

New Quality Productive Forces Empower the Development of the New Energy Vehicle Industry: A Case Study of BYD

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Abstract: Against the backdrop of accelerating global energy transition and carbon neutrality goals, the new energy vehicle industry has become a strategic emerging sector where nations are competing to establish their positions. Although China's new energy vehicle market continues to lead in scale, its high-quality development mechanism urgently requires a new framework that transcends traditional productivity theories for interpretation. New quality productive forces, as an advanced form of productive forces characterized by high technology, high efficiency, and high quality and driven by technological innovation, offers a fresh perspective for understanding industrial development. This paper focuses on the internal mechanisms through which new quality productive forces empower the new energy vehicle industry. Taking BYD as a representative case, it employs a combination of case analysis and literature review to systematically examine its practices across three dimensions: technology, organization, and factors. The findings reveal: Firstly, new quality productive forces empower technological innovation, laying a high-tech foundation for industrial development. Secondly, they empower organizational transformation, establishing institutional safeguards for high-efficiency operations. Thirdly, new quality productive forces optimize factor allocation, achieving high-quality output and development. Furthermore, technology, organization, and factors form a micro-level synergistic closed loop, continuously propelling enterprises toward higher-order forms of development. This study not only validates the practical logic of new quality productive forces at the micro-enterprise level but also provides strategic insights for China's new energy vehicle industry to strengthen technological synergy, optimize policy utilization, and

enhance brand globalization.

Keywords: New Quality Productive Forces; New Energy Vehicle; BYD

1. Introduction

Currently, the global energy transition is accelerating, and achieving carbon neutrality goals has become increasingly urgent. This trend profoundly influences the development strategies and industrial layouts of nations worldwide. Against this backdrop, China has proposed the dual carbon strategy of "carbon peak and neutrality," setting clear requirements for the green transformation of its energy structure. The transition toward a cleaner, low-carbon energy system has become inevitable. The new energy vehicle industry, characterized by its use of renewable energy, near-zero emissions, and high energy efficiency, has been designated a strategic emerging industry by the state and receives intensive policy support [1]. From fiscal subsidies and tax incentives to the dual-credit policy [2] and charging network infrastructure development, systematic support measures have injected robust momentum into the sector. Driven by both policy and market forces, China's NEV market continues to lead globally in scale. The China New Energy Vehicle Industry Development White Paper (2025) reveals that global new energy vehicle sales reached 18.236 million units in 2024, with China accounting for 12.866 million units. China's share of global sales rose from 64.8% in 2023 to 70.5%. The penetration rate of new energy vehicles surpassed 40%, highlighting their status as a key engine for high-quality economic development and a vital pillar for green and low-carbon initiatives. Amidst this explosive industry growth, a diverse array of enterprises—represented by BYD, Tesla, and GAC Aion—have rapidly emerged, collectively embodying China's industrial strength and innovative vitality.

However, amid the sustained high-speed and high-quality development of the new energy vehicle industry, applying traditional theories of productive forces to explain its development mechanisms has gradually revealed limitations. These theories struggle to comprehensively account for the new phenomena and patterns emerging in the industry's growth, making new theoretical frameworks urgently needed. As a quintessential example of a technology-intensive, innovation-driven, and green-led sector, the new energy vehicle industry is precisely the vital domain where new quality productive forces are taking shape and advancing. In September 2023, General Secretary Xi Jinping introduced the major concept of “new quality productive forces” at the symposium on promoting the comprehensive revitalization of Northeast China in the new era. Subsequently, during the 11th collective study session of the Political Bureau of the CPC Central Committee, the General Secretary further emphasized that “developing new quality productive forces is an intrinsic requirement and key focus for advancing high-quality development,” noting that “new quality productive forces have already taken shape in practice and demonstrated strong driving and supporting forces for high-quality development.” This major strategic concept, rooted in China's high-quality development practices in the new era and inheriting and developing Marxist productivity theory, has injected powerful and novel momentum into industrial upgrading and economic transformation. It also provides a fresh perspective and analytical framework for the development of the new energy vehicle industry. Academic literature closely related to this paper primarily falls into two categories: The first category focuses on new quality productive forces. Regarding their intrinsic characteristics, scholars generally agree that they constitute a three-dimensional unity of disruptive technological breakthroughs, innovative factor allocation, and deep industrial transformation. Their core features manifest as higher-tech, high-efficiency, and high-quality productive forces. However, He Jun cautions that “heterogeneity analysis” is needed to distinguish genuine from superficial innovation and avoid conceptual overgeneralization. Regarding the generation mechanism of new quality productive forces [3], Pu Qingping and Xiang Wang provide an in-depth analysis of its implementation

pathways based on Chinese-style modernization [4], while Du Chuanzhong, Shu Shuang, and Li Zehao reveal the transmission mechanism of “production factors-organizational forms-industrial systems-technological innovation” [5]. The second category comprises literature integrating new quality productive forces with new energy vehicles. For instance, when discussing how new energy vehicles leverage new quality productive forces for high-quality development, Zhou Runlin proposes restructuring value chains through intelligent connectivity technologies [6], while Yan Qiangming constructs a tripartite pathway of “technological breakthroughs-scenario applications-institutional safeguards” [7]. When using new energy vehicles as a case study to explain the production mechanism of new quality productive forces, Zeng Xianju et al. analyzed the three-dimensional synergistic logic of “technology innovation chain-factor coordination network-institutional adaptation field” based on the Shenzhen case [8], while Zhai Yinghui et al. distilled paradigms of technological leapfrogging and organizational innovation from nationwide experiences [9]. Reviewing existing literature reveals that scholars predominantly analyze at the macro level, focusing on regional clusters like the Guangdong-Hong Kong-Macao Greater Bay Area and Shenzhen [10] or national industrial policies [11]. There is a lack of in-depth examination of micro-level corporate dynamics, particularly overlooking critical processes at the enterprise level such as factor allocation efficiency and organizational adaptation to transformation driven by new quality productive forces. Furthermore, scholars have overlooked the value of exemplary cases. BYD, for instance, serves as an ideal model due to its vertically integrated supply chain, benchmark digital transformation, and global innovation practices [12]. Yet existing literature only fragments its technological achievements without systematically dissecting the logic behind its capability development. Therefore, this paper employs a case study approach to construct a theoretical framework for the mechanism through which new quality productive forces empower the new energy vehicle industry. Using BYD as a representative case, it presents the operational mechanisms at the technological, organizational, and factor levels based on the core characteristics of high technology, high

efficiency, and high quality inherent in new quality productive forces, thereby enriching existing micro-enterprise-level research. This study addresses the following questions: How are new quality productive forces embodied, applied, and leveraged to deliver critical enabling effects within new energy vehicle enterprises like BYD? What are their underlying mechanisms? What implications does this hold for other new energy vehicle enterprises?

2. The Mechanism of New Quality Productive Forces Empowering New Energy Vehicles

2.1 Conceptual Definition

(1) New Quality Productive Forces

New quality productive forces are a significant economic concept introduced in the context of the new era. Its definition is grounded in Marxist productivity theory, integrating technological revolutions, industrial transformations, and China's developmental realities. General Secretary Xi Jinping first proposed “new quality productive forces” at the symposium on promoting the comprehensive revitalization of Northeast China in September 2023, emphasizing its close connection with strategic emerging industries and future industries [13]. New quality productive forces represent an advanced state of productive forces formed through revolutionary technological breakthroughs, innovative allocation of production factors, and deep industrial transformation and upgrading [14]. Its core lies in science and technology innovation as the driving force, achieving breakthroughs in key disruptive technologies to transcend traditional productive forces, thereby necessitating new production relations to adapt [15]. At the factor level, it expands and emphasizes the role of new high-quality production factors such as data. In terms of industrial form, it is closely linked to the development of strategic emerging industries and future industries [16], characterized by high technology, high efficiency, and high quality. It serves as the core force driving high-quality economic development [14].

(2) New Quality Productive Forces Empowering the Development of the New Energy Vehicle Industry

Based on the above connotations and considering the technology-intensive, innovation-driven, and green-low-carbon attributes of the new energy vehicle industry, this

paper defines the empowerment of new quality productive forces for the development of the new energy vehicle industry as follows: New quality productive forces take innovation factors such as data, technology, and talent as core production elements, rely on breakthroughs in key disruptive technologies as the primary driving force, and utilize flexible and collaborative new organizational forms and modern industrial systems as vital carriers. Through the deep integration of technological innovation, organizational transformation, and optimized allocation of factors, they propel the new energy vehicle industry from electrification toward higher-level evolution in intelligence and connectivity. This achieves the unity of product performance upgrades, enhanced production efficiency, and green, low-carbon development, ultimately empowering the industry's high-quality growth. Its core essence lies in: innovation elements form the foundational support for new quality productive forces to empower the new energy vehicle industry; key disruptive technologies serve as the core driving force; new organizational structures and modern industrial systems provide crucial safeguards; and advancing high-quality, green, and intelligent industrial development remains the fundamental objective.

2.2 Mechanism of Action

New quality productive forces represent an advanced form of productive forces that drive profound industrial transformation and high-quality development. Their empowerment of the new energy vehicle industry is not a single-point improvement but a systematic process. This process is propelled by breakthrough technological innovations as its engine, carried by high-efficiency organizational transformation as its vehicle, and grounded by the innovative allocation of production factors as its foundation. Through the deep integration and dynamic synergy of these three elements, it collectively propels the industry toward high-tech, high-efficiency, and high-quality evolution. Specifically, new quality productive forces empower the development of the new energy vehicle industry primarily at three levels: technology, organization, and factors. The mechanism of action is elaborated as follows.

1) New quality productive forces empower technological innovation, laying a high-tech foundation for industrial development.

New quality productive forces, with technological innovation as their core driver, profoundly empower the new energy vehicle industry to achieve technological transformation and path leap. They propel the industry to break free from reliance on traditional fuel vehicle technology systems, pursuing original and pioneering breakthroughs in core areas such as power batteries, drive systems, and intelligent connectivity. By focusing on battery energy density, safety lifespan, charging efficiency, as well as vehicle intelligence and connectivity levels, new quality productive forces accelerate technological iteration in the new energy sector. This process not only directly enhances the performance, safety, reliability, and user experience of new energy vehicles but, more importantly, elevates the industry's core competitiveness and reshapes its competitive landscape. It propels the industry's strategic focus from the initial "electrification" phase toward higher-level forms of "intelligentization and connectivity" thereby establishing a robust high-tech foundation for the sector's long-term sustainable development.

2) New quality productive forces empower organizational transformation, establishing institutional safeguards for high-efficiency operations.

The development of new quality productive forces necessitates dismantling the rigid, bureaucratic organizational structures aligned with traditional large-scale industrial production, giving rise to and requiring flexible, open, and collaborative new organizational forms as their foundation. Within the technology-intensive, rapidly evolving new energy vehicle industry, new quality productive forces drive organizational transformation in EV companies. By establishing flat, modular, and networked management mechanisms, they enhance cross-departmental and cross-functional collaboration efficiency. This approach focuses on optimizing decision-making processes to shorten response cycles from market feedback to R&D and production; reconfigures market-oriented innovation units to stimulate the creative potential of talent, particularly R&D and technical personnel; and refines mechanisms that tightly link innovation outcomes with market performance to achieve incentive objectives. Consequently, new quality productive forces significantly elevate overall operational efficiency across R&D, lean manufacturing,

supply chain coordination, and market expansion. It provides indispensable organizational and institutional safeguards for industries to navigate uncertainty, sustain innovation, and achieve agile development.

3) New quality productive forces optimize factor allocation, achieving high-quality output and development.

New quality productive forces ensure the high-quality attributes of industrial development outcomes through revolutionary reshaping and optimized allocation of production factors. They drive advanced production factors-including data, high-tech, top-tier talent, and financial capital-to deeply penetrate, integrate, and flow efficiently throughout the entire research, manufacturing, and service chain of the new energy vehicle industry. Leveraging advanced technologies like industrial internet, artificial intelligence, and digital twins, the new energy vehicle industry has achieved full-process digitalization and intelligence-from product design simulation, intelligent production scheduling, and flexible manufacturing to quality traceability and supply chain collaboration. This has significantly enhanced the precision of factor allocation and resource utilization efficiency. Simultaneously, new quality productive forces have guided various production factors to shift from low-value-added traditional manufacturing segments toward high-value-added domains such as research and design, brand services, and software development ecosystems. This optimization of factor allocation not only drives the transformation of industrial production models toward green, low-carbon practices, refined operations, and systemic innovation, but ultimately achieves the organic integration of economic, ecological, and social benefits within industrial growth, propelling high-quality economic development.

3. Case Analysis

3.1 Case Selection and Data Collection

(1) Case Representativeness

This paper selects BYD in the new energy vehicle industry as its research subject, primarily due to its dual representativeness. First, it exemplifies strategic emerging industries. In 2010, the State Council issued the "Decision on Accelerating the Cultivation and Development of Strategic Emerging Industries," designating new energy vehicles as a key strategic emerging

industry for development. As a carrier of new technologies integrating electrification, greening, and intelligence, new energy vehicles embody “high-tech” characteristics. Through technological breakthroughs, they profoundly transform and upgrade traditional industries, gradually evolving into a “high-efficiency, high-quality” emerging sector. This represents a quintessential practice of driving industrial innovation through scientific and technological advancement [8]. Deeply analyzing the relationship between new energy vehicles and new quality productive forces holds significant implications for promoting China's high-quality economic development. Second, the exemplary nature of the enterprise. Against the backdrop of economic globalization and industrial restructuring, BYD has emerged as a new domestic automotive brand in China. Within the new energy vehicle industry, BYD has secured a dominant position through its vertical integration capabilities across the entire industrial chain and breakthroughs in core technologies, becoming one of the earliest automakers to enter China's new energy vehicle product catalog [17]. According to official BYD data, the company achieved sales of 4.27 million vehicles in 2024, solidifying its position as the global sales leader. From January to July 2025, its sales reached 2.49 million units, maintaining its dominant position in the Chinese market. Its journey of achieving disruptive innovation in its flagship blade battery amid fierce competition, implementing business unit reforms, and continuously optimizing smart factories and the DiLink intelligent connectivity system in real time-along with the accumulated successful experiences-holds significant research value and warrants in-depth analysis.

(2) Data Collection

Through systematic gathering of multi-source materials including annual reports, publicly available financial statements, authoritative media coverage, industry white papers, and public statements by leaders, we conduct an in-depth analysis of their practices across three dimensions: technology, organization, and factors. Triangulation is employed to cross-verify data sources, enhancing the reliability and logical consistency of the information.

3.2 Innovation as the Primary Driving Force: Fostering “High-Tech” Productivity

The key characteristic of new quality productive forces is “high-tech,” whose core lies in achieving a qualitative leap in productivity through original breakthroughs in foundational technologies and structural systems. BYD's development and industrialization of the “Blade Battery” exemplifies this characteristic at the corporate level. This technology abandons the industry's traditional approach of solely optimizing chemical materials. Instead, it employs a disruptive physical design-using CTP integration technology to directly arrange long, thin lithium iron phosphate cells into packs, eliminating the need for traditional battery module structures. This innovation increases battery pack volume utilization by over 50% while achieving energy density comparable to mainstream ternary lithium batteries. Consequently, it significantly extends driving range to over 600 kilometers within limited space[18], effectively resolving the core conflict between EV range and vehicle layout.

In terms of safety, the Blade Battery has redefined industry standards with its exceptional performance. It has successfully passed the most stringent needle penetration test in battery safety and withstood a 46-ton truck crush test under extreme conditions[19], achieving a combination of “super safety” and “super strength.” This breakthrough stems from its stable lithium iron phosphate chemical system and unique structural design, systematically resolving the industry-wide challenge of balancing high energy density with safety and reliability.

In terms of economic efficiency and strategic autonomy, Blade Battery also demonstrates significant advantages. Its material costs are significantly lower than ternary lithium batteries, thereby driving a substantial reduction in overall manufacturing costs. Simultaneously, its absence of scarce metals like nickel and cobalt reduces reliance on overseas strategic resources, enhancing the supply chain's autonomy and controllability. Since its launch in 2020, the Blade Battery has rapidly achieved large-scale adoption, directly propelling the strong global resurgence of the lithium iron phosphate (LFP) battery technology route. Its market share has surpassed that of ternary batteries since 2021.

In summary, the Blade Battery represents not incremental improvement but a paradigm shift in new quality productive forces. It exemplifies a system-level structural innovation that achieves comprehensive breakthroughs across

performance, safety, cost, and resource efficiency. This breakthrough has established a robust technological barrier and developmental foundation for the company amid intense global competition.

3.3 Building “High-Efficiency” Productivity Through Organizational Transformation

The development of new quality productive forces relies not only on technological innovation but also on high-efficiency organizational structures that enable optimal resource allocation and agile responses to market demands. BYD's systematic implementation of a business division system since 2021 represents a pivotal practice in constructing this “high-efficiency” productivity. The core of this reform lies in dismantling traditional vertical centralized management. By establishing independent brand divisions—including Dynasty, Ocean, Denza, and Yangwang—the company has decentralized operational authority and shifted profit centers downward. Each division operates with high autonomy within clearly defined boundaries of responsibility, enabling rapid decision-making and specialized operations tailored to their respective market segments.

The effectiveness of this organizational transformation is evident through a series of measurable metrics. In terms of operational performance, after decisively halting all gasoline vehicle production in 2022 and focusing resources on the new energy sector, the company achieved over 93.4% year-on-year growth in new energy vehicle sales that same year, demonstrating rapid economies of scale[20]. Net profit reached RMB 9.155 billion in Q1 2025, a 100% year-on-year increase[21], reflecting significant improvements in resource allocation efficiency and profitability. In market responsiveness, the new organizational model demonstrated remarkable agility: the new model under the Fangchengbao brand achieved market launch within just five months of its unveiling, successfully penetrating the mainstream market. Concurrently, the “Sawadee Research Institute” (Overseas Product Center) developed localized models specifically for overseas markets, driving substantial growth in international sales in 2024 and achieving a 41% market share in Thailand[22]. To further optimize internal synergy and reduce transaction costs, BYD reorganized its R&D system in 2025, integrating independent brand research institutes

under the unified management of the Automotive Engineering Institute. This move is projected to reduce internal communication costs and minimize redundant R&D investments.

This demonstrates how the business division reform, by establishing an organizational structure characterized by clear responsibilities, rapid responsiveness, and a blend of specialization and synergy, not only unleashes and stimulates internal innovation vitality but also serves as an efficient “transmission system” for converting cutting-edge “high-tech” achievements into market competitiveness and economic benefits. This profoundly embodies the “high efficiency” essence required by new quality productive forces.

3.4 Focusing on Production Factors to Foster “High-Quality” Productivity

The ultimate goal of new quality productive forces is to achieve “high-quality” development. This requires innovative allocation of traditional production factors and driving profound transformations in production processes toward intelligence, environmental sustainability, and precision. BYD's “smart factory” serves as a prime example of this concept in practice. By deeply integrating advanced elements such as data, technology, and capital, it has redefined the value creation model in manufacturing.

The “high-quality” characteristic of a smart factory is first reflected in the extreme standardization and stability of its production processes. The factory extensively deploys industrial internet, AI vision quality inspection, and digital twin technologies to build a data-driven real-time monitoring and optimization system. For example, the AI quality inspection system has significantly reduced the rate of missed burr defects on electrode sheets, preventing over 200 million yuan in annual quality losses. The end-to-end traceability system, powered by blockchain and digital twin technology, has greatly enhanced product traceability accuracy, ensuring consistent and reliable quality control. Additionally, “high-quality” manifests as a leap in production efficiency. Highly automated production lines, such as the Zhengzhou Super Factory with an automation rate of 98%, achieve an average output of one vehicle every 50 seconds. In 2024, the factory's production volume surged by 169.8% year-on-year to reach 545,000 units[23], with its scaled production capacity providing a

solid foundation for rapid market expansion. Finally, “high-quality” incorporates the core requirements of green and sustainable development. The smart factory fully adopts green manufacturing processes, employing technologies such as lead-free treatment, catalytic combustion, and activated carbon adsorption. This approach achieves an annual reduction of over 20,000 tons in lead usage, effectively preventing heavy metal pollution[24]. The lithium iron phosphate starter batteries used have a cycle life exceeding 3,000 cycles[18], matching the vehicle’s lifespan, thereby reducing resource consumption and environmental footprint throughout the entire life cycle. Moreover, the “high-quality” development emphasized by new quality productive forces hinge on fully unlocking the value of data as a new factor of production. BYD’s independently developed DiLink intelligent connectivity system serves as the core digital platform for achieving this goal. By connecting millions of smart vehicles worldwide, the system collects real-time data on vehicle operations, user interactions, and environmental conditions. Leveraging cloud-based big data analytics and artificial intelligence algorithms, it transforms this data into actionable insights that drive value creation. On the R&D front, vast real-world scenario data drives continuous optimization and OTA upgrades for algorithms in battery management, intelligent driving, and other systems. In manufacturing and supply chain operations, data flows are deeply integrated with factory processes. For user experience, data empowers personalized services and business model innovation. By systematically unlocking data value, the DiLink system establishes a closed-loop process from data collection and analysis to application feedback. This ensures that corporate operations and product iterations are consistently grounded in precise insights. Consequently, the concept of “high quality” expands beyond the exceptional performance of physical products to encompass digitalization, intelligence, and sustainable development across the entire value chain. This vividly illustrates the core principle of “innovative allocation of production factors” within the new quality productive forces.

3.5 Synergy Among Three Elements: The Micro-Circulation Mechanism Empowered by New Quality Productive Forces

Technology, organization, and factor allocation do not operate in isolation but form a mutually driven, dynamically linked virtuous cycle system within enterprises. This micro-circulation mechanism constitutes the intrinsic logic through which new quality productive forces empower enterprises to pursue sustained high-quality development.

(1) Technological breakthroughs drive organizational transformation. The emergence of disruptive technologies like “blade batteries” imposes new and complex demands on corporate research collaboration, production management, and market promotion. Traditional functional organizational structures struggle to adapt to the demands of rapid technological iteration and multi-brand differentiated operations. Consequently, the internal pressures of technological innovation have spurred “business unit restructuring.” This reform aims to establish a more agile organizational form that is closer to the market and better equipped to energize business units, thereby aligning with and accelerating the industrialization and commercialization of new technologies.

(2) Organizational guarantees for technology transfer and factor upgrading. The “high-efficiency” organizational structure formed after the reform provides critical institutional safeguards for the commercialization of “high-tech” achievements. Flat, specialized business units can more accurately identify market demands and efficiently mobilize resources for product definition and promotion. Simultaneously, this organizational model has vigorously advanced the construction of “smart factories” and the digital upgrading of production factors. For instance, the company can advance intelligent factory upgrades holistically based on overarching strategy. Inter-division collaboration needs-such as technology sharing-facilitate optimized resource allocation practices, like transferring the Yunlian-P system from Yangwang to Fangchengbao, thereby enhancing research resource reuse rates.

(3) Element optimization nourishes technology and organization. The “high-quality” production capabilities achieved by the “smart factory” and DiLink provide robust feedback and support for both technology and organizational structures. Its stable, efficient, and low-cost manufacturing assurance forms the foundation for rapidly scaling up and iteratively upgrading innovative

products like the “blade battery.” Simultaneously, the vast amounts of real-time data generated during smart factory and DiLink operations continuously feed back into R&D and management departments. This provides data-driven decision-making support for the next round of technological optimization, process improvements, and even precise adjustments to organizational workflows, thereby initiating the next cycle of innovation.

Therefore, within the micro-level landscape where new quality productive forces empower enterprise development, high technology-that is, technological breakthroughs-serves as the engine driving system evolution. High efficiency-that is, organizational transformation-functions as the transmission system ensuring the efficient transfer and conversion of energy. High quality-that is, factor allocation-represents the ultimate output and value manifestation of the entire system's operation. Technology, organization, and factors of production form a closed-loop system that cycles and reinforces itself, continuously propelling enterprises toward dynamic development at higher levels of quality. BYD's practices not only clearly demonstrate the operational trajectory of this micro-level cyclical mechanism but also provide a robust analytical framework for understanding how new quality productive forces transform from macro-level strategy into micro-level corporate momentum.

4. Conclusions and Suggestions

4.1 Research Findings

Centered on the core question of “how new quality productive forces empower the development of the new energy vehicle industry,” this study uses BYD as a representative case to construct a three-dimensional analytical framework encompassing “technology-organization-factors.” It systematically elucidates the generative logic, operational pathways, and synergistic mechanisms of new quality productive forces at the micro-enterprise level. Key findings are as follows:

(1) The three core characteristics of new quality productive forces-high technology, high efficiency, and high quality-are embodied and vividly demonstrated in leading enterprises like BYD. At the technological level, the “blade battery” achieves breakthroughs in performance, safety, cost, and resource utilization through

structural innovation, demonstrating the fundamental role of “high technology” as the engine driving industrial development. At the organizational level, the “business division reform” has established a “high-efficiency” transmission system which is well-suited for rapid iteration and market responsiveness through decentralization, clear accountability, and specialized operations. At the elemental level, the “smart factory” leverages digital and intelligent technologies to achieve innovative allocation of production factors. Meanwhile, the DiLink intelligent connectivity system serves as the core digital platform, driving precise decision-making and business innovation by unlocking the value of data elements across the entire R&D, manufacturing, and service chain. Together, they ensure “high-quality” output and green sustainable development throughout the entire value chain. These collectively demonstrate that new quality productive forces are not an abstract concept, but rather an observable, analyzable, and implementable enterprise capability system.

(2) The internal mechanism by which new quality productive forces empower enterprise development embodies a dynamic synergistic closed-loop formed by technology, organization, and factors. Technological breakthroughs serve as the fundamental engine driving system evolution, propelling organizational structures toward greater flexibility and specialization. High-performance organizations, in turn, provide institutional safeguards for technological transformation and factor upgrading, facilitating resource optimization and collaborative innovation. The optimized allocation of production factors then feeds back into technological iteration and organizational adaptation through high-quality, low-cost, and sustainable output capabilities. This micro-level cyclical mechanism reveals the internal logic by which new quality productive forces continuously exert their influence within enterprises, propelling high-quality development.

(3) By focusing on micro-level enterprise practices, this study broadens the analytical dimensions and research implications of new quality productive forces at the theoretical level. This study translates the core characteristics of new quality productive forces into observable dimensions for enterprises. Using BYD as a case study for systematic

deconstruction, this establishes an analytical bridge connecting macro-level strategic discourse with micro-level operational practices, providing a reusable analytical framework for subsequent related research.

In summary, new quality productive forces serve as the core driving force propelling the new energy vehicle industry toward advanced forms of development. At the enterprise level, their role represents a systemic project characterized by technological drive, organizational safeguards, factor support, and cyclical enhancement. The BYD case study not only confirms the practicality and explanatory power of the new quality productive forces but also provides a micro-level example for understanding the high-quality development of China's strategic emerging industries.

4.2 Suggestions

To further release the potential of new quality productive forces and promote the sustainable, high-quality development of China's new energy vehicle industry, it is necessary to systematically optimize the current issues drawing on the experience of leading international companies. Based on a comparative analysis of Tesla and BYD, this section proposes the following three suggestions:

(1) Promoting Technology Sharing to Reduce Internal Resource Competition

Tesla has achieved large-scale reuse of core components such as batteries, motors, and electrical architectures by developing highly integrated vehicle platforms. This has created a deeply shared, continuously iterated technology system that significantly reduces research and manufacturing costs per vehicle model. In contrast, BYD faces challenges in implementing its business division system and revitalizing its brands, including scattered technical resources, redundant investments, and insufficient trickle-down of high-end technologies to mid-to-low-end product lines. There remains room for improvement in internal coordination efficiency. To this end, it is recommended that domestic automobile companies explore establishing a "centralized research and open sharing" technology governance mechanism within their organizational structures: At the group level, establish a unified foundational technology research institute responsible for tackling common and cutting-edge technologies and developing them into platforms;

Simultaneously, establish an internal technology licensing and sharing platform to define brand divisions' technical usage rights and collaboration workflows. Particular emphasis should be placed on promoting mature advanced technologies like the "Blade Battery," ensuring their orderly and rapid integration across the entire brand matrix through modularization and standardization. This approach maintains market agility while enhancing the efficiency and concentration of overall technology resource allocation.

(2) Strategically leveraging subsidies to mitigate pressure from high research sunk costs

Tesla actively applies for and utilizes local policy tools such as new energy vehicle subsidies and carbon credits across major global markets. These serve as vital supplementary resources supporting the company's long-term research and market expansion efforts, rather than operational dependencies, effectively alleviating the financial strain caused by substantial research investments. In comparison, although China's new energy vehicle companies have grown rapidly under policy support, they still rely heavily on subsidies and exhibit a certain degree of a "sprinkling pepper" phenomenon in research resource allocation [18]. This has led to insufficient investment in forward-looking technologies and the accumulation of sunk cost risks. It is recommended that enterprises establish a more systematic and precise policy resource matching and management system, positioning various subsidies, tax incentives, and special funds as "innovation accelerators" and "risk buffers." These resources should be prioritized for investment in cutting-edge technologies and fundamental research areas such as battery research, advanced intelligent driving systems, and new electrical architectures. At the same time, companies should establish comprehensive cost control and dynamic evaluation mechanisms for the entire lifecycle of research projects. This will prevent resource wastage caused by blind expansion or technological path lock-in, ensuring enterprises maintain competitiveness in the post-subsidy era through sustained endogenous innovation capabilities.

(3) Enhance brand positioning and raise global competitiveness.

Tesla adopted a "top-down" brand strategy in global markets: first launching high-end sports cars to establish its image, then anchoring the

“tech-luxury” brand label with high-value models like the Model S and Model X to build formidable brand premium power worldwide. Subsequently, it entered the mass market with models like the Model 3 and Model Y. While Chinese automobile companies like BYD have achieved breakthroughs in sales volume and market share, they still mainly rely on their “high cost-performance ratio” and “pragmatic” product image to compete in the international market. Their brand premium capability and high-end recognition have yet to be fully established, which constrains their long-term profitability and the depth of their globalization. In response, domestic enterprises are advised to implement a brand and globalization strategy characterized by “graded enhancement and differentiated implementation”: On one hand, continuously develop globally influential flagship technology products through premium sub-brands like Yangwang, breaking through price and value ceilings; On the other hand, strengthen localized narratives in key overseas markets to systematically communicate the company's comprehensive strengths in green technology, smart manufacturing, and supply chain security, elevating brand perception from “high-value-for-money manufacturer” to “global technology leader.” Concurrently, accelerate the establishment of overseas research centers, production bases, and service systems to achieve the transition from “product export” to “brand localization.”

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