2021 Report

Fintech Facilitates Green Finance Development in China: Cases and Outlook

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保尔森基金会
PAULSON INSTITUTE

Executive Summary

In September 2020, at the 75th UN General Assembly, Chinese President Xi Jinping announced that China would strive to peak its carbon dioxide emissions by 2030 and achieve carbon neutrality by 2060. As a result, China's investment in green and low-carbon sectors is expected to continue its rapid growth, in which green finance will play a more significant role. In China's expanding green finance system, financial technologies (fintech)—from digital payments and cloud computing to AI and big data—hold great potential for scaling environmentally friendly solutions.

China is a pioneer in using fintech to facilitate green finance and sustainable development. It has applied fintech to a growing number of sectors to solve various challenges—lowering costs for processing and analyzing environmental risks, improving information transparency, and creating more efficient green finance regulatory policies.

This report provides an overview of fintech development in China over the last year. It features two new case studies examining how fintech can advance Environmental, Social, and Governance (ESG) sustainable investment and how fintech enables companies to implement better carbon emissions management. The report closes with a look into the current challenges in policies, markets, and technologies. Finally, it proposes relevant recommendations for governments, financial regulatory agencies, financial institutions, and fintech companies.

The report builds on a joint 2020 study by the Paulson Institute's Green Finance Center and the Institute of Finance and Sustainability, Fintech Facilitates Green Finance Development in China: Cases and Outlook. It also provides an update of the case studies included in the 2020 report.

Overview of Policy Support and Market Development for Fintech in China

In recent years, the Chinese government has sent clear policy signals about the importance it places on integrating fintech with green finance development. Financial regulatory authorities such as the People's Bank of China (PBOC), China Banking and Insurance Regulatory Commission (CBIRC), and China Securities Regulatory Commission (CSRC) have made financial support of carbon neutrality goals one of their key tasks in 2021 and made technological innovation a top priority. In December 2020, Yi Gang, Governor of the PBOC, stated that the bank would continue to explore ways of using fintech to develop green finance. Big data,

artificial intelligence (AI), blockchain, and other fintech tools have excellent potential to mainstream green finance.

Since 2019, we have tracked the myriad fintech applications in China's green finance market. As of 2020, 59 fintech companies are actively engaged in green finance, including 41 green fintech companies and 18 technical service companies affiliated with financial institutions or financial investment groups. The survey of the 41 fintech companies whose primary business is green finance yielded the following findings:

Fintech tools are mainly used for green credit, green funds, green energy market, and green bonds products with green credit and green funds leading the way in utilization rate. However, in the green equity market, green trust and green leasing businesses are lagging far behind in incorporating fintech for their businesses.

Fintech tools have several applications to ESG investment and financing, national carbon trading market, green buildings, green consumption, green agriculture, and SMEs.

As a data tool, fintech is widely applied in environmental data sets, producing and evaluating ESG data sets, environmental benefits accounting, risk monitoring, information sharing systems, and financial institution green lending information management systems.

Fintech applications in green asset identification and traceability, environmental and climate financial risk quantitative assessments, and credit risk management will become the next hotspots.

In terms of the number of green fintech projects in development, the projects of local financial regulatory agencies account for half of the total. There is only one project for central financial regulatory agencies and just one focused on individual users.

Big data, AI, and cloud computing are still the three major technologies driving green finance development in China. While the application of blockchain and the internet of things (IoT) is still relatively rare, there will likely be rapid development in these technologies for green finance.

Green fintech companies are predominantly clustered in Beijing and Shanghai, with 80% of employees located in these metropolises. Beijing has the most companies (with 16 green fintech

companies), but the registered capital of green fintech companies in Shanghai is more than those in Beijing—exceeding 1.34 billion yuan.

International capital is increasingly paying more attention to green fintech in China as about one-quarter of green fintech companies are foreign-funded or joint ventures. Among them, six technology companies registered overseas provide green finance services in China, including green funds, green energy markets, and carbon finance.

Update of 2020 Case Studies

Fintech Facilitates Green Finance Development in China: Cases and Outlook released in 2020 introduced four cases, demonstrating how fintech tools can solve critical issues in the green finance ecosystem. Over the last year, each of the four examples continued to develop their systems, and the following summarizes their latest progress.

Case 1: PBOC Green Finance Information Management System

Since the official launch of the PBOC Green Finance Information Management System in August 2019, the PBOC's Huzhou branch has collected and managed accurate data on green lending by all the banks in its jurisdiction, along with a review of their performance. In 2020, the PBOC updated the green lending data reporting interface of all the branches connected to the system to ensure alignment with the green lending statistical standards of the PBOC. In addition, the system has extended to PBOC branches in prefecture-level cities of Zhejiang and will expand to cover the Yangtze River Delta Region.

Case 2: Huzhou City Green Finance One-Stop Service Platform

As of the end of 2020, the Huzhou City Green Finance One-Stop Service Platform has registered more than 30,000 SMEs, double the 2019 numbers. It has helped over 20,000 green SMEs obtain financing exceeding 200 billion yuan from banks, a 25% increase over 2019. In addition, it has found investors for nearly 90 projects that collectively received 8.644 billion yuan in financing, a 30% increase over 2019. In 2020, the platform enhanced functions replicated in other areas of China that include guarantees and legal safeguards and upgraded its ESG ratings for enterprises in the system.

Case 3: Huzhou Bank's Green Credit Management System

By the end of 2020, Huzhou Bank's Green Credit Management System conducted smart green identification and provided corresponding identification labels for around 40,000 green lending cases. As a result, the system facilitated credit to prioritize supporting green projects with excellent environmental performance and shortened data reporting by at least a third. Also, now the system can automatically provide early warnings using big data to strengthen post-loan management and improve environmental risk management.

Case 4: People's Insurance Company of China Property and Casualty (PICC P&C) Remote Damage Assessment and Claim Settlement System for Catastrophe Insurance

After nearly five years of development, PICC P&C's remote loss assessment and claim settlement system for catastrophe insurance is now widely adopted in Ningbo. Its coverage, processing capability, and data management capability have significantly improved, leading to improved efficiency of loss assessment and claim settlement functions and enhanced protection against catastrophe risks.

Taking the survey results and analysis of the case study developments into consideration, the breadth and depth of fintech applications in China's green finance are expansive and replicated in many regions in China, covering existing industry segments including:

- Green enterprise certification
- Green finance business management and operations within financial institutions
- Environmental and climate risk analysis, and green finance products and service innovation

New Cases

For the 2021 report, we selected and analyzed two new cases to demonstrate how China is using fintech to enable green finance development. The first case features the Harvest Fund using fintech to build its ESG Rating System. The second case features Huadian Corporation leveraging fintech to build its Carbon Emissions Management System to support carbon trading.

Case 1: Harvest Fund's ESG Rating System: Fintech enables ESG investing

Harvest Fund is one of the earliest fund management companies and one of China's largest mutual fund companies. ESG investing is an increasingly important and growing market for investors as China has committed to goals of carbon peak by 2030 and carbon neutrality by 2060.

To help grow the ESG investing market in China and address the current barriers in the market, Harvest Fund has leveraged fintech tools like AI, machine learning, and natural language processing (NLP) to build an ESG rating system. The rating system improves data quality, timeliness, and data availability, which helps investors identify ESG-related risks and integrate ESG factors into their portfolios to generate returns. In addition, the system is not only aligned with mainstream international ESG frameworks and standards but also fully reflects Chinese domestic market frameworks and standards as well.

Case 2: China Huadian Corporation's Carbon Emissions Management System: Fintech facilitates power company participating in China's national carbon market

China Huadian Corporation is the third-largest power generation company in the world and one of the top five state-owned power generation corporations in China. Drawing on fintech tools like big data, China Huadian established a digital carbon emissions management system.

Connected to the system are its thirty subsidiaries and more than 110 thermal power plants—allowing for robust carbon emissions data reporting and analysis, carbon trading at China's current regional pilot markets, and management of those carbon assets to happen on a real-time basis. As a result, this system has significantly improved the efficiency and reliability of obtaining corporate carbon emissions data leading to more insightful corporate carbon management strategy.

With further development of China's national carbon market, especially by including more industrial sectors like building, steel, and electrolytic aluminum, the system can serve as a good example. Moreover, the system is a model for other power companies at provincial levels and the large industrial groups of other sectors set for inclusion in the national emissions trading system.

Challenges Facing Green Fintech Development

1. Regulatory agencies

Specific policies guiding fintech to facilitate green finance are not codified or recognized. Regulatory authorities have not made sufficient effort to learn from and promote successful application cases.

Regulatory sandboxes, the testing grounds for yet to be regulated new business models, are not focused on green fintech innovations. While there are regulatory sandboxes for fintech in Beijing and Shanghai, the support for green fintech innovations specifically is incomplete. None of the regulatory sandboxes are designed to test fintech product innovation scenarios or develop fintech services in green finance.

Data supporting or used for green fintech is not traceable and not high-quality. Although the government shares public data of green fintech, it is often costly, inefficient, and unreliable due to poor updating, tractability, and quality in obtaining the public data. For fintech products to provide good support for monetary tools of central banks and regulatory accountability, they will need to be traceable.

2. Financial institutions

Strategic company goals in using fintech to achieve green and low carbon transition are few and neither clear nor specific. As a result, the decision-makers of financial institutions have not fully realized the importance of using fintech to achieve green and low carbon transition.

Green fintech is insufficiently resourced. Therefore, financial institutions must firmly commit to investing financial resources in strategic planning, organization design, and human capital to facilitate fintech and green finance development.

Green fintech lacks experts and professional training, and education. Green fintech is a relatively novel field, and as such, there is not yet a deep enough talent pool of human capital who have developed knowledge and experience in both green finance and fintech. The lack of professional experts may cause challenges in green fintech product design, application and innovation, implementation of green finance, and fintech development strategies.

3. Fintech companies

Green fintech companies have not invested enough in research and development (R&D) of blockchain and the internet of things (IoT) applications for green finance. Many established Chinese fintech companies have focused on solving operation efficiency problems, such as using big data, AI, and cloud computing to improve green standards, project identification, environmental benefit accounting, and ESG index development. There is less focus on innovating and applying blockchain and the internet of things to green finance, which can be valuable in addressing information transparency, reliance, and traceability barriers.

Recommendations for Green Fintech Development

1. Recommendations for regulatory agencies

Establish a regulatory sandbox that specifically supports green fintech innovation. This would include the use of blockchain technology that could prove helpful to building a project pool for the underlying assets of green bonds, green asset securitization, and disclosing real-time information about project risks and environmental benefits to investors, which lower third-party verification costs, improve bond issuance efficiency, and increase information transparency. Additionally, the regulatory sandbox can support cross-border transactions of green assets that use blockchain technology to register accounting certificates for overseas funds, monitor and record the capital gains and changes of foreign investment institutions, and achieve low-cost, real-time, and unalterable tracking. Blockchain would also track fund transaction records and income records, a valuable and efficient method when redeeming overseas funds.

Establish an efficient green finance monitoring and management system. Deploying blockchain, big data, and AI technologies to establish a green finance monitoring and management system would go a long way in tracking and recording green finance-related data and statistics. These technologies can digitally record green and low carbon projects and their asset sources, identify accurate certification processes, improve the efficiency of green and low carbon projects, environmental benefit accounting and risk quantification, increase the efficiency of green finance data transmission and statistical analysis, and make green assets traceable.

Establish a robust non-financial data and information sharing platform. With access to more enterprise-level and public information, regulatory agencies are in a position to integrate and share information widely and in a standardized manner. Examples of this type of information include environmental violation and penalty information, enterprise-level pollutant discharge permit details, green project feasibility study reports, and credit data.

Establish a carbon emissions data-sharing platform. As the national carbon market comes online, blockchain and cloud technologies can establish a carbon emissions data-sharing platform critical for developing efficient carbon emissions accounting and information disclosure mechanisms for both industry-level and company-level carbon emissions data.

2. Recommendations for financial institutions

Establish a green fintech development plan and invest more resources in green fintech. Sustainability is a growing trend, and companies would be well-positioned to establish development strategies, outline key tasks, and guarantee measures that enable fintech to facilitate green finance. In addition, companies should install the appropriate operational systems and mechanisms, build a team of experts, and develop innovative technologies to capitalize on green fintech.

Use fintech to build a green finance database and evaluation capabilities. With the fintech tools available, financial institutions should use them to advance their green finance capabilities. Additionally, fintech can standardize its internal data and information formats, integrating them with external data sources from big data bureaus, comprehensive financial services platforms, and the national carbon trading market. The tools can also improve green identification and environmental risk management capabilities, enhance risk management, green operation, and information disclosure to achieve carbon neutrality.

Some other examples include:

- Big data and AI technologies used to identify and categorize green assets and brown assets;

- Big data and cloud used to calculate, analyze, and disclose green assets and brown assets and measure the risks of credit asset transformation;

- Big data, cloud computing, and AI technologies used in corporate and project ESG evaluation;

- Blockchain and other relevant technologies used to calculate and disclose carbon emissions for investment and financing activities, the company's carbon emissions and carbon footprints, and automatically generate information disclosure reports for these.

Be at the forefront of using fintech to innovate green ESG-themed products. There is an opportunity to incorporate green ESG strategy into new financial product innovation processes and improve existing green finance products by drawing on fintech solutions. One example is to explore the use of blockchain technology to establish an underlying asset pool of green bonds and green asset-backed securities (ABS), increase information disclosure transparency and standardization, lower costs, and facilitate the launch of green bonds, green ABS, and green real estate investment trust (REIT) products.

3. Recommendations for fintech companies

Invest in blockchain R&D to support green supply chain product and services innovation. The information reliability and traceability of blockchain can be leveraged to increase transparency in corporate green supply chain financing and provide technologies and data products and services for financial institutions to develop green supply chain products. For example, blockchain technology can assist regulators with green asset labeling and traceability, making a difference in standards development, auditing, and reducing greenwashing.

Use big data and AI technologies to provide financial institutions with green fintech products and services for ESG risk identification and pricing. Big data and AI can generate ESG credit profiles for the credit subject of banks. Banks can include these in the credit management process. In addition, the same technologies can produce green consumer behavior profiles, which become the basis for exploration into innovative applications of individual green credit evaluation.

Focus on R&D of carbon emissions accounting products and services for financial institutions. For example, to tackle the problems of carbon emissions accounting, fintech companies can use AI to calculate company borrowers carbon emissions, track their carbon footprints, and automatically generate environmental information disclosure reports.

4. Talent training

Cultivate professional talent with expertise in both fintech and green finance. Building a pipeline for skilled talent in fintech and green finance begins by incorporating the subject matter into higher education and other technical training mechanisms. Promoting green fintech vocational training on a large scale and providing green fintech training and ESG training would create a substantial supply of human capital armed with solid technical capabilities for the market.

5. International cooperation

Actively introduce international cutting-edge green fintech technologies and promote international capital cooperation. China is a fintech leader, but there is also much to be learned from other global players in the space. The convergence of cutting-edge global technologies with domestic ones could solve green finance challenges, including green asset identification, transition risk quantification, and data traceability. In addition to technologies, global capital integration into the Chinese green fintech space could facilitate more significant growth for the market.

ABOUT THE REPORT

Fintech Facilitates Green Finance Development in China: Cases and Outlook is an annual research report released jointly by Paulson Institute Green Finance Center and Institute of Finance and Sustainability. The report tracks the development of fintech-enabled green finance solutions, selecting and studying cases that represent innovations happening in China. It also analyzes the challenges facing fintech applications in China. Finally, it proposes a series of policy recommendations, aiming to provide helpful guidance and reference for fintech to better facilitate the development of green finance.

ABOUT THE AUTHORS

Paulson Institute Green Finance Center

Founded in 2011 by former Treasury Secretary Henry M. Paulson, Jr., the Paulson Institute is a non-partisan, independent "think and do tank" dedicated to fostering a US-China relationship that serves to maintain global order in a rapidly evolving world. The Green Finance Center, established in 2018, supports efforts to green the financial system by moving green finance from a philanthropic niche to the mainstream of markets. The Center houses the Institute's work on green finance and focuses on three core areas—carbon, finance, and fintech. The Center aims to promote market-driven solutions to foster a vibrant international green finance market through convening, advocacy, thought leadership, and our expertise.

More information is available at PaulsonInstitute.org

Institute of Finance and Sustainability (IFS)

Institute of Finance and Sustainability is a think tank that provides policy, market and product researches and international cooperation platform for Chinese and global green finance and sustainable development. As a non-profit organization, IFS' goal is to become a think tank with global influence in green finance, natural capital financing, low carbon development and energy transition, and makes substantial contribution to improving global environment and addressing climate change.

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