



Development of the Global Electric Vehicle Market: The Role of China, the United States, and the European Union

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ABSTRACT :

The article explores the role of trade and industrial policies in shaping the development of the global electric vehicle (EV) market between 2021 and 2025, with particular emphasis on China, the United States, and the European Union. The rapid expansion of electric mobility, increasing international competition, and the growing use of protectionist measures have significantly transformed global automotive trade. The study aims to identify how government regulations, financial incentives, import tariffs, and domestic production requirements influence electric vehicle sales, international trade flows, and the competitive positions of major automotive markets.

The research applies comparative analysis, statistical evaluation, and a systematic approach to examining the relationship between government policies and market developments. The findings indicate that China's leading position in the global EV industry is supported by extensive industrial development programs, manufacturing capacity, integrated supply chains, and export-oriented strategies. In contrast, the United States prioritizes domestic manufacturing and the development of regional supply chains through tax incentives and localization requirements. The European Union pursues a combined approach, promoting the transition to electric mobility while introducing trade defense measures to address competitive pressures from imported electric vehicles.

The study highlights that differences in national trade policies influence not only the geographical distribution of EV sales but also investment decisions, production strategies, and international supply chain development. The findings suggest that the future competitiveness of electric vehicle manufacturers will increasingly depend on their ability to adapt to changing regulatory environments, optimize cross-border operations, and respond to shifts in global trade conditions.

Keywords: electric vehicles, international automotive trade, China, trade policy, international competitiveness, supply chains, import tariffs, industrial policy.

Problem Statement

The global electric vehicle (EV) market is developing rapidly, shaped by the trade policies of three major economic hubs: China, the United States, and the European Union. While government subsidies and demand-side incentives played a primary role during the industry's early stages, the period from 2024 to 2025 has seen increasing emphasis on tariff restrictions, the protection of domestic manufacturing, and the development of national supply chains. According to international research, global EV sales increased from 6.6 million units in 2021 to more than 20 million units in 2025, reflecting sustained growth in the global electric vehicle market [1–4, 21]. This trend underscores the growing significance of the electric vehicle sector within the global economy and international trade.

At the same time, the market's evolution depends not only on technological innovation, environmental goals, and consumer demand but also on government regulation. China, the US, and the EU employ diverse mechanisms—ranging from producer support and tariff protection to tax incentives and the localization of production—that influence pricing, export volumes, international competition, and the geographic distribution of EV sales. Examining these processes is essential for understanding current shifts in the global automotive industry.

Analysis of Recent Research and Publications

In contemporary Ukrainian academic research, increasing attention is being paid to the economic, environmental, and trade-related aspects of the development of the electric vehicle market.

O. Stetsiuk, R. Lozynskyi, O. Skliarska, and H. Labinska examine the development of electromobility in European countries, emphasizing the importance of state support and the institutional environment [12]. S. Kharin, Yu. Papizh, and S. Korovin view electric vehicles as a significant factor in the decarbonization and transformation of the global economy [15]. O. Dovhal analyzes international experience in stimulating demand for electric vehicles through tax incentives, subsidies, and other public policy instruments [13].

M. Shuba investigates international trade and investment in the electric vehicle sector, using Ukraine and Poland as case studies, with a focus on the integration of these countries into European production and trade chains [14].

Among international researchers, W. Zhang compares the public policies of China and the United States, highlighting the differences between the large-scale support provided to Chinese manufacturers and the localization model characteristic of the U.S. market [17]. A. L. Cheng, E. R. H. Fuchs, and J. J. Michalek explore the impact of U.S. industrial policy on battery manufacturing development, costs, and supply chain resilience [16].

S. Yan and Z. Liao analyze shifts in trade relations between China and Europe, as well as the impact of trade barriers on the automotive industry [18]. R. Zaino et al. summarize the technological, environmental, and political factors driving the development of electromobility [19]. A study by the International Monetary Fund examines the potential economic implications of EU trade restrictions on Chinese electric vehicles [20].

Despite a significant body of academic literature, the comprehensive impact of the trade policies of China, the US, and the EU on international competition, export geography, and the structure of global electric vehicle sales remains insufficiently explored. This underscores the need for further comparative analysis.

Objective of the Article

The objective of this article is to examine the impact of the trade policies of China, the United States, and the European Union on the development of the global electric vehicle (EV) market during the 2021–2025 period.

Particular attention is paid to the analysis of tariff restrictions, government subsidies, tax incentives, local production requirements, and environmental standards. The study aims to determine how these instruments influence the international competitiveness of manufacturers, export volumes, sales structures, and the formation of global supply chains for electric vehicles.

Research Methods

To achieve this objective, a combination of general scientific and specialized research methods was employed.

Systems analysis was used to examine the global electric vehicle market as a component of international automotive trade, the development of which depends on technological, economic, and regulatory factors.

Comparative analysis was utilized to identify the specific features of the trade policies of China, the United States, and the EU. Specifically, the study examines government support for manufacturers in China, localization requirements in the United States, and the application of countervailing duties and environmental standards within the European Union.

Statistical and structural-dynamic analysis was applied to assess changes in global electric vehicle sales from 2021 to 2025, the distribution of market shares among leading nations, and the interrelationships between trade restrictions, government incentives, and international trade flows. The method of scientific generalization was used to systematize the results of Ukrainian and foreign studies regarding the impact of state regulation, trade protectionism, and international competition on the development of the electric vehicle industry.

Presentation of Key Research Findings

Between 2021 and 2025, the global electric vehicle (EV) market demonstrated a high rate of development. According to the International Energy Agency (IEA), global sales exceeded 10 million units in 2022, approached 14 million in 2023, and surpassed 17 million in 2024. In the first half of 2025, approximately 9.1 million electric vehicles were sold—an increase of 28% compared to the same period in the previous year. Global electric vehicle sales exceeded 20 million units in 2025, continuing the market's expansion [21].

This trend (Fig. 1) indicates sustained market growth, driven by technological advancements, environmental priorities, and active government support. At the same time, trade policy is increasingly influencing international competition by shaping market access conditions, the development of production capabilities, and the structure of global supply chains.

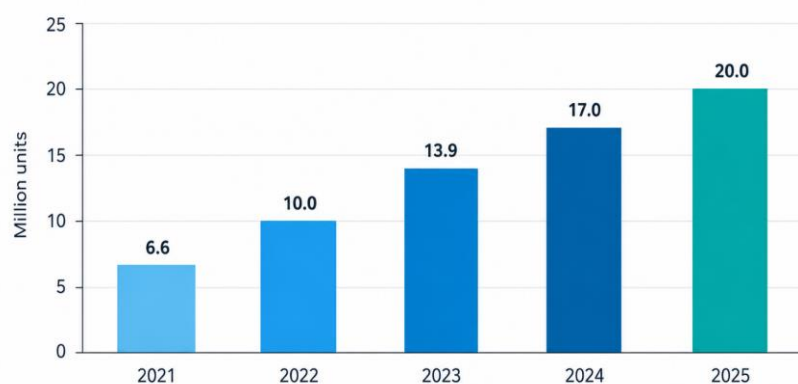
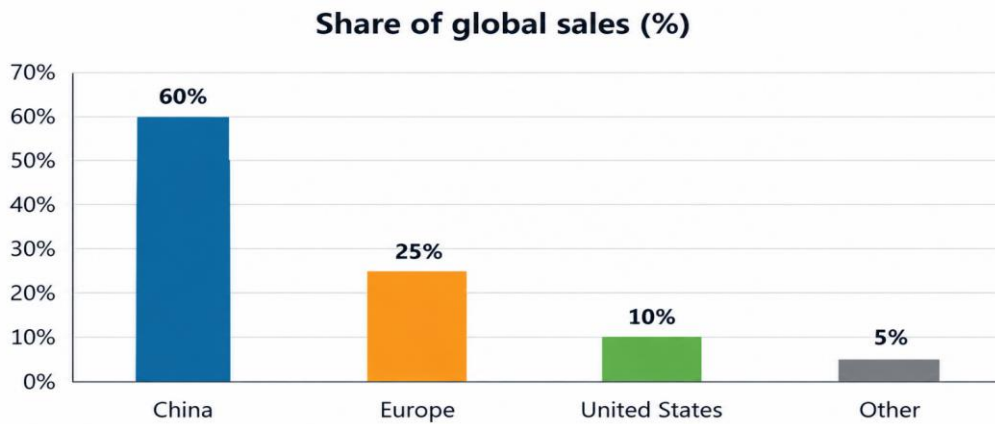


Fig. 1. Dynamics of global electric vehicle sales, 2021–2025.

China plays a leading role in the development of the global electric vehicle market. According to IEA estimates, over 11 million electric vehicles were sold in the country in 2024, with their share of new car sales approaching 50%. By comparison, electric vehicle sales in Europe remained relatively stable in 2024, accounting for a market share of approximately 20%. In the United States, the market continued to grow, though at a significantly slower pace than in China [4].

Fig. 2. Regional structure of global electric vehicle sales in 2023 [3].



This structure indicates that global demand is concentrated in three major markets: China, Europe, and the United States. At the same time, differences in the public policies of these economic hubs significantly influence the development of the automotive industry and international trade.

A comparative analysis shows that China, the USA, and the EU employ different approaches to regulating the electric vehicle market (Table 1). China focuses on supporting production, stimulating domestic demand, and developing exports. The USA prioritizes the localization of production, attracting investment, and protecting its domestic market. The European Union combines environmental regulation with trade defense instruments.

Table 1. Comparison of the trade policies of China, the USA, and the EU regarding the electric vehicle market, 2021–2025.

Jurisdiction	Key Policy Instruments (2021–2025)	Impact on EV Sales
European Union (EU)	CO ₂ emission standards for new vehicles; target of a 100% reduction in emissions from new cars by 2035; definitive countervailing duties of 7.8–35.3% on Chinese battery electric vehicles (BEVs) introduced in 2024; greater flexibility in meeting emission targets for 2025–2027 introduced in 2025.	Accelerates the electrification of vehicle fleets in the EU while reducing price competition from Chinese imports. However, trade restrictions may increase the cost of affordable EV models for consumers.
United States (US)	Inflation Reduction Act (IRA) tax credits of up to USD 7,500; final vehicle assembly requirements in North America; battery component and critical mineral sourcing requirements; restrictions related to Foreign Entities of Concern (FEOC); 100% tariffs on Chinese EVs introduced in 2024.	Encourages domestic manufacturing and investment in battery supply chains. Reduces import dependence but limits access to lower-cost imported EV models.
China	Vehicle purchase tax exemptions for new energy vehicles (NEVs) in 2024–2025 (up to CNY 30,000); a 50% tax reduction for 2026–2027; vehicle trade-in subsidies introduced in 2024; long-term industrial support and expansion of manufacturing capacity.	Maintains EV affordability, stimulates domestic demand, and enables Chinese manufacturers to expand exports through economies of scale.

Source: developed by the author [6–11].

Between 2021 and 2025, European Union policy focused on reducing CO₂ emissions and supporting European automakers. Regulation (EU) 2023/851 tightened emission standards for new vehicles, thereby incentivizing the development of electric transport [7].

Concurrently, in 2024, the EU introduced countervailing duties on imports of Chinese-made electric vehicles. Specifically, additional rates were set at 17.0% for BYD, 18.8% for Geely, 35.3% for SAIC, 7.8% for Tesla (Shanghai), and 20.7% for other companies that cooperated with the European Commission during the investigation [6]. While these measures are intended to protect European manufacturers from subsidized imports, they may also lead to higher costs for certain electric vehicle models.

US trade policy is characterized by the active promotion of domestic production and the restriction of imports. The Inflation Reduction Act (IRA) provides tax credits of up to \$7,500 for electric vehicles that meet specific requirements regarding their place of assembly, as well as the origin of their battery components and critical minerals [9]. Furthermore, in 2024, the US increased tariffs on Chinese electric vehicles to 100% [8].

These measures foster the development of American manufacturing capacity and encourage investment in local supply chains. At the same time, high trade barriers limit the access of Chinese manufacturers to the U.S. market and reduce competition in the affordable electric vehicle (EV) segment. China's development model for the electric vehicle industry is based on a combination of state support for manufacturers, demand stimulation, and the expansion of export opportunities. In 2024–2025, buyers of new electric vehicles were eligible for an exemption from the vehicle purchase tax, capped at 30,000 yuan. For 2026–2027, a 50% reduction in this tax is planned, with a maximum benefit of 15,000 yuan [10].

An additional support mechanism was the vehicle fleet renewal (trade-in) program, which, in 2024, provided subsidies for the purchase of new electric vehicles, contingent upon the scrapping of older vehicles [11].

The combination of government incentives, large-scale production, advancements in battery technology, and efficient supply chains has secured China a leading position in the global electric vehicle market. Chinese manufacturers have gained the ability to offer competitive vehicles in both domestic and international markets.

The outcomes of these various state policy models are reflected in the data on the production, exports, imports, and domestic sales of electric vehicles in 2024 (Table 2).

Table 2. Key indicators of international trade in electric vehicles in 2024

Market / Jurisdiction	Key Trade Indicators (2024)	Implications for Global Competition
China	Over 11 million EVs sold domestically; more than 70% of global EV production; approximately 1.25 million EVs exported, accounting for nearly 40% of global EV exports.	China holds a leading position due to its manufacturing scale, competitive pricing, and production efficiency. It plays a major role in shaping global EV prices and technological development.
European Union (EU)	Approximately 2.4 million EVs produced; around 830,000 EVs exported and 680,000 imported; approximately 60% of EV imports originated from China.	The EU has a strong manufacturing base but faces increasing competition in the affordable EV segment. This strengthens the rationale for trade protection measures.
United States / North America	The US imported approximately 630,000 EVs and exported fewer than 200,000. Mexico was a net exporter to the US, supplying approximately 145,000 EVs.	The regional market is being reshaped by the localization of supply chains. Its competitive strategy relies more heavily on industrial policy than on export dominance.

Source: Developed by the author [4].

According to available estimates, the volume of international trade in electric vehicles (EVs) grew by nearly 20% in 2024, reaching approximately 3.2 million units. China accounted for over 70% of global EV production and about 40% of global EV exports. At the same time, the country remained the largest market for electric vehicles.

Thus, China influences the global automotive market simultaneously as a leading producer, exporter, and consumer of electric vehicles. Significant production capacity, technological advancement, and extensive supply chains underpin the competitive advantages of Chinese automotive companies. In 2024, the European Union produced approximately 2.4 million electric vehicles, exported about 830,000 units, and imported around 680,000 units. Notably, about 60% of these imports originated from China. This underscores the significant role of Chinese manufacturers in the European market and explains the EU's move toward stronger trade protection measures.

In the United States, EV imports reached approximately 630,000 units in 2024, while exports did not exceed 200,000 vehicles. Mexico has emerged as a key supplier to the U.S. market, indicating the gradual development of regional production and logistics chains within North America.

Consequently, the trade policies of major economies have a complex impact on the development of the global electric vehicle market. Government subsidies, tax incentives, and environmental standards stimulate demand and attract investment. At the same time, import duties, localization requirements, and trade restrictions can increase the cost of electric vehicles, limit international competition, and alter the direction of trade flows.

As a result, the global electric vehicle market is gradually transitioning from a phase of rapid sales growth to one of intensified international competition for production capacity, technologies, investments, and supply chains.

These trends persisted in 2025, when global electric vehicle sales exceeded 20 million units [21]. The future development of the industry will depend not only on technological progress and demand but also on the ability of manufacturers to adapt to shifts in trade policy, regulatory requirements, and international competition.

Conclusions

Global electric vehicle sales increased from 6.6 million units in 2021 to more than 20 million units in 2025, demonstrating sustained market expansion despite growing trade restrictions and international competition [1; 21].

It was found that the trade policies of China, the United States and the European Union significantly affect the development of the global electric vehicle market. China, thanks to state support, large-scale production and stimulation of domestic demand, has taken leading positions in the production, export and sales of electric vehicles. The United States focuses on the localization of production, the development of national supply chains and the protection

of the domestic market. The European Union combines environmental requirements with trade restrictions aimed at supporting the competitiveness of European automakers.

It was determined that the main instruments of trade policy influence are import duties, state subsidies, tax incentives and requirements for localization of production. Their application affects the cost of electric vehicles, the international competitiveness of manufacturers, the geography of exports and the development of global supply chains.

An analysis of scientific publications has shown the need for a comprehensive study of the relationship between the trade policies of leading economies and changes in the global electric vehicle market. The comparison made it possible to determine the features of three models of state regulation and their impact on international automotive trade.

Further development of the global electric vehicle market will depend on a combination of state support, openness of international trade, technological development and availability of battery components. Maintaining a competitive environment will contribute to the expansion of the market, while strengthening trade barriers may lead to price increases and uneven development of the electric vehicle industry in different regions of the world.

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