CHINA SUSTAINABLE DEBT

STATE OF THE MARKET REPORT

2022

Published jointly by the Climate Bonds Initiative, China Central Depository & Clearing Research Centre (CCDC Research) and CIB Economic Research and Consulting (CIB Research)

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Introduction

This is the seventh iteration of the China Sustainable Debt State of the Market Report. It describes the shape and size of the green, social, and sustainable (GSS) markets, plus sustainability-linked bonds (SLBs), and transition bonds, known as the GSS+ market. Data extends to the end of 2022.

This report is co-produced by the Climate Bonds Initiative (Climate Bonds), China Central Depository & Clearing Research Centre (CCDC Research Centre) and CIB Economic Research and Consulting Co., Ltd. (CIB Research), with support from the Standard Chartered Bank.

Scope of analysis

This report explores five sustainable debt themes based on the projects, activities, and expenditures financed: green, social, sustainability, SLB, and transition.

Debt labels describe the types of projects, activities, or expenditures financed, and/or their benefits. Green, social, sustainability, and transition are the most common labels, but a broad range of labels is used (see Appendix A)

Climate Bonds expands its Certification Scheme to include corporate entities and SLBs

Certification under the Climate Bonds Standard v4 (CBS v4) has expanded beyond Use of Proceeds (UoP) bonds to include non-financial corporates and their SLBs. Launched in Q1 2023, CBS v4 is a major new development for Climate Bonds, which has driven credible climate financing for over a decade. Drawing from its experience in developing detailed sector criteria for assets, activities and investments, Climate Bonds can also provide transparent science-based criteria for non-financial corporate entities, credible SLBs and similar instruments, and assurance for investors that sustainability requirements have been met in respect of any certified issuance.

This work goes beyond sectoral transition pathways and includes key governance elements that indicate a company's preparedness to transition to net zero. Certification will be available for corporates with emissions already near zero as well those with activities in the high emitting sectors, provided the corporate has suitably ambitious performance targets and credible transition plans. CBS v4 enables corporates aligned with 1.5-degree pathways, or those that will be aligned by 2030, to obtain certification. SLBs issued by and in respect of the activities of qualifying non-financial corporates can also be certified under the CBS v4.

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Sustainable fixed income market

Theme	Label	Format
GSS	Green	Use of proceeds
	Social	Use of proceeds
	Sustainability	Use of proceeds
Transition	Sustainability-linked	Entity KPI-linked
	Transition	Use of proceeds

About the Climate Bonds Initiative

Climate Bonds Initiative is an international organisation working to mobilise global capital for climate action. It promotes investment in projects and assets needed for a rapid transition to a low-carbon, climate-resilient, and fair economy. The mission focus is to help drive down the cost of capital for large-scale climate and infrastructure projects and to support governments seeking increased capital markets investment to meet climate and greenhouse gas (GHG) emission reduction goals. Climate Bonds conducts market analysis and policy research; undertakes market development activities; advises governments and regulators; and administers a global green bond Standard and Certification scheme.

About the CCDC Research Centre

China Central Depository & Clearing Co., Ltd. (CCDC) formally established the **CCDC Research Centre** in July 2017. CCDC Research Centre positions itself as a professional think tank and focuses on filling in gaps in professional fields. It conducts in-depth studies on prominent issues related to operations, regulations, and infrastructure construction of bond and related financial markets. It provides results that closely combine theory and practicality and is dedicated to building a CCDC research brand that integrates research, publicity, and other services.

About the CIB Research

CIB Economic Research and Consulting Co., Ltd (CIB Research) is a member institution of the Industrial Bank. It is the first legally independent research company of the banking system in China. It operates in accordance with market-oriented mechanisms and lays out three research blocks around strategy, market, and industry, focusing on the macro market, green finance, financial industry, currencies and commodities, fixed income, and various industrial sectors. It aims to serve the high-quality development of China's economy as its mission and is guided by the five development concepts of innovation, coordination, greenness, openness and sharing. It is committed to integrating professional research into financial practice, contributing to China's economic transformation.

GSS+ Market Snapshot

China's economic and social development have underpinned the growth of a formidable GSS+ debt market with unique characteristics. This experience can support whole economy transition by extending access to capital to entities operating in the hard-to-abate sectors.

China's high-level strategic objectives have underpinned the proliferation of labelled themes in the bond market. Labelled themes attached to green, transition, social and sustainability reflect the overarching long-term strategic agenda in China's economic and social development. China views tackling climate change as an important angle for high-quality economic development, high-level environmental protection, and construction of ecological civilisation.[1] The commitment to reaching carbon peaking by 2030 and carbon neutrality before 2060 propelled the growth of China's green bond market in 2021 and its continued development into 2022. Meanwhile, the government's ambition for more balanced economic and social development, articulated in the Common Prosperity and Rural Revitalisation Strategy, contributed to the proliferation of poverty alleviation and rural revitalisation-related bonds under the social theme.

China supplied the largest volume of green bonds in 2022, by Climate Bonds definition. By the end of 2022, cumulative labelled green bond volumes originating from China reached USD489bn (RMB3.3tn). This included USD155bn (RMB1tn) priced in onshore and offshore markets in 2022, representing year-on-year (YOY) growth of 35%.[2] Climate Bonds recorded USD85.4bn (RMB 575.2bn) in its Green Bond Database (GBDB) in 2022, with a cumulative tally of USD286.9bn (RMB1.9tn). China was the largest source of green bonds in 2022, according to Climate Bonds definition. However, the contribution of labelled green bonds to China's overall debt market remained small, at 1.5% in the onshore market. In July 2022, the China Green Bond Standards Committee published *China Green Bond Principles* to further harmonise definitions and practices in the domestic and international green bond markets.[3]

Transition-related bond instruments emerged to address the financing needs of economy-wide transition. The Chinese economy relies on carbon-intensive sectors, which must be addressed if China is to meet its carbon neutrality objectives. Following a pilot scheme of SLB issuance in 2021, China began to explore transition bonds for eight heavy industries in 2022. As of the end of 2022, SLBs and transition bonds listed onshore and offshore had reached cumulative volumes of USD19.6bn (RMB131.9bn), 92% of which were SLBs. The market is still in its infancy, demanding policy support around standards and incentives to facilitate growth. China's central bank is expected to put forward sector-specific transition finance standards, starting with steel, thermal power, construction materials, and agriculture. It will later be expanded to broader areas according to actual needs.[4]

Scaling up the market takes a diverse group of participants, public and private, domestic and international. China's state-owned enterprises (SOEs) have been a major issuer type in the thematic debt markets. 2022 started to see more participation from private companies in green bonds and debut issuers from various industries contributed to more than half of the green bond supply. As China accelerates the opening of its bond market with further harmonsation of definitions and practices, it is also likely to see more participation from international issuers and investors. Foreign issuers have already brought thematic labelled panda bonds.

China's massive low-carbon transition creates huge investment opportunities. Labelled bond products have a huge role to play. China's climate think tank estimated that the nation's energy transition would require more than RMB100tn (about USD15tn) over the next 30 years, pointing to huge investment opportunities.[5] A few industrial trends around renewable energy and electric vehicles have contributed to booming green bond issuance. Renewable energy has accounted for the largest share of green bond UoP while the auto industry is gearing up to embrace a zero-emission vehicle (ZEV) future.[6] Standardised, labelled green bonds can support such transformations, and that of the entire supply chain. Ensuring the credibility and transparency of thematic debt instruments will be pivotal to scaling in the capital market.

Green

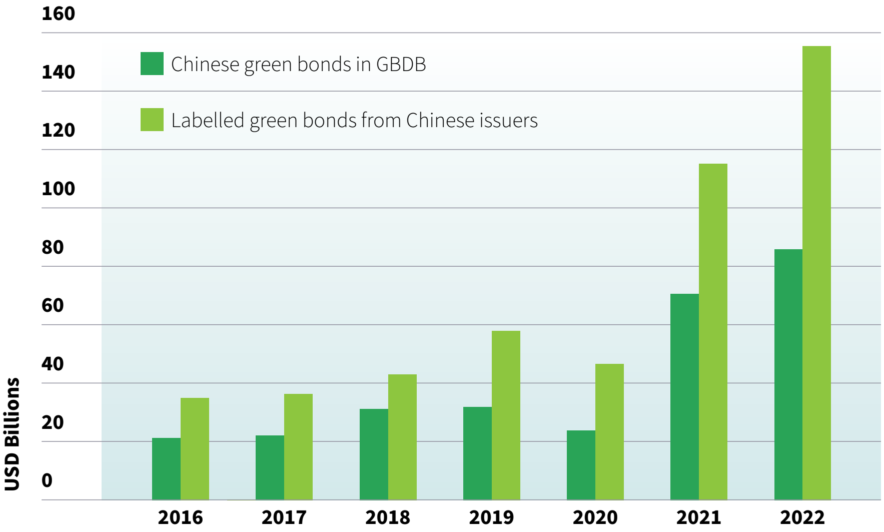
Overview

China's green bond market

China's labelled green bond issuance reached a new annual high in 2022 following a vigorous rebound the year before. As the country's climate commitment became further integrated into its overall policy and economic system, labelled bonds gained prominence as a channel to support green activities and projects, even during an economic slowdown.

In 2022, Chinese issuers priced a total of USD155bn (RMB1.0tn) in onshore and offshore labelled green bonds representing 35% YOY growth. This brought cumulative volumes to USD489bn (RMB3.3tn) by the end of the year. The growth was led by the expansion of onshore labelled green bond issuance (around 890bn). While growth in China's domestic bond supply remained flat (RMB61.9tn), labelled green bonds gained a bigger share, reaching 1.5% in 2022 up from 1% in 2021.

China's green bond issuance continued to expand in 2022



Source: Climate Bonds Initiative

China has huge potential to further scale up its domestic and international green bond markets. As a well understood and broadly standardised tool, green bonds can help direct capital flows to the relevant assets, projects, and expenditures, and contribute to meeting China's climate goals.

China is the leading source of green bonds globally, by Climate Bonds definitions

Climate Bonds Green Bond Database (GBDB)

Climate Bonds screens self-labelled debt instruments from over 80 jurisdictions against the Climate Bonds Green Bond Database Methodology (2022 version) (the Methodology) to inform inclusion in the Climate Bonds GBDB. Inclusion in Climate Bonds GBDB indicates that there is publicly available evidence to support the bond's general alignment (aligned green bonds) to the Climate Bonds Taxonomy. By applying the standard methodology, this screening exercise allows cross-market comparison and global application.

Climate Bonds GDBD and green bond indices

Various index providers have created green bond indices whose composition is informed by inclusion in the Climate Bonds GBDB. Examples include the J.P. Morgan ESG (JESG) indices, Solactive Green Bond indices, FTSE Chinese (Onshore CNY) Green Bond Index.[11,12,13] Inclusion into the GBDB indicates the securities' general alignment with the Climate Bonds Taxonomy, an internationally recognised standard for green projects, activities, and expenditures. By doing so, it ensures that all bonds are assessed on a level playing field.

Green Bond Database Methodology: key updates in 2022

Climate Bonds is dedicated to ensuring rigor and ambition in the green bond market and promoting a credible economy-wide transition toward a low carbon future.

Climate Bonds published its latest GBDB Methodology in July 2022, with tightened screening criteria in more established sectors such as building and transport. Major changes in assessment criteria are highlighted below.

As the green bond market matures and the need to decarbonise becomes more pressing, the assessment for inclusion to the GBDB will be further tightened and a more granular level of disclosure will be needed.

Sector	Major updates
Building	The assessment was tightened so that only higher rated, well-established international and local certification schemes and energy performance rating schemes are eligible for inclusion. For example, in previous approaches the GBDB Methodology accepted lower levels of building certification than the LEED Gold proxy used for Certification, and this is no longer acceptable.[14] Refer to Annex E of the 2022 edition for the list of Eligible Building Certifications. In addition, The Methodology now specifies a threshold of 30% improvement in energy efficiency compared with a requirement of 'significant improvement' in the previous version.
Transport	The assessment is accompanied with more granular threshold indicators in certain subsectors. The updated Methodology now specifies a threshold of less than 50g CO2/p-km to the end of 2025 and zero emissions thereafter for low carbon vehicles (ZEVs, hybrids and hydrogen fuel cell vehicles), as well as for public transport buses and coaches, bus rapid transit (BRT). The Methodology now specifies the reporting metrics for ship vessels of 5,000 GT or above. Refer to Annex F of the 2022 edition for details.
Hydropower	The assessment for this asset category was updated along with the Climate Bonds Taxonomy, which focuses on the power density and GHG footprint of reservoirs. Excluded deals may be included retroactively to reflect the evolution of scientific thinking.

The following analysis is based on the Climate Bonds GBDB as of 20 January 2023, unless otherwise specified. The term "green bonds" refers to those included in the GBDB, unless otherwise specified.

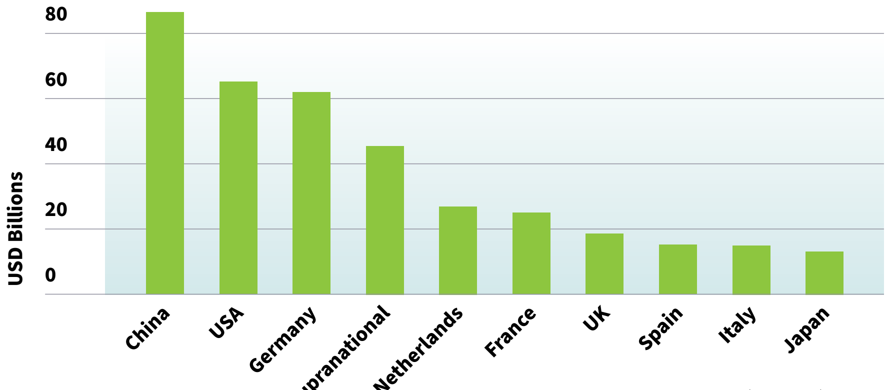
China was the largest country source of green bonds in 2022 and Climate Bonds recorded volumes of USD85.4bn (RMB 575.2bn) from onshore and offshore issuers. The USA followed with volumes of USD64.4bn and Germany (USD61.2bn) took third place.

China's cumulative green bond volumes in the GBDB reached USD286.9bn (RMB1.9tn) by the end of 2022, coming second after the USA with total volumes of USD380.0bn (RMB2.6tn). While other major green bond markets experienced declines in their 2022 issuance volume, China remained a bright spot with a USD15.1bn (RMB102.0bn) increment, or 22% YOY growth. This expansion was underpinned by the country's continued implementation of green finance policies to support commitments towards carbon peaking by 2030 and carbon neutrality before 2060.

The GBDB inclusion rate decreased by six percentage points from 2021 to 55% in 2022. This was partly because Climate Bonds tightened its screening Methodology as referenced above. For example, bonds funding green building projects with lower certification labelling than the China Green Bond Label (GBEL) Three Star would no longer be eligible for inclusion. Meanwhile, about 23% of China's onshore labelled green bonds were private placement deals in 2022, for most of which Climate Bonds could not find sufficient information to support inclusion in the GBDB. The alignment of onshore Chinese labelled green bonds with the 100% UoP-to-green principle improved significantly. Please see page 8 for detailed analysis.

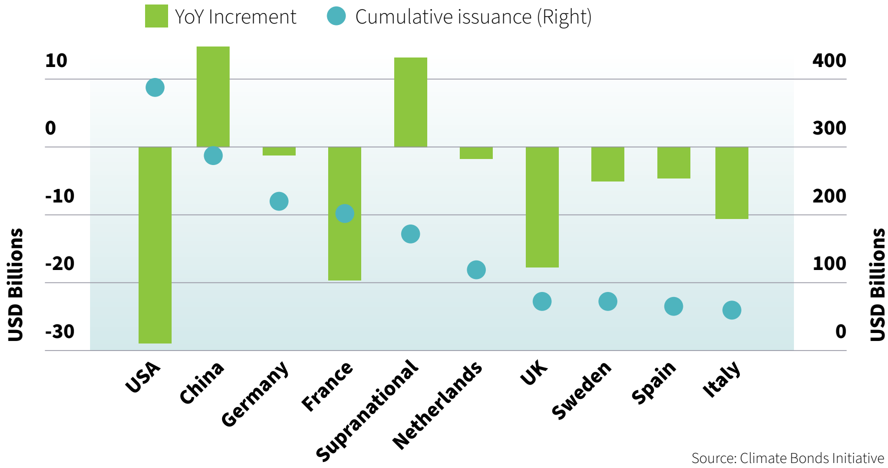
Most Chinese green bonds will reach maturity in the next three years. Chinese issuers tend to favour shorter tenors, with about 97% of labelled green bonds and 89% of green bonds in the GBDB having a maturity of five-years of less.

China was the largest source of green bonds recorded by Climate Bonds in 2022



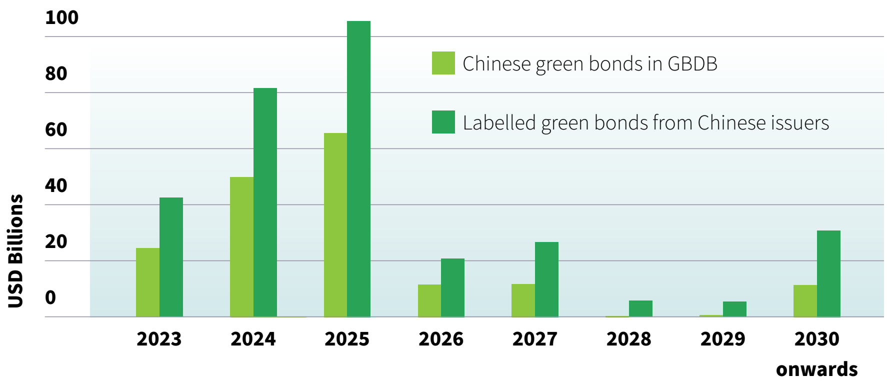
Source: Climate Bonds Initiative

Green bond issuance from China expanded in 2022



Source: Climate Bonds Initiative

Chinese issuers favour shorter tenors



Source: Climate Bonds Initiative

External reviews remain the norm, while new regulations will guide third-party verifiers

External reviews provide independent confirmation on the alignment of the green bond with a stated green bond framework or standard. The proliferation and practice are likely to improve as the government put forward regulatory guidelines for the third-party verifications. Different types of external reviews also provide various levels of rigour in guarding against greenwashing.

Most green bonds obtained an external review, 81% by volume or 68% by deal count, among the issuance aligned with the Climate Bonds definition. The second-party opinion (SPO) remained the most popular method in both onshore and offshore markets by volume and deal count.

Certification is a formal endorsement of a debt instrument's green credentials based on an assurance report from an independent external reviewer confirming full alignment with the Climate Bonds Standard (CBS) and relevant Sector Eligibility Criteria. Five deals from China's onshore market obtained Climate Bonds Certification in 2022. They were issued by the **Agricultural Bank of China** and the **China Development Bank**, with a combined volume of USD7.0bn (RMB47.2bn) or equivalent to nearly 10% of onshore bonds logged in the GBDB.

China Green Bond Standards Committee, affiliated with the China Securities Regulatory Commission (CSRC) and National Association of Financial Market Institutional Investors (NAFMII), approved 18 third-party external review service providers in September 2022. Most of these service providers are also Climate Bond Approved Verifiers, who are qualified to provide assurance about whether a bond meets the requirements of the CBS and sector-based technical criteria under the CBS and Certification Scheme. Examples included China Lianhe Equator, China Chengxin Green Finance, Golden Credit, iGreenBank, CECEP Hundred Technical Service (Beijing), Beijing Zhongcai Green Financing Consultants, China Quality Certification Centre, SynTao Green Finance, and Morningstar Shanghai.[7]

Climate Bonds Certification versus SPO

	Climate Bonds Certification	SPO
What is it?	A formal endorsement of a debt instrument's green credentials which is based on an assurance report from an independent external reviewer confirming full alignment with the CBS and relevant Sector Criteria.	An opinion by an independent external reviewer to determine whether the green bond framework is aligned to accepted market principles (e.g., the Green Bond Principles or the Green Loan Principles) and that the intended UoP of the bond or loan are aligned with the stated taxonomy.
Who does them?	A Climate Bonds Approved Verifier conducts the verification engagement and the Climate Bonds awards the Certification Label.	SPO service providers
Pros	• Requires the issuer to follow up with post issuance verification and annual reporting for the duration of the bond • The rigorous framework is considered best practice by investors • The binary assessment is conducted against fully transparent standards and criteria • The CBS incorporates the ICMA Green Bond Principles, so no separate SPO is required • Sector Criteria are based on science and align with the Paris Agreement • Certification is available for both the green and carbon-intensive sectors, for entities, assets, SLBs from non-financial corporate issuers, and UoP instruments	• This is the most established approach in the market • Typically confirms alignment of the issuer's Green Bond Framework with the ICMA Green Bond Principles but may also include alignment with stated taxonomies and/or UN SDGs
Cons	• The Certification Scheme requires alignment with clear and specific requirements, rather than guiding principles and does not offer flexibility	• Many different approaches used by SPO providers, including proprietary methods and assessment framework which may not be fully transparent • Not as sufficient to fully guard against greenwashing • As SPOs do not follow a single standard or methodology, they are not comparable across issuers or sectors • Not required to follow-up after issuance and allocation of the proceeds • SPOs are still uncommon for SLBs and there is no accepted international standard for assessing green companies/entities

Further adoption of the Common Ground Taxonomy (CGT)

As a joint initiative of the People's Bank of China (PBOC) and the European Commission, the CGT was an in-depth comparison exercise between the green classification systems (taxonomies) of China and the European Union (EU). It mapped out the commonalities and differences between the two taxonomies, forming an important piece of policy infrastructure.

In November 2021, the International Platform on Sustainable Finance (IPSF) published the first version of the CGT report and list of activities. It was later updated in June 2022 to cover 72 climate change mitigation activities that share common ground for both China and the EU taxonomies with regard to the 'substantial contribution' criteria. The work focused on six priority sectors, including forestry, manufacturing, energy, waste treatment, construction, and transport. Though the CGT is not legally binding in China nor the EU, it plays an important role in increasing the comparability and interoperability of sustainable finance taxonomies and green definitions globally.

The market saw more use cases of the CGT being incorporated in onshore and offshore green products. Since the first adoption by the **Construction Bank of China Macau Branch** in its December 2021 green bond a few more banks/entities incorporated the CGT in their green frameworks in 2022.[8]

Climate Bonds expects more market applications of the CGT as it gets further integrated into policy measures. The *China Green Bond Principles*, released in July 2022, stated that overseas issuers could use the CGT as a reference to identify green products. The Hong Kong Special Administrative Region (HKSAR) is also exploring developing a green classification framework for local adoption, which would facilitate easy navigation across the CGT, Mainland China's and the EU's taxonomies.[9,10]

Example use cases of the CGT in 2022

Issuer	Date	Listing	Type	Funded projects
China Merchants Bank (Sydney Branch)	March 2022	Offshore	Bond	Wind power projects
Industrial Bank (Hong Kong Branch)	May 2022	Offshore	Bond	Low carbon and low emission transportation, including but not limited to the construction of rail transit; Renewable energy, including but not limited to the development and construction of photovoltaic farms and offshore wind farms
Bank of China (Frankfurt Branch)	June 2022	Offshore	Bond	Electricity generation from wind power; Pumped hydropower storage; Urban rail transportation; Pure electric bus; Manufacture of energy-saving equipment
Trina Solar Energy Development	September 2022	n/a	Loan	Electricity generation using solar photovoltaic technology; Production of solar generators
Agricultural Bank of China	October 2022	Onshore	Bond	Low carbon rail transport (metro projects)
CDB Leasing	November 2022	n/a	Loan	Wind power projects

Onshore

Energy and Transport remained the two largest categories by UoP

Climate Bonds recorded onshore green bond volumes of USD71.5bn (RMB481.5bn) in 2022, up 26% from the prior year.[15] Onshore volume accounted for about 84% of green bonds originating from China. Half of onshore bonds included Renewable Energy (Energy) in their UoP.[16] Low Carbon Transport (Transport) accounted for 27%.

Energy UoP declined by 4% YOY to USD35.9bn (RMB241.7bn). Top deals with purely Energy UoP came from the **Industrial and Commercial Bank of China (ICBC)**, the **State Power Investment Corporation Limited** and **China Merchants Bank**. Issuance from SOEs made up 91% by volume, mainly from the Utilities and Financials industry groups.[17]

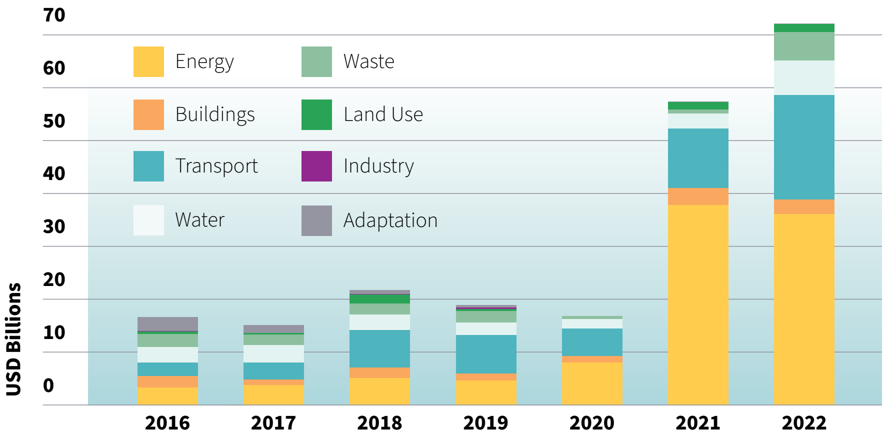
Transport UoP experienced 77% YOY growth to USD19.6bn (RMB132.1bn). Non-SOE participation was more active in this space compared with the Energy category, making up 30% share by volume. Top deals with purely Transport UoP came from the **China Development Bank**, **Agricultural Bank of China**, and **BYD Auto Finance Company Limited**.

Water and Waste UoPs grew 1.2 times and 6.6 times YOY respectively to USD6.4bn (RMB42.9bn) and USD5.3bn (RMB35.9bn), while funding to the Building category declined by 17% to USD2.7bn (RMB18.1bn). Climate Bonds tightened the screening criteria for green building projects in 2022. This resulted in the inclusion of fewer bonds supporting green building projects which were below the GBEL Three Star.

Increased diversification of supply as issuer base broadened

2022 saw numerous debut issuers joining the green bond market, increasing the diversification of supply. The 2022 pool of green bonds came from 186 participants, 130 of whom were debut issuers.

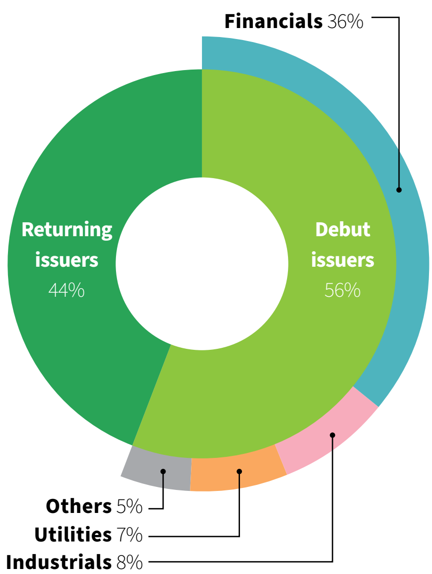
Transport, Water and Waste UoP exhibited growth, while Energy UoP remained the largest



Source: Climate Bonds Initiative

These issuers either had not previously issued green bonds; or this was the first time their labelled debt had qualified for inclusion in the GBDB. The debut issuers contributed 56% of the 2022 supply of green bonds onshore. Most came from the financials, industrials and utilities sectors.[18] Examples of debut issuers included the lithium-ion battery maker **Contemporary Amperex Technology (CATL)**, the national joint-stock commercial bank **Ping An Bank**, and steel makers **Liu Zhou Iron & Steel** and **Hunan Iron & Steel Group**.

Debut issuers dominated in 2022



Source: Wind, Climate Bonds Initiative

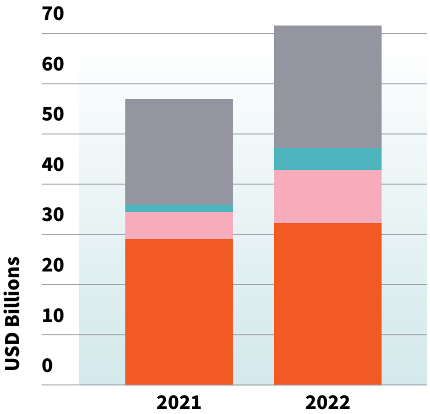
Sectors and UoP categories

The sector of a bond describes the economic activity of its issuer. The Global Industry Classification and Standard (GICS) and WIND Industry Classification are examples of sector classification standards. The UoP category describes how the funds raised from the sale of the instrument will be deployed. Taxonomies provided by organisations such as Climate Bonds, the EU, and China are examples of UoP categorisations. The sector of a bond issuer is unrelated to the UoP categories. For example, a bank (financial sector) can issue green bonds with UoP earmarked for Energy and Transport.

Non-SOEs became more active participants in the market compared to prior years. In 2022, about 16% of onshore issuance volume, or USD11.4bn (RMB76.6bn) came from non-SOEs. Issuance from the Guangdong Non-SOEs made up 55% of the total non-SOE green bond volume. Examples included **China Merchants Bank**, **Ping An Bank** and **Guangzhou Rural Commercial Bank**, which are classified as public companies by the WIND company nature classification.

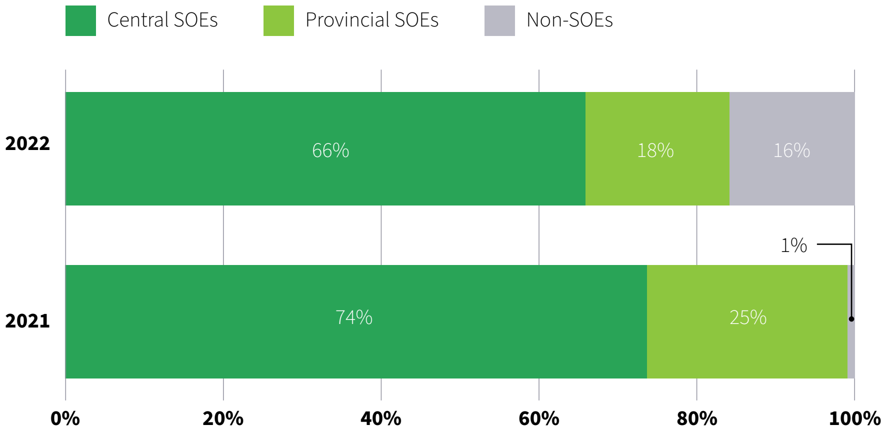
Geographically, Beijing led green bond issuance with a volume of USD32.3bn (RMB217.7bn), or 45% of the total onshore volume recorded by Climate Bonds in 2022. This was in line with the observations by company nature, as most central SOEs' headquarters are registered in Beijing and they have been the main sources of green bond supply. However, the largest geographic growth came from the Guangdong Province, which nearly doubled issuance from a year ago to USD10.5bn (RMB70.9bn). Deals from the non-SOEs registered in the province was a major driving force for this growth.

Guangdong Province showed rapid deal growth while Beijing remained the top region of supply



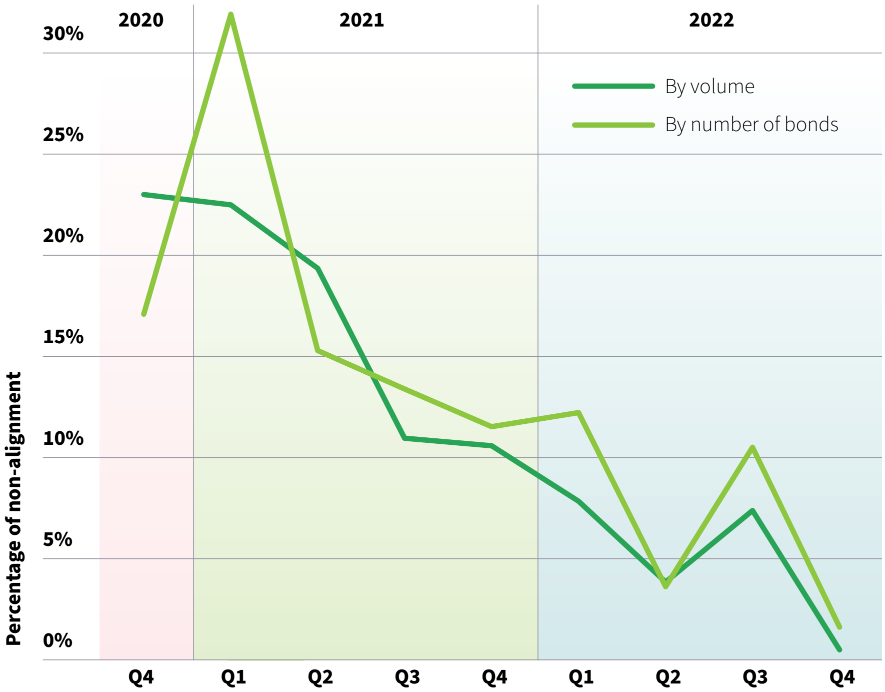
Source: Wind, Climate Bonds Initiative

2022 saw more participation from non-SOEs in green bond issuance



Source: Wind, Climate Bonds Initiative

Alignment with the 100% UoP-to-green rule significantly improved amongst Chinese onshore labelled green bonds



Source: Climate Bonds Initiative

Improved alignment with 100% UoP-to-green rule

The Green Bond Standards Committee released the *China Green Bond Principles* (CGBP) in late July 2022. It advocated for standardisation and high-quality development of Chinese green bonds, potentially leading to their higher recognition in the international market. The guidelines are self-regulatory and voluntary by nature. The CSRC also instructed both the Shanghai and Shenzhen exchanges to revise listing rules for such bonds accordingly.[19]

One of the highlights of the CGBP was to mandate 100% of the bond proceeds to green projects. This update reduced discrepancies between international and Chinese green bond standards with respect to the allocation of proceeds. Historically, Chinese enterprise and corporate green bonds could respectively have up to 50% and 30% of proceeds used for general corporate purposes, whereas the CBS and ICMA Green Bond Principles require 100% of net proceeds to green assets, projects, or activities.[20]

Full implementation of the CGBP across all Chinese bond types, governed by different government authorities, will be key to improving international recognition of Chinese green bond supply. Allocating part of the net proceeds for general working capital had been one of the main reasons for excluding some Chinese onshore labelled green bonds from the Climate Bonds' GBDB. Based on the screening results, alignment around this metric improved over the last two years. Percentage of non-alignment due to using partial UoPs for general working capital purpose decreased significantly, measured by both issuance volume and deal count.

Harmonisation of green definitions supported scaling the China's green bond market

China began to put out green bond-related policies in 2015. Since then, its green bond market enjoyed generally continuous growth to its leading scale today. The harmonisation of domestic green definitions amidst different bond products, supported by collective efforts from various ministries, played a pivotal role in bringing clear guidelines to the market. This was showcased by making the *Green Bond Endorsed Projects Catalogue (2021 Edition)* applicable to the whole Chinese green bond market in the *China Green Bond Principles*, even as the supervisory structure of the bond market remained fragmented. The update of the *Green Bond Endorsed Projects Catalogue (2021 Edition)* from its 2015 version also demonstrated efforts to align the domestic green definition with international counterparts, most notably with the removal of 'clean coal'.

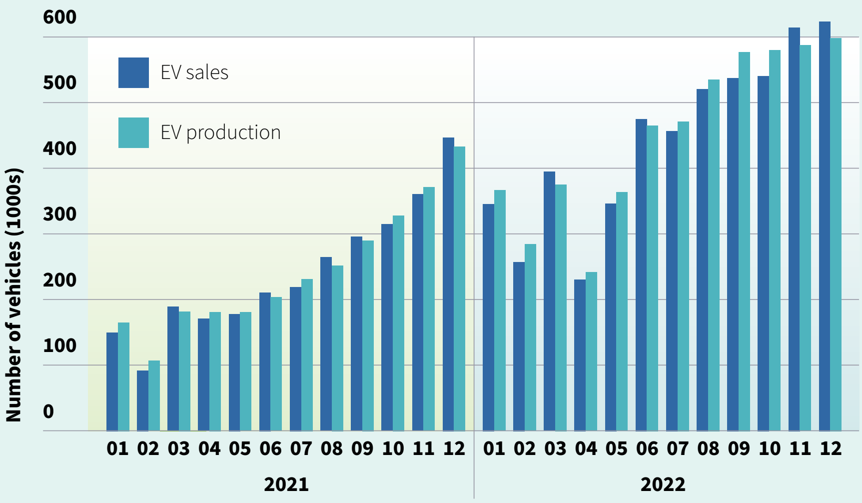
Time	Supervisory authority	Policy Measures	Product Type	Taxonomy reference
22 Dec 2015	PBOC	Administrative Measures for the Issuance of Financial Green Bonds in the National Inter-bank Bond Market	Financial bonds	Green Bond Endorsed Projects Catalogue (2015 Edition)
31 Dec 2015	NDRC	Guidelines on Green Bond Issuance	Enterprise bonds	NDRC Guidelines[23]
02 Mar 2017	CSRC	Guiding Opinions for Supporting the Green Bonds	Corporate bonds and corporate ABS	Green Bond Endorsed Projects Catalogue (2015 Edition)
22 Mar 2017	NAFMII	Guidelines on Green Debt Financing Tools for Non-financial Enterprises	Debt financing instruments and asset backed notes (ABN)	Green Bond Endorsed Projects Catalogue (2015 Edition)
02 Apr 2021	PBOC, NDRC, CSRC	Notice of PBOC, NDRC, CSRC on Issuing the Green Bond Endorsed Projects Catalogue (2021 Edition)	All of the above	Green Bond Endorsed Projects Catalogue (2021 Edition)
29 Jul 2022	China Green Bond Standards Committee	China Green Bond Principles	Types of green bonds: Green bonds (UoP) Carbon yield green bond Green project revenue bond Green ABS	Domestic issuers: Green Bond Endorsed Projects Catalogue (2021 Edition) Overseas issuers: Common Ground Taxonomy EU Taxonomy

Chinese electric vehicles drive green bond deals

China's electric vehicle industry is fast-growing. Battery electric vehicle sales and production reached a record high in 2022. The trend is likely to continue in the coming years, with the government's target of 40% of incremental vehicles fuelled by new and clean energy annually by 2030.[21] Green bond issuance can support investments along the supply chain as car makers and battery manufacturers expand their production lines. Green ABS from EV sales is also expected to grow accordingly.

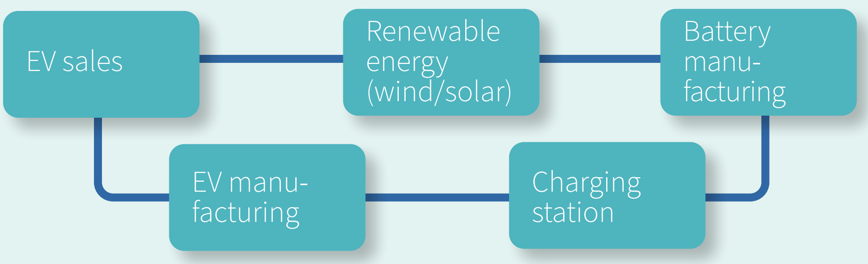
In 2022, Climate Bonds recorded green bond deals from **BAIC Motor Corporation**, with UoP earmarked for new energy vehicle capacity expansion. Climate Bonds also included green asset-backed securities (ABS) from auto financing companies set up by Chinese EV auto companies such as **BYD**, **Zhejiang Geely**, **China FAW Group**, and **SAIC-GM**, as well as battery leasing companies such as **Weineng Battery**. A securitisation can be defined as green when the underlying cash flows relate to low-carbon assets or where the proceeds from the deal are earmarked to invest in low-carbon assets.[22]

The green bond market can support EV development



Source: Wind

Green bonds can support investments along the EV supply chain

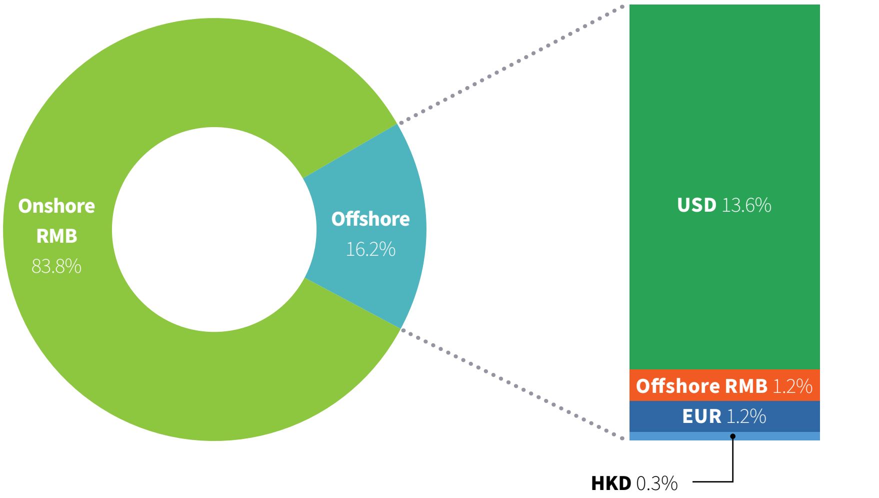


Offshore

In 2022, Climate Bonds recorded offshore green bond volumes of USD13.8bn (RMB93.2bn) from Chinese issuers, accounting for about 16% of its overall supply. Growth stayed relatively moderate at 4% YOY, compared with 26% expansion in the onshore market. Most of the offshore green bonds were denominated in USD, followed by EUR and CNH (offshore Renminbi). The Stock Exchange of Hong Kong (HKEx) remained the largest listing venue for Chinese offshore green bonds, taking a share of around 43%.[24]

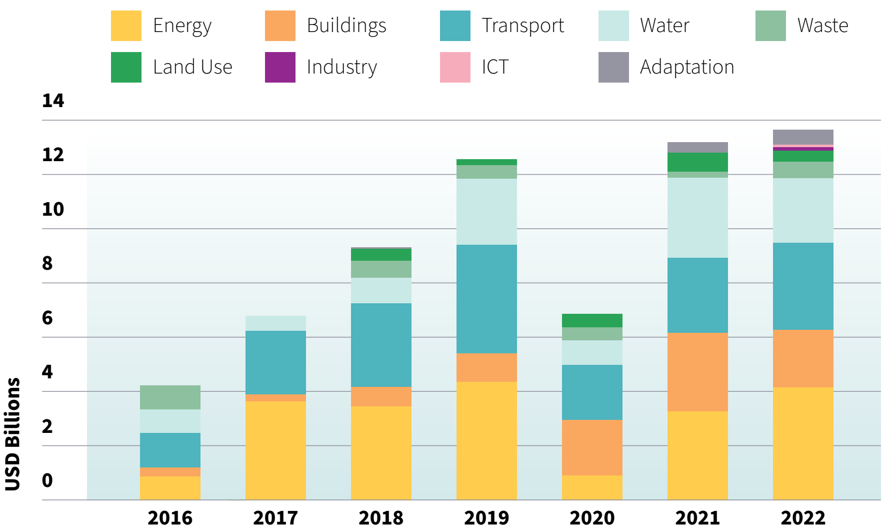
Unlike the onshore market, where the UoP are mostly earmarked for Energy and Transport, the UoP in the offshore market were more evenly distributed across various categories. Energy, Building, Transport and Water made up a combined 87% of the volume. Entities operating in the financial-corporate space took 74% of the volumes, similar to the prior year.

Offshore volume made up 16% of total supply from Chinese issuers in 2022



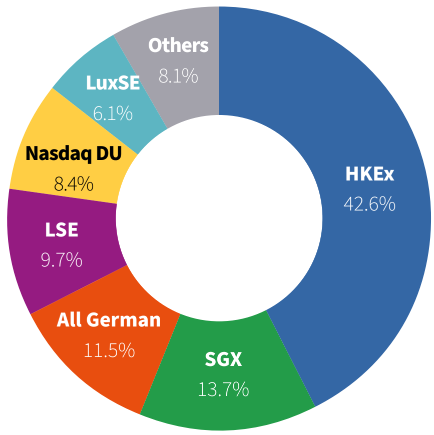
Source: Climate Bonds Initiative

UoP distribution of Chinese offshore green bonds



Source: Climate Bonds Initiative

HKEx remained leading venue for offshore Chinese green bond listing in 2022



Source: Climate Bonds Initiative

Offshore green bonds by the People's Government of Shenzhen Municipality of Guangdong Province (Shenzhen Government)

Shenzhen, is one of the most economically advanced regions in China, and led by prioritising climate change response in its ecological environment governance system. The city began to implement China's first green finance law (the Shenzhen Special Economic Zone Green Finance Regulations) in March 2021, mandating listed financial companies registered in Shenzhen to disclose environmental information from the start of 2022.

Date	Size	Tenor	Coupon rate	UoPs
19 Oct 2021	RMB1.5bn	3-year	2.70%	Clean transportation projects[25]
19 Oct 2021	RMB2.4bn	5-year	2.90%	Water treatment projects / sponge city related projects
7 Nov 2022	RMB1.5bn	3-year	2.65%	Clean transportation projects / water treatment projects and/or sponge city related projects[26]
7 Nov 2022	RMB1.1bn	5-year	2.83%	Water supply projects / water sanitation projects

The Shenzhen Government issued offshore Renminbi (CNH) local government green bonds in Hong Kong in October 2021 and priced again in November 2022, against its Green Finance Framework and Green and Blue Finance Framework respectively. Shenzhen's successful offshore green bond experience can be model for other provinces and municipalities in China.

Transition

Overview

China has developed a formidable green bond market underpinned by clear guidelines and the commitment to realise its climate goals. This experience can be extended to scaling up its nascent transition debt market.

China's economy currently has a high degree of reliance on energy-intensive, high-emitting industries, or what is often termed hard-to-abate sectors. Heavy industries contribute to 31% of the nation's total emissions, eight percentage points higher than the world average.[27] China is also a leading producer in carbon-intensive sectors such as steel, cement, and chemicals. These sectors need a large amount of capital to support their low-carbon transition efforts, from technological research and development to green purchasing and retrofitting. Despite significant strides that the country has made towards the achievement of its 30.60 climate targets, green or near-green activities only account for a small fraction of its economy. China needs to build a credible and scalable market to mobilise a significant amount of additional financing for the whole-economy transition.

A sizable transition finance market can only be created, backed by verifiable, credible, ambitious, and transparent strategies and action plans. In September 2022, Climate Bonds updated its white paper *Transition Finance for Transforming Companies* (originally published in 2021), providing a comprehensive framework to support entities in developing credible and ambitious transition plans. Climate Bonds will provide transparent science-based criteria for non-financial corporate entities, credible SLBs and similar instruments, and assurance for investors that sustainability requirements have been met in respect of any Certified issuance. Increasingly, transition plans are becoming a crucial tool for public and private sector stakeholders to drive action to net zero and avoid greenwashing when defining and financing decarbonisations.

Clear guidance from the regulators is also crucial. The G20 Transition Finance Framework, published in 2022 with lead drafters from China and the US, refers to transition finance as 'financial services supporting the whole-of-economy transition, in the context of the Sustainable Development Goals (SDGs), towards lower and net-zero emissions and climate resilience, in a way aligned with the goals of the Paris Agreement'. It was an important building block, based on which various jurisdictions can develop measures to facilitate the market. It could also serve as a reference for financial service providers to strategise their positions.[28]

Huge financing opportunities to support transition in China

The financing need is vast and urgent. For example, the World Bank estimated that China would need USD14-17tn from now until 2060 for the power and transport sectors alone, depending on different decarbonisation scenarios.[29] Climate Bonds estimated that China's steel industry alone would require RMB20tn (US3tn) investment, or RMB 500bn (USD74bn) annually, to achieve carbon neutrality.[30] However, the journey of transition finance has just begun, pointing to a large, urgent financing gap.

China's transition finance is still in a pilot stage

Bond instruments supporting transition are mostly SLBs and transition bonds. SLBs raise general purpose finance and involve penalties or rewards (e.g., coupon step-ups/step-downs, early repayment obligations, etc.) linked to the achievement of pre-defined, time bound sustainability performance targets (SPTs), typically at the entity level.

Transition bonds are UoP instruments predominantly from carbon-intensive industries. They do not fall into the existing definitions of green but are a critical component of an economy-wide transition to net zero. Example sectors include extractives such as mining; materials such as steel and cement; and industrials including aviation and shipping.

China started exploring transition debt instruments in 2021. In April 2021, the NAFMII launched 'sustainability-linked debt financing instrument', with relevant requirements referring to the ICMA's *Sustainability-Linked Bond Principles*. In June 2022, the Shanghai Stock Exchange clarified the relevant arrangements for 'low-carbon transition-linked corporate bonds'. These products are essentially SLBs, with UoP contributing to general purpose capital and involving penalties/rewards with key performance indicators (KPIs) linked to specific SPTs.

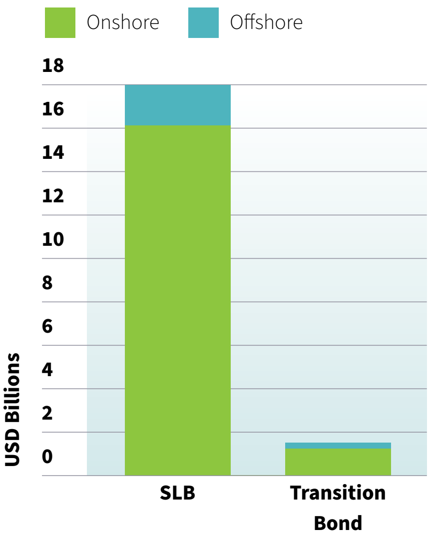
In June 2022, the Shanghai Stock Exchange and the NAFMII put forward the relevant guidelines on transition bond products. The Shanghai Stock Exchange launched 'low-carbon transition corporate bonds' to prod green and low-carbon transformation. It was shortly followed by the NAFMII *Notice to Launching Innovation Pilot Programme Related to Transition Bonds* report, to support debt financing instruments addressing climate change and adaptation. NAFMII also provided boundaries on low-carbon transition activities or areas.

Guideline on low-carbon transition by Chinese regulators

Low-carbon transition areas	
Shanghai Stock Exchange	**1. Advanced equipment catalogue** in accordance with various industry-specific guidelines, R&D and application of other advanced processes and equipment that contribute to pollution prevention, energy saving and carbon emission reduction.[33] **2. Clean and efficient development and utilisation of fossil energy** such as safe, efficient, green mining of coal, clean and efficient utilisation of oil and gas. **3. Application of energy saving and consumption reduction technologies**, transformation and upgrading of infrastructure, data centres and others. **4. The overall optimisation of industrial park's energy system and pollution control**, the construction of the "Green Island" project and other areas of industrial park's energy conservation and environmental protection improvement.[34] **5. Other areas that enable low-carbon transition.**
NAFMII	**Category 1.** Projects that have been included in the Green Bond Endorsed Projects Catalogue (2021 Edition), but their technical indicators do not meet the standards
	Category 2. Projects and other related economic activities that are in line with the carbon peaking and carbon neutrality goals, with the effect of reducing pollution and carbon emission, as well as improving energy efficiency, including but not limited to: **1.** Clean production and efficient utilisation of coal **2.** Clean use of natural gas **3.** Replacement of capacity in the eight heavy industries: electric power, building materials, steel, non-ferrous metals, petrochemicals, chemicals, papermaking, civil aviation **4.** Application of green equipment and technology **5.** Other projects with low carbon transition benefits

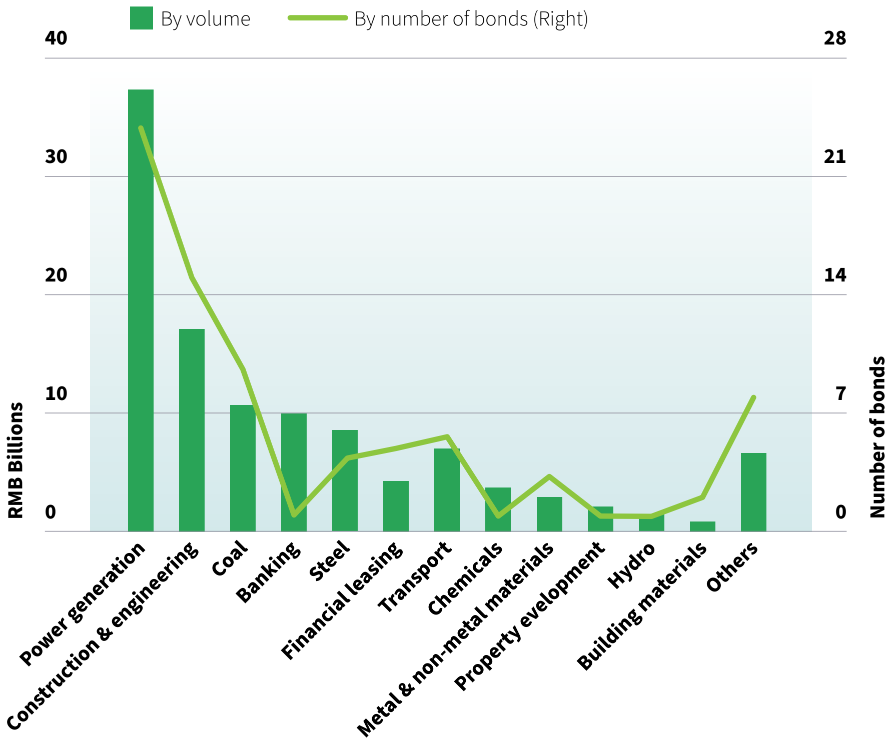
Source: compiled by CIB Research

SLBs accounted for 92% of all-time labelled bond issuance related to transition (by volume)



Source: Climate Bonds Initiative

Onshore SLB issuance



Climate Bonds records but does not yet screen transition-related bonds against thresholds or targets. As relevant criteria at both activity and entity level are developed, Climate Bonds will introduce screening for bonds and issuers in those sectors based on a publicly transparent methodology.

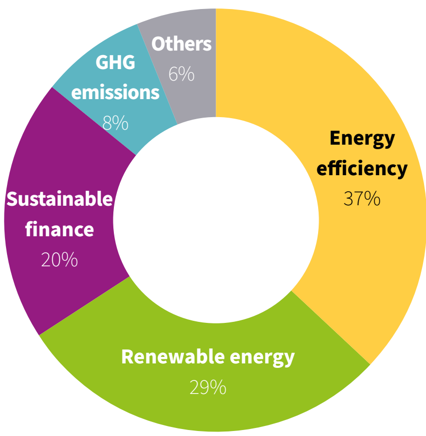
As of the end of 2022, the combined all-time issuance of SLBs and transition bonds listed onshore and offshore from Chinese issuers came to USD19.6bn (RMB131.9bn), where 92% from SLB and the rest from transition bonds. A wide range of heavy industries ranging from electric power, construction materials, power, steel, cement to chemical companies, participated in the market. Although SOEs were major players, the market also saw issuance from non-SOEs such as the **Hongshi Group** (a private cement company) and **Huaxin Cement**.

Cumulative issuance of SLBs reached USD18bn (RMB121.5bn), where 90% of volume were issued onshore. In 2022, the volume of SLBs increased by 38% to USD10.2bn (RMB68.7bn). Cumulative issuance of transition bonds reached USD1.6bn (RMB10.4bn), 82% of which came from onshore issuance. A total of 83 SLB and 16 transition deals were recorded.

Climate Bonds classifies KPIs for SLBs into multiple categories.[31] Energy efficiency led as the top choice at the end of 2022, reflecting the focus of near-term transition strategies by heavy industries in China. For example, **Anshan Iron and Steel Group** issued an RMB2bn SLB in January 2022, with the KPI tied to the energy consumption per ton of steel from its Anshan and Bayuquan bases. Renewable energy was the second most popular measure, especially amongst utilities and energy companies. An example would be **Shandong Energy Group** issuing an RMB2.5bn SLB in August 2022, with the KPI linked to the cumulative installed renewable capacity. An example KPI used under sustainable finance-related category would be using the percentage of green loans in the gross loan amount.

Climate Bonds encourages the uses of absolute GHG emission targets, or GHG emission intensity tied to physical metrics (such as production), as it would provide higher transparency and linkage to GHG reduction impact. For example, **Huaxin Cement** issued a dual-tranche SLB deal in July 2022 worth of RMB900m, tied to a target to reduce GHG Scope 1 and 2 Emissions to 829.63 kg CO_2e/t clinker by 2024.

Most KPIs reference energy efficiency



Source: Climate Bonds Initiative

Scaling credible transition

Standards help identify transition activities and investment opportunities

Economic and energy structures vary amongst different jurisdictions. This leads to different deep decarbonisation strategies. One of the key distinctions of China's carbon emission profile compared with developed countries is its much larger emission shares from carbon-intensive heavy industries. China's energy sector is the source of almost 90% of its greenhouse gas emissions.[32]

Since China announced its 30.60 climate goal in September 2020, a few leading heavy industry players have made carbon neutrality pledges. They are mostly SOEs from sectors such as power generation, oil and gas, and steel. Though these announcements sent strong signals of commitment to key stakeholders and had a demonstrative effect on smaller peers in their respective industries, they ought to be backed up by strategy, action plans and reporting to demonstrate credibility.

Behind these pledges and roadmaps lies an urgent need for a clear transition plan, including details of how proposed actions will be financed. Without a clear transition finance standard, companies in carbon-intensive sectors may find it difficult to justify their causes to the lending institutions using transition finance tools. On the other hand, investors are facing a large barrier in identifying credible transition activities and investment opportunities. Standards, by either a taxonomy or a set of principles, could bridge the gap.

In 2022, Climate Bonds expanded its sector standards into heavy industries with the launch of the Basic Chemicals Criteria, Steel Criteria, and Cement Criteria, as well as the enabling technology Hydrogen Production Criteria. These standards can offer an important point of reference with forward-looking pathway guidelines aligned with the Paris Agreement 1.5oC limit. Issuers can follow this guidance to ensure they are meeting the highest levels of ambition

A tool to assess forward-looking transition plan

Climate Bonds developed the Five Hallmarks as a tool to assess that transition plans are credible. The Five Hallmarks emphases key governance elements that are important indicators of a company's willingness and ability to deliver on its decarbonisation targets, but also adds the granularity needed to ensure that those targets are ambitious and in line with the agreed climate goals. These Hallmarks can be used on a standalone basis by any stakeholder to set and assess the credibility of their own or others' transition. Climate Bonds encourages issuers to address all Five Hallmarks when developing their transition plans.

Examples of decarbonisation pledges by large corporations from China's heavy industries

Company	Sector	Carbon neutrality target year	Key message
Baowu Group	Steel	2050	*China Baowu Carbon Neutrality Action Plan*: reduce carbon emissions by 30% to 1.3 tons per ton of steel from the 2020 baseline and strive to be carbon neutral by 2050. The plan also lists six directions of future development to achieve this goal.[35]
Sinopec Corp.	Oil and gas	2050	Achieving net zero by 2050.[36]
Three Gorges Group	Power generation	2040	Carbon peaking by 2023, and carbon neutrality in 2040.[37]
Jianlong Group	Steel	2060	Carbon peak by 2025; 20% carbon emission reduction from peak in 2033, and carbon intensity 25% lower than that in 2020; carbon neutrality in 2060.[38]

Five Hallmarks can be used to assess companies' transition plans as well as SLBs.

Credible transition plans	**Credible sustainability-linked bonds**
Paris-aligned targets	**Key performance Indicators Sustainability Performance Targets**
Robust Plans	**Strategies to achieve the SPTs**
Implementation Action	**Achieving the SPTs**
Internal monitoring	**Internal monitoring**
External Reporting	**SLB Reporting**

Case study: using the Five Hallmarks to assess SLBs

Huaxin Cement Co. Ltd (Huaxin Cement) is a Chinese domestic cement producer. It issued a RMB900m dual-tranche SLB deal in July 2022 and its KPIs were tied to GHG Scope 1 +2 Emissions reduction targets by 2024. It was the first low carbon transition-linked corporate bond from the cement industry listed on the Shanghai Stock Exchange. The deal was well received by 21 institutional investors in the market and obtained the lowest interest rate at issuance amongst bonds of the same tenor within the industry.[39]

Name: Huaxin Cement
Issuer type: Non-financial corporate
Amount issued: Two tranches of RMB450m
Issue date: 19 July 2022
Maturity: 19 July 2025, 19 July 2027
KPI: GHG Emissions (Scope 1 and 2) by unit in kg CO_2e/t clinker
SPT: 829.63 kg CO_2e/t clinker
Observation date: 31 December 2024
Financial Measure: Coupon step-up of 10bp if targets are not met.

Climate Bonds' summary view

Huaxin Cement's SLB has set a strong precedent in the domestic Chinese market for the use of GHG targets in SLBs. Climate Bonds urges Huaxin Cement and other issuers to raise the level of ambition in their GHG targets, by calibrating targets against 1.5˚C pathways, including all scopes of emissions, and providing further transparency to investors.

Five Hallmarks	Comments
1.Paris-aligned targets	Huaxin Cement has set detailed short-,mid- and long-term Scope 1 emission intensity targets for both its cement and concrete business streams in its *Low Carbon Development White Paper (LCD White Paper)*. These targets (against a 2020 baseline) are five-yearly till 2035, as well as 2050 and 2060 targets. While Carbon Capture Utilisation and Storage (CCUS) will play an important role in the business decarbonisation, Climate Bonds applaud that Huaxin Cement chose to have its emission reductions from CCUS and BECCUS not included in the calibration of these targets. Climate Bonds applauds Huaxin Cement's ambitious Scope 1 emission targets, as well as the use of the SLB format to reinforce its commitment to decarbonisation. Climate Bonds encourages Huaxin Cement to 1) standardise its SLB targets with cement pathways; 2) include scope 2 emissions; 3) conduct relevant Scope 3 emission assessment.[40]
2.Robust plans 3.Implementation action	Huaxin Cement's transition strategy and action plan is documented in detail in its *LCD White Paper*, including itemised carbon reduction potential estimates for cement sector-specific decarbonisation technologies and activities, the main ones being alternative use, clinker substitution, carbon capture and low-carbon clinker development. The same paper also estimates an investment plan of RMB10.5bn in R&D and production facilities upgrades between 2020 and 2030 to facilitate this transition. More recently, the company announced an expected RMB12.2bn capital expenditure in 2022, up 68% from the previous year, for its overall and low-carbon development. Huaxin has governance mechanisms in place to manage these environmental risks and manage the company's decarbonisation, including involvement from the board of directors, managers, and working groups.
4.Internal reporting 5.External reporting	Huaxin Cement has committed to continuing annual Scope 1 and 2 absolute emissions and emission intensity reporting as part of this SLB. Such disclosure was included in its 2021 ESG report, and H1 2022 report. Scope 3 reporting is also encouraged.

Emergence of multi-labelled products

Following the proliferation of various green, social and transition themes, the market saw emergence of multi-labelled products. The RMB2bn bond issued by the **Huaneng Lancang River Hydropower** in July 2022 was an innovation on this front. The bond, labelled as a sustainability-linked/rural revitalisation/carbon neutrality bond, was essentially a product with combined green and social UoP, and SLB characteristics. This bond's UoP were earmarked for green projects (hydropower facilities meeting Climate Bonds definition). Meanwhile, its coupon rate was linked to KPIs such as the newly installed renewable energy capacity. The investment also brings social impact that meets requirements of the Rural Revitalisation label under the Chinese regulations.

Social and sustainability

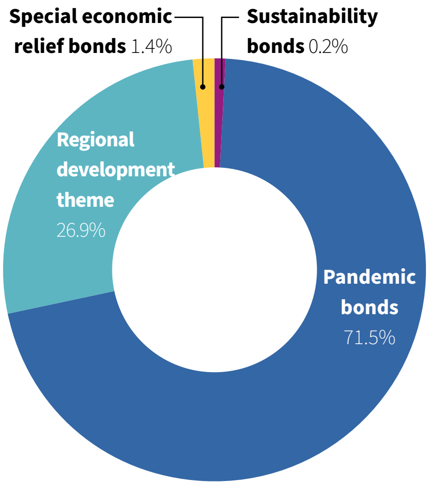
Based on the ICMA Social Bonds Principles, social bonds are those with UoP exclusively earmarked to finance or re-finance eligible social projects. Sustainability bonds refer to bonds where proceeds are earmarked to finance or re-finance a combination of both green and social projects. This principle of exclusive UoP allocation was also adopted by the NAFMII in 2021 when it launched the pilot social and sustainability panda bond programme on China's interbank market.[41] Currently, some Chinese thematic bonds such as rural revitalisation bonds, though categorised under social bonds, do not meet the rule of exclusive UoP allocation. Climate Bonds' work on social and sustainability bonds originating from China has just begun. The dataset referenced in this part reflects labelled social-themed bonds and sustainability bonds without screening.

Onshore

Cumulative onshore issuance of labelled social and sustainability bonds from China tops RMB2tn

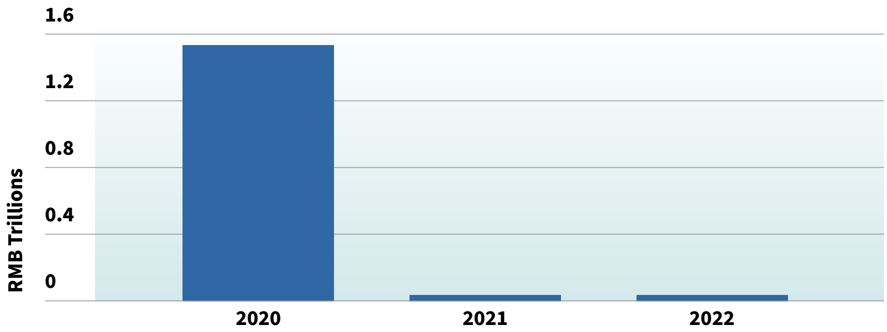
By the end of 2022, the cumulative issuance of China's labelled social and sustainability bonds in the domestic market reached RMB2.17tn (USD321.7bn). Pandemic bonds accounted for 71.5% of the total amount, with cumulative volumes of RMB1.55tn (USD230.1bn), buttressed by that China issued RMB1tn of special treasury bond issuance in 2020 for pandemic prevention and control. In addition, bonds supporting regional development (including rural revitalisation bonds, poverty alleviation bonds, revolutionary base revitalisation bonds), special economic relief bonds, and sustainability bonds reached cumulative volumes of RMB582.7bn (USD86.5bn), RMB30.5bn (USD4.5), and RMB3.1bn (USD0.5bn) respectively.

Pandemic bonds accounted for over 70% of social and sustainability bonds from China



Source: Wind, CIB Research

Most pandemic bonds were issued in 2020 as COVID-19 emerged



Source: Wind, CIB Research

Regional development UoP made up most of China's social and sustainability bonds

Source: Wind, CIB Research

Various social and sustainability UoP have gained momentum as COVID-19 faded.

Since 2021, other social themes such as rural revitalisation have picked up momentum, while the volume of pandemic bond issuance faded. Social and sustainability bonds excluding pandemic bonds increased by 1.8 times YOY to RMB193.8bn (USD28.8bn) in2021. This figure dropped by 35.4% YOY in 2022 to RMB125.2bn(USD18.6bm), but was still significantly higher than the 2020 and before level.

Brief intro to Climate Bonds' Social and Sustainability Bond Database

Climate Bonds added a Social and Sustainability Bond Database (SSBDB) to complement its GBDB to provide a clearer snapshot of the GSS+ debt market.[42] Climate Bonds screens self-labelled UoP social and sustainability debt instruments to determine inclusion in the SSBDB against the SSBDB Methodology.[43]

There are three overarching requirements for inclusion:

1. Debt instruments includes but is not limited to bonds, asset-backed securities and loans.

2. Self labelled, defined as a decision by the issuer to tag the instrument under the social and/or sustainability themes, as communicated in deal documentations.

3. Sufficient public disclosure to:

a. determine if the financed assets, projects, activities, and expenditures fall under relevant categories within the social or sustainability themes, and

b. allow the entry of the debt instrument into the database, most notably including an amount outstanding and settlement date.

Climate Bonds' work on social and sustainability bonds originating from China has just begun. Climate Bonds does screen, classify and verify indicative data pertaining to social and sustainability bonds from China; however, the dataset referenced in this report reflects bonds labelled as social and sustainability without screening.

Focus: rural revitalisation bonds

The regional development theme is an important component of China's social and sustainability bond market and contributed 26.9% of the cumulative volume by the end of 2022. It covers rural revitalisation bonds, poverty alleviation bonds, and revolutionary base revitalisation bonds. The UoP are earmarked to support the development of poor rural areas. It promotes equitable development of different regions in the Chinese society, corresponding to poverty eradication (Sustainable Development Goal, or SDG1), decent work and economic growth (SDG8), and reduction of social inequality (SDG10).

By the end of 2022, cumulative volumes of rural revitalisation bonds (including notes) stood at RMB292.2bn (USD43.4bn) and it was the largest sub-label of the social and sustainability bond market. It accounted for 92.1% and 94.9% of China's domestic social and sustainability bonds in 2021 and 2022 respectively.

Rural revitalisation bonds have taken centre stage amongst the social and sustainability themes in China. In 2018, the Chinese government issued a series of top-level documents on strategy to revitalise rural areas. It was also during this time that some local governments started to issue bonds dedicated to rural revitalisation. As China realised its poverty alleviation goals and tasks during the 13th Five-Year Plan (which ended in 2020), the country started to comprehensively promote its rural revitalisation strategy in 2021, with the release of the No.1 Central Document *'Opinions on comprehensively promoting rural revitalisation and accelerating agricultural and rural modernisation'*. Subsequently, the NAFMII and exchanges launched products such as rural revitalisation notes and rural revitalisation corporate bonds.

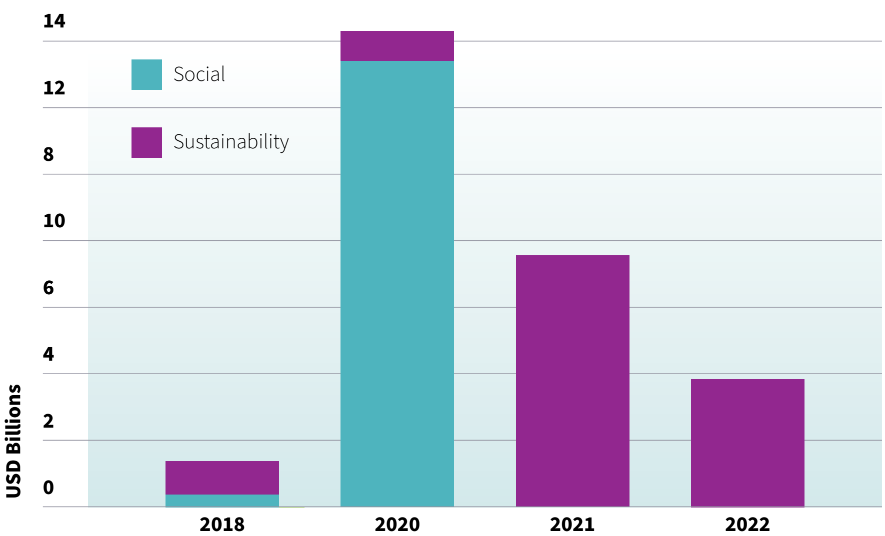
Regulations on UoP

Regulator	Guideline
NAFMII	**No less than 30% of the funds raised by rural revitalisation notes should be used for rural revitalisation purposes**, covering project construction, repayment of project loans, and replenishment of project operating funds.
	The funds raised from rural revitalisation notes should be invested in accordance with the requirements of the People's Bank of China for rural revitalisation in financial services and be used to support the development of agriculture, rural areas and farmers. The investment in rural revitalisation projects should adhere to the principle of commercial sustainability and have a market-oriented investment income mechanism. The types of supported projects include those related to rural revitalisation, such as farmers' employment and income increase, agricultural modernisation, and rural construction.
Exchanges (Shanghai and Shenzhen)	**Corporate bonds for rural revitalisation should meet one of the following conditions**: 1. The company is registered in a key county for rural revitalisation or an area that has been lifted out of poverty for less than five years in accordance with relevant national regulations; the funds raised are mainly used for rural revitalisation-related areas; 2. The funds raised are mainly used for construction, operation, acquisition, or repayment of project loans for rural revitalisation-related projects; the funds raised for such projects should not be less than 70% of the total amount raised.
	The funds raised should be mainly used in the field of rural revitalisation, including supporting the development of characteristic rural industries in poverty-stricken areas, promoting the stable employment of poverty-stricken people, improving infrastructure conditions in poverty-stricken areas, improving public service levels in poverty-stricken areas, and optimising rural employment structures through market-oriented and legalised methods. Improve the rural industrial system, improve rural infrastructure, etc.

Offshore

By the end of 2022, Chinese issuers had priced social and sustainability volumes of USD27.1bn (RMB182.4bn) in the offshore market. No social bonds originated from China in the offshore market in 2021 and 2022 as the need to support the immediate impacts of the COVID-19 pandemic had evaporated. 2022 volumes of sustainability decreased by nearly 50% YOY to USD3.8bn (RMB25.9bn). Most notably, in October 2022, the Hainan Provincial Government priced two tranches of RMB sustainability bonds (RMB3.8bn in total) in Hong Kong, to support projects covering a wide range of environmental and social objectives mapped to the United Nations SDGs.[44] The deal was the first offshore sustainability bond issued by a Chinese local government.

Offshore social and sustainability bond issuance from Chinese issuers



Source: Climate Bonds Initiative

Sustainability bond case study

Sustainability bonds are bonds where the proceeds will be exclusively applied to finance or re-finance a combination of both green and social projects.[45]

Issuer: Guangzhou Development District Investment Group Co Ltd (GDD Inv)

Issue Date: 28/07/2022

Maturity Date: 28/07/2025

Amount Issued: 400 million

UoP (100% allocation)
All net proceeds will be used for eligible green and social projects defined in its Sustainable Finance Framework (SFF).

Project selection
GDD Inv's SFF is in alignment with ICMA's Green Bond Principles (2021), Social Bond Principles (2021). The project selection process shows the issuer has a good balance between social and green projects, and includes covers a wide range of eligible project categories.

Social
Employment Training (building industrial parks to attract companies to settle in), Education (develop public education and training facilities in targeted communities), affordable infrastructure (construction of industrial parks and supporting facilities)

Green
Energy (procurement and/or installation of renewable energy systems), Buildings (receive recognized green building certifications), Transport (Electric Rail Infrastructure and Rolling Stock), Water (sustainable water resources and wastewater management), Waste (prevent and reduce waste and pollution)

SDG mapping
SDG4, SDG6, SDG7, SDG8, SDG9, SDG11, SDG12

Project evaluation and regular reporting
The Sustainable Finance Working Group (SFWG) is responsible for the management of this SFF and the compliance of all financing instruments issued under the SFF. The SFWG consists of senior representatives from various departments.

Regular reporting enhances accountability and transparency. The issuer has regular Allocation Reporting and Impact Reporting. Allocation reporting will disclose the allocation of the net proceeds annually. Impact Reporting will potentially cover environmental and social benefits of the eligible projects with specific environmental and social impact indicators disclosed. In addition, calculation methodologies and key assumptions will be disclosed.

Outlook

The world cannot reach carbon neutrality without rapid adoption and proliferation of low-carbon technologies such as renewable energy and low-carbon hydrogen. The current political and business momentum has opened a strategic window to further scale up capacity and drive down costs to allow these technologies to become widely used. Key strategic industry development initiatives from China, such as its hydrogen development plan, EV manufacturing and renewable energy capacity expansion will continue to have important implications to the world. GSS+ debt instruments will be an important channel through which to tap into those opportunities.

China must rapidly scale up its GSS+ debt market to achieve its 30.60 climate goal. The policy and market mechanisms that were successful in kicking off its world-leading scale green bond market can be leveraged to jump start a credible and scalable transition finance market. Climate Bonds highlights three developments that will enhance market growth in 2023.

1. Policy will continue to underpin market growth

China's 'five pillar' green finance policy framework is expected to spawn further policy measures including more granular and actionable guidelines around standards, disclosure, products, incentives, and international cooperation.

The 2022 publication of the *China Green Bond Principles* introduced closer alignment of domestic practices, and harmonisation with international standards which included reference to the CGT. This and the *Green Bond Endorsed Projects Catalogue (2021 Edition)*, marked a collaboration between different ministries to bring a set of clear definitions and standards even as China's bond regulatory supervision remained fragmented.

High-emitting industries will require large amounts of capital to support their transformation and the market must be supported via clear, transparent, standards to identify credible transition opportunities. The PBOC is leading the formation of sector-specific transition finance standards, starting with steel, thermal power, construction materials, and agriculture.

Local pilot schemes will provide opportunities to gather experience and finesse requirements before wider adoption. Huzhou, one of the 2017 eight green finance pilot zones introduced its Huzhou Transition Financial Taxonomy in January 2022, covering eight industries from textiles to agriculture.[46] In August 2022, nine ministries including the Ministry of Ecology and Environment (MEE) and NDRC identified 23 areas as pilots for climate investment and financing, encouraging them to explore financial solutions to tackle climate mitigation and adaptation in an orderly manner.

2. Engagement around disclosure

China has already established a stringent and advanced regulatory disclosure framework, according to Climate Bonds 2022 research paper, *Post-Issuance Reporting in China's Green Bond Market*.[47] With the coming of a global baseline guideline around climate-related disclosure such as the ISSB, there will likely be more engagement around disclosure between local authorities and international counterparts. In late December 2022, the IFRS Foundation signed a Memorandum of Understanding (MoU) with the Ministry of Finance of China to establish an ISSB office in Beijing.

3. Broadening credible labelling to include more instrument types

The expansion of Climate Bonds Certification under the CBS v4 will extend the identification of credible transition finance. Enlarging the universe of suitable instruments can encourage more investors to commit to dedicated investment mandates, which in turn will attract new issuers to the market.

Appendices

Appendix A. Composition of labels in GSS+ themes

Green	Sustainability	Social	SLB	Transition
Blue	ESG	Affordable housing	Sustainability-linked	Transition
Climate	Positive impact	Education	ESG-linked	Blue transition
Green	Sustainability	Equality	SDG-linked	Green transition
Green (carbon neutrality)	Sustainability awareness	Gender	Social impact-linked	Low-carbon transition
Renewable energy	SDG	Healthcare	Social- and sustainability-linked	
Solar	Socially responsible investing (SRI)	SDG housing		
Environmental	Sustainable development	Town revitalisation		
Water	Green innovation	Youth		
PACE	Impact	Employment		
Sustainability		Impact		
SDG				
Climate resilience				
Impact				

Appendix B. CCDC Research: ChinaBond Environmental Benefits Disclosure Status

CCDC developed the ChinaBond Green Bond Environmental Benefit Disclosure Indicator System (the ChinaBond Indicator System) and the ChinaBond Green Bond Environmental Benefit Database (the ChinaBond Database).[48] The ChinaBond Databases tracks both labelled green bonds and non-labelled bonds with proportion of funds invested in the green industry projects. CCDC calls this latter set of bonds Green-oriented bonds.

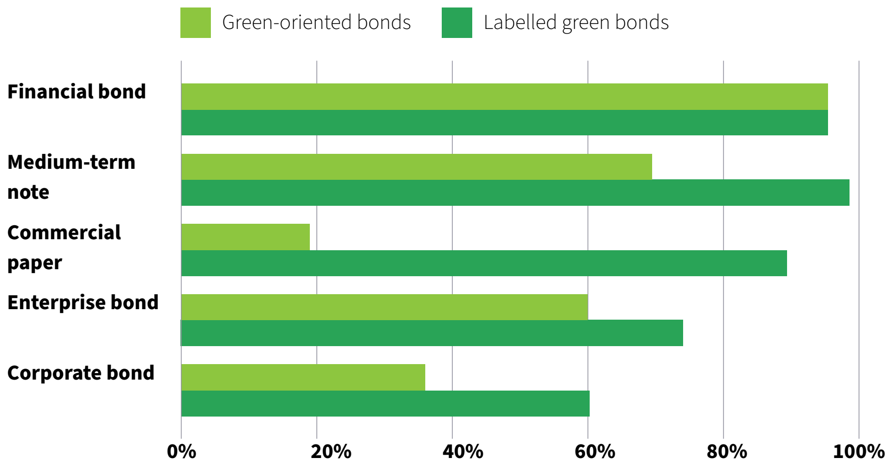
Environmental impact of green-oriented bonds in China in 2022

Indicator	Unit	Environmental impact (reported)	Environmental impact (estimated)
Carbon emission reduction	Tonne/year	39,598,304	74,015,522
Fossil fuel replacement	Tonne of standard coal/year	15,672,841	29,295,030
Sulphur dioxide reduction	Tonne/year	30,693	57,370
NOx reduction	Tonne/year	38,319	71,625
Chemical oxygen demand reduction	Tonne/year	374,291	699,609
Ammonia nitrogen reduction	Tonne/year	16,457	30,762
PM emission reduction	Tonne/year	46,295	86,532
Water saving	Tonne/year	39,906,458	74,591,511
Desilting	Tonne/year	9,661,583	18,059,034
Average daily passenger volume of public transport	Ten thousand people	7,991	14,937

Source: ChinaBond Green Bond Environmental Benefit Database

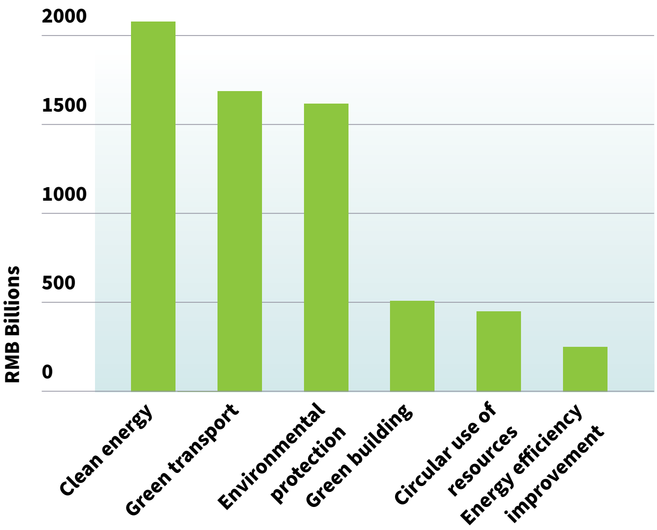
The ChinaBond Indicator System provides a score based on the completeness of disclosure. The highest score of 100 can be granted if all mandatory fields are reported, and an additional maximum of 20 marks can be obtained by reporting voluntary environmental fields.

Chart 1. Percentage of bonds disclosing environmental information at the pre-issuance stage (by number of bonds)



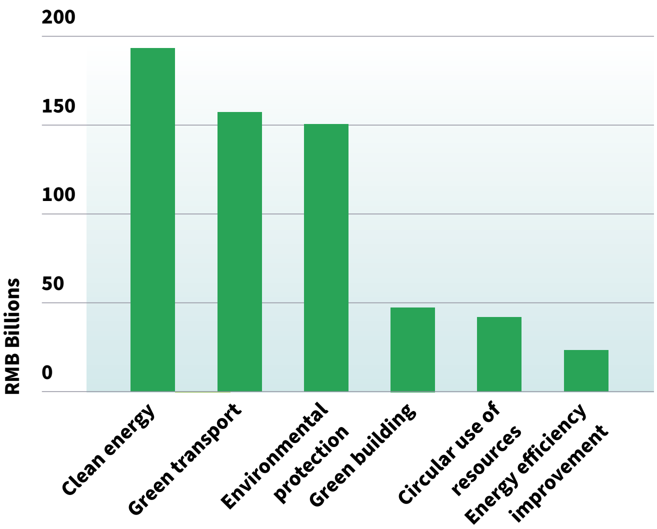
Source: ChinaBond Green Bond Environmental Benefit Database

Chart 2. UoP amongst Green-oriented bonds in 2022



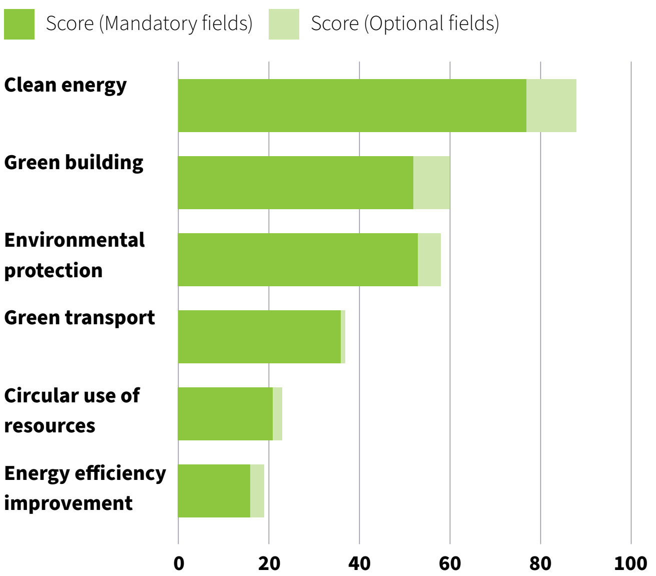
Source: ChinaBond Green Bond Environmental Benefit Database

Chart 4. UoP of labelled green bonds in 2022



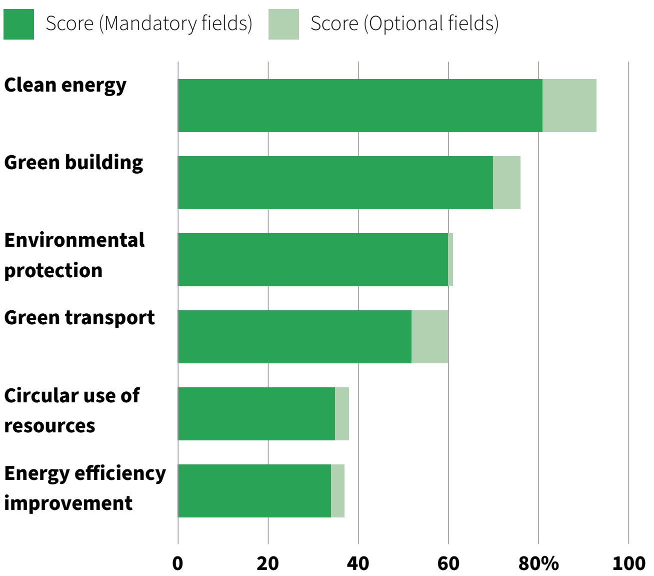
Source: ChinaBond Green Bond Environmental Benefit Database

Chart 3. Environmental disclosure score of green-oriented bonds in 2022



Source: ChinaBond Green Bond Environmental Benefit Database

Chart 5. Environmental disclosure score of labelled green bonds in 2022



Source: ChinaBond Green Bond Environmental Benefit Database

Endnotes

1. China's Achivements, New Goals and New Measures for Nationally Determined Contributions. https://unfccc.int/sites/default/files/NDC/2022-06/China's Achievements, New Goals and New Measures for Nationally Determined Contributions.pdf
2. A 2022 average USDCNY exchange rate of 6.7366 is used for conversion between USD and RMB in this paper, unless otherwise stated.
3. NAFMII. July 2022. *China Green Bond Principle.* https://www.nafmii.org.cn/ggtz/gg/202207/P020220801631427094313.pdf
4. Sina news. https://finance.sina.com.cn/money/bank/bank_yhfg/2022-12-12/doc-imxwkmhu9903778.shtml
5. Yicai news. https://www.yicai.com/news/100788326.html
6. SCMP news. https://www.scmp.com/business/article/3205828/china-seen-accelerating-wind-solar-power-installation-under-five-year-plan-reaching-2030-renewable
7. Morningstar Group acquired Sustainalytics (now 'Morningstar Sustainalytics') in 2020. Morningstar Shanghai, a subsidiary of Morningstar Group, is engaged in Morningstar Sustainalytics business. Morningstar Sustainalytics is an Approved Verifier for Certified Climate Bonds.
8. Sina news. https://finance.sina.com.cn/esg/investment/2021-12-15/doc-ikyamrmy9027921.shtml
9. China Green Bond Standards Committee. July 2022. *China Green Bond Principles.* https://www.nafmii.org.cn/ggtz/gg/202207/P020220801631427094313.pdf
10. Hong Kong Monetary Authority. 30 May 2023. Prototype for a Green Classification Framework for Hong Kong. https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2023/20230530e1.pdf
11. J.P.Morgan Index Product Guide Global Index Research. https://www.jpmorgan.com/content/dam/jpm/cib/complex/content/markets/index-research/Global-Index-Research-Product-Guide-2022.pdf#page=12
12. Solactive. 2021. Shining Green: Bonds to Tackle Climate Change. https://www.solactive.com/wp-content/uploads/2021/09/Solactive-Green-Bonds-September-2021.pdf
13. FTSE Chinese (Onshore CNY) Green Bond Index v1.3. 2022. https://research.ftserussell.com/products/downloads/FTSE_Chinese_Green_Bond_Index_RuleBook.pdf
14. Climate Bonds Initiative. 2022. Green Bond Database Methodology. https://www.climatebonds.net/files/files/CBI_Method_Criteria_03A.pdf
15. The RMB figures in the onshore session are as reported rather than converted using the 2022 average USDCNY exchange.
16. In cases where the UoP allocation is not disclosed at issuance, Climate Bonds uses the bond frameworks to come up with proxies of UoP allocations.
17. The type of company field is derived from the WIND categorisation. SOEs include central SOEs and provincial SOEs, and Non-SOEs include private companies, listed companies, wholly foreign-owned enterprises (WOFEs), foreign-funded companies, sino-foreign joint ventures etc..
18. WIND Classification
19. South China Morning Post. 24, August 2022. Beijing tightens green bond rules, requires 100 per cent of proceeds to be invested in environmentally friendly projects. https://www.scmp.com/business/banking-finance/article/3190064/beijing-tightens-green-bond-rules-requires-100-cent
20. Under the Chinese financial regulatory system, enterprise bonds are approved by the National Development and Reform Commission (NDRC) and corporate bonds are governed by the China Securities Regulatory Commission (CSRC).
21. State Council. 2021. *Action Plan for Carbon Dioxide Peaking Before 2030.* https://en.ndrc.gov.cn/policies/202110/t20211027_1301020.html
22. Climate Bonds Initiative. 2020. *China Green Securitisation State of the Market 2020 report.* https://www.climatebonds.net/resources/reports/china-green-securitization-state-market-2020-report
23. Largely align with the Green Bond Endorsed Projects Catalogue (2015 Edition).
24. In multi-listing cases, each exchanges is allocated the full issuance amount for calculation.
25. Shenzhen Government. 2021. Offering Circular. https://www1.hkexnews.hk/listedco/listconews/sehk/2021/1020/2021102000242_c.pdf
26. Shenzhen Government. 2022. Offering Circular. https://www1.hkexnews.hk/listedco/listconews/sehk/2022/1108/2022110800209.pdf
27. Yang, X., Nielsen, C.P., Song, S. et al. Breaking the hard-to-abate bottleneck in China's path to carbon neutrality with clean hydrogen. Nat Energy 7, 955–965 (2022). https://doi.org/10.1038/s41560-022-01114-6
28. G20 Sustainable Finance Working Group. 10 October 2020. *2022 G20 Sustainable Finance Report.* https://g20sfwg.org/wp-content/uploads/2022/10/2022-G20-Sustainable-Finance-Report-2.pdf
29. World Bank Group. 2022. Country Climate and Development Report. https://openknowledge.worldbank.org/bitstream/handle/10986/38136/FullReport.pdf
30. Climate Bonds Initiative. 2021. Transition Finance in China. https://www.climatebonds.net/files/releases/mediarelease_china_transition_launch_final.pdf
31. Categories cover Undisclosed, Social, ESG score, GHG emissions, Circular economy, Energy efficiency, Sustainable fiancé, Waste, Water, Renewable energy, Biodiversity etc. This may change in the future as the database is still in development phase.
32. IEA. 2022. An Energy Sector Roadmap to Carbon Neutrality in China. https://iea.blob.core.windows.net/assets/9448bd6e-670e-4cfd-953c-32e822a80f77/AnenergysectorroadmaptocarbonneutralityinChina.pdf
33. The industry-specific equipment and technology catalogues include《高耗能行业重点领域节能降碳改造升级实施指南》、《绿色技术推广目录》、《工业节能技术推荐目录》and "能效之星"装备产品目录.
34. The "Green Island" project is essentially a centralised disposal (storage) facility for pollutants. http://js.people.com.cn/n2/2022/0128/c360304-35116119.html
35. SMM. 29 Nov 2021. "China Baowu Carbon Neutrality Action Plans" released to explore new ideas of green low-carbon metallurgy in the industry. https://news.metal.com/newscontent/101678929/%22china-baowu-carbon-neutralization-action-plan%22-released-to-explore-new-ideas-of-green-low-carbon-metallurgy-in-the-industry
36. China Dialogue. 21 April 2021. Carbon neutrality in China: behind the corporate hype. https://chinadialogue.net/en/climate/carbon-neutrality-in-china-behind-the-corporate-hype/
37. China Dialogue. 21 April 2021. Carbon neutrality in China: behind the corporate hype. https://chinadialogue.net/en/climate/carbon-neutrality-in-china-behind-the-corporate-hype/
38. SMM. 14 March 2022. Jianlong Group issues a roadmap for green and low-carbon development of iron and steel plate. https://news.metal.com/newscontent/101774858/jianlong-group-issues-a-roadmap-for-green-and-low-carbon-development-of-iron-and-steel-plate
39. Huaxin company news release. 20 July 2022. Huaxin Cement successfully issued the first low carbon transition linked corporate bond in cement industry. https://www.huaxincem.com/view/5322.html
40. Climate Bonds' Cement Criteria pathway requires the inclusion of all emissions (including Scope 3) up to the point of the finished cement, though not downstream emissions associated with transporting or using the cement product.
41. NAFMII. October 2021. Q&As on Pilot Program of Social Bonds and Sustainability Bonds. https://www.nafmii.org.cn/englishnew/news/202112/W020211221402887081694.pdf
42. The SSBDB Methodology is reviewed at least semi-annually. Please see Climate Bonds website for details.
43. Climate Bonds Initiative. 2022. Social & Sustainability Bond Database Methodology. https://www.climatebonds.net/files/files/CBI-Social-and-Sustainability-Bond-Methodology-14092022.pdf
44. Bond Prospectus. 26 October 2022. https://www1.hkexnews.hk/listedco/listconews/sehk/2022/1103/2022110300423.pdf
45. ICMA. June 2021. Sustainability Bond Guidelines. https://www.icmagroup.org/assets/documents/Sustainable-finance/2021-updates/Sustainability-Bond-Guidelines-June-2021-140621.pdf
46. Macro and Green Finance Lab. 8 July 2022. http://mgflab.nsd.pku.edu.cn/qyzz/98bfd494a1044bc4966245c4a66dc6e4.htm
47. Climate Bonds Initiative. 2022. Post-Issuance Reporting in China's Green Bond Market. https://www.climatebonds.net/files/reports/post-issuance_reporting_in_chinas_green_bond_market_en.pdf
48. CCDC research report. http://www.ccdc.com.cn/ccdc/cn/business/c150471295/c150471502/c150481996/20230317/162246734.shtml

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