

The Green Finance Case for China's
Low Carbon Infrastructure Transition



Financing for rooftop distributed new energy logistics and warehousing facilities

Climate Bonds INITIATIVE



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Background

The **Climate Bonds Initiative** (Climate Bonds) is an investor-focused, non-profit organisation whose main work includes green bond standards and certification, green bond data and market analysis, policy analysis and development. Climate Bonds has supported green bond market development in many countries and regions, including Europe, the US, China, India, Brazil, and Mexico, in partnership with governments and regulators, such as the United Nations Environment Programme, the United Nations Development Programme, the European Commission, multilateral development finance institutions, the OECD and others. Climate Bonds is an invited member of the Green Finance Committee of the Chinese Society of Finance.

The **Green Finance Research Centre** at the National Institute of Finance, Tsinghua University (Green Finance Centre) is dedicated to academic and policy research, tool innovation, industry-research integration, and international cooperation in the field of green finance and sustainable finance. It was among the first green finance-focused think tanks established in China and enjoys close collaboration with international institutions. The Centre serves national strategies and conducts research in key areas such as carbon neutrality mechanisms and pathways, environmental and climate risk analysis, green financial products and standards, ESG investment, the link between biodiversity and financial stability, etc., and supports policy formulation and strategic planning of relevant national ministries, regulatory and financial institutions.

Climate Bonds China Programme and the Green Finance Centre jointly conducted a case study on green finance innovation, to highlight emerging trends and opportunities in green finance in China to support the low carbon transition.

Acknowledgements

The Shanghai Municipal Government has provided generous support and guidance on case selection, investigation and writing, the Industrial Bank Shanghai Branch and Pufeng New Energy provided detailed information on the premise of protecting commercial secrets. The case team would like to thank you for all the support.

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Editorial support: Laqiqige Zhu,
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Case description

The entity and the financial institution

PuFeng New Energy is a development, investment, and operational platform of distributed new energy jointly funded in 2018 by Global Logistic Properties (GLP), a leading global provider of modern logistics and industrial facilities, and Brookfield Asset Management Inc.^{1,2} PuFeng New Energy is currently focused on distributed photovoltaic power plants and intends to expand into a variety of distributed energy businesses such as wind power and energy storage, as well as energy businesses such as power purchase and sale, power distribution and park grid management. PuFeng New Energy aims to become a leading provider of distributed green energy services in China.

PuFeng New Energy will leverage GLP's warehouse rooftop resources to capture the growing demand for clean energy in large manufacturing industries and logistics, especially the food cold chain. So far, PuFeng New Energy has installed photovoltaic power generation and energy storage equipment on the rooftops at over 100 logistics parks to provide green energy for the operations of those parks.

China Industrial Bank (CIB) has pioneered green finance in China, introducing the first energy efficiency finance product in 2006. This was followed by underwriting the first domestic blue bond and the issuance of the first overseas blue financial bond by a Chinese joint stock bank in 2020. CIB has formed a multi-disciplinary green finance product line and service system through continuous innovation in its business model. By the end of November 2021, the bank's green financial bonds amounted to RMB100bn (USD15.7bn), with a total of RMB3,553.2bn (USD558.6bn) in green financing provided to 40,419 enterprises, and 32,935 green finance customers. It is estimated that the green projects supported by CIB will achieve annual savings of 38.45 million tonnes of standard coal, and annual emission reduction of 98.3 million tonnes of carbon dioxide.³

Green finance business model

PuFeng New Energy is at the end of the downstream PV industry chain. The PV industry chain is in a pyramid structure, including six links such as silicon, ingot casting (rod pulling), slicing, battery hips, battery components, and application systems. The number of entities active in the six links of the industry chain has increased substantially. PuFeng New Energy mainly concentrates on the pre-project development and survey, project construction preparation, design, procurement, construction, and operations and maintenance.

In September 2021, CIB granted a loan of RMB81.4m (USD12.8m) to PuFeng New Energy. The proceeds were earmarked for a large single distributed PV 40.6 MW project, which will generate approximately 41.3 million KWh of electricity per year, saving approximately 12,995 tonnes of standard coal and reducing CO₂ emissions by approximately 33,787 tonnes per year. The current financing model of CIB and PuFeng New Energy was designed to provide project loans (or project replacement loans) for distributed photovoltaic projects across the country. The core business activity will cover the annual principal and interest with future cash flows (mainly electricity revenue), and the loan term is around 15 years.

New energy generation (green power) meets Clause 3.2.2 Construction and operation of solar energy utilisation facilities of the Green Industry Catalogue, issued by the National Development and Reform Commission.⁴ It also meets the PBOC's Green Loan recognition criteria, and falls within the scope of support from the PBOC's Energy Conservation and Emission Reduction Support Tool.^{5,6}

Based on the technical due diligence reports of professional institutions, PuFeng New Energy obtains the local sunlight level, combines (1) the historical owner's power generation data and reasonable forecasts to obtain the self-generation ratio and average electricity price level, and (2) combines the decay rate of photovoltaic power generation to estimate the power generation income within the contract period (usually 20 or 25 years), to make investment return calculations. The interest payments on project loans are adjusted according to the project's annual return projections, and due consideration is given to granting a certain grace period, etc., to ensure that the inflow of electricity returns fully covers principal and interest as far as possible and to avoid risks such as delinquency. In addition, the bank will also conduct sensitivity tests on the project's income and other conditions, so that any fluctuations within a reasonable range will not affect normal debt service payments, thus achieving the objective of controlling credit risk.

Information statistics and green performance evaluation

In accordance with the requirements of the regulatory authorities, CIB will

1. Report green loan data and emission reduction to the PBOC on a quarterly basis
2. Conduct quarterly disclosure of carbon emission reduction loans starting Q1 2022, as required by the PBOC's circular on matters relating to the establishment of carbon emission reduction support tools.

CIB has embedded an environmental benefit model within its green finance information system to calculate the carbon reduction effect of each business based on the project's power generation data.

Implications

China's dual carbon strategy (to achieve carbon peaking by 2030 and carbon neutrality by 2060) could transform China's energy system. According to the Opinions on Promoting the High-Quality Development of Logistics and Promoting the Formation of a Strong Domestic Market issued by the National Development and Reform Commission and others (Development and Reform Economic and Trade [2019] No.352), logistics is an organic part of the real economy.

Building a high-quality logistics infrastructure network system can lower logistics costs, especially for manufacturing enterprises. There is an urgent need to deepen structural reform of energy supply, enhance the endogenous power of economic development, and improve the efficiency of social and economic operations. In addition, a high-quality logistics infrastructure network will promote the formation of a robust and efficient domestic market, and contribute to the development of the national economy.

Today's warehouses are no longer just storage spaces, also serving as operations centres, assuming a critical role in supply chain management. As the implementation of artificial intelligence and automation in logistics warehousing facilities becomes more pervasive, and the proportion of cold chain warehousing facilities increases, the demand for electricity will rise each year. The low-carbon transition of the logistics industry includes energy saving and emissions reduction in transport, packaging, and operations and extends to green energy consumption and power storage facilities.

On 20 June 2021, the National Energy Administration issued a notice on the submission of pilot schemes for whole-county (city and district) rooftop distributed PV development. Integration of resources and intensive development of distributed PV required the energy departments of each province (autonomous region and municipality directly under the Central Government) to prioritise the development of ideas and organise pilot schemes as soon as possible.⁷

The National Grid also issued a notice to provincial branches involved in a pilot scheme for whole county (city, district) rooftop distributed photovoltaic development. The notice instructed local branches to take the initiative to cooperate with government departments in rooftop resources and business model exploration, ensure local funds and other support policies were in place to support, strengthen the upgrading of the distribution network, and ensure that large-scale distributed photovoltaic was accessible in the pilot areas.

High-end logistics enterprises increasingly recognise that combining storage facilities with distributed photovoltaic power generation can contribute to energy conservation and the transition to a low carbon logistics industry while making economic savings.⁸

According to the Green Bond Endorsed Project Catalogue (2021 edition) and the IPSF Common Ground Taxonomy for Sustainable Finance (2021) (Common Ground Taxonomy) co-led by China and the EU, photovoltaic power generation and the installation, maintenance, and repair of new energy technology facilities on buildings that meet the applicable technical criteria fall under the category of climate mitigation economic activities jointly recognised by China and the EU. Entities that introduce such projects in China are eligible for green finance support in both domestic and international financial markets providing that they comply with the relevant technical and environmental standards.^{9,10}

The case study inspired financial institutions and enterprises to work together in the context of China's industry development plans, to fully explore and develop green finance business opportunities and assess economic viability based on the green finance catalogue, and to serve the dual carbon strategy through market-based operations.

Endnotes

1. GLP is a global industrial services and investment management company focused on new infrastructure in the supply chain, big data, and new energy sectors.
2. Brookfield Asset Management is a global alternative asset manager.
3. Industrial Bank Co., Ltd, Industrial Bank won the IFF "2021 Global Green Finance Award", <https://www.cib.com.cn/cn/aboutCIB/about/news/2021/20211209.html>
4. Green Industry Guidance Catalogue (2019 Edition), https://www.amac.org.cn/businessservices_2025/ywfw_esg/esgz/zcsgsc/202007/t20200714_9848.html
5. Notice of the People's Bank of China on the Revision of the Special Statistical System for Green Loans, <http://www.gzqfa.org.cn/Guojiazhengce-35/171.html>
6. The PBoC launched a carbon emission reduction support tool, <http://www.pbc.gov.cn/redianzhuanti/118742/4357176/4357209/4384182/index.html>

7. National Energy Administration: Notice on the submission of pilot schemes for whole-county (city and district) rooftop distributed PV development, <http://www.chic.org.cn/home/index/detail?id=1100>
8. National Grid: Notice on actively striving for the whole county (city, district) rooftop distributed photovoltaic development, https://www.sohu.com/a/474974340_257552
9. Notice of the People's Bank of China, National Development and Reform Commission, China Securities Regulatory Commission on the Issuance of the Green Bond Endorsed Projects Catalogue (2021 Edition): <http://www.pbc.gov.cn/goutongjiaoliu/113456/113469/4236341/index.html>
10. IPSF Common Ground Taxonomy Table, https://ec.europa.eu/info/files/211104-ipsf-common-ground-taxonomy-table_en



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Design: **Godfrey Design**

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