

Impact of New Energy Vehicle Support Policies on Industrial Upgrading and Corporate Development: Evidence from BYD

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Abstract. Nations around the world are actively advancing carbon neutrality targets, and electrification has turned into an unavoidable trend reshaping the entire global auto sector. To achieve carbon peaking and carbon neutrality goals, China has introduced a complete set of supporting measures for new energy vehicles (NEVs), which has greatly accelerated the expansion of its domestic NEV market. This study selects BYD as the research object and combines policy text analysis with a qualitative single-case study. It identifies three distinct development phases of China's NEV support policies, and explores how phased policy tools affect domestic auto consumption markets in practice. By observing industrial upgrades and the growth path of individual enterprises driven by policy benefits, this paper evaluates the real outcomes brought by various NEV support schemes. From the analysis, relevant policies can effectively lift consumer demand in the terminal market, encourage carmakers to invest more in independent technical research, and speed up the low-carbon transformation of traditional auto manufacturers. Benefiting from years of continuous policy support, BYD has continuously increased its production and sales volumes and has established a comprehensive sales and production network both domestically and internationally. However, the domestic NEV sector still faces significant structural deficiencies: many automakers rely excessively on government subsidies, while market-oriented operational systems remain underdeveloped. This paper also states its own deficiencies, including limited research samples and insufficient quantitative data support. The conclusions drawn here can offer practical references for authorities to adjust industrial policies, and help domestic self-owned NEV brands achieve steady, high-quality development in the long run.

Keywords: New energy support policies, New energy passenger vehicles, BYD, Automotive industrial upgrading, Dual-credit regulation

1. Introduction

Global energy landscapes have undergone dramatic shifts amid worldwide carbon neutrality initiatives [1]. Mounting crude oil shortages and severe vehicle exhaust pollution have compelled the traditional automotive sector to pursue low-carbon transitions, making electrification a universally recognized development priority [1]. To advance China's dual-carbon goals, optimize industrial energy consumption and upgrade traditional manufacturing, central authorities have rolled

out a full set of targeted incentive policies covering purchase subsidies, dual-credit rules, charging infrastructure and industrial standards [2]. Driven by these layered policies, domestic new energy vehicle (NEV) consumption has expanded steadily [3]. As a landmark domestic independent brand, BYD has transformed from a battery and fuel car OEM manufacturer into a global NEV leader over the past decade, with its explosive growth closely tied to phased policy dividends released by the government. Accordingly, this paper adopts BYD as a typical single-case sample to explore the practical influences of China's phased NEV incentive policies.

Existing domestic and overseas research mostly adopts macro industrial statistics and econometric models to verify policy effectiveness, focusing on aggregate industrial changes while neglecting micro corporate responses [4]. Few scholars systematically examine the interactive links between policy iteration, industrial evolution, and corporate strategic adjustments, which leaves an evident research gap [5]. This study combines policy text sorting and qualitative single-case analysis to examine how stage-based policies reshape industrial transformation, technological innovation and market competition, alongside BYD's adaptive development strategies. Theoretically, it supplements micro-case studies on NEV policy effects [5]; practically, its findings deliver actionable references for authorities to refine industrial policies and help domestic brands reduce their reliance on subsidies and achieve sustainable, market-oriented growth.

2. Evolution stages of China's new energy vehicle support policies

2.1. Stage 1: germination and cultivation period (dominated by fiscal subsidies)

In the initial development stage of China's new energy vehicle industry, the overall industrial foundation was relatively weak. The core battery technology was immature, product types were single, vehicle cruising performance was limited, and the after-sales supporting service system was not perfect. At that time, ordinary consumers had low recognition of new energy vehicles, and the market sales scale was extremely limited. In order to cultivate the emerging industry from scratch, the government used fiscal subsidies as the core policy tool at this stage [6].

The central government formulated tiered subsidy criteria based on core technical indicators, including cruising range and battery energy density. Through direct financial subsidies to automobile manufacturers and end consumers, the policy effectively reduced purchase costs for consumers and greatly stimulated consumer willingness to purchase electric vehicles. At the same time, fiscal subsidy policies also guided traditional automobile enterprises to increase investment in independent research and development of new energy technologies, promoted the initial upgrading of domestic industrial chains for power batteries and motor control, and laid a solid foundation for the initial development of the new energy vehicle industry [6]. In general, the policy orientation of this stage was mainly demand-side stimulation, focusing on expanding market scale and cultivating industrial awareness.

2.2. Stage 2: optimization and adjustment period (centered on the dual-credit regulation)

With the continuous development of the industry, the technical level of new energy vehicle products improved continuously, product diversity increased significantly, and consumers' acceptance of electric vehicles grew markedly. The market gradually moved away from complete policy dependence and began to show some independent market vitality. In order to avoid long-term single financial intervention leading to enterprise inertia and insufficient independent innovation

motivation, the state began to gradually reduce financial purchase subsidies year by year and entered the stage of policy optimization and adjustment [7].

In this process, the dual-credit regulation policy has officially become the core supervision tool of the domestic automobile industry. The policy set strict credit assessment standards for traditional fuel vehicle manufacturers and new energy vehicle producers. Automobile enterprises must complete the corresponding new energy credit indicators within the specified time, otherwise they will face market penalties such as credit purchase and production restriction [8]. This rigid institutional constraint has effectively forced a large number of traditional fuel vehicle enterprises to actively deploy new energy vehicle businesses, accelerated the industrial transformation of traditional automobile manufacturers, and promoted the overall structural upgrading of China's automobile industry. Unlike the direct financial incentive in the initial stage, this stage relied on market-oriented institutional tools to force industrial upgrading, which greatly improved the industry's operational capability.

2.3. Stage 3: high-quality market-oriented development period

After long-term policy cultivation and market accumulation, China's new energy vehicle industry has completed the initial scale expansion and entered a new stage of high-quality market-oriented development. The core logic of policy formulation has undergone fundamental changes. The government no longer takes simple market expansion as the main goal, but focuses more on optimizing the industrial structure, breaking through technical bottlenecks and expanding overseas market space [2, 7].

At this stage, terminal consumer purchase subsidies were largely withdrawn from the market. The policy focus has shifted to the research and development and breakthroughs in core technologies such as vehicle chips, power battery materials, and intelligent driving systems. The state has issued a number of industrial supporting policies focusing on industrial chain optimization, supporting leading enterprises to carry out technological innovation and industrial upgrading. At the same time, the country has actively launched export incentive policies such as vehicle export tax rebates and international trade cooperation support, encouraging outstanding domestic new energy vehicle brands to go global and participate in international market competition.

Through continuous policy improvement, China's new energy vehicle industry has formed a long-term and stable market-oriented development system, effecting the transformation from policy-driven growth to endogenous market-driven growth, thereby greatly enhancing the overall competitiveness and sustainable development capacity of the industry.

2.4. Changing logic of policy orientation across three stages

The three-stage evolution of new energy vehicle policies reflects a progressive and scientific industrial cultivation logic. In the initial stage of the emerging industry, the government adopted demand-side fiscal stimulus to quickly activate the market and complete the initial cultivation of the industry. In the middle stage of industrial growth, market-oriented regulatory policies were used to standardize industrial development and force enterprises to carry out technological transformation and upgrading. In the mature stage of industrial development, supply-side structural optimization policies were adopted to break through technical bottlenecks and expand international market space [6, 7].

On the whole, the policy system has gradually weakened direct administrative intervention and financial subsidies, while continuously strengthening market-oriented guidance and institutional

constraints. This progressive policy adjustment mode is highly compatible with the growth law of emerging industries, and effectively promotes the stable and healthy development of China's new energy vehicle industry.

3. Policy-driven development of China's NEV industry and BYD's practical experience

3.1. General development status of domestic NEV market

Driven by long-term policy guidance and market demand, China's new energy vehicle industry has achieved remarkable development achievements. The annual output and sales volume of domestic new energy vehicles continue to reach new highs, while the market penetration rate has risen year by year, making new energy vehicles one of the mainstream travel options for domestic consumers [3]. With the continuous improvement of public low-carbon environmental awareness, more and more family users choose new energy vehicles for daily commuting and travel, forming stable and lasting market consumption demand.

To meet increasingly diversified consumer demand, major automakers have continuously enriched product lines and upgraded vehicle intelligence, comfort, and safety configurations. At the same time, the domestic new energy vehicle supporting industrial chain has been continuously improved. The upstream and downstream industrial clusters of power batteries, drive motors and vehicle control systems have gradually taken shape, and the industrial supporting capacity has been greatly improved, providing strong industrial support for the rapid expansion of the new energy vehicle market [2]. At present, China's new energy vehicle industry has completely moved away from the extensive growth model that relied solely on policy subsidies in its early stage, and has formed a sound development model driven by both policy guidance and market demand [7].

3.2. How policies promote BYD's industrial transformation and technical innovation

As a core beneficiary and practitioner of domestic new energy vehicle industrial policies, BYD has achieved comprehensive industrial transformation and technological upgrading under the guidance of multi-stage policy dividends. Supported by national industrial incentive policies, BYD has continuously increased annual R&D investment, focusing on the independent research and development of core technologies such as power batteries and hybrid power systems. After years of technical accumulation, BYD has successfully developed industry-leading core technologies such as blade batteries and DM-i super hybrid systems, achieving iterative upgrades of vehicle products and continuous breakthroughs in overall vehicle performance [4, 5].

In addition, the policy of loosening purchase restrictions and regional NEV subsidy policies have effectively boosted the domestic consumer market for household vehicles, greatly expanding BYD's market sales scale in the civilian vehicle field [8]. In strict accordance with the national strategic deployment of automobile industrial transformation, BYD took the lead in completely stopping the production and sales of traditional fuel vehicles, abandoning the traditional fuel vehicle OEM business, and concentrating all enterprise resources on the research, development, production and sales of new energy vehicles. This thorough industrial transformation enabled BYD to firmly occupy the leading position in the domestic new energy vehicle market and laid a solid foundation for subsequent global market layout.

3.3. Export incentive policies and BYD's global market layout

In order to help China's new energy vehicle brands break through international trade barriers and expand overseas markets, the state has issued a series of export support policies such as complete vehicle export tax rebates and cross-border economic and trade cooperation incentives. These policy measures effectively reduce the overseas operational costs of domestic automakers and create a favorable policy environment for Chinese NEVs to enter the global market [9].

Leveraging national export policy benefits, BYD has actively pursued global market expansion in recent years. The enterprise adopts the development mode of overseas localized factory construction and in-depth cooperation with local dealers, continuously expands overseas sales channels and market coverage, and steadily increases overseas market share. Alongside its own surging overseas sales performance, BYD has lifted the global influence and competitiveness of all Chinese independent NEV brands and greatly accelerated the internationalization of China's automotive sector [6, 10, 11].

4. Evaluation of policy implementation effects, existing problems and optimization advice

4.1. Positive impacts brought by NEV support policies

The implementation of China's new energy vehicle support policies has produced significant positive industrial effects. First, diversified policy incentives have fully unlocked the consumption potential of the domestic automotive market, steadily raised the market penetration rate of NEVs, and facilitated the rapid expansion of the overall scale of the NEV industry [1]. The continuous expansion of market scale creates significant economies of scale, effectively reduces the average manufacturing cost per vehicle, and significantly improves the cost-effectiveness and market competitiveness of domestic NEVs.

Secondly, policy-oriented R&D incentive mechanisms have effectively stimulated technological innovation among automakers. Major automobile brands continue to increase capital and talent investment in core component research and development, gradually break through the technical barriers of key parts such as vehicle batteries and automobile chips, and comprehensively improve the overall manufacturing level of China's automobile industry [7]. Thirdly, the implementation of the dual-credit system strongly forces traditional fuel vehicle enterprises to carry out low-carbon industrial transformation, fundamentally optimizes the structural layout of China's automobile industry, and promotes the overall upgrading of the traditional manufacturing industry [7]. Finally, export incentive instruments significantly lower the market entry barriers for domestic independent brands, speed up the global expansion of Chinese NEVs, and strengthen the international competitive edge of China's automotive sector accelerate the global market layout of Chinese new energy vehicles, and enhance the international competitiveness of China's automobile industry [8].

4.2. Deficiencies and restrictions of the current policy system

Although the series of new energy vehicle policies has achieved remarkable promotional effects on the industry, there are still some notable deficiencies and constraints in their actual implementation. Firstly, the long-term financial subsidy policy in the early stage has caused some small and medium-sized automakers to develop serious subsidy dependence. Following the phased withdrawal of fiscal subsidies, these enterprises lack sufficient independent innovation motivation and market operation ability, and their sustainable development capacity is weak [4, 9].

Secondly, the current industrial market supervision system remains imperfect. Prominent issues include low-end product duplication and homogeneous price competition among enterprises, which lead to a waste of industrial resources and restrict the high-quality development of the industry [9]. Thirdly, the supporting policies for high-end core technologies are insufficient. The domestic new energy vehicle industry still faces obvious technical bottlenecks in high-end automotive chips, precision electronic components and new battery materials, and the industrial chain has not yet formed a complete independent and controllable system [2]. Fourthly, the overseas export support policies lack targeted and differentiated design. This makes it difficult to effectively respond to trade protection policies and market barriers in different regions, which restricts the further international expansion of domestic NEV enterprises [8, 12].

4.3. Optimization suggestions for governments and auto enterprises

4.3.1. Suggestions for government authorities

To address the above-mentioned flaws within the prevailing policy framework, administrative authorities should further refine the industrial policy system from multi-dimensional perspectives. First of all, the state should formulate more refined targeted industrial policies according to different links of the new energy vehicle industrial chain, increase special financial support for the research and development of core technologies such as vehicle chips, power batteries and automotive electronic systems, and break through industrial technical bottlenecks [2, 7].

Secondly, the government needs to accelerate the development of a national charging and swapping infrastructure network, improve the supporting service system for NEV consumption, and further stimulate market demand [2]. Thirdly, regulatory authorities should strengthen industrial market supervision, improve industry access standards and competition rules, standardize the market competition behavior of automobile enterprises, and curb vicious homogeneous competition and low-end redundant construction [9]. Finally, the state should formulate differentiated overseas export incentive policies for different regional markets to effectively respond to international trade barriers and help domestic brands expand global market share [8, 12].

4.3.2. Suggestions for automakers

NEV manufacturers must proactively adapt to the evolving market-oriented policy system to achieve independent and sustainable development. First of all, manufacturers should thoroughly eliminate reliance on fiscal subsidies, regard independent technological innovation as their long-term core development strategy, and build differentiated and non-replicable technical competitive edges [8, 9]. Secondly, automobile brands need to accelerate the layout of overseas markets, reasonably arrange overseas production bases and sales channels, and continuously improve global operation and market risk response capabilities [11, 12].

In addition, enterprises should deepen cooperation along the industrial chain, jointly conduct key technological research, and enhance the overall competitiveness of the industrial chain. At the same time, according to the differentiated consumption needs of domestic and foreign markets, enterprises should carry out targeted product development and design, avoid low-price homogeneous competition, and realize high-quality brand development [8].

5. Conclusion

This paper systematically clarifies the progressive three-stage evolutionary logic of China's new energy vehicle industrial policies, summarizes the overall development status and industrial characteristics of the domestic new energy vehicle market in recent years, and takes BYD, a typical leading enterprise in the industry, as the research case to deeply analyze the multi-dimensional impact of staged policy changes on enterprise industrial transformation, technological innovation and overseas market layout. The research results show that the progressive new energy vehicle support policy system has played a vital role in cultivating emerging industries, stimulating enterprise technological innovation and promoting the low-carbon upgrading of the traditional automobile industry. Continuous policy dividends have helped BYD complete comprehensive industrial transformation and rapid scale expansion, and gradually build an integrated development pattern covering domestic business and global overseas layout.

The research of this paper has certain theoretical and practical value. In theory, it enriches the micro-case research on the effect of new energy vehicle policies, and constructs a complete analysis framework of policy iteration driving industrial upgrading and enterprise growth. Practically, the findings can provide actionable optimization implications for authorities to refine industrial policy systems, and also provide practical development ideas for domestic independent new energy vehicle brands to achieve long-term stable and high-quality operation. At the same time, this study also acknowledges inherent research limitations. This study only selects BYD as a single research sample, and the research method is mainly based on qualitative text analysis, lacking quantitative data empirical test and horizontal comparative analysis of multiple enterprises, which makes the generalization of the research conclusions limited. In future related research, researchers can expand the research sample size, adopt econometric analysis methods to quantitatively measure the specific impact of different policy tools, and further enrich and improve the relevant research system. In the future, with the continuous improvement of the domestic market-oriented policy system, Chinese NEV enterprises must uphold independent technological innovation and thoroughly eliminate subsidy reliance, continuously optimize global market layout, and finally promote the sustainable and high-quality development of China's entire new energy vehicle industry.

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