

Business Report: Review of Tesla Inc.'s Corporate Strategy and Performance with Focus on its Business Operations in China

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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.

1.2 Tesla’s global strategy, particularly with reference to its presence 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.

1.3 Results of the strategic management review and the Strengths, Weaknesses, Opportunities and Threat (“SWOT”) analysis show that Tesla:.

- (1) has strong strategic management concepts with a clearly defined vision and mission;
- (2) has a clearly defined and actionable product development and launch strategy;
- (3) has made a right move to open its Gigafactory in China, benefiting from the access to the huge potential market, pro-business government policies incentives and lower production cost structure while achieving its vision and mission.
- (4) Strengths: superior technology in EVs (battery technology), futuristic design and software, unique marketing platform and positioning, improving financial conditions (strong sales, increasing cash flows, better profitability, most valuable car maker)
- (5) Weakness: experienced huge order backlog, a number of product recalls reflecting concerns on product quality, cyclicity of the automotive business
- (6) Opportunities: made a good deal with China;
- (7) Threats: Continuing COVID-19 pandemic, supply chain disruption, new entrants / new rivalry from conventional ICE car makers turning to EV makers; potential reduction of government incentives; escalating competition from start-ups in China

1.4 Strategy Evaluation & Recommendations

- (1) Growing awareness of environment protection, pro-business government policies to promote the EV development, premium quality of products/services selling at affordable prices and the support from patient and willing investors seem to be recipe for the success of Tesla in the first round of automotive industry transition from petrol-powered vehicles to electric vehicles.
- (2) Challenges Ahead: Cyclicity of vehicle business, more competition, more customers.
- (3) Recommendations: Rethink of product portfolio, Reinventing supply chains, further dispersion into inner cities of China and Asia, corporate restructuring to address increased bureaucracy and to promote decentralisation, setting up a central office to monitor changes in government policies/regulations/ESG practices.

2. Background

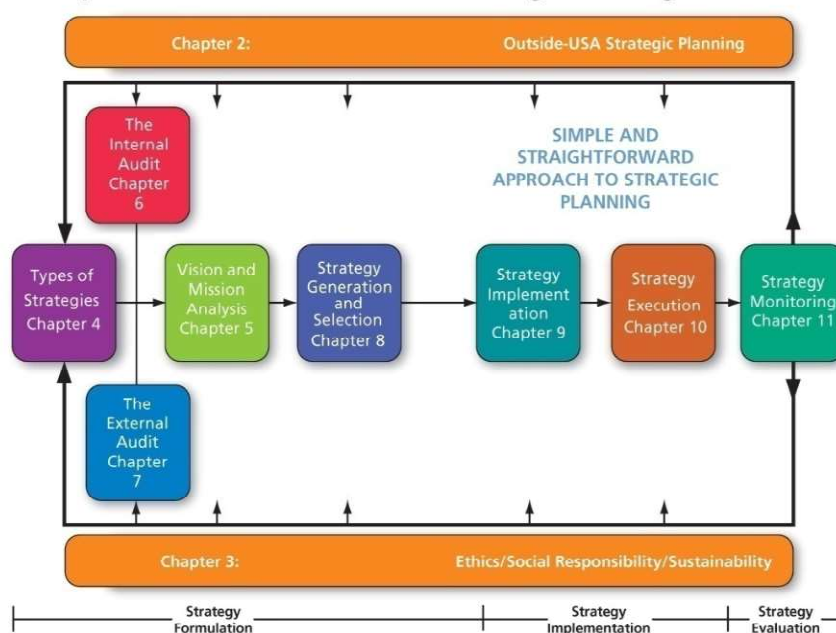
Tesla Inc. (“Tesla”) is a US-based multinational corporation (“MNC”) that designs, produces, sells and leases high-performance electric vehicles (“EV”), energy generation and storage systems and offers services related to these products. Tesla usually sells its products directly to customers, either 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.

Thanks to the global macroeconomic and the environmental, social and governance (“ESG”) considerations, EVs have been getting more popular and the global EV market is heating up. Tesla Inc. benefits much from this global trend and has become the leader in the EV market.

By adopting David & David’s Comprehensive Strategic Management Model (David & David (2014) (Exhibit 1), this report 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.

Exhibit 1: Comprehensive Model of the Strategic-Management Process

Comprehensive Model of the Strategic-Management Process



Source: David & David (2014)

3. Internal Strategic Management Audit

3.1 Tesla's Business Model and Strategies

This business report will focus on Tesla's management of its business model, planning, deployment, 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". 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

Tesla's corporate strategy is substantially inspired by Mr 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)

These clearly defined and easily understood vision and mission statements are instrumental for guiding the management and the employees in their day-to-day operations. Indeed, with the conclusion of the Paris Agreement on the Climate Change in late 2015, public awareness of the environmental protection has been growing rapidly. It provides a promising business environment for adopting green products such as EV to protect the environment.

3.3 Marketing Strategy

Adopting 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.

3.3.1 Products

Tesla operates two key business segments, namely (a) automotive and (b) energy generation and storage. Within the automotive segment, there have been mainly 5 different products which are all-electric vehicles. Musk wrote in his company blog in August 2006 about Tesla's Master Plan for its product development and launch strategy:

- 1) The initial product (Tesla Roadster) in 2008: This high-performance electric sports car was 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: 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) Tesla' strategy: 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 (Model S) in 2012: a sporty four-door family car at roughly half the USD89,000 price of Tesla Roadster.
- 5) The third model (Model X) in 2015: even more affordable. In keeping with a fast growing technology company, all free cash flows from earlier models (e.g. Tesla Roadster & Model S) are plowed back into research & development to drive down the costs and bring the follow-on products to market as fast as possible.
- 6) The fourth model (Model 3) in 2017: a smaller and more affordable version (half price) of the flagship Model S.

Tesla has been sticking to this product development strategy since 15 years ago and has proved it a success with strong business performance in the last couple of years.

3.3.2 Price

As reflected in Section 3.3.1 above, the pricing strategy of each vehicle model follows the philosophy of the Master Plan.

3.3.3 Place

This includes the places of production, product distribution and customer services. As of 31 December 2021, the status of each of Tesla's announced models in production and under development is as follows (Annual Report 2021, page 32):

Production Location	Vehicle Model(s)	Production Status
Fremont Factory	Model S / Model X	Active
	Model 3 / Model Y	Active
Gigafactory Shanghai	Model 3 / Model Y	Active
Gigafactory Berlin	Model Y	Equipment test
Gigafactory Texas	Model Y	Equipment test
	Cybertruck	In development
TBD	Tesla Semi	In development
TBD	Tesla Roadster	In development

Tesla has admitted that “Increasing the exports of vehicles manufactured at Gigafactory Shanghai has been effective in mitigating the strain on our deliveries in markets outside of the United States....”

There was an increase of 433,815 Model 3 and Model Y cash deliveries in 2021 over 2020 from production ramping at both Gigafactory Shanghai and the Fremont Factory at a slightly higher combined average selling price, whereas a decrease of 28,819 Model S and Model X cash deliveries (produced only at the Fremont Factory) was registered.

3.3.4 Promotion

Tesla has adopted a new technology-based approach to automobile marketing, unlike the traditional automobile marketing approach that favours mass marketing and mass production. Through its website, a potential customer can:

- (a) select the items: car model, paint colour, colour of the interior, wheels, assisted/enhanced/full automated driving, intended driving range, 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 outlets/galleries).

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. Media coverage and words of mouth about the company and the products are the primary drivers of its sales, without using traditional advertising and car dealers. This results in lower marketing expenses.

3.4 Tesla’s Financial Conditions

3.4.1 Most valuable car maker

Tesla, Inc. has emerged as the world’s most valuable car maker with market capitalization reaching USD 1 trillion in October 2021, being the sixth company surpassing this level in the American history.

3.4.2 Results of Operations:

As revealed from its Annual Report 2021, Tesla’s total revenues grew substantially by 28% in 2020 and 71% in 2021 respectively to USD53.8 bn for the FY2021, amidst strong automotive sales growth of 27% in 2020 and 79% in 2021 respectively! It achieved

comprehensive net income attributable to common stockholders of USD1,120 mn in 2020 and USD5,210 mn in 2021, being the first time Tesla reporting positive income since its inception in 2003.

The total cost of revenues grew by 21% in 2020 and 61% in 2021, less than the growth rates for the total revenues, indicating its effective and favourable cost control. Significant cost reduction for Model 3 and Model Y was due to localized procurement and manufacturing in China (Annual Report 2021, page 39). This resulted in improving total gross margin from 16.6% in 2019 to 21.0% in 2020 and further to 25.3% in 2021.

Results of Operations

Revenues

(Dollars in millions)	Year Ended December 31,			2021 vs. 2020 Change		2020 vs. 2019 Change	
	2021	2020	2019	\$	%	\$	%
Automotive sales	\$ 44,125	\$ 24,604	\$ 19,358	\$ 19,521	79 %	\$ 5,246	27 %
Automotive regulatory credits	1,465	1,580	594	(115)	-7 %	986	166 %
Automotive leasing	1,642	1,052	869	590	56 %	183	21 %
Total automotive revenues	47,232	27,236	20,821	19,996	73 %	6,415	31 %
Services and other	3,802	2,306	2,226	1,496	65 %	80	4 %
Total automotive & services and other segment revenue	51,034	29,542	23,047	21,492	73 %	6,495	28 %
Energy generation and storage segment revenue	2,789	1,994	1,531	795	40 %	463	30 %
Total revenues	\$ 53,823	\$ 31,536	\$ 24,578	\$ 22,287	71 %	\$ 6,958	28 %

Source: Tesla Inc. Annual Report 2021 (Form 10-K)

Cost of Revenues and Gross Margin

(Dollars in millions)	Year Ended December 31,			2021 vs. 2020 Change		2020 vs. 2019 Change	
	2021	2020	2019	\$	%	\$	%
Cost of revenues							
Automotive sales	\$ 32,415	\$ 19,696	\$ 15,939	\$ 12,719	65 %	\$ 3,757	24 %
Automotive leasing	978	563	459	415	74 %	104	23 %
Total automotive cost of revenues	33,393	20,259	16,398	13,134	65 %	3,861	24 %
Services and other	3,906	2,671	2,770	1,235	46 %	(99)	-4 %
Total automotive & services and other segment cost of revenues	37,299	22,930	19,168	14,369	63 %	3,762	20 %
Energy generation and storage segment	2,918	1,976	1,341	942	48 %	635	47 %
Total cost of revenues	\$ 40,217	\$ 24,906	\$ 20,509	\$ 15,311	61 %	\$ 4,397	21 %
Gross profit total automotive	\$ 13,839	\$ 6,977	\$ 4,423				
Gross margin total automotive	29.3 %	25.6 %	21.2 %				
Gross profit total automotive & services and other segment	\$ 13,735	\$ 6,612	\$ 3,879				
Gross margin total automotive & services and other segment	26.9 %	22.4 %	16.8 %				
Gross profit energy generation and storage segment	\$ (129)	\$ 18	\$ 190				
Gross margin energy generation and storage segment	-4.6 %	0.9 %	12.4 %				
Total gross profit	\$ 13,606	\$ 6,630	\$ 4,069				
Total gross margin	25.3 %	21.0 %	16.6 %				

Source: Tesla Inc. Annual Report 2021

Tesla, Inc.
Consolidated Statements of Comprehensive Income (Loss)
(in millions)

	Year Ended December 31,		
	2021	2020	2019
Net income (loss)	\$ 5,644	\$ 862	\$ (775)
Other comprehensive income (loss):			
Foreign currency translation adjustment	(308)	399	(28)
Unrealized net loss on marketable securities	(1)	—	—
Comprehensive income (loss)	<u>5,335</u>	<u>1,261</u>	<u>(803)</u>
Less: Comprehensive income attributable to noncontrolling interests and redeemable noncontrolling interests in subsidiaries	125	141	87
Comprehensive income (loss) attributable to common stockholders	<u>\$ 5,210</u>	<u>\$ 1,120</u>	<u>\$ (890)</u>

- 3.4.3 Debt positions – Tesla obtained a secured term loan facility of CNY 9.0 bn (or USD equivalent) in December 2019 and a unsecured revolving working capital facility up to CNY 4 bn (or USD equivalent) in May 2020 from banks in China, which were all paid off in 2021 with the strong cashflows from its business operations. These term loan and working capital facilities were very instrumental for Tesla during this critical period prior to its harvest phase starting from 2020. As of 31 December 2021, Tesla had USD286 mn of unused letters of credit outstanding.
- 3.4.4 Dividend policy – To facilitate future corporate growth, Tesla has never paid cash dividends and does not anticipate any cash dividends in the foreseeable future.
- 3.4.5 Segment reporting: Automotive segment accounts for about 94% of total revenues and nearly 100% of total gross profit. Energy generation and storage segment can be regarded as supplementary products/services to the automotive business.
- 3.4.6 Geographic reporting: The U.S. remains the single biggest market for Tesla although its share of total revenues has been trending down from 51.5% in 2019 to 44.5% in 2021, whereas China’s revenue contribution has been increasing sharply from 12.1% in 2019 to 25.7% in 2021. The substantial revenue contribution from China is supported by the long-lived assets in China that accounts for only 9.8% of the global total. This can be regarded as very efficient deployment of the assets in China.

Tesla, Inc.

Note 18 - Segment Reporting and Information about Geographic Areas

By revenues and gross profit by reportable segment (in mn):

				% of the total		
Year ended 31 Dec.	2021	2020	2019	2021	2020	2019
Automotive segment						
Revenues	51,034	29,542	23,047	94.8%	93.7%	93.8%
Gross Profit	13,735	6,612	3,879	100.9%	99.7%	95.3%
Energy generation & storage segment						
Revenues	2,789	1,994	1,531	5.2%	6.3%	6.2%
Gross Profit	(129)	18	190	-0.9%	0.3%	4.7%
Revenues - total	53,823	31,536	24,578			
Gross Profit - total	13,606	6,630	4,069			

Revenue by geographic area based on the sales location of Tesla's products				% of the total		
	2,021	2,020	2,019	2021	2020	2019
United States	23,973	15,207	12,653	44.5%	48.2%	51.5%
China	13,844	6,662	2,979	25.7%	21.1%	12.1%
Other	16,006	9,667	8,946	29.7%	30.7%	36.4%
Total	53,823	31,536	24,578	100.0%	100.0%	100.0%

Long-lived assets by geographic area (in USD mn)			% of the total	
As of 31 Dec.	2021	2020	2021	2020
United States	19,026	15,989	77.2%	85.4%
Germany	2,606	894	10.6%	4.8%
China	2,415	1,479	9.8%	7.9%
Other international	602	364	2.4%	1.9%
Total	24,649	18,726	100.0%	100.0%

3.4.7 Financial Ratio Analysis (Please refer to page 32 of the report)

- (1) **Profitability** –Tesla’s profitability has been improving sharply from 2019 to 2021, with Return on Capital Employed increasing from 12.2% in 2020 to 16.7% in 2021; Return on Equity jumping from 5.0% to 17.3% and Net Profit Margin from 2.3% to 10.3%.
- (2) **Activity ratios** – Net asset turnover increased from 0.83 in 2020 to 1.27 in 2021, indicating generation of more sale revenues per unit of total assets net of current liabilities. Both stock holding period and debt collection period were shortened, from 60.1 days to 52.2 days for stockholding and from 21.8 days to 13.0 days for debt collection.

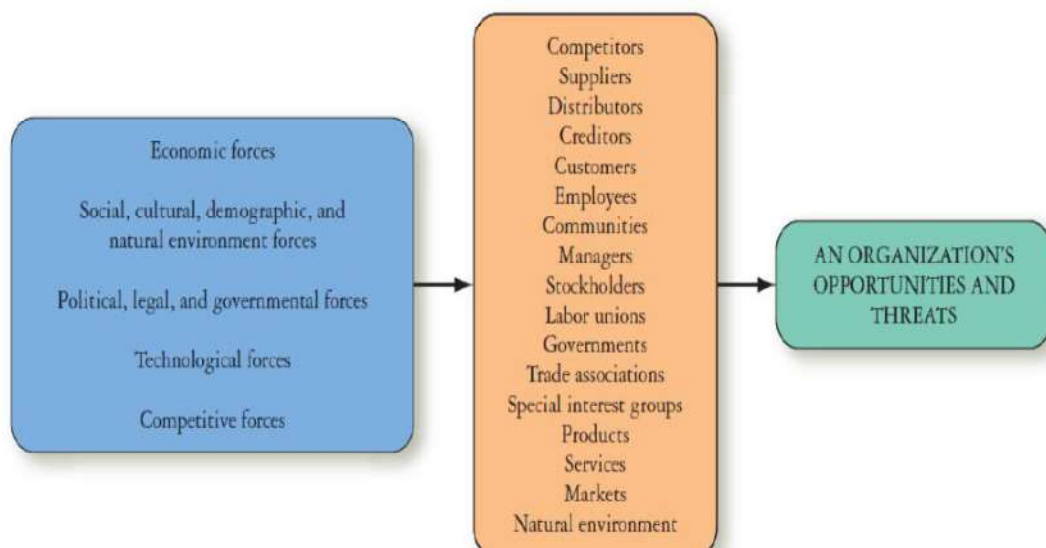
- (3) Liquidity -- The two liquidity ratios were decreasing, with current ratio from 1.88 in 2020 to 1.38 in 2021 and quick asset ratio from 1.59 in 2020 to 1.08 in 2021. This reflects the larger growth rate of 38% in the current liabilities than only 1.4% growth in the current assets. Cash level was reduced by USD1.8 bn probably for paying off part of the longer term debt / finance leases.
- (4) Capital gearing ratios – Gearing ratio improved from 0.42 in 2020 to 0.29 in 2021. Similarly, the debt to equity ratio also reduced from 0.73 in 2020 to 0.41 in 2021. This reflects the reduction of debts and increase in retained earnings. Indeed, the retained earnings improved by USD5,730 mn from an accumulated deficit of USD5,399 mn in 2020 to a surplus of USD331 mn in 2021.

3.4.8 Financial Review Conclusion: With strong growth in car sales, Tesla performed well during the period 2019 – 2021, with increasing cash flows, repayment of debts, registering positive net income since 2020. In 2021, the strong sales revenues and profitability also brought the cumulative retained earnings from deficit to surplus. It could easily raise needed long-term capital through debt and/or equity.

4. External Strategic Management Audit

This section will focus on the set of circumstances facing an entire industry within which Tesla operates. As illustrated in Figure 2 below, 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.

Exhibit 2: Relationships between key external forces and an organisation



4.1 Political environment

4.1.1 In 2010s, air pollution in China went from being a major health hazard to being a political issue. The “red alert” for smog in certain cities led to cars being off the road and closure of schools/ offices/factories/power plants. This also results in huge social and economic costs. (Iskryan (2016)).

4.1.2 Tesla signed an agreement in July 2018 to open its first overseas Gigafactory in Shanghai, amidst the escalating US-China trade tensions. Targeting the Chinese market and nearby regions, this factory would have a production capacity of ~450,000 vehicles a year, a big jump from less than 200,000 vehicles produced in 2018 by Tesla’s factory in California.

Before this announcement, Tesla had hiked prices of its vehicles selling to China by about 20 percent 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 Trump administration. The basic Model S was priced at USD128,779 in China, 70 percent higher than in the U.S. at USD74,500! (Lemon (2018))

However, the smooth opening of the Shanghai Gigafactory reflected the blessings from both the US and Chinese Governments.

4.1.3 Chinese Government Policies

(a) Policy objectives -- China first announced in 2009 its policy:

- to develop its electric cars and grow the industry (Keith Bradsher (2009));
- to solve the worrying air pollution problem;
- to catch up with the western countries on EV technology; and
- to help achieve its carbon neutrality by 2060. (Meyers (2020)).

(b) Support policies -- To promote adoption of EVs, Chinese Government has played a massive role, including:

- investing at least USD60 bn to support the EV industry;
- NEV buyer subsidies (~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 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 was concentrated in Japan, Korea and China. Together, they accounted for nearly 95% of total battery production for vehicles. Within the 95%, China has more than 60% and is clearly the leader in terms of battery production capabilities.
- (d) China has standardised its charging sockets for all EVs in any places in China.
- (e) Effect of the Chinese Government subsidies - The sales of NEVs rose from 500 units in 2009 to 1.2 mn in 2019 and expectedly to 5 mn in 2022.

4.1.4 China's incentives for Tesla in China -- Shanghai Government has granted to Tesla's Shanghai subsidiary:

- (a) Certain incentives in connection with eligible capital investments at Gigafactory Shanghai that offset the related costs of Tesla's facilities in its consolidated financial statements;
- (b) A beneficial corporate income tax rate of 15%, lower than the 25% statutory rate in China, for the period from 2019 through 2023.
(Annual Report 2021, page 9)

4.1.5 US Government Policies

- (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. (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 offers rebate of USD5,000 for EV that further improves Model 3 affordability. (Ohnsman, 2017)
- (c) President Biden said that the USA and Canada to work towards achieving net zero emissions by 2050. (Reuters, 23 Feb 2021)

4.2 Economic and Industry Environment

4.2.1 Overview of Electric Vehicles

(a) There are four types of EVs in the global market, namely:

- (i) Battery Electric Vehicle (“BEV”) -- also called all-electric vehicle.
- (ii) Hybrid Electric Vehicle (“HEV”) -- consists of a gasoline-powered internal combustion engine (“ICE”) and a battery that can be recharged.
- (iii) Plug-in Hybrid Electric Vehicle (“PHEV”) – including both ICE engine and electric motor that is powered by a rechargeable battery using an external charging cable.
- (iv) 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.

(b) EVs are becoming more popular as they would bring the following benefits:

- (i) No air pollution – as no exhaust gas will be generated.
- (ii) Low noise pollution -- 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, there is no carbon emission from the power generation. However, in case the electricity is from the power grid which uses fossil fuels, it would not be that environmental friendly.
- (iv) Money saving – electricity is significantly cheaper than gasoline/diesel.
- (v) Low maintenance needs – Without any ICE and related components, an EV will have less components for repair or replacement.
- (vi) More convenient – An EV may be recharged using a household socket at home, without going to the gasoline station.

(c) On the other hand, an EV owner may suffer from the following drawbacks:

- (i) Finding charging station is challenging, especially in the country side.
- (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 – quite problematic to travel long distance with a single charge. Hence, “range anxiety” is always the top concern.
- (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.

4.2.2 Overview of Global Electric Vehicles Market & Competitive Environment

As decarbonisation gathers pace since 2015, electrification is one of the key trends shaping the 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 reached 6.75 million units in 2021, 108% more than that in 2020, when the market was hurt by regulations and the COVID-19 pandemic. 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. The global auto market improved by only 4.7% in 2021 over the crisis year of 2020.

Tesla led the OEM EV ranking with 936,000 deliveries, 436,000 more than that in 2020! Its Model-3 reached 501,000 units. The Volkswagen Group stayed on rank #2 and BYD climbed 4 positions to #3, delivering nearly 600,000 units.

For 2022, EV sales are expected to resume normalcy, reaching around 9.5 million units higher, if supply and logistics issues are resolved. (Irle (2022))

Exhibit 3



Source: EV Volumes

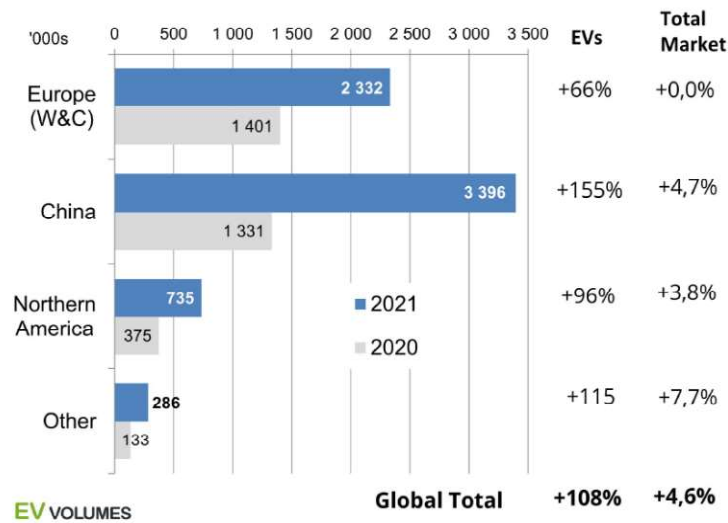
4.2.3 EV Market by Region

The Exhibit 4 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.

In Europe, the EV share increased from 10% to 17% in 2021 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%.

Exhibit 4

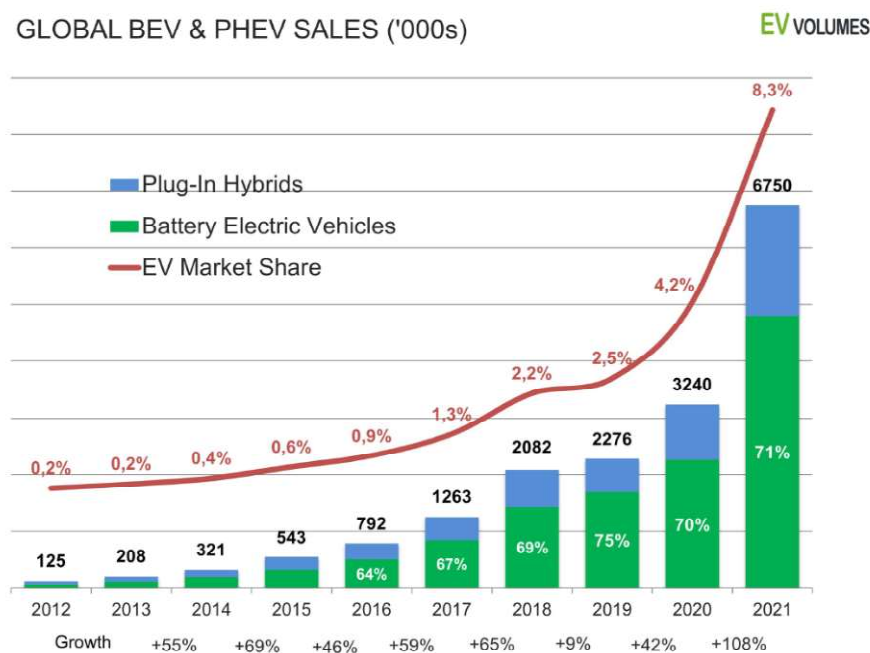
BEV+PHEV SALES AND % GROWTH



Source: EV Volumes

Exhibit 5

GLOBAL BEV & PHEV SALES ('000s)



Source: EV Volumes

4.2.4 EV market in Mainland China

According to the Chinese Government, NEVs are expected to account for 20 percent of new car sales in 2025, rising to 40 percent in 2030 and 50 percent in 2035 (Li Fusheng, 16 Aug 2021).

Notwithstanding the short supply of memory chips, supply chain disruption arising from COVID-19 pandemic and the sharp price increase of lithium, the Made-in-China (“MIC”) 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!

4.3 Social environment

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

As “the very purpose of Tesla’s existence is to accelerate the world’s transition to sustainable energy”, the car maker 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. (Annual report, 2021)

4.4 Technological factors

Tesla has a good grasp of advanced technology in battery and in the design of the EVs so as to lengthen the driving range, shorten the acceleration time and increase the top speed. .

4.5 Legal and Regulatory environment

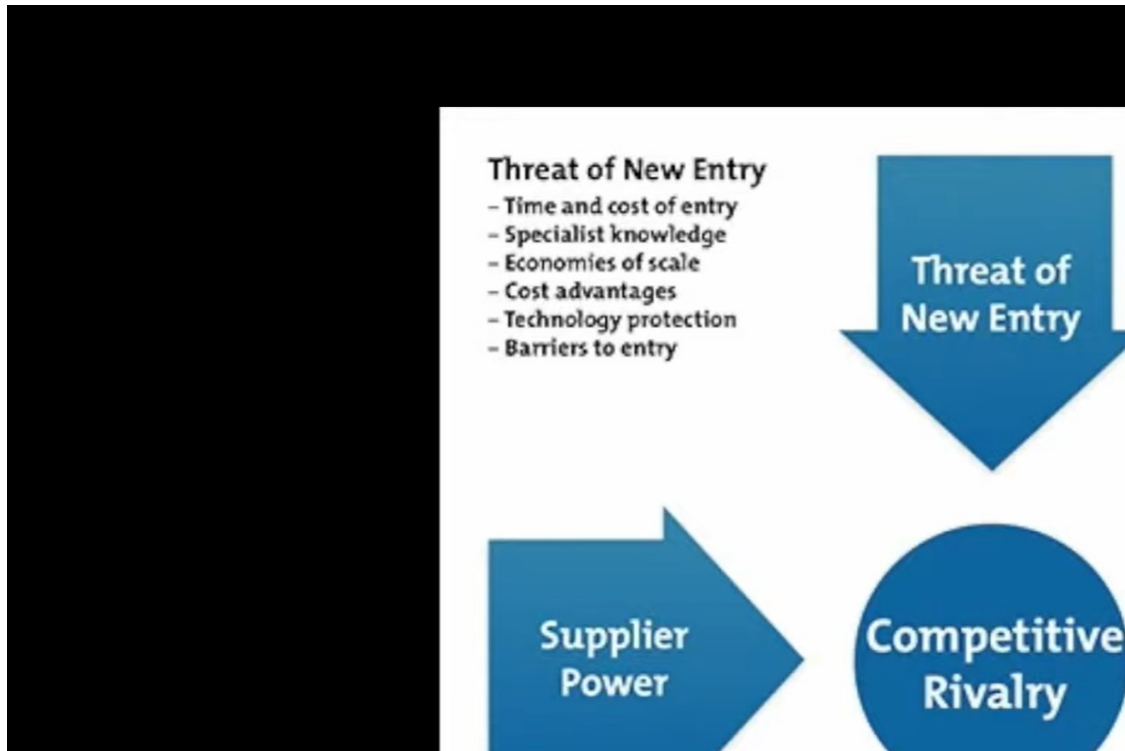
Wherever they are being made, Tesla’s vehicles are subject to federal and state regulations on vehicle safety standards in the U.S., the European Union and all applicable markets. There may be new regulations/guidelines stipulating on self-driving vehicles or self-driving equipment, and also on energy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

4.6 Environment factor

As highlighted elsewhere in this report, such as Sec. 4.2.2(b) and Sec. 4.3 above, air pollution, climate change and wastage of natural resources are gaining much concerns and scrutiny of the public, particularly non-governmental organisations. The latest focus is to take climate actions to decarbonise our livings and consumption behaviour.

5. Review of Tesla's Competitiveness using Michael Porter's Five Forces Analysis Model

Exhibit 6



5.1 Competitive rivalry

Competing products typically include ICE vehicles from more established car producers and also EVs from the start-up firms. Tesla considers “the worldwide automotive market highly competitive and will become even more competitive going forward”. In China, Tesla has been facing much competition from the local rivals such as Buffet’s long-time darling BYD and start-ups NIO and Xpeng. In spite of shaving the price of its China-made Model 3 EVs to CNY244,900 (~USD38,500) and the rollout of Tesla’s mid-sized SUV, Model Y, at a lower than expected price, sales of BYD and NIO surged in 2021.

5.2 Threat of new entrants

In recent years, many major automobile producers have EVs available in major markets including the US, China and Europe. The following manufacturers (and the list is growing) have their own series of electric cars:

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

General Motors declared in January 2021 its plans to exclusively offer EVs by 2035, ending production of its petrol-powered vehicles, so as to be carbon neutral by 2040 in its global 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!

5.3 Threat of substitution

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

5.4 Bargaining power of suppliers

Tesla has a high degree of vertical integration, which was estimated by a Goldman Sachs analyst in 2016 at a level of 80%. 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 governments with the value of having a premium product from Tesla. They tend to be satisfied without bargaining for more.

5.6 Strategies employed by the competitors in China

5.6.1 In December 2020, Elon Musk, commented that "I would guess the most competitive company for Tesla might be a company created in China" and also that Tesla's second largest market after the U.S. (i.e. China) is "extremely competitive" with its very good companies and people there work super hard. (CGTN 5 Feb 2021)

5.6.2 The natural advantages of Chinese EV makers over the foreign players:

- (a) Local EV makers can access to 5G communications, navigation systems such as Beidou, which provides a good foundation for the development of intelligence.
- (b) The preferential policies also incentivize local EV makers to improve their innovation.

- (c) Government's development plan: Purely EVs are expected to overcome all other vehicles to become the primary choice for new vehicles among consumers by 2035.
- (d) Young Chinese EV consumers have high degree of acceptance of domestic EV brands and do not blindly pay for foreign brands but prefer to buy products that suit them.
- (e) The key for Chinese EV makers will be who can achieve and maintain a positive synergy cycle the fastest, i.e. translating technological developments into vehicle sales and cycling that money back into R&D. (CGTN, 5 Feb 2021).

5.6.3 Marketing Strategy of Nio vs. Tesla

	(as of 16 Apr 2022)	Tesla China Model 3	NIO China Model ET5	Remarks
1.	Product features	4 doors mid-size sedan	4 doors, 4 seats, mid-size sedan	Similar class
	Recharge range, km	556	550 -1000	On par
	Top speed, km/h	225	N/A	
	100 km acceleration, sec.	6.1	4.3	NIO a bit better
2.	Price (basic model)	CNY279,900 USD43,930	USD51,250; USD41,600 w/o battery	Tesla's pricing is more competitive
	Enhanced auto assisted driving	CNY32,000	CNY680/mth For AR/VR	
	After-sales services / complementary product: Power refill method	Tesla 300+ supercharging stations (with 5,700 supercharger stalls) in China (30-45 min by rapid charge). Tesla once tried battery swapping but never deployed it.	NIO 828+ battery swapping stations" (Electrive.com 29 Jan 2022); solid-state rechargeable lithium batteries (5 min); free of charge for life! Also 637 supercharging stations.	Battery swap shortens waiting time significantly; free of charge for life is an excellent selling point.
3.	Place : Production	Tesla's Shanghai factory, China	OEM in Hefei, Anhui Province, China	NIO has additional risk of no direct plant.
4.	Promotion	Website, social media, words of mouth	Website, social media, words of mouth	Similar promotion strategy

Source: Tesla, NIO, The Car Space

Gone are the long waits at charging stations: Chinese EV start-up NIO is pioneering battery-swapping systems in China, challenging Tesla and other rival car makers. The pricing for NIO Model ET5 without battery, supplemented by battery swapping services may make NIO competitive, depending on the consumers' responses to the swapping services.

6. SWOT Analysis of Tesla

6.1 Tesla's Strengths

6.1.1 Elon Musk is the visionary leader and the most important asset of Tesla

As shown in Section 3.3.1 (Products), Elon Musk has been sticking to this product development strategy since 15 years ago, Tesla has finally proved it a success with the strong business performance in the last couple of years.

6.1.2 Corporate image and product differentiation

After the launch of Tesla Roadster and 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.

6.1.3 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 3 (base price of USD35,000) and Model Y are intended to compete with small to medium-sized sedans and compact SUVs. With better acceleration, technology and looks, Ohnsman (2017) thought that Model 3 was a game changer for EVs, as it "finally compels large number of motorists to forsake petroleum-powered cars for quiet, high-powered emission-free driving".

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).

6.1.5 Reputation

- (a) 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))
- (b) Cui Dongshu, the CPCS’s secretary general, praised Tesla as a “unique technology leader” in the world and that “there is still a big gap between Chinese EV companies and Tesla in terms of technology”.
- (c) The Model S won several automotive awards:
 - The 2013 Motor Trend Car of the Year.
 - The best-selling plug-in electric car worldwide for 2015 and 2016.
- (d) The Model 3, Tesla’s high-performance EV with affordable price,
 - in March 2016 secured 232,000 orders within only 2 days, breaking previous record of 80,000 orders received by Citroen DS in 1955!
 - the world’s best selling plug-in electric car for three years (2018 to 2020).
 - one of the Top 10 Tech Cars by the IEEE in 2018
 - 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))
 - named Large Electric Car of the Year by ‘What Car?’ Magazine in January 2021
- (e) In October 2021, Hertz car rental ordered 100,000 full-price Model 3 cars for its rental fleet, reflecting their confidence.

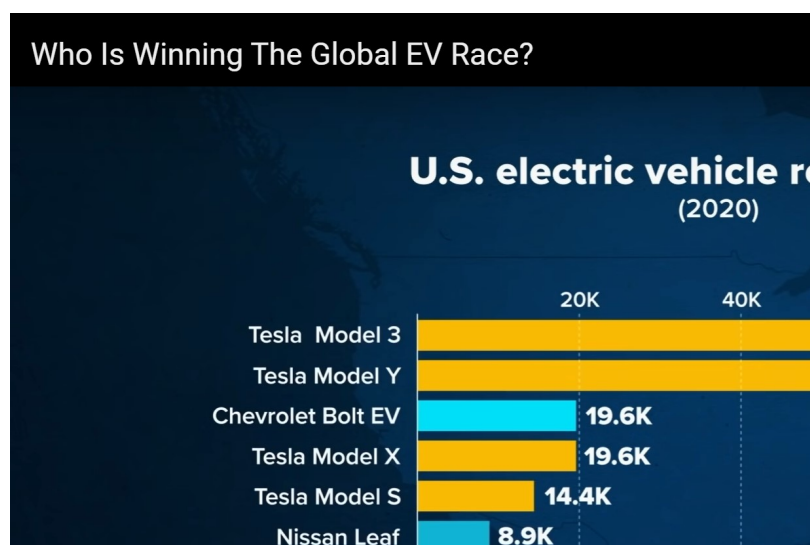


Exhibit 7

Source: CNBC

6.2 Weaknesses

6.2.1 Huge order backlog – In 2017, Tesla once suffered from a huge order backlog of 50,000 for its most affordable EV Model 3. Kadar (2017) revealed that the delivery of the Model 3 was delayed by 12-18 months, simply because of its supply chain that had “about 30 percent of its components coming from abroad”. Paul Page (2017) explained 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”. The lesson learnt from this problematic rollout was to diversify the company’s 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 – The following product recalls are more significant incidents that cast doubt on the quality of Tesla cars, although these seemed not result in devastating effect.

(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

6.3.1 Against the backdrop of the heating up of global electric vehicle market and China’s ambitious plan to fortify its EV industry and to transition to all-electric or hybrid cars by 2035, Elon Musk has taken this opportunity to adopt its global expansion starting from China. This would allow Tesla to get access to the world’s biggest market, with the prospect of lowering its production costs and the diversification of its sourcing of

resources and components, as well as benefitting from a number of incentives from the Chinese Government. 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.

6.3.2 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.

6.3.3 Recent rally in crude oil prices – The rally in crude oil prices since March 2022 to above USD80 per barrel would lead any intending car buyers to go for NEVs which are more economically to run than ICE vehicles.

6.4 Threats

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.

By a price cut of 8% in early October 2020 so as to make it qualified for the government subsidies, Tesla boosted the orders for Model 3 EV from 12,000 – 13,000 units in September 2020 sharply to 31,000 units in October 2020. (Reuters, 1 Oct 2020). This illustrates the effect of having subsidies in encouraging EV sales.

6.4.3 Entry of New Rivalry

A closer look at the market news reveals that Tesla is no longer the undisputed champion of the global EV market. As shown in Section 5.2 above, there is a long list of new entrants/existing major ICE vehicles manufacturers turning into EV producers going forward, it is not difficult to understand how competitive the global EV market will be in the coming decades.

6.4.4 Cyber security risk

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

6.4.5 Demand and Supply of Lithium ion battery and new battery technology

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

Due to the surging EV demand in 2020-21, lithium prices have been surging sharply, with lithium carbonate price passing USD75,000 per metric ton, about 5.2x of the five-year average!!

Over the next decade, McKinsey forecasts “continued growth of Li-ion batteries at an annual compound rate of about 30%. The batteries share of lithium demand is expected to grow from less than 30 percent in 2015 to 95 percent by 2030. By 2030, the lithium supply by recycling from Li-ion batteries is expected to account for slightly more than 6 percent of total lithium production.

As currently there is no substitute for lithium to meet the demands of the mobility sector, there is little prospect for declining lithium demand by 2030. This would underpin the trend of lithium prices, likely leading to higher prices of Li-ion battery and the EVs going forward.

(b) Rise of solid state battery

Toyota Motors announced recently 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 & smaller size than lithium ion battery pack
- (iv) Long life
- (v) With the solid state battery pack, it moves one 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 Strategic Position and Action Evaluation

Taking into account of the SWOT Analysis of Tesla in Section 6 above, let us now turn to the review of the strategic position and consider what actions need to be taken.

7.1.1 Distribution of products / services

As Tesla has adopted a policy of marketing and sales of its products through its own website and retail outlets, without using any third-party dealers or service providers, there is no need for Tesla to commission any forward integration strategy.

7.1.2 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.

7.1.3 Market penetration and development strategy

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 overseas markets.

(b) To Tesla

- (i) Gaining access to the burgeoning automotive market in China, being a part of Tesla’s global expansion strategy.
- (ii) Benefiting from lower production costs in China, relating to labour, land, capital and raw materials/semi-produced goods/components;
- (iii) Benefiting from incentives (such as subsidies, tax credit) provided by the Chinese government.

This market penetration strategy has been feasible for Tesla against the backdrop:

- (i) The Chinese government targeted EVs to account for increasing shares of total vehicle sales by phases to 50 percent by 2035 (See Section 4.2.5 above).
- (ii) There is a niche for introducing green cars to China for alleviating perennial problems of choking air pollution, serious carbon emission level which causes climate changes.
- (iii) With a huge potential market, there is a prospect of enjoying economies of scale, leading to increased level of competitive advantages.

7.1.4 Construction of Tesla's first Gigafactory in Shanghai was finished in August 2019, and the initial Tesla Model 3s were in production from it in October 2019. It took only 13 months to build the factory from the date of signing agreement and less than 3 months to ramp up for production!

7.1.5 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 at the time of deteriorating US-Chinese relations. 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.

7.1.6 In 2021, China accounted for 25.7% of Tesla vehicle sales revenue, and was the second largest market for Tesla after the US, which accounts for 44.5% of its sales.

7.2 Strategy options

Based upon Michael Porter's Five Generic Strategies framework (Exhibit 8), it can be observed that Tesla Inc. has adopted the Type 3 strategy (Differentiation) for its EVs and related products/ services. Tesla aims at producing unique industry-wide EVs and directs at consumers who are relatively price-insensitive.

The global EV market would be growing fast with the growing concerns on the climate change and the increasing demand for green products to save the earth.

Tesla Inc. has been benefiting from the first-mover advantages in going for the environmental-friendly EVs and related products e.g. roof-top solar panels. As a consequence, Tesla has benefited from being the first mover,

- (i) Securing access and commitments to rare resources – 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 – such as the battery technology.
- (iii) Gaining market share and position in the best location – After opening its Gigafactory in Shanghai, Tesla has gained direct access to the huge domestic market in China with EVs produced at competitive prices.
- (iv) Establishing and securing long-term relationships with customers, suppliers, distributors, and investors.

Exhibit 8 Porter's Five Generic Strategies

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

8. Selection of Strategies and Challenges Ahead

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 policy of import substitution and promoting technological transfers. Tesla should continue to ramp up local procurement and production in 2022.

- (b) 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. (Annual Report 2021, page 32)

8.2 Challenges Ahead

- (a) 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.
- (b) 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.
- (c) 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 market outside of the United States. Tesla may consider opening additional factories closer to local markets as a part of its global expansion strategy. E.g. Tesla has also built its fourth Gigafactory in Germany for serving its sales and operations in Europe.
- (d) To address the issues arising from the product recalls, Tesla needs to explore ways to increasing the reliability of its vehicles.
- (e) To ensure cost effectiveness and customer satisfaction, Tesla needs to enhance its delivery, servicing and charging infrastructure locally in other areas of China.
- (f) To cope with increasing number of existing and potential customers, Tesla needs to increase its capability and efficiency of its servicing operations by recruiting and training more staff.

9. Conclusions and Recommended Actions

9.1 Conclusion

After more than a decade of running the EV business, Tesla has finally managed to have positive net cashflow and profitability since 2020. It has executed a good global expansion strategy, particularly with its first overseas factory in Shanghai, China. Tesla has benefitted 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 Recommendations 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, pursuing organizational restructuring, digital transformation, and enhancing their corporate image.

9.2.2 To address the potential risks arising from the disruption of supply chain, including temporary suspension of manufacturing facilities worldwide, port congestion and inter-mitten supplier shutdowns and delays.

9.2.3 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:

- Further expansion of volume
- Geographical dispersion – in the inner cities of China, other parts of Asia such as India, with its growing middle-class
- vertical integration – particularly backward integration with suppliers
- product diversification – FCEV? EV using solid-state battery? Lithium Sulphur battery? Feasibility of introducing battery swapping services in China?

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

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

9.2.5 To address the prospects/risks related to changes in government laws and regulations, including government subsidies and 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 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.

Financial ratios analysis (Tesla)	2021	2020	2019
1. Profitability ratios			
(a) Return on capital employed (ROCE) = EBIT/Total assets x 100	16.7%	12.2%	
(b) Return on equity = Net profit/equity x 100	17.3%	5.0%	
(c) Gross profit margin = Gross profit/Sales x 100	25.3%	21.0%	16.6%
(d) Net profit margin = Net profit/Sales x 100	10.3%	2.3%	-3.5%
2. Activity ratios			
(a) Net asset turnover = Sales/(Total assets less current liabilities)	1.27	0.83	
(b) Stockholding period = Stock/Cost of Sales x 365	52.25	60.10	
(c) Debt collection period = Debtors/Sales x 365	12.97	21.83	
(d) Creditor payment period = Creditors/Sales x 365	49.36	50.85	
3. Liquidity ratios			
(a) Current ratio = Current assets/Current liabilities	1.38	1.88	
(b) Quick asset ratio = (Current assets - stocks) / Current liabilities	1.08	1.59	
4. Capital gearing ratios			
(a) Gearing ratio = Long & short term borrowings/Capital employed * * Shareholders' funds + total borrowings	0.29	0.42	
(b) Debt to equity = Long & short term borrowings/Shareholders' funds # # equity + reserves	0.41	0.73	
(c) Interest cover = EBIT/Interest charges	17.58	2.67	(0.10)

References:

Azevedo, M., Baczynska, M., Hoffman, K., & Krauze, A. (2022). Lithium mining: How new production technologies could fuel the global EV revolution. McKinsey & Company, 12 April 2022.

Bobylev, D. (2022). Tesla almost doubled sales in China in March. 66,000 MIC cars delivered, only 60 exported. Car News China, 11 April 2022.

<https://carnewschina.com/2022/04/11/tesla-almost-doubled-sales-in-china-in-march-66000-mic-cars-delivered-only-60-exported/>

Bradsher K. (2009). China vies to be World's leader in electric cars. The New York Times, 1 April 2009.

CGTN (5 Feb 2021). Domestic EV makers rivals Tesla in China, can they win?

China Daily (28 March 2022). NEVs competing with petrol cars for sales

<https://www.chinadaily.com.cn/a/202203/28/WS62417158a310fd2b29e53b70.html>

China Daily (28 March 2022). MIIT to ease price hikes in NEV raw materials

<https://global.chinadaily.com.cn/a/202203/28/WS62417f16a310fd2b29e53ba1.html>

China Passenger Cars Association (CPCA) (2022). China's National Passenger Cars Market Analysis Report for March 2022. 11 Apr 2022.

<http://www.cpcauto.com/newslist.php?types=csjd&id=2724>

Clayton, S.J. (2021). An agile approach to change management. Harvard Business Review. (11 January 2021)

David, Fred R. & David, Forest R. (2014). Strategic Management – Concepts and Cases, 15th Ed., Pearson, Global Ed.

Find Energy (4 Dec 2020). Electric Cars & Clean Car Technology of the Future.

<https://findenergy.co.uk/automotive/electric-cars/>

Find Energy (15 Mar 2021). Electric Car Emissions: 400 times less than petrol.

<https://findenergy.co.uk/automotive/electric-car-emissions/>

Find Energy (23 May 2021). China booms ahead – adopting new electric vehicles.

<https://findenergy.co.uk/automotive/china-electric-cars/>

Fleming, S (2021). These Countries Offer the Best Electric Car Incentives to Boost Sales. World Economic Forum. 29 Jun 2021.

[These Countries Offer The Best Electric Car Incentives to Boost Sales | World Economic Forum \(weforum.org\)](https://www.weforum.org/articles/2021/06/29/these-countries-offer-the-best-electric-car-incentives-to-boost-sales/)

Jacobs F. (2022). China to eliminate EV subsidies in 2022. Global Fleet – The executive network. 3 Jan 2022.

<https://www.globalfleet.com/en/taxation-and-legislation/asia-pacific/article/china-eliminate-ev-subsidies-2022?a=FJA05&t%5B0%5D=EVs&curl=1>

IEA Global EV Outlook 2020 & 2021

<https://www.iea.org/reports/global-ev-outlook-2020>

<https://www.iea.org/reports/global-ev-outlook-2021>

Iskryan, K. (2016). The China risk no one talks about. Asia Wealth Investment Daily. 4 Jan 2016.

(<https://web.archive.org/web/20171115182631/https://stansberrychurchouse.com/category/asia-wealth-investment-daily/>)

Kader, I. (2017). Electric Vehicle Company Unveils Ambitious Manufacturing Schedule. Global EDGE Blog (2 August 2017).

[globalEDGE Blog: Electric Vehicle Company Unveils Ambitious Manufacturing Schedule >> globalEDGE: Your source for Global Business Knowledge \(msu.edu\)](https://www.globalEDGE.com/en/2017/08/02/electric-vehicle-company-unveils-ambitious-manufacturing-schedule)

Kane, M. (2021). World's top 5 EV automotive groups ranked by sales: Q1-Q4 2020. InsideEVs (6 Feb 2021). <https://insideevs.com/news/486325/world-top-ev-automotive-groups-2020/>

Kolodny L (2019). “Tesla shares soar after crushing third-quarter earnings”. CNBC news report (23&24 Oct 2019). <https://www.cnbc.com/2019/10/23/tesla-tsla-earnings-q3-2019.html>

Lao, M; Feinstein, D. & Lafontaine, F. (2015). Direct-to-consumer auto sales: It's not just about Tesla. Federal Trade Commission (11 May 2015).

<https://www.ftc.gov/enforcement/competition-matters/2015/05/direct-consumer-auto-sales-its-not-just-about-tesla>

Lemon, J (2018). Tesla announces first foreign factory in China as Trump's trade war escalates. Newsweek 10 July 2018. <https://www.newsweek.com/tesla-announces-first-foreign-factory-china-trump-trade-war-escalates-1016622>.

Li F.S., (2021). Electric cars hit highway to the future. China Daily, 16 Aug 2021

Liu, R. (2021). Musk says Tesla would be shut down if its cars spied in China, elsewhere. Reuters (20 Mar 2021). <https://www.reuters.com/article/us-china-forum-musk-idUSKBN2BC04Q>

Manthey, N. (2022). Nio marks 800+ battery swapping stations in China. Electrive.com 29 Jan 2022.

Meyers, S.L. (2020). China's pledge to be carbon neutral by 2060: what it means. The New York Times, 23 Sep 2020.

Musk, E. (2006). The Secret Tesla Motors Master Plan (just between you and me). Tesla.com blog. 2 August 2006.

<https://www.tesla.com/blog/secret-tesla-motors-master-plan-just-between-you-and-me>

Paoli, L. & Gul, T., IEA (2022), Electric cars fend off supply challenges to more than double global sales, IEA, Paris. <https://www.iea.org/commentaries/electric-cars-fend-off-supply-challenges-to-more-than-double-global-sales>

Quartz (2021). Elon Musk's vision board for Tesla's future. 21 March 2021. <https://qz.com/elon-musks-vision-board-for-Tesla>

Scooter Doll (2022). Nissan announces prototype facility for solid-state batteries, plan for EV integration in 2028. Electrek, 8 April 2022. <https://electrek.co/guides/solid-state-batteries/>

Tesla, Inc. Annual Report (Form 10-K) FY2021
<https://www.sec.gov/Archives/edgar/data/1318605/000095017022000796/tsla-20211231.htm>

Tesla, Inc. Annual Report (Form 10-K) FY2021
https://www.sec.gov/Archives/edgar/data/1318605/000156459021004599/tsla-10k_20201231.htm#ITEM_15_EXHIBITS_FINANCIAL_STATEMENT_SCH

Top-selling light duty plug-in electric vehicle global markets (cumulative sales through December 2021 by country/region). China has the world's largest stock of plug-in passenger cars. (Source: Mario Roberto Duran Ortiz - own work)

Razvadauskas, F.V. (2022). Who is winning the electric vehicle race? Euromonitor International (14 March 2022). <https://www.euromonitor.com/article/who-is-winning-the-ev-race>.

Ronald, B. (2021). Tesla is no longer the undisputed leader in electric vehicles. Klue'd (16 Dec 2021). <https://klue.com/blog/tesla-is-no-longer-the-undisputed-leader-in-electric-vehicles>

The Engineers Post, How an electric car works? Its parts & functions explained (25 Oct 2021) <https://www.youtube.com/watch?v=tJfERzrG-D8>

Tycangco, B (2018). This auto market is leaving the rest of the world in the dust. Asia Wealth Investment Daily (2 Nov 2018).

Who is winning the global EV race? CNBC 15 March 2022, Youtube. <https://www.youtube.com/watch?v=tJfERzrG-D8>

Wayland, M (2021). General Motors plans to exclusively offer electric vehicles by 2035. CNBC 28 Jan 2021. <https://www.cnbc.com/2021/01/28/general-motors-plans-to-exclusively-offer-electric-vehicles-by-2035.html>