

LEVEL 7 ASSESSMENT SPECIFICATION

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Business Report: Review of Tesla Inc.'s Corporate Strategy and Performance with focus on its China's operations

1. Executive Summary

1.1 Tesla, Inc. has been going global since late 2010s, with its first “Gigafactory” opening outside the US in Shanghai, China in 2019. It also started construction of a new Gigafactory in 2020 near Berlin, Germany.

Tesla's global strategy, particularly with reference to opening of its Gigafactory in China, has been very successful. The report will examine its challenges and success factors in constructing its production base and developing its markets in China and the region.

1.2 Results of the strategic management review and SWOT analysis

- (1) Tesla has strong strategic management concepts with a clearly defined vision and mission
- (2) The company's objectives and goals measurable and well communicated
- (3) It has a balanced organization's structure upon completion of its Gigafactory in China, Germany and a new headquarters in Texas.

Marketing Strategy

- (1) Tesla is one of the early car producers offering high-performance quality electric vehicles in a meaningful way
- (2) It has a unique market positioning among competitors
- (3) The firm's market share been increasing.
- (4) Its present channels of distribution are reliable and cost effective.
- (5) Through its excellent website and retail outlets, it has an effective sales organisation, promotion and customer services
- (6) The product quality and customer service have been good.
- (7) Its products and services priced appropriately and competitive.

Finance/Accounting Functions

- (1) Investment decision: It has a good move by going into China.
- (2) Financing decision: Banks in China have provided a low-interest loan and working capital credit facility which have been paid off in 2021.
- (3) The level of cashflows has been strong in recent years, with increased profitability after more than a decade of negative corporate profit. .

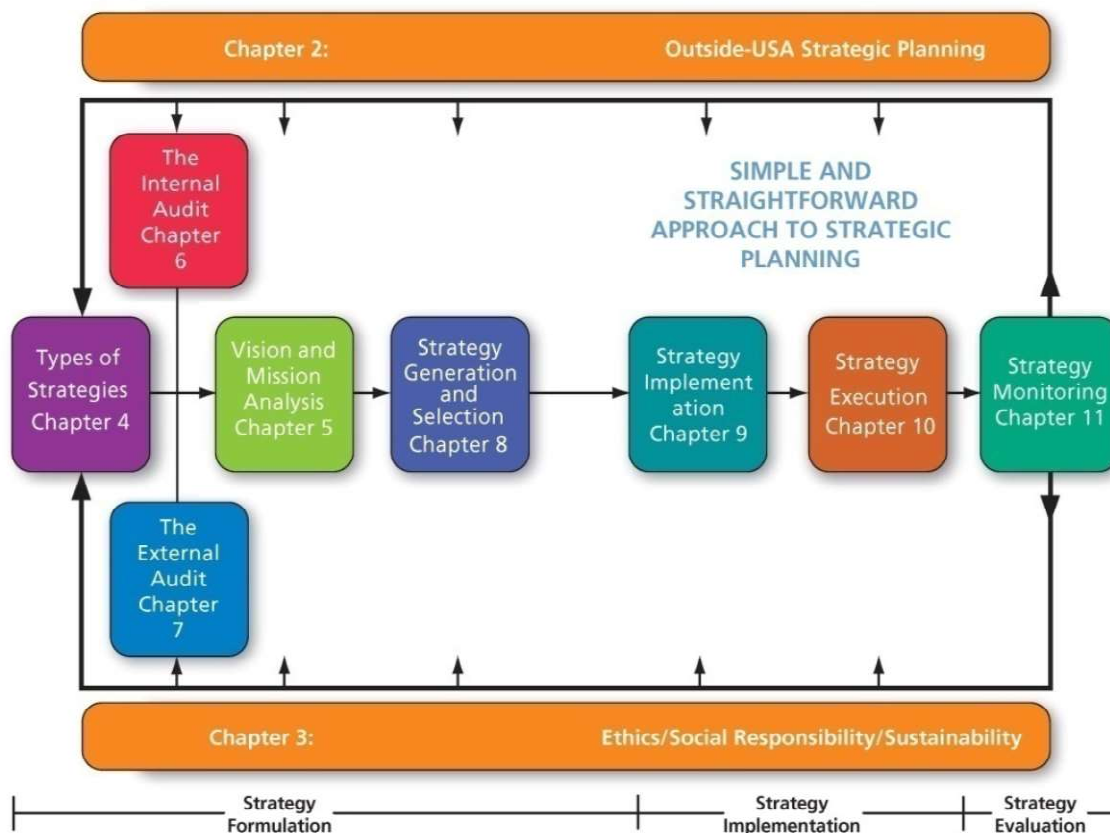
2. Background

Tesla Inc. (“Tesla”) is a US-based multinational corporation (“MNC”) that designs, produces, sells and leases high-performance electric vehicles (“EV”), energy generation and storage systems and offers services related to these products. Tesla usually sells its products directly to customers, either through its dedicated website or retail outlets, without using any third-party dealers. Through its global network of vehicle service centres, mobile service technicians, Supercharger stations and destination chargers, the company has been growing its client-facing infrastructure.

EVs have been getting more popular globally in the last decade. Thanks to the global macroeconomic and the environmental, social and governance considerations, the world’s EV market is heating up in recent years. Tesla Inc. in particular benefits much from the global trends and has become the leader in the EV market.

By adopting David & David’s Comprehensive Strategic Management Model (David & David (2014)), this paper examines how Tesla formulates and implements its global strategy, and evaluates the strengths, weaknesses, opportunities and threats (“SWOT”) of its corporate strategic management, with particular focus on its strategy on the China’s market. An attempt is also made to recommend any possible adaptation of the corporate strategy in light of subsequent changes in the macro and micro environments, with a view to formulating an actionable plan for improving Tesla’s competitiveness and for ensuring its continued success.

Comprehensive Model of the Strategic-Management Process



Source: David & David (2014)

3. Strategic Internal Audit

3.1 Tesla's Business Model and Strategies

This business report will focus on Tesla's management of its business model, planning, deployment and the execution and continuous management of its corporate strategies. According to David & David (2014), the term "strategic management" is defined as "the art and science of formulating, implementing, and evaluating cross-functional decisions that enable an organization to achieve its objective". Hence, let us take a look at the elements of the strategic management one by one in the following.

3.2 Strategy Formulation: Vision, Mission and Purpose

The corporate strategy of Tesla is substantially inspired by Elon Musk, one of the co-founders and the current Chief Executive Officer ("CEO"). The vision of Musk is to electrify everything with lots of cheap solar power, and store it in batteries in Tesla's vehicles, as well as buildings and the existing electric grid. (Quartz (2021)).

The mission of Tesla is to accelerate the world's transition to sustainable energy, engineering expertise, vertically integrated business model and focus on user experience differentiate Tesla from other companies.(Tesla's Annual Report, 2021)

Being clearly defined and easily understood, the vision and mission are instrumental for the management and the employees to follow in their day-to-day operation. Indeed, with the endorsement of the Paris Agreement on the Climate Change in late 2015, awareness of the environmental protection has been growing rapidly. It provides an excellent business environment for adopting green products such as EV to protect the environment.

3.3 Marketing Strategy

Based on the "4Ps" Marketing Mix Model of Jerome McCarthy (1960), this report will review on the fundamental areas of marketing strategy of Tesla: Product, Price, Place and Promotion. These are also supplemented by the review of Propriety and Partnership.

3.3.1 Products

Tesla operates two key business segments, namely (a) automotive and (b) energy generation and storage. Within the automotive segment, there are mainly 4 different products which are all-electric vehicles:

Product differentiation strategy

- (a) Products and Services
- (b)

Product development strategy

3.3.2 Price

3.3.3 Place

This include the place of production, product distribution and customer services.

3.3.4 Promotion

Tesla has adopted a new technology-based approach to automobile marketing, different from the traditional automobile industry's marketing approach that favours mass marketing and mass production. Through the company website, a potential customer can:

- (a) select the items of their choice: car model, paint colour of the car, colour of the interior, choice of wheels, choice of assisted/enhanced/full automated driving, intended range for a single charge, speed acceleration;
- (b) obtain information of government tax credit /subsidy for different models of cars and also the expected delivery time;
- (c) place order with deposit (or through Tesla's retail outlet).

Such customer information and selections can facilitate Tesla's ordering of necessary components from its suppliers, estimation of the necessary production time and matching production volume with the actual orders received for efficient inventory and cost controls.

Tesla has been able to generate significant media coverage of its company and products. Media coverage and words of mouth are the primary drivers of its sales without using traditional advertising and car dealers. This results in low marketing costs.

3.4 Financial conditions of Tesla

3.4.1 Tesla, Inc. has recently emerged as one of the world's most valuable car maker with a market capitalization reaching USD 1 trillion in October 2021. Thus it is the sixth company of worth higher than this level in the American history. It could raise needed long-term capital through debt and/or equity.

3.4.2 Results of Operations:

Revenues grew substantially by 70% in 2021 and 28% in 2020 respectively. It achieved a positive net income attributable to common stockholders of USD721mn in 2020 and USD5,519mn in 2021 after more than a decade of negative figures.

3.4.3 Debt positions – Tesla raised a number of loans and financing from banks in China, which were paid off in 2021.

(1) Fixed Asset Facility –

- (a) Amount : a secured term loan facility of up to RMB9.0 bn or the equivalent amount drawn in USD from a syndicate of lenders in China.
- (b) Accrued interest at a rate of
 - (i) For RMB-denominated loans: market quoted interest published by PBoC – 0.7625%
 - (ii) For USD-denominated loans: one-year LIBOR + 1.3%
- (c) Security: certain real property relating to Gigafactory Shanghai and is non-recourse to Tesla's other assets.
- (d) During the year ended 31 Dec 2021, Tesla fully repaid USD614 mn in aggregate principal of the Fixed Asset Facility and the facility was terminated.

(2) 2020 China Working Capital Facility– with a lender in China in May 2020

- (a) Amount : Unsecured revolving working capital facility up to RMB 4 bn (or USD equivalent)
- (b) Use: for expenditures related to production at Tesla's Gigafactory Shanghai.
- (c) Interest rate:
 - (i) for RMB loans: the market quoted interest rate published by PBoC – 0.35%
 - (ii) for USD loans: 1-year LIBOR + 0.8%
- (d) Security: non-recourse to Tesla's assets.
- (e) During the year ended 31 Dec 2021, the Working Capital Facility matured and was terminated.

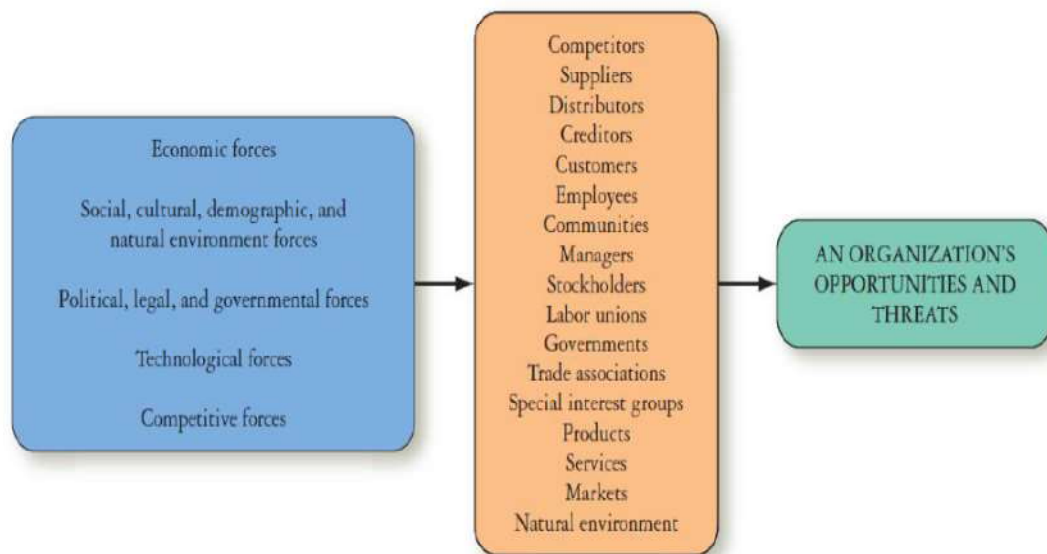
- (3) Dividend payout policies – Tesla does not pay dividends to its shareholder. It is reasonable for the company to plow it back for facilitating future corporate growth.

Conclusion: With strong growth in car sales, Tesla performed well in recent years with increasing cashflows, repayment of debts and started registering positive net income since 2020.

4. External Strategic Management Audit

This section will focus on the set of circumstances facing an entire industry within which Tesla operates. The assessment includes the political, economic, social, technology, legal and environmental factors (“PESTLE”) and also competitive forces based upon Michael Porter’s Five Forces Model of Competition.

Figure [*] Relationships between key external forces and an organisation



Source:

4.1 Overview of Global Electric Vehicles Industry & Competitive Environment

There are 4 types of EVs in the global electric vehicle market, namely:

- (a) Battery Electric Vehicle (“BEV”) -- also called all-electric vehicle. e.g. Chevy’s Bolt, Nissan Leaf, Tesla Model 3 and Volkswagen e-Golf.
- (b) Hybrid Electric Vehicle (“HEV”) -- including standard hybrid and parallel hybrid. It consists of a gasoline-powered internal combustion engine (“ICE”) and a battery that can be recharged. e.g. Toyota Prius Hybrid.

- (c) Plug-in Hybrid Electric Vehicle (“PHEV”) – including both ICE engine and electric motor. E.g. Ford C-max Energi.
- (d) Fuel Cell Electric Vehicle (“FCEV”) – also known as zero emission vehicle, as the hydrogen will combine with oxygen chemically to produce power/electricity and water. The vehicle contains various unique components, such as hydrogen tank, fuel cell stack, boost converter, electric motor, as well as power control unit. E.g. Toyota Mirai and Hyundai Tucson.

This report focuses on BEV as Tesla produces only this type of EVs. EVs are becoming more popular as they would bring the following benefits:

- (i) Environmental friendly -- No exhaust gas will be generated and hence no air pollution will be caused.
- (ii) Low noise pollution -- Instead of being powered by ICE, an EV runs on battery motor which is almost silent.
- (iii) Less carbon dioxide emission -- In case the electricity charged in the battery pack comes from renewable energy source such as solar energy, there is no carbon emission from the power generation. This would be environmental friendly for not aggravating the global warming and hence the climate change. However, in case the electricity for charging the battery pack is from the power grid which relies on power generation using fossil fuels, it would not be that environmental friendly.
- (iv) Money saving – electricity is significantly cheaper than gasoline/diesel.
- (v) Low maintenance needs – As an EV does not have any internal combustion engine and related components, there will be less components for repair or replacement.
- (vi) More convenient – An EV may be recharged using a household socket at home, without going to the gas station.

On the other hand, an EV owner may suffer from the drawbacks:

- (i) Finding charging station is challenging, especially during early stage of the adoption of EVs by the community and in the country side where charging infrastructure was insufficient.
- (ii) Charging an EV can take longer time (~45 minutes for rapid charging; 6~15 hours for normal charging) than refilling a gasoline car (~5 minutes).
- (iii) Limited driving range – In early stage of EV development, it has been quite problematic to travel long distance with a single charge. Hence, “range anxiety” is often the top concern. In recent years, thanks to better battery technology, more EVs have longer range of 500 km or more.

- (iv) High initial cost – EVs cost from at least USD3,000 (small & short range EVs) to USD80,000 or even more for higher-end models.

Overview of the EV Market

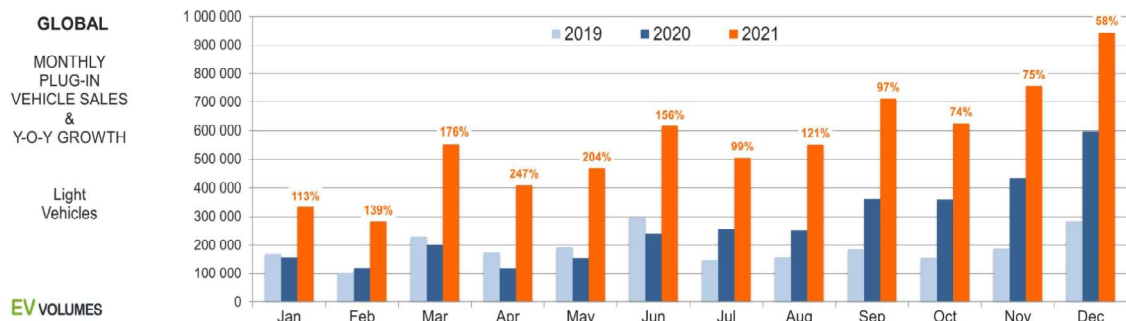
As decarbonisation gathers pace since the endorsement of the Paris Agreement on the Climate Change in late 2015, electrification is one of the hottest trends shaping the mobility and automotive industries. In 2021, all electric cars (BEVs) accounted for 6.8% of new vehicle registrations across 42 major economies – up from 3.9% in 2020. (Razvadauskas (2022))

According to Irle (2022), global EV sales, including passenger vehicles, light trucks and light commercial vehicles, reached 6.75 million units in 2021, 108% more than that in 2020. The global share of EVs (BEV & PHEV) in global light vehicle sales was 8.3%, compared to 4.2% in 2020. BEVs stood for 71% of total EV sales, PHEVs for 29%. The global auto market improved by only 4.7% over the crisis year of 2020. As in 2020, EVs again were resilient to set backs in auto demand and supply.

The remarkable growth rate of 108% yoy needs to be seen relative to the low base volume of 2020, being hurt by government regulations and the COVID-19 pandemic. Global EV sales in 2021 returned back to long-term trend.

Tesla led the OEM EV ranking with 936,000 deliveries, 436,000 more than that in 2020! Its Model-3 reached 501,000 units, becoming the second most sold mid-size cars after the Toyota Camry. The Volkswagen Group stayed on rank #2 and BYD climbed 4 positions to #3. BYD delivered nearly 600,000 units (without buses), over 400,000 more than in 2020.

For 2022, EV sales is expected to return to more normal growth, reaching around 9.5 million units higher, if remaining issues in supply and logistics are resolved. (Irle (2022))



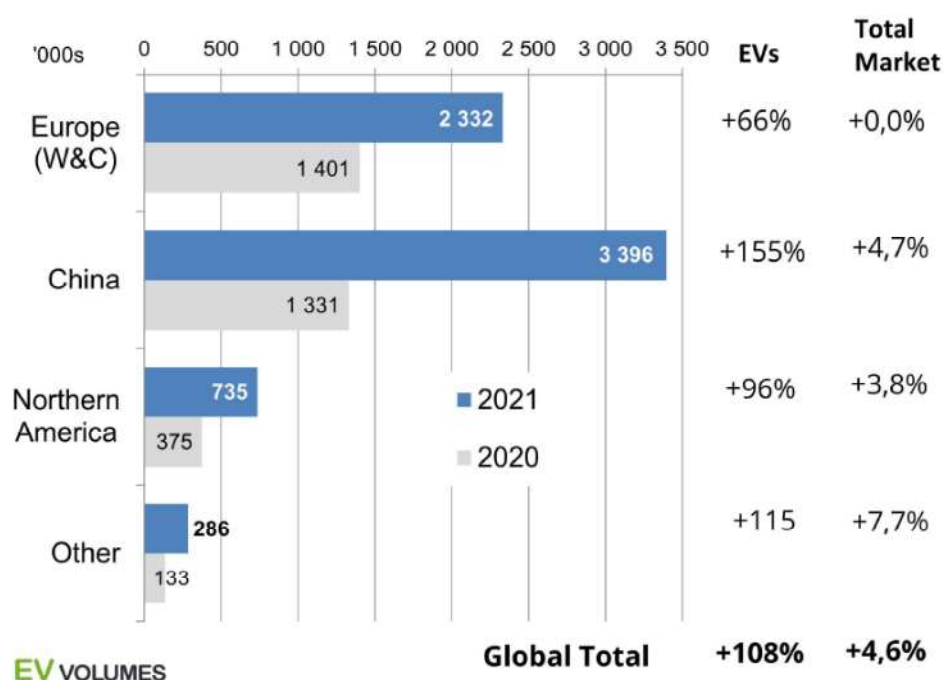
Source: EV Volumes

EV Market by Region

The figure [] below shows that the sales of New Energy Vehicles (“NEV”) in China emerged stronger than ever from the steel bath during 2019 and 2020. Sales jumped by more than 2 million units, more than the combined volume increase of all other regions combined. Growth in Europe stayed lower as it compares to the boom in 2020H2. North America sales benefited from the roll-out of attractive, new offerings by nearly all OEM and from better availability of Tesla Model 3 and Model Y.

Variations between the market regions are strong: In Europe the EV share increased from 10% to 17% in a persistently weak total market. In North America, EVs had 4.4% share vs 2.3% in 2020. In China, their share jumped from 5.5% to 13.3%. For the remaining markets, the combined EV share was 1.5%.

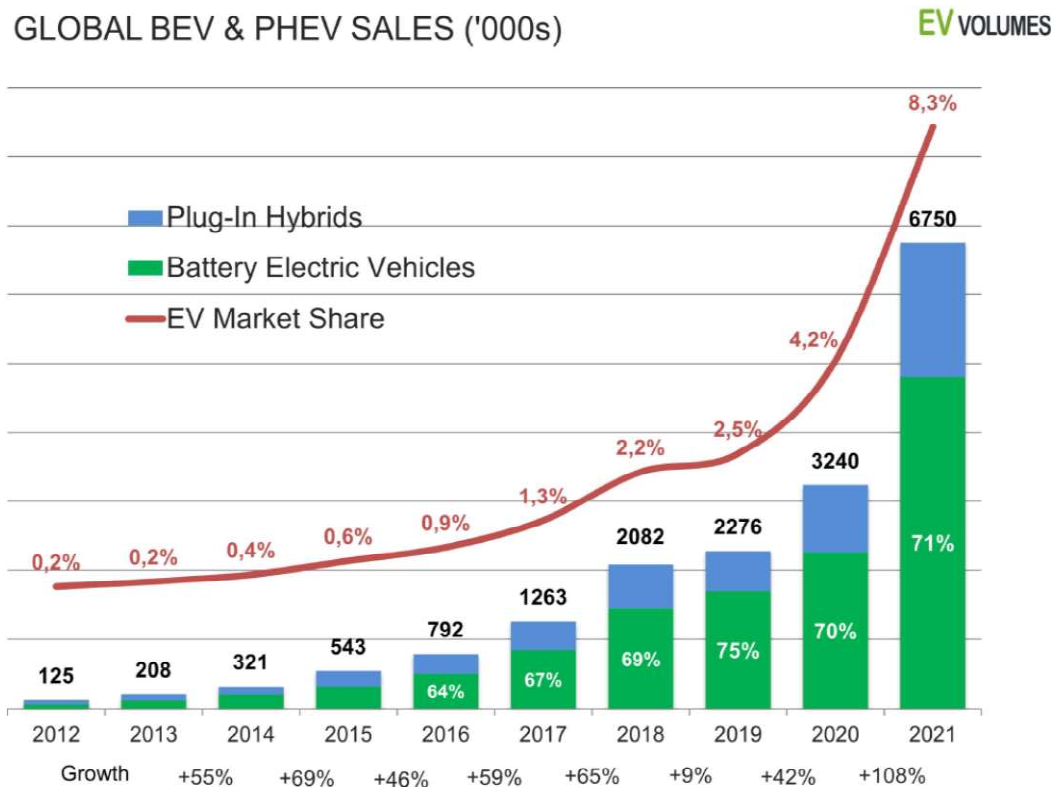
BEV+PHEV SALES AND % GROWTH



Source: EV Volumes

EV market by types of vehicle

BEVs increased by 1% in the EV mix with most of the gains happening in the 2021H2. Their volume rose to 4.8 million units, PHEVs sold 1.94 million units and FCEVs 15,400 units.



Source: EV Volumes

EV market in Mainland China

Against the backdrop of the short supply of memory chips partly as a result of supply chain disruption arising from COVID-19 pandemic and also sharp price increase of lithium as a result of perennial global shortage of lithium, the Made-in-China (“MIC”) New Energy Vehicles (“NEV”) sales in the first two months of 2022 has risen to 65% of the world total market. In terms of all types of vehicles, the passenger cars output by China reached 32% of the world market share, a new high!

4.2 Government Policies

4.2.1 Chinese Government Policy

- (a) Policy objectives -- China first announced its policy to develop its electric cars and grow the industry as early as in 2009. (Keith Bradsher (2009)). The

determination of Chinese Government to promote its EV market and manufacturing capabilities was to solve the worrying air pollution problem, to catch up with the Western countries on EV technology and, in recent years, to achieve its carbon neutrality by 2060 (Meyers (2020)).

- (b) Support policies -- To promote adoption of EVs, the Chinese Government has played a massive role, including:
 - having invested at least USD60 bn to support the EV industry
 - New energy vehicle (“NEV”) buyer subsidies (equivalent to USD9,800 per head maximum) of a cumulative total of CNY300 bn (USD47 bn) since 2009. (Jacobs (2022))
 - pushing an ambitious plan to phase out conventional gasoline-powered cars for transition to all-electric or hybrid cars by 2035 (Shunsuke Tabeta (27 Oct 2020)).
- (c) EV infrastructure and EV companies – Chinese government provided support to battery producers at the supply chain to reduce production cost of batteries which represents the bulk of the cost of the EVs. Michael Dunne observed that battery production around the world is concentrated in Northeast Asia: Japan, Korea and China. Together, they account for nearly 95% of total battery production for vehicles. Within the 95%, China has more than 60% at this point and is clearly the leader in terms of battery production capabilities.
- (d) Standardization of charging sockets – China has standardised its charging socket for all EVs in any places in the Mainland China.
- (e) Effect of the Chinese Government subsidies - The sales of NEVs rose from 500 units in 2009 to 1.2 mn in 2019. In December 2021, the China Association of Automobile Manufacturers estimated that NEV sales in China would grow by 47% to 5 million in 2022. According to Jacobs (2022), the Chinese government has set a target for NEVs to make up 20% of sales by 2025.

4.2.2 US Government Policy

- (a) US federal, state and local governments have established various policies, incentives and financial mechanisms to reduce the cost of solar energy and to accelerate the adoption of solar energy. These incentives include tax credits, cash grants, tax abatements and rebates. For instance, Section 48 and 25D of the US

Internal Revenue Code currently provide a tax credit of 26% of qualified commercial or residential expenditures for solar energy systems, which may be claimed by Tesla's customers for systems they purchase, or by Tesla Inc. for arrangements where Tesla own the systems. These tax credits are primarily for the direct benefits of Tesla's customers and are currently scheduled to decline and/or expire in 2023 and beyond. (Annual Report 2021, page 10)

- (b) Model 3 buyers will qualify for a USD7,500 federal tax credit, subject to 200,000-car maximum per manufacturer to receive the full IRS credit. Separately, California also offers rebates of USD5,000 for electric cars that will further improve Model 3 affordability. (Ohnsman, 2017),
- (c) According to Reuters (23 Feb 2021), President Biden says that the USA and Canada to work towards achieving net zero emissions by 2050.

4.3 Strategies employed by the competitors

4.3.1 Nio' strategy

4.3.2 Volkswagen's strategy

4.4 Government's support

4.4.1 China's incentives for the production site -- Under the terms of the agreement with Shanghai Government for land use rights at Gigafactory Shanghai, Tesla is required to meet a cumulative capital expenditure target and an annual tax revenue target starting at the end of 2023. Incidentally, the Shanghai Government has granted to Tesla's Gigafactory Shanghai subsidiary certain incentives to be used in connection with eligible capital investments at Gigafactory Shanghai. These incentives offset the related costs of Tesla's facilities in its consolidated financial statements. (Tesla Inc. Annual Report 2021 on Form 10-K, page 9)

4.4.2 Automotive Regulatory Credits

Tesla earns tradable credits in the operation of its business under various regulations related to zero-emission vehicles ("ZEVs"), greenhouse gas, fuel economy and clean fuel. Tesla sells these credits to other regulated entities who can use the credits to comply with emission standards and other regulatory requirements. (Annual Report 2021, page 10)

4.5 Social environment

Environmental, Social and Governance ("ESG")

The global atmosphere has been showing more acceptance of adopting ESG principles in the corporate operational decisions and household consumption behaviours.

Tesla has expressed in its 2021 annual report that “the very purpose of Tesla’s existence is to accelerate the world’s transition to sustainable energy”. The company believes the world cannot reduce carbon emissions without addressing both energy generation and consumption. Tesla is designing and manufacturing a complete energy and transportation ecosystem to achieve this goal, including building more efficient and sustainable new factory, reducing waste, water usage and carbon footprint of its supply chain.

4.6 Political environment

4.6.1 In 2010s, the air pollution problem went from being a major health hazard to being a political issue. The “red alert” for smog in certain cities has made Chinese government worry about, as such red alert led to cars off the road, closure of schools/offices/factories/power generation plants. This was just huge social and economic cost, but also political issue (Iskryan (2016)).

4.6.2 Tesla announced on 10 July 2018 that it had signed an agreement to open its first overseas factory in Shanghai, when the trade war between the U.S. and China continued to escalate. Targeting to serve the Chinese market, Tesla started working with the Shanghai Government in 2017 on the idea of establishing a factory in the region. The Gigafactory 3 would be built to manufacture electric vehicles with a capacity of 500,000 vehicles a year. This would be a big jump in the production capability, compared to the output of less than 200,000 vehicles in 2018 by Tesla’s factory in California.

Before this announcement, Tesla had hiked prices of its vehicles in China by about 20% in response to growing trade tensions. China lifted its import duties on US-made vehicles to 40 percent in early July 2018, in the wake of tariffs imposed by President Trump’s administration. The basic Model S was priced at USD128,779 in China, which was some 70 percent higher than in the U.S. at USD74,500! (Lemon (2018))

The smooth opening of the Gigafactory in Shanghai reflected the blessings from both the US and Chinese Governments.

4.7 Legal and Regulatory environment

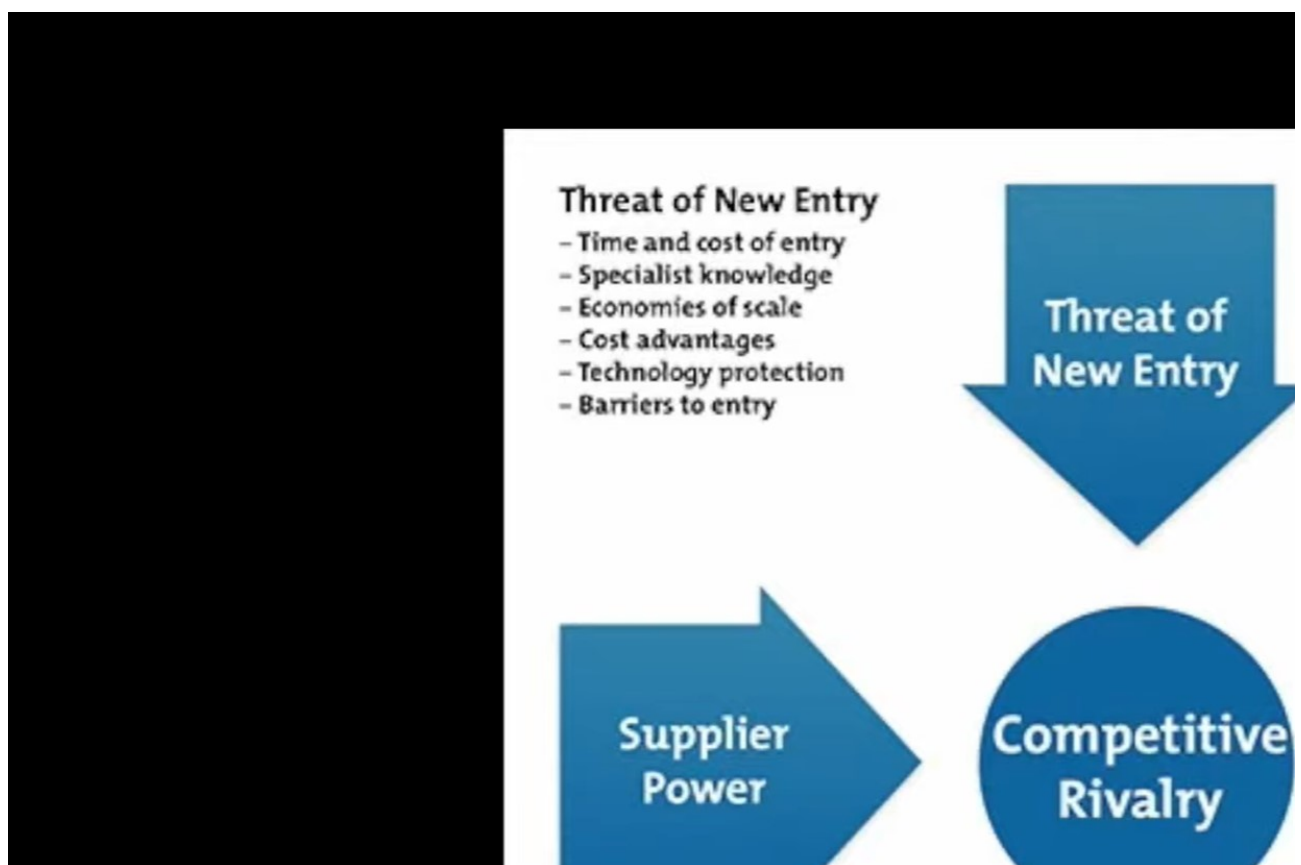
Tesla's vehicles are subject to federal and state regulations on vehicle safety standards in the U.S., the European Union and all applicable markets that it sells vehicles. There may be new regulations/guidelines stipulating on self-driving vehicles or self-driving equipment, and also on energy storage system and related incentives and policies.

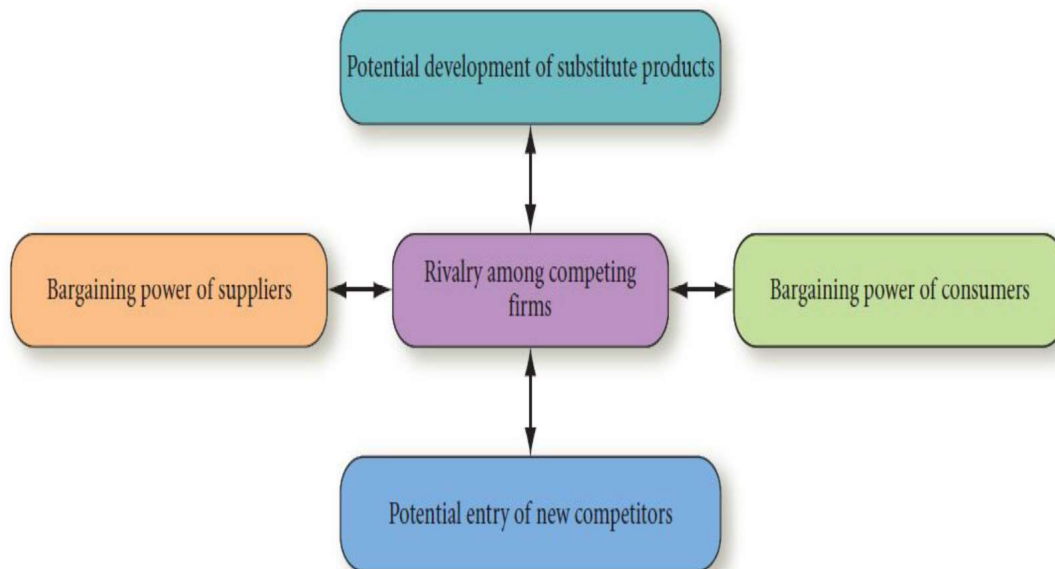
4.8 Technological factors

Tesla has a good grasp of advanced technology in battery and in the design of the EVs.

4.9 Economics

5. Michael Porter's Five Forces Analysis





5.1 The threat of existing competitors

Tesla considers the worldwide automotive market highly competitive and will become even more competitive going forward.

5.2 The threat of new entrants

Porsche CEO Oliver Blume recently revealed that the automaker delivered just over 300,000 vehicles globally in 2021, and 41,296 of them were the all-electric Taycan. Following this early success, Porsche has updated its goal to electrify 80% of all vehicles by 2030. In 2025, half of all new Porsche sales are expected to come from the sale of electric vehicles.

5.3 Threat of substitutes

- (a) Solid-state battery
- (b) Lithium Sulphur battery

5.4 Bargaining power of suppliers

Tesla has been said to have a high degree of vertical integration, estimated in 2016 by a Goldman Sachs analyst at 80%, which is rare in the automotive industry. Typically automakers outsource 80% of components to suppliers and focus on engine manufacturing and final assembly. Tesla produces vehicle components in-house, such as batteries, motors and software, as well as building proprietary stations where customers can charge their vehicles. In that sense, Tesla is not much subject to the suppliers' bargaining power and is

able to adopt low-cost production strategy, with which it can expand its business into a broader market by offering standard technology items.

5.5 Bargaining power of buyers

Buyers enjoy rather good incentives from the government with the value of having a premium product from Tesla. They tend to be satisfied with it without bargaining for more.

6. SWOT Analysis of Tesla

6.1 Tesla's Strengths

6.1.1 Elon Musk

Elon Musk, the co-founder and CEO, is really visionary. He wrote in his blog "The Secret Tesla Motors Master Plan (just between you and me)" in August 2006, the strategy in product launch:

- 1) "The initial product is a high performance electric sports car called the Tesla Roadster" to change the long-held misconception of people regarding the power and travelling range of EVs as compared with gasoline-powered cars.
- 2) Tesla's long term plan is to build a wide range of models, including affordable priced family cars, which are to expedite the move from a hydrocarbon economy towards a solar electric economy.
- 3) The strategy of Tesla is to enter at the high end of the market, where customers are prepared to pay a premium, and then drive down market as fast as possible to high unit volume and lower prices with each successive model.
- 4) The second model will be a sporty four door family car (Model S) at roughly half the USD89,000 price point of the Tesla Roadster.
- 5) The third model will be even more affordable. In keeping with a fast growing technology company, all free cash flow is plowed back into R&D to drive down the costs and bring the follow-on products to market as fast as possible.
- 6) Buyers of Tesla Roadster are actually helping pay for development of the low cost family car.

6.1.2 High quality, high performance with competitive price

Tesla believes that its vehicles compete in the market both based on its traditional segment classification and on their propulsion technology. Tesla's Model S and Model X, for instance, compete primarily with premium sedans and premium SUVs whereas Model 3 and Model Y compete with small to medium-sized sedans and compact SUVs, which are extremely competitive markets.

Competing products typically include internal combustion vehicles from more established automobile manufacturers. In recent years, many major automobile producers have electric vehicles available today in major markets including the US, China and Europe.

There is also an increasing competition for Tesla's vehicle offerings as a platform for delivering self-driving technologies, charging solutions and other features and services. Tesla will be offering its products such as Autopilot, FSD, and neural capabilities. Supercharger network and infotainment offerings to compete in this developing market. (Annual Report 2021, page 12)

Tesla has earned the reputation of having “superior technology, futuristic design, and Mars-loving-CEO, all combined to solidify its position at the top of the EV hierarchy”. (Ronald (2021)

The production of its first model, the Tesla Roadster, the first electric sports car, was stopped in 2012 after 4 years when Tesla shifted production to the Model S. Since then, Tesla Motors offers just this type of vehicle which was later joined by the new SUV, the Model X by the end of 2015, In 2017, a smaller and more affordable (base price of USD35,000) version (half price) of the flagship Model S, the Model 3 was introduced. Hence, it can be seen that Tesla is sticking to its strategy planned in 15 years ago: Entering at the high end of the market (high quality, high performance electric sports car) where customers are prepared to pay a premium, and then drive down market as fast as possible in order to higher unit volume and lower prices with each successive model. (Musk, 2006)

Musk commented in 2017 that Tesla's Model 3 would be a standout in its category with better acceleration, technology and looks than anything it competed with. Ohnsman (2017) thought that Model 3 was a gamechanger for EVs, as it “finally compels large number of motorists to forsake petroleum-powered cars for quiet, high-powered emission-free driving.

Who Is Winning The Global EV Race?

U.S. electric vehicle registrations (2020)



6.1.4 Vehicle software update through-the-air

The software of Tesla cars is regularly updated over-the-air upon release of new versions. Functionalities and control features of the vehicles are kept updated and improved after purchase. The car maker also provides the option to unlock features in the car through over-the-air software upgrades by the car owner. These include basic Autopilot, Full Self Driving, acceleration boost (Model 3), and rear-heated seats (Model 3).

6.2 Weaknesses

6.2.1 Huge order backlog – Kadar (2017) revealed that Tesla suffered in 2017 from a huge order backlog of 50,000 for its most affordable electric vehicle on the market Model 3, which competed with fuel-efficient cars like the Hyundai Ioniq EV, Chevrolet Volt, BMW i3 and Nissan Leaf. The delivery of the Model 3 EV were expected to be ready within the next 12-18 months, simply because of its supply chain that had “about 30 percent of its components coming from abroad”. Paul Page (2017) of the Wall Street Journal explained on 31 July 2017 that Tesla would encounter a “race to get its supply chain in gear before competitors with long-established assembly lines draw away the buyers interested in EVs”. Tesla heavily sourced from all around the world, the parts for its Model X and S, from Italy, Switzerland, Spain, Germany, Japan and China. The lesson learnt from this problematic rollout, plagued by delays and production problems, was to diversify the companies’ sources of supply and to

have backward integration of the suppliers to the extent possible, for ensuring stable supply of essential components and parts.

6.2.2 Product Recalls –

- (a) On 20 April 2017, Tesla issued a worldwide recall of 53,000 (~70%) of the 76,000 vehicles it sold in 2016 due to faulty parking brakes.
- (b) On 29 March 2018, Tesla issued a worldwide recall of 123,000 Model S cars built before April 2016 due to corrosion-susceptible power steering bolts.
- (c) In October 2020, Tesla initiated a recall of nearly 50,000 Model X and Y vehicles throughout China for suspension issues. In November 2020, the NHTSA announced it had opened its own investigation into 115,000 Tesla car regarding “front suspension safety issues”, citing specifically 2015-2017 Model S and 2016-2017 Model X years.
- (d) In December 2021, 356,309 vehicles of 2017-2020 Model 3 were recalled because of the possibility of damage to the rear view camera wiring harness caused by the trunk operation.

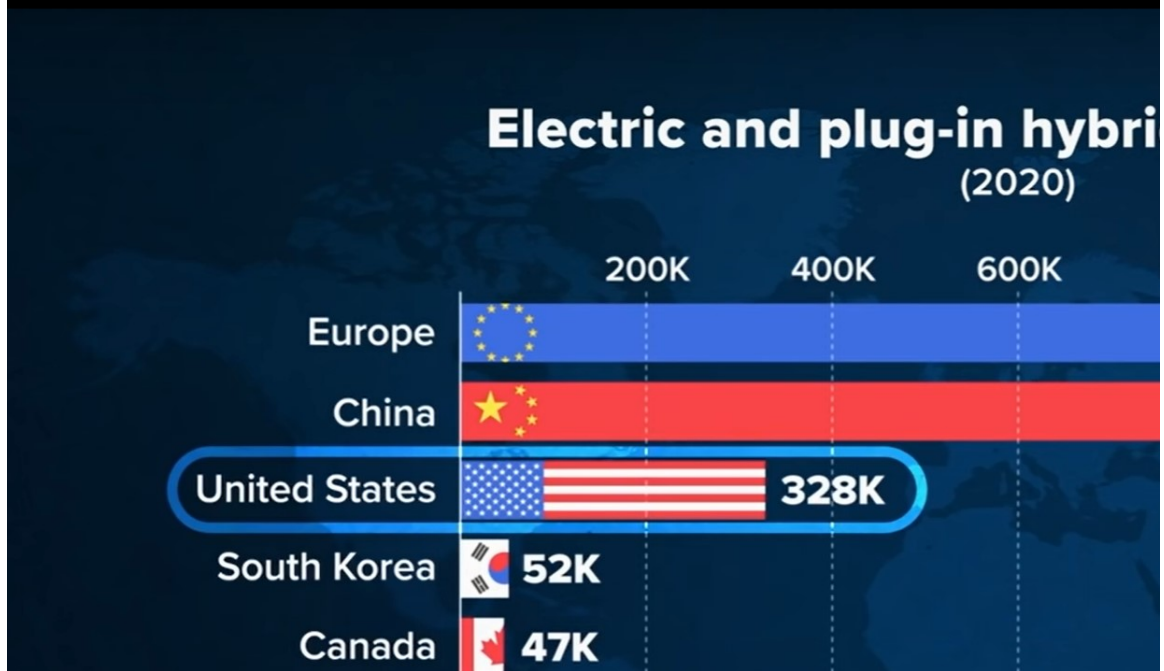
6.3 Opportunities

(a) The global electric vehicle market is heating up and China wants to dominate. The country has invested at least USD60 bn to support the EV industry and it is pushing an ambitious plan to transition to all-electric or hybrid cars by 2035. Elon Musk understands that China wanted to fortify its stance as the strongest EV industry in the world with Tesla and its suppliers operating right there and that the incentives may be in place for Tesla to take advantage of.

While other foreign car makers were all required to set up joint venture with the Chinese auto makers, Tesla was able to get a unique deal from China: Tesla can own its factory in China and operate without a joint venture with a local Chinese partner.

Indeed, Tesla was cutting prices in China of its Model 3 EV a couple of times in 2020 (Laura He, 1 May 2020), including the biggest cut of 8% in early October 2020 so as to make it qualified for the government subsidies (Reuters, 1 Oct 2020). As a consequence, the orders for Model 3 EV was boosted from 12,000 – 13,000 in September 2020 sharply to 31,000 in October 2020.

Who Is Winning The Global EV Race?



- (b) Prior to Tesla's entry to China, over 777,000 NEVs were sold in China, a 53 percent jump from 2016! China accounted for two-thirds of the global total sales of EVs (Tycangco (2018)), which Tesla considered it not a market to miss for its global expansion.
- (c) Recent rally in crude oil prices – Due to military conflicts in Ukraine and other reasons, crude oil and natural gas prices have been surging since March 2022, reaching the level of around USD100 per barrel for the crude oil. The rally in crude oil prices leads the intending car buyers to go for new energy vehicles which are more economically to run using power grid or solar energy.

6.4 Threat

6.4.1 Continuing COVID-19 pandemic

The potential impacts of COVID-19 pandemic on Tesla's business, supply chain constraints, strategy, competition, future operations and production capacity are considered substantial, which would also affect the sales and pricing of its products, customer services and hence the income and financial conditions of the company.

6.4.2 China tax commitment

Chinese Government announced in January 2022 that the level of national tax credit / subsidies to new energy vehicles would be reduced by 30% in 2022. At the end of 2022, the subsidies will be eliminated completely.

6.4.3 Entry of Rivalry

- (a) A closer look at the competitive business environment reveals that Tesla is no longer the undisputed champion of the global electric vehicle market. Indeed, Volkswagen Group, with its brands like Audi and Porsche, sold more electric vehicles than Tesla in 2020Q4. (Ronald (2021)). Nowadays, all of the following manufacturers (and the list is growing), in addition to Tesla, have their own series of electric cars:

- BAIC
- BMW
- Volkswagen
- Chevrolet
- Daimler (Mercedes, Smart)
- Ford
- BYD
- Hyundai
- Mitsubishi
- Renault-Nissan
- Toyota
- Kia
- Xpeng
- Nio
- General Motors

Indeed, General Motors announced in January 2021 its plans to exclusively offer electric vehicles by 2035, ending production of its cars, trucks and SUV with diesel- and gasoline-powered engines, so as to be carbon neutral by 2040 in its global products and operations. (Wayland (2021)). Similarly, Porsche has also updated its goal to electrify 80% of all vehicles by 2030. With more heavyweight auto makers joining the EV battlefield, Tesla would obviously feel the pinch!

(b) Chinese Government Policy of further open up the automotive industry

6.4.4 Cyber security risk

In response to the Chinese military banning Tesla cars from entering military housing complexes, Elon Musk stated during the China Development Forum in March 2021 that the company would stop producing cars in China if cars were being used to spy. (Liu (2021))

6.4.5 The development of battery technology and supply of the raw materials

(a) Long-term demand and supply of Lithium ion battery

During 2020 – 2021, surging EV demand has seen lithium prices skyrocket by about 550 percent in a year: by the beginning of March 2022, the lithium carbonate price had passed USD75,000 per metric ton and lithium hydroxide prices had exceeded USD65,000 per metric ton, which was about 5 - to 5.2x of the five-year average of about USD14,500 per metric ton!!

Lithium demand factors

Over the next decade, McKinsey forecasts “continued growth of Li-ion batteries at an annual compound rate of about 30%. By 2030, EVs, along with energy-storage systems, e-bikes, electrification of tools, and other battery-intensive applications, could account for 4,000 to 4,500 gigawatt-hours of Li-ion demand”. Not long ago, in 2015, less than 30 percent of lithium demand was for batteries. By 2030, batteries are expected to account for 95 percent of lithium demand, and the total needs will grow annually by 25 to 26 percent to reach 3.3 mn to 3.8 mn metric tons LCE depending on the scenarios.

Li-ion batteries can be recycled, recovering up to 80 percent of the lithium contained in end-of-life batteries. By 2030, such secondary supply is expected to account for slightly more than 6 percent of total lithium production.

Although there is a queue of developed technologies for substituting lithium for energy storage purposes, currently there is no substitute for lithium to meet the demands of the mobility sector. Given the foregoing, there is little risk of lithium demand decreasing by 2030.

(b) Rise of solid state battery

Toyota Motors announced the development of solid state battery for its EVs, Model Bz4X, which are claimed to enjoy the following advantages:

- (i) Fast charging -- can fast charge in 15 minutes through 400 consecutive cycles, replenishing from 10% to 80% capacity while still retaining over 80% of the initial energy.
- (ii) Long driving range for a single charge –300 miles.
- (iii) Light weight
- (iv) Smaller size than lithium ion battery pack
- (v) Long life
- (vi) With the solid state battery pack, it moves on step closer to lower EV charge times, while growing EV adoption.

Gill Pratt, the chief technology officer of Toyota, admitted that “Solid-state batteries are, at the moment, more expensive to produce.”

7. Strategies generation

7.1 SWOT Matrix for Tesla

- 7.1.1 Corporate image and product differentiation -- After its launch of the EV sports car, Roadster in 2008 and subsequent its Model S, Tesla has developed its corporate image of producing environmental-friendly luxury cars capable of travelling a reasonable range of more than 320 km per charge, with a host of safety and tech-savvy features, such as high-end stereo systems, digitised dashboards that can change colour according to your mood and complete connectivity to the internet.
- 7.1.2 The Model S luxury sedan won several automotive awards during 2012 and 2013, including the 2013 Motor Trend Car of the Year. In September 2013, the strong sales in Norway made it the first electric car ever to top the monthly sales ranking of a country. The Model S was also the best-selling plug-in electric car worldwide for the years 2015 and 2016.
- 7.1.3 The launch of the Model 3, Tesla’s high-performance EV with affordable price, in March 2016 attracted much attention. Within only 2 days, Tesla had 232,000 reservations of Model 3 with deposit, breaking previous record for advance deposits on a car of 80,000 received by Citroen DS in 1955!
- 7.1.4 The Model 3 was the world’s best selling plug-in electric car for three years (2018 to 2020). The Model 3 was chosen as one of the Top 10 Tech Cars by the IEEE in 2018.
- 7.1.5 In 2020, the Model 3 was the best-selling plug-in car in China (137,459) (SDchina.com, 5 Feb 2021) and the U.S. (95,135). (Moore (2021))

7.1.6 In October 2021, Hertz car rental ordered 100,000 full-price Model 3 cars for its rental fleet, reflecting the confidence of the commercial fleet on Tesla's cars.

7.1.7 In January 2021, the Model 3 Standard Range Plus was named Large Electric Car of the Year by 'What Car?' Magazine, being awarded five stars out of five.

7.2 Strategic Position and Action Evaluation ("SPACE") Matrix

7.2.1 Distribution of products / services

To begin with, Tesla has adopted a policy of marketing and sales of its products through its own network or through its corporate website, without using any third-party dealers or service providers. Hence, there is no need for Tesla in commissioning any forward integration strategy.

7.2.2 Sourcing and supply of raw materials or components

(1) Tesla has indeed implemented a number of backward integration transactions by seeking the ownership or increasing its control of a number of firms which provide supplies to

(a) Solar panels/photovoltaic systems – through acquiring and privatising SolarCity in 2016, Tesla has transformed it to Tesla Energy, which is one of the largest global suppliers of battery energy storage systems, with 3.99 GWh installed in 2021. The products from Tesla Energy include solar panels, the Tesla Solar Roof, the Solar Inverter, Powerwall, the Powerpack and Megapack, and a software to allow customers to monitor and control their systems.

(b) Supercharging stations – Tesla started constructing a network of 480-volt fast-charging Supercharger stations in 2012. As of November 2020, Tesla operates over 20,000 Superchargers in over 2,100 stations worldwide. The Supercharger is a proprietary direct current technology that provides up to 250 kW of power. All Tesla cars except the first generation Roadster come standard with hardware to charge at Superchargers. The navigation software in Tesla vehicles can recommend the fastest route for long-distance travel, incorporating charging stops.

- (c) Automated manufacturing equipment – Grohmann Engineering in January 2017, which facilitated launching of Tesla Advance Automation, Germany.
 - (d) Enhanced abilities in battery technology - Maxwell Technologies and SilLion.
- (2) To ensure its supply of lithium for its production of battery packs, Tesla signed a sales agreement with Piedmont Lithium in September 2020 to buy high-purity lithium ore for up to ten years, specifically to supply “spodumene concentrate from Piedmont’s North Carolina mineral deposit”.
- (3) Panasonic cooperates with Tesla in producing cylindrical 2170 batteries at Giga Nevada, where it has the capacity to manufacture 39 GWh per year of batteries. Tesla’s batteries used in Gigafactory Shanghai are supplied by Panasonic and Contemporary Amperex Technology (CATL), and are the more traditional prismatic (rectangular) cells used by other automakers.

7.2.3 Seeking ownership or increasing control over competitors

7.2.4 Market penetration and development

In order to penetrate the potential biggest automotive market in the world, Tesla has co-operated with the Shanghai government to build a Gigafactory in Shanghai, with a view to selling its products (Model 3 and Model Y) manufactured onshore in China. This would have the following benefits:

(a) To China:

- (i) Alleviating the air pollution problem
- (ii) Import substitution
- (iii) Increase employment in China
- (iv) Increase tax revenues for the Chinese government
- (v) Technological transfer to China
- (vi) Assisting in creating a competitive EV market in China and for encouraging export of quality products of EVs to foreign countries.

(b) To Tesla Motors Inc.

- (i) Gaining access to the burgeoning automotive market in China, being a part of Tesla’s global diversification strategy.

- (ii) Benefiting from lower production costs in China, relating to labour, land, capital and raw materials/semi-produced goods/components;

(iii)

This market penetration strategy is feasible for Tesla against the backdrop:

- (i) The current EV market in China is not saturated. Indeed, The Chinese government targeted electric vehicles to account for 10 percent of total vehicle sales in the country by 2020, and 20 percent by 2025. This is equivalent to about 5.8 million in annual sales of NEVs, which would be 640 percent increase from 2017 total.
- (ii) The usage rate of present customers could be increased significantly.
- (iii) There is a niche for introducing green cars to China that can help alleviate the perennial problems of choking air pollution, serious carbon emission level which causes climate change due to the global warming effect.
- (iv) With a huge potential market, there is a prospect of enjoying increased economies of scale, leading to increased level of competitive advantages.
- (v)

7.2.5 In July 2018, Tesla signed an agreement with Chinese authorities to build a factory in Shanghai, China, which was Tesla's first Gigafactory outside of the United States. The factory building was finished in August 2019, and the initial Tesla Model 3s were in production from Giga Shanghai in October 2019. It took only 13 months to complete the construction and less than 3 months to ramp up for production!

7.2.6 Tesla enjoyed special treatment and strong government support in China, including tax breaks, cheap financing, and assistance in building its Gigafactory Shanghai at breakneck speeds. Musk has praised China's way of doing things, a controversial stance due to deteriorating US-Chinese relations, China's ongoing persecution of Uyghurs, and alleged human rights abuses in Hong Kong. It is however not uncommon, acclaimed businessmen such as Berkshire Hathaway's Charlie Munger, and Volkswagen CEO Herbert Diess have also lauded China's methods.

7.2.7 In 2020, China accounted for 21% of Tesla vehicle sales revenue, and was the second largest market for Tesla after the US, which account for 48% of its sales.

7.3 Strategy options

Based upon Michael Porter's Five Generic Strategies framework, it can be observed that Tesla Inc. has adopted the Type 3 strategy (Differentiation) for its electric vehicles and related energy generation and storage products and services. Tesla aims at producing unique industry-wide and directs at consumers who are relatively price-insensitive.

The global EV market is regarded as a unique market which would be growing quite fast with the increasing concerns of the climate change and the growing awareness of the need of adopting environmental friendly products to save the earth.

Tesla Inc. has indeed been benefiting from the first mover advantages in going for the environmental-friendly electric vehicles and related products such as the roof-top solar panels. As a consequence, Tesla has benefited from being the first mover,

- (i) Securing access and commitments to rare resources – Xin Guobin, Vice-Minister of Industry and Information Technology spoke at the China EV 100 Forum on 27 March 2022 that China would accelerate the development of domestic resources, crack down on unfair competition activities, such as hoarding and speculation, and guide upstream and downstream enterprises in the industrial chain to strengthen cooperation which would help ease prices of key raw materials. The Chinese government will improve the supply capacity of key raw materials and parts, and the guaranteed capacity of charging and changing services. (China Daily, 28 March 2022)
- (ii) Gaining new knowledge of critical success factors and issues
- (iii) Gaining market share and position in the best location – Prior to Tesla's signing of the agreement with the Shanghai government in 2018, there were over 777,000 NEVs being sold in China in 2017, equivalent to about two-thirds of the global total sales of NEVs.
- (iv) Establishing and securing long-term relationships with customers, suppliers, distributors, and investors
- (v) Gaining customer loyalty and commitments

Type 1: Cost Leadership—Low Cost
 Type 2: Cost Leadership—Best Value
 Type 3: Differentiation
 Type 4: Focus—Low Cost
 Type 5: Focus—Best Value

		GENERIC STRATEGIES		
		Cost Leadership	Differentiation	Focus
SIZE OF MARKET	Large	Type 1 Type 2	Type 3	—
	Small	—	Type 3	Type 4 Type 5

Figure [**] Porter's Five Generic Strategies

8. Selection of strategy

8.1 Selection of strategy options

- (a) Localized procurement and production -- Tesla regarded its cost reduction efforts and additional localized procurement and manufacturing key to its vehicles' affordability and facilitated the company to competitively price its vehicles in China. This coincides with China's anti-pollution policy and the import substitution policy that also makes it possible for technological and knowledge transfers. In addition to ramping production in 2022, Tesla will also continue to generate demand and brand awareness by improving its vehicles' performance and functionality, including through products based on artificial intelligence such as Autopilot and FSD, and other software features. Thanks to the global awareness of the issues relating to climate change, Tesla expect to continue to benefit from a spike in demand in the automotive industry generally, as well as ongoing electrification of the automotive sector and increasing environmental awareness. (Tesla Inc. Annual Report 2021, page 32)

Indeed, the Gigafactory in Shanghai, Tesla's first plant outside the USA, has been operating at full speed such that it delivered 484,130 vehicles in 2021, exceeding its planned annual production capacity of 450,000 units by 7.6%! The total number of MIC delivered vehicles represents 51.7% of its global total of 936,000 units, showing the importance of Tesla production capability in China with respect to the global total. (Bobylov (2022))

- (b) Cyclical nature of vehicle business – Tesla operates in a cyclical industry that is sensitive to trade, environmental and political uncertainty, all of which may also be compounded by any future global impact from the COVID-19 pandemic.
- (c) Entry of additional competitors into the market and bringing the world closer to sustainable transportation, Tesla will need to continue to execute well to maintain its momentum.
- (d) Deliveries and customer infrastructure – Increasing the exports of vehicles manufactured at Gigafactory Shanghai has been effective in mitigating the strain on Tesla's deliveries in markets outside of the United States and it also benefits from situating additional factories closer to local markets.
- (e) Expansion of manufacturing operations globally – Tesla has also built its fourth Gigafactory in Germany to serve the operations and sales in Europe.
- (f) Increase and staff its delivery, servicing and charging infrastructure accordingly.
- (g) Maintaining its vehicle reliability – To address the issues arising from the product recalls, Tesla needs to explore ways to increasing the reliability of its vehicles.
- (h) Optimize its Supercharger locations to ensure cost effectiveness and customer satisfaction. (Annual Report 2021, page 12) .
- (i) Increasing the capability and efficiency of its servicing operations – to cope with increasing number of potential customers and also the services for the existing customers, Tesla needs to increase its capability and efficiency of its servicing operations by recruitment and training of additional staff in its local operations.

9. Conclusions

9.1 Conclusion

After more than a decade of running the EV business, Tesla has finally managed to have positive cashflow and profitability since 2020. It has had good global expansion strategy, particularly with its first location in Shanghai, China. Tesla has benefited from the strong partnership with Chinese government and related entities, namely: a speedy completion of the factory in Shanghai within 13 months and started operations in less than 1.5 years. It also

benefited from the strong growth of the EV market in Mainland China and elsewhere in other part of the world, thanks to the increasing global awareness of the climate change and the urgency of taking climate actions for decarbonisation of the earth.

9.2 Recommendation and Action Plan

9.2.1. In the wake of COVID-19 pandemic and the increasing competition going forward, Tesla needs to fundamentally rethink their product and service portfolios, reinventing their supply chains, pursuing large-scale organizational restructuring and digital transformation, and enhancing their corporate image.

9.2.2 To cater for the potential strong growth in the adoption of EV and also related energy storage system, Tesla may need to consider re-designing its organisation structure to fit the strategy:

- Expansion of volume
- Geographical dispersion – in the inner cities of the Mainland China, other parts of Asia such as India, with its growing middle-class
- vertical integration
- product diversification

9.2.3 With the company growing bigger and its corporate structure becoming more complex, Tesla may need to address the potential main consequences:

- increased bureaucracy: need to set up formal control systems and planning
- increased decentralisation: need to move to multidivisional structures

9.2.4 To address the potential risks arising from the disruption of supply chain, including temporary suspension of manufacturing facilities worldwide, port congestion and intermittent supplier shutdowns and delays

9.2.5 To address the risks related to changes in government laws and regulations, including reduction or elimination of government subsidies and other economic incentives such as tax credits, Tesla may consider setting up a team in its central office for monitoring the development.

9.2.6 To address the potential arising from its highly dependence on the services of Elon Musk, Technoking of Tesla and their CEO, Tesla may consider:

- (a) empowering a group of trusted experts deeper in the organization who can be redeployed full-time against the challenge at hand.
- (b) building an external network of advisers who can quickly be tapped to weigh in on business threats where in-house expertise doesn't exist. With this ready, it will reduce response time and lend credibility to the plans that are created. This group of experts should include a change management adviser.
- (c) delegating and empowering its middle and junior managers to expand their management capability.

9.2.7 To eliminate friction and delays, the group of internal and external experts will also need to quickly align on guiding principles and open a physical or virtual “war room” to drive collaboration.

9.2.8 To monitor closely and exercise reasonable financial control on the potential additional costs and risks arising from increased scrutiny and changing expectations from stakeholders with respect to the company's ESG practices.

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