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Global Electric Vehicle Products and the Strategy for China's Electric Vehicle Industry: A Case Study of BYD

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ABSTRACT

This study analyses the current state of the US market and demonstrates that BYD's business strategy aligns with global trends in the electric vehicle industry. However, the phasing out of subsidy schemes, high trade tariffs and a shortage of public charging infrastructure may indicate that these key factors are constraining the development of the US electric vehicle industry; hybrid models are attracting greater market attention, and the local supply chain is accelerating domestic restructuring. As evidence suggests that its entire industrial chain has achieved comprehensive vertical integration, the research findings may indicate that BYD has gained significant cost advantages. Furthermore, the company will implement overseas expansion plans tailored to market differences; data may suggest that related businesses such as energy storage and public transport have now become part of its business portfolio. Therefore, Porter's Competitive Strategy can explain that BYD's market choices follow a clear logic: the company emphasises cost leadership in emerging markets, whilst shifting to a differentiation strategy in mature markets. Practical challenges, however, continue to plague the company. Despite these findings, this study recommends a number of improvements to help the company maintain its competitive edge in global markets, including increasing investment in research and development of smart technologies, establishing localised manufacturing bases overseas, and refining its battery recycling system.

KEYWORDS

Electric vehicles; BYD; Vertical integration; International expansion; the US new energy market

1. INTRODUCTION

The global automotive industry is undergoing a profound transition towards electrification, with national industrial policies, trade barriers and infrastructure conditions collectively shaping the development trajectory of the electric vehicle market. As a traditional automotive powerhouse, the United States has seen growth in its domestic electric vehicle market slow due to factors such as the expiry of subsidies, inadequate charging infrastructure and supply chain restructuring, whilst hybrid models have garnered greater market attention. China's new energy vehicle industry has achieved leapfrog development, with BYD emerging as a leading global automaker. The company has continuously expanded its market share through vertical integration across the entire industrial chain, an international footprint and diversification into new energy-related businesses; however, it also faces challenges such as overseas trade restrictions, weak smart technology capabilities and difficulties in breaking into the high-end market. This paper takes BYD as a case study, employing PEST analysis and Porter's generic competitive strategies to analyse its strategic positioning. By combining an examination of industry challenges with recommendations for optimisation, it aims to provide insights for Chinese new energy vehicle manufacturers seeking to compete on the global stage.

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2. ORGANIZATION OF THE TEXT

2.1. Macroeconomic Trends

In 2024, sales surpassed 1.5 million units, with a penetration rate of almost 10%. 2025 saw a slowdown in growth as a result of policy withdrawals.

State and federal policy incentives, such tax credits, are crucial to growth. The market is significantly impacted in the short term by policy changes, such as the credit's September 2025 expiration.

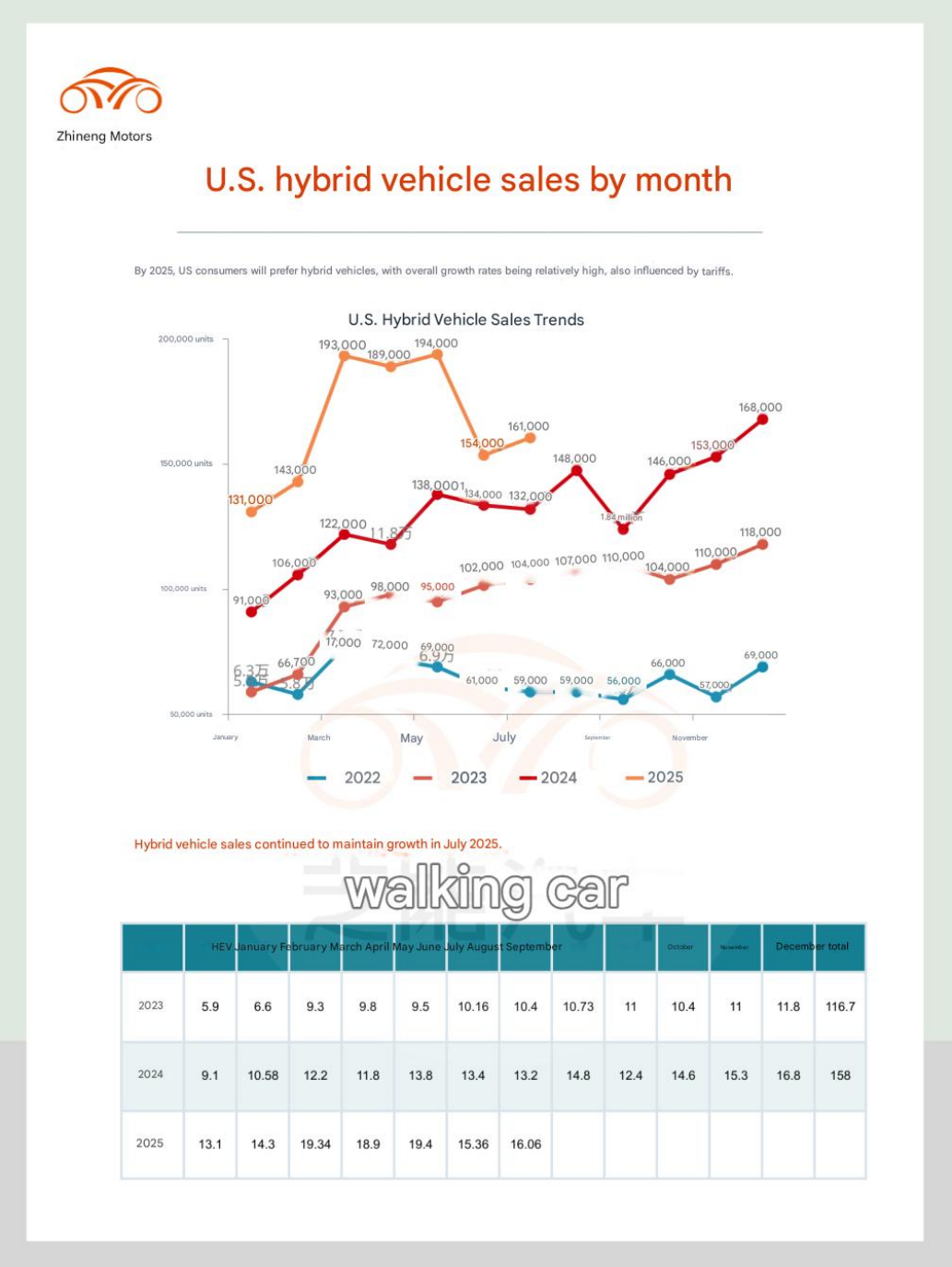
Supply chain localization trend: Supply chains are returning to North America as a result of the Inflation Reduction Act. China is still a net importer of electric vehicles, though. In 2024, sales surpassed 1.5 million units, with a penetration rate of almost 10%. 2025 saw a slowdown in growth as a result of policy withdrawals.



month	pure electric	PHEV	TOGETHER	total amount	Penetration
January 2025	9.4	2.1	13.1	111.1	10.35%
February 2025	9.5	2.2	14.3	122	9.45%
March 2025	11.5	3.78	19.34	159	10%
April 2025	9.8	3.4	18.9	146.3	9%
May 2025	10.2	2.9	19.4	146.6	9%
June 2025	9.37	1.97	15.36	125.4	9%
July 2025					
August 2025					
September 2025					
October 2025					
November 2025					
December 2025					

Figure 1. U.S. Auto sales overview

Growth has slowed significantly, and the market is showing signs of divergence: the market share of pure electric vehicles is projected to hover around 10% in 2025, with weakening growth momentum. Hybrid electric vehicles (HEVs) are performing strongly, with year-on-year growth of nearly 20%. The market is undergoing adjustments following the expiration of the federal tax credit policy at the end of September 2025. The International Energy Agency (IEA) predicts that by 2035, electric vehicle sales in the United States could account for nearly a quarter of total vehicle sales [1].



	HEV January	February	March	April	May	June	July	August	September	October	November	December	total
2023	5.9	6.6	9.3	9.8	9.5	10.16	10.4	10.73	11	10.4	11	11.8	116.7
2024	9.1	10.58	12.2	11.8	13.8	13.4	13.2	14.8	12.4	14.6	15.3	16.8	158
2025	13.1	14.3	19.34	18.9	19.4	15.36	16.06						

Figure 2. U.S. hybird vehicle sales by month

While the average transaction price of new electric vehicles is declining, it is still about $7,611 higher than that of gasoline-powered vehicles. Automakers are offering substantial incentives (up to 17.5% of the vehicle price) to stimulate demand. With decreasing battery costs and mass production, electric vehicles are expected to achieve purchase cost parity with gasoline-powered vehicles in the long run. Their fuel and maintenance cost advantages during the usage phase will become even more pronounced.

The battery supply chain is highly dependent on overseas markets: global battery manufacturing and key component production are heavily concentrated in China. The Inflation Reduction Act aims to promote the localization of the supply chain, but building a complete system will take time. Localization and regional restructuring: Driven by policy and security, battery and vehicle manufacturing capacity is accelerating its shift to North America to establish a more independent and resilient supply chain [1, 2].



Figure 3. The new APT tram

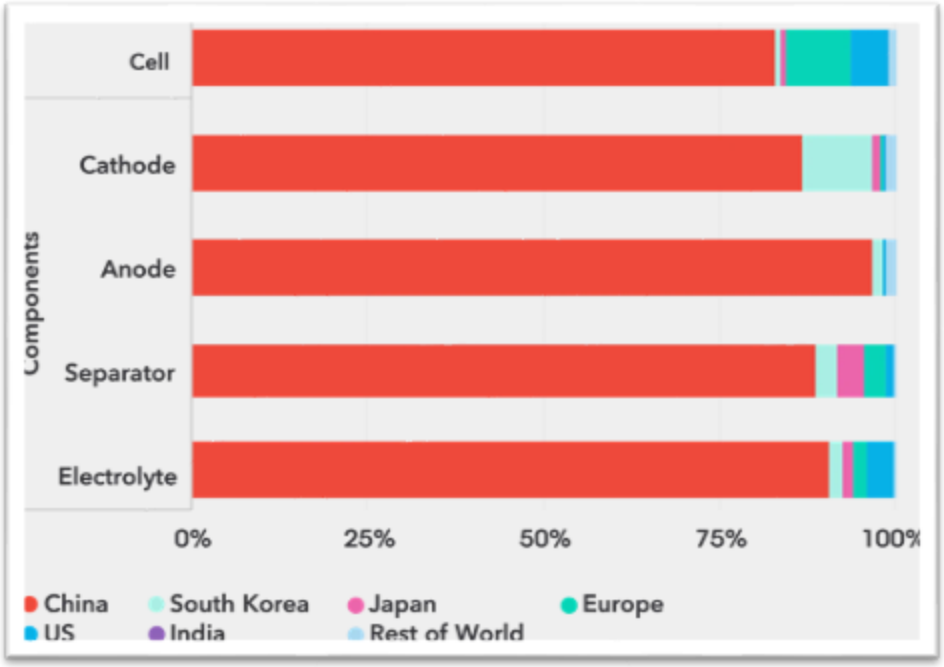


Figure 4. Global battery manufacturing and the production of key components are highly concentrated in China.

2.2. Use Frameworks

2.2.1. Politics

Highly reliant on federal policy: The Inflation Reduction Act strongly stimulated demand and domestic production through tax credits. However, uncertainty remains regarding subsidy policies.

The US electric vehicle market is shrouded in uncertainty stemming from trade tariffs and the termination of incentives.

Emerging markets (such as Thailand and Brazil) are attracting investment through tax incentives. The Thai cabinet recently formally approved a draft law to provide tax breaks for companies investing in large commercial electric vehicles (EVs), further promoting the development of Thailand's new energy vehicle industry [4].

2.2.2. Economy

Citing the need to protect its domestic auto industry, the United States announced higher tariffs on imported Chinese electric vehicles, raising the tariff on electric vehicles from 25% to 100%. American automakers have long worried that the influx of Chinese electric vehicles could bankrupt them. The cost of electric vehicle batteries has fallen dramatically by 90% over the past decade, providing strong support for automakers to narrow the price gap with gasoline-powered vehicles [4].

China is the largest and most mature market, still growing at 29%. The European market is growing steadily, while emerging markets are growing the fastest, but from a low base.

2.2.3. Society

Interest among younger demographics fluctuated: In 2024, the percentage of Gen Z and Gen Y respondents who indicated they were "very likely" to consider purchasing declined. Charging anxiety was the primary obstacle: 52% of potential buyers declined to purchase due to the lack of public charging stations.

Globally leading acceptance; a young and rational consumer base. Core decision-making factors are "safety, cost, and experience." Significant policy impact (74.33% of consumers are affected by policy changes).

The early termination of the $7,500 tax credit is the most direct blow to market demand. This may delay the timeline for electric vehicles to achieve cost parity with gasoline-powered vehicles.

Extremely high tariff barriers have essentially closed the door for Chinese-made vehicles to directly enter the US market. Their primary goal is to protect domestic manufacturing and employment. Tariffs on batteries and key minerals (such as graphite) have forced automakers and suppliers to accelerate the "de-Sinicization" of their supply chains to comply with the localization requirements of the Inflation Reduction Act. [9] However, this has driven up manufacturing costs in the short term, and the construction of domestic supply chains has been slow. Emerging markets attract foreign automakers (especially Chinese) to build factories on their soil by opening their domestic markets and offering tax incentives, driving the industrial chain and generally relying on Chinese investment, technology, affordable models, and battery materials to quickly launch their markets.

2.2.4. Environment

Environmental protection is an important factor, but it is usually closely linked to policy incentives, technological experience, and practicality, rather than being the sole driving force. Mining (lithium, cobalt, nickel) causes ecological damage, [11] water consumption, and human rights concerns. Recycling systems are still underdeveloped, and economic viability and scalability remain challenges.

Possessing the world's most advanced and convenient public charging network effectively alleviates range anxiety and provides strong support for market development. In 2024, more than two-thirds of the world's newly added charging piles were located in China; 79% of Chinese users believe that public charging is becoming increasingly convenient.

2.2.5. Technology

China has established global scale and cost advantages in the three core components of electric vehicles (battery, motor, and electronic control). Mainstream models have a range of around 600

kilometers, and space and efficiency are continuously optimized through technologies such as cell-to-pack (CTP) and cell-to-chassis (CTC).

Cutting-edge research and development, and proactive innovation: The United States possesses groundbreaking technologies such as 24M ETOP, which can significantly improve energy density. Solid-state batteries are moving from the laboratory to commercialization.

According to the 2024 U.S. Electric Vehicle Consideration Research Report: 1. Generation Z and Generation Y consumers' "very likely" consideration to purchase electric vehicles has declined: The lack of affordable electric models has affected the two youngest consumer groups, Generation Z and Generation Y. "Very likely" consideration has dropped by 2 and 5 percentage points respectively compared with the same period last year. Among consumers who say they are "unlikely" or "very unlikely" to consider buying an electric car, inadequate charging infrastructure remains a stumbling block to mainstream consumers' EV purchases, and it's getting worse: 52% cited lack of availability of public chargers as a key reason for their decision.

Cumulative global public chargers:

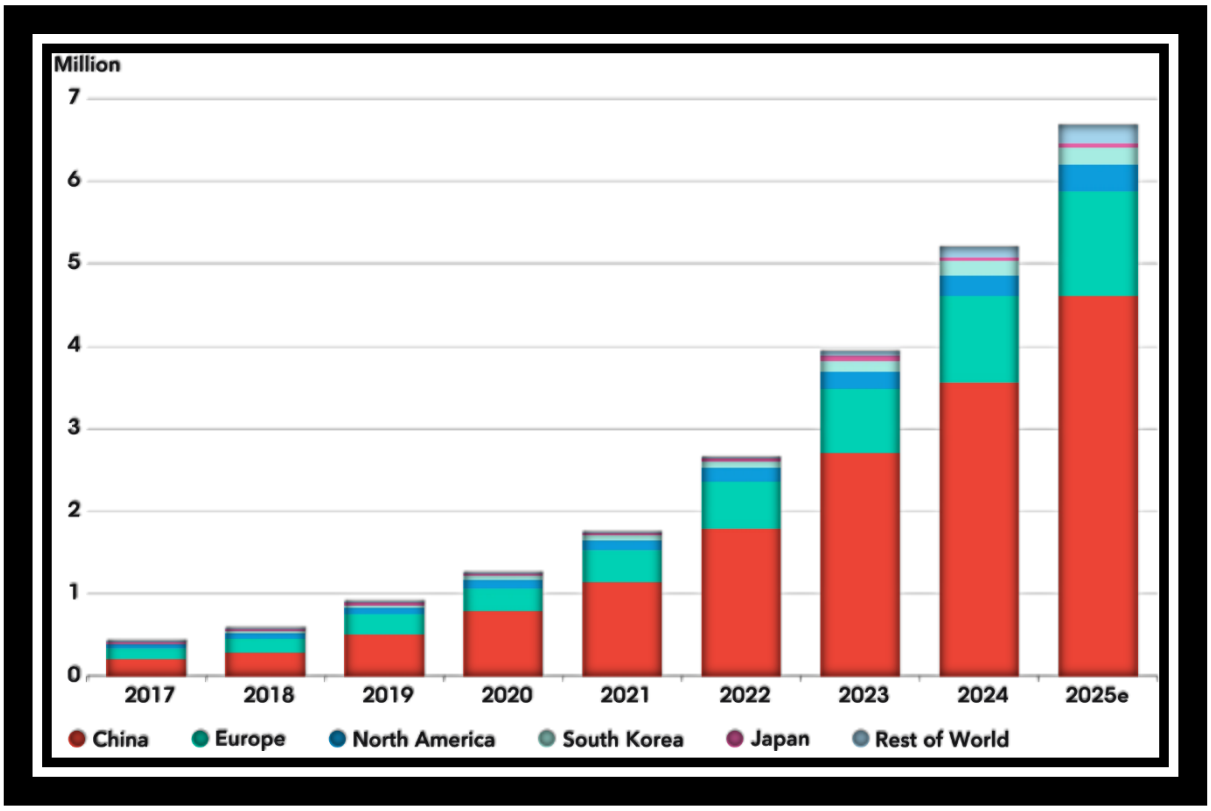


Figure 5. Cumulative global public chargers

The total amount is insufficient, the distribution is uneven, and fast charging is lagging behind: there are more than 200,000 public chargers, but they face problems such as differences between urban and rural areas and the slow construction of fast charging networks (especially ultra-fast charging). Construction speed and technical level: China's public charging network is the largest in the world, and ultra-fast charging technology has been put into use, making charging convenience far superior to that of the United States [13].

Competition among existing competitors:

The US electric vehicle industry is characterized by a dominant player and several strong competitors. Tesla reigns supreme in the US electric vehicle market, while GM, Ford, and Hyundai are fiercely competing in terms of models, pricing, and smart technology.

Competition among existing competitors:

The industry has extremely high capital and technological barriers, but it faces two types of potential entrants: one is traditional technology giants (such as Apple) crossing over into the field, and the other is Chinese automakers (such as BYD) penetrating through non-tariff means.

Threat of alternatives:

Other electrified vehicle types: Hybrid vehicles. Energy-saving solutions that don't require charging: a perfect fit for consumers with charging anxiety and price sensitivity. [1] In May 2025, sales surged 39.6% year-on-year, with Toyota alone contributing over 44% of those sales.

Suppliers' bargaining power:

Concentration of core resources and geopolitical risks: The mining and processing of key battery minerals (lithium, cobalt, nickel) are highly concentrated in a few countries, with China dominating the global processing sector. [11] This dependence amplifies geopolitical risks and supply chain vulnerabilities, granting upstream suppliers (or resource-rich countries) extremely strong bargaining power.

The U.S. electric vehicle industry presents a pattern of one strong and many strong. Tesla relies on its first-mover advantage and vertical integration to temporarily lead in terms of brand, technology, cost, etc. General Motors and Ford are accelerating their transformation and launching electric platforms and new models. Rivian and Lucid focus on high-end or niche markets [4].

There are other threats. On the one hand, technology companies with capital and software capabilities may cross borders; on the other hand, Chinese electric vehicle manufacturers with the most cost advantages, although hindered by high tariffs, may enter the North American market by building factories elsewhere, posing a long-term strategic threat.

Hybrid vehicles can significantly reduce fuel consumption without changing users' refueling habits, and solve consumers' multiple concerns about insufficient charging infrastructure, battery life and car purchase costs. It is an upgrade option for fuel vehicles.

Buyer's bargaining power:

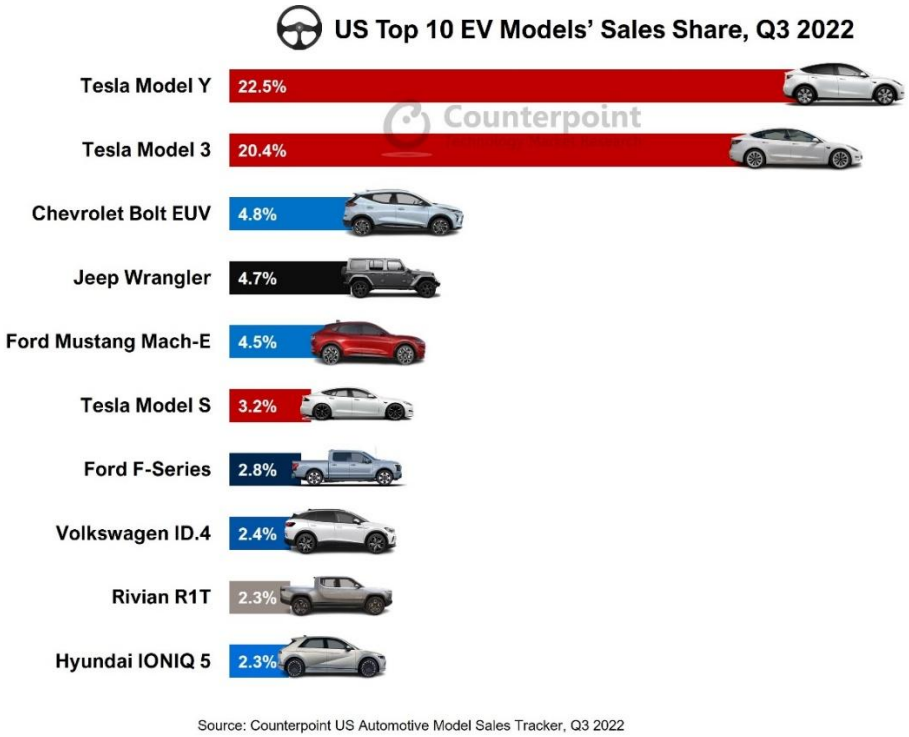


Figure 6. U.S. top10 EV model's sales share, Q3 2022

Consumers are extremely price-sensitive, and the expiration of the $7,500 federal tax credit for electric vehicles on September 30th directly led to a more than 25% plunge in EV sales in October [21].

From Tesla, GM, and Ford to Rivian, Lucid, and international brands like Hyundai and Kia, the market offers an unprecedented abundance of choices. Consumers are no longer faced with an "all or nothing" mentality. Furthermore, the halo effect of brands is weakening; for example, the controversial behavior of Tesla's CEO has been proven to have directly led to the loss of some customers and a decline in sales.

The market structure has changed, and the market is no longer controlled only by Tesla, it turns into a more competitive market with many different brands; buyers will look at roughly three different car brands on average before they make purchase decisions, and this phenomenon shows that single brands can no longer easily keep their users locked in; at the same time, risks related to brand reputation become more obvious, and this situation pushes enterprises to take more careful actions to protect their brand image so that they can keep existing customers. For most consumers in the United States, electric cars are not essential goods, hybrid cars become more and more popular because these vehicles can completely solve worries about charging and pressure brought by high prices [1]; besides, traditional fuel cars still keep strengths in total usage cost, convenient operation and second-hand resale value, these substitute products give consumers another available choice, and such options greatly raise consumers' ability to bargain.

2.3. Current and Future Development Trends

At the present stage: The United States stays in the leading position of research and development work, and it uses advanced technologies such as 24M ETOP to greatly raise battery energy density, solid-state battery research is transferring from laboratory testing to commercial application [25];

Looking ahead: Multiple technical routes will become the normal state of the industry, hybrid cars and pure electric cars will coexist for a long period and occupy a large market proportion before infrastructure and economic problems get fully solved; industry prediction data shows that all electrified vehicles including hybrids may account for 25% of the whole market by 2025 [1];

The federal government offers a tax subsidy of 7,500 US dollars, and this policy will stop taking effect at the end of September 2025, many people regard this policy expiry as one direct factor for slow market growth, analysts forecast that the market share of electric vehicles may drop down from its highest level once the subsidy is cancelled; charging worries still exist for car buyers, the public charging network does not spread evenly and fast charging points are not enough, this problem influences the purchase willingness of consumers who live away from city centres.

Meanwhile, tariff policies aimed at protecting domestic industries have hindered the entry of more cost-competitive Chinese models, such as those from BYD, preventing American consumers from enjoying more affordable products.

2.4. Discuss Global Shifts Over The Next 15 Years That May Affect United States Automotive Sector

From "globalization" to "multipolarity," the single market is split into regional markets with distinct regulations, such as those in North America, Europe, China, and the "Global South." Market fragmentation and strategic complexity: It is no longer feasible to rely on "one car to sell globally," and distinct strategies must be developed for each market. striking a balance between rapidly expanding but thin-margin emerging markets (Global South) and profitable established markets (North America, Europe). Hybrid and pure electric power will become commonplace. [1] A new business model will result from the integration of the electrification platform, which offers the finest carrier for intelligence.

The global software-defined automotive market is expected to grow to US$3.4 trillion by 2035. By then, almost all new cars will be developed based on software architecture and can be continuously optimized through over-the-air upgrades [17].

Electrification is the foundation and not the end: pure electric and hybrid will become mainstream. The electrification platform provides the best carrier for intelligence, and the integration of the two will give rise to a new business model.

2.5. Include an Overview of Major EV Companies and Their Strategies

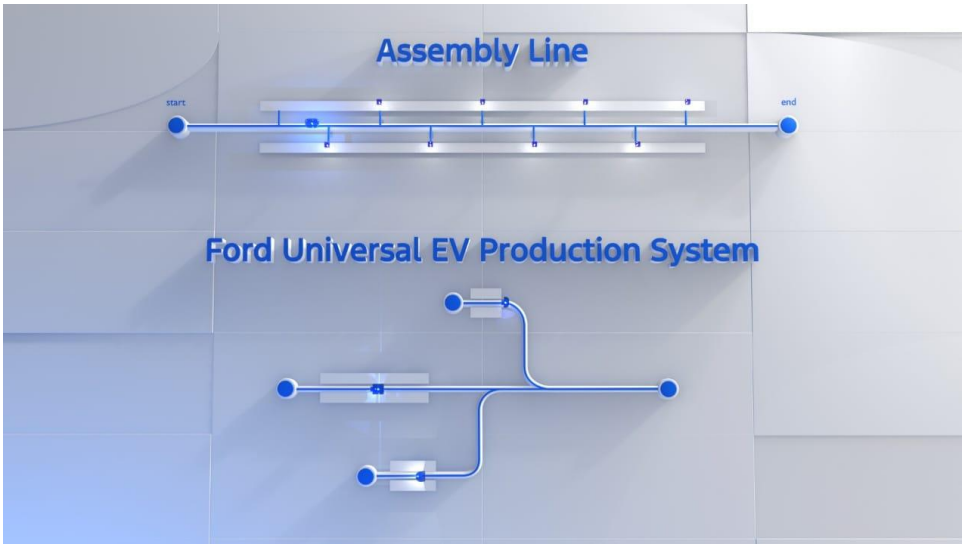


Figure 7. Assembly Line and Ford Universal EV production system

Tesla is shifting its strategic focus from car manufacturing to AI, Robotaxi (autonomous taxis), and energy businesses, leading the way with its ecosystem. Simultaneously, it is addressing market competition through price reductions and plans for lower-cost models [27].

Ford is revolutionizing manufacturing, focusing on affordability. It has invested $5 billion to launch a new GM electric vehicle platform and a "tree-like" production system. [9] The goal is to significantly reduce complexity and efficiently produce affordable vehicles for the masses.

Ford's automobile manufacturing revolution and cost breakthrough: Through innovative platforms and production systems (such as the Universal EV platform and "tree-like" assembly lines), Ford aims to launch an affordable electric pickup truck priced at about US$30,000. 1. Invest approximately US$5 billion to upgrade factories and battery production.

The new platform aims to reduce parts and improve efficiency to reduce costs and selling prices.

Use lithium iron phosphate battery technology to control costs.

Although Tesla faces market pressure, its core strategy is to rely on software, FSD (fully autonomous driving) and energy ecology to establish long-term advantages. 1. Prioritize production and delivery in the United States before federal tax credits expire.

Facing growth pressure, it is necessary to launch more affordable next-generation models to stimulate demand.

2.6. Evaluate BYD's Corporate Strategy By Analysing How The Following Elements Shape Its Strategic Positioning

a. Its vertical integration across the value chain, from battery production to end products.

b. Its international expansion strategy.

c. Its diversification into related sectors (e.g., energy storage, public transport, electronics).

① Reshaping Core Competitiveness: BYD can gain a structural cost advantage ranging from 15% to 20% through vertical integration, and this advantage offers key backing for the firm's strategy to boost sales volume and expand market reach by adjusting product prices;

Upstream, BYD owns shares in lithium mines to reach a 40% self-supply rate, and it also makes strategic arrangements for cathode material production, which keeps its lithium carbonate costs 30% below regular market prices, and weakens the negative influence caused by raw material price hikes;

Midstream, the subsidiaries under BYD Group independently design and manufacture core parts including blade batteries, IGBT/SiC chips and eight-in-one electric drive systems, blade batteries carry 30% to 40% lower costs than the average level of the whole industry [28], the cost of its IGBT/SiC chips is merely 44% of the cost of Infineon's related products, and the eight-in-one electric drive helps the company cut 15% of expenses when compared with purchasing these parts externally, so BYD can turn the spending on buying key components into internal earnings;

Downstream, BYD applies CTB battery-body integration technology and 9,000-ton die-casting technology, these two technologies can simplify the vehicle production steps, and they bring an extra 20% drop in the manufacturing cost for each finished car.

Such cost strengths made BYD carry out price competition within the mainstream new energy vehicle market with a price range of 100,000 to 200,000 RMB, and the company took market share from traditional fuel vehicles and other competing brands at a fast speed, BYD achieved total sales of over 4.6 million vehicles by 2025, and this result secured its leading position across the whole world, which matches its strategic goal to enter the large consumer market.

② BYD's overseas business expansion shows that the firm's strategy is more than just selling finished products abroad, and it builds a complete system that combines product manufacturing, technology sharing, local production ability and multiple actions to lift its brand value; the firm carries out well-planned layout in different regions, it moves step by step from developing markets to developed markets, and shifts from mass sales to high-end brand positioning, so it widens the scope of its global strategy. In addition, this growth in business scale can help the brand get rid of restrictions from China's domestic market, and strengthen BYD's status as a top global maker of new energy vehicles. The domestic new energy vehicle market has seen its adoption rate go above 40%, and its growth speed starts to drop, so overseas expansion can become the main driving force for BYD to keep expanding its sales scale.

Meanwhile, the business layout covers more than 70 countries and areas around the world. In 2025, BYD sold 1.2 million vehicles in overseas markets [35], these overseas sales took up 26 percent of its total vehicle sales, with a year-on-year increase higher than 50 percent. For this reason, its regional strategy focuses mainly on developing markets where new energy vehicles are not widely used and policy support is available, including Southeast Asia, South America and the Middle East such as Thailand and Brazil, and the firm tries to grab market share quickly and raise its brand recognition [32].

Even so, BYD's local production plants in Thailand and Brazil have started production, and its factory in Europe is still being built; the local production proportion can hit 80 percent, this condition helps the company avoid import tax barriers, cut transportation costs and make its car prices more competitive in foreign markets. For this reason, the firm aims to reach 17 percent of the global market

share in 2025, and it can beat Tesla to take the leading place in this industry, to fully release its room for further growth.

③ Related diversification approaches show BYD is greatly broadening its main strategic ranges, and the firm changes its original image as a regular car manufacturer to become a large enterprise running a full new energy business system; BYD does not adopt unrelated diversification for its business layout, instead, it uses the related diversification mode, this mode relies on basic battery technology, and it extends to many important sectors including energy storage, public transport equipment like electric buses, forklifts and rail transit [33], electronic goods and solar power generation, alongside other connected industries. All of these business activities centre on the core idea of new energy, they build a framework with shared technology, ecological cooperation and resource complementation, and this structure widens the company's business boundaries in all aspects.

Besides, the development trend of chip technology tells us that vehicle-level IGBT/SiC chips can also be adapted for energy storage converter chips and electronic equipment chips, and applying chips across many different usage scenarios raises the use rate of chip production capacity; different business lines can share core technologies including batteries, motors, electronic control systems and chips, and the firm can finish research and development work once and reuse the results in multiple application cases, this method lowers research expenses and lifts the efficiency of technology development.

2.7. Using Porter's Generic Strategies Framework, Analyse BYD's Competitive Positioning. How Does BYD Balance Cost Leadership, Differentiation, And Focus Strategies Across Its International Operations? Finally, Critically Assess Whether BYD's Focus on Sustainability Currently Enables Meaningful Differentiation in the Global Market And Evaluate Whether This Advantage is Likely To Persist In The Long Term

(1) Keeping the supply chain stable: Shifting from "passive reliance" to "active management", and supporting the business goal of "global layout plus stable operation"

Vertical integration removes the risk that outside suppliers may restrict its business, and it forms the basic protection for BYD's global market expansion; when the worldwide chip shortage took place in 2022, BYD owned its production ability for self-developed IGBT chips, so it was the only major car company that kept its production running, while traditional car makers cut their output by 30%-50%, and new industry participants had their delivery waiting time stretched to 6 to 12 months; BYD can produce key parts including batteries and motors by itself, this situation prevents production changes brought by trade limits and broken supply links in the process of global expansion, and it offers basic support for the company to enter more than 70 countries and regions.

This feature sets BYD apart from traditional car manufacturers and new industry participants that depend on outside supply networks.

(2) Differentiation Strategy: Technology plus Ecosystem plus Brand, Creating Hard-to-Replace Competitive Barriers [38]

Besides, differentiated operation acts as the central source of BYD's strong competitive strengths, the firm is able to make use of its special technical features, complete business ecosystem and tiered brand setup, this condition shows that BYD has stepped out of internal price competition, and it realizes the upgrade from cost superiority to value superiority;

Technological Differentiation: Self-research on core technologies, forming patent protection barriers

The differentiated technical strength comes from technologies researched by the company itself, blade batteries provide better safety performance, DM-i/p hybrid systems bring balanced driving range, e-

platform 3.0 achieves high-efficiency component integration, and cloud connection supports smart vehicle control, these items together form BYD's exclusive technical marks.

(3) Regional Market Strategy Balance: Differentiated Adaptation and Precise Execution:

① Emerging Markets (Southeast Asia, South America, Middle East, Africa): Cost Priority + Targeted Cost Strategy

Strategic Core: BYD takes advantage of the cost benefits brought by vertical integration, it targets the mainstream consumer market, and it quickly occupies markets where new energy vehicles are not widely popular by providing products with good value for money;

Implementation Strategy:

Products: The company exports Dynasty and Ocean product lines, and these cars are priced between 100,000 and 250,000 RMB, it mainly develops DM-i plug-in hybrid versions, and it creates unique selling points with low fuel use, long driving range and affordable prices; BYD sets up local manufacturing lines in Thailand and Brazil, and the local production proportion can reach 80%, this setup helps the company skip import taxes which range from 10% to 30% in Southeast Asia, cut delivery expenses and further improve its cost strengths [32];

Key Focus: BYD chooses markets where new energy vehicle adoption is lower than 10%, including Thailand, Indonesia and Brazil, it stays away from intense competition inside mature markets, and it builds up its market share at a fast speed, the brand has obtained 25% market share in Thailand and holds the top position in this local market [37].

② Mature Markets (Europe, Australia, and parts of North America): Differentiated Strategy + Targeted Differentiated Strategy

Strategic Core: BYD concentrates on technical and ecological distinction, it aims at high-end markets and areas with strict environmental rules, and it uses its strengths in safety, low carbon emission and leading technology to gain higher product prices;

Implementation Strategy:

Products: The firm releases two premium brand lines, Denza with prices from 300,000 to 600,000 RMB and Yangwang whose price starts at one million RMB, these products mainly use pure electric systems, cloud-controlled chassis and blade batteries, and they highlight the ideas of safety, smart functions and luxury experience, and they compete against brands like Mercedes-Benz, BMW and Tesla;

Technology: BYD exports blade batteries and energy storage related technology, it works together with local energy enterprises [10], such as joining European energy storage projects, and this action improves its brand image of green technology to form unique market features;

Market Positioning: BYD targets European nations that carry out strict carbon border tax and carbon neutrality policies including Germany and Norway, it focuses on the high-end new energy vehicle market which takes up 30 percent of Europe's whole new energy vehicle market, and it prevents itself from price competition by using differentiated product features.

(4) Long-Term Sustainability Assessment:

Carbon Emissions across the Value Chain: At present, the environmentally friendly features of electric cars are mostly shown during the period when customers use the vehicles, regulators and buyers will place greater focus on the total carbon footprint covering the whole product life cycle in the future, this range includes battery raw material extraction and the application of clean energy during manufacturing work [33]; BYD has to make sure its large supply chain built by vertical integration satisfies strict environmental requirements in every single stage of operation.

2.8. Based on Your Analysis Of BYD's Current Situation and the Emerging Challenges in the Global Automotive Industry, Provide Strategic Recommendations for BYD To Sustain and Enhance Its Competitive Advantage

(1) Core Strengths

Whole-value-chain Vertical Integration: BYD can supply more than 80 percent of its key parts by itself, the blade battery and IGBT chip costs sit 30%-40% below the average level of the industry, and the firm gains a structural cost edge of 15%-20% [39];

Self-directed Research Advantages: The company's total spending on research and development has gone beyond 220 billion RMB, and it owns more than 48,000 patents, technologies such as blade batteries and DM-i hybrid systems are one to two generations more advanced than most products in this sector [44];

Obvious Scale Benefits: BYD's worldwide vehicle sales are expected to surpass 4.6 million units in 2025, and it will keep its status as the global top seller [45], the utilization rate of its production capacity hits 78.3%, and the fixed costs for research and manufacturing get cut greatly.

(2) Main Weaknesses

Slow progress in intelligent technology: BYD puts limited funds into the research of automatic driving and smart vehicle cabins, and the firm falls behind rivals including Tesla and XPeng, the market share of its intelligent driving systems stays below 5%;

Barriers in high-end market: Consumers do not easily accept BYD's products priced over 300,000 RMB, the global brand premium of BYD and Denza cannot match Mercedes-Benz, BMW and Tesla, and its market share in high-end segment is less than 5%;

Falling operational performance: The number of days for inventory turnover rises from 60 days to 79 days, and this figure is higher than the industry average of 70 days, the company's net cash flow from daily business drops by almost 30% compared with the previous year.

(3) New challenges facing the industry

Intensified competition: Traditional automakers (Volkswagen, Toyota) are accelerating their electrification transformation, while emerging companies (XPeng, Li Auto) are focusing on showcasing their intelligent advantages, and the competitive landscape is shifting from price wars to value wars;

A stricter policy environment: The long-term nature of global carbon neutrality policies is increasingly valued, but rising trade protectionism, the EU carbon border tax, and the US Inflation Control Act have all increased compliance costs [46];

(4) Increased R&D investment and resource allocation

The proportion of R&D investment in intelligent driving can be increased from the current 8% to 20%, which means that more than RMB 10 billion annually could be concentrated in three main areas: L4 autonomous driving, intelligent cockpit operating systems, and automotive-grade AI chips. In addition, three intelligent driving R&D centers can be established in Silicon Valley, Munich, and Shanghai. [47] These centers can also attract top talent from companies such as Tesla and Waymo to build an intelligent driving team of more than 5,000 people. Simultaneously, collaborations with companies like Nvidia, Mobileye, and Baidu can provide support in chips and algorithms. Nevertheless, maintaining independent R&D of core technologies is crucial to avoid being "held hostage."

(5) Accelerate Production Localization: Shifting from "Commodity Export" to "Industry Export"

Capacity Layout: Factories in Hungary and Brazil will commence production in 2026, factories in Germany and Indonesia in 2027, and factories in Mexico and Malaysia in 2028, reaching a global capacity of 8 million vehicles [48].

Supply Chain Localization: Establish parts supply parks near overseas factories to attract Chinese suppliers to expand into overseas markets. Simultaneously, collaborate with local suppliers to increase the localization rate to over 80%, circumventing trade barriers.

Localized R&D: Establish R&D centers in Europe and the United States to develop products that meet local market demands (e.g., the European market focuses on range and safety, while the US market focuses on power and intelligence).

Energy Scenarios: Construct a closed-loop system of "power generation-energy storage-consumption" through photovoltaic power generation + energy storage + charging networks. It is projected that the global energy storage market share will exceed 25% by 2030.

Recycling solutions: Increasing the utilization rate of used batteries to 80% and the metal recycling rate to 99.5%, forming a "resource-production-regeneration" cycle, and reducing raw material costs by more than 30%.

3. CONCLUSION

The global automotive industry is gradually moving towards electrification, with national industrial policies, trade barriers and infrastructure conditions collectively influencing the development of the electric vehicle market. As a traditional automotive powerhouse, the United States has seen growth in its new energy vehicle market begin to slow; the termination of subsidy schemes, inadequate charging infrastructure and supply chain restructuring are all constraining the industry's progress, whilst hybrid models are attracting greater consumer attention in the process. This paper takes BYD as a case study, utilising PEST analysis and Porter's generic competitive strategies to examine the company's market positioning. By addressing existing industry challenges, it offers recommendations for improvement, with the aim of providing guidance to domestic new energy vehicle manufacturers competing on the international stage.

BYD has established a competitive foundation through independent production across the entire industrial chain, expansion into overseas markets and a diversified business portfolio. The company has secured significant cost advantages through vertical supply chain management and tailors its business strategies to different overseas regions; in less developed markets, it emphasises cost advantages, whilst in mature markets it pursues a path of differentiation. Related businesses such as energy storage and public transport enable the company to share technological achievements and mitigate various risks associated with diversified operations. Despite these favourable conditions, BYD still faces numerous practical challenges: its intelligent vehicle technology lags behind that of some competitors; its premium brand has achieved only limited market recognition; and international trade regulations have added compliance pressures to its overseas operations.

To maintain its competitive position in the global market, BYD needs to increase investment in the research and development of smart technologies, establish localised production bases overseas, and continuously refine its comprehensive battery recycling mechanism. In the future, the global automotive market will evolve into multiple regional segments, with pure-electric and hybrid models coexisting for the long term. Domestic new energy vehicle manufacturers cannot simply replicate their domestic development experience; instead, they must adapt their products and operational approaches to local conditions, transforming their supply chain advantages into sustainable market competitiveness.

REFERENCES

[1] The Paper. (2025). The US electric vehicle industry faces policy support cutoff, with its future shrouded in uncertainty. Retrieved December 11, 2025, from https://www.thepaper.cn/newsDetail_forward_31394591

[2] Automotive Electronics Design. (2025). In the first half of 2025, Tesla's share price in the US new energy vehicle market is projected to decline by 10%. Retrieved December 11, 2025, from https://www.ednchina.com/technews/35234.html

[3] Sigma Earth. (2025). Best electric vehicle incentives in each state by 2025. Retrieved December 11, 2025, from https://sigmaearth.com/zh

[4] Economic and Commercial Section, Embassy of the People's Republic of China in the Kingdom of Thailand. (2025). Thai Cabinet approves tax incentives for investment in electric vehicles. Retrieved December 11, 2025, from https://th.mofcom.gov.cn/zcfg/qtfg/art/2025/art_f2d5598afa4446be9132da4513ca4da1.html?f_link_type=f_linkinlinenote&flow_extra=eyJpbmxpbmVfZGlzcGxheV9wb3NpdGlvbiI6MCwiZG9jX3Bvc2l0aW9uIjowLCJkb2NfaWQiOiI2OTMxMzE1ZjIzYTA1NDFlLWVjNWU3ZDljYTA2Yzg4YjQifQ%3D%3D

[5] Car Market Insights. (2024). Can trade protection policies protect the U.S. electric vehicle industry? Retrieved December 11, 2025, from https://www.36kr.com/p/2786804234553093

[6] Huxiu. (2025). Tesla decides to change its way of life. Retrieved December 11, 2025, from https://www.huxiu.com/article/4815849.html

[7] Ford Motor Company Media Center. (2025). Focusing on innovation and efficiency, Ford invests another $5 billion in electric vehicles, launching an innovative new electric vehicle platform, electric vehicle production process, and an all-electric pickup truck. Retrieved December 11, 2025, from https://media.ford.com/content/fordmedia/fap/cn/zh_cn/news/2025/08/universal-ev.html

[8] Deheng Law Firm. (2022). The U.S. Inflation Reduction Act and its impact on the new energy vehicle industry. Retrieved December 12, 2025, from https://www.dehenglaw.com/CN/tansuocontent/0008/026259/7.aspx?MID=0902

[9] Ford HQ. (2025). Ford's $5 billion investment in the US: a new electric vehicle platform, assembly processes and a mid-size pick-up truck that combine innovation and efficiency. Retrieved December 12, 2025, from https://www.fromtheroad.ford.com/us/en/articles/2025/ford-affordable-electric-vehicle-platform-midsize-electric-truck

[10] International Energy Agency. (2025). Global electric vehicle outlook 2025. Retrieved December 12, 2025, from https://www.iea.org/reports/global-ev-outlook-2025

[11] Roland Berger. (2024). Connectivity and software-defined vehicles. Retrieved December 12, 2025, from https://www.rolandberger.com/en/Insights/Publications/Connectivity-and-software-defined-vehicles.html

[12] Shanghai Intelligence Service Platform. (2025). Current status and challenges of the US electric vehicle industry. Retrieved December 12, 2025, from https://www.istis.sh.cn/cmsnews/article/79/27431

[13] Zhihu. (2024). Official release! Full text of the International Energy Agency (IEA) report 'Recycling of Critical Minerals' now available. Retrieved December 12, 2025, from https://zhuanlan.zhihu.com/p/11581320470

[14] Zhihu. (2022). Special research report on the new energy vehicle industry: A special analysis of new energy vehicles in the United States. Retrieved December 12, 2025, from https://zhuanlan.zhihu.com/p/460342333

[15] Core Language. (2025). International Energy Agency (IEA): Global Electric Vehicle Outlook 2025. Retrieved December 12, 2025, from https://www.eet-china.com/mp/a420498.html

[16] BloombergNEF. (2026). Electric vehicle outlook 2026. Retrieved December 12, 2025, from https://assets.bbhub.io/professional/sites/44/EVO2026-Executive-Summary

[17] Roland Berger. (2024, October 30). Automotive 2040: Connectivity and software-defined vehicles [Industry report]. Retrieved December 12, 2025, from https://www.rolandberger.com/en/Insights/Publications/Connectivity-and-software-defined-vehicles.html

[18] Shanghai Intelligence Service Platform. (2025). IEA releases "Global Electric Vehicle Vision 2025": Global market shows diversification. Retrieved December 12, 2025, from https://www.istis.sh.cn/cms/news/article/79/27614

[19] ICCT. (2025). Record electric vehicle sales indicate U.S. demand—are U.S. automakers delivering or retreating? Retrieved December 12, 2025, from https://theicct.org/record-electric-vehicle-sales-show-american-demand-will-us-automakers-deliver-or-retreat-nov25/

[20] Ministry of Commerce of the People's Republic of China. (2025). The Thai cabinet approved tax incentives for electric vehicle investments. Retrieved December 12, 2025, from https://th.mofcom.gov.cn/zcfg/qtfg/art/2025/art_f2d5598afa4446be9132da4513ca4da1.html

[21] China Economic Net. (2025). The market share of electrified vehicles in the United States may reach 25% by 2025. Retrieved December 12, 2025, from http://auto.ce.cn/auto/gundong/202501/08/t20250108_39259859.shtml

[22] Mordor Intelligence. (2025). Electric vehicle powertrain market size and share analysis - Growth trends and forecasts (2025–2030). Retrieved December 12, 2025, from https://www.mordorintelligence.com/zh-CN/industry-reports/electric-vehicle-powertrain-market

[23] BloombergNEF. (2025). Electric vehicle outlook for 2025. Retrieved December 12, 2025, from https://about.bnef.com/insights/clean-transport/electric-vehicle-outlook

[24] BBC News Chinese. (2025). How the US gradually fell behind in the global electric vehicle race. Retrieved December 12, 2025, from https://www.bbc.com/zhongwen/articles/c04q6nq7qkzo/trad

[25] 199IT. (2025). The US electric vehicle market share will fall below 4% by September 2025. Retrieved December 12, 2025, from https://www.199it.com/archives/1783087.html

[26] Sina Finance. (2025). Revolutionary breakthrough! 24M Technologies launches ETOP technology, making a 50% increase in electric vehicle range a reality. Retrieved December 12, 2025, from https://finance.sina.com.cn/roll/2025-09-25/doc-infrsnht5792260.shtml

[27] Xcar. (2026). Global automotive market outlook for 2026: Do you agree with these changes? Retrieved January 30, 2026, from https://aikahao.xcar.com.cn/item/3734780.html

[28] Sina Finance. (2026). How can CATL, which earns 200 million yuan daily, fend off BYD's competitive edge? Retrieved January 30, 2026, from https://finance.sina.com.cn

[29] Core Language. (2026). Top 10 trends and investment strategies in the automotive industry in 2026. Retrieved January 30, 2026, from https://www.eet-china.com/mp/a466583.html

[30] International Energy Agency. (2025). Global EV outlook 2025. Retrieved January 30, 2026, from https://www.iea.org/reports/global-ev-outlook-2025

[31] McKinsey & Company. (2026). The automotive software and electronics market through 2035. Retrieved January 30, 2026, from https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/mapping-the-automotive-software-and-electronics-landscape

[32] China Daily Website. (2026). BYD Thailand has delivered over 130,000 vehicles in total, with continuous deepening of localized manufacturing and product layout. Retrieved January 30, 2026, from https://cn.chinadaily.com.cn/

[33] China EV100. (2025). China's new energy vehicle industry development report (2025). Retrieved January 30, 2026, from https://www.chinaev100.com/focus/detail/1820

[34] Kesarwani, A., Wagh, S., & Chaudhary, R. (2025). A study on the current state of EV scenario at global level using Mike Porter's five force analysis. Cosmos Multidisciplinary Research E-Journal, 2(12), 1–12. Retrieved January 30, 2026, from https://www.cmrj.in/23-Dec-004-Kesarwani-wagh-chaudhary.pdf

[35] BYD. (2026). BYD officially joins the International Automotive Task Force (IATF). Retrieved December 30, 2025, from https://www.bydglobal.com/cn/news/

[36] BYD. (2025). BYD's Q3 2025 financial report and full-year production and sales report. Retrieved January 30, 2026, from https://www.byd.com/cn/investor-relations/announcements

[37] Ming's Value Investing. (2025). BYD in-depth research investment report: Leading the way with an ecosystem closed loop, forging a global energy technology giant. Retrieved January 30, 2026, from https://xueqiu.com/1290568231/365765032

[38] BYD. (2023). 2023 BYD social responsibility report. Retrieved January 30, 2026, from https://www.bydglobal.com/material/__CN/

[39] Securities Times Website. (2026). Business headlines No.119 | BYD seeks new technological dividends. Retrieved January 30, 2026, from https://stcn.com/article/detail/3740053.html?f_link_type=f_linkinlinenote&flow_extra=eyJkb2NfaWQiOiI5MmJmODdlNjM0ZGJlYjU3LTYzOWMyYmFmMjg0Njk5ODciLCJpbmxpbmVfZGlzcGxheV9wb3NpdGlvbiI6MCwiZG9jX3Bvc2l0aW9uIjowfQ%3D%3D

[40] National Development and Reform Commission. (2025). Green transformation plan for public transportation. Retrieved January 30, 2026, from https://www.ndrc.gov.cn/fggz/fzzlgh/gjjzxgh/202506/t20250601_1302487.html

[41] Knights Discuss the Way. (2026). Breaking the ice in China-Europe tram trade: A win-win solution amidst the wave of unilateralism. Retrieved January 30, 2026, from https://www.toutiao.com/group/7600177458347868714/

[42] Eastmoney.com. (2026). BYD's solid-state battery technology is leading, and its mass production timeline is clear [Industry analysis]. Retrieved January 30, 2026, from https://caifuhao.eastmoney.com/news/20260130191035336548710

[43] CITIC Securities. (2025). Analysis of BYD's diversification strategy 2025 [Brokerage research report]. Retrieved January 30, 2026, from https://www.cs.ecitic.com/research/

[44] Securities Times Website. (2026). BYD reported a net profit of 32.62 billion yuan in 2025, with R&D investment reaching 63.4 billion yuan. Retrieved January 30, 2026, from https://stcn.com/article/detail/3706667.html?f_link_type=f_linkinlinenote&flow_extra=eyJkb2NfcG9zaXRpb24iO

jAsImRvY19pZCI6IjU4MTljNjJlODkzYWM1M2QtMGJkZDg0YjhiMDA5YWQxMSIsImlubGluZV9kaXNwbGlzcGxheV9wb3NpdGlvbiI6MCwiZG9jX3Bvc2l0aW9uIjowfQ%3D%3D

[45] Shanghai Securities News. (2026). BYD's revenue in 2025 surpassed 800 billion yuan, and its annual sales ranked among the top five globally for the first time. Retrieved January 30, 2026, from https://www.cnstock.com/commonDetail/658760?f_link_type=f_linkinlinenote&flow_extra=eyJpbmxpbmVfZGlzcGxheV9wb3NpdGlvbiI6MCwiZG9jX3Bvc2l0aW9uIjowLCJkb2NfaWQiOiI1Nzg3ZmMwZmUxYTY2ZjhhLWZlMGUwMzllODIyMWY2N2UifQ%3D%3D

[46] Deloitte. (2026). CBAM in automotive: When the cost of imports is felt in every bolt. Retrieved January 30, 2026, from https://www.deloitte.com/cz-sk/en/Industries/automotive/blogs/cbam-in-automotive.html

[47] BYD. (2026). BYD becomes world's first automaker to pledge full damage coverage for both intelligent parking and urban NOA. Retrieved January 31, 2026, from https://www.byd.com/us/news-list/BYD-Becomes-World%E2%80%99s-First-Automaker-to-Pledge-Full-Damage-Coverage-for-Both-Intelligent-Parking-and-Urban-NOA?f_link_type=f_linkinlinenote&flow_extra=eyJpbmxpbmVfZGlzcGxheV9wb3NpdGlvbiI6MCwiZG9jX3Bvc2l0aW9uIjowLCJkb2NfaWQiOiI5YzMzMzBhMDRiNzdhMDZjLWIxOWM1ZjFhNWQwY2Q5NjMifQ%3D%3D

[48] Sina Tech. (2026). A breakdown of BYD's profit figures: Where did the money go under pressure? Retrieved January 31, 2026, from https://finance.sina.com.cn/tech/roll/2026-04-02/doc-inhtcnfx9417281.shtml?f_link_type=f_linkinlinenote&flow_extra=eyJpbmxpbmVfZGlzcGxheV9wb3NpdGlvbiI6MCwiZG9jX3Bvc2l0aW9uIjowLCJkb2NfaWQiOiI0YjRmMThmMWU0NTgzNDcxLTc0NTRhN2VmMGZmYzhjYmEifQ%3D%3D