Journal of Trends in Finance and Economics
Print ISSN: 3007-6951
Online ISSN: 3007-696X
DOI: https://doi.org/10.61784/jtfe3076

ANCHOR ENTERPRISE-LED COLLABORATIVE MECHANISMS AND PATHWAYS FOR HIGH-QUALITY DEVELOPMENT OF ZHAOQING'S NEW ENERGY VEHICLE INDUSTRY CHAIN

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Abstract: Using Xiaopeng Motors and its new energy vehicle industrial chain in Zhaoqing as a case study, this paper employs a single-case study approach, longitudinal process analysis, and mechanism coding to examine the mechanisms through which a lead enterprise drives collaboration and high-quality development within a local new energy vehicle industrial chain. The study found that Xpeng Motors' development in Zhaoqing underwent an evolutionary process of "Anchor enterprise embedding—Industry chain extension—Deepening of synergy," with its role gradually shifting from a vehicle manufacturer to an industry chain organizer. The anchor enterprise primarily drove the restructuring of industry chain relationships through technological, innovative, supply-demand, factor, and institutional synergies, forming a collaborative structure characterized by "Order-driven—technological adaptation—Innovative interaction—Factor aggregation—Institutional support." Based on these findings, this paper proposes development pathways such as strengthening the leadership of the chain-leading enterprise, enhancing local supply capabilities, establishing a collaborative innovation system, improving industrial chain governance, and deepening collaboration, with the aim of propelling Zhaoqing's new energy vehicle industry from a cluster of individual projects toward a cluster of industrial chain capabilities.
Keywords: Leading enterprises; New energy vehicle industry chain; Industry chain synergy; Xiaopeng Motors; High-quality development

1 INTRODUCTION

The new energy vehicle industry has become a key vehicle for local governments to foster new-quality productive forces and drive the transformation and upgrading of the manufacturing sector. Leveraging its foundation in vehicle manufacturing, power batteries, and supporting components, Zhaoqing has begun to establish a new energy vehicle industry cluster; however, it still faces challenges such as low local supply chain coverage, insufficient collaboration along the supply chain, and weak innovation synergy. Against this backdrop, lead enterprises—with their capabilities in resource integration, technological leadership, collaborative innovation, and ecosystem organization—are increasingly becoming vital hubs for enhancing the overall competitiveness of the industrial chain. Regarding the role of chain-leading enterprises, existing research primarily focuses on three aspects: functional positioning, mechanisms of synergy transmission, and the effects on high-quality development.

In terms of functional positioning, research generally holds that chain-leading enterprises do not rely solely on scale to gain a competitive advantage, but rather occupy a pivotal position in industrial technology, market organization, and resource allocation, enabling them to integrate upstream and downstream resources, drive technological innovation, organize collaboration within the chain, and shape the industrial ecosystem [1]. With the deepening application of digital and intelligent technologies, the ecosystem leadership of chain-leading enterprises is evolving from "point-based breakthroughs" to "chain-based collaboration" and then to "ecosystem integration," further enhancing their capabilities in technological innovation, market guidance, and resource integration [2]. Regarding synergy transmission mechanisms, relevant research primarily explores pathways such as digital transformation, cost-sharing, mergers and acquisitions, smart manufacturing, and institutional coordination. The digital transformation of chain-leading enterprises can reduce innovation, transaction, and credit costs, thereby promoting the reorganization of resources and business synergy within the chain and enhancing the efficiency of industrial and supply chain coordination [3]; simultaneously, this digital transformation generates significant spillover effects, improving the operational efficiency of enterprises along the chain through information sharing, supply-demand matching, and integrated coordination [4]. The accumulation of digital technologies, digital synergy, and the development of digital ecosystems help drive collaboration within green industrial chains, while strategic mergers and acquisitions and smart manufacturing can enhance the resilience of industrial chains and their ability to restructure resources in the event of supply disruptions [5]. Regarding the effects on high-quality development, the focus of research has gradually expanded from efficiency improvements to innovation breakthroughs, value chain stability, and the cultivation of new-quality productive forces. Integrated innovation governance can enhance the innovation capabilities of leading enterprises in key core technologies and promote R&D investment and high-quality innovation outputs [6]; capabilities in key core technologies can further drive the formation of new-quality productive forces at the regional level [7]; and "chain-leader"

governance can promote breakthrough innovation among enterprises along the chain and enhance value chain stability by improving the industry chain's resilience, recovery, and transformation capabilities [8].

In summary, existing research provides an important foundation for understanding the role of chain-leading enterprises; however, regional analyses of new energy vehicle industrial chains in prefecture-level cities remain limited. There is a lack of a comprehensive explanation of the intrinsic connections among "chain-leading enterprise guidance—industrial chain synergy—high-quality development," and the interactions among multiple stakeholders and their operational processes require further in-depth discussion in the context of specific industrial ecosystems. Therefore, taking the new energy vehicle industry in Zhaoqing as a case study to analyze the formation mechanisms through which chain-leading enterprises drive industrial chain synergy and high-quality development holds significant practical relevance and theoretical value for further research.

2 RESEARCH DESIGN

2.1 Case Selection

This paper employs a single-case study approach, focusing on Xiaopeng Motors and the new energy vehicle industrial chain it has established in Zhaoqing as its core case. The case selection follows the principle of theoretical sampling, with a particular focus on examining how a lead enterprise with strong industrial chain organizational capabilities alters the modes of connection among local industrial actors through production, technology, order management, and resource allocation activities, thereby driving the evolution of the new energy vehicle industry from a cluster of core projects toward industrial chain synergy.

The selection of Xiaopeng Motors was primarily based on three considerations. First, Xiaopeng Motors has undergone a relatively continuous evolutionary process alongside the development of Zhaoqing's new energy vehicle industry. In 2017, Xiaopeng Motors established its first production base in the Zhaoqing High-Tech Zone; in 2020, the Zhaoqing plant obtained production certification and began manufacturing the Xiaopeng P7, marking the company's transition from the project construction phase to full-scale production; In 2021, the Zhaoqing facility launched its second-phase expansion, and the increased production scale further boosted demand for component suppliers, logistics services, and production resources. This process provides a clear timeline for observing the transformation of the anchor enterprise from a primary producer to an organizer of the industrial chain. Second, Xiaopeng Motors has formed a relatively typical anchor-supplier relationship with Zhaoqing's local industries. In 2022, construction began on the Xiaopeng Smart Vehicle Component Industrial Park, which aims to enhance industrial support systems for areas such as vehicle assembly, batteries, electric motors, electronic control systems, and automotive lightweighting, while also facilitating the establishment of a number of supplier projects. The Zhaoqing High-Tech Zone established a joint investment promotion and government-enterprise interaction mechanism with Xiaopeng Motors, enabling the supplier resources, order demands, and industry information held by the chain-leading enterprise to be integrated into the local investment promotion and resource allocation processes. As a result, local industrial governance has gradually shifted from serving individual projects to strengthening and complementing the industrial chain. Third, Xiaopeng Motors effectively demonstrates the process by which industrial relationships have deepened from general support to multi-stakeholder collaboration. In 2023, Xiaopeng Motors held its Global Partner Conference in Zhaoqing, where a large number of suppliers participated in discussions on topics such as supply chain management, cost optimization, and the industrial ecosystem. Subsequently, with the introduction of new models and adjustments to the production system, interactions among the company, suppliers, the government, and industrial parks deepened further. Therefore, the Xiaopeng Motors case provides a relatively comprehensive illustration of the evolutionary logic: "entry of the lead enterprise—expansion of production capacity—clustering of suppliers—joint investment promotion—supply chain collaboration—deepening of the industrial ecosystem." This article does not aim to evaluate Xiaopeng Motors' own operational performance but rather, by leveraging its central position within the industrial network, analyzes how the capabilities of a chain-leading enterprise transcend organizational boundaries and translate into collaborative capabilities within Zhaoqing's new energy vehicle supply chain.

2.2 Data Sources and Data Collection

This paper builds a case study database centered on the interactive relationship among "Xiaopeng Motors—supplier enterprises—local governments—industrial parks," primarily collecting publicly available corporate information, government and industry data, as well as news and industry reports. Corporate data is mainly sourced from Xiaopeng Motors' official website, company announcements, and relevant public information, with a focus on compiling events such as the construction of the Zhaoqing base, production capacity expansion, the introduction of new models, the development of supporting industrial parks, supplier partnerships, and supply chain management; Government and industry data primarily consist of industrial plans, policy documents, key projects, and investment promotion information released by Guangdong Province, Zhaoqing City, and the Zhaoqing High-Tech Zone, which are used to identify local government actions regarding industrial chain layout, resource allocation, and institutional support centered on anchor enterprises; relevant news and industry materials are mainly used to supplement the context surrounding supplier onboarding, technological cooperation, and industrial development. The compilation of materials follows a logical framework of "timeline—entity—key events—mode of operation—synergistic outcomes," and the reliability of the case evidence is enhanced through cross-verification among different sources. For key events such as

project investments, industrial park construction, and supplier collaborations, cross-verification using multiple sources is employed wherever possible to minimize interpretive biases that may arise from relying on a single information source.

2.3 Case Study Methodology

This paper employs a method that combines longitudinal process analysis with mechanism coding to analyze the case materials. The focus of the study is not on examining the spatial distribution of suppliers, but rather on identifying how the lead firm transforms the relationships among industry actors. Based on key events and changes in industrial relationships, the interaction process between Xiaopeng Motors and the Zhaoqing new energy vehicle industrial chain is summarized into three phases: 2017–2020 was the lead firm embedding phase, primarily characterized by the establishment of a production base and the development of vehicle manufacturing capabilities; 2021–2022 constituted the supply chain extension phase, during which, accompanied by expanded production capacity, the construction of supporting industrial parks, and the entry of suppliers, the lead firm's production demands began to translate into the organizational capacity of the local industrial chain; since 2023, the process has entered the phase of deepened collaboration, characterized by strengthened supplier cooperation, upgrades to the production system, and enhanced government-enterprise interactions, with industrial relationships gradually expanding from general support to multi-stakeholder collaboration. The case materials were coded primarily around five types of collaboration mechanisms (Table 1):

Table 1 Case Code

Behavior of the Chain Leader Company	Case Study Content	Collaboration Mechanism
Product Standards, Quality Requirements, Production System Upgrade	Technical Alignment Among Upstream and Downstream Companies, Process Adjustments	Technical Collaboration
Technical Cooperation, Collaboratively Resolving Product and Production Issues	Knowledge Sharing and Capacity Building Among Enterprises	Innovation Collaboration
Order Organization, Production Plan, Nearby Amenities	Aligning Supply with Production Pace	Supply-Demand Coordination
Supporting Investment Promotion, Industrial Park Construction, Supplier Cluster	Restructuring of Capital, Enterprises, Land, and Service Resources	Element Synergy
Joint Investment Promotion, Government-Business Interaction, Industrial Policy Support	Aligning Business Needs with the Allocation of Public Resources	Institutional Synergy

Consequently, this paper establishes a case analysis framework comprising "identification of key events—extraction of lead enterprise behavior—coding of collaboration mechanisms—analysis of cross-mechanism relationships—explanation of high-quality development effects." The objective is to address a core question based on Xiaopeng Motors' practices in Zhaoqing: Through which organizational processes do the technological, market, and organizational advantages possessed by the lead enterprise transcend corporate boundaries and ultimately translate into the collaborative capacity of the local new energy vehicle industry chain.

3 LED BY XIAOPENG MOTORS AS THE INDUSTRY LEADER, THE NEW ENERGY VEHICLE INDUSTRY CHAIN IN ZHAOQING IS EVOLVING IN A COORDINATED MANNER

The new energy vehicle industry chain in Zhaoqing did not emerge simply through the expansion of the number of companies, but rather evolved gradually through the continuous integration of leading enterprises, growing production demand, and the reallocation of local industrial resources. Taking Xiaopeng Motors' development in Zhaoqing as a case study, it is evident that the company's role has gradually expanded from the establishment of a vehicle manufacturing project to the organization of the supply chain and the promotion of industrial ecosystem synergy. By examining the construction of production bases, capacity expansion, the entry of supporting enterprises, and changes in government-enterprise interactions, this paper summarizes this process into three stages: "anchor enterprise embedding—chain extension—deepening of synergy."

3.1 Chain Owner Embedding: Formation of Core Industrial Hubs

In 2017, Xiaopeng Motors established its first production base in the Zhaoqing High-Tech Zone, thereby integrating the key process of new energy vehicle manufacturing into Zhaoqing's industrial ecosystem. In 2020, the Zhaoqing plant obtained a vehicle production license and began manufacturing the Xiaopeng P7, establishing a complete manufacturing process that includes stamping, welding, painting, final assembly, and battery pack assembly. As the lead enterprise in the supply chain, the company has transitioned from project construction to full-scale production.

During this period, Xiaopeng Motors primarily served as an "anchor" for the industry. As vehicle manufacturing occupies the demand-integration end of the new energy vehicle supply chain, its entry not only generated new output value but also created sustained demand across segments such as power batteries, electric motors, electronic control systems, automotive electronics, structural components, and logistics services, providing a clear supply chain hub for Zhaoqing's new energy vehicle industry. In 2021, Phase II of the Zhaoqing base project was launched, with plans to

increase the annual design capacity for vehicle production from 100,000 to 200,000 units. This expansion of production capacity further increased demand for parts supply, logistics distribution, and production services. Local industrial development began to shift from "establishing vehicle manufacturing capabilities" to "enhancing supporting capabilities around vehicle manufacturing," and the leading enterprise's role in driving the allocation of upstream and downstream resources gradually strengthened.

3.2 Chain Extension: Supplier Clustering and Chain-Based Investment Promotion

As vehicle production capacity expands, reducing transportation distances, improving delivery efficiency, and enhancing supply chain responsiveness have become pressing needs for the development of the industrial chain. In 2022, construction began on Xiaopeng Motors' Automotive Components Industrial Park, which is designed to support the entire vehicle, battery, electric motor, electronic control systems, automotive lightweighting, and aftermarket sectors. At the same time, several supporting projects were signed and established in the Zhaoqing High-Tech Zone, extending the industrial development from a single vehicle manufacturing project to its upstream and downstream supply chains.

The most significant change during this phase is reflected in the investment promotion model. The Zhaoqing High-Tech Zone has established a mechanism with Xiaopeng Motors to jointly build a supporting industrial park, conduct joint investment promotion, and foster government-enterprise interaction, thereby incorporating the procurement needs, supplier resources, and industrial chain gaps identified by the lead enterprise into local investment promotion decision-making. This has given rise to a chain-based investment promotion logic: "chain-leading enterprises identify needs—the government allocates resources—suppliers follow suit and enter the market." Chain-leading enterprises provide industrial demand and supplier information; local governments reduce entry costs for businesses through land, industrial parks, policies, and public services; and suppliers determine their location based on order projections and industrial clustering conditions.

The clustering of suppliers in close proximity has further improved conditions for industrial collaboration. Geographical proximity reduces transportation and communication costs for components and enhances response times for production adjustments and unexpected orders; stable demand for complete vehicles strengthens the expectations of component suppliers to make specialized investments. As a result, the new energy vehicle industry in Zhaoqing has gradually shifted from a single-point cluster centered on vehicle assembly projects to a chain-like structure where vehicle manufacturing and component supply are interconnected.

3.3 Collaborative Deepening: Expanding from Supply Relationships to an Industrial Ecosystem

As the basic industrial chain takes shape, the focus of industry competition is shifting from "whether a supporting ecosystem has been established" to "whether different stakeholders can collaborate efficiently." In 2023, Xiaopeng Motors held its Global Partner Conference in Zhaoqing, with nearly 500 suppliers in attendance. Discussions centered on cost optimization, supply chain management efficiency, and the development of the supply chain ecosystem. This indicates that the relationship between lead enterprises and suppliers has evolved from traditional procurement and delivery to efficiency improvements, collaborative capabilities, and supply chain governance.

As supplier relationships deepened, orders gradually became a key vehicle for the transfer of technology and knowledge. The iterative development of vehicle models required suppliers to simultaneously adapt their technologies, adjust their processes, and allocate production capacity. Through their ongoing participation in the lead enterprise's production system, suppliers also continuously built up their capabilities in quality control, rapid delivery, and technical responsiveness. In 2024, Xiaopeng Motors' Zhaoqing plant began retrofitting its production lines for new models. Changes within the lead enterprise's production system were further transmitted to suppliers' product development, technology, delivery, and logistics operations, making the dynamic synergy of the supply chain even more pronounced.

At this stage, industrial organizational relationships have expanded from a bilateral "chain-leading enterprise–supplier" relationship to a multi-stakeholder network comprising "chain-leading enterprise–supplier–government–industrial park–service provider." Chain-leading enterprises signal demand through technical standards, orders, and supplier systems; supporting enterprises adjust their capabilities to meet the needs of vehicle production; and local governments and industrial parks provide support through investment promotion, infrastructure, and public services. Synergies among technology, supply and demand, production factors, and institutional frameworks are gradually accumulating. Xiaopeng Motors' role as a chain leader in Zhaoqing has evolved functionally from demand anchoring and chain organization to ecosystem coordination. This internal process manifests as follows: embedding of the vehicle manufacturing project → expansion of production demand → clustering of supporting enterprises → formation of supply chain relationships → deepening of multi-stakeholder collaboration → enhancement of regional industrial chain capabilities. This evolution demonstrates that a supply chain leader's ability to drive the local new energy vehicle industry does not rely solely on its own scale expansion. Rather, it involves gradually transforming corporate-level market demand, technological capabilities, and supply chain resources into regional industrial organizational capacity, thereby laying the foundation for subsequent synergies in technology, innovation, supply and demand, production factors, and institutional frameworks.

4 THE MECHANISM THROUGH WHICH LEADING ENTERPRISES DRIVE COLLABORATION IN THE ZHAOQING NEW ENERGY VEHICLE INDUSTRY CHAIN

Xiaopeng Motors' development in Zhaoqing has progressed through a process of embedding as a chain leader, extending the supply chain, and deepening collaboration. Its role as a chain leader is not limited to establishing vehicle manufacturing capabilities; rather, through technical standards, order coordination, the supplier system, and government-business interaction, the company continuously extends its capabilities beyond the supply chain and drives the transformation of relationships including those involving technology, innovation, supply and demand, production factors, and institutional frameworks from fragmented operations to coordinated interaction, as illustrated in Figure 1.

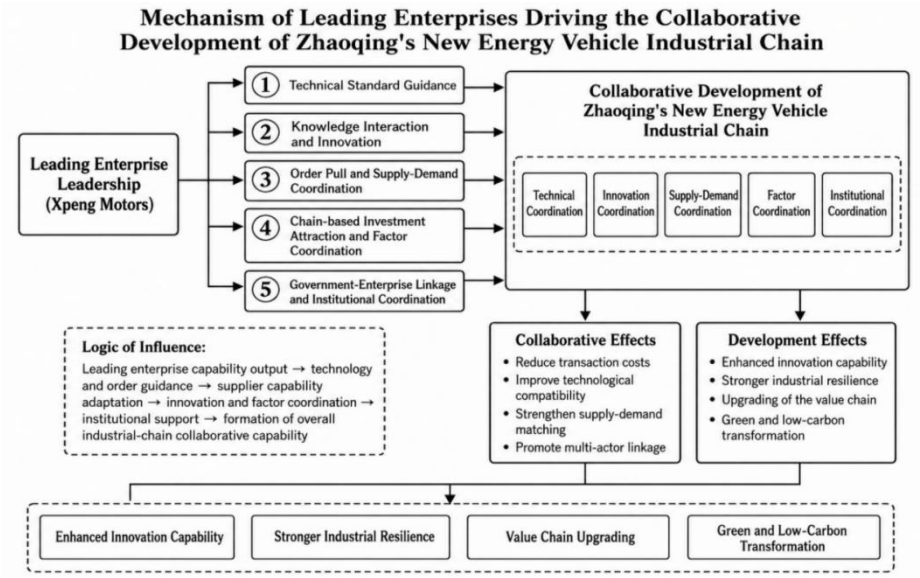

Figure 1 Mechanism of Leading Enterprises in Promoting Collaborative Development of Zhaoqing's New Energy Vehicle Industrial Chain

4.1 Technical Standards-Driven Development and Technical Synergy

The manufacturing of new energy vehicles involves a high degree of system integration. For parts suppliers to enter the supply chain of a lead enterprise, they must ensure compatibility in areas such as product quality, technical interfaces, manufacturing processes, and delivery standards. Xiaopeng Motors' Zhaoqing plant has established a comprehensive manufacturing system encompassing stamping, welding, painting, final assembly, and battery pack assembly, while continuously advancing smart warehousing, dynamic resource allocation, and digital management of production processes. Through supplier qualification, quality standards, and production specifications, the lead enterprise can thereby cascade technical requirements upstream along the supply chain, driving supporting companies to adjust their processes, upgrade their equipment, and enhance their capabilities. The essence of technical synergy lies in gradually transforming the lead enterprise's internal standards into technical interfaces that are jointly adhered to by both upstream and downstream partners, thereby improving the industry chain's technical compatibility and production coordination efficiency.

4.2 Knowledge Interaction and Collaborative Innovation

Once stable supply relationships are established, the interaction between the supply chain leader and suppliers gradually shifts from standard supply to joint problem-solving focused on product development, process optimization, and technical issues. At the 2023 Global Partner Conference held by Xpeng in Zhaoqing, the scope of supply chain collaboration had expanded to include cost optimization, management efficiency, and the development of an industrial ecosystem. Automakers possess an understanding of market demand, product architecture, and system integration capabilities, while specialized suppliers hold in-depth knowledge of materials, components, and manufacturing processes. Through vehicle model development and production improvements, both parties facilitate the exchange and recombination of knowledge. As a result, innovation capabilities are no longer confined to the lead enterprise but spread throughout the supply chain through ongoing collaboration, driving technological accumulation and enhancing the innovation capabilities of local suppliers.

4.3 Order-Driven Approach and Supply-Demand Coordination

Orders serve as a vital link connecting the lead enterprise with its upstream and downstream partners. Through procurement plans, production schedules, and delivery requirements, the lead enterprise communicates market demand to suppliers, who then allocate equipment, personnel, inventory, and logistics resources accordingly. Xiaopeng Motors' Component Industrial Park promotes the concept of "neighboring supply and timely response," which essentially reduces transportation and communication costs by locating suppliers in close proximity, thereby improving the alignment between component supply and vehicle production. Stable orders also reduce the uncertainty associated with

suppliers' investments in dedicated equipment and process modifications, making companies more willing to make long-term investments aligned with the lead enterprise's needs. The supply-demand relationship gradually shifts from short-term transactions to stable production collaboration, providing an economic foundation for sustained synergy across the industrial chain.

4.4 Chain-Based Investment Promotion and Factor Synergy

As Xiaopeng Motors ramps up mass production, its demand for resources—including corporate partnerships, capital, talent, land, logistics, and technical services—continues to grow. In 2022, construction began on the Xiaopeng Smart Vehicle Component Industrial Park. The Zhaoqing High-Tech Zone and Xiaopeng Motors established a joint investment promotion and government-enterprise collaboration mechanism to jointly facilitate the implementation of upstream and downstream projects. Local investment promotion has shifted from a general approach of "attracting enterprises" to strengthening and filling gaps in the supply chains of anchor enterprises. Anchor enterprises provide procurement needs, supplier resources, and technical direction, while local governments allocate industrial parks, land, policies, and public services, creating a complementary exchange of information and resources between the two parties. Once suppliers enter the market, they further drive the aggregation of capital, talent, and professional services, leading to the reallocation of production factors around key links in the industrial chain and improving the efficiency of matching local industrial resources with the needs of anchor enterprises.

4.5 Government-Business Collaboration and Institutional Synergy

The new energy vehicle industry chain encompasses multiple areas, including industrial investment promotion, project development, technological upgrades, talent recruitment, and public services; it is difficult to achieve full coordination through market transactions between companies alone. The joint investment promotion and industrial collaboration mechanism established by Xiaopeng Motors and the Zhaoqing local government enables the company to promptly relay its supply chain needs to the local governance system, while the government supports the refinement of the industry chain through industrial policies, industrial park development, and the allocation of public resources. During the 2024 renovation of production lines for new models at Xiaopeng Motors' Zhaoqing plant, the company continued to advocate leveraging its role as a supply chain leader to promote the clustering of the new energy vehicle and parts industries, indicating that government-enterprise collaboration has extended from project implementation to the ongoing adjustment of the industrial chain. The role of institutional coordination lies in reducing the costs of cross-entity cooperation and providing a stable external environment for the coordination of technology, supply and demand, and production factors.

4.6 Multidimensional Synergistic Coupling and the Development of Industrial Chain Capabilities

These five types of synergy mechanisms do not operate in isolation. Stable orders drive suppliers' investment in technology; technological adaptation increases the need for knowledge exchange and joint innovation; innovation activities further attract the aggregation of talent, capital, and service resources; and as the number of industry participants grows, greater demand for institutional coordination arises. Ultimately, this forms a synergy structure characterized by "order-driven—technological adaptation—innovation interaction—factor aggregation—institutional support." It is evident, therefore, that the key to a chain-leading enterprise driving industrial chain synergy lies not merely in expanding its own scale, but in transforming its technological, market, and organizational advantages into relational and organizational capabilities at the industrial chain level. Its mechanism of action can be summarized as follows: capability output by the chain-leading enterprise → technology and order-driven traction → capability adaptation by suppliers → innovation and factor synergy → institutional support → formation of overall industrial chain synergy. This process also lays the foundation for enhancing the innovation capacity, strengthening the resilience, upgrading the value chain, and facilitating the green and low-carbon transition of Zhaoqing's new energy vehicle industry.

5 PATHWAYS TO ACHIEVING HIGH-QUALITY DEVELOPMENT OF THE NEW ENERGY VEHICLE INDUSTRY IN ZHAOQING

The role of leading enterprises in driving the development of the local new energy vehicle industry is reflected not only in production capacity expansion and project clustering, but also in their ability to transform technical standards, market demand, supplier networks, and organizational capabilities into collaborative capabilities across the industrial chain. Currently, Zhaoqing has established a foundation in vehicle manufacturing, power batteries, and component supply, but issues such as insufficient local supply capabilities, low levels of coordination, weak innovation synergy, inadequate industrial service support, and shallow regional integration continue to hinder the industry's transition from scale expansion to high-quality development. Therefore, under the leadership of anchor enterprises, efforts should be made to further enhance capabilities in industrial chain organization, supply-demand coordination, innovation synergy, factor allocation, and regional network integration.

5.1 Strengthen the Leadership Role of Anchor Enterprises and Enhance the Organizational Capabilities of Industrial Chains

Zhaoqing should shift its focus from "supporting leading enterprises in expanding production" to "organizing industrial chains around chain-leading enterprises." The city can develop lists of industrial chain needs and supporting capabilities centered on chain-leading enterprises such as Xiaopeng Motors, with a focus on identifying supply gaps in areas such as power batteries, electric drive systems, automotive electronics, lightweight materials, and key components. Furthermore, the technological trends, procurement needs, and supplier information held by chain-leading enterprises should be integrated into local industrial planning and investment promotion decisions. At the same time, efforts should be made to encourage chain-leading enterprises to establish stable partnerships with local firms in the areas of technology, procurement, and quality control. This will enable the chain-leading enterprises' standards systems and supply chain management capabilities to spread upstream and downstream, gradually forming an industrial organizational system driven by chain-leading enterprises, supported by core supporting enterprises, and featuring the specialized participation of small and medium-sized enterprises.

5.2 Improve Local Infrastructure and Enhance the Ability to Coordinate Supply and Demand

Local supply chain capabilities determine whether the scale advantages of leading enterprises can be further transformed into regional industrial advantages. Zhaoqing should leverage the procurement needs and supplier networks of leading enterprises to guide the strategic placement of component manufacturers with high delivery timeliness, transportation sensitivity, and technical collaboration requirements, thereby enhancing local supply capabilities in critical areas. The development of the supporting ecosystem should not simply pursue the number of enterprises or localization rates, but should instead focus more on corporate technical capabilities and value within the industrial chain. Through tiered supplier development, quality system guidance, production planning coordination, and logistics system optimization, local enterprises should be encouraged to upgrade from general suppliers to stable core suppliers. At the same time, digital supply chain platforms should be utilized to strengthen the sharing of information on orders, inventory, production capacity, and logistics, thereby improving the ability to respond rapidly to changes in market demand and supply disruptions.

5.3 Building a Collaborative Innovation System to Drive Value Chain Upgrading

The key to high-quality development in the new energy vehicle industry lies in the continuous enhancement of innovation capabilities and value creation. Zhaoqing should strengthen knowledge linkages among lead enterprises, supporting companies, research institutions, and public innovation platforms to promote the expansion of technological innovation from internal corporate R&D to collaborative innovation across the industrial chain. Focusing on areas such as smart manufacturing, battery management, automotive electronics, lightweighting, and green manufacturing, an innovation mechanism can be established in which lead enterprises propose requirements and enterprises along the supply chain collaborate on joint research and development. Additionally, barriers to innovation for small and medium-sized enterprises (SMEs) can be lowered through testing and certification, technical services, and industry-academia-research collaboration. The technical requirements set by lead enterprises should be transformed from mere supplier qualification standards into a driving force for local enterprises to upgrade their technologies. This will enable supporting enterprises to accumulate capabilities in R&D, quality management, and product development through long-term collaboration, gradually moving from general manufacturing processes to high-value-added segments.

5.4 Improve Collaborative Governance and Enhance the Efficiency of Factor Allocation

The new energy vehicle industry chain involves a wide range of resources, including land, capital, talent, logistics, technical services, and public platforms; efficient allocation of these resources is difficult to achieve through market transactions between companies alone. Zhaoqing should improve its mechanisms for joint government-enterprise investment promotion and industrial services, establishing a regular collaborative platform involving the government, leading enterprises, industrial parks, and key supporting enterprises. Leading enterprises should provide information on supply chain needs and industry trends; the government should coordinate policies, infrastructure, and public resources; and industrial parks should facilitate business establishment and provide specialized services. By leveraging complementary information and resources, the overall operational efficiency of the industrial chain can be enhanced.

Industrial chain governance should also extend from project services to operational management. Dynamic monitoring and risk early-warning mechanisms can be established around key components, core suppliers, and logistics hubs to enhance the ability to secure alternative supplies and allocate resources in the face of supply disruptions, market fluctuations, and technological adjustments, thereby strengthening the resilience of the industrial chain.

5.5 Deepening Cooperation in the Bay Area and Strengthening Regional Network Integration

The new energy vehicle industry chain has distinct cross-regional characteristics. Rather than pursuing a self-contained, complete local industry chain, Zhaoqing should leverage its manufacturing base and spatial capacity advantages to

deeply integrate into the Guangdong-Hong Kong-Macao Greater Bay Area's new energy vehicle industry network. Zhaoqing should strengthen functional linkages with cities such as Guangzhou, Shenzhen, Foshan, and Dongguan in areas including R&D, parts manufacturing, logistics, and markets, and acquire cutting-edge technologies and innovation resources through cross-regional joint innovation and supply chain collaboration. More importantly, it should encourage local supporting enterprises to leverage the quality standards, production capabilities, and industry reputation they have developed while serving leading enterprises to enter a broader new energy vehicle supply system, thereby reducing dependence on any single leading enterprise. This will forge a development pathway characterized by "chain-leading enterprises organizing the industrial chain—local supporting enterprises strengthening supply-demand coordination—collaborative innovation driving value upgrading—industrial governance optimizing resource allocation—and Greater Bay Area collaboration expanding the industrial network." This approach will propel Zhaoqing's new energy vehicle industry from a focus on enterprise and project clustering toward the aggregation of industrial chain capabilities, thereby achieving simultaneous improvements in innovation capacity, industrial resilience, value creation, and regional integration.

6 CONCLUSIONS AND OUTLOOK

6.1 Research Findings

Using Xiaopeng Motors and the new energy vehicle industrial chain it has established in Zhaoqing as a case study, this paper analyzes the internal mechanisms through which anchor enterprises lead local industrial chain collaboration and drive high-quality development. The study finds that the role of anchor enterprises in regional industrial development does not stem solely from the expansion of corporate scale, but rather from the external transmission of technology, orders, markets, and organizational capabilities to the industrial chain, thereby driving the transformation of corporate relationships from general transactions to multi-stakeholder collaboration.

(1) The lead enterprise serves as a critical organizational node in the evolution of Zhaoqing's new energy vehicle industry chain. Xiaopeng Motors has undergone a development process in Zhaoqing characterized by "integration as the lead enterprise—extension of the industry chain—deepening of collaboration." Its role has gradually expanded from vehicle manufacturing and demand anchoring to supplier organization, industrial investment promotion, the establishment of technical standards, and coordination of the industrial ecosystem, transforming its role from a production entity to an industry chain organizer.

(2) Leading enterprises in the supply chain primarily drive the restructuring of industrial chain relationships through technological synergy, innovation synergy, supply-demand synergy, factor synergy, and institutional synergy. Technical standards facilitate the alignment of supplier capabilities; stable orders improve the efficiency of supply-demand matching; knowledge exchange drives the accumulation of innovation capabilities; chain-based investment promotion fosters the clustering of enterprises and production factors; and government-enterprise collaboration bridges industrial demand with the allocation of public resources. These five mechanisms reinforce one another, forming a synergistic structure of "Order-driven—Technical alignment—Innovation interaction—Factor aggregation—Institutional support."

(3) Industrial chain synergy is a key channel for transforming the strengths of leading enterprises into regional industrial capabilities. The technological, market, and supply chain advantages of leading enterprises can only be further transformed into industrial innovation, supply chain resilience, value creation, and regional integration capabilities when they transcend corporate boundaries through technology diffusion, supplier development, knowledge sharing, and resource reorganization. Therefore, the development of Zhaoqing's new energy vehicle industry should shift from "project clustering" to "industrial chain capability clustering." The underlying logic can be summarized as follows: leadership by Anchor enterprises-Multidimensional industrial chain synergy-Enhancement of regional industrial capabilities-High quality development of the new energy vehicle industry.

6.2 Research Outlook

This paper employs a single-case study of Xiaopeng Motors. Since different chain-leading enterprises exhibit differences in their technological approaches, supply chain governance, and modes of regional embedding, the study's conclusions still require further validation through a multi-case comparison. This paper primarily relies on publicly available corporate data, government documents, and industry information; observations regarding supplier selection, technological cooperation, and relationship governance remain limited. Future research could incorporate data from corporate interviews, supplier transactions, patent collaborations, and logistics connections to further enhance the reliability of identifying these mechanisms. Additionally, attention could be directed toward the dynamic changes in the functions of lead enterprises and industrial chain relationships against the backdrop of digitalization, artificial intelligence, green manufacturing, and cross-regional collaboration within the Guangdong-Hong Kong-Macao Greater Bay Area, thereby deepening our understanding of the mechanisms driving high-quality development in the new energy vehicle industry.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

FUNDING

This research was supported by the 2026 Zhaoqing Philosophy and Social Science Planning Project, "Study on the Collaborative Mechanisms and High-Quality Development Pathways of Zhaoqing's New Energy Vehicle Industry Chain Led by Chain-Leading Enterprises" (Project No. 26GJ-324).

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