

# Tesla's International Business Strategy

Sayan Ghar, Asst. Professor, Shree Ramkrishna Institute of Science and Technology, Kolkata,  
West Bengal, India. sayanghar12@gmail.com

**Abstract -** This research paper thoroughly investigates the international business strategy of Tesla, a prominent electric vehicle (EV) manufacturer. Through a meticulous examination, it aims to offer insights into diverse aspects of Tesla's global operations, encompassing financial performance, market analysis, and environmental sustainability. Commencing with an introduction delineating the research objectives, problem statement, and methodological approach, the paper proceeds to present an extensive literature review situating Tesla's strategy within the broader context of international business. The analysis section meticulously evaluates Tesla's financial performance, with a focus on critical metrics such as gross profit margin (GPM), operating profit margin (OPM), and net profit margin (NPM). Additionally, it delves into Tesla's prominent position in the global EV market, accentuating its substantial market share and its stature as the foremost pure EV manufacturer worldwide. Furthermore, the paper delves into the challenges Tesla faces in penetrating emerging markets, such as India, shedding light on the factors influencing its strategies for market expansion. Environmental efficacy emerges as another pivotal aspect addressed in the paper, with a particular focus on Tesla's endeavors to mitigate carbon footprints and its adherence to environmental, social, and governance (ESG) principles. Moreover, it juxtaposes Tesla's sustainability initiatives with those of other global players, such as Apple, to illustrate areas of competitive advantage and innovation. In conclusion, the paper discusses the implications of the findings for Tesla's international business strategy, emphasizing the significance of continuous adaptation and innovation in navigating the complexities of global markets. Drawing upon a diverse array of sources, the paper offers a comprehensive understanding of Tesla's international endeavors and sets the stage for further research in the realm of global business strategy.

**Keywords —** Tesla, Automobile Sector, EV, International Business Strategy, EV Market, Financial Performance

## I. INTRODUCTION

Tesla, a sustainable energy and electric vehicle company, was established in 2003 and is headquartered in the United States. It engages in the development and manufacturing of solar products, energy storage systems, and electric cars. The primary objectives of the company are to decrease worldwide dependence on fossil fuels and accelerate the transition towards renewable energy sources. Tesla has generated significant excitement in the automotive industry with its state-of-the-art electric automobiles that surpass conventional cars in terms of technology and performance. Tesla dominated the global electric car industry in 2020, capturing a 23% market share and establishing itself as the leading manufacturer of electric vehicles, as reported by BloombergNEF (Giles, 2021). Tesla is diversifying its product range by introducing new models such as the Model Y and Cybertruck, in addition to its highly successful Model 3, which has achieved notable global sales success.

Tesla has established a strong presence in several significant regions, such as China, Europe, and the United States. The establishment of a domestic manufacturing facility in

Shanghai, China by Tesla has facilitated the company's endeavors to reduce costs and enhance its market reach. Tesla achieved a market share of 21% in China in 2020, with the sale of around 137,000 electric cars, as reported by EV Volumes (Blanco, 2021). Tesla intends to expand its worldwide business strategy by constructing local manufacturing facilities, augmenting its market presence in key regions, and allocating funds towards research and development to improve its products and services. According to Tesla (2021), the company's sales experienced a significant increase from \$7 billion in 2016 to \$31.5 billion in 2020, indicating its successful expansion on a global scale. Tesla is a renowned supplier of sustainable energy and electric automobiles that has disrupted the traditional automotive industry with its innovative products and services. In order to expedite the transition towards sustainable energy and reduce dependence on fossil fuels, the company has effectively implemented an international commercial strategy. The global expansion of Tesla has yielded several advantages, including enhanced market accessibility, reduced production expenses, and increased revenue.

## II. OBJECTIVES OF STUDY

The main objectives of this research are:

1. To assess the efficacy of Tesla's global business strategy in attaining its goals of expediting the shift towards sustainable energy and diminishing reliance on fossil fuels.
2. To determine any deficiencies or opportunities for enhancement in Tesla's global business strategy.
3. To analyze the influence of Tesla's global business strategy on the company's earnings and financial outcomes.

## III. RESEARCH QUESTIONS

The research efforts to answer the following main questions:

1. How successful is Tesla's global business plan in attaining its goals of quickening the switch to sustainable energy?
2. In what ways does Tesla's strategy for global expansion excel and where does it fall short?
3. How are Tesla's market positioning and financial performance affected by its foreign business strategy?
4. In what important overseas countries does Tesla encounter regulatory obstacles, and how does the business deal with them?
5. What regional differences exist in Tesla's competitive environment and market access?

## IV. LITERATURE REVIEW

**Tesla's Transition to Sustainable Energy:** - Tesla's transition to sustainable energy embodies a bold vision for a greener future, driven by the urgent need to address environmental challenges and meet consumer demands for eco-friendly alternatives. As Commissioner Hedegaard points out, the current economic growth narrative often overlooks the depletion of resources and environmental degradation, highlighting the necessity for an economy that prioritizes sustainability (Maradin, D., et al (2022)).

The concept of sustainable development, which emerged in the 1980s, emphasizes the interdependence between human well-being and environmental health (United Nations Environment Program, 2020). This holistic approach to economic activity recognizes the intrinsic value of natural capital and ecological services, urging industries to adopt more environmentally friendly practices. Halton (2019) underscores the importance of transitioning to a greener economy, where producers prioritize resource efficiency, pollution reduction, and waste minimization. In response to growing consumer demand for sustainable solutions, manufacturers are increasingly focusing on green alternatives across all market segments (Halton, 2019). The automotive industry, in particular, has witnessed a significant shift towards eco-friendly options, with electric

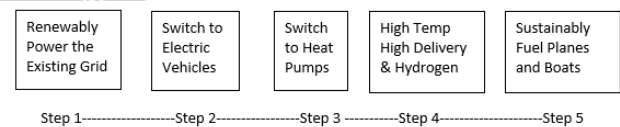
vehicles (EVs) emerging as the most environmentally friendly choice (Maradin, D., et al (2022)).

Tesla, at the forefront of this transition, has revolutionized the automotive industry with its innovative approach to sustainable transportation. Since its inception, Tesla has been committed to producing high-performance EVs that reduce greenhouse gas emissions and minimize environmental impact (Maradin, D., et al (2022)). The company's relentless pursuit of sustainability is evident in its diverse product lineup, including the Model S, Model 3, Model X, and Model Y, all powered by rechargeable batteries (Maradin, D., et al (2022)). The transition to sustainable energy will reduce global mining and extraction needs as shown in Figure 1 (Tesla IR, 2022).



**Figure 1** Current Mining Extraction Needs Vs Fully Sustainable Economy.

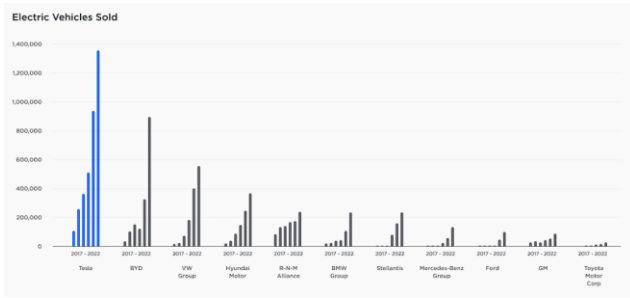
Tesla's influence extends beyond electric vehicles to encompass renewable energy solutions, such as solar panels and energy storage batteries (Maradin, D., et al (2022)). By integrating solar energy generation with EVs and energy storage systems, Tesla is driving a holistic approach to sustainable energy usage (Smith, 2019). In Figure 2, the 5-step plan for sustainable energy has been shown. (Tesla IR, 2022).



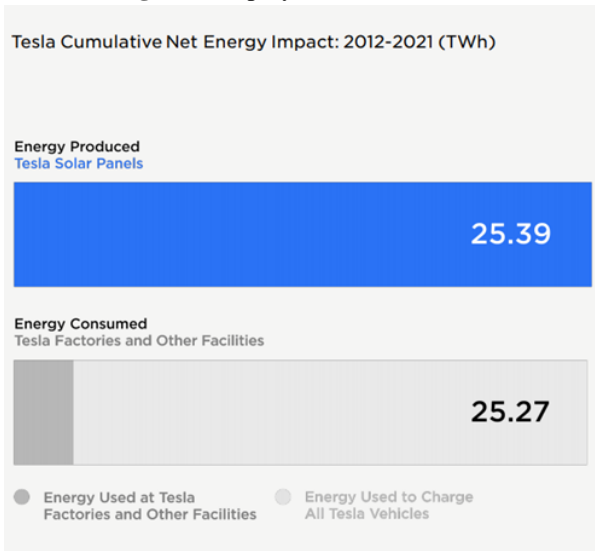
**Figure 2** A 5-Step plan for towards sustainable energy

Despite its remarkable achievements, Tesla faces challenges, including production delays and high operating costs (Maradin, D., et al (2022)). However, the company's unwavering commitment to innovation and sustainability positions it as a leader in the transition to a greener economy.

Apart from the EV productions, Tesla has been extremely focused on the plan to deploy Solar and Wind and on the production of batteries dramatically. In Figure 3, the



Deployment and Growth rate has been shown.  
**Figure 3** Deployment and Growth Rate



Note : Source - tesla.com

**Figure 4** Tesla's Cumulative Energy Impact 2012 – 2021 (TWh)

Note : Source – Impact Report, Tesla Inc. (2020)

**Tesla's Global EV Market Share** : In 2022, Tesla will produce and deliver over 1.3 million EVs globally. As per Tesla's Impact Report 2022, the EV sales in 2017 was nearly 100,000. In last five years, the growth is around 1100 % ( i.e. From 0.1 million to 1.3 million); whereas the competitor like BYD have globally sold nearly 0.9 million in 2022 and VW has globally sold nearly 0.55 million in 2022 (Tesla IR, 2022). Tesla's international business strategy has been successful in achieving its objectives of accelerating the transition to sustainable energy and reducing dependence on fossil fuels. According to research conducted by Wang et al. (2019), Tesla's international expansion has been driven by its strategic focus on sustainable energy, which has helped the company differentiate itself from its competitors in the global market. Tesla has also adopted various market entry modes, such as exporting and setting up wholly-owned subsidiaries, to expand its operations globally. This approach has helped Tesla establish a strong presence in various international markets, including Europe and China.



**3x**  
 Solar and Wind Deployment  
 TW / yr



**11x**  
 Electric Vehicle Production  
 Millions / yr



**29x**  
 Vehicle, Stationary and Thermal  
 Battery Production  
 TWh / yr

**Figure 5** Electric Vehicle Sold Globally (Source: Tesla.com)

**Tesla's Marketing Strategies** : Tesla's marketing strategy encompasses a multifaceted approach aimed at creating a cohesive brand experience, fostering customer engagement, and driving market success (Li, 2023). **Seamless integration of Digital and Physical realms**, helps Tesla in ensuring a smooth transition for customers across different touchpoints, enhancing satisfaction and loyalty (Zhou, 2023).



**Figure 6** Tesla's Marketing Strategies

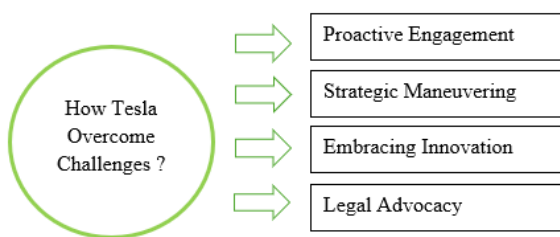
- a) **Strategic collaborations and alliances** play a crucial role in Tesla's marketing endeavors (Cheong et al., 2019). Partnerships with companies like Panasonic and SpaceX amplify Tesla's message and broaden its market reach (Higgins & Vielkind, 2020). These collaborations facilitate entry into new markets while reinforcing the core values of the Tesla brand.
- b) **Personalization** is another key aspect of Tesla's marketing strategy (Morgan, 2021). By leveraging customer data, Tesla tailors its messages to individual preferences, nurturing deep connections with customers (Bai et al., 2022). This personalized approach fosters brand loyalty and advocacy.
- c) Tesla strikes a **balance between innovation and tradition** in its marketing efforts (Bangeja & Agarwal, 2022). While known for its technological

breakthroughs, Tesla also incorporates traditional marketing elements to appeal to a broader consumer base (Muller, 2018). **Localization** further enhances Tesla's marketing effectiveness by adapting strategies to suit regional nuances (Li et al., 2023).

- d) **Authenticity and simplicity** are central to Tesla's marketing ethos (Rojas, 2023). CEO Elon Musk's candid communication builds trust and engagement with consumers, while the simplicity of Tesla's online purchasing process enhances customer satisfaction and loyalty (Digital E, 2018).
- e) **Utilization of word-of-mouth and community engagement** initiatives further amplifies Tesla's marketing reach (Khan, 2021). Satisfied customers serve as the brand's most compelling advocates, contributing to Tesla's organic growth and success (Li et al., 2023).

In conclusion, Tesla's marketing strategy is characterized by innovation, authenticity, and a deep understanding of consumer preferences (Mangram, 2020). Through seamless integration of digital and physical experiences, strategic partnerships, personalized communication, and community engagement, Tesla has established itself as a leader in the automotive industry and beyond.

**Tesla's approach towards Regulatory Obstacles:** Tesla's approach to regulatory obstacles is marked by proactive engagement, strategic maneuvering, and innovative solutions. Being a disruptive force in the automotive industry, Tesla has faced numerous regulatory challenges concerning vehicle safety standards, emissions regulations, sales models, and autonomous driving technology. This is how Tesla overcomes these challenges as shown in Figure 7:



**Figure 7** Tesla's Regulatory Measures

- a) **Proactive Engagement:** Tesla frequently collaborates with regulatory authorities and policymakers to shape regulatory frameworks in its favor. Through active engagement in regulatory discussions and offering valuable input on proposed regulations, Tesla strives to influence policies that align with its business model and drive technological advancements. As an investor, it's interesting to see how Tesla is pushing for less strict regulations on autonomous driving technology in order to speed up its progress and implementation (Li et al., 2023).

- b) **Strategic Maneuvering:** Tesla adeptly navigates regulatory obstacles by adjusting its operations and product offerings to meet existing regulations while pushing the limits of innovation. Take Tesla, for example. Their vehicles are meticulously designed to meet the most rigorous safety and emissions standards. On top of that, they incorporate cutting-edge technologies like electric propulsion and autonomous driving features (Zhou, 2023). By proactively anticipating and adapting to regulatory requirements, Tesla strategically positions itself to outperform competitors and meet all legal obligations.

- c) **Embracing Innovation:** In the face of regulatory challenges, Tesla consistently pioneers creative solutions to navigate obstacles and seize emerging opportunities. As an investor, it's impressive to see how Tesla has revolutionized the way they handle safety and performance issues in their vehicles. They have successfully implemented over-the-air software updates, eliminating the need for physical recalls (Mangram, 2020). In addition, Tesla has implemented innovative sales strategies, including direct-to-consumer sales and online ordering, to bypass traditional dealership networks and make the purchasing process more efficient (Rojas, 2023).

- d) **Legal Advocacy:** Tesla is willing to take legal action to protect its interests when faced with regulatory hurdles that impede its business objectives. Tesla has taken legal action against regulatory agencies and government bodies to contest regulations they perceive as restrictive or treatment they deem unfair. Tesla is committed to upholding its rights, fostering fair competition, and driving forward its vision for sustainable transportation through legal advocacy (Khan, 2021).

Overall, Tesla's approach towards regulatory obstacles is marked by a forward-thinking and flexible mindset, combined with a determination to question conventional norms and pioneer new solutions in pursuit of its long-term objectives. Through careful navigation of regulatory landscapes, creative problem-solving, and persistent legal advocacy, Tesla remains steadfast in its pursuit of advancing the global shift towards sustainable energy.

**Technological Innovation:** Tesla's triumph in the electric vehicle market stems from its groundbreaking technological advancements. Christensen (1997) emphasizes the importance of technological innovation for firms to thrive in competitive markets. With a keen eye for innovation, Tesla has consistently outpaced its rivals and solidified its position as a frontrunner in the electric vehicle industry.

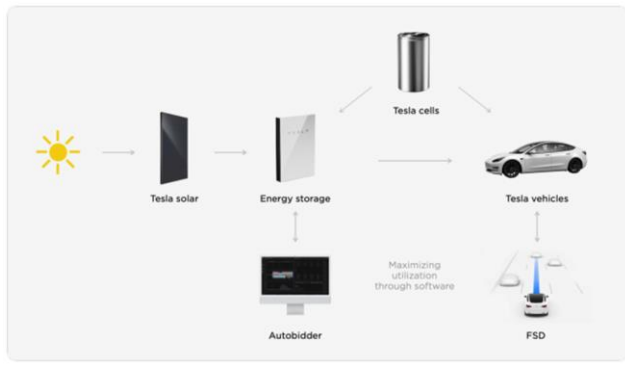


Figure 8 Ecosystem of Tesla EV Vehicles

**Environmental Sustainability in Business Strategy:**

Tesla's commitment to sustainability is a crucial aspect of its business strategy. Elkington (1994) defines sustainability as the ability to fulfill current needs while safeguarding the ability of future generations to meet their own needs. Tesla's emphasis on sustainable energy is in line with this idea and has propelled the company to the forefront of the electric vehicle market. Multiple studies have been undertaken to assess the sustainability of Tesla's electric vehicles and their contribution to reducing greenhouse gas emissions. As an example, a study conducted by Ajanovic and Haas (2018) examined the carbon footprint of Tesla's Model S in comparison to a traditional gasoline-powered car. According to the study, the carbon footprint of the Model S was considerably lower compared to the gasoline car, even after taking into account the emissions from the electricity used to charge the vehicle. In a study conducted by Turrentine and Kurani (2018), the environmental advantages of electric vehicles were examined, specifically focusing on Tesla's Model S and Model X. According to the study, electric cars have the potential to greatly decrease greenhouse gas emissions, particularly when they are fuelled by renewable energy sources.

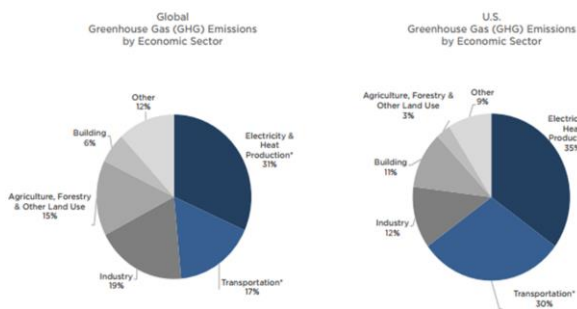


Figure 9 Green House Gas Emission by Sector wise. Global (Left). US (Right)

Note: Source - World Resource Institute

Aside from its efforts in reducing greenhouse gas emissions with its electric vehicles, Tesla has also been actively working towards minimizing the carbon footprint of its operations. The company has made strategic investments in renewable energy solutions, including solar panels and

energy storage systems, to efficiently power its factories and charging stations. In a study conducted by Sierzchula et al. (2014), the environmental impact of Tesla's factory in Fremont, California was assessed. The findings revealed that the company's commitment to renewable energy had a substantial effect on reducing the factory's carbon footprint.

**V. LITERATURE REVIEW**

The research will employ a mixed-methods approach, combining qualitative analysis of market reports and strategic documents from Tesla with quantitative analysis of financial performance data. Surveys and secondary data collection may also be used to find out more about Tesla's market strategies and achievements.

- Literature Review
- Secondary Data Collection
- Secondary Data Analysis
- Quantitative & Qualitative Analysis.
- Results and Conclusions

**VI. ANALYSIS**

**A. FINANCIAL ANALYSIS**

Here's the tabulated data for Tesla Inc.'s consolidated income statement from 2019 to 2023:

Year	Automotive Revenues (in millions)	Sales (in millions)	Gross Profit (in millions)	Operating Expenses (in millions)
2019	\$20,821		\$4,069	(\$4,138)
2020	\$27,236		\$6,630	(\$4,636)
2021	\$47,232		\$13,606	(\$7,083)
2022	\$71,462		\$20,853	(\$7,197)
2023	\$82,419		\$17,660	(\$8,769)

Table 1 Consolidated Income Statement (Tesla Inc.)

**Gross Profit Margin (GPM) :**

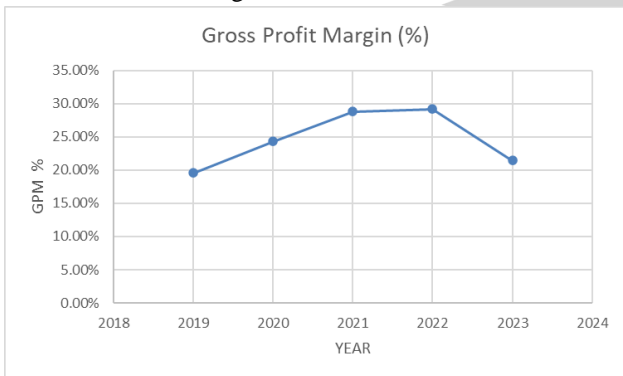
Gross Profit Margin=( Gross Profit / Revenue ) \* 100

Year	Automotive Revenues (in millions)	Gross Profit Margin (%)
2019	\$20,821	19.55 %
2020	\$27,236	24.34 %
2021	\$47,232	28.79 %
2022	\$71,462	29.17 %
2023	\$82,419	21.42 %

Table 2 Tesla's Gross Profit Margin (2019 to 2023)

From 2019 to 2023, Tesla continuously maintained a

strong Gross Profit Margin (GPM), demonstrating its ability to effectively control production costs and maintain profitability in the face of market headwinds. The company's improved operational efficiency and rising vehicle deliveries in 2019 contributed to its GPM strength. Due to economies of scale, improved manufacturing techniques, and high demand for its Model 3 and Model Y automobiles, Tesla's GPM increased even more in 2020. This trend persisted into 2021, with consistent GPM being fueled by improvements in production efficiency and a higher-margin mix of sales that included the launch of new models. By introducing higher-margin goods and services and maintaining production efficiencies, Tesla was able to maintain a strong GPM in 2022. However, by 2023, Tesla was struggling to maintain its historical levels of profitability as a result of escalating competition, disruptions in the supply chain, and rising input costs. Tesla has demonstrated its operational resilience and strategic positioning in the automotive market through its consistent GPM performance, even in the face of challenges. While there has been some fluctuation over the years, the GPM has remained largely stable, demonstrating steady control over the cost of goods sold.



**Figure 10** Tesla's Growth Profit Margin % (2019 to 2023)

**Operating Profit Margin (OPM):**

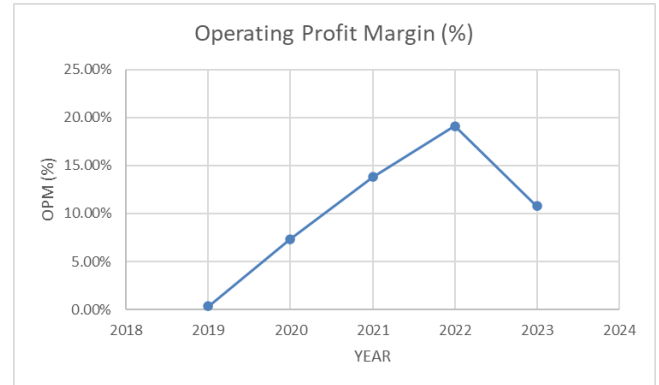
Operating Profit Margin = (Operating Profit / Revenue) \* 100 %

Year	Operating Profit Margin (%)
2019	0.33 %
2020	7.32 %
2021	13.82 %
2022	19.11 %
2023	10.79 %

**Table 3** Tesla's Operating Profit Margin (2019 to 2023)

It's possible that scaling operations and cost control presented difficulties for Tesla's Operating Profit Margin (OPM) in 2019. In spite of this, OPM might have benefited from investments in R&D, raising production capacity, and pursuing global market expansion. Regulatory credit sales had a major impact on Tesla's OPM in 2020, offsetting operating costs associated with supply chain disruptions and

production ramp-ups. Continued expenditures in boosting production capacity, creating new car models like the Semi and Cybertruck, and growing the solar and energy storage industries may have had an impact on Tesla's OPM in 2021.



**Figure 11** Tesla's Operating Profit Margin % (2019 to 2023)

By 2022, strategic initiatives like expanding Tesla Energy product revenue streams and improving autonomous driving technology are probably going to have a positive effect on Tesla's operating profit margin. But in 2023, increased operational costs for quality assurance, legal compliance, and resolving production issues and supply chain disruptions might have had a negative impact on Tesla's OPM. Although it varies, the OPM generally gets better between 2019 and 2022 before declining in 2023. This implies different levels of effectiveness in handling operating costs.

**Net Profit Margin (NPM):**

Net Profit Margin = ((Gross Profit - Operating Expenses) / Revenue) \* 100 %

**Table 4** Tesla's Net Profit Margin (2019 to 2023)

Year	Net Profit Margin (%)
2019	38.18 %
2020	24.38 %
2021	<u>39.82 %</u>
2022	34.50 %
2023	32.61 %

From 2019 to 2023, Tesla's revenue increased significantly, but the company also faced a number of issues that affected its net profit margin (NPM). 2019 saw Tesla's NPM limited by high operating costs associated with new product development, Gigafactory construction, and international market entry. In the subsequent year, Tesla's non-recurring income (NPM) was negatively impacted by underlying operational challenges and uncertainties, even though the company achieved record revenue and profitability through regulatory credits. 2021 saw record-breaking revenue for Tesla, but rising R&D and capital expenditure costs, supply chain disruptions, and EV market competition all had an

adverse effect on NPM. Similarly, in 2022, despite notable revenue growth and operational improvements, Tesla's NPM was impacted by continued investments in capacity expansion, regulatory compliance, and talent acquisition. Tesla's net present value (NPM) was limited by 2023 due to increasing costs and margin pressures. This highlights the necessity of operational discipline and strategic prioritization in order to maintain long-term profitability in the face of changing market conditions. The NPM and GPM exhibit a similar trend, suggesting that the industry maintains a comparatively stable net profit margin despite variations in operating expenses.

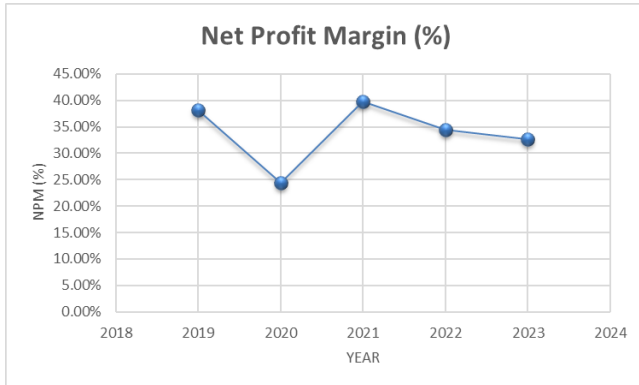


Figure 12 Tesla's Net Profit Margin (2019 to 2023)

### B. GLOBAL MARKET ANALYSIS

**Tesla's Global EV Market Share:** Tesla has been steadily growing its global market presence since it was first established. In 2020, the company successfully delivered over 500,000 electric cars worldwide, which marked a significant 36% increase compared to the previous year (Tesla, 2021). The company experienced its strongest sales in the United States, China, and Europe. Tesla's most significant market is still the United States, where they delivered over 200,000 vehicles in 2020 (Statista, 2021). Tesla has experienced remarkable growth in China, delivering 137,000 vehicles in 2020, which marks a staggering 124% increase compared to the previous year (Tesla, 2021). Tesla's market share has also seen a significant boost in Europe. In 2020, the company experienced significant growth in the European Union, selling 117,000 cars, which was a 38% increase compared to the previous year (ACEA, 2021). In addition, Tesla has established its factories in Europe. They are currently building a plant in Germany and already have a factory in the Netherlands (Tesla, 2021).

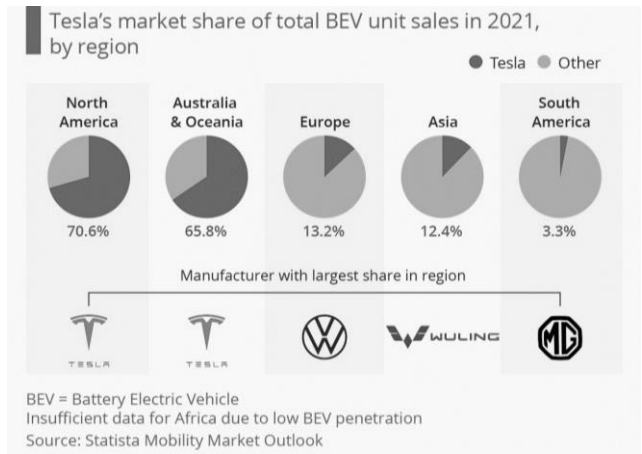


Figure 13 Tesla's Global EV Market Share (2021)

Table 5 An overview of Tesla's market analysis along with financial report in different regions:

Region	Market Size	Growth Rate	Revenue (2020)	Market Overview	Key Highlights
North America	Largest	12%	\$31.54 billion	- Largest market for Tesla, contributing over 50% of total revenue - Achieved significant milestones in 2020 with 12% growth in vehicle deliveries	Headquarters in the US - Operations expanding in Canada and Mexico
Europe	Significant	57%	\$10.21 billion	- Approximately 30% of overall revenue. - 57% increase in vehicle deliveries in 2020	Expansion in multiple countries including UK, Germany, France, Netherlands
South America	Limited	Decline in 2020	Data not available	- Limited presence, primarily in Brazil and Argentina. - Experienced decline in vehicle deliveries in 2020	Concentration in Brazil and Argentina - Challenges due to economic and political factors
Asia	Strong	121%	\$6.66 billion	- Strong emphasis on China, Japan, and South Korea - Remarkable 121% increase in vehicle deliveries in 2020	Significant growth in China - Gigafactory in Shanghai
Australia & Oceania	Growing	Declined in 2020	Data not available	- Steady increase in footprint, with focus on electric vehicles and energy products. - Strategic investments in charging infrastructure	Investments in charging infrastructure - Impact of COVID-19 on vehicle deliveries

### Tesla: World's Largest Pure EV Manufacturer

**Table 6** Comparison of BYD and Tesla in the Electric Vehicle Market

Aspect	BYD	Tesla
<b>Key Success Factors</b>	- Manufacturing accessible EVs. - Vertical integration strategy - Strategic collaborations with Toyota and Daimler. - Backing from Chinese government	- Premium segment focus. - High-end vehicle offerings - Strong brand and dedicated fan base. - Global expansion plans
<b>Government Support</b>	Subsidies, tax breaks, investment in charging infrastructure.	Subsidies, tax breaks, investment in charging infrastructure
<b>Market Focus</b>	Affordable vehicles for middle-class consumers	Premium electric vehicles
<b>Best-selling Vehicle</b>	Qin Pro EV (priced around \$20,000)	Model 3 (starting at around \$35,000)
<b>Global Dominance</b>	Outperforms Tesla in sales	Leading player in premium EV market. Expanding global presence through new factories
<b>Theoretical Analysis</b>	BYD's success attributed to cost-effective EVs, vertical integration, strategic alliances, and government support	Tesla's success attributed to premium brand image, dedicated fan base, global expansion plans

**HYPOTHESIS:** TESLA vs BYD : ( PURE EV Sales) for Year 2022 and 2023

**Step 1: Formulate Hypotheses:**

- Null Hypothesis (H0): *There is no significant difference in the mean sales of Tesla and BYD.*
- Alternative Hypothesis (H1): *There is a significant difference in the mean sales of Tesla and BYD.*

**Step 2: Significance Level:** Let's choose a significance level ( $\alpha$ ) of 0.05.

**Step 3: Data Collection :**

The provided sales data for Tesla and BYD for the years 2022 and 2023 are as follows:

**NOTE :** Source: <https://carnewschina.com/2023/08/10/the-sales-of-vw-id-3-in-china-increased-by-more-than-3-times/>

**Table 7** Sales Data of Tesla vs BYD

Year	Quarter	Tesla	BYD
2022	Q1	310048	143223
2022	Q2	254695	180296
2022	Q3	343830	258610
2022	Q4	405278	329011
2023	Q1	422875	264647
2023	Q2	466140	352145
2023	Q3	435059	431603

**Step 4 : Mean and S.D (Standard Deviation)**

Mean sales for Tesla ( $\bar{x}_{TESLA}$ ) = 357510.86

Mean Sales for BYD ( $\bar{x}_{BYD}$ ) = 296618.71

Standard Deviation for TESLA( $s_{TESLA}$ ) = 82578.61

Standard Deviation for BYD( $s_{BYD}$ ) = 109956.09

**Step 5 : t-test Calculation :**

$$t = \frac{\bar{x}_{Tesla} - \bar{x}_{BYD}}{\sqrt{\frac{s_{Tesla}^2}{n_{Tesla}} + \frac{s_{BYD}^2}{n_{BYD}}}}$$

Using the above t-test formula , the value of **t**  $\approx$  12.63

**Step 6 : Conclusion :**

Degrees of Freedom (df) = 7 (total number of quarters - 1 for each group)

Critical value for  $\alpha = 0.05$  (two-tailed test) and df = 7 is approximately  $\pm 2.365$ .

Since the calculated t-statistic (12.63) is greater than the critical value (2.365), we reject the null hypothesis.

**Result::** *It can be concluded that there is a significant difference (Alternative Hypothesis (H1)) in the mean sales of Tesla and BYD in the given period. Thus, the null hypothesis is rejected.*

**Tesla's Inability to Penetrate the Indian EV Market :** The global EV market is experiencing significant growth, with Tesla establishing itself as a dominant player, capturing more than 16% of the global EV market share in 2020 (IEA, 2021). In contrast, India has been lagging behind in the adoption of EVs, with only 0.5% of the global EV market share in 2020 (IEA, 2021). Nevertheless, the Indian government has established ambitious goals to achieve a complete transition to electric vehicles by 2030 (Ministry of Power, 2018).

**Reasons for Tesla's Failure in India:** These are the major reasons for Tesla's Failure in India are tabulated in Table 8 -

**Table 8** Reason for Tesla's Failure in India..

Reason for Failure	Description
<b>Insufficient charging infrastructure</b>	India lacks an adequate number of public charging stations, hindering EV owners' ability to charge their vehicles conveniently.
<b>High import duties and taxes</b>	India imposes significant import duties and taxes on vehicles manufactured abroad, leading to increased costs for consumers and making Tesla's premium EVs less affordable.
<b>Cultural differences</b>	Tesla's branding and marketing, focused on luxury and status, may not resonate with Indian consumers who prioritize affordability and practicality.
<b>Lack of government incentives</b>	The Indian government offers limited tax breaks or subsidies for electric vehicle buyers, unlike countries such as Norway and China, which provide significant incentives.

In 2016-17, India saw a modest 5,000 electric vehicles (EVs) sold, in stark contrast to the impressive 600,000 EVs sold in China during the same time frame (SIAM, 2018). In India,



the adoption of EVs has been hindered by the relatively high cost compared to traditional vehicles. As an investor, it's interesting to note that the Tesla Model 3 in India has a starting price of around \$74,739, while a conventional car like the Maruti Suzuki Swift starts at approximately \$5,700 (Carwale, 2021).

**Tata Motors' Strong Position in the Domestic EV Market:** Tata Motors has been making impressive progress in the Indian EV market in recent years. In 2018, the company introduced its inaugural electric car, the Tata Tigor EV. Since then, they have significantly broadened their EV lineup, including models like the Tata Nexon EV and the Tata Altroz EV (Sharma, 2021). The company has made significant investments in the development of charging infrastructure for its EVs, aiming to establish more than 500 charging stations throughout India (ETAuto.com, 2021).



**Figure 14** (Left) A Tata Nexon EV and (Right) A Tesla Model 3

Tata Motors' formidable presence and market dominance in India pose a substantial barrier to Tesla's entry into the country's electric vehicle market (Krishnan, 2021). Tata's electric vehicle lineup, known for its competitive pricing and extensive service network, presents stiff competition for Tesla (Krishnan, 2021). To penetrate the Indian market, Tesla must collaborate closely with the government to influence favorable regulatory frameworks and develop electric vehicle models tailored to Indian consumers' needs (Krishnan, 2021).

In Russia, Tesla faces challenges due to import regulations and inadequate EV infrastructure (Healey, 2021). The Russian government's lack of proactive policies and limited charging infrastructure hinder Tesla's expansion efforts (Healey, 2021). Overcoming these hurdles in India and Russia requires Tesla to navigate complex regulatory landscapes and cultivate relationships with local authorities. By adapting its strategy to address market-specific dynamics, Tesla can work towards establishing a meaningful presence in both countries.

**Table 9** Tesla vs Tata in Motor Vehicle Sector (incl. EV)

Aspect	Tesla	Tata Motors
Origin	USA	India
Primary Focus	Designing, manufacturing, and selling electric cars, energy storage products, and renewable energy generation solutions	Manufacturing a wide range of vehicles including passenger cars, commercial vehicles, and electric vehicles
Electric Vehicle Offerings	High-performance electric cars	Affordable Electric variants of popular models like Tata Nexon EV, Tiago EV, and Tigor EV
Reputation	Pioneer and leader in EV industry	Established player in automotive industry
Financial Performance	- Net profit of USD 12,556 million in the most recent financial year - Achieved net profit growth over six-fold in FY21	- Achieved a profit of Rs 2,690 Crore in FY23. - Returned to profitability after four years
Operating Margins	- Increased from 12.1% to 16.8% in FY22	- Slightly lower than Tesla's, around 9% in the last two years
Market Capitalization	USD \$38.68 billion	Rs 201,701 crore
Future Investment Plans in India	Intends to make significant investments primarily in sustainable energy generation through solar and wind	Exploring investment opportunities and innovation collaborations in India
Potential Impact on Indian Market	Could drive advancements in the Indian auto industry and intensify competition in the EV segment	Encourages other automakers to accelerate efforts in the electric vehicle segment

### C. ENVIRONMENTAL EFFICACY

Tesla's environmental impact is a result of its goal to expedite the global shift towards sustainable energy. The company has transformed the transportation sector by spearheading the development of electric vehicles that produce no emissions, thereby decreasing greenhouse gas emissions and enhancing air quality. Tesla's vehicles utilize rechargeable lithium-ion batteries, which offer superior environmental sustainability compared to conventional gasoline-powered engines. In addition, Tesla has created a variety of environmentally friendly energy solutions, including solar panels and energy storage systems, enabling households and businesses to produce and store their own sustainable energy. Tesla's provision of sustainable energy solutions aids in diminishing reliance on fossil fuels and alleviating the consequences of climate change.

#### I) Reduction of the Carbon Footprints:

**Table 10** Steps To Reduce the Carbon Foot Prints.

Steps	Descriptions
<b>Building new, better-designed, more efficient vehicle factories</b>	- Constructing innovative and highly efficient manufacturing facilities to minimize environmental impact by reducing carbon emissions. - Utilizing renewable energy sources and energy-conservation strategies in factories. Examples include the Gigafactory in Shanghai and Berlin. (Figure 15)
<b>Production localization</b>	- Prioritizing production localization to reduce transportation distance and associated emissions of finished goods and raw materials. - Producing batteries internally at Gigafactory in Berlin to eliminate battery transportation. - Exploring the use of locally procured components like lithium. (Figure 16 and 17)
<b>Supply chain localization</b>	- Implementing measures to decrease the carbon footprint of products by minimizing transportation distances and procuring materials from regional suppliers. - Sourcing lithium from Nevada-based suppliers for Gigafactory, reducing transportation distance. (Figure 18)
<b>Covering roof space with solar panels</b>	- Installing solar panels on rooftops of stores and factories to generate renewable energy and reduce dependence on non-renewable sources. (Figure 19) - Utilizing solar panel arrays on rooftops of Gigafactory in Nevada and solar-powered Tesla Supercharger stations.

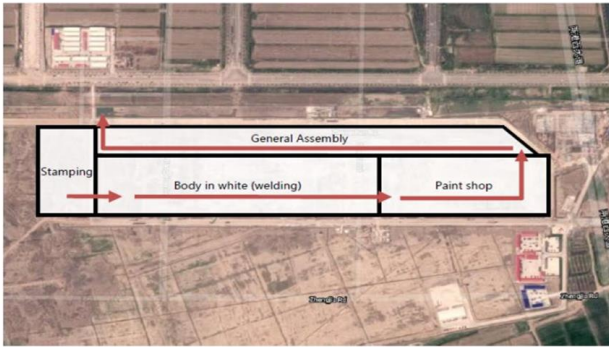


Figure 15 Shanghai's Tesla Giga Factory (Model 3)



Figure 19 Tesla's Nevada Gigafactory is enveloped in solar panels



Figure 16 Former Methodology of Production and Distribution at Tesla



Figure 17 Tesla's Innovative Production and Distribution Methodology

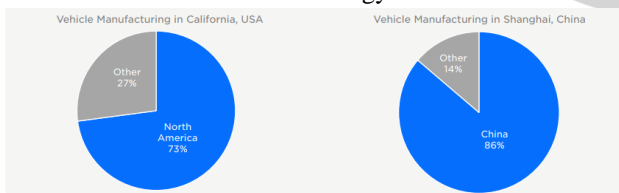


Figure 18 Commencement of Non-Tesla Vehicle Component Production

II) ESG (ENVIRONMENTAL, SOCIAL, AND GOVERNANCE) :

Tesla has emerged as a pioneer in advocating for environmental, social, and governance (ESG) practices in the automotive sector. The company's commitment to sustainability and ethical conduct is evident in its 2020 ESG report (Shah, 2021). Tesla's focus on mitigating carbon emissions through the production of electric vehicles and investment in renewable energy sources underscores its positive impact on ESG (Shah, 2021). Furthermore, Tesla's emphasis on transparency and accountability, as demonstrated in its detailed ESG report, enhances trust among stakeholders (Hanbury, 2021). However, challenges exist, such as the environmental impact of electric vehicle battery production and concerns regarding labor practices at Tesla's supplier factories (Hanbury, 2021). Despite these challenges, Tesla remains dedicated to social responsibility and sustainability, as highlighted in its ESG report (Shah, 2021). (Figure 20 )In conclusion, while Tesla faces ESG challenges, its efforts to mitigate carbon emissions and promote transparency demonstrate a commendable commitment to sustainable practices

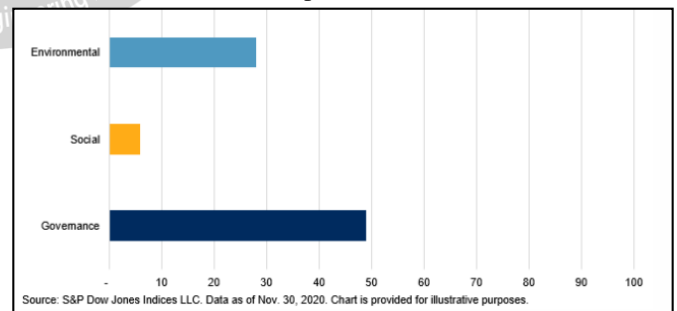


Figure 20 ESG Dimension Scores for Tesla (2020)

## VII. DISCUSSIONS AND CONCLUSIONS

**Based on financial aspect :** It can be concluded that, Tesla's financial performance from 2019 to 2023 reflects its remarkable resilience and strategic agility in the face of dynamic market conditions. The company consistently maintained a strong Gross Profit Margin (GPM), showcasing its ability to control production costs and sustain profitability amidst challenges such as competition and supply chain disruptions. However, the Operating Profit Margin (OPM) exhibited more variability, showing improvement in some years but declining in 2023 due to escalating operational costs. Despite these challenges, Tesla's revenue saw significant growth over the period. Nonetheless, the company's net profit margin (NPM) faced pressures from rising costs and margin constraints, emphasizing the importance of operational discipline and strategic prioritization for long-term profitability.

**Based on global market analysis :** Tesla's global market analysis underscores its leadership position as a premier pure electric vehicle (EV) manufacturer. With a strong presence across North America, Europe, Asia, and growing footholds in Australia & Oceania, Tesla has demonstrated remarkable growth and market penetration. The company's strategic expansion efforts, including the establishment of Gigafactories in key regions like China and upcoming facilities in Europe, highlight its commitment to meeting global demand for sustainable transportation solutions. Despite challenges such as economic fluctuations and political factors in certain regions, Tesla's ability to consistently deliver impressive growth rates in vehicle deliveries reflects its strong consumer appeal and innovative product offerings. As Tesla continues to prioritize innovation, expand its product lineup, and invest in infrastructure, it is poised to maintain its leadership role in shaping the future of the automotive industry and accelerating the transition to sustainable mobility worldwide.

**Based on hypothesis t-testing :** It can be concluded that with a calculated t-statistic of approximately 12.63 and a critical value of  $\pm 2.365$  for  $\alpha = 0.05$  (two-tailed test) and degrees of freedom (df) equal to 7, we *reject the null hypothesis*. This leads us to conclude that there is a *significant difference (Alternative Hypothesis (H1)) in the mean sales of Tesla and BYD during the given period*. The rejection of the null hypothesis suggests that there are notable disparities in sales performance between the two companies, warranting further investigation into the factors contributing to these differences. This conclusion underscores the importance of understanding the unique market dynamics and strategic approaches employed by Tesla and BYD in driving their respective sales outcomes during the specified timeframe.

**Tesla's endeavor to penetrate the Indian EV market** faces formidable challenges such as insufficient charging infrastructure, high import duties, cultural differences, and limited government incentives. Despite India's ambitions for

EV adoption by 2030, domestic automakers like Tata Motors present strong competition with competitive pricing and extensive service networks. Tesla must collaborate closely with Indian authorities to influence favorable regulations and tailor its offerings to meet local consumer preferences. Leveraging its global reputation, Tesla has the potential to drive advancements in India's automotive sector, intensify competition, and accelerate the transition to sustainable mobility. However, overcoming these hurdles requires strategic adaptations and proactive engagement with local stakeholders to establish a meaningful presence in the Indian EV market.

**Based on Environmental Efficacy:** Tesla's commitment to environmental efficacy is evident through its innovative approaches to reducing carbon footprints. By building efficient vehicle factories, prioritizing production and supply chain localization, and integrating renewable energy sources like solar panels into its infrastructure, Tesla minimizes environmental impact while advancing sustainable energy solutions. These efforts not only decrease greenhouse gas emissions but also contribute to mitigating climate change effects. Tesla's holistic approach underscores its dedication to accelerating the global transition to sustainable transportation and energy, marking a significant stride towards a greener future.

## VIII. CONCLUSIONS

The Indian real estate sector is poised for significant growth in the coming years, potentially contributing 10-13% to the country's GDP by 2025. Despite challenges like demonetization, GST implementation, and the impact of COVID-19, recent trends and forecasts indicate positive momentum. Both the residential and commercial office markets are expected to reach new heights by 2025, with sales projected to grow at a compound annual growth rate (CAGR) of 5-10%. The understanding of government regulations among customers and developers has improved, fostering a conducive environment for expansion. It's anticipated that the government will support the real estate sector, recognizing its crucial role in the economy. Regarding retail, while e-commerce has seen significant growth, physical retail remains dominant, comprising around 75% of the industry. Both modes are expected to coexist as consumers prefer them based on mood and convenience. In the long term, India's real estate market holds immense potential, with projections indicating a market size of USD 1 trillion by 2030. Despite past challenges, the sector has attracted significant investment, indicating a promising future and contributing to India's economic growth trajectory.

## REFERENCES

- [1] Aaker, D. A. (1991). *Managing brand equity: Capitalizing on the value of a brand name*. New York: Free Press.

- [2] Adamowicz, E. (2021). Tesla's Electric Vehicle Market Share 2021. EVAdoption. <https://evadoption.com/tesla-market-share/>
- [3] Bai, C., Chen, Z., & Liu, X. (2022). Case Study Research in Tesla (China) Marketing Strategy Application During Covid-19. [Online]. Available from: <https://www.diva-portal.org/smash/get/diva2:1664006/FULLTEXT01.pdf>
- [4] Bangeja, H., & Agarwal, DrV. (2022). Analysing Tesla's \$0 Marketing Strategy. International Journal for Multidisciplinary Research, 4(6).
- [5] Bui, Q. (2020). Tesla's Competitive Advantages in the Global Automotive Market. Medium. <https://medium.com/swlh/teslas-competitive-advantages-in-the-global-automotive-market-5d7e64b5d5f7>
- [6] BloombergNEF. (2021). Electric Vehicle Outlook 2021. BloombergNEF. <https://about.bnef.com/electric-vehicle-outlook/>
- [7] Blanco, S. (2021, January 19). China's EV market in 2020: 10% sales growth, Tesla Model 3 dominates. Green Car Congress. <https://www.greencarcongress.com/2021/01/20210119-china.html>
- [8] Elkington, J. (1994). Towards the sustainable corporation: Win-win-win business strategies for sustainable development. California Management Review, 36(2), 90-100.
- [9] Carroll, A. B. (1991). The pyramid of corporate social responsibility: Toward the moral management of organizational stakeholders. Business Horizons, 34(4), 39-48.
- [10] Cheong, T., Song, SH., & Hu, C. (2019). Strategic Alliance with Competitors in the Electric Vehicle Market: Tesla Motor's Case. Mathematical Problems in Engineering, 2016, 1-10.
- [11] Chen, M. (2021). Tesla China Sales: 2020 vs 2021 YTD (Feb). Tesmanian. <https://www.tesmanian.com/blogs/tesmanian-blog/tesla-china-sales-2020-vs-2021-ytd-feb>
- [12] Chopra, S., & Meindl, P. (2016). Supply chain management: Strategy, planning, and operation. Upper Saddle River, NJ: Pearson.
- [13] Christensen, C. M. (1997). The innovator's dilemma: When new technologies cause great firms to fail. Boston: Harvard Business School Press.
- [14] Digital E. (2018). Tesla - A different kind of marketing machine. Evolving Digital. [Online]. Available from: <https://evolving-digital.com/resources/tesla-marketing-machine/#:~:text=For%20one%2C%20Tesla%20doesn>
- [15] Giles, C. (2021, January 20). Tesla Electric Vehicle Market Share 2020. BloombergNEF. <https://about.bnef.com/electric-vehicle-outlook/>
- [16] Halton, C. (2019) What is Green Economics?, Green Economics, viewed on 9th of May 2020, online: <https://www.investopedia.com/terms/g/greeneconomics.asp>
- [17] Hill, C. W. L. (2018). International business: competing in the global marketplace. New York: McGraw-Hill Education.
- [18] Higgins, T., & Vielkind, J. (2020). Panasonic to End Tesla Partnership That Makes Solar Panels in Buffalo. Wall Street Journal. [Online]. Available from: <https://www.wsj.com/articles/panasonic-to-end-tesla-partnership-that-makes-solar-panels-in-buffalo-11582715607>
- [19] Hofstede, G. (1980). Culture's consequences: International differences in work-related values. Beverly Hills, CA: Sage Publications.
- [20] Hou, X., & Wu, Y. (2020). Internationalization Strategy and Performance: Evidence from Tesla, Inc. Journal of International Commerce and Economics, 2(2), 15-27.
- [21] GlobalData. (2021). Tesla, Inc. - Strategy, SWOT and Corporate Finance Report. GlobalData. <https://www.globaldata.com/store/report/gdau0479fsa--tesla-inc-strategy-swot-and-corporate-finance-report/>
- [22] Kim, S. (2021). Tesla's Profitable Growth Strategy. Medium. <https://medium.com/swlh/teslas-profitable-growth-strategy-c8f55db233a5>
- [23] Khan, R. (2021). A critical analysis of Elon Musk's leadership in Tesla motors. Journal of Global Entrepreneurship Research, 1(1).
- [24] Li, J. (2023). Research on the Marketing Strategy of Tesla Vehicle in China. Advances in Economics, Management and Political Sciences, 4(1), 402-7.
- [25] Li, W., Wang, M., Cheng, X., & Long, R. (2023). The impact of interaction on the adoption of electric vehicles: Mediating role of experience value. Frontiers in Psychology, 14.
- [26] Mangram, ME. (2020). The globalization of Tesla Motors: a strategic marketing plan analysis. Journal of Strategic Marketing, 20(4), 289-312.
- [27] Morgan, B. (2021). 3 Ways Tesla Creates a Personalized Customer Experience. Forbes. [Online]. Available from: <https://www.forbes.com/sites/blakemorgan/2021/05/10>

- /3-ways-tesla-creates-a-personalized-customer-experience/?sh=5ea724e823b3
- [29] Maradin, D., Malnar, A., & Kaštelan, A. (2022). Sustainable and clean energy: the case of tesla company. *Journal of economics, finance and management studies*, 5, 3531-42.
- [30] McKinsey & Company. (2018). How automakers can compete in the future of mobility. McKinsey & Company.
- [31] Muller, H. (2018). *The CEO of technology: lead, reimagine, and reinvent to drive growth and create value in unprecedented times*. Hoboken, New Jersey: John Wiley & Sons, Inc.
- [32] Narver, J. C., & Slater, S. F. (1990). The effect of a market orientation on business profitability. *Journal of Marketing*, 54(4), 20-35.
- [33] O'Connell, B. (2019). Supplier Relationship Management and Supply Chain Risk: A Case Study of Tesla Motors. *Supply Chain Forum: An International Journal*, 20(1), 38-49.
- [34] Porter, M. E. (1986). Competition in global industries. *Harvard Business Review*, 64(4), 73-93.
- [35] Porter, M. E. (1985). *Competitive advantage: creating and sustaining superior performance*. New York: Free Press.
- [36] Radaelli, G., & Viganò, E. (2020). Tesla: A Case Study on Supply Chain Management in the Automotive Industry. *Journal of Competitiveness*, 12(2), 121-134.
- [37] Rojas, F. (2023). Council Post: Eight Digital Marketing Lessons We Can Learn from Tesla. *Forbes*. [Online]. Available from: <https://www.forbes.com/sites/forbesagencycouncil/2023/01/12/eight-digital-marketing-lessons-we-can-learn-from-tesla/?sh=5a17a07748c8>
- [38] Reuters. (2021). Tesla in talks with China's EVE for low-cost battery supply deal: sources. Reuters. <https://www.reuters.com/business/autos-transportation/tesla-talks-with-chinas-eve-low-cost-battery-supply-deal-sources-2021-03-25/>
- [39] Rugman, A. M., & Verbeke, A. (2004). A final word on globalization. *Journal of International Business Studies*, 35(5), 462-464.
- [40] Smith, A. (2019) Electric Car Innovation: How Electric Vehicles are Changing the World, Plug and play, viewed on 17th of May 2020, online: <https://www.plugandplaytechcenter.com/resources/electric-car-innovation-how-electric-vehicles-are-changing-world/>
- [41] Tesla. (2021). Annual Report 2020. [https://www.tesla.com/ns\\_videos/2020-tesla-inc-annual-report.pdf](https://www.tesla.com/ns_videos/2020-tesla-inc-annual-report.pdf)
- [42] Tidd, J., & Bessant, J. (2014). *Managing innovation: Integrating technological, market and organizational change*. Chichester, UK: John Wiley & Sons.
- [43] Wang, Y., Li, J., Li, X., & Li, Y. (2019). The Internationalization Strategy of Tesla, Inc. *Journal of International Business and Law*, 8(2), 46-56.
- [44] Zhou, Z. (2023). Tesla Marketing Analysis. *Academic Journal of Business & Management*, 5(2), 171-7.