogen costs are expected to drop significantly (Exhibit 17). At only about USD 2 per kilogram, green hydrogen could become cost competitive in various sectors [30].

Moreover, the rapid market growth causes some institutions to lack behind. Many present regulatory policies are still based on battery technologies that are already being discontinued. More specifically, this involves discussions regarding the integration of residential storage into the power grid and the settlement of its owners [31].

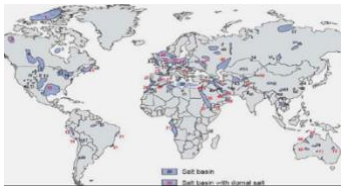

Exhibit 15: Location of Salt deposits (Caverns) worldwide

In addition to financial hurdles, there are also risks related to sustainability. Batteries typically have a life cycle that ends at about 60% to 80% of the original energy capacity [27]. The limited lifespan combined with finite raw materials and toxic chemicals required for manufacturing and the pollutants generated during production, storage, treatment, and disposal raises questions regarding environmental impact [31] [32].

Finally, there are challenges regarding the supply chain. It is expected that the predicted market growth will add even more pressure to the already stretched supply chains, at least in the near term. Even though there are sufficient lithium reserves, market prices are highly volatile. *Andy Tang*, head of *Wärtsilä's* energy storage division, explains that battery storage accounts for only about 10% of the lithium market, while 90% is attributed to electric vehicle manufacturers. Furthermore, EV capacities are prioritized over battery storage. However, the shift to alternative technologies, such as sodium-based batteries, poses significant challenges, as a new scaled supply chain and production must be established from scratch [33].

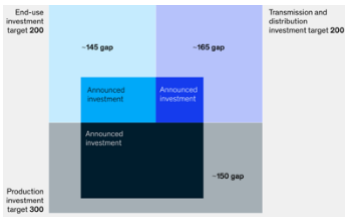

Exhibit 16: Announced versus required Hydrogen investments until 2030

In the wake of the pandemic, the solar PV industry is also struggling with supply chain difficulties. Consequently, in 2021, the cost of PV modules increased for the first time in years from an average of USD 0.21 to USD 0.33 per watt, an increase of 32%. Similarly, other raw materials required for production have seen a sharp rise in prices during the past year. Prices of industrial silicon increased by 300%, aluminum by 50%, polysilicon by 350%, and soda ash, which is used for solar glass, by 80%. To put this in perspective, the raw materials (polysilicon, metals, coatings, and glass) account for about 65% of the total cost of a PV module. In contrast, manufacturing accounts for about 22%, and logistics and shipping for 12.5%. Polysilicon, which has seen the steepest price increase over the past year, accounts for about 35% of total module costs. However, the recent price increases have primarily been captured by suppliers of the solar

industry.

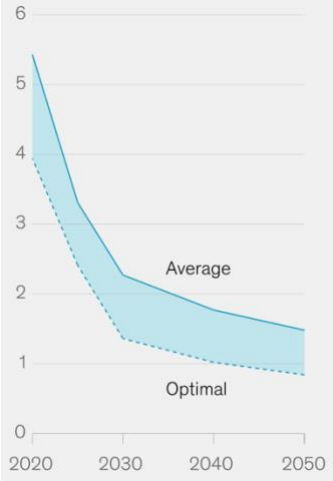

Exhibit 17: Projected cost development for green hydrogen in USD per kg

Especially China, as an important market and component supplier (50% of the world's polysilicon comes from the Xinjiang region) has a significant impact on the most recent price developments. China's national policy pursues the strategy of reducing the country's energy intensity, resulting in a limited production capacity of PV components. High demand facing constraint production capacities is one of the significant cost drivers. Moreover, delayed shipping from China and drastically increased shipping costs affect prices [22].

Like battery storage, solar power requires regulatory action to address backlogs. In addition to trillion-dollar investments, policy modifications are required to enable large-scale deployments of solar plants. Moreover, the production process of solar modules cannot be classified as sustainable either. In addition to using chemicals and the need for finite raw materials, production often involves coal-fired power plants, especially in China. Furthermore, there are concerns that the polysilicon industry in China is directly related to the forced labor of the Uyghur Muslims. On top of that, solar panels have a limited lifespan of about 25 years. By 2050, 78 million tons of waste could be generated. However, since the recycling process of solar panels is very complicated, it is expected that most of the waste will end up in landfills. Given the toxic materials that solar panels contain, there is a risk to the environment [34].

- Opportunities

Solar energy and battery storage markets offers significant growth potential

Globally, an increasing number of power grids are heavily stretched and aging. At the same time, the share of renewable energies in total power generation is steadily increasing. In addition to the resulting need for load balancing, the number of severe weather events is rising and can create and exacerbate bottlenecks in the energy supply. Besides an increased threat of power outages, this also causes electricity costs to rise. Actions are required to ensure the resilience and reliability of the power grid. Accordingly, more and more utilities are investing in network modernization and introducing so-called demand-response programs, which incentivize customers to reduce their electricity consumption at peak load times. There are also extensive investments in utility-scale energy storage solutions located near power plants, substations, and transmission lines to stabilize the grid.

Likewise, the demand for energy storage systems for private households is proliferating. As explained previously, linking private storage systems to the grid creates additional opportunities to balance energy demand and supply. Although such integration faces many barriers, initial pilot programs are already in place in some U.S. states. Accordingly, private households are supposed to be compensated by utilities for consuming their stored energy at peak load times.

Another essential demand driver is the subsidization and incentivization of battery storage. For solar systems purchased in combination with battery storage, U.S. citizens can claim tax benefits that can reduce costs by 30%. Further, there are also local, state-dependent programs. The *California Self-Generation Incentive Program* provides cost savings of $1600 to $2500 for residential storage systems.

By 2019, energy storage systems were already of interest to 20% of the total U.S. population. Falling prices for storage systems and decreasing costs for installation are likely to expand the market significantly (Exhibit 18). Similarly, by 2018, 43% of C&I players in the U.S. could have benefitted from battery storage systems (Exhibit 19) [35]. In addition, the combination of solar modules with battery storage offers various advantages. Apart from more flexibility and more

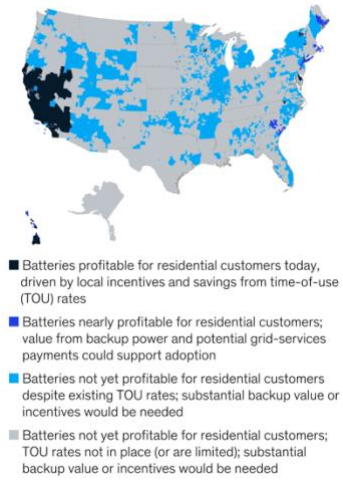

Exhibit 18: Profitability of Battery Storage Systems for Residential Applications in the U.S.

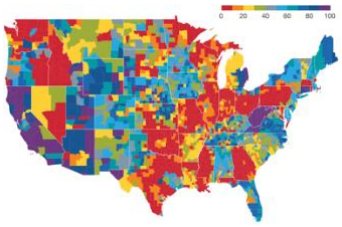

Exhibit 19: Profitability of Battery Storage Systems for Commercial and Industrial Applications in the U.S.

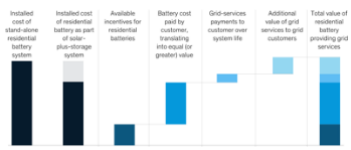

Exhibit 20: Average Solar and Battery Storage bundle savings

versatile application options, integrated solutions offer the potential for immense cost savings (Exhibit 20).

As with battery storage, rising costs for fuel and electricity are also driving the solar market. Especially rooftop roof-mounted solar installations have become very popular to reduce costs and increase independence from external utilities. Furthermore, niche applications, such as floating installations on open water or in agricultural environments, offer enormous growth potential.

Other potential applications include merging solar technology with buildings and vehicles. Tesla has already launched its solar roof, a product that allows full integration with buildings in the form of roof tiles. Currently, the development of innovations in the field of PV-integrated surfaces is most supported in Europe. In the area of PV-integrated vehicle technology, some pilot projects already exist in Germany. Accordingly, Mercedes-Benz is investigating the integration of solar activated surfaces along with electrified vehicles.

The U.S. market in particular continues to offer strong growth potential for Tesla, as the government is increasingly promoting domestic manufacturing, thus pursuing the strategy of breaking dependencies on other countries and positioning itself as a strong player in the solar industry. Moreover, since 2018 the U.S. declared import duties for solar modules and components of 30%, which were recently extended until 2026.

Still, the biggest market driver for solar PV is global politics. Security of supply and independence, especially in the context of the Russian invasion of Ukraine, which started in early 2022, play an important role. In addition, self-imposed climate targets of various countries contribute to high demand forecasts. Even if fossil fuels still dominate the market, a structural change of the global energy system becomes more and more inevitable. To realize a net zero scenario by 2030, annual investments in solar PV will have to triple, among other efforts [22].

Forecast

Energy Generation and Storage

As Tesla does not disclose much information regarding its energy generation and storage division, the projected development relies heavily on assumptions which will be explained in the following. As always, three cases are assumed: Bear case, base case, and bull case. Furthermore, market trends and developments from previous chapters serve as basis for subsequent valuation assumptions and are not explained in detail again.

- Average Selling Prices

Average selling prices were calculated based on data obtained from Tesla's website and its configurator (as of November 2022), considering bundle discounts (e.g., Solar plus storage discount is on average 10%) as well as different model variants and volume discounts. According to this, the average price per kW for Tesla's solar panels is USD 2,151, while its solar roof is priced at USD 6,278. All prices include installation fees and costs for Tesla's solar inverter, which are not specified. Likewise, Tesla's Megapack and Powerwall are priced at USD 667 and USD 734 per kWh.

Considering current market trends, thus rising demand and constraint supply, prices for all products are forecasted to increase further until the end of 2023. However, from 2024 to 2030, prices are expected to decline significantly. Therefore, prices for solar panels are expected to

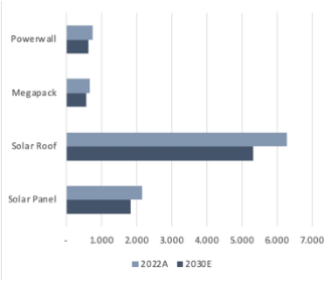

Exhibit 21: Average Selling Price per kW Forecast by Product Type

decrease at a CAGR of -4.8%, primarily driven by increasing competition. However, Tesla's solar roof prices are expected to decrease slower (at a CAGR of -2.64%) as the technology is relatively new, and production cannot be scaled as much. While institutional customers tend to prefer financial KPIs over design, Megapack prices are expected to decrease the most (CAGR of -5.77%). In turn, prices of Powerwalls are expected to decrease slower (CAGR of -5.05%), as the product targets clients that tend to prefer design over price performance. Still, Powerwall prices are expected decrease significantly as competition rises (Exhibit 21).

- Revenue

Tesla's revenue is set for significant growth

As Tesla does not disclose any data regarding quantities of its energy products sold nor revenue breakdown by product type, assumptions had to be incorporated. Tesla installed solar roofs equivalent to 2.5 MW during the second quarter of 2022 [36] and 100,000 Powerwalls equivalent to 1,350 MWh within 2020 [37]. Given those figures and Tesla's officially disclosed annual solar and storage deployments in MW and MWh, a breakdown was obtained. Accordingly, Tesla's deployed storage in 2020 was composed of 55% Megapacks (1,672 MWh) and 45% Powerwalls (1,350 MWh). Similarly, Tesla's solar roof accounted for just 2.36% (2.5 MW) of total deployed solar in quarter Q2 2022, while Tesla's solar panels accounted for an estimated 97.64% (103.5 MW).

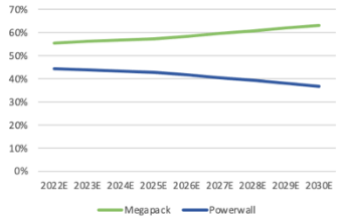

Exhibit 22: Product Share of Storage Deployment

Considering the market outlook for large-scale projects and the new build Megapack factory in Lathrop, California with a capacity of 40 GWh [38], Megapack's share of deployment is expected to grow (Exhibit 22).

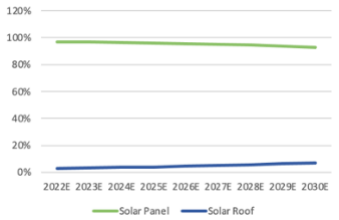

Exhibit 23: Product Share of Solar Deployment

Moreover, as prices decrease, solar roofs are expected to become more affordable and, thus, more popular. Consequently, by 2030, solar roofs are expected to account for 7% of Tesla's total solar deployment (Exhibit 23). Assuming an average solar system output of 7 kW, Tesla is deploying approximately 23 solar roofs per week, which equals roughly 300 houses [39]. However, *Elon Musk* aims to deploy 1000 solar roofs per week (equal to 108.7 MW) or 5,217.39 MW per year [39]. Considering the 2030 bull case forecast, 5,304 MW related to solar roofs will be deployed annually, which aligns with the projected share and growth rate.

The global battery storage market is expected to grow at a CAGR of 30% until 2030 [40]. However, Tesla is already one of the top market players and has years of experience in battery production. As a result, the base case assumes storage deployment to grow at 40% annually until 2030. For the bull, Elon Musk's goal of reaching an annual storage deployment of 1,500 GWh is applied [41]. Thus, coming from 3,992 MWh deployed in 2021, a CAGR of 93% is required to achieve his goal by 2030 (Exhibit 24).

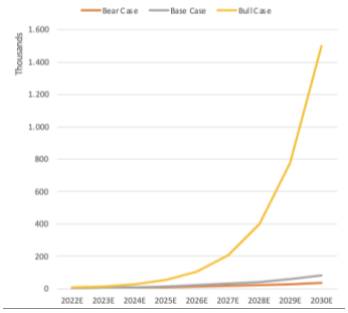

Exhibit 24: Storage Deployment Forecast in MWh

To reach worldwide net zero emission goals by 2050, global solar deployment must grow at least 25% between 2022 and 2030 [42]. Considering Tesla's strong brand, loyal customer base, and location in the second most relevant country for the solar PV industry, Tesla's solar deployments are estimated to grow at a CAGR of 35% in the base case scenario. However, as there is no publicly available information regarding Elon Musk's solar deployment goals, the bull case reflects the storage bull case growth, since solar and battery storage industries are linked to each other. As a result, solar deployments are estimated to grow at a CAGR of 82%, reaching an annual deployment of 74,057 MWh in the bull case by 2030 (Exhibit 25). Lastly, the bear case adjusts for potential challenges, which is reflected in 70% of base case growth for both solar and storage deployments.

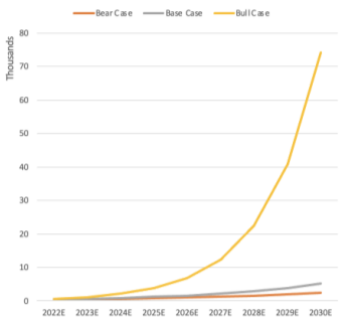

Exhibit 25: Solar Deployment Forecast in MW

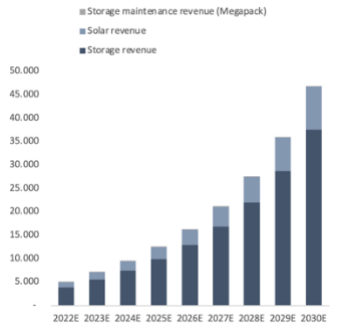

Exhibit 26: Energy generation & storage revenues in the Base Case Scenario

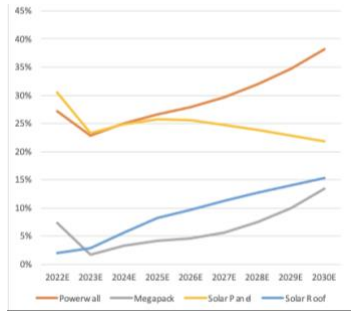

Exhibit 27: Gross Margin Forecast by Product Type

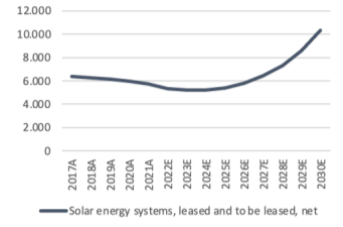

Exhibit 28: Solar energy systems, leased and to be leased, net (in USD millions)

In conclusion, by 2030, the base case scenario assumes Tesla to achieve deployment of 4,770 MW in solar panels, 368 MW in solar roofs, 17,373 Megapack units, 2,248,919 Powerwall units and to generate USDm 71 in Megapack maintenance fees. Therefore, Tesla's energy generation and storage business is expected to generate an annual revenue of USDm 46,865 (Exhibit 26).

- Cost and Gross Margin

Like the price development, costs are expected to increase further until the end of 2023, followed by a significant annual decline. It is important to mention, that cost of sales already includes depreciation. Based on benchmark systems for solar and storage, the individual cost drivers could be identified and forecasted until 2030 [43] [44]. The cost of solar systems is expected to decrease by about 35% from 2024 to 2030. The predicted decrease in the cost of storage systems is even higher. It is assumed that costs will drop by approximately 48%, almost halving costs. In particular, the advancing replacement of lithium-ion NMC batteries with lithium-ion LFP batteries reduces costs [45].

Consequently, the gross margin for Powerwalls is expected to increase from 27% in 2022 to 38% in 2030. Similarly, the Megapack's gross margin is predicted to increase from 7% in 2022 to 13% in 2030. As previously explained, this development is a result of falling costs and economies of scale. However, the gross margin for Powerwalls is significantly higher, as it addresses an entirely different customer base than Megapacks. The gross margin for solar panels is expected to shrink as there is a strong dependence on Chinese suppliers and more competitors enter the market. Furthermore, Tesla has less know-how related to the solar industry than in battery storage and started with the independent production of solar modules only a few years ago. Accordingly, the gross margin is expected to decline from 30% in 2022 to 22% in 2030. A different picture emerges for the solar roof. Since this product is based on a new technology and production has not been scaled yet, the gross margin is expected to increase from 2% in 2022 to 15% in 2030. (Exhibit 27)

- Leasing

Since the leasing revenues and costs are already incorporated in the segment's total revenues and costs and are not listed separately, a potential split can only be determined based on assumptions. According to the *Solar Energy Industries Association* and *Enphase*, 28% of total deployed solar systems are leased, with terms lasting on average 20 to 25 years [46] [47].

Given Tesla's historical values of solar energy systems leased and to be leased and considering that 28% of new systems are subject to leasing while assuming that 10% of the previous year's leasing value will expire, a forecast could be estimated. Respectively, Tesla's leasing values are assumed to increase in the base case from 5,562 in Q2 2022 to 10,905 in 2030 (Exhibit 28).

Services and Other

Similarly to the Energy and storage segment, Tesla does not disclose any revenue or cost breakdowns for its automotive sub-segment services and other. Nevertheless, Tesla publishes official numbers regarding its store and service locations, mobile service fleet, supercharger stations and supercharger connectors. Further, it is important to mention, that cost of sales already includes depreciation.

In the base case, aftersales related revenue drivers such as store and service locations and the mobile service fleet are expected to grow at average historical rates. However, considering that

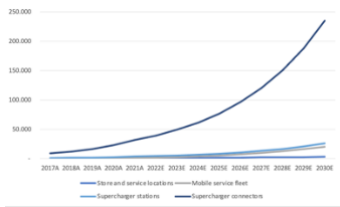

Exhibit 29: Services and Other Revenue Drivers

services will become more efficient in the future, for example through economies of scale, technical innovations and increased connectivity of vehicles, growth is expected to slow down from 2026 onwards. The bear and bull cases are tied to the bear and bull deliveries scenarios as after-sales services are directly related to the number of vehicles on the market.

Although Tesla has already one of the leading charging networks, its charge points are expected to grow significantly. According to *BCG*'s estimated CAGR of 25%, Tesla's number of supercharger stations will grow from 3,476, reaching 25,898 by 2030. Again, bear and bull cases are adjusted for different vehicle delivery scenarios, as charging demand is driven by vehicles on the market (Exhibit 29).

Tesla Supercharging Network TAM (mn)

	Tesla Superchargers				
Daily BEVs charged	25000	50000	100000	250000	500000
5	$ 479	$ 958	$ 1.916	$ 4.791	$ 9.581
8	$ 767	$ 1.533	$ 3.066	$ 7.665	$ 15.330
10	$ 958	$ 1.916	$ 3.833	$ 9.581	$ 19.163
12	$ 1.150	$ 2.300	$ 4.599	$ 11.498	$ 22.995
15	$ 1.437	$ 2.874	$ 5.749	$ 14.372	$ 28.744

Exhibit 30: Tesla Supercharger Network Revenue

Finally, total revenue was computed based on historical data, applying the average growth of previously mentioned revenue drivers. By 2030, the base case scenario projects a revenue of EURm 30,580. Besides general growth, this achievement is primarily due to opening the charging network to other brands. According to *Goldman Sachs*, this could generate USDbn 25 or more [48] (Exhibit 30). However, considering market trends such as improved parts quality and reduced maintenance requirements. The overall segments revenue growth is expected to slow down from 2026 onwards.

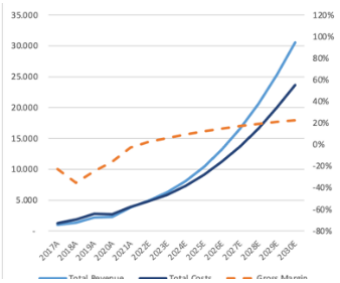

Exhibit 31: Tesla Services and Other Revenue and Costs

For the bull case it is considered that Elon Musk is aiming at a gross margin of 30% for its charging network [49], and that aftersales gross margins for electric vehicles are estimated to be at roughly 24% at maximum (70-90% of ICE margin i.e. >30%). Given historical gross margins, which just turned positive (4%) in Q3 2022, it is estimated that gross margins will further increase, reaching 26% (bull case), 23% (base case) and 20% (bear case) by 2030. As a result, Tesla's historical trend of reducing costs as percentage of revenue (4% annual decline from 2018 to 2021) is assumed to continue, although slowing down from 2025 onwards [50] (Exhibit 31).

Financing

Capital Structure

Tesla's debt to equity ratio declines continuously

Considering Tesla's historical capital structure, it is apparent that the company has been strongly deleveraged since 2019. Accordingly, the debt-to-equity ratio based on book values declined from 203% in 2019 to 9% in Q3 2022. The debt-to-equity ratio based on market values decreased even more, from 215% in 2019 to 8% in Q3 2022. Since Tesla is highly profitable and theoretically does not rely on debt for investments, it is assumed that this trend will continue in the future. Further, there is no publicly available information regarding the strategy Tesla is pursuing with respect to its capital structure. Based on the historical change in leverage of -16% per year, Tesla is expected to fully deleverage by 2030 (Exhibit 32). Lastly, it is important to mention that Tesla does not pay dividends.

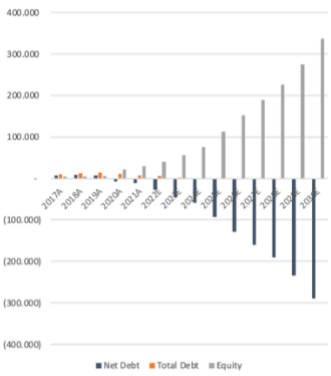

Exhibit 32: Tesla Capital Structure in the Base Case Scenario

Beta

Tesla's leveraged beta was determined using regression analysis. Based on Tesla's daily stock prices (closing) and the corresponding values of the relevant stock index *S&P 500*, the beta has been calculated for 2017 to 2022. In terms of the year 2022, the cut of was on 21st October 2022. The beta was determined separately for each year, as the ratio can fluctuate strongly over extended periods, thus ensuring a more accurate result. The unlevered beta was determined based on the specific debt-to-equity ratio and the U.S. federal tax rate of 21%. For 2017 to 2022, the average leveraged beta is 1.52, and the unleveraged beta is 1.16 (Exhibit 33).

Cost of Capital

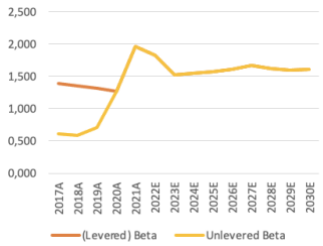

Exhibit 33: Tesla Stock Beta

The cost of equity was calculated using the capital asset pricing model. The risk-free rate was determined based on daily 30yr U.S. treasury par yield curve rates (6-average of 2.52%) [51]. Furthermore, the U.S. equity risk premium (average of 5.04% from 2017 to 2022) published by *Aswath Damodaran* is included in the cost of equity calculation [52]. Damodaran estimates the country's equity risk premium based on historical premiums earned by stocks over default-free securities [53]. Inserting all inputs into the formula, the average cost of equity for the period 2017 to 2030 is 9.31%. One can observe that the cost of equity increases from 6.01% in 2017 to 10.16% in 2030, indicating a higher financial risk for shareholders.

Since Tesla currently holds relatively little debt and the calculated average interest rates therefore do not provide a suitable basis to forecast the cost of debt, the debt-rating approach was applied. Given Tesla's current BBB rating issued by *S&P Global Ratings* [54] and U.S. corporate BBB effective yields, a cost of debt of, on average, 5.24% is assumed [55].

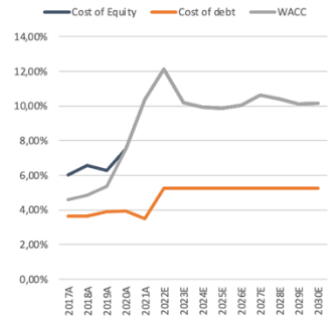

Exhibit 34: Tesla Cost of Capital

In conclusion, the weighted average cost of capital for Tesla is 9.02% (2017-2030). Since the cost of debt loses significance due to the forecasted debt reduction, the weighted cost of capital will equalize with the cost of equity from 2020 onwards (Exhibit 34). The slightly increasing weighted average cost of capital implies a rising risk for investors. As a result, cash flows generated must be discounted to a greater extent.

Valuation

Multiples

Strong growth expectations for the energy segment drive Tesla's enterprise value

In addition to the DCF valuation approach, Tesla was valued based on public trading multiples and precedent transactions. Required financials by segment as of 2023 were obtained, based on revenue shares. The public trading peer group for Tesla's automotive business includes large international corporates such as *Ford*, *Mercedes*, and BYD. No separate stand-alone valuation was carried out for the services and other business, as the peer group does not provide reliable results and substantial overlaps with the automotive business can be identified. Moreover, the identified peer group for energy generation and other includes companies such as *Sunrun*, *SolarWorld*, *General Electric*, and Generac. Not all core competitors, such as LG Chem, were included since large conglomerates operating in a variety of industries are not relevant to determine specific industry multiples.

Weighted Average Share Price - 3 Cases	
Weights	
Bear Case	25%
Base Case	70%
Bull Case	5%
Total Enterprise Value	756,94B USD
Automotive + Services and Other EV	320,39B USD
Energy generation & storage EV	436,56B USD
+ Total Cash & ST Investments	41,93B USD
- Total Debt	1,89B USD
Equity Value	796,99B USD
/ Shares Outstanding	3,16B
Price per share	252,37 USD

Exhibit 35: Weighted Average Share Price (Relative Valuation)

Precedent transactions were obtained from *mergermarket*. To ensure relevance, only transactions regarding the vehicle manufacturing and alternative energy industry from 2017 to 2022 were analyzed.

To obtain a final enterprise value, additional factors were considered. Accordingly, the geographical location of companies located in the USA is weighted more heavily (60%) than the rest of the world. Furthermore, EBITDA multiples with 80% have significantly more impact than revenue multiples, as EBITDA provides better comparability by normalizing capital structure, taxes, and accounting standards. Public trading multiples and precedent transactions are weighted equal, as both are perceived as relevant. The final enterprise value represents the average of the median and mean-based values.

Ultimately, applying the same case weighting assumptions as with the DCF approach, a total

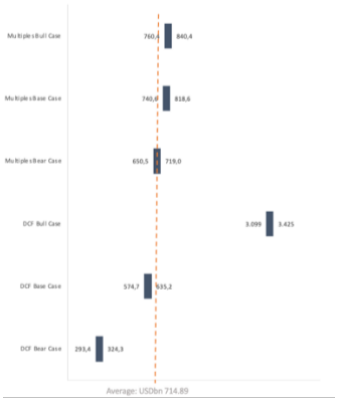

Exhibit 36: Tesla Football Field Valuation Overview (in USD billion)

enterprise value of USDbn 796,99 is obtained (USD 252.37 per share). A separate valuation for the automotive and energy segments results in a business value of USDbn 320.39 and USDbn 436.56. In conclusion, multiples for the Energy generation and storage business are significantly higher than in the vehicle manufacturing industry, implying high-growth expectations of investors (Exhibit 35).

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"TESLA, INC."

COMPANY REPORT

"AUTOMOTIVE & ENERGY"

16 DECEMBER 2022

STUDENT: "N. EGGERS; M. GRIPP"

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Tesla: Pioneering electric mobility & energy solutions

Growing markets present strong prospects

- The recommendation resulting from the probability weighted DCF valuation is **BUY,** resulting from the **price target of $223,75** with an expected **upside potential of 42%.**
- Following increased societal awareness and political incentives, the global electric vehicle market is expanding quickly, with Tesla expected to **grow deliveries at a 22.5% CAGR** 2021-2030.
- With the Ukraine crisis **increasing inflation and causing supply shortages** mainly in Europe, many car manufacturers face issues. Due to most of Tesla's production occurring outside of Europe and past events like COVID-19 showing **little affect towards Tesla & the EV market**, this creates a potential **opportunity** for Tesla to outperform the competition.
- Tesla's **established supply chain** and **battery technology know-how** form the foundation for further expansion into the **high growth battery storage and solar markets**.
- **High liquidity** and **strong free cash flows** ensure solvency regarding the pursued growth strategy.

Company description

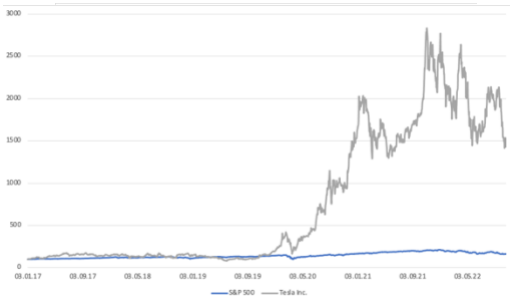
Tesla is a US-based company producing exclusively battery electric vehicles, energy storage products, solar panels and charging stations, while also providing car serviced. Currently still focussing on the premium segment, Tesla aims to reach the affordable mass market with cost reductions in the future. Tesla operates globally, with plants in the US, Germany and China.

Recommendation:	**BUY**
Vs Previous Recommendation	*HOLD*
Price Target FY23:	**223.75 $**
Vs Price Target FY22	*160.73 $*
Price (as of 15-Dec-22)	**157.57 $**

Bloomberg: TSLA

52-week range ($)	153.28-402.67
Market Cap ($bn)	497.57
Outstanding Shares (bn)	3.158
Beta (5Y Monthly)	1.91

Source: Yahoo Finance



Source: Yahoo Finance

(Values in $ millions)	2021A	2022E	2023F
Revenues	53.823	80.352	120.599
EBITDA	9434	17021	25632
Net Profit	5644	8817	14608
EPS	5.6	2.91	4.09

Source: Annual Report 2021, Quarterly Reports, Analyst Estimation

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Company Overview

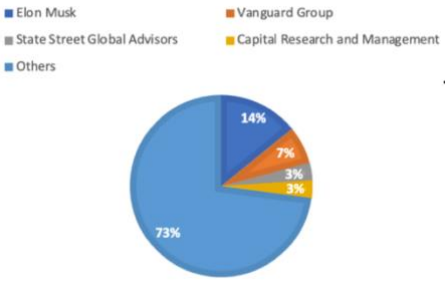

Exhibit 1: Tesla's Top 4 Shareholders 2022

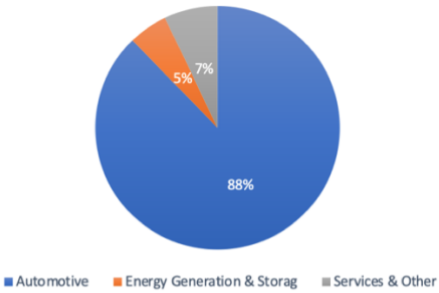

Exhibit 2: Tesla Revenues by Segment 2021

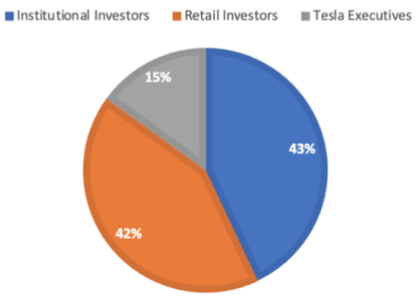

Exhibit 3: Tesla's Shareholder Structure 2022

From the founding of Tesla by Martin Eberhard and Marc Tarpenning in 2003, to the joining of current CEO Elon Musk in 2004, until now, Tesla's mission has been to "accelerate the advent of sustainable transport by bringing compelling mass market electric vehicles to market", with the vision of "creating the most compelling car company of the 21st century, by driving the world's transition to electric vehicles". This results from the increasing pressures to lower societies dependency on oil and consequently gasoline, as well as growing concerns about greenhouse gasses, environmental protection and global warming. Due to these developments, legacy automakers and new entrants began servicing the increasing demand and interest for electric vehicles (EV), hybrid electric vehicles (HEVs), plug-in hybrid electric vehicles (PHEVs) and battery electric vehicles (BEVs). Tesla focusses solely on BEVs, fully moving away from traditional internal combustion engines (ICE), following the release of their first production vehicle in 2008, disrupting the automotive industry. Following the early growth stages, Tesla went public in 2010 with the IPO netting $226 million. Currently Tesla operated in three segments, the automotive segment, energy generation and storage, after the purchase of SolarCity in 2016, as well as services and other.

Market and Sector overview

Automotive Sector

Tesla Automotive Product Mix

Tesla began its life as a vehicle manufacturer in 2008, with the release of the high-end sports car Tesla Roadster, retailing at around $120,000. Following Tesla's IPO, they released their second car, the five-door sedan, Model S in 2010, starting at around $60,000 at the time. In 2012 Tesla announced its luxury SUV-Crossover, beginning deliveries in 2015 with the starting price of around $85.000. Next, Tesla released its third actively produced vehicle, the Model 3, another five-door sedan, with a considerably lower price tag than the Model S, starting at just $39,000, intended for the mass market. The latest model is the Model Y, a compact crossover based on the Model 3, with prices starting at $58,000. Having begun deliveries in 2020, the Model Y has since then gone on to become Tesla's second most successful vehicle and currently sits at number three for most sold EV worldwide.

With just four models currently produced, Tesla is looking to expand its product portfolio as quickly as possible. Due to the high demand and limited production capacities Tesla has to offer, some delays in the release of further models occurred. Next to passenger vehicles, Tesla is experimenting with commercial vehicles in the form of a semi-truck, with Tesla announcing the Tesla Semi, a fully electric semi-trailer truck in 2017, starting at $150,000, with deliveries forecasted to begin in early 2023. Additionally, Tesla announced the Roadster 2 in 2017, a high-end sports car to follow the original Roadster, starting at $200,000 and expected to begin production in 2023 as well. Furthermore, Tesla announced the Cybertruck in 2019, a pickup truck with a very non-conventional design, receiving mixed first impressions, but a good amount of pre-orders. After having its release delayed multiple times, it is also expected to begin production in 2023, at a base price of $39,900. Lastly, to follow Tesla's mission of bringing affordable EVs to the market, Tesla is working on an entry level model compact car starting at around $21,000. This model is truly aimed at the mass-market, and while there has been no confirmation or official reveal, it is expected to launch around 2025.

- Market overview

Global Overview

Due to the Russia-Ukraine conflict, the world and especially Europe have been facing high price increases and material as well as energy shortages. While it is expected to affect the whole economy, European automakers will struggle the most, due to their increased reliance on Russian and Ukrainian supplies, when compared to Tesla. Furthermore, while electricity prices have increased, oil and gasoline prices have increased at an even higher rate. Overall, while the crisis might affect Tesla's sales in the short-term, the increased struggles of Tesla's European competition, as well as increased gasoline prices might benefit Tesla longer-term. Comparing this crisis with COVID-19, which barely affected Tesla sales, it is assumed that Tesla will not have significant issues, outside of minor price increases due to inflation and potential temporary sales decreases in Europe.

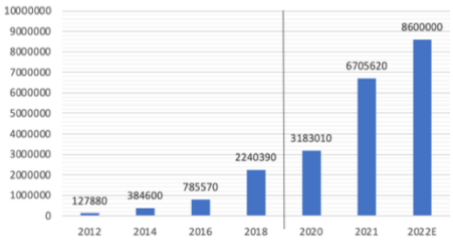

Exhibit 4: Worldwide EV Sales Growth (Units)

Global Automotive Sales:

CAGR EV Registrations 2012-2021: *48.58%*

CAGR EV Registrations 2019-2021: *42.65%*

[1] [2]

Global automotive sales have been growing since 2009, peaking in 2019, before COVID-19 and ensuing supply chain disruptions caused sales to drop. While the automotive market declined, the EV sales for the same time period grew, with twice as many sales in 2021 compared to 2020, as can be seen in *Figure 4*. The total market volume of EVs was around $171.26 billion in 2020 and is forecasted to reach about $725.14 billion by 2026, indicating an assumed CAGR of around 23% for that timeframe, in line with a forecast 22,5% CAGR between 2022 and

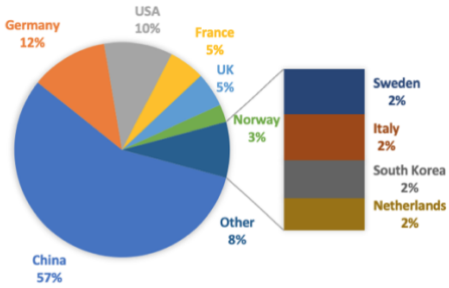

Exhibit 5: Top Ten Countries by EV Sales

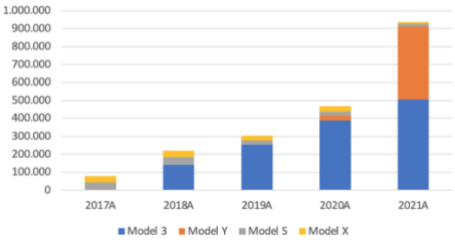

Exhibit 6: Tesla Sales by Model (Units)

USA Tesla Sales:

CAGR Tesla Sales 2017-2021: *48%*

CAGR Tesla Sales 2021-2028: *25.4%*

[6]

Exhibit 7: Tesla Past Deliveries by Region (Units)

2030 [1][2]. By comparison, the total automotive market volume worldwide was around $3,5 trillion, meaning around 5% of vehicle sales were EVs, doubling in 2021, with nearly 10% of new vehicle sales being EVs. Out of the total EV sales, the portion of BEVs compared to PHEV has been steadily increasing since 2012 growing from a 57% share to a 70% share in 2021.

Considering the EV market, Tesla has been one of the market leaders since its inception as a first mover in the EV markets and especially the BEV market. Tesla sold 936,222 units in 2021, an 87% increase from its 499,647 sales in 2020, expanding its lead towards competitors as the most sold BEV brand worldwide. With a 2021 market share of 13.84% of the EV market, Tesla was the total EV market leader. [3] Keeping their top position as BEV manufacturer Tesla has solely seen supply constraints, while demand remains consistently high, leading to consistently high growth rates as showing in *Figure 6*, displaying Tesla's past sales growth segmented by model.

North America and the USA still fall behind Europe and China in EV sales, as can be seen in *Exhibit 5*, the main reasons being the attractiveness of EVs and especially BEVs, primarily driven by political incentives and regulations, as well as existing charging infrastructure and resulting range anxiety. Depending on geographic spread, the implementation of BEVs and charging infrastructure varies in difficulty and therefore availability throughout the region, mostly being concentrated around metropolitan areas. As a consequence, different sates and regions employ differing incentives and policies to implement EV usage.

United States of America and North America

The USA constitutes the primary market for Tesla since its founding there. With a total automotive market volume of $557.6 billion following a 2.9% growth in 2022, the US market resumes growth after 2.3% yearly decline between 2017 and 2022. It is expected to reach a projected market volume of $584.8 billion, at a CAGR of 0.96% by 2027. [4] [5] A part of the market decline can be led back to demand shocks and supply restraints due to COVID-19, with overall vehicle sales declining by 13% in the year 2020 alone. Conversely, EV sales for the same year of 2020 experienced growth of around 4%. In total, the US EV market volume is estimated at $28.24 billion in 2021, with analysts forecasting growth at a 25.4% CAGR, to a total EV market volume of $137.43 billion by 2028. [6] BEV sales have been increasing steadily, making up around 60% of all EVs sold in 2018 and about 70% in 2019. [1]

As previously mentioned, the USA is currently still Tesla's primary market, with Tesla's dominating BEV market share of almost 80% in 2020, which has declined to around 70% in 2022 as the competition catches up. Considering the total

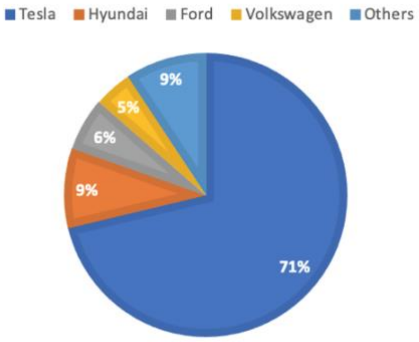

Exhibit 8: Tesla USA EV Market Share 2022

automotive market, Tesla's market share of the US and Canada combined is 3.2%, with estimations of growth to around 3.5% by the end of 2022 and 4% by the end of 2023. Nonetheless, Tesla has experienced high growth in the last couple of years, with a CAGR of 48% for US deliveries between 2017 and 2021. While this growth is expected to slow down, the CAGR for US deliveries is expected to be just above 24% between 2021 and 2030. With around 356,222 vehicle sales in 2021, the USA made up around 38% of Tesla's total deliveries, equalling about $16,923 million in automotive sales revenues.

On a nation-wide basis, policies, such as the US Environmental Protection Agencies set standards for greenhouse gas emissions revised in 2021, project an increase to 17% EV sales of the total automotive market by 2026, a large jump from the current 7%, should the standards be successfully followed. [7] All in all, the 2026 forecast is still far behind Joe Biden's goal of 50% EV sales by 2030, but it shows a clear goal and growth prospects for the US EV market.

China and Asia

Asia EV Sales:

China CAGR EV Sales 2017-2022: *31.26%*

South Korea CAGR EV Sales 2022-2027: *21.06%*

[1] [8]

Asia has the largest automotive market volume at $713.6 billion in 2022, estimated to grow to $798.9 billion by 2027, at a CAGR of 2.28%. China is the largest contributor to Asia's automotive market volume, with the other relevant EV market in Asia being South Korea. Having sold around 3,334,000 EVs in 2021, about 50% of worldwide EV sales were in China, following over 100% growth 2020-2021 [1][8]. While EV sales only constituted 4.9% of total vehicle sales in 2019, EV sales made up 24% of vehicle sales in the first two quarters of 2022, with BEVs accounting for 19% and PHEVs accounting for 4%. In total China's EV market volume is estimated to reach $160.4 billion by the end of 2022. Furthermore, South Korea EV market volume is projected to reach about $7.21 billion by the end of 2022, expected to reach a projected market volume of $18.76 billion by 2027.

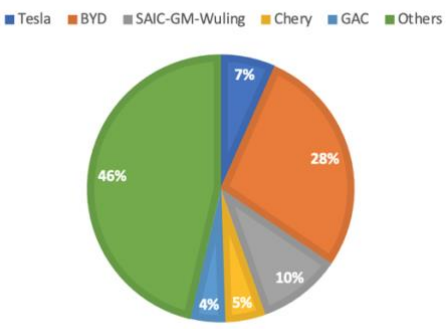

Exhibit 9: Tesla China EV Market Share 2022

While China is by far the largest EV market worldwide, Tesla only ranks 3rd in EV sales, with the other four EV manufacturers being Chinese. This constitutes a market share of 6.6% of the EV market, having sold around 320,000 vehicles in 2021, an increase of more than 130% compared to about 135,000 sales in 2020 [9]. Consequently, 35% of Tesla sales were in China in 2021, with the first three quarters of 2022 showing further promising growth at an about 68% sales increase on a year-over-year basis [10]. Should these growth rates continue, China would become Tesla's new primary market, with 38% of Tesla's being sold in China by 2023, compared to 35% in the USA. This can be led back to the fact that China's overall automotive, EV and BEV market are growing at faster rates than those of the US, while Tesla keeps or potentially even grows its market

share. Furthermore, while being overshadowed by China in absolute sales numbers, Tesla's market share in South Korea makes up nearly 44% of EV sales having sold around 23,000 vehicles in 2021, up 64% over 2020 sales. Overall, this leads to a forecast of about 25.97% CAGR in Asia between 2021 and 2030, depending on how Tesla can assert itself toward its competition.

China have already surpassed their 2025 goal for 20% EV sales, as outlined by their five-year-plan for Energy Saving and Emission Reductions, the direction and ambitions of any new goals set, remain to be seen, but are expected to further benefit the EV market [11]. On the other hand Japan has lower than expected EV sales, with EVs making up just about 1% of total vehicle sales, as they have primarily focused on hydrogen-based vehicles [12]. Additionally, countries like India lack supporting infrastructure, while only 5% of total EV sales were four-wheeled passenger cars, with 92% of EV sales being two- or three-wheelers, with low EV sales overall currently making this a very small market for Tesla [13].

Europe

Europe's automotive market volume is estimated to reach about $414.6 billion by the end of 2022, making it the smallest out of the three regions discussed. With an expected CAGR of 1.75%, this market volume is forecasted to reach around $452.2 billion by 2027 [14]. Looking at the European EV market by comparison, it is expected to reach $150.3 billion by the end of 2022, further growing to a market volume of $340.7 billion by 2027 [15]. Taking a closer look at BEV sales numbers, historical data shows a CAGR of 57.2% between 2017 and 2021, with 878,432 vehicles sold in 2021, up 63% from 538,734 sales in 2020. Considering absolute sales numbers, Germany leads with 356.425 BEV sales in 2021, up 84% from 2020, with the top ten shown in *Exhibit 10*. Two other notable European countries when it comes to EV sales are Norway and the Netherlands, with Norway selling 55.9% EVs in 2019, up from 49.1% in 2018 and the Netherlands selling 15.1% EVs in 2019, up from just 6.3% EV sales in 2018 out of total automotive sales. Taking this into account, BEV sales made up 9,3% of total vehicle sales in 2021, up from 5.7% in 2020, while PHEVs made up 7.6% in 2021, up from 4.5 in 2020 [1].

Tesla's market share in Europe has been steadily increasing, from just 0.8% in Q1 of 2020 to 2.1% of Q1 in 2022 of total automotive sales. Tesla's share of the EV and BEV markets tell the same story, with Tesla's sales in Europe steadily increasing from over 111,000 sales, constituting a market share of 20% of the EV market in 2019 to over 250,000 sales in 2021, resulting in a decreased market share of 10%, even though absolute sales increased. With a CAGR of 55.89% between 2017 and 2021, Tesla has shown strong historical growth, comparable

Europe EV Sales:

Europe CAGR EV Sales 2017-2021: *57.2%*

Europe CAGR EV Sales 2022-2027: *17.78%*

Europe CAGR BEV Sales 2017-2021: 57.2%

[14] [15]

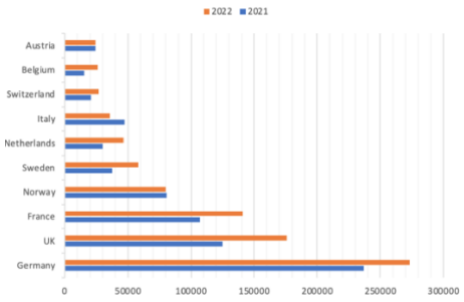

Exhibit 10: Top Ten Total EV Sales Y-o-Y Europe (Units)

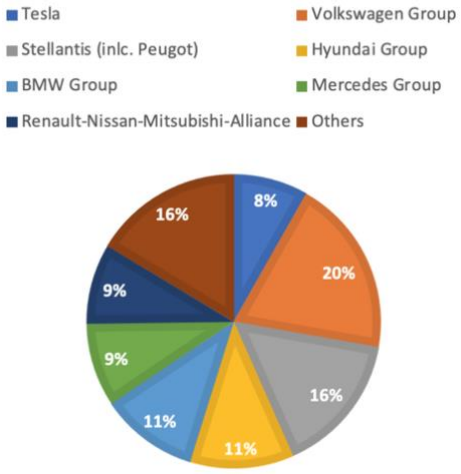

Exhibit 11: Tesla EU EV Market Share 2022

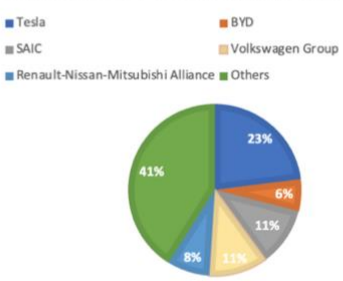

Exhibit 12a: Worldwide BEV Sales Market Share 2020

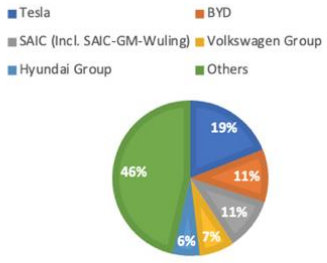

Exhibit 12b: Worldwide BEV Sales Market Share H1 2022

to the other regions. Following the Ukraine invasion and resulting inflation, energy crisis and supply shortages, Tesla experienced a decline in total sales, as nearly 60,000 sales in Q1 2022, making up 11% of EV sales and 18% of BEV sales, declined by over 50% to just above 26,000 sales in Q2 2022, a market share of 5% of the EV- and 8% of the BEV market [16]. This slump seems to have been temporary though, as the Tesla Model Y set the all-time monthly sales record for EV sales by model in Europe in September. Taking in to account the over 40,000 sales of Model Y and Model 3 in September alone combined, Tesla seems to have been able to recoup some of its EV market share, increasing it to 8.2% [17]. Overall, it remains to be seen how Tesla will perform in Europe in the future and how the demand will be affected by the high level of competition there, which is catching up rapidly, while currently around 27% of Tesla's sales are in Europe. Nonetheless, it is expected for Tesla to further increase automotive sales, with an estimated forecast CAGR of 26.45% between 2021 and 2030, with slightly slower growth in 2022-2023 due to the Ukraine crises.

Europe set the global benchmark, with the EU setting the goal of 100% EV sales by 2035 and 35% EV sales by 2030, having already reached the goal of 15% by 2025 [11]. Different countries employ alternative incentives and infrastructure, with Norway already reaching targets set far in the future for most other EU countries and the Netherlands providing by far the highest EV charging density in Europe, as examples. Overall, Europe has set a clear direction towards electric mobility, with all countries expanding charging networks and employing political incentives, albeit at different speeds.

- Automotive Industry Competition and Risks

While Tesla enjoys the benefits of first mover advantages, the competition has picked up in the recent years, with legacy automakers as well as new entrants closing the gap to Tesla. Unfortunately for Tesla, combined sales data of Q1 and Q2 of 2022, show that Tesla has lost its EV sales lead to the Chinese manufacturer BYD, who have caught up to Tesla by increasing sales by 320% on a year-over-year basis, showing that the competition is catching up fast. With BYD producing around 50% of their EVs as PHEVs, Tesla still remains the by far largest BEV producer worldwide. Looking at the top 5 BEV producers of Q1 and Q2 2022 in *Exhibit 12b*, Tesla's lead becomes clear [18]. Comparing these numbers with annual data from 2020 in *Exhibit 12a*, it becomes clear that Tesla has kept a relatively stable position at the top of the list concerning vehicle sales [19][20]. While there is a slight decrease in Tesla's market share, taking in to account Tesla's growth in the same time period, shows that the BEV market has simply been growing at a faster rate than Tesla. Tesla still occupies two of the top

three spots of most sold EVs, with the Model 3 being at the top spot and the Model Y at the third spot in 2021, with both models combined making up slightly over 50% of total BEV sales. Nonetheless, legacy automakers are releasing an ever-increasing number of EVs, with Fords new EV line-up and VWs ID EV-line expected to be Tesla's biggest competitors in North America and Europe. Furthermore, new entrants such as BYD and NIO, primarily from China as well as Polestar from Europe and Lucid Air from the USA, potentially threaten Tesla's market dominance. To conclude, it is worth mentioning, that Tesla has been subject to high demand worldwide and growth rates are driven primarily by how they can keep up with demand and increase capacities as well as deliveries, implying supply side constraints instead of demand constraints.

Exhibit 13: Top Ten Worldwide BEV Sales by Model 2021 (Units)

While most of the world seems to see the future of the automotive industry primarily using EVs to combat environmental issues, defendants of the traditional ICE vehicles believe that future developments and improvements on ICE technology could reduce emissions to levels that are comparable to those of EV production. While this is uncertain, and EV makers including Tesla are rushing to minimize the environmental impacts of battery sourcing, the future of drivetrain technology remains a potential yet currently small risk for Tesla's. In addition to the ICE drivetrain risk, comes the hydrogen-based drivetrain risk, which could bring some advantages over EVs, as previously mentioned in the context of Japan's future automotive strategy [21]. At the current stage of technological development, the production of hydrogen is very expensive as well as inefficient, while storage of hydrogen requires high amounts of energy, rendering it as a low threat for now. Nonetheless, further developments in hydrogen technologies could disrupt the automotive market, similarly to how EVs are disrupting it now.

Lastly, a current risk all EV makers face are supply constraints for batteries, due to nickel and lithium shortages, making them either unavailable or inflated in price. Tesla has not faced this issue as much as competitors due to their good supplier relations. Nonetheless, with the race towards EV leadership these constraints may increase as battery production and materials sourcing struggles to keep up with the demand for EVs.

- Competitive Advantages and Opportunities

As market leader and one of the first movers in the EV and BEV market, Tesla has built up an assortment of different competitive advantages towards other EV and especially BEV makers. One of the main competitive advantages is the brand name Tesla itself, being by far the most associated brand with EVs, not only standing for progressive and most advanced technologies but also being known for the best price to performance ratio, especially with the Model 3 [1].

Tesla Competitive Advantages:

First mover advantage and strong brand value

Vertical integration and good supplier relationships

Advanced Software and updating capabilities

Exclusive use of Supercharger network in certain regions

Furthermore, Tesla's battery supply chain proves to be a large competitive advantage, with Tesla having produced more batteries in KWh terms than all other automakers combined in 2020. While this allows Tesla to reap the benefits of decreasing production costs for batteries, it also allows for innovative vehicle designs, better incorporating batteries in to the bodywork of the cars. Additionally, as mentioned before, competing automakers have suffered through increasing supply shortages of batteries as the market increases its EV supply. Tesla on the other hand has barely felt the impacts of these shortages and have been able to constantly increase production throughout.

Another competitive advantage is the software Tesla's come with, including self-driving technologies amongst others. While fully autonomous driving seems to be far in the future, with mostly regulations halting progression, Tesla AI, its autonomous driving software is some of the most advanced currently available on the market, with only some legacy automakers such as Mercedes, being able to keep up. Combining these and other technological features with over-the-air updating capabilities, Tesla offers its customers an additional benefit to purchasing their vehicles, even though its full usage might currently not be possible.

Lastly, Tesla's Supercharger network is currently exclusively available to Tesla's in some regions, meaning that Tesla owners enjoy the benefits of additional high-speed charging stations, reducing range anxiety in comparison to other EV owners. While it is unclear whether these Supercharger might be open to the public in the future, and if they might give priority to Tesla owners, they currently still offer Tesla a competitive advantage. [22]

Services and Other

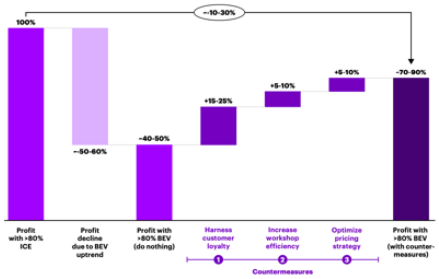

Exhibit 14: Annual customer-paid business profit for ICEs versus BEVs

Tesla's *Services and Other* business is considered a subsegment of its automotive division. The business unit captures products and services related to charging infrastructure and the vehicle aftersales market, which includes parts and used vehicle sales, non-warranty maintenance and repair services as well as access to supercharger stations.

The aftersales market for electric vehicles differs substantially from those powered by combustion engines. While combustion engines consist of approximately 2000 moving parts, electric engines have about 99% less. Additionally, overall parts quality tends to increase, resulting in significantly less required maintenance. For example, while combustion engines generate, on average, EUR 60 in oil and accessories revenue per vehicle, battery electric vehicles (BEVs) only return EUR 10. Although connectivity of vehicles and over-

the-air software updates are expected to increase, they cannot offset this decline in revenues [23] [24].

Currently, the traditional original equipment manufacturers (OEMs) vehicle aftersales business generates profit margins of 30% and more [25]. However, according to *Accenture*, due to an increasing share of electric vehicles (EVs), profits will likely decline unless countermeasures are taken. Nevertheless, aftersales revenues decline can be capped at 10% to 30% given the right strategic actions. Furthermore, enhanced customer loyalty, improved workshop efficiency, and optimized pricing strategies enable OEMs to limit profit decreases (Exhibit 14).

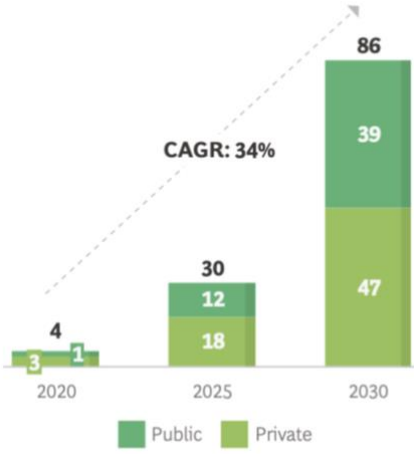

Exhibit 15: Projected Vehicle Charging Demand in Europe

Alongside a changing aftersales market, the refueling and charging infrastructure is also experiencing a significant transformation. Over the course of the significantly increasing share of electric vehicles, an extreme demand for charging infrastructure is predicted. As a Benchmark, the overall charging demand from passenger vehicles in Europe is expected to grow from 4 TWh in 2020 to 86 TWh in 2030 (CAGR 34%) (Exhibit 15). Likewise, the number of public charge points is forecasted to grow from 203,000 in 2020 to 1.838 million in 2030 (CAGR 25%) (Exhibit 16). Further, the amount of charged vehicles per charge point is expected to increase significantly.

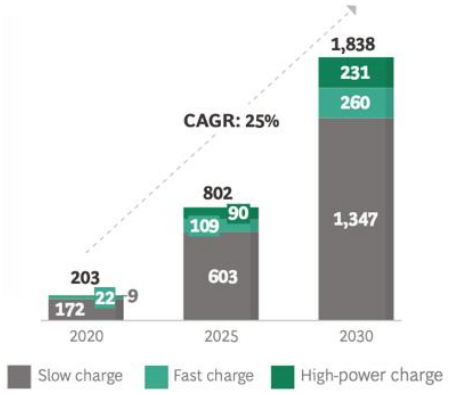

Exhibit 16: Projected Number of Public Charge Points in Europe

The competitive environment is set to change drastically going forward. Potential competitors include oil and gas companies, retailers, infrastructure investors and utilities. Especially oil and gas companies have a significant advantage, as they already operate sites at traffic hubs [26].

Energy Generation and Storage

Since the company was founded in 2003, Tesla has pursued the goal of accelerating the world's transition to sustainable energy [27]. As a result, Tesla entered the *energy generation and storage* industry by acquiring *SolarCity* in November 2016, thus combining SolarCity's photovoltaics installations business with Tesla's battery storage know-how [28]. Tesla's energy division serves residential, commercial & industrial (C&I) and utility-scale projects [29]. Residential projects are typically small deployments for households, while utility-scale projects are defined as massive projects, producing more than 10 MW of energy. C&I Projects, on the other hand, target corporations and commercial applications in general, for example, solar carports at stadiums [30].

Exhibit 17: Tesla Solar Panel

Tesla's product and service offering for energy generation includes solar panels, the *solar roof* and the solar inverter (Exhibit 17 to 19). Until 2021, conventional solar panels were not manufactured by Tesla itself. Tesla rebranded and

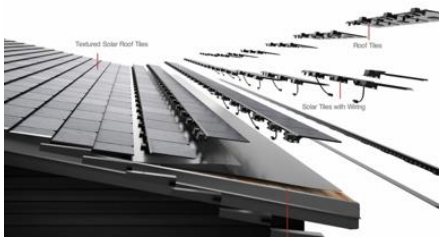

Exhibit 18: Tesla Solar Roof

Exhibit 19: Tesla Powerwall System Setup

Exhibit 20: Tesla Megapack

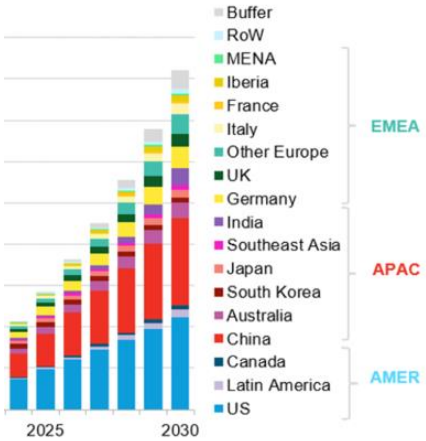

Exhibit 21: Cumulative Energy Storage Installations Worldwide

marketed products from *Hanwha Qcells* [31]. Conventional solar panels can be retrofitted individually on existing buildings. The solar roof, in contrast, consists of unique roof tiles that can generate electricity similarly to a conventional solar panel. Moreover, the solar roof allows a fully functional solar system to be integrated without sacrificing significant aesthetic changes to the house. The design of both product types has a great importance for Tesla. The energy generation portfolio primarily targets residential markets, although both product types can be used in a commercial and utility-scale context. To utilize the generated electricity, Tesla offers its own inverter, which transforms incoming DC power to AC power [29].

Tesla's product and service offering for energy storage includes the Tesla Powerwall, a home energy storage system, and the *Powerpack* and *Megapack*, large-scale energy storage systems (Exhibit 19 and 20). The Tesla Megapack was introduced in 2019, replacing the older *Powerpack*, being 60% more energy-dense [32] [33] [37]. As with all of Tesla's products, the company is also very design-conscious with its storage offering. According to a principal research analyst at *Navigant Research*, Tesla's Powerwalls look like a piece of art hanging on the wall [34]. Further services of Tesla's energy and storage business segment include installation services and maintenance services for Megapacks [29].

Currently, Tesla's Powerwall is only sold as a bundle in combination with the company's solar products. This decision was made in April 2021 and is reported to be due to a Powerwall order backlog of 80,000 units worth USDm 500 (as of 07/2021). Tesla will likely keep both product types linked until its production capabilities are sufficient to meet demand. A similar scenario can be observed for the Megapack. As of March 2022, there is an order backlog extending into the first quarter of 2023. As way to cope with bottlenecks emerging due to global supply shortages, Tesla has continuously increased its prices for the Powerwall and Megapack [32] [35] [36].

- Market overview

Currently, Tesla's energy and storage business segment still has a strong focus on the US market, although already operating in China (since June 2021), Europe (especially Germany), and other geographies. However, due to supply shortages, Tesla focuses on markets with high solar power penetration and energy costs [38].

In the United States, the solar industry is growing at a record pace, with a CAGR of 33% for the past decade [39]. Similar trends are emerging in global demand for energy storage. *BloombergNEF* expects battery storage capacities to

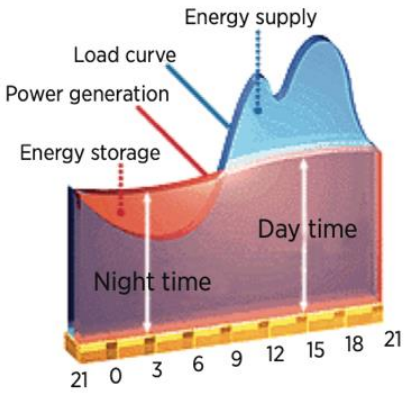

Exhibit 22: Graphical Representation of Energy Supply Fluctuation

increase from 17 GWh deployed as of 2018 to 2,850 GWh by 2040. Consequently, battery prices have already dropped 85% over the period of 2010 to 2018. According to BNEF, a further halving of prices per kilowatt hour by 2030 is possible. Shortly, the combination of battery storage and solar energy will be a strong driver for global battery production. Moreover, a geographical shift in the core markets will occur. While South Korea recorded the most storage installations in 2019, China and the U.S. are estimated to lead the statistics by 2040 (Exhibit 21). Falling costs for renewable energy and batteries will lead to a fundamental change in the energy and transportation sector. By 2040, it is expected that 40% of the world's electricity will be generated from wind and solar energy. In comparison, in 2019, the share was 7% [40].

Solar energy and battery storage systems greatly benefit from each other

In addition to the rapidly increasing share of electric vehicles, the energy storage market is primarily driven by renewable energies. Compared to conventional power generation, electricity generated from renewable sources has the disadvantage that it cannot always be supplied at full capacity. Accordingly, there are substantial fluctuations. Electricity generated from solar panels is dependent on sunlight and other non-controllable meteorological factors. Since electricity consumption does not correlate with electricity generation, there is a need for intermediate storage (Exhibit 22). Furthermore, decentralized energy storage systems can substitute the construction of new power grids when combined with PV systems or strengthen and relieve existing power grids. Similarly, numerous residential storage systems could be increasingly used for system services and individual applications [40]. In contrast, residential feed-in to the public grid could eliminate the personal benefits of having private energy storage. For example, battery life is likely to decrease, and feeding in just before an unexpected blackout might eliminate backup power for personal applications [41]. Moreover, the recent events in Ukraine and rapidly soaring electricity prices have led to increasing demand for independent energy supply, especially in Europe [42]. In conclusion, uninterruptable power supply (UPS) is not only essential for critical infrastructures but is also becoming increasingly relevant for multi-use applications [43].

As previously explained, the energy storage market is directly related to electricity generated from renewable sources, particularly solar energy. Accordingly, both markets show a very dynamic development. The global solar photovoltaics market grew by 25% in 2021 compared to the previous year, maintaining a solid growth trend [44].

The two most important markets are China, followed by the USA. China installed 54.9 GW in 2021 and exhibited the highest cumulative installation capacity of 305.9 GW as well as the most substantial growth. The USA added 26.9 GW in

2021, representing roughly half of China's newly installed capacity. As a result, Asia leads the ranking for the ninth consecutive year, with 51% of the world's installed solar capacity in 2021. Americas follow with 21%, and Europe is in third place with 17% [44].

In 2021, the US solar PV market grew by 19%, representing a total installed capacity of 121.4 GW. The capacity installed as part of utility-scale projects increased by 17 GW compared to the previous year. Even though the residential market is behind, residential demand recorded the most considerable annual growth since 2015 of 30% (4.2 GW) [44].

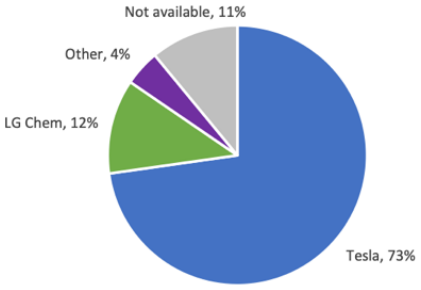

Exhibit 23: U.S. ESS market share by company

- Competitive Landscape

According to data on residential energy storage installations in 2020, Tesla has established a powerful market position in the U.S. market. Tesla accounted for 73% of installed storage systems, while *LG Chem* was in second place with 12%. The remaining 15% are attributable to more than 30 other competitors (Exhibit 23). Low prices and the strong reputation of the Tesla brand have contributed to this success. In addition, in-house cross-selling opportunities for energy storage in combination with solar systems and in-house installation technicians added to the achievement. Besides lower prices, Tesla's current Powerwall models offer more advanced features than competing systems, such as higher storage capacity and an integrated inverter. LG Chem as the most relevant competitor likewise scores with a strong brand and a global network. However, demand for its products dropped by 15% from 2018 to 2020.

Competition in the market is growing steadily

Further, both Tesla and LG Chem continue to benefit from their role as battery producers for utility-scale projects and the automotive industry. Tesla benefits from the existing supply chain that was originally established for the automotive segment. The production of components that are useful in both industries and the know-how acquired over the years on technologies and production processes in the field of batteries are equally of great benefit. However, a diversified business model requires that, in case of doubt, one division has to be prioritized. Due to semiconductor shortages, both Tesla and LG Chem could not meet the US demand for energy storage systems (ESS), as Tesla prioritizes the automotive sector and LG Chem focuses on the Asian market.

Since the market for battery storage is just developing, Tesla's main challenge is to defy the growing competition alongside supply chain problems. In the USA, more and more established companies are including battery products in their portfolio. Moreover, global players from abroad are increasingly trying to serve the American market. Specifically, multinational companies entering the market have a variety of strengths. Typically, these companies have established brand

names, international sales, installer networks, cross-selling opportunities, existing customer relationships, supply chain management experience, and financial resources to ensure rapid market entry.

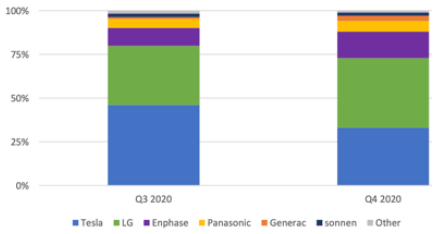

Exhibit 24: Share of price quotes on EnergySage by company

By the second half of 2020, the competitive environment had already changed. Companies such as *Enphase*, a United States-based manufacturer of solar inverters, and *Generac*, a U.S. based manufacturer of generators, have entered the market. Reportedly, Enphase launched large-scale sales of battery storage systems produced in China. Generac, in turn, is pursuing a strategy of breaking into the market through acquisitions. Both Enphase and Generac realized significant sales increases shortly after entering the market. In addition, Generac's prices are very close to those of Tesla. Accordingly, the variety of manufacturers and products on the online marketplace *EnergySage* has already increased significantly in the fourth quarter of 2020 (Exhibit 24).

Besides established players, the number of start-up businesses is also growing, pressuring the market with new products and services. As a result, the number of U.S. imports attributable to battery storage increased by 700% between 2019 and 2020. Hence, small companies such as *Blue Planet Energy*, *NeoVolta*, and *SimpliPhi Power* experienced significant revenue increases.

In turn, the utility-scale battery storage market is primarily dominated by a few global players (Exhibit 25). 66% of the global utility-scale projects in 2021 are attributable to just seven companies. These companies include Tesla, with 7 GWh of installed capacity, the joint venture between *AES* and *Siemens* (6 GWh), *Powin*, *BYD*, *Sungrow*, *Wärtsilä*, and *Flexgen*. However, experts expect competition to increase sharply for utility-scale projects. By the end of 2022, the market share of the top seven companies is expected to decrease from 66% in the previous year to 32% [45].

Exhibit 25: ESS Competitive Landscape

Comparable trends are occurring in the solar PV market. Besides Tesla, companies such as *Heliene*, *Mission Solar*, *Seraphim*, *Silfab Solar*, *Solaria*, *SolarTech Universal*, *SolarWorld Americas*, and *SunSpark* offer solar panels made in the USA. Yet not all these companies are U.S.-owned. Some of them, such as SunSpark, are subsidiaries of foreign conglomerates that have set up production facilities in the U.S. to avoid tariffs. Other relevant players include *First Solar*, *Hanwha Q Cells*, *JinkoSolar* and *SunPower*. While Heline, for example, is focused on large-scale projects, *Mission Solar* and *Solaria* offer design-focused solar panels [46]. Compared to battery storage, the market for solar products is already much more fragmented. In any case, both industries are highly competitive with the Chinese market.

Chinese market demand and increasing imports of battery cells, ESS components, and solar modules from Asia to the U.S. will likely pose the most significant challenge for Tesla in the future. It remains to be seen whether Tesla can compete with production facilities located in low-wage countries like China and to what extent such products will spread to the U.S. market. However, the competitive situation for Tesla is certain to intensify [47].

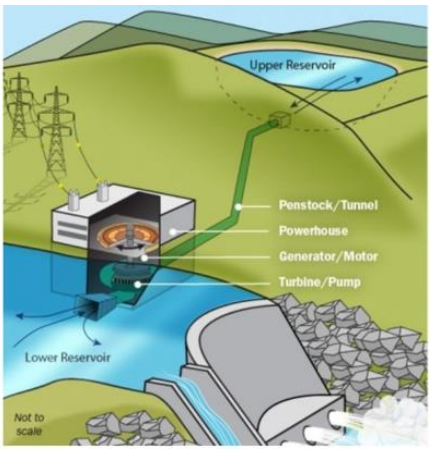

Exhibit 26: Pumped hydrogen storage

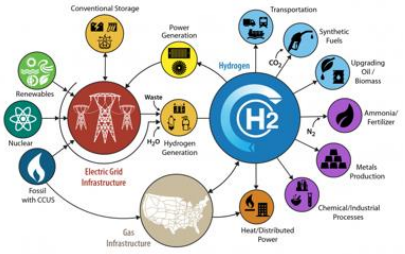

Exhibit 27: Range of applications for Hydrogen

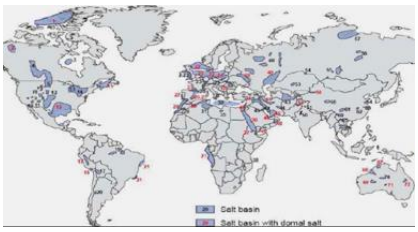

Exhibit 28: Location of Salt deposits (Caverns) worldwide

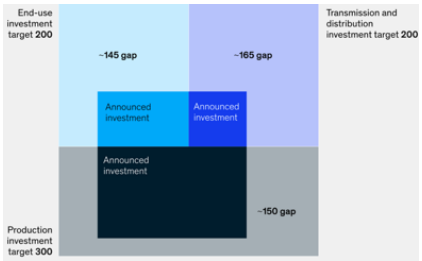

Exhibit 29: Announced versus required Hydrogen investments until 2030

Challenges

Energy can be stored not only by battery-based technologies. For over a decade, the energy storage market was led by only one technology: pumped hydrogen storage. (Exhibit 26) [48] [49]. However, a significant advantage of batteries is their versatility. Batteries can be manufactured in various sizes and placed right where the energy is needed. Furthermore, battery storage is far more space efficient [50]. While new projects for energy storage are almost exclusively based on battery storage, the ongoing development of hydrogen technologies poses risks for batteries, as an even more comprehensive range of possible applications could be covered (Exhibit 27).

While hydrogen is not yet commercially viable, significant investments are being made worldwide to improve production, transportability, and usability. In contrast to battery storage, hydrogen is additionally suitable for applications in industries where electrification is not practical or possible, such as the steel industry [51]. Besides the increased flexibility, hydrogen can also be stored cost-effectively in natural reservoirs (Exhibit 28) [50]. To meet the estimated demand of 660 million metric tons of green hydrogen by 2050, a further investment of USDbn 460 is required by 2030 (Exhibit 29). Alongside rapid market growth, hydrogen costs are expected to drop significantly (Exhibit 30). At only about USD 2 per kilogram, green hydrogen could become cost competitive in various sectors [52].

Moreover, the rapid market growth causes some institutions to lack behind. Many present regulatory policies are still based on battery technologies that are already being discontinued. More specifically, this involves discussions regarding the integration of residential storage into the power grid and the settlement of its owners [53].

In addition to financial hurdles, there are also risks related to sustainability. Batteries typically have a life cycle that ends at about 60% to 80% of the original energy capacity [49]. The limited lifespan combined with finite raw materials and toxic chemicals required for manufacturing and the pollutants generated during production, storage, treatment, and disposal raises questions regarding environmental impact [53] [54].

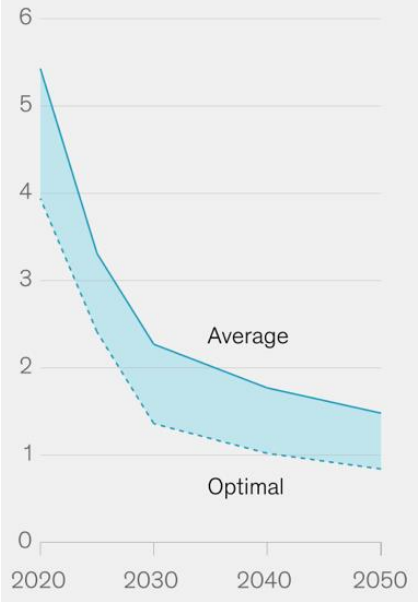

Exhibit 30: Projected cost development for green hydrogen in USD per kg

Finally, there are challenges regarding the supply chain. It is expected that the predicted market growth will add even more pressure to the already stretched supply chains, at least in the near term. Even though there are sufficient lithium reserves, market prices are highly volatile. *Andy Tang*, head of *Wärtsilä's* energy storage division, explains that battery storage accounts for only about 10% of the lithium market, while 90% is attributed to electric vehicle manufacturers. Furthermore, EV capacities are prioritized over battery storage. However, the shift to alternative technologies, such as sodium-based batteries, poses significant challenges, as a new scaled supply chain and production must be established from scratch [55].

In the wake of the pandemic, the solar PV industry is also struggling with supply chain difficulties. Consequently, in 2021, the cost of PV modules increased for the first time in years from an average of USD 0.21 to USD 0.33 per watt, an increase of 32%. Similarly, other raw materials required for production have seen a sharp rise in prices during the past year. Prices of industrial silicon increased by 300%, aluminum by 50%, polysilicon by 350%, and soda ash, which is used for solar glass, by 80%. To put this in perspective, the raw materials (polysilicon, metals, coatings, and glass) account for about 65% of the total cost of a PV module. In contrast, manufacturing accounts for about 22%, and logistics and shipping for 12.5%. Polysilicon, which has seen the steepest price increase over the past year, accounts for about 35% of total module costs. However, the recent price increases have primarily been captured by suppliers of the solar industry.

Especially China, as an important market and component supplier (50% of the world's polysilicon comes from the Xinjiang region) has a significant impact on the most recent price developments. China's national policy pursues the strategy of reducing the country's energy intensity, resulting in a limited production capacity of PV components. High demand facing constraint production capacities is one of the significant cost drivers. Moreover, delayed shipping from China and drastically increased shipping costs affect prices [44].

Like battery storage, solar power requires regulatory action to address backlogs. In addition to trillion-dollar investments, policy modifications are required to enable large-scale deployments of solar plants. Moreover, the production process of solar modules cannot be classified as sustainable either. In addition to using chemicals and the need for finite raw materials, production often involves coal-fired power plants, especially in China. Furthermore, there are concerns that the polysilicon industry in China is directly related to the forced labor of the Uyghur Muslims. On top of that, solar panels have a limited lifespan of about 25 years. By 2050, 78 million tons of waste could be generated. However, since the recycling process of solar panels is very complicated, it is expected that most of

the waste will end up in landfills. Given the toxic materials that solar panels contain, there is a risk to the environment [9.9].

- Opportunities

Solar energy and battery storage markets offers significant growth potential

Globally, an increasing number of power grids are heavily stretched and aging. At the same time, the share of renewable energies in total power generation is steadily increasing. In addition to the resulting need for load balancing, the number of severe weather events is rising and can create and exacerbate bottlenecks in the energy supply. Besides an increased threat of power outages, this also causes electricity costs to rise. Actions are required to ensure the resilience and reliability of the power grid. Accordingly, more and more utilities are investing in network modernization and introducing so-called demand-response programs, which incentivize customers to reduce their electricity consumption at peak load times. There are also extensive investments in utility-scale energy storage solutions located near power plants, substations, and transmission lines to stabilize the grid.

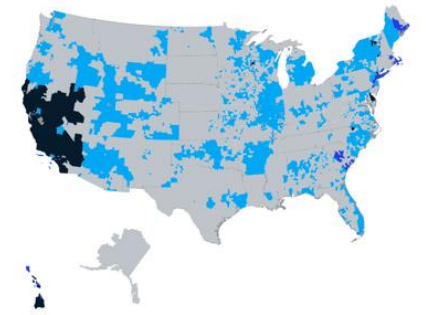

Exhibit 31: Profitability of Battery Storage Systems for Residential Applications in the U.S.

Likewise, the demand for energy storage systems for private households is proliferating. As explained previously, linking private storage systems to the grid creates additional opportunities to balance energy demand and supply. Although such integration faces many barriers, initial pilot programs are already in place in some U.S. states. Accordingly, private households are supposed to be compensated by utilities for consuming their stored energy at peak load times.

Another essential demand driver is the subsidization and incentivization of battery storage. For solar systems purchased in combination with battery storage, U.S. citizens can claim tax benefits that can reduce costs by 30%. Further, there are also local, state-dependent programs. The *California Self-Generation Incentive Program* provides cost savings of $1600 to $2500 for residential storage systems.

By 2019, energy storage systems were already of interest to 20% of the total U.S. population. Falling prices for storage systems and decreasing costs for installation are likely to expand the market significantly (Exhibit 31). Similarly, by 2018, 43% of C&I players in the U.S. could have benefitted from battery storage systems (Exhibit 32) [57]. In addition, the combination of solar modules with battery storage offers various advantages. Apart from more flexibility and more versatile application options, integrated solutions offer the potential for immense cost savings (Exhibit 33).

As with battery storage, rising costs for fuel and electricity are also driving the solar market. Especially rooftop roof-mounted solar installations have become

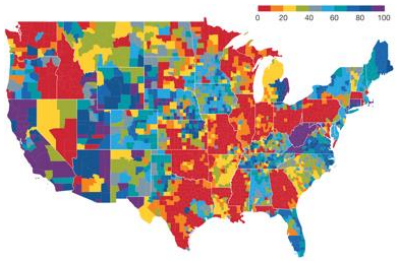

Exhibit 32: Profitability of Battery Storage Systems for Commercial and Industrial Applications in the U.S.

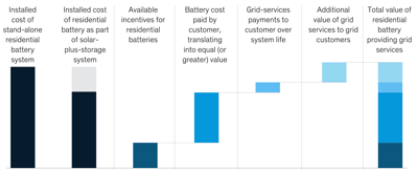

Exhibit 33: Average Solar and Battery Storage bundle savings

very popular to reduce costs and increase independence from external utilities. Furthermore, niche applications, such as floating installations on open water or in agricultural environments, offer enormous growth potential.

Other potential applications include merging solar technology with buildings and vehicles. Tesla has already launched its solar roof, a product that allows full integration with buildings in the form of roof tiles. Currently, the development of innovations in the field of PV-integrated surfaces is most supported in Europe. In the area of PV-integrated vehicle technology, some pilot projects already exist in Germany. Accordingly, Mercedes-Benz is investigating the integration of solar activated surfaces along with electrified vehicles.

The U.S. market in particular continues to offer strong growth potential for Tesla, as the government is increasingly promoting domestic manufacturing, thus pursuing the strategy of breaking dependencies on other countries and positioning itself as a strong player in the solar industry. Moreover, since 2018 the U.S. declared import duties for solar modules and components of 30%, which were recently extended until 2026.

Still, the biggest market driver for solar PV is global politics. Security of supply and independence, especially in the context of the Russian invasion of Ukraine, which started in early 2022, play an important role. In addition, self-imposed climate targets of various countries contribute to high demand forecasts. Even if fossil fuels still dominate the market, a structural change of the global energy system becomes more and more inevitable. To realize a net zero scenario by 2030, annual investments in solar PV will have to triple, among other efforts [44].

Forecast

Automotive

- Automotive Sales and Revenue Forecast

Deliveries

Due to Tesla being a relatively new company, as well as disrupting a well-established market through technological advancements, accurate and certain forecasts are impossible to make, which is why a bear case, describing less optimistic forecast for the future of Tesla and EVs, a base case, describing the most likely, middle ground forecast and lastly, the bull case, describing forecasts that are primarily goals that Tesla and CEO Elon Musk have set for themselves, was created. Since Tesla does not provide a regional or even individual model-based split for their sales reports, they were estimated based on other sources.

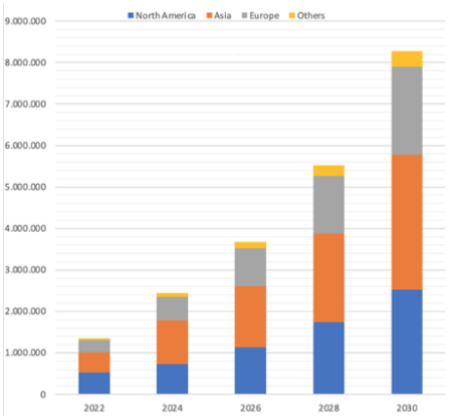

Exhibit 34: Tesla Deliveries by Region – Base Case (Units)

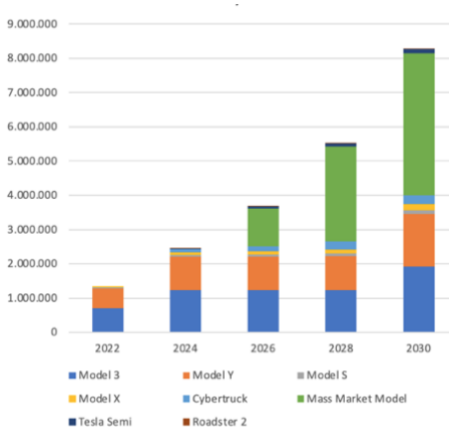

Exhibit 35: Tesla Deliveries by Model – Base Case (Units)

One of the primary revenue drivers are the vehicle deliveries, while simultaneously being one of the largest sources of uncertainty for investors and analysts. Looking at the base-case, Tesla's deliveries are expected to grow at a 22.5% CAGR, the expected 2022-2030 CAGR of the EV market worldwide, following a more Tesla specific forecast of 2 million deliveries in 2023. [58] [59] This would forecast Tesla at above 8 million deliveries by 2030, a forecast similar to that of UBS base case scenario. [60] Less optimistic forecasts expect the global EV market to reach 31.1 million deliveries by 2030, with Tesla's market current market share lying between 13% and 30% depending on the source [60][3]. Combining the aforementioned least optimistic report of Tesla's current market share of just 13.84%, would forecast about 4.3 million deliveries by 2030, with the bear-case scenario forecasting linear growth from 2022 to reach this forecast. Lastly, the bull-case scenario incorporates the most optimistic forecast, Tesla's goal of 20 million deliveries by 2030, which would make Tesla the largest automotive producer worldwide. While Tesla and especially CEO Elon Musk are known for very ambitious goals, which they don't always reach in their expected timeframe, Tesla's current goal of over 50% yearly growth rate for "quite a while", seems more realistic considering their past CAGR. [61] Therefore, the bull-case assumes a 50% growth rate until 2027, followed by a slightly lower CAGR of around 22.6% from 2027 to 2030, reaching their goal of 20 million deliveries.

Considering the deliveries breakdown by model, it is expected that the Model 3 and Model Y will remain the most sold models until 2026-2027, following the success they have. Similarly, it is expected that the share of Model S and Model X remains close to their current share of Tesla deliveries. The percentage of the existing Tesla model of overall deliveries is expected to only decrease slightly until 2026, due to the deliveries of the newly released Cybertruck, Roadster 2 and Tesla Semi in 2023. Given the geographical split of pre-orders, as well as affinity towards pickup trucks in comparison to other regions, it is expected that 87% of Cybertrucks will be sold in North America, only making up below 6% of total deliveries worldwide and capping at 250,000 deliveries a year for the base-case, due to its controversial design and practicality. [62] The Roadster 2 is also expected to make up a small percentage of total deliveries, due to its high price tag, remaining below 0.1% of deliveries for the entire forecast period. The Tesla Semi is expected to have a slow start, following issues arising from BEV based trucks, due to range anxiety combined with transport of heavy loads, peaking at 1.7% of total deliveries for the forecast period, as Tesla does not have its focus on the trucking industry. Lastly, Tesla's mass market model, expected to be released around 2025, following Tesla's mission of bringing affordable EVs to everyone, is forecast to make up a big portion of deliveries by the time production

is ramped up in 2026. It is forecast, that by 2027 most Tesla's sold will be the mass market model, being the main driver for Tesla to reach the forecast vehicle deliveries, especially for the high number of deliveries expected in the bull-case. The overall split between regions is expected to remain roughly the same as it is now, with China expected to overtake the USA as Tesla's most sold to market, following the reasons outlined under the geographic outlook.

Prices and Revenues

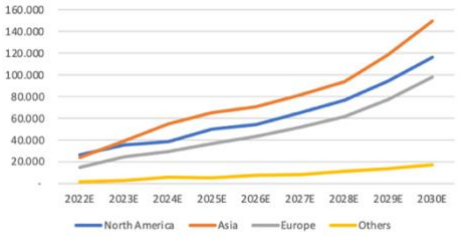

Exhibit 36: Tesla Revenues by Region – Base Case (in USD millions)

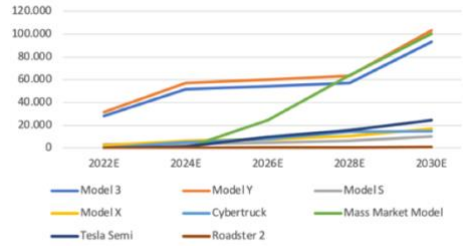

Exhibit 37: Tesla Revenues by Model – Base Case (in USD million)

The overall prices for each Tesla model are determined by the prices that existing models are currently being sold at, as well as the prices unreleased models were announced at. The calculated average price is then adjusted by a factor allowing for total 2021 deliveries multiplied by the adjusted average price to equal 2021 automotive sales revenues, leaving the adjusted price a s the average revenue Tesla actually receives for the average car sold, being $54,083 in 2021. This average price for a Tesla sold is then adjusted yearly by the average inflation rate for cars of 2.46% and broken down into ratios for each different model, reflecting their individual prices. By forecasting the release of Tesla's mass market model in 2025 and expecting a high number of deliveries to consist of this most inexpensive Tesla, a decrease of the average price of a Tesla sold can be seen from 2025 onwards. By multiplying the expected deliveries with the expected prices, revenues are forecasted, with the base-case implying a 24% CAGR from 2022-2030, equalling $364.807 billion of total automotive sales revenues in 2030. The total revenues per region, as well as the total revenues by model of the base case can be seen in *Exhibit 36* and *Exhibit 37*, respectively.

- Automotive Cost and Gross Profits Forecast

To estimate Tesla's automotive sales costs, the total 2021 automotive sales costs was divided by the deliveries, resulting in the average cost of a Tesla sold. This average cost was further broken down in to three groups, firstly, the relatively fixed components of cost of materials, which was adjusted for the automotive industry average inflation, as well as depreciation, which was estimated as the ratio of total depreciation equal to the automotive revenue's ratio to total revenue. Secondly, the cost was broken down into the costs of labour, followed by the cost of logistics, which are both subject to decreases due to Tesla's increasing economies of scale, slightly offsetting increases due to inflation, and lastly, the battery, which is subject to fluctuations based on nickel and lithium prices, as well as technological improvements, as seen in the newly released 4680 batteries. [63] The resulting average cost per Tesla sold is then adjusted by the decreases in selling price per average Tesla sold, due to the

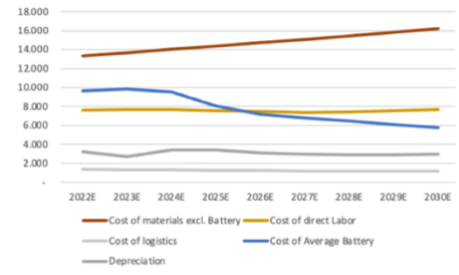

Exhibit 38: Average Cost per Tesla Sold by Cost Driver (in USD million)

gravitation toward the more inexpensive mass market model. This average cost is then multiplied with the aforementioned price ratio per model, creating the cost estimates for each individual model. The developments of the cost per average unit, as well as for the individual cost divers can be seen in *Exhibit 38*. To arrive at the total costs, the cost per unit was simply multiplied with the deliveries.

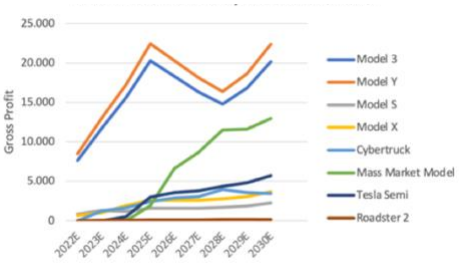

Exhibit 39: Total Gross Profits by Model – Base Case (in USD million)

The resulting total gross profits per model for the base-case can be seen in *Exhibit 39*. Furthermore, the gross profit margin of all Tesla models is relatively high, following their impressive 2021 gross margin of 31%, forecast to grow slightly to a peak of 32% in 2025, due to expected decreases in battery prices because of Tesla's new 4680 batteries, combined with their good supplier relations. The gross margin is then forecast to steadily decrease until 2030, reaching 18%, to account for competition catching up and Tesla needing to cut back on their margins, due to increasing costs associated with software and materials used, to be able to sustain the forecasted sales numbers. The unreleased mass market model is the exception, expected to have a peak gross margin of 29% during its release in 2025, decreasing to 14%, following Tesla's mission to make inexpensive Evs available for everyone, while also being a requirement to reach the forecast sales, in the tougher competition of the compact EV market. Focussing on the bull-case, lower gross profit margins were forecast, to sustain the high growth in vehicle sales, while the bear-case assumes slightly higher profit margins, due to lower sales numbers.

Lastly, Tesla has been selling automotive regulatory credits, with the revenues making up about 2.83% of total automotive sales one average for the first three quarters of 2022. This is forecast to remain constant at the average percentage in the base-case, as Tesla claims that it will "not plan its business around that (regulatory credits)" and increasingly stricter regulations are expected to keep demand high, while being only slightly offset due to more automakers meeting regulations. Overall, since the credits are received by Tesla for free, the profit margins are 100%. The bear- and bull-case are forecast at a flat percentage as well, with a less optimistic assumption of 2.55% and more optimistic assumption of 3.4%, respectively. The bull-case regulatory credits are capped at the 2026 value, as that is expected to be Tesla's full potential, due to meeting most of the markets expected demand [64].

- Automotive Leasing

Due to the lack of data on Tesla's leasing contracts, it was assumed that the operating lease vehicles are fixed at 14% of total vehicles delivered that year, the average rate between 2018 and 2021. The average revenue per leased vehicle was obtained by dividing leasing revenues by total vehicles leased and forecast

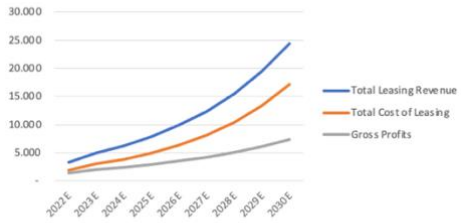

Exhibit 40: Automotive Leasing Base Case – Cost, Revenues & Gross Profit (in USD million)

to be the average leasing revenue between 2018 and 2021 of $17,361 per vehicle, adjusted for the automotive industry inflation. As for the gross margin, Tesla's average between 2018 and Q3 2022 was 42%, noticeably quite a bit higher than automotive sales gross margin, and is expected to decrease by a 4% CAGR until reaching 30% in 2030, to be able to keep up with competition and the sales forecast, similarly as with the automotive sales segment, by making Tesla leasing more attractive. The resulting revenues, costs and gross profit for the base-case can be seen in *Exhibit 40*.

Energy Generation and Storage

As Tesla does not disclose much information regarding its energy generation and storage division, the projected development relies heavily on assumptions which will be explained in the following. As always, three cases are assumed: Bear case, base case, and bull case. Furthermore, market trends and developments from previous chapters serve as basis for subsequent valuation assumptions and are not explained in detail again.

▪ Average Selling Prices

Average selling prices were calculated based on data obtained from Tesla's website and its configurator (as of November 2022), considering bundle discounts (e.g., Solar plus storage discount is on average 10%) as well as different model variants and volume discounts. According to this, the average price per kW for Tesla's solar panels is USD 2,151, while its solar roof is priced at USD 6,278. All prices include installation fees and costs for Tesla's solar inverter, which are not specified. Likewise, Tesla's Megapack and Powerwall are priced at USD 667 and USD 734 per kWh.

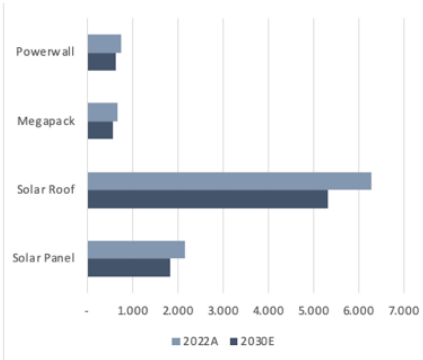

Exhibit 41: Average Selling Price per kW Forecast by Product Type

Considering current market trends, thus rising demand and constraint supply, prices for all products are forecasted to increase further until the end of 2023. However, from 2024 to 2030, prices are expected to decline significantly. Therefore, prices for solar panels are expected to decrease at a CAGR of -4.8%, primarily driven by increasing competition. However, Tesla's solar roof prices are expected to decrease slower (at a CAGR of -2.64%) as the technology is relatively new, and production cannot be scaled as much. While institutional customers tend to prefer financial KPIs over design, Megapack prices are expected to decrease the most (CAGR of -5.77%). In turn, prices of Powerwalls are expected to decrease slower (CAGR of -5.05%), as the product targets clients that tend to prefer design over price performance. Still, Powerwall prices are expected decrease significantly as competition rises (Exhibit 41).

▪ Revenue

Tesla's revenue is set for significant growth

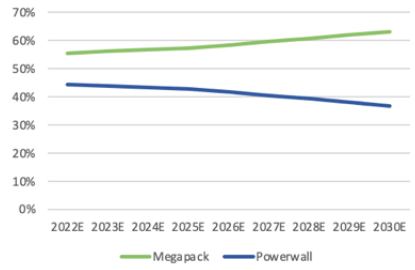

Exhibit 42: Product Share of Storage Deployment

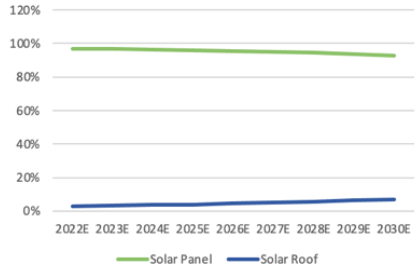

Exhibit 43: Product Share of Solar Deployment

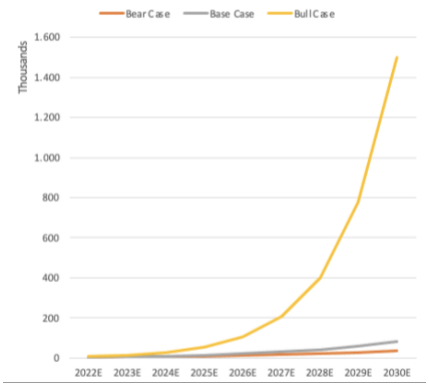

Exhibit 44: Storage Deployment Forecast in MWh

As Tesla does not disclose any data regarding quantities of its energy products sold nor revenue breakdown by product type, assumptions had to be incorporated. Tesla installed solar roofs equivalent to 2.5 MW during the second quarter of 2022 [65] and 100,000 Powerwalls equivalent to 1,350 MWh within 2020 [66]. Given those figures and Tesla's officially disclosed annual solar and storage deployments in MW and MWh, a breakdown was obtained. Accordingly, Tesla's deployed storage in 2020 was composed of 55% Megapacks (1,672 MWh) and 45% Powerwalls (1,350 MWh). Similarly, Tesla's solar roof accounted for just 2.36% (2.5 MW) of total deployed solar in quarter Q2 2022, while Tesla's solar panels accounted for an estimated 97.64% (103.5 MW).

Considering the market outlook for large-scale projects and the new build Megapack factory in Lathrop, California with a capacity of 40 GWh [67], Megapack's share of deployment is expected to grow (Exhibit 42).

Moreover, as prices decrease, solar roofs are expected to become more affordable and, thus, more popular. Consequently, by 2030, solar roofs are expected to account for 7% of Tesla's total solar deployment (Exhibit 43). Assuming an average solar system output of 7 kW, Tesla is deploying approximately 23 solar roofs per week, which equals roughly 300 houses [68]. However, *Elon Musk* aims to deploy 1000 solar roofs per week (equal to 108.7 MW) or 5,217.39 MW per year [68]. Considering the 2030 bull case forecast, 5,304 MW related to solar roofs will be deployed annually, which aligns with the projected share and growth rate.

The global battery storage market is expected to grow at a CAGR of 30% until 2030 [69]. However, Tesla is already one of the top market players and has years of experience in battery production. As a result, the base case assumes storage deployment to grow at 40% annually until 2030. For the bull, Elon Musk's goal of reaching an annual storage deployment of 1,500 GWh is applied [70]. Thus, coming from 3,992 MWh deployed in 2021, a CAGR of 93% is required to achieve his goal by 2030 (Exhibit 44).

To reach worldwide net zero emission goals by 2050, global solar deployment must grow at least 25% between 2022 and 2030 [71]. Considering Tesla's strong brand, loyal customer base, and location in the second most relevant country for the solar PV industry, Tesla's solar deployments are estimated to grow at a CAGR of 35% in the base case scenario. However, as there is no publicly available information regarding Elon Musk's solar deployment goals, the bull case reflects the storage bull case growth, since solar and battery storage industries are linked to each other. As a result, solar deployments are estimated to grow at a CAGR of 82%, reaching an annual deployment of 74,057 MWh in

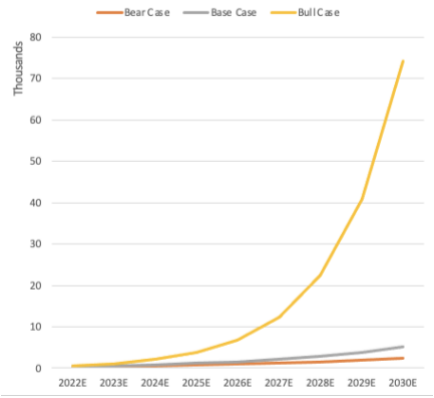

Exhibit 45: Solar Deployment Forecast in MW

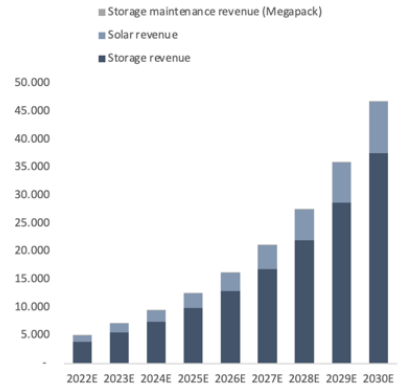

Exhibit 46: Energy generation & storage revenues in the Base Case Scenario

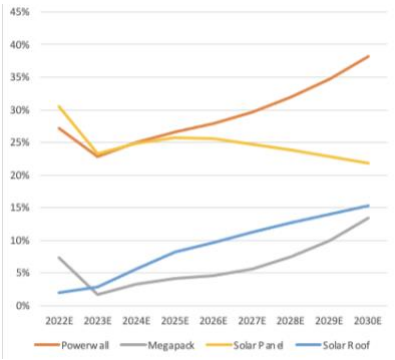

Exhibit 47: Gross Margin Forecast by Product Type

the bull case by 2030 (Exhibit 45). Lastly, the bear case adjusts for potential challenges, which is reflected in 70% of base case growth for both solar and storage deployments.

In conclusion, by 2030, the base case scenario assumes Tesla to achieve deployment of 4,770 MW in solar panels, 368 MW in solar roofs, 17,373 Megapack units, 2,248,919 Powerwall units and to generate USDm 71 in Megapack maintenance fees. Therefore, Tesla's energy generation and storage business is expected to generate an annual revenue of USDm 46,865 (Exhibit 46).

- Cost and Gross Margin

Like the price development, costs are expected to increase further until the end of 2023, followed by a significant annual decline. It is important to mention, that cost of sales already includes depreciation. Based on benchmark systems for solar and storage, the individual cost drivers could be identified and forecasted until 2030 [72] [73]. The cost of solar systems is expected to decrease by about 35% from 2024 to 2030. The predicted decrease in the cost of storage systems is even higher. It is assumed that costs will drop by approximately 48%, almost halving costs. In particular, the advancing replacement of lithium-ion NMC batteries with lithium-ion LFP batteries reduces costs [74].

Consequently, the gross margin for Powerwalls is expected to increase from 27% in 2022 to 38% in 2030. Similarly, the Megapack's gross margin is predicted to increase from 7% in 2022 to 13% in 2030. As previously explained, this development is a result of falling costs and economies of scale. However, the gross margin for Powerwalls is significantly higher, as it addresses an entirely different customer base than Megapacks. The gross margin for solar panels is expected to shrink as there is a strong dependence on Chinese suppliers and more competitors enter the market. Furthermore, Tesla has less know-how related to the solar industry than in battery storage and started with the independent production of solar modules only a few years ago. Accordingly, the gross margin is expected to decline from 30% in 2022 to 22% in 2030. A different picture emerges for the solar roof. Since this product is based on a new technology and production has not been scaled yet, the gross margin is expected to increase from 2% in 2022 to 15% in 2030. (Exhibit 47)

- Leasing

Since the leasing revenues and costs are already incorporated in the segment's total revenues and costs and are not listed separately, a potential split can only be determined based on assumptions. According to the *Solar Energy Industries*

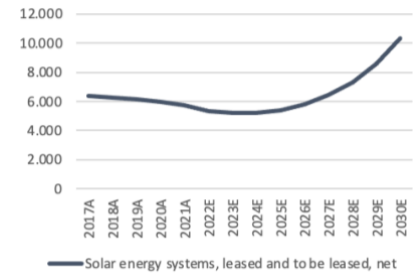

Exhibit 48: Solar energy systems, leased and to be leased, net (in USD millions)

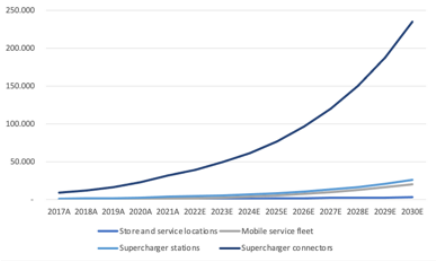

Exhibit 49: Services and Other Revenue Drivers

Tesla Supercharging Network TAM (mn)						
		Tesla Superchargers				
		25000	50000	100000	250000	500000
Daily BEVs charged	5	$ 479	$ 958	$ 1.916	$ 4.791	$ 9.581
	8	$ 767	$ 1.533	$ 3.066	$ 7.665	$ 15.330
	10	$ 958	$ 1.916	$ 3.833	$ 9.581	$ 19.163
	12	$ 1.150	$ 2.300	$ 4.599	$ 11.498	$ 22.995
	15	$ 1.437	$ 2.874	$ 5.749	$ 14.372	$ 28.744

Exhibit 50: Tesla Supercharger Network Revenue

Association and *Enphase*, 28% of total deployed solar systems are leased, with terms lasting on average 20 to 25 years [75] [76].

Given Tesla's historical values of solar energy systems leased and to be leased and considering that 28% of new systems are subject to leasing while assuming that 10% of the previous year's leasing value will expire, a forecast could be estimated. Respectively, Tesla's leasing values are assumed to increase in the base case from 5,562 in Q2 2022 to 10,905 in 2030 (Exhibit 48).

Services and Other

Similarly to the Energy and storage segment, Tesla does not disclose any revenue or cost breakdowns for its automotive sub-segment services and other. Nevertheless, Tesla publishes official numbers regarding its store and service locations, mobile service fleet, supercharger stations and supercharger connectors. Further, it is important to mention, that cost of sales already includes depreciation.

In the base case, aftersales related revenue drivers such as store and service locations and the mobile service fleet are expected to grow at average historical rates. However, considering that services will become more efficient in the future, for example through economies of scale, technical innovations and increased connectivity of vehicles, growth is expected to slow down from 2026 onwards. The bear and bull cases are tied to the bear and bull deliveries scenarios as after-sales services are directly related to the number of vehicles on the market.

Although Tesla has already one of the leading charging networks, its charge points are expected to grow significantly. According to *BCG*'s estimated CAGR of 25%, Tesla's number of supercharger stations will grow from 3,476, reaching 25,898 by 2030. Again, bear and bull cases are adjusted for different vehicle delivery scenarios, as charging demand is driven by vehicles on the market (Exhibit 49).

Finally, total revenue was computed based on historical data, applying the average growth of previously mentioned revenue drivers. By 2030, the base case scenario projects a revenue of EURm 30,580. Besides general growth, this achievement is primarily due to opening the charging network to other brands. According to *Goldman Sachs*, this could generate USDbn 25 or more [77] (Exhibit 50). However, considering market trends such as improved parts quality and reduced maintenance requirements. The overall segments revenue growth is expected to slow down from 2026 onwards.

For the bull case it is considered that Elon Musk is aiming at a gross margin of 30% for its charging network [78], and that aftersales gross margins for electric

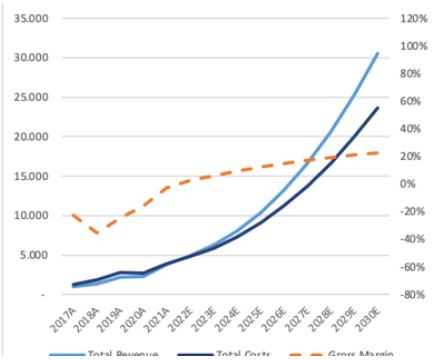

Exhibit 51: Tesla Services and Other Revenue and Costs

vehicles are estimated to be at roughly 24% at maximum (70-90% of ICE margin i.e. >30%). Given historical gross margins, which just turned positive (4%) in Q3 2022, it is estimated that gross margins will further increase, reaching 26% (bull case), 23% (base case) and 20% (bear case) by 2030. As a result, Tesla's historical trend of reducing costs as percentage of revenue (4% annual decline from 2018 to 2021) is assumed to continue, although slowing down from 2025 onwards [79] (Exhibit 51).

Operating Expenses

Due to Tesla not reporting data for its different business units, operating expenses (OPEX) are examined for Tesla in total. They are expected to grow in absolute terms, while declining slightly in relation to revenues decreasing from 9% in 2022 to 5% in 2030 for the base-case.

Breaking the OPEX down in to its relevant components, similarly to total OPEX, research and development (R&D) spending is expected to grow, while slightly declining in proportion to revenues. With Tesla spending more on R&D per vehicle than any other automaker, most of the R&D expenses incurred are directed towards BEV mobility, whereas traditional automakers divide R&D between Evs and ICE based vehicles. Furthermore, while some R&D expenses are directed towards the energy and storage business unit the synergies of improvements in electricity storage being easily transferrable to electricity storage in form of BEV batteries, allow for very efficient R&D allocation. Nonetheless, R&D spending in proportion to revenues is expected to slightly decline from 4% in 2022 to 2.5% in 2030 for the base-case, following Tesla's historically decreasing trend for this proportion, in large due to increasing economies of scale. To reach expected sales, the bear- and bull-case are forecast with slightly higher and lower R&D proportion to revenues respectively, with the bull-case R&D spending capped at around $17 billion from 2027 onwards.

As for the selling, general and administrative (SG&A) costs, the forecast is similar, with SG&A expected to grow in absolute values, but decrease in proportion to revenues, falling from 5.1% in 2022 to 2.6% in 2030 for the base-case. While Tesla employs a direct sales model, implying increased SG&A in comparison to other automakers, these increases are offset by Tesla's lack of advertising/marketing costs, following the closing of their public relations department and sufficient word-of-mouth marketing. The decrease in proportion to revenues, similarly to R&D and total OPEX, can be led back mostly to increasing economies of scale, following Tesla's SG&A proportions historically decreasing trend.

Property, Plant and Equipment

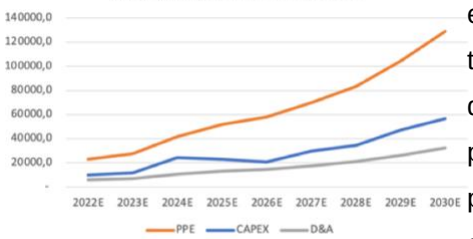

Exhibit 52: Total PP&E, CAPEX and D&A – Base Case (in USD million)

Following Tesla's expansion and constant growth of deliveries in the automotive, energy & storage, as well as service and other business units, capacities needed to keep growing, to be able to service the demand. Similarly to OPEX, Tesla does not provide information on the properties, plants and equipment (PPE) used per individual business unit and as some PPE, like the Gigafactory in Nevada producing both automotive and energy storage products, are used conjointly by different business units, PPE has been forecast for Tesla as a whole. Considering the automotive production capacities, Tesla has increased the possible output to around 2.1 million vehicles per year, following the recent opening of their first European Gigafactory Berlin, as well as capacity increases in the relatively new Gigafactory Shanghai. Comparing the estimated automotive capacity with the 2023 forecast deliveries, which are in the region of 2.1 million vehicles, it is clear that Tesla will have to open new production facilities soon, to keep up with forecast deliveries [80]. The energy and storage sector share similar issues concerning PPE, with current Powerwall capacities at around 312,000 and Megapack capacities at recently upgraded 15,500 units and Solar capacities at 1000 MW per year, being too low to be able to serve forecasted deliveries [81]. In total, it is estimated that six new factories need to be opened for the automotive segment throughout the forecast period of 2022-2030, while three new factories are expected to be needed for the energy sector for the base-case. Additionally, due to increasing efficiencies, it was assumed that new factories increase in capacity by 10% per year. By estimating the average inflation adjusted price, as well as average capacity increase for Tesla's newest factories, it is forecast in the base-case that Tesla will need to spend a total of over $45 billion on new factories between 2022 and 2030, with around $30 billion needed for automotive capacity increases alone.

To arrive at total PPE based capital expenditures (CAPEX), the expected increases in capacities due to new factories, and their relevant costs are added to a baseline CAPEX based on the automotive industries average CAPEX to revenues ratio [82], which is estimated to be a good proxy for maintenance CAPEX on existing PPE. The useful life of CAPEX, as well as for historical assets is assumed to stay at Tesla's average of five years, through which yearly depreciation is forecast, overall resulting in Tesla's total PPE forecast. This results in a PPE base-case CAGR of 24% between 2022 and 2030, a slight increase over the 2017-2022 CAGR of 18%, to be able to keep up with demand, as Tesla still has waiting times of around a year for most models.

Working Capital

Working Capital:

Overall Negative Working Capital

High Expected Cash Flows minimize liquidity risks

Positive Changes in Working Capital

Similarly to OPEX and PPE, Tesla's working capital has been forecast for the total company, as the lack of information for working capital accounts concerning Tesla's individual business units makes it impossible to assess individual working capital accurately. Firstly, trade receivables were forecast based on the 2017-2021 average days sales outstanding (DSO) of 17, below the automotive industry average of 59, implying that Tesla receives cash owed in a comparably short time [83]. As for inventory, this was forecast on the basis of Tesla's average days of inventory (DIO) outstanding between 2019-2021, which is below the automotive industry average DIO of 175 [84]. This is expected, due to Tesla selling its products quickly, struggling to keep up with demand, in turn meaning less time for products to spend in inventory. On the liabilities side, trade payables were forecast on the basis of days payable outstanding (DPO), based on the average DPO between 2017 and 2021 of 81. This DPO is much lower than the estimated automotive industry average of 627 days, suggesting Tesla pays most suppliers comparatively fast [85]. Nonetheless, comparing Tesla's lower DPO to DSO, suggests that there are no major liquidity risks, as Tesla receives cash owed before they need to pay for trade payables. This is confirmed by Tesla's negative net trade cycle, confirming that they receive payment for products before having to pay suppliers, an overall positive for Tesla as their revenues are expected to grow. Additional working capital items such as prepaid expenses, customer deposits and current portions of accrued liabilities and deferred revenue were forecast based on their respective average proportion to revenues, with the exception of resale value guarantees, which have been forecast at zero since 2020. Overall, the total working capital for Tesla is negative for all forecast years, which, while suggesting Tesla could not pay off its current liabilities with current assets excluding cash, is not expected to be a problem, due to Tesla being a growing company with steadily increasing revenues, as well as its relatively high expected cash flows. As a result of steadily increasing negative working capital, the change in net working capital is positive. This is in line with Tesla's capabilities of receiving cash before having to pay suppliers, in part due to accepting customer deposits and pre-orders on vehicles and energy systems, which they have yet to produce due to capacity constraints.

Financing

Capital Structure

Considering Tesla's historical capital structure, it is apparent that the company has been strongly deleveraged since 2019. Accordingly, the debt-to-equity ratio based on book values declined from 203% in 2019 to 9% in Q3 2022. The debt-

Tesla's debt to equity ratio declines continuously

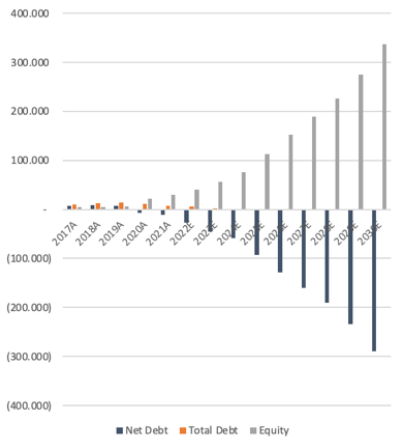

Exhibit 53: Tesla Capital Structure in the Base Case Scenario

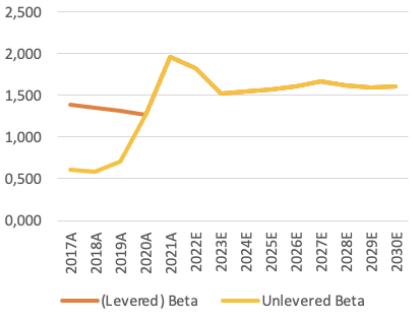

Exhibit 54: Tesla Stock Beta

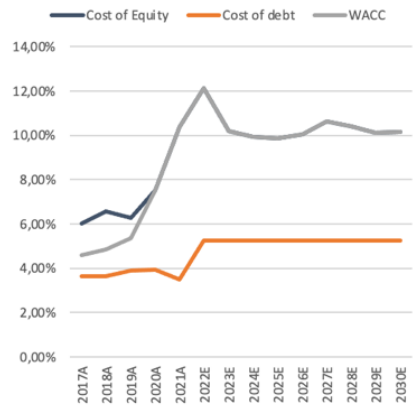

Exhibit 55: Tesla Cost of Capital

to-equity ratio based on market values decreased even more, from 215% in 2019 to 8% in Q3 2022. Since Tesla is highly profitable and theoretically does not rely on debt for investments, it is assumed that this trend will continue in the future. Further, there is no publicly available information regarding the strategy Tesla is pursuing with respect to its capital structure. Based on the historical change in leverage of -16% per year, Tesla is expected to fully deleverage by 2030 (Exhibit 53). Lastly, it is important to mention that Tesla does not pay dividends.

Beta

Tesla's leveraged beta was determined using regression analysis. Based on Tesla's daily stock prices (closing) and the corresponding values of the relevant stock index *S&P 500*, the beta has been calculated for 2017 to 2022. In terms of the year 2022, the cut of was on 21st October 2022. The beta was determined separately for each year, as the ratio can fluctuate strongly over extended periods, thus ensuring a more accurate result. The unlevered beta was determined based on the specific debt-to-equity ratio and the U.S. federal tax rate of 21%. For 2017 to 2022, the average leveraged beta is 1.52, and the unleveraged beta is 1.16 (Exhibit 54).

Cost of Capital

The cost of equity was calculated using the capital asset pricing model. The risk-free rate was determined based on daily 30yr U.S. treasury par yield curve rates (6-average of 2.52%) [86]. Furthermore, the U.S. equity risk premium (average of 5.04% from 2017 to 2022) published by *Aswath Damodaran* is included in the cost of equity calculation [87]. Damodaran estimates the country's equity risk premium based on historical premiums earned by stocks over default-free securities [88]. Inserting all inputs into the formula, the average cost of equity for the period 2017 to 2030 is 9.31%. One can observe that the cost of equity increases from 6.01% in 2017 to 10.16% in 2030, indicating a higher financial risk for shareholders.

Since Tesla currently holds relatively little debt and the calculated average interest rates therefore do not provide a suitable basis to forecast the cost of debt, the debt-rating approach was applied. Given Tesla's current BBB rating issued by S&P Global Ratings [89] and U.S. corporate BBB effective yields, a cost of debt of, on average, 5.24% is assumed [90].

In conclusion, the weighted average cost of capital for Tesla is 9.02% (2017-2030). Since the cost of debt loses significance due to the forecasted debt reduction, the weighted cost of capital will equalize with the cost of equity from 2020 onwards (Exhibit 55). The slightly increasing weighted average cost of

capital implies a rising risk for investors. As a result, cash flows generated must be discounted to a greater extent.

Valuation

Discounted Cashflow Valuation

Perpetuity Growth Rate-Based Valuation BEAR CASE	
Total PV of Cash Flows	132.625
Annuity Value	110.760
PV of Annuity	56.245
Continuing Value	422.260
PV of Continuing Value	119.958
Enterprise Value	308.828
+Cash	41.935
-Financial liabilities	1.889
Equity Value	348.874
Number of shares outstanding (as of 31 Aug 2020)	3.158
Price per share (in USD)	110

Exhibit 56: DCF Results – Bear Case 2023

Perpetuity Growth Rate-Based Valuation BASE CASE	
Total PV of Cash Flows	180.168
Annuity Value	240.351
PV of Annuity	122.053
Continuing Value	1.065.686
PV of Continuing Value	302.746
Enterprise Value	604.967
+Cash	45.579
-Financial liabilities	1.889
Equity Value	648.656
Number of shares outstanding (as of 31 Aug 2020)	3.158
Price per share (in USD)	205

Exhibit 57: DCF Results – Base Case 2023

Perpetuity Growth Rate-Based Valuation BULL CASE	
Total PV of Cash Flows	487.589
Annuity Value	2.776.678
PV of Annuity	682.448
Continuing Value	7.363.641
PV of Continuing Value	2.091.902
Enterprise Value	3.261.939
+Cash	46.475
-Financial liabilities	1.889
Equity Value	3.306.525
Number of shares outstanding (as of 31 Aug 2020)	3.158
Price per share (in USD)	1.047

Exhibit 58: DCF Results – Bull Case 2023

Following the estimations of Tesla's WACC and the lack of target capital structure, as well as Tesla's decreasing overall debt and negative net debt since 2020, it was assumed that Tesla is un-levering the company long-term, implying a target debt to equity ratio of zero. Therefore, the discounted cash flow valuation (DCF), aims to discount unlevered cash flows, concluding in Tesla's unlevered value, which is expected to be Tesla's actual value due to aforementioned reasons. The resulting present value of unlevered free cash flows for the forecast period of 2022-2030 is $180,168 million for the base-case in December 2023. To arrive at the total enterprise value, the terminal growth rate was estimated by multiplying Tesla's return on newly invested capital (RONIC) with its reinvestment rate (RR). Due to the fact, that the resulting RONIC as well as growth rate don't stabilize, this growth rate of 7.45% for the base-case was assumed to apply to the next five years, resulting in the present value of the growing annuity for 2030-2035 of $122,053 million. Following the five-year annuity period, it is expected that Tesla's growth stage has been completed, with the growth rate for the terminal value following 2035 estimated to be the average worldwide GDP growth. Adding the present values of the three aforementioned expected cash flows, equals an estimated enterprise value of $604,957 million, resulting in an equity value of $648,656 million, which divided by Tesla's current 3,158 million shares outstanding equals a share price of $205 per share in December 2023 for the base-case.

- Sensitivity Analysis

Sensitivity Analysis Base Case: Enterprise value									
	WACC factor								
Growth perpetuity	604.967	0,7	0,8	0,9	1	1,1	1,2	1,3
	2,2%	639.567	622.881	607.290	592.711	579.066	566.287	554.308
	2,3%	643.549	626.862	611.271	596.692	583.048	570.268	558.290
	2,4%	647.633	630.946	615.355	600.776	587.132	574.352	562.374
	2,5%	651.823	635.137	619.546	604.967	591.322	578.543	566.564
	2,6%	656.125	639.438	623.847	609.268	595.624	582.844	570.866
	2,7%	660.541	643.855	628.264	613.685	600.040	587.261	575.282
	2,8%	665.078	648.391	632.800	618.221	604.577	591.797	579.819

Exhibit 59: Base Case Enterprise Value Sensitivity Analysis – Growth Perpetuity & WACC (in USD million)

As previously mentioned, due to the current growth stage of Tesla, as well as the uncertainty and growth of the underlying electric vehicle, energy and energy storage industries, a bear-case containing less optimistic forecast and a bull-case containing Tesla's claims and goals for future forecasts about sales, costs, OPEX, PPE and working capital was created. To arrive at the final DCF based valuation, a weighted average of all three scenarios was taken in to account, with a 25% weight applied to the bear-case scenario, 70% weight applied to the base-case and 5% weight applied to the bull-case. The weights were picked according to the probabilities assigned to each scenario happening, as well as the weights distribution applied to December 2022 DCF valuation of Tesla, for which the

resulting share price resembles Tesla's current actual share price. The resulting enterprise value using the weighted average for Tesla in December 2023 is $663,781 million, while the equity value is $ 706,604 million implying a share price of $223,75 per share. Furthermore, a sensitivity analysis has been conducted on the effects on enterprise value due to changes in the WACC as well as terminal growth rates, which can be seen in *Exhibit 59* for the base-case.

Multiples

Strong growth expectations for the energy segment drive Tesla's enterprise value

In addition to the DCF valuation approach, Tesla was valued based on public trading multiples and precedent transactions. Required financials by segment as of 2023 were obtained, based on revenue shares. The public trading peer group for Tesla's automotive business includes large international corporates such as *Ford*, *Mercedes*, and BYD. No separate stand-alone valuation was carried out for the services and other business, as the peer group does not provide reliable results and substantial overlaps with the automotive business can be identified. Moreover, the identified peer group for energy generation and other includes companies such as *Sunrun*, *SolarWorld*, *General Electric*, and Generac. Not all core competitors, such as LG Chem, were included since large conglomerates operating in a variety of industries are not relevant to determine specific industry multiples.

Weighted Average Share Price - 3 Cases	
Weights	
Bear Case	25%
Base Case	70%
Bull Case	5%
Total Enterprise Value	756,94B USD
Automotive + Services and Other EV	320,39B USD
Energy generation & storage EV	436,56B USD
+ Total Cash & ST Investments	41,93B USD
- Total Debt	1,89B USD
Equity Value	796,99B USD
/ Shares Outstanding	3,16B
Price per share	252,37 USD

Exhibit 60: Weighted Average Share Price (Relative Valuation)

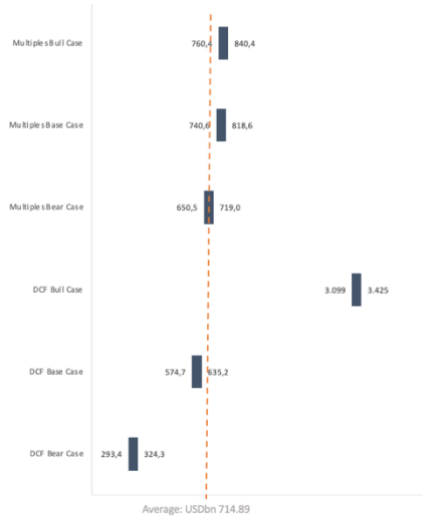

Exhibit 61: Tesla Football Field Valuation Overview (in USD billion)

Precedent transactions were obtained from *mergermarket*. To ensure relevance, only transactions regarding the vehicle manufacturing and alternative energy industry from 2017 to 2022 were analyzed.

To obtain a final enterprise value, additional factors were considered. Accordingly, the geographical location of companies located in the USA is weighted more heavily (60%) than the rest of the world. Furthermore, EBITDA multiples with 80% have significantly more impact than revenue multiples, as EBITDA provides better comparability by normalizing capital structure, taxes, and accounting standards. Public trading multiples and precedent transactions are weighted equal, as both are perceived as relevant. The final enterprise value represents the average of the median and mean-based values.

Ultimately, applying the same case weighting assumptions as with the DCF approach, a total enterprise value of USDbn 796,99 is obtained (USD 252.37 per share). A separate valuation for the automotive and energy segments results in a business value of USDbn 320.39 and USDbn 436.56. In conclusion, multiples for the Energy generation and storage business are significantly higher than in the vehicle manufacturing industry, implying high-growth expectations of investors (Exhibit 60).

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Financial Statements

Bear Case

TESLA Consolidated Income Statement						Forecast								
in USD millions	2017A	2018A	2019A	2020A	2021A	2022A	2023A	2024A	2025A	2026A	2027A	2028A	2029A	2030A
Revenues														
Automotive sales	8.535	17.632	19.952	26.184	44.125	61.457	81.837	103.401	123.234	128.846	144.248	159.123	166.986	187.036
Automotive regulatory credits	-	-	-	-	1.465	1.567	2.087	2.637	3.143	3.286	3.679	4.058	4.259	4.770
Automotive leasing	1.107	883	869	1.052	1.642	3.082	4.103	5.171	6.290	7.461	8.686	9.966	11.304	12.702
Total automotive revenues	9.641	18.515	20.821	27.236	47.232	66.106	88.027	111.210	132.667	139.593	156.613	173.148	182.549	204.509
Energy generation and storage	1.116	1.555	1.531	1.994	2.789	4.543	5.950	7.259	8.767	10.477	12.497	14.910	17.794	21.255
Services and other	1.001	1.391	2.226	2.306	3.802	4.712	5.504	7.128	8.822	10.488	12.107	13.668	15.166	16.530
Total revenues	11.759	21.461	24.578	31.536	53.823	75.361	99.481	125.597	150.255	160.557	181.216	201.725	215.509	242.294
Cost of revenues														
Automotive sales	6.724	13.686	15.939	19.696	32.415	45.829	60.488	75.879	79.762	88.291	104.355	118.898	133.893	152.826
Automotive leasing	708	488	459	563	978	1.789	2.451	3.176	3.963	4.814	5.730	6.714	7.768	8.891
Total automotive cost of revenues	7.433	14.174	16.398	20.259	33.393	47.617	62.939	79.055	83.724	93.105	110.086	125.612	141.660	161.718
Energy generation and storage	875	1.365	1.341	1.976	2.918	3.628	4.609	5.479	6.488	7.650	8.974	10.466	12.122	13.936
Services and other	1.229	1.880	2.770	2.671	3.906	4.827	5.423	6.753	8.069	9.294	10.429	11.478	12.447	13.290
Total cost of revenues	9.536	17.419	20.509	24.906	40.217	56.073	72.971	91.287	98.281	110.049	129.489	147.556	166.229	188.944
Gross profit	2.222	4.042	4.069	6.630	13.606	19.288	26.510	34.310	51.974	50.508	51.727	54.169	49.280	53.350
Operating expenses														
Research and developement	1.378	1.460	1.343	1.491	2.593	3.307	4.365	5.027	5.486	5.451	5.720	5.920	5.880	6.147
Selling, general and administrative	2.477	2.834	2.646	3.145	4.517	4.267	5.633	6.211	6.490	6.408	6.683	6.874	6.785	7.049
Restructuring and other	-	135	149	-	(27)	-	-	-	-	-	-	-	-	-
Total operating expenses	3.855	4.430	4.138	4.636	7.083	7.574	9.998	11.239	11.976	11.858	12.403	12.794	12.666	13.196
Profit from operations	(1.632)	(388)	(69)	1.994	6.523	11.714	16.511	23.071	39.998	38.650	39.325	41.375	36.614	40.154
Interest income	20	25	44	30	56	-	-	-	-	-	-	-	-	-
Interest expense	(471)	(663)	(685)	(748)	(371)	(132)	(231)	(71)	(21)	(6)	(2)	(1)	(0)	(0) m
Other (expense) income, net	(125)	22	45	(122)	135	-	-	-	-	-	-	-	-	-
Profit before income taxes	(2.209)	(1.005)	(665)	1.154	6.343	11.582	16.280	23.000	39.977	38.643	39.323	41.375	36.614	40.154
Provision for income taxes	32	58	110	292	699	2.432	3.419	4.830	8.395	8.115	8.258	8.689	7.689	8.432
Net income	**(2.241)**	**(1.063)**	**(775)**	**862**	**5.644**	**9.150**	**12.861**	**18.170**	**31.582**	**30.528**	**31.065**	**32.686**	**28.925**	**31.722**
Net income attributable to noncontrolling interests and redeemable nonco	(279)	(86)	87	141	125	-	-	-	-	-	-	-	-	-
Net income attributable to common stockholders	(1.962)	(976)	(862)	721	5.519	9.150	12.861	18.170	31.582	30.528	31.065	32.686	28.925	31.722
Less: Buy-out of noncontrolling interest	-	-	8	31	-	-	-	-	-	-	-	-	-	-
Net income used in computing netincome (loss) per share of common sto	(1.962)	(976)	(870)	690	5.519	9.150	12.861	18.170	31.582	30.528	31.065	32.686	28.925	31.722
Net income per share of common stock attributable to common stockholders														
Basic	$ (11,83)	$ (5,72)	$ (4,92)	$,74	$ 5,6	$ 2,91	$ 4,09	$ 5,78	$ 10,04	$ 9,7	$ 9,87	$ 10,39	$ 9,19	$ 10,08
Diluted	$ (11,83)	$ (5,72)	$ (4,92)	$,74	$ 4,9	$ 2,64	$ 3,71	$ 5,24	$ 9,11	$ 8,8	$ 8,96	$ 9,43	$ 8,34	$ 9,15
Weighted average shares used in computing net loss per share of common stock														
Basic	166	171	177	933	986	3.146	3.146	3.146	3.146	3.146	3.146	3.146	3.146	3.146
Diluted	166	171	177	1.083	1.129	3.468	3.468	3.468	3.468	3.468	3.468	3.468	3.468	3.468
Source: SEC FORM 10-K, Quarterly Reports and Student Estimates														
Effective tax rate	-1,43%	-5,76%	-16,54%	25,30%	11,02%	21,00%	21,00%	21,00%	21,00%	21,00%	21,00%	21,00%	21,00%	21,00%

TESLA Consolidated Balance Sheet						Forecast								
Assets														
in USD million	**2017A**	**2018A**	**2019A**	**2020A**	**2021A**	**2022A**	**2023A**	**2024A**	**2025A**	**2026A**	**2027A**	**2028A**	**2029A**	**2030A**
Current assets														
Cash and cash equivalents	3.368	3.686	6.268	19.384	17.576	33.039	41.935	56.066	83.697	107.198	138.098	165.572	187.843	215.966
Short-term marketable securities	-	-	-	-	131	-	-	-	-	-	-	-	-	-
Restricted Cash	155	193	246	-	-	131	131	131	131	131	131	131	131	131
Accounts receivable, net	515	949	1.324	1.886	1.913	3.576	4.721	5.960	7.130	7.619	8.599	9.573	10.227	11.498
Inventories	2.264	3.113	3.552	4.101	5.757	12.083	15.950	20.137	24.091	25.743	29.055	32.343	34.553	38.848
Prepaid expenses and other current assets	268	366	713	1.346	1.723	2.164	2.856	3.606	4.314	4.610	5.203	5.792	6.188	6.957
Total current assets	6.571	8.306	12.103	26.717	27.100	50.993	65.593	85.900	119.364	145.301	181.087	213.411	238.942	273.399
Operating lease vehicles, net	4.117	2.090	2.447	3.091	4.511	6.500	8.445	10.389	12.333	14.278	16.222	18.166	20.111	22.055
Solar energy systems, leased and to be leased, net	6.347	6.271	6.138	5.979	5.765	5.279	5.104	5.022	5.036	5.150	5.369	5.706	6.177	6.809
Property, plant and equipment, net	10.028	11.330	10.396	12.747	18.884	22.525	25.700	34.052	42.712	50.513	54.400	63.200	71.387	80.088
Operating lease right-of-use assets	-	-	1.218	1.558	2.016	2.016	2.016	2.016	2.016	2.016	2.016	2.016	2.016	2.016
Digital assets, net	-	-	-	-	1.260	218	218	218	218	218	218	218	218	218
Intangible assets, net	362	282	339	313	257	257	257	257	257	257	257	257	257	257
Goodwill	60	68	198	207	200	200	200	200	200	200	200	200	200	200
MyPower customer notes receivable, net of current portion	457	422	393	-	-	-	-	-	-	-	-	-	-	-
Restricted cash, net of current portion	442	398	269	-	-	-	-	-	-	-	-	-	-	-
Other assets	273	572	808	1.536	2.138	2.580	3.406	4.300	5.144	5.496	6.204	6.906	7.378	8.295
TOTAL ASSETS	**28.655**	**29.740**	**34.309**	**52.148**	**62.131**	**90.569**	**110.938**	**142.353**	**187.280**	**223.429**	**265.972**	**310.080**	**346.685**	**393.336**
Liabilities and equity														
in USD million	**2017A**	**2018A**	**2019A**	**2020A**	**2021A**	**2022A**	**2023A**	**2024A**	**2025A**	**2026A**	**2027A**	**2028A**	**2029A**	**2030A**
Liabilities														
Current liabilities														
Accounts payable	2.390	3.404	3.771	6.051	10.025	16.914	22.327	28.189	33.723	36.035	40.672	45.275	48.368	54.380
Accrued liabilities and other	1.731	2.094	2.905	3.855	5.719	8.915	11.769	14.858	17.776	18.994	21.438	23.865	25.495	28.664
Deferred revenue	1.015	630	1.163	1.458	1.447	3.559	4.698	5.932	7.096	7.583	8.559	9.527	10.178	11.443
Resale value guarantees	787	503	317	-	-	-	-	-	-	-	-	-	-	-
Customer deposits	854	793	726	752	925	2.025	2.674	3.375	4.038	4.315	4.870	5.421	5.792	6.512
Current portion of long-term debt and capital leases	797	2.568	1.785	2.132	1.589	2.541	775	236	72	22	7	2	1	0
Current portion of solar bonds and promissory notes issued to rela	100	-	-	-	-	-	-	-	-	-	-	-	-	-
Total current liabilities	7.675	9.992	10.667	14.248	19.705	33.955	42.243	52.591	62.705	66.950	75.546	84.090	89.835	100.999
Long-term debt and capital leases, net of current portion	9.416	9.404	11.634	9.556	5.245	3.656	1.115	340	104	32	10	3	1	0
Solar bonds issued to related parties, net of current portion	0	-	-	-	-	-	-	-	-	-	-	-	-	-
Convertible senior notes issued to related parties	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Deferred revenue, net of current portion	1.178	991	1.207	1.284	2.052	4.134	5.457	6.890	8.243	8.808	9.941	11.066	11.822	13.291
Resale value guarantees, net of current portion	2.309	329	36	-	-	-	-	-	-	-	-	-	-	-
Other long-term liabilities	2.443	2.710	2.655	3.330	3.546	8.091	8.529	10.768	12.883	13.766	15.537	17.296	18.477	20.774
Total liabilities	23.023	23.426	26.199	28.418	30.548	49.836	57.344	70.589	83.934	89.555	101.034	112.455	120.135	135.065
Commitments and contingencies (Note 17)														
Redeemable noncontrolling interests in subsidiaries	398	556	643	604	568	568	568	568	568	568	568	568	568	568
Convertible senior notes (Note 13)	0	-	-	51	-	-	-	-	-	-	-	-	-	-
Equity														
Stockholders' equity														
Preferred stock	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Common stock	0	0	-	1	1	-	-	-	-	-	-	-	-	-
Additional paid-in capital	9.178	10.249	12.737	27.260	29.803	38.552	51.156	68.963	99.913	129.830	160.274	192.306	220.653	251.740
Accumulated other comprehensive gain (loss)	33	(8)	(36)	363	54	79	104	141	204	265	327	392	450	514
Accumulated deficit	(4.974)	(5.318)	(6.083)	(5.399)	331	708	940	1.267	1.835	2.385	2.944	3.532	4.053	4.624
Total stockholders' equity	4.237	4.923	6.618	22.225	30.189	39.339	52.200	70.370	101.952	132.480	163.545	196.231	225.156	256.878
Noncontrolling interests in subsidiaries	997	834	849	850	826	826	826	826	826	826	826	826	826	826
Total liabilities and equity	**28.655**	**29.740**	**34.309**	**52.148**	**62.131**	**90.569**	**110.938**	**142.353**	**187.280**	**223.429**	**265.972**	**310.080**	**346.685**	**393.336**
Check	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE

Source: SEC FORM 10-K, Quarterly Reports and Student Estimates

TESLA Consolidated Cash Flow Statement						Forecast								
in USD millions	**2017A**	**2018A**	**2019A**	**2020A**	**2021A**	**2022A**	**2023A**	**2024A**	**2025A**	**2026A**	**2027A**	**2028A**	**2029A**	**2030A**
Cash Flows from Operating Activities														
Net income	(2.241)	(1.063)	(775)	862	5.644	9.150	12.861	18.170	31.582	30.528	31.065	32.686	28.925	31.722
Adjustments to reconcile net loss to net cash used in operating activities:														
Depreciation and amortization	1.636	1.901	2.154	2.322	2.911	5.631	6.425	8.513	10.678	12.628	13.600	15.800	17.847	20.022
Stock-based compensation	467	749	898	1.734	2.121	-	-	-	-	-	-	-	-	-
Amortization of debt discounts and issuance costs	91	159	188	180	-	-	-	-	-	-	-	-	-	-
Inventory write-downs	132	85	193	202	140	-	-	-	-	-	-	-	-	-
Loss on disposals of fixed assets	106	161	146	117	-	-	-	-	-	-	-	-	-	-
Foreign currency transaction losses (gains)	52	(2)	(48)	114	(55)	-	-	-	-	-	-	-	-	-
Loss (gain) related to SolarCity acquisition	58	-	-	-	-	-	-	-	-	-	-	-	-	-
Non-cash interest and other operating activities	135	49	186	228	245	-	-	-	-	-	-	-	-	-
Digital assets gain, net	-	-	-	-	(27)	-	-	-	-	-	-	-	-	-
Operating cash flow related to repayment of discounted convertible notes	-	-	(188)	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Changes in operating assets and liabilities, net of effect of business combinations:														
Accounts receivable	(25)	(497)	(367)	(652)	(130)	(1.663)	(1.145)	(1.239)	(1.170)	(489)	(980)	(973)	(654)	(1.271)
Inventory	(179)	(1.023)	(429)	(422)	(1.709)	(6.326)	(3.867)	(4.187)	(3.954)	(1.652)	(3.312)	(3.288)	(2.210)	(4.294)
Operating lease vehicles	(1.523)	(215)	(764)	(1.072)	(2.114)	(1.989)	(1.944)	(1.944)	(1.944)	(1.944)	(1.944)	(1.944)	(1.944)	(1.944)
Prepaid expenses and other current assets	(72)	(82)	(288)	(251)	(271)	(441)	(693)	(750)	(708)	(296)	(593)	(589)	(396)	(769)
Other non-current assets	(15)	(207)	115	(344)	(1.291)	(442)	(826)	(894)	(844)	(353)	(707)	(702)	(472)	(917)
Accounts payable	388	1.723	682	2.102	4.578	10.085	8.267	8.951	8.452	3.531	7.081	7.029	4.724	9.180
Deferred revenue	469	407	801	321	793	4.194	2.462	2.666	2.517	1.052	2.109	2.094	1.407	2.734
Customer deposits	170	(97)	(58)	7	186	1.100	648	702	663	277	555	551	370	720
Resale value guarantee	209	(111)	(150)	-	-	-	-	-	-	-	-	-	-	-
Other long-term liabilities	81	160	109	495	476	4.545	439	2.239	2.114	883	1.771	1.758	1.182	2.296
Net cash used in operating activities	(61)	2.098	2.405	5.943	11.497	23.844	22.628	32.226	47.385	44.165	48.644	52.422	48.779	57.478
Cash Flows from Investing Activities														
Capital expenditures	-	-	-	-	-	(9.272)	(9.600)	(16.864)	(19.339)	(20.428)	(17.487)	(24.600)	(26.033)	(28.723)
Purchases of property and equipment excluding capital leases, net of sales	(3.415)	(2.101)	(1.327)	(3.157)	(6.482)									
Maturities of short-term marketable securities	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Purchases of solar energy systems, leased and to be leased	(667)	(219)	(105)	(75)	(32)	486	176	82	(14)	(114)	(219)	(336)	(471)	(632)
Purchases of digital assets	-	-	-	-	(1.500)	-	-	-	-	-	-	-	-	-
Proceeds from sales of digital assets	-	-	-	-	272	1.042	-	-	-	-	-	-	-	-
Purchases of marketable securities	-	-	-	-	(132)	-	-	-	-	-	-	-	-	-
Proceeds from maturities of marketable securities	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Purchase of intangible assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Increases in restricted cash	(223)	-	(5)	(10)	-	-	-	-	-	-	-	-	-	-
Receipt of government grants	-	-	46	123	6	-	-	-	-	-	-	-	-	-
Business combinations, net of cash acquired	(115)	(18)	(45)	(13)	-	-	-	-	-	-	-	-	-	-
Net cash used in investing activities	(4.419)	(2.337)	(1.436)	(3.132)	(7.868)	(7.745)	(9.424)	(16.782)	(19.353)	(20.543)	(17.706)	(24.937)	(26.505)	(29.355)
Cash Flows from Financing Activities														
Net cash flows from other debt activities	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Collateralized lease repayments	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net borrowings (repayments) under vehicle and energy product financing	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net cash flows from noncontrolling interests - Solar	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Proceeds from issuances of common stock in public offerings	400	-	848	12.269	-	-	-	-	-	-	-	-	-	
Proceeds from issuances of convertible and other debt	7.138	6.176	10.669	9.713	8.883	-	-	-	-	-	-	-	-	
Repayments of convertible and other debt	(3.995)	(5.247)	(9.161)	(11.623)	(14.167)	(637)	(4.308)	(1.313)	(400)	(122)	(37)	(11)	(3)	(1)
Repayments of borrowings under Solar Bonds issued to related parties	(165)	(100)	-	-	-	-	-	-	-	-	-	-	-	-
Collateralized lease borrowings	511	(559)	(389)	(240)	(9)	-	-	-	-	-	-	-	-	-
Proceeds from exercises of stock options and other stock issuances	259	296	263	417	707	-	-	-	-	-	-	-	-	-
Principal payments on capital leases	(103)	(181)	(321)	(338)	(439)	-	-	-	-	-	-	-	-	-
Common stock and debt issuance costs	(63)	(15)	(37)	(6)	(9)	-	-	-	-	-	-	-	-	-
Purchases of convertible note hedges	(204)	-	(476)	-	-	-	-	-	-	-	-	-	-	-
Proceeds from settlements of convertible note hedges	287	-	-	-	-	-	-	-	-	-	-	-	-	-
Proceeds from issuances of warrants	53	-	174	-	-	-	-	-	-	-	-	-	-	-
Payments for settlements of warrants	(230)	(0)	-	-	-	-	-	-	-	-	-	-	-	-
Proceeds from investments by noncontrolling interests in subsidiaries	790	437	279	24	2	-	-	-	-	-	-	-	-	-
Distributions paid to noncontrolling interests in subsidiaries	(262)	(227)	(311)	(208)	(161)	-	-	-	-	-	-	-	-	-
Payments for buy-outs of noncontrolling interests in subsidiaries	(0)	(6)	(9)	(35)	(10)	-	-	-	-	-	-	-	-	-
Net cash provided by financing activities	4.415	574	1.529	9.973	(5.203)	(637)	(4.308)	(1.313)	(400)	(122)	(37)	(11)	(3)	(1)
Effect of exchange rate changes on cash and cash equivalents	39	(23)	8	334	(183)	-	-	-	-	-	-	-	-	-
Cash and cash equivalents, beginning of period	3.393	3.368	3.686	6.268	19.384	17.576	33.039	41.935	56.066	83.697	107.198	138.098	165.572	187.843
Cash and cash equivalents, end of period	3.368	3.686	6.268	19.384	17.576	33.039	41.935	56.066	83.697	107.198	138.098	165.572	187.843	215.966
Net (decrease) increase in cash and cash equivalents	**(25)**	**318**	**2.582**	**13.116**	**(1.808)**	**15.463**	**8.896**	**14.131**	**27.632**	**23.501**	**30.900**	**27.474**	**22.271**	**28.123**
Supplemental Non-Cash Investing and Financing Activities														
Shares issued in connection with business combinations and assumed vested awards	11	-	-	-	-	-	-	-	-	-	-	-	-	-
Equity issued in connection with business combination	-	-	207	-	-	-	-	-	-	-	-	-	-	-
Acquisitions of property and equipment included in liabilities	914	249	562	1.088	2.251	-	-	-	-	-	-	-	-	-
Estimated fair value of facilities under build-to-suit leases	313	94	-	-	-	-	-	-	-	-	-	-	-	-
Supplemental Disclosures														
Cash paid during the period for interest, net of amounts capitalized	183	381	455	444	266	(132)	(231)	(71)	(21)	(6)	(2)	(1)	(0)	(0)
Cash paid during the period for taxes, net of refunds	66	35	54	115	561	2.432	3.419	4.830	8.395	8.115	8.258	8.689	7.689	8.432

Source: SEC FORM 10-K, Quarterly Reports and Student Estimates

Base Case

TESLA Consolidated Income Statement						Forecast								
in USD millions	2017A	2018A	2019A	2020A	2021A	2022A	2023A	2024A	2025A	2026A	2027A	2028A	2029A	2030A
Revenues														
Automotive sales	8.535	17.632	19.952	26.184	44.125	65.333	99.441	126.035	153.076	169.485	198.621	231.710	290.730	364.807
Automotive regulatory credits	-	-	-	-	1.465	1.851	2.818	3.572	4.338	4.803	5.628	6.566	8.239	10.338
Automotive leasing	1.107	883	869	1.052	1.642	3.277	4.979	6.249	7.843	9.845	12.356	15.509	19.466	24.432
Total automotive revenues	9.641	18.515	20.821	27.236	47.232	70.461	107.237	135.856	165.257	184.132	216.606	253.784	318.434	399.577
Energy generation and storage	1.116	1.555	1.531	1.994	2.789	4.959	7.092	9.447	12.457	16.253	21.168	27.576	35.934	46.865
Services and other	1.001	1.391	2.226	2.306	3.802	4.931	6.270	8.078	10.385	13.184	16.547	20.553	25.287	30.580
Total revenues	11.759	21.461	24.578	31.536	53.823	80.352	120.599	153.380	188.099	213.569	254.321	301.913	379.656	477.022
Cost of revenues														
Automotive sales	6.724	13.686	15.939	19.696	32.415	51.043	76.495	96.589	104.384	120.772	154.711	191.887	238.633	303.837
Automotive leasing	708	488	459	563	978	1.901	2.975	3.837	4.941	6.351	8.152	10.449	13.376	17.103
Total automotive cost of revenues	7.433	14.174	16.398	20.259	33.393	52.945	79.470	100.426	109.325	127.123	162.863	202.336	252.009	320.939
Energy generation and storage	875	1.365	1.341	1.976	2.918	3.961	5.493	7.129	9.217	11.863	15.189	19.330	24.426	30.623
Services and other	1.229	1.880	2.770	2.671	3.906	4.811	5.894	7.316	9.096	11.206	13.690	16.596	19.979	23.691
Total cost of revenues	9.536	17.419	20.509	24.906	40.217	61.716	90.858	114.871	127.638	150.192	191.742	238.263	296.414	375.253
Gross profit	2.222	4.042	4.069	6.630	13.606	18.635	29.741	38.509	60.461	63.377	62.579	63.650	83.242	101.769
Operating expenses														
Research and developement	1.378	1.460	1.343	1.491	2.593	3.205	4.811	5.581	6.244	6.591	7.298	8.055	9.418	11.002
Selling, general and administrative	2.477	2.834	2.646	3.145	4.517	4.136	6.208	6.896	7.386	7.749	8.526	9.352	10.867	12.616
Restructuring and other	-	135	149	-	(27)	-	-	-	-	-	-	-	-	-
Total operating expenses	3.855	4.430	4.138	4.636	7.083	7.342	11.019	12.477	13.629	14.340	15.824	17.407	20.284	23.618
Profit from operations	(1.632)	(388)	(69)	1.994	6.523	11.293	18.722	26.031	46.831	49.037	46.755	46.243	62.958	78.151
Interest income	20	25	44	30	56	-	-	-	-	-	-	-	-	-
Interest expense	(471)	(663)	(685)	(748)	(371)	(132)	(231)	(71)	(21)	(6)	(2)	(1)	(0)	(0)
Other (expense) income, net	(125)	22	45	(122)	135	-	-	-	-	-	-	-	-	-
Profit before income taxes	(2.209)	(1.005)	(665)	1.154	6.343	11.161	18.491	25.961	46.810	49.030	46.753	46.243	62.957	78.151
Provision for income taxes	32	58	110	292	699	2.344	3.883	5.452	9.830	10.296	9.818	9.711	13.221	16.412
Net income	**(2.241)**	**(1.063)**	**(775)**	**862**	**5.644**	**8.817**	**14.608**	**20.509**	**36.980**	**38.734**	**36.935**	**36.532**	**49.736**	**61.739**
Net income attributable to noncontrolling interests and redeemable nonco	(279)	(86)	87	141	125	-	-	-	-	-	-	-	-	-
Net income attributable to common stockholders	(1.962)	(976)	(862)	721	5.519	8.817	14.608	20.509	36.980	38.734	36.935	36.532	49.736	61.739
Less: Buy-out of noncontrolling interest	-	-	8	31	-	-	-	-	-	-	-	-	-	-
Net income used in computing netincome (loss) per share of common sto	(1.962)	(976)	(870)	690	5.519	8.817	14.608	20.509	36.980	38.734	36.935	36.532	49.736	61.739
Net income per share of common stock attributable to common stockholders														
Basic	$ (11,83)	$ (5,72)	$ (4,92)	$,74	$ 5,6	$ 2,8	$ 4,64	$ 6,52	$ 11,75	$ 12,31	$ 11,74	$ 11,61	$ 15,81	$ 19,62
Diluted	$ (11,83)	$ (5,72)	$ (4,92)	$,74	$ 4,9	$ 2,54	$ 4,21	$ 5,91	$ 10,66	$ 11,17	$ 10,65	$ 10,53	$ 14,34	$ 17,8
Weighted average shares used in computing net loss per share of common stock														
Basic	166	171	177	933	986	3.146	3.146	3.146	3.146	3.146	3.146	3.146	3.146	3.146
Diluted	166	171	177	1.083	1.129	3.468	3.468	3.468	3.468	3.468	3.468	3.468	3.468	3.468
Source: SEC FORM 10-K, Quarterly Reports and Student Estimates														
Effective tax rate	-1,43%	-5,76%	-16,54%	25,30%	11,02%	21,00%	21,00%	21,00%	21,00%	21,00%	21,00%	21,00%	21,00%	21,00%

TESLA Consolidated Balance Sheet						Forecast								
Assets														
in USD million	**2017A**	**2018A**	**2019A**	**2020A**	**2021A**	**2022A**	**2023A**	**2024A**	**2025A**	**2026A**	**2027A**	**2028A**	**2029A**	**2030A**
Current assets														
Cash and cash equivalents	3.368	3.686	6.268	19.384	17.576	29.854	45.579	57.936	91.368	127.274	158.901	189.539	232.917	288.544
Short-term marketable securities	-	-	-	-	131	-	-	-	-	-	-	-	-	-
Restricted Cash	155	193	246	-	-	131	131	131	131	131	131	131	131	131
Accounts receivable, net	515	949	1.324	1.886	1.913	3.813	5.723	7.278	8.926	10.135	12.068	14.327	18.016	22.636
Inventories	2.264	3.113	3.552	4.101	5.757	12.883	19.336	24.592	30.159	34.242	40.776	48.407	60.871	76.483
Prepaid expenses and other current assets	268	366	713	1.346	1.723	2.307	3.463	4.404	5.401	6.132	7.302	8.669	10.901	13.697
Total current assets	6.571	8.306	12.103	26.717	27.100	48.988	74.232	94.341	135.984	177.914	219.179	261.072	322.837	401.490
Operating lease vehicles, net	4.117	2.090	2.447	3.091	4.511	6.910	10.248	12.554	15.378	18.839	23.077	28.270	34.630	42.422
Solar energy systems, leased and to be leased, net	6.347	6.271	6.138	5.979	5.765	5.302	5.186	5.214	5.407	5.792	6.406	7.305	8.565	10.299
Property, plant and equipment, net	10.028	11.330	10.396	12.747	18.884	22.910	27.639	41.543	51.627	57.789	69.891	83.328	104.350	128.852
Operating lease right-of-use assets	-	-	1.218	1.558	2.016	2.016	2.016	2.016	2.016	2.016	2.016	2.016	2.016	2.016
Digital assets, net	-	-	-	-	1.260	218	218	218	218	218	218	218	218	218
Intangible assets, net	362	282	339	313	257	257	257	257	257	257	257	257	257	257
Goodwill	60	68	198	207	200	200	200	200	200	200	200	200	200	200
MyPower customer notes receivable, net of current portion	457	422	393	-	-	-	-	-	-	-	-	-	-	-
Restricted cash, net of current portion	442	398	269	-	-	-	-	-	-	-	-	-	-	-
Other assets	273	572	808	1.536	2.138	2.751	4.129	5.251	6.439	7.311	8.706	10.336	12.997	16.330
TOTAL ASSETS	**28.655**	**29.740**	**34.309**	**52.148**	**62.131**	**89.553**	**124.124**	**161.593**	**217.526**	**270.336**	**329.951**	**393.001**	**486.071**	**602.085**
Liabilities and equity														
in USD million	**2017A**	**2018A**	**2019A**	**2020A**	**2021A**	**2022A**	**2023A**	**2024A**	**2025A**	**2026A**	**2027A**	**2028A**	**2029A**	**2030A**
Liabilities														
Current liabilities														
Accounts payable	2.390	3.404	3.771	6.051	10.025	18.034	27.067	34.424	42.216	47.933	57.079	67.761	85.209	107.062
Accrued liabilities and other	1.731	2.094	2.905	3.855	5.719	9.506	14.267	18.145	22.253	25.266	30.087	35.717	44.914	56.433
Deferred revenue	1.015	630	1.163	1.458	1.447	3.795	5.696	7.244	8.884	10.087	12.011	14.259	17.931	22.529
Resale value guarantees	787	503	317	-	-	-	-	-	-	-	-	-	-	-
Customer deposits	854	793	726	752	925	2.159	3.241	4.122	5.055	5.740	6.835	8.114	10.203	12.820
Current portion of long-term debt and capital leases	797	2.568	1.785	2.132	1.589	2.541	775	236	72	22	7	2	1	0
Current portion of solar bonds and promissory notes issued to rela	100	-	-	-	-	-	-	-	-	-	-	-	-	-
Total current liabilities	7.675	9.992	10.667	14.248	19.705	36.036	51.046	64.172	78.480	89.047	106.019	125.853	158.258	198.845
Long-term debt and capital leases, net of current portion	9.416	9.404	11.634	9.556	5.245	3.656	1.115	340	104	32	10	3	1	0
Solar bonds issued to related parties, net of current portion	0	-	-	-	-	-	-	-	-	-	-	-	-	-
Convertible senior notes issued to related parties	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Deferred revenue, net of current portion	1.178	991	1.207	1.284	2.052	4.408	6.616	8.414	10.318	11.716	13.951	16.562	20.827	26.168
Resale value guarantees, net of current portion	2.309	329	36	-	-	-	-	-	-	-	-	-	-	-
Other long-term liabilities	2.443	2.710	2.655	3.330	3.546	5.053	10.340	13.151	16.127	18.311	21.805	25.885	32.551	40.899
Total liabilities	23.023	23.426	26.199	28.418	30.548	49.153	69.116	86.076	105.029	119.105	141.785	168.303	211.637	265.912
Commitments and contingencies (Note 17)														
Redeemable noncontrolling interests in subsidiaries	398	556	643	604	568	568	568	568	568	568	568	568	568	568
Convertible senior notes (Note 13)	0	-	-	51	-	-	-	-	-	-	-	-	-	-
Equity														
Stockholders' equity														
Preferred stock	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Common stock	0	0	-	1	1	-	-	-	-	-	-	-	-	-
Additional paid-in capital	9.178	10.249	12.737	27.260	29.803	38.226	52.542	72.640	108.881	146.840	183.036	218.838	267.579	328.084
Accumulated other comprehensive gain (loss)	33	(8)	(36)	363	54	78	107	148	222	300	374	447	546	670
Accumulated deficit	(4.974)	(5.318)	(6.083)	(5.399)	331	702	965	1.334	2.000	2.697	3.362	4.019	4.915	6.026
Total stockholders' equity	4.237	4.923	6.618	22.225	30.189	39.006	53.614	74.123	111.103	149.837	186.772	223.304	273.040	334.779
Noncontrolling interests in subsidiaries	997	834	849	850	826	826	826	826	826	826	826	826	826	826
Total liabilities and equity	**28.655**	**29.740**	**34.309**	**52.148**	**62.131**	**89.553**	**124.124**	**161.593**	**217.526**	**270.336**	**329.951**	**393.001**	**486.071**	**602.085**
Check	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE

Source: SEC FORM 10-K, Quarterly Reports and Student Estimates

TESLA Consolidated Cash Flow Statement						Forecast								
in USD millions	2017A	2018A	2019A	2020A	2021A	2022A	2023A	2024A	2025A	2026A	2027A	2028A	2029A	2030A
Cash Flows from Operating Activities														
Net income	(2.241)	(1.063)	(775)	862	5.644	8.817	14.608	20.509	36.980	38.734	36.935	36.532	49.736	61.739
Adjustments to reconcile net loss to net cash used in operating activities:														
Depreciation and amortization	1.636	1.901	2.154	2.322	2.911	5.728	6.910	10.386	12.907	14.447	17.473	20.832	26.088	32.213
Stock-based compensation	467	749	898	1.734	2.121	-	-	-	-	-	-	-	-	-
Amortization of debt discounts and issuance costs	91	159	188	180	-	-	-	-	-	-	-	-	-	-
Inventory write-downs	132	85	193	202	140	-	-	-	-	-	-	-	-	-
Loss on disposals of fixed assets	106	161	146	117	-	-	-	-	-	-	-	-	-	-
Foreign currency transaction losses (gains)	52	(2)	(48)	114	(55)	-	-	-	-	-	-	-	-	-
Loss (gain) related to SolarCity acquisition	58	-	-	-	-	-	-	-	-	-	-	-	-	-
Non-cash interest and other operating activities	135	49	186	228	245	-	-	-	-	-	-	-	-	-
Digital assets gain, net	-	-	-	-	(27)	-	-	-	-	-	-	-	-	-
Operating cash flow related to repayment of discounted convertible notes	-	-	(188)	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Changes in operating assets and liabilities, net of effect of business combinations:														
Accounts receivable	(25)	(497)	(367)	(652)	(130)	(1.900)	(1.910)	(1.556)	(1.648)	(1.209)	(1.934)	(2.258)	(3.689)	(4.620)
Inventory	(179)	(1.023)	(429)	(422)	(1.709)	(7.126)	(6.453)	(5.256)	(5.567)	(4.084)	(6.534)	(7.631)	(12.465)	(15.611)
Operating lease vehicles	(1.523)	(215)	(764)	(1.072)	(2.114)	(2.399)	(3.338)	(2.306)	(2.825)	(3.460)	(4.239)	(5.192)	(6.361)	(7.792)
Prepaid expenses and other current assets	(72)	(82)	(288)	(251)	(271)	(584)	(1.156)	(941)	(997)	(731)	(1.170)	(1.367)	(2.232)	(2.796)
Other non-current assets	(15)	(207)	115	(344)	(1.291)	(613)	(1.378)	(1.122)	(1.189)	(872)	(1.395)	(1.629)	(2.661)	(3.333)
Accounts payable	388	1.723	682	2.102	4.578	11.796	13.794	11.235	11.900	8.730	13.967	16.312	26.646	33.371
Deferred revenue	469	407	801	321	793	4.704	4.109	3.346	3.544	2.600	4.160	4.858	7.936	9.940
Customer deposits	170	(97)	(58)	7	186	1.234	1.082	881	933	685	1.095	1.279	2.089	2.617
Resale value guarantee	209	(111)	(150)	-	-	-	-	-	-	-	-	-	-	-
Other long-term liabilities	81	160	109	495	476	1.507	5.287	2.811	2.977	2.184	3.494	4.080	6.666	8.348
Net cash used in operating activities	(61)	2.098	2.405	5.943	11.497	21.164	31.555	37.987	57.016	57.024	61.853	65.816	91.753	114.076
Cash Flows from Investing Activities														
Capital expenditures	-	-	-	-	-	(9.754)	(11.638)	(24.290)	(22.991)	(20.609)	(29.575)	(34.269)	(47.110)	(56.715)
Purchases of property and equipment excluding capital leases, net of sales	(3.415)	(2.101)	(1.327)	(3.157)	(6.482)									
Maturities of short-term marketable securities	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Purchases of solar energy systems, leased and to be leased	(667)	(219)	(105)	(75)	(32)	463	116	(27)	(193)	(386)	(614)	(899)	(1.261)	(1.733)
Purchases of digital assets	-	-	-	-	(1.500)	-	-	-	-	-	-	-	-	-
Proceeds from sales of digital assets	-	-	-	-	272	1.042	-	-	-	-	-	-	-	-
Purchases of marketable securities	-	-	-	-	(132)	-	-	-	-	-	-	-	-	-
Proceeds from maturities of marketable securities	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Purchase of intangible assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Increases in restricted cash	(223)	-	(5)	(10)	-	-	-	-	-	-	-	-	-	-
Receipt of government grants	-	-	46	123	6	-	-	-	-	-	-	-	-	-
Business combinations, net of cash acquired	(115)	(18)	(45)	(13)	-	-	-	-	-	-	-	-	-	-
Net cash used in investing activities	(4.419)	(2.337)	(1.436)	(3.132)	(7.868)	(8.249)	(11.522)	(24.317)	(23.183)	(20.995)	(30.189)	(35.167)	(48.371)	(58.449)
Cash Flows from Financing Activities														
Net cash flows from other debt activities	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Collateralized lease repayments	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net borrowings (repayments) under vehicle and energy product financing	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net cash flows from noncontrolling interests - Solar	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Proceeds from issuances of common stock in public offerings	400	-	848	12.269	-	-	-	-	-	-	-	-	-	
Proceeds from issuances of convertible and other debt	7.138	6.176	10.669	9.713	8.883	-	-	-	-	-	-	-	-	
Repayments of convertible and other debt	(3.995)	(5.247)	(9.161)	(11.623)	(14.167)	(637)	(4.308)	(1.313)	(400)	(122)	(37)	(11)	(3)	(1)
Repayments of borrowings under Solar Bonds issued to related parties	(165)	(100)	-	-	-	-	-	-	-	-	-	-	-	-
Collateralized lease borrowings	511	(559)	(389)	(240)	(9)	-	-	-	-	-	-	-	-	-
Proceeds from exercises of stock options and other stock issuances	259	296	263	417	707	-	-	-	-	-	-	-	-	-
Principal payments on capital leases	(103)	(181)	(321)	(338)	(439)	-	-	-	-	-	-	-	-	-
Common stock and debt issuance costs	(63)	(15)	(37)	(6)	(9)	-	-	-	-	-	-	-	-	-
Purchases of convertible note hedges	(204)	-	(476)	-	-	-	-	-	-	-	-	-	-	-
Proceeds from settlements of convertible note hedges	287	-	-	-	-	-	-	-	-	-	-	-	-	-
Proceeds from issuances of warrants	53	-	174	-	-	-	-	-	-	-	-	-	-	-
Payments for settlements of warrants	(230)	(0)	-	-	-	-	-	-	-	-	-	-	-	-
Proceeds from investments by noncontrolling interests in subsidiaries	790	437	279	24	2	-	-	-	-	-	-	-	-	-
Distributions paid to noncontrolling interests in subsidiaries	(262)	(227)	(311)	(208)	(161)	-	-	-	-	-	-	-	-	-
Payments for buy-outs of noncontrolling interests in subsidiaries	(0)	(6)	(9)	(35)	(10)	-	-	-	-	-	-	-	-	-
Net cash provided by financing activities	4.415	574	1.529	9.973	(5.203)	(637)	(4.308)	(1.313)	(400)	(122)	(37)	(11)	(3)	(1)
Effect of exchange rate changes on cash and cash equivalents	39	(23)	8	334	(183)	-	-	-	-	-	-	-	-	-
Cash and cash equivalents, beginning of period	3.393	3.368	3.686	6.268	19.384	17.576	29.854	45.579	57.936	91.368	127.274	158.901	189.539	232.917
Cash and cash equivalents, end of period	3.368	3.686	6.268	19.384	17.576	29.854	45.579	57.936	91.368	127.274	158.901	189.539	232.917	288.544
Net (decrease) increase in cash and cash equivalents	**(25)**	**318**	**2.582**	**13.116**	**(1.808)**	**12.278**	**15.725**	**12.357**	**33.432**	**35.906**	**31.627**	**30.638**	**43.378**	**55.626**
Supplemental Non-Cash Investing and Financing Activities														
Shares issued in connection with business combinations and assumed vested awards	11	-	-	-	-	-	-	-	-	-	-	-	-	-
Equity issued in connection with business combination	-	-	207	-	-	-	-	-	-	-	-	-	-	-
Acquisitions of property and equipment included in liabilities	914	249	562	1.088	2.251	-	-	-	-	-	-	-	-	-
Estimated fair value of facilities under build-to-suit leases	313	94	-	-	-	-	-	-	-	-	-	-	-	-
Supplemental Disclosures														
Cash paid during the period for interest, net of amounts capitalized	183	381	455	444	266	(132)	(231)	(71)	(21)	(6)	(2)	(1)	(0)	(0)
Cash paid during the period for taxes, net of refunds	66	35	54	115	561	2.344	3.883	5.452	9.830	10.296	9.818	9.711	13.221	16.412

Source: SEC FORM 10-K, Quarterly Reports and Student Estimates

Bull Case

TESLA Consolidated Income Statement						Forecast								
in USD millions	2017A	2018A	2019A	2020A	2021A	2022A	2023A	2024A	2025A	2026A	2027A	2028A	2029A	2030A
Revenues														
Automotive sales	8.535	17.632	19.952	26.184	44.125	69.210	106.704	169.210	216.412	310.424	443.115	535.460	646.054	798.230
Automotive regulatory credits	-	-	-	-	1.465	2.353	3.628	5.754	7.359	10.556	10.556	10.556	10.556	10.556
Automotive leasing	1.107	883	869	1.052	1.642	3.471	5.334	8.199	12.600	19.366	29.763	37.393	46.978	59.021
Total automotive revenues	9.641	18.515	20.821	27.236	47.232	75.034	115.667	183.162	236.371	340.345	483.434	583.409	703.588	867.807
Energy generation and storage	1.116	1.555	1.531	1.994	2.789	6.808	13.369	24.460	44.307	79.423	142.157	254.545	455.960	817.411
Services and other	1.001	1.391	2.226	2.306	3.802	5.150	6.598	10.824	17.694	28.293	44.331	55.120	67.885	82.168
Total revenues	11.759	21.461	24.578	31.536	53.823	86.992	135.634	218.446	298.373	448.061	669.923	893.073	1.227.433	1.767.386
Cost of revenues														
Automotive sales	6.724	13.686	15.939	19.696	32.415	52.669	81.434	122.478	161.310	227.810	356.773	445.007	554.172	705.742
Automotive leasing	708	488	459	563	978	2.014	3.188	5.035	7.938	12.494	19.636	25.192	32.281	41.315
Total automotive cost of revenues	7.433	14.174	16.398	20.259	33.393	54.684	84.621	127.513	169.248	240.304	376.409	470.199	586.452	747.057
Energy generation and storage	875	1.365	1.341	1.976	2.918	5.438	10.354	18.453	32.763	57.902	101.775	177.749	308.047	529.150
Services and other	1.229	1.880	2.770	2.671	3.906	4.773	5.903	9.349	14.805	23.007	35.136	42.692	51.500	61.186
Total cost of revenues	9.536	17.419	20.509	24.906	40.217	64.895	100.879	155.314	216.815	321.213	513.320	690.640	946.000	1.337.393
Gross profit	2.222	4.042	4.069	6.630	13.606	22.098	34.755	63.132	81.558	126.848	156.603	202.433	281.433	429.993
Operating expenses														
Research and developement	1.378	1.460	1.343	1.491	2.593	3.123	4.870	7.154	8.914	12.445	17.301	17.301	17.301	17.301
Selling, general and administrative	2.477	2.834	2.646	3.145	4.517	4.030	6.284	8.839	10.544	14.631	20.213	24.898	31.620	42.070
Restructuring and other	-	135	149	-	(27)	-	-	-	-	-	-	-	-	-
Total operating expenses	3.855	4.430	4.138	4.636	7.083	7.154	11.153	15.993	19.458	27.076	37.514	42.199	48.921	59.371
Profit from operations	(1.632)	(388)	(69)	1.994	6.523	14.944	23.601	47.139	62.100	99.772	119.089	160.234	232.512	370.622
Interest income	20	25	44	30	56	-	-	-	-	-	-	-	-	-
Interest expense	(471)	(663)	(685)	(748)	(371)	(132)	(231)	(71)	(21)	(6)	(2)	(1)	(0)	(0) m
Other (expense) income, net	(125)	22	45	(122)	135	-	-	-	-	-	-	-	-	-
Profit before income taxes	(2.209)	(1.005)	(665)	1.154	6.343	14.812	23.370	47.068	62.079	99.766	119.087	160.234	232.512	370.622
Provision for income taxes	32	58	110	292	699	3.110	4.908	9.884	13.036	20.951	25.008	33.649	48.828	77.831
Net income	**(2.241)**	**(1.063)**	**(775)**	**862**	**5.644**	**11.701**	**18.462**	**37.184**	**49.042**	**78.815**	**94.079**	**126.585**	**183.685**	**292.792**
Net income attributable to noncontrolling interests and redeemable nonc	(279)	(86)	87	141	125	-	-	-	-	-	-	-	-	-
Net income attributable to common stockholders	(1.962)	(976)	(862)	721	5.519	11.701	18.462	37.184	49.042	78.815	94.079	126.585	183.685	292.792
Less: Buy-out of noncontrolling interest	-	-	8	31	-	-	-	-	-	-	-	-	-	-
Net income used in computing netincome (loss) per share of common sto	(1.962)	(976)	(870)	690	5.519	11.701	18.462	37.184	49.042	78.815	94.079	126.585	183.685	292.792
Net income per share of common stock attributable to common stockholders														
Basic	$ (11,83)	$ (5,72)	$ (4,92)	$,74	$ 5,6	$ 3,72	$ 5,87	$ 11,82	$ 15,59	$ 25,05	$ 29,9	$ 40,24	$ 58,39	$ 93,07
Diluted	$ (11,83)	$ (5,72)	$ (4,92)	$,74	$ 4,9	$ 3,37	$ 5,32	$ 10,72	$ 14,14	$ 22,73	$ 27,13	$ 36,5	$ 52,97	$ 84,43
Weighted average shares used in computing net loss per share of common stock														
Basic	166	171	177	933	986	3.146	3.146	3.146	3.146	3.146	3.146	3.146	3.146	3.146
Diluted	166	171	177	1.083	1.129	3.468	3.468	3.468	3.468	3.468	3.468	3.468	3.468	3.468
Source: SEC FORM 10-K, Quarterly Reports and Student Estimates														
Effective tax rate	-1,43%	-5,76%	-16,54%	25,30%	11,02%	21,00%	21,00%	21,00%	21,00%	21,00%	21,00%	21,00%	21,00%	21,00%

TESLA Consolidated Balance Sheet						Forecast								
Assets														
in USD million	**2017A**	**2018A**	**2019A**	**2020A**	**2021A**	**2022A**	**2023A**	**2024A**	**2025A**	**2026A**	**2027A**	**2028A**	**2029A**	**2030A**
Current assets														
Cash and cash equivalents	3.368	3.686	6.268	19.384	17.576	33.788	46.475	86.498	123.465	201.890	283.668	388.245	544.650	814.064
Short-term marketable securities	-	-	-	-	131	-	-	-	-	-	-	-	-	-
Restricted Cash	155	193	246	-	-	131	131	131	131	131	131	131	131	131
Accounts receivable, net	515	949	1.324	1.886	1.913	4.128	6.436	10.366	14.159	21.262	31.790	42.379	58.246	83.868
Inventories	2.264	3.113	3.552	4.101	5.757	13.948	21.747	35.024	47.839	71.839	107.411	143.189	196.798	283.371
Prepaid expenses and other current assets	268	366	713	1.346	1.723	2.498	3.894	6.272	8.567	12.865	19.235	25.643	35.243	50.747
Total current assets	6.571	8.306	12.103	26.717	27.100	54.492	78.683	138.291	194.161	307.987	442.235	599.587	835.068	1.232.181
Operating lease vehicles, net	4.117	2.090	2.447	3.091	4.511	7.320	10.980	16.470	24.705	37.058	55.587	68.160	83.577	102.481
Solar energy systems, leased and to be leased, net	6.347	6.271	6.138	5.979	5.765	5.405	5.614	6.381	8.081	11.351	17.280	27.814	46.369	79.057
Property, plant and equipment, net	10.028	11.330	10.396	12.747	18.884	23.423	36.632	49.966	74.621	102.182	153.597	216.465	305.634	432.226
Operating lease right-of-use assets	-	-	1.218	1.558	2.016	2.016	2.016	2.016	2.016	2.016	2.016	2.016	2.016	2.016
Digital assets, net	-	-	-	-	1.260	218	218	218	218	218	218	218	218	218
Intangible assets, net	362	282	339	313	257	257	257	257	257	257	257	257	257	257
Goodwill	60	68	198	207	200	200	200	200	200	200	200	200	200	200
MyPower customer notes receivable, net of current portion	457	422	393	-	-	-	-	-	-	-	-	-	-	-
Restricted cash, net of current portion	442	398	269	-	-	-	-	-	-	-	-	-	-	-
Other assets	273	572	808	1.536	2.138	2.978	4.643	7.478	10.214	15.339	22.934	30.573	42.019	60.504
TOTAL ASSETS	**28.655**	**29.740**	**34.309**	**52.148**	**62.131**	**96.309**	**139.244**	**221.277**	**314.473**	**476.608**	**694.324**	**945.290**	**1.315.357**	**1.909.139**
Liabilities and equity														
in USD million	**2017A**	**2018A**	**2019A**	**2020A**	**2021A**	**2022A**	**2023A**	**2024A**	**2025A**	**2026A**	**2027A**	**2028A**	**2029A**	**2030A**
Liabilities														
Current liabilities														
Accounts payable	2.390	3.404	3.771	6.051	10.025	19.524	30.441	49.028	66.966	100.562	150.356	200.439	275.482	396.668
Accrued liabilities and other	1.731	2.094	2.905	3.855	5.719	10.291	16.046	25.843	35.298	53.007	79.254	105.653	145.209	209.087
Deferred revenue	1.015	630	1.163	1.458	1.447	4.109	6.406	10.317	14.092	21.161	31.640	42.179	57.970	83.472
Resale value guarantees	787	503	317	-	-	-	-	-	-	-	-	-	-	-
Customer deposits	854	793	726	752	925	2.338	3.645	5.871	8.019	12.042	18.005	24.002	32.988	47.499
Current portion of long-term debt and capital leases	797	2.568	1.785	2.132	1.589	2.541	775	236	72	22	7	2	1	0
Current portion of solar bonds and promissory notes issued to rela	100	-	-	-	-	-	-	-	-	-	-	-	-	-
Total current liabilities	7.675	9.992	10.667	14.248	19.705	38.804	57.313	91.295	124.447	186.794	279.261	372.275	511.650	736.726
Long-term debt and capital leases, net of current portion	9.416	9.404	11.634	9.556	5.245	3.656	1.115	340	104	32	10	3	1	0
Solar bonds issued to related parties, net of current portion	0	-	-	-	-	-	-	-	-	-	-	-	-	-
Convertible senior notes issued to related parties	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Deferred revenue, net of current portion	1.178	991	1.207	1.284	2.052	4.772	7.440	11.983	16.368	24.579	36.750	48.991	67.333	96.953
Resale value guarantees, net of current portion	2.309	329	36	-	-	-	-	-	-	-	-	-	-	-
Other long-term liabilities	2.443	2.710	2.655	3.330	3.546	5.793	11.629	18.729	25.582	38.416	57.438	76.570	105.238	151.532
Total liabilities	23.023	23.426	26.199	28.418	30.548	53.025	77.497	122.347	166.501	249.821	373.458	497.840	684.221	985.212
Commitments and contingencies (Note 17)														
Redeemable noncontrolling interests in subsidiaries	398	556	643	604	568	568	568	568	568	568	568	568	568	568
Convertible senior notes (Note 13)	0	-	-	51	-	-	-	-	-	-	-	-	-	-
Equity														
Stockholders' equity														
Preferred stock	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Common stock	0	0	-	1	1	-	-	-	-	-	-	-	-	-
Additional paid-in capital	9.178	10.249	12.737	27.260	29.803	41.053	59.146	95.586	143.647	220.886	313.083	437.136	617.147	904.082
Accumulated other comprehensive gain (loss)	33	(8)	(36)	363	54	84	121	195	293	451	639	892	1.259	1.845
Accumulated deficit	(4.974)	(5.318)	(6.083)	(5.399)	331	754	1.086	1.756	2.638	4.057	5.750	8.029	11.335	16.606
Total stockholders' equity	4.237	4.923	6.618	22.225	30.189	41.890	60.353	97.536	146.579	225.393	319.472	446.057	629.741	922.533
Noncontrolling interests in subsidiaries	997	834	849	850	826	826	826	826	826	826	826	826	826	826
Total liabilities and equity	**28.655**	**29.740**	**34.309**	**52.148**	**62.131**	**96.309**	**139.244**	**221.277**	**314.473**	**476.608**	**694.324**	**945.290**	**1.315.357**	**1.909.139**
Check	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE

Source: SEC FORM 10-K, Quarterly Reports and Student Estimates

TESLA Consolidated Cash Flow Statement						Forecast								
in USD millions	2017A	2018A	2019A	2020A	2021A	2022A	2023A	2024A	2025A	2026A	2027A	2028A	2029A	2030A
Cash Flows from Operating Activities														
Net income	(2.241)	(1.063)	(775)	862	5.644	11.701	18.462	37.184	49.042	78.815	94.079	126.585	183.685	292.792
Adjustments to reconcile net loss to net cash used in operating activities:														
Depreciation and amortization	1.636	1.901	2.154	2.322	2.911	5.856	9.158	12.491	18.655	25.546	38.399	54.116	76.408	108.056
Stock-based compensation	467	749	898	1.734	2.121	-	-	-	-	-	-	-	-	-
Amortization of debt discounts and issuance costs	91	159	188	180	-	-	-	-	-	-	-	-	-	-
Inventory write-downs	132	85	193	202	140	-	-	-	-	-	-	-	-	-
Loss on disposals of fixed assets	106	161	146	117	-	-	-	-	-	-	-	-	-	-
Foreign currency transaction losses (gains)	52	(2)	(48)	114	(55)	-	-	-	-	-	-	-	-	-
Loss (gain) related to SolarCity acquisition	58	-	-	-	-	-	-	-	-	-	-	-	-	-
Non-cash interest and other operating activities	135	49	186	228	245	-	-	-	-	-	-	-	-	-
Digital assets gain, net	-	-	-	-	(27)	-	-	-	-	-	-	-	-	-
Operating cash flow related to repayment of discounted convertible notes	-	-	(188)	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Changes in operating assets and liabilities, net of effect of business combinations:														
Accounts receivable	(25)	(497)	(367)	(652)	(130)	(2.215)	(2.308)	(3.930)	(3.793)	(7.103)	(10.528)	(10.589)	(15.866)	(25.623)
Inventory	(179)	(1.023)	(429)	(422)	(1.709)	(8.191)	(7.799)	(13.278)	(12.815)	(24.000)	(35.572)	(35.778)	(53.609)	(86.572)
Operating lease vehicles	(1.523)	(215)	(764)	(1.072)	(2.114)	(2.809)	(3.660)	(5.490)	(8.235)	(12.353)	(18.529)	(12.573)	(15.417)	(18.904)
Prepaid expenses and other current assets	(72)	(82)	(288)	(251)	(271)	(775)	(1.397)	(2.378)	(2.295)	(4.298)	(6.370)	(6.407)	(9.600)	(15.504)
Other non-current assets	(15)	(207)	115	(344)	(1.291)	(840)	(1.665)	(2.835)	(2.736)	(5.124)	(7.595)	(7.639)	(11.446)	(18.485)
Accounts payable	388	1.723	682	2.102	4.578	14.072	16.671	28.383	27.394	51.304	76.041	76.483	114.599	185.064
Deferred revenue	469	407	801	321	793	5.382	4.966	8.454	8.159	15.281	22.649	22.780	34.133	55.121
Customer deposits	170	(97)	(58)	7	186	1.413	1.307	2.226	2.148	4.023	5.963	5.997	8.986	14.512
Resale value guarantee	209	(111)	(150)	-	-	-	-	-	-	-	-	-	-	-
Other long-term liabilities	81	160	109	495	476	2.247	5.836	7.100	6.853	12.834	19.022	19.133	28.667	46.295
Net cash used in operating activities	(61)	2.098	2.405	5.943	11.497	25.841	39.572	67.928	82.378	134.924	177.558	232.107	340.539	536.752
Cash Flows from Investing Activities														
Capital expenditures	-	-	-	-	-	(10.395)	(22.368)	(25.824)	(43.311)	(53.107)	(89.814)	(116.985)	(165.576)	(234.649)
Purchases of property and equipment excluding capital leases, net of sales	(3.415)	(2.101)	(1.327)	(3.157)	(6.482)									
Maturities of short-term marketable securities	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Purchases of solar energy systems, leased and to be leased	(667)	(219)	(105)	(75)	(32)	360	(209)	(768)	(1.699)	(3.271)	(5.929)	(10.534)	(18.554)	(32.689)
Purchases of digital assets	-	-	-	-	(1.500)	-	-	-	-	-	-	-	-	-
Proceeds from sales of digital assets	-	-	-	-	272	1.042	-	-	-	-	-	-	-	-
Purchases of marketable securities	-	-	-	-	(132)	-	-	-	-	-	-	-	-	-
Proceeds from maturities of marketable securities	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Purchase of intangible assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Increases in restricted cash	(223)	-	(5)	(10)	-	-	-	-	-	-	-	-	-	-
Receipt of government grants	-	-	46	123	6	-	-	-	-	-	-	-	-	-
Business combinations, net of cash acquired	(115)	(18)	(45)	(13)	-	-	-	-	-	-	-	-	-	-
Net cash used in investing activities	(4.419)	(2.337)	(1.436)	(3.132)	(7.868)	(8.993)	(22.576)	(26.592)	(45.010)	(56.378)	(95.743)	(127.519)	(184.131)	(267.337)
Cash Flows from Financing Activities														
Net cash flows from other debt activities	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Collateralized lease repayments	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net borrowings (repayments) under vehicle and energy product financing	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net cash flows from noncontrolling interests - Solar	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Proceeds from issuances of common stock in public offerings	400	-	848	12.269	-	-	-	-	-	-	-	- -	-	
Proceeds from issuances of convertible and other debt	7.138	6.176	10.669	9.713	8.883	-	-	-	-	-	-	- -	-	
Repayments of convertible and other debt	(3.995)	(5.247)	(9.161)	(11.623)	(14.167)	(637)	(4.308)	(1.313)	(400)	(122)	(37)	(11)	(3)	(1)
Repayments of borrowings under Solar Bonds issued to related parties	(165)	(100)	-	-	-	-	-	-	-	-	-	-	-	-
Collateralized lease borrowings	511	(559)	(389)	(240)	(9)	-	-	-	-	-	-	-	-	-
Proceeds from exercises of stock options and other stock issuances	259	296	263	417	707	-	-	-	-	-	-	-	-	-
Principal payments on capital leases	(103)	(181)	(321)	(338)	(439)	-	-	-	-	-	-	-	-	-
Common stock and debt issuance costs	(63)	(15)	(37)	(6)	(9)	-	-	-	-	-	-	-	-	-
Purchases of convertible note hedges	(204)	-	(476)	-	-	-	-	-	-	-	-	-	-	-
Proceeds from settlements of convertible note hedges	287	-	-	-	-	-	-	-	-	-	-	-	-	-
Proceeds from issuances of warrants	53	-	174	-	-	-	-	-	-	-	-	-	-	-
Payments for settlements of warrants	(230)	(0)	-	-	-	-	-	-	-	-	-	-	-	-
Proceeds from investments by noncontrolling interests in subsidiaries	790	437	279	24	2	-	-	-	-	-	-	-	-	-
Distributions paid to noncontrolling interests in subsidiaries	(262)	(227)	(311)	(208)	(161)	-	-	-	-	-	-	-	-	-
Payments for buy-outs of noncontrolling interests in subsidiaries	(0)	(6)	(9)	(35)	(10)	-	-	-	-	-	-	-	-	-
Net cash provided by financing activities	4.415	574	1.529	9.973	(5.203)	(637)	(4.308)	(1.313)	(400)	(122)	(37)	(11)	(3)	(1)
Effect of exchange rate changes on cash and cash equivalents	39	(23)	8	334	(183)	-	-	-	-	-	-	-	-	-
Cash and cash equivalents, beginning of period	3.393	3.368	3.686	6.268	19.384	17.576	33.788	46.475	86.498	123.465	201.890	283.668	388.245	544.650
Cash and cash equivalents, end of period	3.368	3.686	6.268	19.384	17.576	33.788	46.475	86.498	123.465	201.890	283.668	388.245	544.650	814.064
Net (decrease) increase in cash and cash equivalents	**(25)**	**318**	**2.582**	**13.116**	**(1.808)**	**16.212**	**12.687**	**40.023**	**36.967**	**78.425**	**81.778**	**104.577**	**156.405**	**269.414**
Supplemental Non-Cash Investing and Financing Activities														
Shares issued in connection with business combinations and assumed vested awards	11	-	-	-	-	-	-	-	-	-	-	-	-	-
Equity issued in connection with business combination	-	-	207	-	-	-	-	-	-	-	-	-	-	-
Acquisitions of property and equipment included in liabilities	914	249	562	1.088	2.251	-	-	-	-	-	-	-	-	-
Estimated fair value of facilities under build-to-suit leases	313	94	-	-	-	-	-	-	-	-	-	-	-	-
Supplemental Disclosures														
Cash paid during the period for interest, net of amounts capitalized	183	381	455	444	266	(132)	(231)	(71)	(21)	(6)	(2)	(1)	(0)	(0)
Cash paid during the period for taxes, net of refunds	66	35	54	115	561	3.110	4.908	9.884	13.036	20.951	25.008	33.649	48.828	77.831

Source: SEC FORM 10-K, Quarterly Reports and Student Estimates

Disclosures and Disclaimers

Report Recommendations

Buy	Expected total return (including expected capital gains and expected dividend yield) of more than 10% over a 12-month period.
Hold	Expected total return (including expected capital gains and expected dividend yield) between 0% and 10% over a 12-month period.
Sell	Expected negative total return (including expected capital gains and expected dividend yield) over a 12-month period.

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