Financial Economics Insights

Article

The Impact of Green Finance Development in the Chengdu-Chongqing Region on New Quality Productivity

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Abstract: Against the backdrop of rapid development in new quality productive forces, green finance acts as a crucial link between green initiatives and financial resources, playing a key role in driving high-quality regional development. As a nationally strategic area, the Chengdu–Chongqing Economic Circle should deeply integrate green finance with the fostering of new quality productive forces to function as a central engine for regional coordinated growth. This paper systematically investigates the practical foundations, distinctive demands, and operational challenges of green finance development in the Chengdu–Chongqing region in cultivating new quality productive forces. It further puts forward recommendations for coordinated green finance development to strengthen these productive forces. The study aims to offer theoretical insights and actionable pathways for achieving high-quality sustainable development in the Chengdu–Chongqing region, while providing useful implications for similar regions across the country.

Keywords: Chengdu-Chongqing Region; Green Finance; New Quality Productivity; Collaborative Development

1. Introduction

Amidst the intertwined challenges of global climate change and economic transformation, China has established the "dual carbon" goals (carbon peak and carbon neutrality), positioning green development as the fundamental approach to achieving high-quality growth. The assertion that "new-quality productive forces are inherently green productive forces" highlights their intrinsic alignment with green and low-carbon development. As the core of the modern economy, the greening of finance plays an indispensable role in cultivating new-quality productive forces and driving a comprehensive green transformation [1].

Situated in the upper reaches of the Yangtze River, the Chengdu-Chongqing Economic Circle is a strategically vital region with significant ecological importance. Supported by a comprehensive industrial system and concentrated innovation resources, it possesses a strong foundation to develop into a major national economic center and a hub for scientific and technological innovation. However, the region also faces considerable challenges, including intense pressure to transform traditional industries, increasingly stringent ecological constraints, and inefficient coordination mechanisms. In 2024, the regional GDP exceeded 13 trillion yuan, accounting for 10.3% of the national total. Yet, the value-added share of green industries remained only 7.2%, 1.5 percentage points below the national average, while the industrialization rate of green technologies stayed under 30%. Notably, Chongqing's traditional fuel-vehicle supply chain is undergoing disruption due to electrification, whereas Sichuan struggles with low green-technology industrialization rates and an underdeveloped mechanism for realizing the value of ecological products. Against this backdrop, leveraging green finance to address

Published: 17 January 2026

these multifaceted challenges and foster new productive forces has become a central task for the region's development.

2. Current Research Status and Related Literature

2.1. New Quality Productivity (NQP)

New Quality Productivity (NQP) represents a fundamental shift away from traditional, factor-driven growth models, which have historically depended on extensive inputs of labor, capital, and natural resources-often at a substantial environmental cost. In contrast, NQP constitutes an innovation-led economic development paradigm that places core emphasis on high technology, high efficiency, and high quality [2]. It signifies a qualitative leap in productivity, moving beyond mere quantitative expansion of output [3].

The literature defines NQP in multiple dimensions. At its heart, NQP is driven by revolutionary technological breakthroughs, the innovative allocation of production factors, and the deep transformation and upgrading of industries [4]. It is intrinsically linked to the development of strategic emerging industries-such as artificial intelligence, biotechnology, and new energy-as well as future-oriented sectors that will define the next generation of economic competitiveness. Essentially, the concept aims to achieve growth in total factor productivity spearheaded by technological innovation, particularly in core, cutting-edge fields [5].

NQP can be distinguished from earlier related concepts. While it shares common ground with Green Total Factor Productivity (GTFP)-a measure incorporating resource and environmental constraints into productivity assessments-NQP is broader in scope. GTFP focuses mainly on improving efficiency within existing environmental limits, whereas NQP emphasizes a more profound, technology-driven restructuring of the entire economic system to create new growth engines that are inherently green and sustainable. A key feature of NQP is its reliance on "new" production factors-such as data, advanced algorithms, and highly skilled labor-deployed through "new" instruments of production, including intelligent and networked manufacturing systems. Ultimately, fostering NQP aims to achieve a form of robust and environmentally sound sustainable economic development [6].

The significance of NQP is twofold. First, it provides a pathway to transcend the "middle-income trap" and other developmental bottlenecks by shifting the basis of growth from imitation and scale to innovation and quality. Second, it embeds sustainability at the heart of the economic model, aligning productivity gains with environmental protection goals. This makes NQP a central pillar in the modern pursuit of high-quality development [7].

2.2. Green Finance (GF)

Green finance represents a critical innovation within the financial system, designed to support and facilitate the transition toward a sustainable economy. It encompasses a broad range of financial activities-including investment, financing, insurance, and risk management-that deliver environmental benefits and advance sustainable development goals. Fundamentally, green finance aims to redirect public and private capital away from polluting and resource-intensive industries toward green, low-carbon, and circular economy projects [8].

The toolkit of green finance is both diverse and continually evolving, comprising a variety of financial instruments and policy mechanisms, such as:

1) Green Credit: Loans extended to enterprises engaged in energy conservation, environmental protection, clean energy production, and green technology R&D. Green credit policies often involve preferential interest rates for green projects and stricter lending criteria or higher costs for polluting projects.

2) Green Bonds: Fixed-income instruments where the proceeds are exclusively applied to finance or re-finance new and existing projects with demonstrable environmental benefits.
3) Green Funds: Investment funds that focus on environmentally sustainable companies and projects, such as renewable energy, sustainable agriculture, and pollution control technologies.
4) Green Insurance: Insurance products designed to manage and mitigate environmental risks, such as liability insurance for pollution incidents or insurance for renewable energy projects against operational risks.
5) Carbon Finance: Financial instruments and markets, such as emissions trading schemes (ETS), that place a price on carbon emissions, creating financial incentives for their reduction.

Green finance operates within a dual-objective framework: it seeks to achieve positive environmental outcomes while also generating acceptable financial returns, thereby reconciling the perceived trade-off between ecological protection and economic profitability. By incorporating environmental risk assessment into conventional financial decision-making, it enables institutions to better manage both physical and transition risks related to climate change and environmental degradation, thereby strengthening the overall stability of the financial system [9].

2.3. The Nexus between Green Finance and New Quality Productivity

The relationship between green finance (GF) and new quality productivity (NQP) is not coincidental but rooted in a coherent and complementary theoretical logic. GF serves as a key enabler of NQP by addressing several fundamental market and systemic barriers that impede the shift toward an innovation-driven, sustainable growth model.

First, GF meets the substantial capital needs of NQP. The core drivers of NQP-technological breakthroughs, R&D in strategic industries, and large-scale clean energy infrastructure-are highly capital-intensive, typically requiring long investment horizons and entailing significant risks [10]. Traditional financial systems, often marked by short-term orientation and risk aversion, tend to fall short in supplying the patient capital needed for such ventures. By design, green finance directs funding specifically toward these long-term sustainable investments, thereby bridging a critical financing gap [11].

Second, GF corrects market failures through the internalization of environmental externalities. In conventional markets, polluters do not bear the social costs of pollution and resource depletion, leading to overinvestment in environmentally harmful activities and underinvestment in green alternatives. Green finance instruments-such as differentiated loan rates for green versus polluting projects and carbon pricing mechanisms-effectively internalize these external costs. This pricing signal reduces the profitability of polluting activities while enhancing the appeal of green innovation, thereby steering investment and corporate behavior toward pathways consistent with NQP development [12].

Third, this relationship can be framed in terms of "empowerment." Beyond passively supplying capital, green finance actively empowers, guides, and reshapes the economy. It functions as a strong market signal, highlighting which industries and technologies align with future policy directions and long-term value creation. This guidance reduces uncertainty for investors and entrepreneurs, channeling resources and talent into sectors foundational to NQP. By establishing a clear incentive structure, GF accelerates the process of "creative destruction," phasing out outdated, polluting production capacities while promoting the emergence of clean, efficient alternatives [13].

In essence, NQP constitutes the "demand" for a new economic structure, while GF supplies the appropriately structured capital and incentives to realize it. The two are complementary forces that jointly foster a new development paradigm in which economic prosperity and environmental sustainability reinforce each other.

Academic research has established a theoretical chain linking "green finance → factor optimization and innovation → new quality productive forces." While existing studies have focused on regions such as Beijing-Tianjin-Hebei, targeted investigations of the Chengdu-Chongqing region remain limited. Given its unique strategic positioning and industrial foundation, the region presents distinct pathways through which green finance can empower new quality productive forces-a central focus of this paper.

3. Research Methods

3.1. Literature Research Method

Academic literature was retrieved from authoritative databases-including CNKI (China National Knowledge Infrastructure), Google Scholar, and Wanfang Data-using keywords such as "green finance," "new quality productive forces," "Chengdu-Chongqing Twin-City Economic Circle," and "regional coordinated development." In addition, relevant national policies (e.g., green finance reform pilot policies, carbon peaking and carbon neutrality action plans), regional development reports (e.g., the Chengdu-Chongqing Twin-City Economic Circle Construction Progress Report), financial regulatory statistics, and industry white papers were collected.

These materials were systematically categorized according to research themes (theoretical mechanisms, regional practices, bottleneck analysis, policy recommendations), methodologies (theoretical deduction, empirical testing, case study), and core conclusions. By synthesizing existing research on the interaction between green finance and new quality productive forces-particularly regarding the theoretical logic of green finance's empowering pathways and regional heterogeneity-this study clarifies both academic consensus and research gaps. Notable among these gaps is the scarcity of targeted studies on strategic western regions such as Chengdu-Chongqing, thereby establishing a solid theoretical foundation for subsequent empirical analysis and policy formulation.

3.2. Case Analysis Method

Typical cases of green finance practice in the Chengdu-Chongqing region were selected for in-depth analysis, encompassing:

1) Regional platform cases: Chongqing's "Yangtze River Green Finance Integration" platform and the Chengdu Environment Exchange, which represent key infrastructure for green finance and environmental-rights trading.
2) Industrial project cases: New-energy vehicle industrial-chain financing in Chongqing and forest carbon-sink mortgage-loan pilots in Sichuan, reflecting how green finance supports traditional-industry transformation and the realization of ecological-product value.

Data and materials were drawn from platform operation reports, project approval documents, corporate annual reports, and regulatory announcements. The analysis focused on three dimensions:

The operational mechanisms of green finance instruments (e.g., green credit, carbon-sink mortgages);

The alignment between financial services and regional development needs (e.g., industrial upgrading, ecological conservation);

Practical outcomes (e.g., project-financing efficiency, carbon-emission reduction benefits).

Through detailed case examination, the specific pathways and existing challenges of green finance in empowering new quality productive forces in the Chengdu-Chongqing region were identified.

4. Related Concepts and Theoretical Foundations

4.1. The Green Implications and Core Characteristics of New Quality Productivity

New-quality productive forces represent an advanced form of productive capacity aligned with contemporary development concepts. Innovation is their core driver, characterized by high technology, high efficiency, and high quality, while green attributes permeate multiple dimensions-technology, factors, and industries. At the technological level, they employ cutting-edge green-low-carbon and digital-intelligent technologies to transform development drivers and upgrade energy structures. At the factor level, they promote the integration of new and traditional production factors, with a focus on quantifying, trading, and financing ecological products. At the industrial level, they foster a modern industrial system marked by low consumption, low emissions, and high efficiency, achieved through greening traditional industries and nurturing new green sectors. Greenness is thus the defining attribute of new-quality productivity; its development inherently entails a comprehensive green transformation of the economy and society, which in turn requires precise support from the financial system.

4.2. Core Functions and Contemporary Mission of Green Finance

The core mission of green finance has evolved from restraining "high-energy-consuming and high-emission" industries to cultivating new green growth drivers. Its essence lies in providing financial services that promote environmental improvement, climate response, and efficient resource utilization, with three key functions:

1) Resource-allocation function: Through a "positive incentive + negative constraint" mechanism, it channels social capital toward green industries, lowers financing costs for green projects, limits the space for outdated production capacity, and ensures funding for nurturing new productive forces.
2) Risk-management function: By utilizing environmental disclosure and climate-risk stress testing, it assists financial institutions and enterprises in identifying and assessing environmental risks, thereby enhancing the resilience of economic and financial systems.
3) Market-pricing function: Through market-based instruments such as carbon-emissions trading and green-power transactions, it internalizes environmental externalities by assigning them a price, thus steering production, investment, and consumption toward green and low-carbon transformation.

4.3. Green Finance's Intermediary Pathways to Empower New Quality Productivity

Green finance empowers new quality productive forces through three intermediary pathways: technological innovation, factor optimization, and industrial upgrading.

1) Technological-innovation pathway: Green finance supplies funding throughout the entire lifecycle of green technology-from R&D and pilot testing to industrialization. It addresses stage-specific needs via instruments such as equity funds, loans, and bonds, while mitigating innovation risks, creating positive incentives, and accelerating technological iteration and adoption.
2) Factor-optimization pathway: It facilitates the quantification and trading of ecological products, converting ecological resources into productive factors through instruments like carbon-sink pledge loans and ecological-benefit-rights pledge financing, and promotes cross-regional coordination of factors.
3) Industrial-upgrading pathway: It supports the green technological transformation of traditional industries while cultivating new green industries, business models, and formats. Industrial-chain finance further enhances the overall competitiveness of the industrial system.

5. Current Status of Developing New Quality Productivity in the Chengdu-Chongqing Twin-City Economic Circle

As the most densely populated, economically largest, and most innovation-rich region in western China, the Chengdu-Chongqing Economic Circle possesses a solid foundation for cultivating NQP. However, it also faces notable challenges, including substantial industrial transformation pressure and insufficient capacity to convert innovation into practical outcomes. Correspondingly, while green finance development in the region has achieved initial progress, significant bottlenecks persist when evaluated against the requirements for fostering NQP, underscoring the need for systematic analysis and targeted solutions.

5.1. The Practical Foundation and Unique Requirements for Cultivating New Quality Productivity in the Chengdu-Chongqing Region

The Chengdu-Chongqing region benefits from a robust industrial foundation, concentrated innovation resources, considerable ecological significance, and distinct "dual-core" characteristics-collectively forming a practical basis for cultivating NQP. These conditions also give rise to unique regional demands in four areas: industrial transformation, technological innovation, ecological value realization, and coordinated development. Addressing these demands constitutes the core objective for green finance empowerment.

5.1.1. Robust Industrial Base but Significant Transformation Pressure

Chongqing serves as a modern manufacturing hub, with automobile production exceeding 3 million units and electronics industry output surpassing 1.2 trillion yuan in 2024. Nevertheless, its traditional fuel-vehicle supply chain faces mounting pressure from electrification. Sichuan, on the other hand, boasts abundant hydropower resources-with installed capacity accounting for over 25% of the national total-and several competitive industries, yet it struggles with low industrialization rates for green technologies. Both regions share a common imperative: to upgrade traditional industries through green technological transformation while actively fostering future green and low-carbon sectors, such as new energy vehicles, power batteries, hydrogen energy, new energy storage, and energy-saving and environmental protection equipment. This dual approach will propel the regional industrial system toward greener, higher-end, and smarter development.

5.1.2. Innovation Resources Are Concentrated, but Conversion Capabilities Need Strengthening

Chengdu and Chongqing host a concentration of higher education institutions, including Sichuan University and Chongqing University, as well as research bodies such as the Chengdu Branch of the Chinese Academy of Sciences and the Chongqing Green Intelligent Technology Research Institute, alongside several national key laboratories. These entities demonstrate strong R&D capabilities in fields such as electronics and information technology, biomedicine, aerospace, and green low-carbon technologies. In 2024, the region's R&D intensity reached 2.5%, exceeding the national average. However, the conversion pathway for green and low-carbon technologies remains inefficient, with many research outcomes stagnating at the laboratory stage and failing to achieve industrial-scale production. A core obstacle is the lack of full-cycle financial support, which leaves green technology innovators facing financing difficulties and high costs during the seed and start-up phases. This gap highlights the urgent need for a green financial system capable of providing targeted, stage-appropriate support.

5.1.3. High Ecological Significance but Underdeveloped Value Realization Mechanisms

The Chengdu-Chongqing region forms a core ecological barrier in the upper Yangtze River basin, encompassing critical zones such as the Giant Panda National Park, the Three

Gorges Reservoir area, and the Ruoergai Wetlands. With forest coverage exceeding 50%, its wetland and farmland ecosystems deliver substantial ecological services. Yet, the region has long faced difficulties in translating these ecological advantages into economic benefits, hampered by an underdeveloped mechanism for realizing the value of ecological products. This shortfall has weakened intrinsic incentives for ecological conservation. Consequently, exploring pathways to monetize ecological value-through instruments such as forest carbon sinks, water rights trading, and biodiversity conservation-has become a major task for cultivating NQP in the region. It also represents a crucial direction for green financial innovation.

5.1.4. Chengdu-Chongqing Region Should Strengthen Synergistic Effects

As the twin cores of the region, Chengdu and Chongqing exhibit distinct industrial structures, resource endowments, and policy environments. Chengdu holds strengths in electronics, information technology, biomedicine, and financial services, whereas Chongqing excels in automobile manufacturing, equipment manufacturing, and logistics. While a degree of inter-city competition exists, the potential for cooperation is vast. Given their complementary industrial profiles, Chengdu and Chongqing should break down administrative barriers to deepen collaboration in areas such as green technology R&D and industrial chain coordination. This imperative places higher demands on the cross-regional coordination of green finance policies, platforms, and resource flows.

5.2. Practical Exploration and Key Bottlenecks in Green Finance Development in the Chengdu-Chongqing Region

In recent years, Chengdu and Chongqing have actively responded to the national green finance development strategy, undertaking a series of practical explorations that have yielded preliminary results. However, when measured against the requirements for cultivating new productive forces, they still face significant shortcomings such as insufficient institutional coordination, market fragmentation, and lackluster product innovation.

5.2.1. Practical Explorations in Green Finance Development in the Chengdu-Chongqing Region.

Several key initiatives have been undertaken in the region:

1) As a pilot zone for green financial reform and innovation, Chongqing has introduced local green finance standards and launched the "Yangtze Green Finance Connect" platform to facilitate precise matching between green projects and financial resources.
2) The Chengdu Environment Exchange has established a first-mover advantage in carbon sink and green electricity trading, actively promoting the development of green loans and bonds, ranking it among the leading platforms in western China.
3) Sichuan and Chongqing have signed cooperation agreements aimed at advancing the mutual recognition of green finance standards and promoting information sharing.

5.2.2. Key Bottlenecks in Green Finance Development in the Chengdu-Chongqing Region.

Despite progress, the region's green finance sector still faces significant shortcomings, hindering its ability to fully meet the demands of cultivating new productive forces.

Firstly, insufficient institutional coordination and inconsistent standards systems. Green finance policies and standards in Sichuan and Chongqing remain unaligned, primarily manifesting in three aspects: First, discrepancies in green project certification criteria-Chongqing employs local green finance standards while Sichuan primarily

references the national green project catalog, resulting in duplicate assessments for cross-regional projects seeking green financing in both regions; Second, inconsistent ESG disclosure requirements. The two regions lack unified norms regarding the scope, content, and format of corporate ESG disclosures, making it difficult for financial institutions to conduct uniform risk assessments for cross-regional enterprises. Third, lack of coordination in green finance incentive policies. Differences in policies such as green credit subsidies and green bond issuance incentives across the two regions dampen financial institutions' enthusiasm for conducting cross-regional business. This institutional lack of coordination creates barriers for cross-regional green project evaluation, certification, and financing, resulting in high costs and low efficiency for financial institutions conducting cross-regional business.

Secondly, market segmentation is pronounced, resulting in inefficient resource allocation. The Chengdu-Chongqing region exhibits significant fragmentation in its green finance market, hindering improvements in resource allocation efficiency. First, environmental rights trading markets remain fragmented. The Sichuan United Environmental Exchange and the Chongqing Resource and Environment Trading Center have yet to achieve effective integration in trading rules, product systems, and data platforms, hindering the free cross-regional trading of environmental rights such as carbon emission allowances and energy consumption rights. Second, green credit data lacks interoperability. Differences in green credit statistical methodologies and data reporting systems among financial institutions in both regions prevent the establishment of a unified regional green credit database, undermining the precise implementation of monetary policy tools. Third, information asymmetry remains pronounced. Data on cross-regional green projects is scattered across different departments in both regions, making it difficult for financial institutions to fully grasp project realities. This results in some high-quality green projects struggling to secure adequate financing, while certain high-risk projects may obtain funding through information concealment, reducing the efficiency of green financial resource allocation.

Thirdly, product and service homogeneity persists, with insufficient targeting and innovation. Green financial products in the Chengdu-Chongqing region remain dominated by traditional green loans and green bonds, accounting for over 80% of offerings. This severe product homogeneity struggles to meet the diverse demands of cultivating new productive forces. First, there is insufficient supply of differentiated products for green technology innovation enterprises. Green tech companies in seed and startup phases are characterized by high risk, high investment, and lack of collateral, yet current green credit products mostly require collateral guarantees. Green equity financing products are relatively small in scale, making it difficult to cover the full lifecycle financing needs of enterprises. Second, financial product innovations linked to the realization of ecological product value lag behind. Despite abundant ecological resources in both regions, products such as forest carbon sink pledge loans, water rights mortgage loans, and ecological protection compensation income pledge financing remain in the pilot stage. Their small scale and narrow coverage hinder the effective conversion of ecological product value. Third, green financial derivatives are absent. The lack of instruments like carbon emission futures and green asset-backed securities (ABS) fails to meet market participants' risk management and investment needs.

Fourth, infrastructure remains fragmented with limited technological empowerment. Lagging green finance infrastructure development hampers the efficient growth of green finance. First, data platforms are built in isolation. For instance, Chongqing's "Yangtze Green Finance Connect" platform and Sichuan's green finance service platform operate independently without data-sharing mechanisms, leading to fragmented regional green finance data. Second, technological application remains superficial. The use of blockchain, artificial intelligence, and the Internet of Things in green finance is still rudimentary, failing to achieve penetrative management of green assets, reliable collection of environmental data, or intelligent risk early warning. Third, there is a shortage of

specialized service providers. The lack of assessment, certification, and rating agencies with dual expertise in green finance and green industries hinders efficient environmental benefit assessments for green projects and green asset pricing, thereby increasing operational costs and risks for financial institutions.

Fifth, risk-sharing mechanisms are absent, and specialized talent is scarce. Green projects, particularly those involving cutting-edge green technologies, carry high-risk characteristics. However, the Chengdu-Chongqing region currently lacks effective risk-sharing mechanisms, constraining the scaled development of green finance. Firstly, regional risk compensation mechanisms are absent. The two cities have yet to establish a unified green finance risk compensation fund pool, making it difficult to effectively diversify the risks faced by financial institutions when conducting green credit, green equity investment, and other related businesses. Second, the green guarantee system is inadequate. Government-backed financing guarantee institutions provide insufficient support for green projects, and high guarantee fees hinder effective reduction of financing barriers for green initiatives. Third, the green insurance system is underdeveloped, with limited insurance products addressing climate risks and environmental pollution liability risks, making it difficult to cover risks throughout the entire lifecycle of green projects. Simultaneously, a significant shortage of specialized talent persists. There is a severe lack of professionals who are proficient in both financial operations and green industry technologies and policies. This shortage hinders financial institutions from accurately assessing the technical feasibility, environmental benefits, and risk profiles of green projects, thereby impeding the innovation and promotion of green financial products.

6. Recommendations for Green Finance to Empower the Development of New Productive Forces in Chengdu-Chongqing

6.1. Strengthen Dual-Core Synergy to Build an Integrated Policy and Market Framework

To overcome institutional fragmentation and enhance regional cohesion, a coordinated governance framework should be established. First, a high-level cross-regional coordination body should be created, responsible for formulating unified green finance development plans, resolving inter-jurisdictional disputes, and maintaining regular policy dialogue. Second, it is essential to develop harmonized regional standards in key areas such as green project catalogs, green bond certification, and ESG disclosure, ensuring mutual recognition between Sichuan and Chongqing. Finally, infrastructure should be jointly developed and shared-including integrated financial service platforms, blockchain-enabled secure data-sharing systems, and interconnected payment clearing and credit reporting networks-to reduce transaction costs and improve market efficiency.

6.2. Deepen Institutional Innovation to Optimize Incentive-Constraint and Risk-Sharing Mechanisms

Institutional innovation is critical to aligning financial incentives with green development goals. Monetary policy tools should be refined, for example through targeted reserve requirement reductions, relending facilities dedicated to green finance, and the issuance of regional green financial bonds. Fiscal risk-sharing mechanisms must also be strengthened, such as by establishing a jointly funded green finance risk compensation pool that provides proportional loss coverage and subsidizes premiums for green insurance products. Furthermore, a joint regulatory working group should be formed to unify supervisory standards, enable information sharing, and rigorously investigate malpractices including "greenwashing." Regulatory data should be integrated into a comprehensive regional service platform to enhance transparency and oversight.

6.3. Promoting Technology Integration to Build a New Smart Green Finance Ecosystem

The integration of advanced technologies can significantly elevate the efficiency and scope of green finance. A core "digital green finance" platform should be developed,

leveraging blockchain for asset provenance and traceability, artificial intelligence and IoT for real-time project monitoring, and satellite remote sensing for environmental impact verification. This platform would support dynamic risk early-warning and improve the credibility of green certifications. Simultaneously, financial institutions should be encouraged and supported to embed green finance modules into their core business systems, develop digital service channels, and utilize data analytics to enhance customer experience and operational efficiency, thereby accelerating the industry-wide digital transformation.

6.4. Expanding Open Collaboration to Enhance Regional Green Finance Influence

To elevate the region's role in the global green finance landscape, Chengdu-Chongqing should actively engage with international practices and partners. First, alignment with globally accepted frameworks-such as the Equator Principles and the Task Force on Climate-Related Financial Disclosures (TCFD)-should be encouraged, and efforts made to promote mutual recognition of green bonds and ESG reporting across borders. Participation in international standard-setting will bolster the region's credibility. Second, foreign green capital can be attracted through dedicated investment summits, the establishment of cross-border green investment guidance funds, streamlined foreign-investment approval procedures, and support for local enterprises issuing green bonds and global depository receipts (GDRs) overseas. Third, green finance cooperation should be extended along the Belt and Road Initiative by exporting green standards, technologies, and financial products, co-building cooperative platforms, and supporting regional firms in "going global" to participate in green infrastructure projects abroad.

7. Conclusions and Outlook

Green finance has become a core engine for driving high-quality regional development. For the Chengdu-Chongqing Economic Circle, developing green finance is a strategic choice to practice the concept that "lucid waters and lush mountains are invaluable assets" and cultivate new competitive advantages. Currently, regional green finance development faces multiple constraints in systems, markets, products, and infrastructure. These challenges require addressing through enhanced dual-core coordination, deepened institutional innovation, promoted technological integration, and expanded open collaboration. Looking ahead, as these recommendations are implemented, green finance in the Chengdu-Chongqing region will deeply integrate with new productive forces, providing robust support for high-quality sustainable development in the region and offering replicable and scalable experiences for similar regions nationwide.

Funding: This work is primarily supported by the Chengdu Green and Low-Carbon Development Research Center (Chengdu Philosophy and Social Sciences Research Center) for the project “Research on Mechanisms and Pathways for Chengdu's Green Finance Development to Empower New Quality Productivity” (Grant No. LD202534). Additionally, support is provided by the Sichuan University of Media and Communications for the 2025 University-Level Scientific Research Project “Research on the Impact Mechanism and Path of Green Finance Pilot Policies on Enterprises' Green Innovation” (Grant No. X20250910).

References

1. T. Xu, G. Yang, and T. Chen, "The role of green finance and digital inclusive finance in promoting economic sustainable development: A perspective from new quality productivity," Journal of Environmental Management, vol. 370, p. 122892, 2024. doi: 10.1016/j.jenvman.2024.122892
2. C. Shao, H. Dong, and Y. Gao, "New quality productivity and industrial structure in China: The moderating effect of environmental regulation," Sustainability, vol. 16, no. 16, p. 6796, 2024. doi: 10.3390/su16166796
3. H. Chu, X. Niu, M. Li, and L. Wei, "Research on the impact of new quality productivity on enterprise ESG performance," International Review of Economics & Finance, vol. 99, p. 104009, 2025. doi: 10.1016/j.iref.2025.104009

4. C. Jiakui, J. Abbas, H. Najam, J. Liu, and J. Abbas, "Green technological innovation, green finance, and financial development and their role in green total factor productivity: Empirical insights from China," Journal of Cleaner Production, vol. 382, p. 135131, 2023. doi: 10.1016/j.jclepro.2022.135131
5. D. Gao, X. Zhou, and J. Wan, "Unlocking sustainability potential: The impact of green finance reform on corporate ESG performance," Corporate Social Responsibility and Environmental Management, vol. 31, no. 5, pp. 4211-4226, 2024.
6. X. Liu, and D. Liu, "How Green Finance Drives New-Quality Productivity from the Perspective of Chinese Modernization," Finance Research Letters, 2025. doi: 10.1016/j.frl.2025.107496
7. X. Wang, "The Logic and Pathway of Green Finance in Advancing the Development of New Quality Productivity," In SHS Web of Conferences, 2024, p. 02004. doi: 10.1051/shsconf/202419202004
8. J. Li, S. Qu, Z. Peng, Y. Ji, and V. Boamah, "The impact of green finance on carbon productivity: The mediating effects of the quantity and quality of green innovation," Journal of Environmental Management, vol. 370, p. 122952, 2024. doi: 10.1016/j.jenvman.2024.122952
9. J. He, H. Xue, W. Yang, Y. Zhong, and B. Fan, "Green credit policy and corporate green innovation," International Review of Economics & Finance, vol. 99, p. 104031, 2025. doi: 10.1016/j.iref.2025.104031
10. M. M. S. Ghaleb, and M. M. Niazi, "Green finance and sustainable development: A comprehensive analysis of financial performance and employment impact," International Journal of Economics and Finance Studies, vol. 15, no. 3, pp. 510-533, 2023.
11. L. Zhuang, and Z. Wang, "The Green Effect of New Quality Productive Forces: Examined from the Perspectives of Green Finance and Technological Innovation," Sustainability, vol. 17, no. 22, p. 10284, 2025. doi: 10.3390/su172210284
12. J. Liu, and G. Fan, "Impact of Digital Green Finance on New Quality Productivity from the Perspective of Spatial Spillover: Evidence from 285 Cities in China," 2026. doi: 10.21203/rs.3.rs-8302706/v1
13. X. Yuan, J. Zhang, J. Shi, and J. Wang, "What can green finance do for high-quality agricultural development? Fresh insights from China," Socio-Economic Planning Sciences, vol. 94, p. 101920, 2024. doi: 10.1016/j.seps.2024.101920