CHINA GREEN BOND MARKET

2019 RESEARCH REPORT

A USD55.8bn Chinese green bond market

Climate Bonds Initiative

中债研发中心 CCDC RESEARCH

HSBC

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Introduction

This is our fourth China Green Bond Market annual report. It summarises the major developments that have taken place during 2019 with a focus on issuance, policy development and wider market growth. HSBC is a supporting organisation for this publication.

Climate Bonds Initiative is an international organisation working solely to mobilise the largest capital market of all, the USD100 trillion bond market, for climate change solutions. The mission is to help drive down the cost of capital for large-scale climate and infrastructure projects and to support governments seeking to increase capital market investment to meet climate goals. The Climate Bonds Initiative carries out market analysis, policy research and market development. It advises governments and regulators and administers a global green bond certification scheme.

Climate Bonds Partners range from investors representing USD14tn of assets under management and the world's leading investment banks to governments such as Switzerland and France. The Climate Bonds Initiative is the lead partner in the Green Infrastructure Investment Coalition. Sean Kidney, Climate Bonds Initiative's CEO, is a member of the European Commission's Technical Expert Group on Sustainable Finance.

Executive Summary

In 2019, the total amount of Chinese green bonds issued in both domestic and overseas market reached USD55.8bn (RMB386.2bn), representing a 33% increase from the USD42bn (RMB282.6bn) in 2018.

China, the USA and France led the country rankings once again by the total amount of labelled green bonds. China was the largest source of labelled green bonds. 2019 was marked by new developments in China's profile of issuer types. The most noticeable is the strong growth in the total volume of green bonds issued by Non-Financial Corporates that have increased by 54% year-on-year. We have also seen the first municipal green bond from China which reflects Chinese local governments' ambitions to address climate change and local environmental issues.

Transport is the largest theme among bonds aligned with Climate Bonds Initiative's (CBI) definition, followed by Energy. However, while Energy-related issuance remained almost the same, Transport has continued to show a robust increase, this time by 11% from USD10.1bn (RMB70.5bn) to USD11.2bn (RMB78.1bn).

China also remains one of the largest global sources of Certified Climate Bonds. In 2019, Chinese issuers brought four Certified deals to the market, totalling USD3bn (RMB21bn).

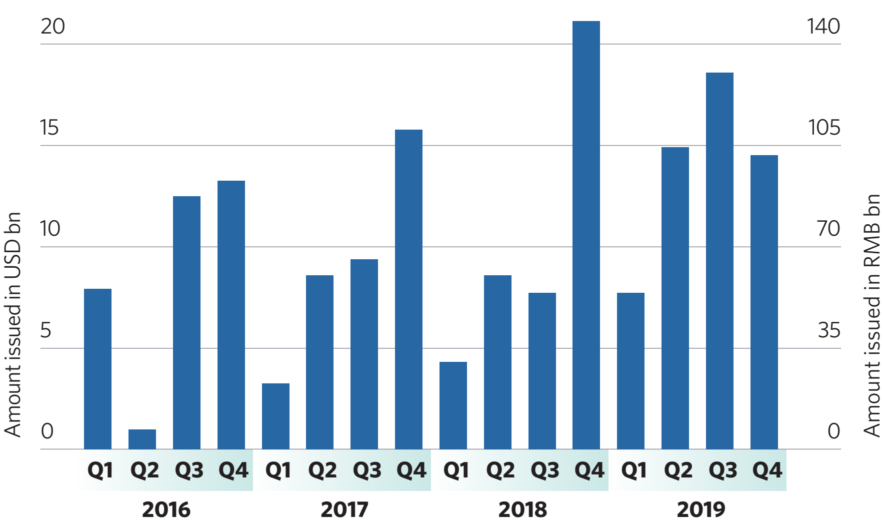
By the end of 2019, the total outstanding amount of China's domestic green bond market stood at USD140bn (RMB977.2bn). A total of USD124bn (RMB865.5bn) worth of green bonds in China reach maturity in the next 5 years, representing 88% of the total outstanding, suggesting a significant opportunity for green bond refinancing.

Currently, discrepancies still exist between China's local green bond guidelines and the international ones, especially when it comes to the eligibility of green projects and disclosure on the proceeds allocation. We analysed Chinese green bonds that are in line with Climate Bonds Initiative's green definition in this report.

This report also sheds light on green bond policy development in 2019. Going forward, the government's role in providing consistent and credible policy signals will continue to be paramount for the sustained and orderly growth of China's domestic green bond issuance volume. We have identified recommendations for supporting the further development of China's green bond market, as well as increasing financing for the country's transition to a low-carbon, sustainable economy.

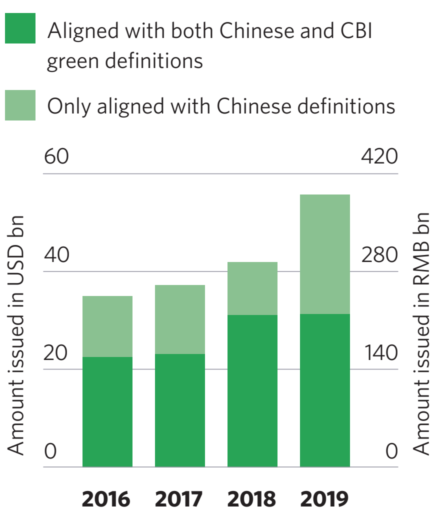
Figures in this report refer to labelled green bonds issued by entities domiciled in mainland China. In the domestic market, labelled green bonds are either approved by the regulators or registered at stock exchanges. Exchange rates may vary throughout the report as the actual exchange rate on each bond's issuance date is reflected.

China's quarterly green bond issuance (2016-2019)



Data source: Climate Bonds Initiative

China's labelled green bond issuance



Data source: Climate Bonds Initiative

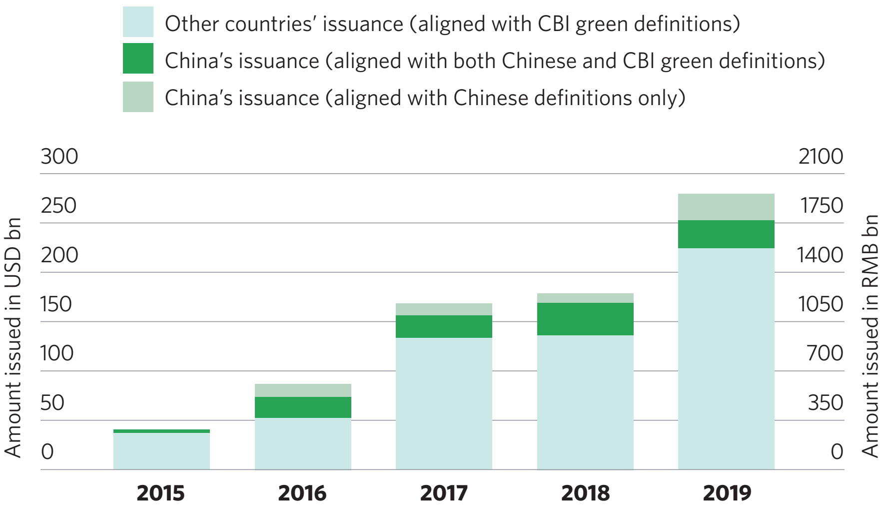
2019 China green bond market: a new milestone

The total amount of Chinese green bonds issued in both domestic and overseas market reached USD55.8bn (RMB386.2bn), representing a 33% increase from the USD42bn (RMB282.6bn) achieved in 2018.

Driven by policy initiatives and regulations, the total annual volume of China's domestic green bond market has increased by 60% since 2016, when People's Bank of China (PBoC) and the National Development and Reform Commission (NDRC) both issued green bond guidelines to kick off the market.

The volume of Chinese green bonds issued overseas has also grown rapidly. Since the first offshore green bond brought to the Hong Kong Exchange (HKEX) by Gold Wind in June 2015, there have been 36 Chinese issuers with a total of USD33.8bn (RMB240bn) green bonds issued overseas.

China's green bond issuance in a global context



Data source: Climate Bonds Initiative

China is the largest source of labelled green bonds in 2019

Global green bond issuance that is aligned with CBI green definitions reached USD259bn in 2019, marking a new global record. The total is up by 52% on the final 2018 figure of USD170.6bn.

With debut green bond issuances from Barbados, Russia, Kenya, Panama, Greece, Ukraine, Ecuador and Saudi Arabia, the market saw further geographic diversification. This is particularly welcome as all the new entrants are from Emerging Markets (EM).

The Netherlands Certified Sovereign Climate Bond (EUR5.9bn/USD6.7bn) from Dutch State Treasury Agency (DSTA) ranked the largest single green bond deal of 2019.

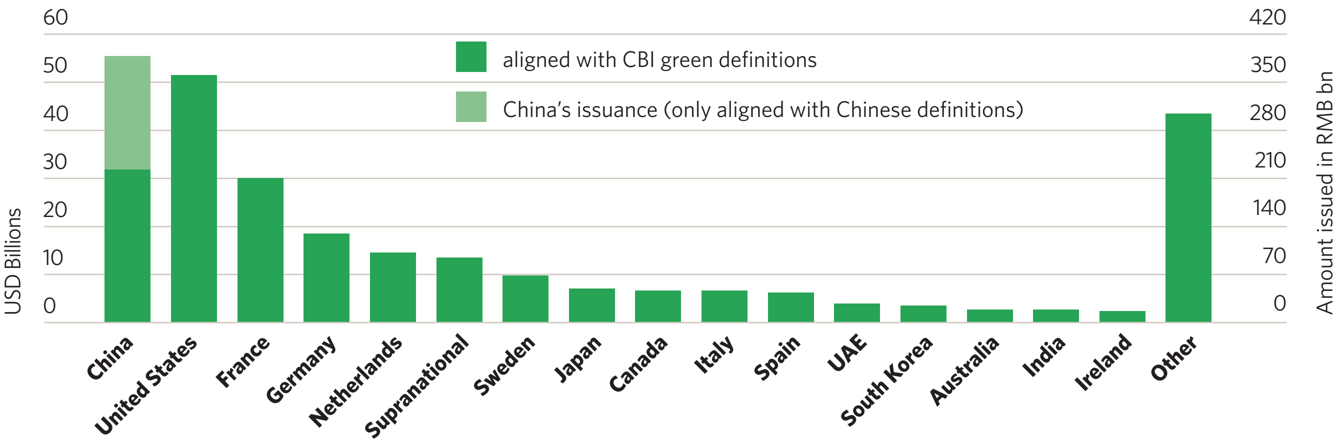
China, the USA and France led the country rankings once again by the total amount of labelled green bonds. China was the largest source of labelled green bonds with USD55.8bn (RMB386.2bn) green bonds issued.

Industrial and Commercial Bank of China (ICBC) is the largest Chinese issuer in 2019, with a total of USD5.3bn (RMB36.7bn) equivalent green bonds issued through its Singapore and Hong Kong branches. In addition, ICBC Financial Leasing - a subsidiary of the banking group, has also issued a USD600m green bond on Hong Kong Exchange (HKEX).

However, discrepancies still exist between China's local green bond guidelines and the international ones, especially when it comes to the eligibility of green projects and disclosure (see page 13). On the definitions of some projects, the international guidelines pay more attention to climate change mitigation and adaptation, while the China's domestic ones also emphasise on environmental benefits such as pollution reduction, resource conservation and ecological protection in addition to the reduction of greenhouse gas emissions. In addition, China's local green bond guidelines also allow the proceeds of some type of green bonds to be used as general corporate operating capital.

Screened against the CBI Green Bond Database Methodology (2019 version), we have identified USD31.3bn (RMB216.8bn) worth of Chinese green bonds that are aligned with both Chinese and CBI green definitions, while USD24.5bn (RMB169.4bn) only aligned with China's local definitions of green. The volume of CBI-aligned green bonds could be even bigger if transparency and integrity are improved in the future.

2019 global green bond issuance: top 15 countries



Data source: Climate Bonds Initiative

Further diversification of green bond issuer types

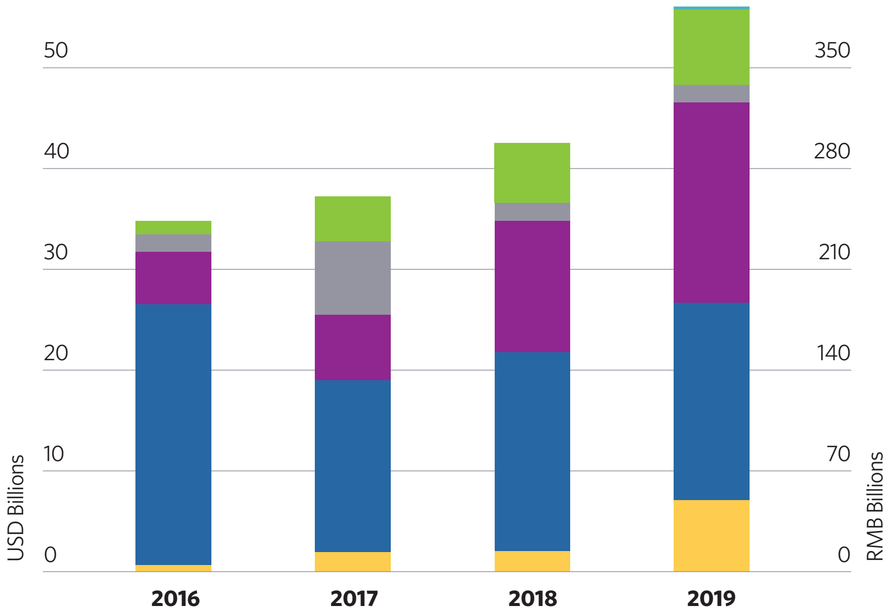
Non-Financial Corporates rise above Financial Corporates to take top spot

2019 has been marked by new developments in China's profile of issuer types. The most noticeable is the strong growth in the total volume of green bonds issued by Non-Financial Corporates that have increased by 54% year-on-year, representing 37% of the total volume of issuance in 2019.

China Three Gorges was the largest Non-Financial Corporate issuer in 2019, with six bonds totalling USD5.1bn (RMB35bn). Lu'An Mining Industry Group and Shandong Iron & Steel Company followed. Within aligned issuers, however, Sichuan Railway Investment Group (three deals), CGN Power Company International (one deal) and Beijing Infrastructure Investment (one deal) rank top, with a combined issuance of USD1.9bn (RMB13bn).

Non-Financial Corporates thus became the largest issuer type in 2019, rising above Financial Corporates, which had dominated issuance since 2015.

Diversified Chinese issuer types (all labelled green bonds)



Data source: Climate Bonds Initiative

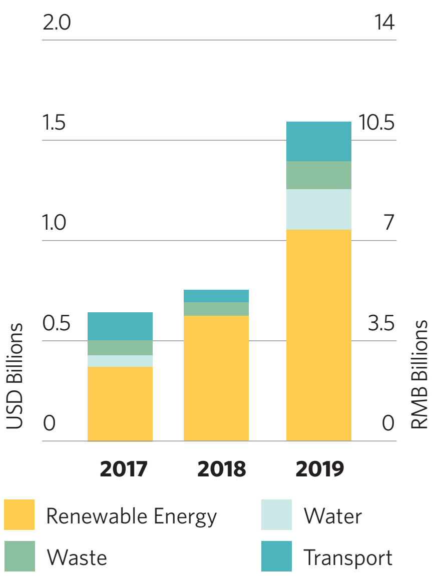
Financial Corporate volumes slightly increased

Despite the slight increase in volume, the share of Financial Corporates dropped from 48% in 2018 to just under 37% in 2019 given the increase in Non-Financial Corporates. In the meantime, Financials witnessed further diversification in 2019 with the emergence of sub-categories, such as financial leasing companies.

Financial Leasing companies' entrance in the green bond market

Financial leasing companies, as a sub-category of Financial Corporate issuers, accelerated their issuance in 2019. Nine financial leasing companies brought 14 deals to the market over the year, issuing a total of USD1.7bn (RMB12bn), which is more than double the volume in 2018. Renewable energy dominates the use of proceeds mix, representing 65% in 2019. Solar and wind equipment are the most common assets. For example, Jiangsu Financial Leasing issued the first Certified Climate Bond in China's domestic market. The deal supports floating solar farms on freshwater bodies. Water is the second largest sector, accounting for 13%. Huarong Financial Leasing used its RMB2bn (USD291m) green bonds to purchase wastewater treatment facilities to serve its clients in a sale-leaseback contract.

The growth of green bonds issued by financial leasing companies



Data source: Climate Bonds Initiative

Financial leasing in low carbon sectors

Financial Leasing is an alternative way of financing whereby a leasing company purchases an asset and leases it to its customer(s). The leasing company (the 'Lessor') maintains ownership of the purchased assets and receives lease payments from the customer (the 'Lessee'), while the Lessee enjoys the use of the asset for the duration of the lease agreement, usually accompanied by an option to buy the asset at the end of the leasing contract.

How it works for green assets?

The cost of purchasing, installing and maintaining low carbon infrastructure is usually high and beyond the reach of most consumers or even operators. Low carbon equipment such as solar photovoltaic (PV) generators, wind turbines, water and waste treatment facilities, and even an EV fleet can be arranged via a leasing contract where the lessor purchase the equipment and, in some cases, provides installation, setup, training and/or maintenance services to the lessee.

New trend to watch

Financial leasing provides easier access to equipment for renewable energy operators or suppliers entering the market, while green bonds give financial leasing companies the ability to finance the purchase of low carbon assets. In the midst the strong growth in China's infrastructure spending - especially in the low carbon sector - we find financial leasing firms may have a greater role to play in driving up the green bond issuance.

Local Government Financing Vehicles (LGFVs) contributed USD6.2bn (RMB42.5bn) to total issuance in 2019

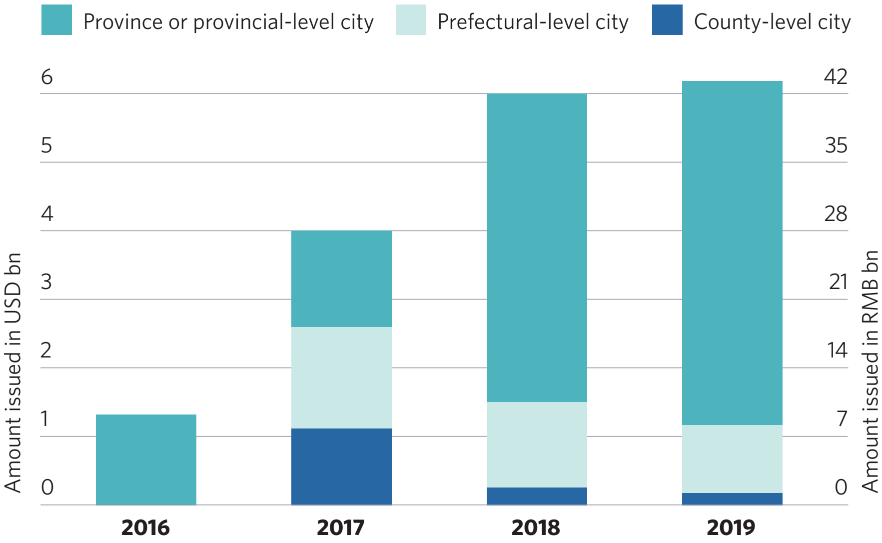
Local government financing vehicles, or LGFVs, are financing firms established and owned by the local government in order to finance the investment and construction of public projects. Green bonds issued by LGFVs largely reflect Chinese local governments' ambitions to address climate change and local environmental issues. Climate Bonds categorises LGFVs as government backed entities in the Climate Bonds Initiative China green bond database.

The volumes of LGFVs green bonds have increased by four times since the inaugural issuance from Jiangsu Guoxin Investment, an investment and holding company of the State-owned Assets Supervision and Administration Commission of Jiangsu Province in 2016. The surge was primarily driven by provincial LGFVs.

There are four formal levels of administration in China - provincial, prefectural, county and township. The issuance of LGFVs green bonds varies significantly across provinces. From 2016 up until December 2019, the total green bond issuance from LGFVs has reached USD17.5bn (RMB118bn). Guangdong province has the largest cumulative volume (USD4bn/RMB27bn), followed by Anhui Province (USD3.2bn/RMB21.5bn) and Shandong Province (USD3.1bn/RMB21.3bn).

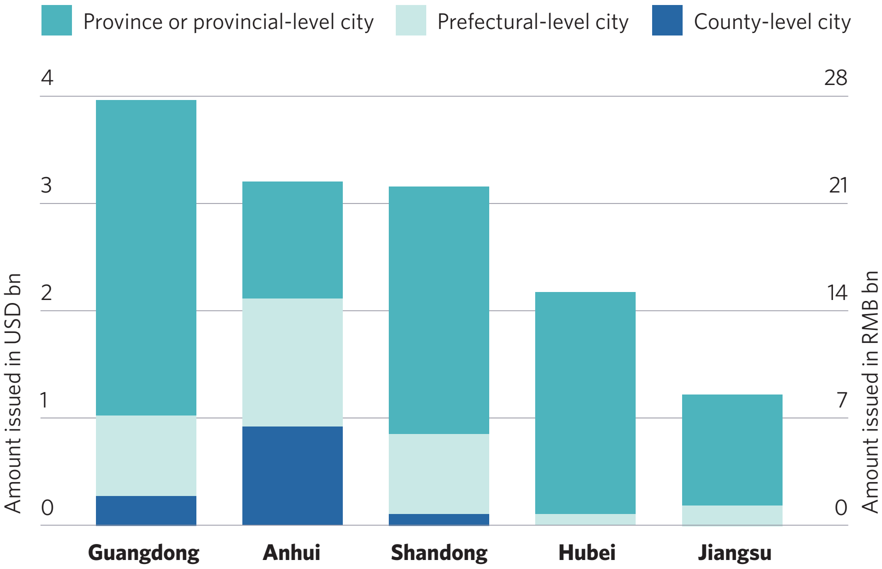
Low carbon transport such as local mass transit system is the most funded project type by LGFVs issuers. For example, Nanjing Metro Group and Chengdu Rail Transit Group raised proceeds for local metro or urban light rail expansion. Water infrastructure is another big area, with issuers such as Shandong Water Affairs Development, whose debut green bond was planned to finance a sewage treatment and three water supply projects in the local region.

The evolution of LGFVs green bond issuance



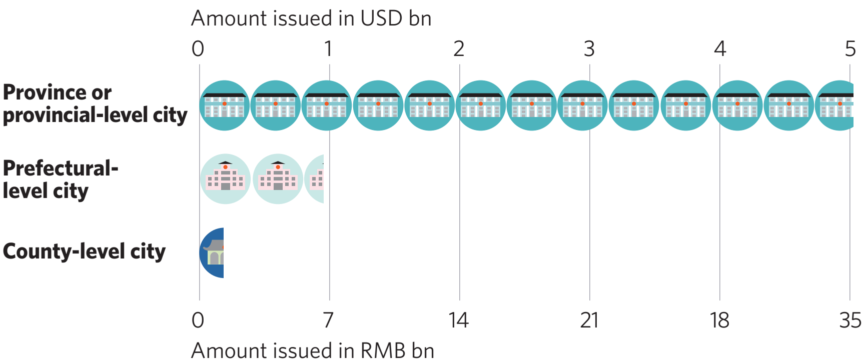
Data source: Climate Bonds Initiative

TOP 5 provinces in cumulative LGFVs green bond issuance



Data source: Climate Bonds Initiative

2019 LGFVs green bond issuance



Data source: Climate Bonds Initiative

The first green bond from a Chinese Local Government

The People's Government of Jiangxi's inaugural green bond marks the first municipal green bond from China. RMB300m proceeds will be fully allocated to two utility tunnel projects. Utility tunnels, also known as common service tunnels or underground pipeline corridors, are passages built underground to house utility lines such as electricity, water supply and sewer pipes, as well as telecommunications such as fibre optics, and telephone cables. One tunnel to be financed by this bond will include pipelines that are related to smart city management, such as water supply and fire control systems. The other tunnel will accommodate drinking water, recycled water, electricity, and telecommunications, etc.

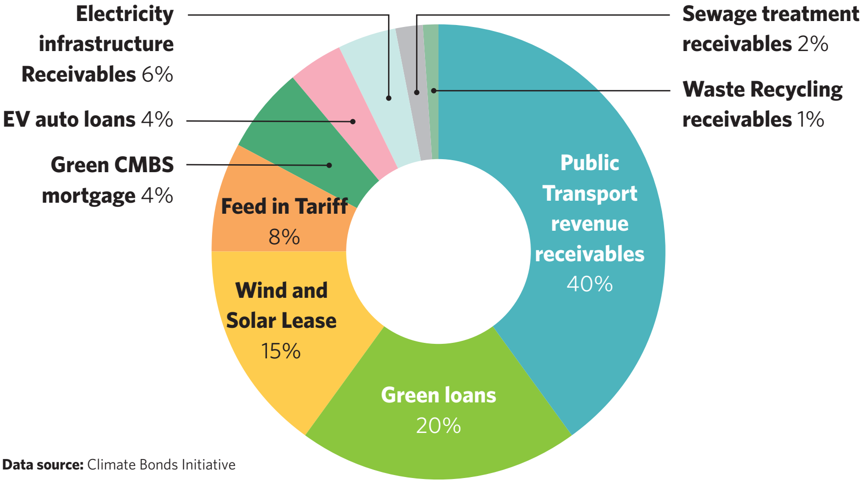
Together with Xinjiang, Guangdong, Guiyang and Zhejiang, Jiangxi province is a green finance pilot zone in China. More green bonds issuance from the Chinese public sector, particularly from these pilot zones are expected.

ABS issuance more than tripled in 2019

It is also worth highlighting that asset-backed securities (ABS) volumes increased strongly in 2019, rising 3.5 times to USD7.2bn (RMB50.3bn) while its share grew from 5% to 13%.

Securitisation enables companies and lenders to sell off existing financial assets to free up capacity for more business. It is the process through which an issuer creates financial instruments – asset backed securities or ABS – backed by financial assets such as mortgages or lease receivables. Asset-backed securities are sold to investors who receive a return drawn from the cash flows of the underlying assets. By aggregating the funding into a common structure, securitisations enable institutional investors to finance small-scale assets and small- and medium-size businesses.

Green asset-backed securities (ABS) collateral types

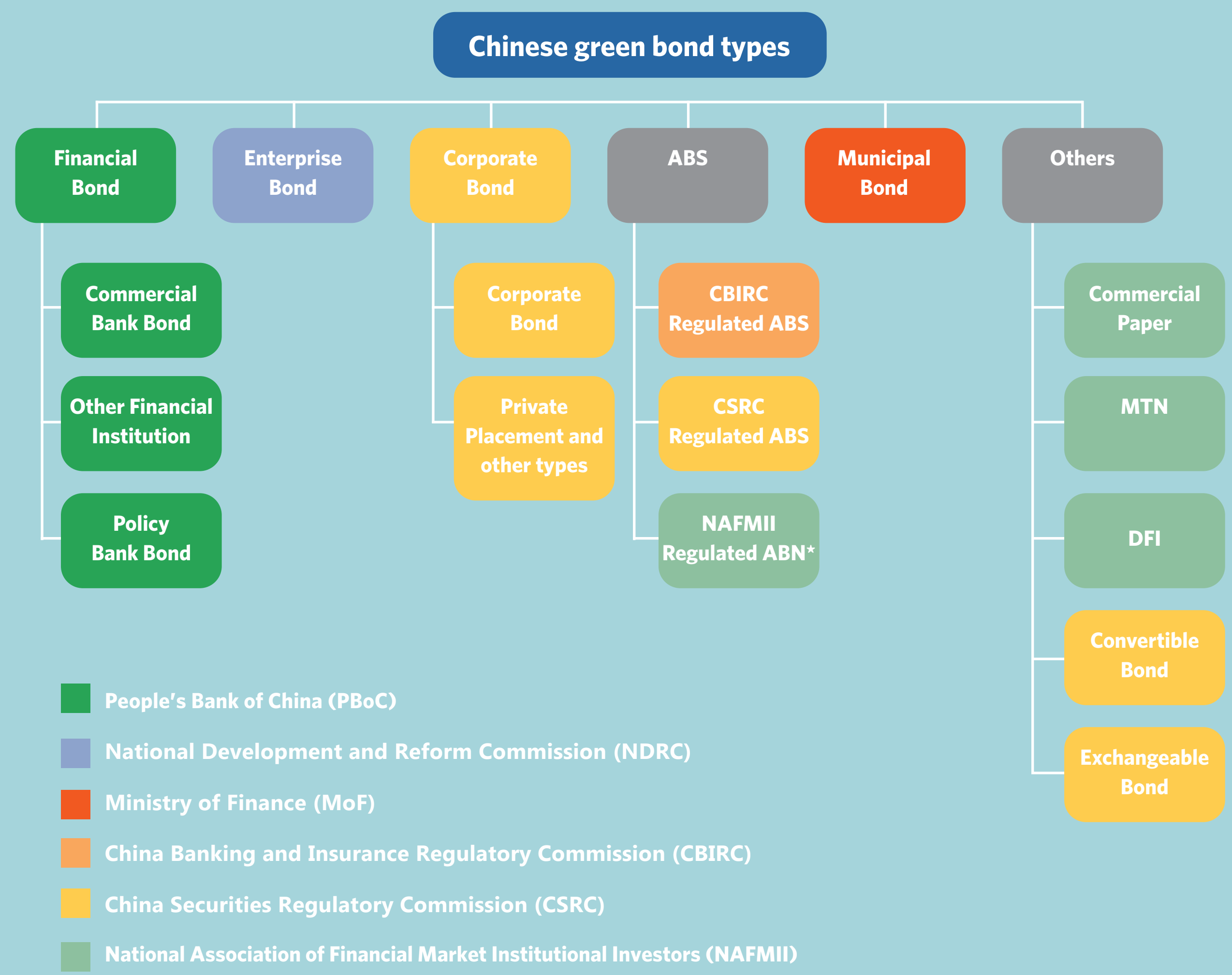


Data source: Climate Bonds Initiative

According to CBI's definition, an ABS instrument 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.

Public transport revenue receivables is the largest collateral type, accounting for 40% of all Chinese green ABS deals in 2019. This is followed by green loans (20%) and wind and solar lease (15%). Other types include feed-in-tariff and EV auto loans.

Chinese Green Bond types by local classifications and regulators



*Asset-backed Note

Green bond external review types

Second-party Opinions continue to rise and are now the most common external review type

The profile of external reviews obtained by Chinese issuers changed significantly in 2019. Second-party Opinions (SPOs) continue to gain popularity, representing 38% of all external reviews by volume. 2019 was the first year in which SPOs were the most common type of review, ranking above green bond assurance. As the ring chart below shows, this has been an ongoing process since 2017, when assurance represented 50% and SPOs only 21% of the total amount.

Despite a steady increase in the amount of Certified Climate Bonds from both onshore and offshore Chinese issuers, the share has dropped in 2019 as a result of the surge in the overall market size.

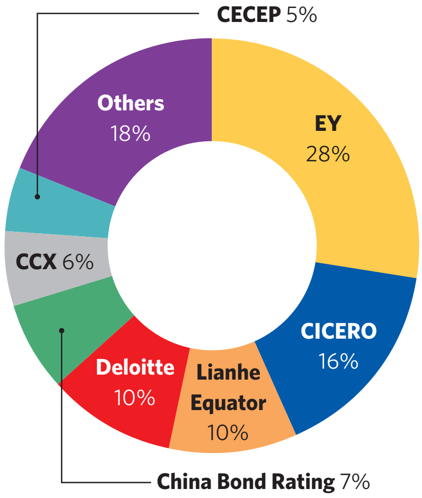
28% of volumes did not have any external review, which is a substantial increase versus 14% in 2018 and 13% in 2017. These mainly comprise private placements, ABS deals and bonds approved by NDRC as its green bond guidelines do not require an external review.

EY remained the largest external reviewer with USD8.6bn (RMB58.7bn) assurance deals and USD2.55bn (RMB17.8bn) Certified Climate Bonds. As one of the earliest Climate Bonds approved verifiers, EY China provided verification reports for two offshore bonds in 2019, including the three-tranche deal from Bank of China (USD963m), and a two-tranche deal from China Construction Bank (USD1.598bn). This is followed by CICERO with USD6.3bn (RMB43.9bn), USD5.3bn (RMB36.7bn) of which were ICBC's issuance following the green bond framework that carries a SPO provided by CICERO.

Local external review providers are gaining substantial market share despite three of the top four still being international firms (by volume). The rise of local external reviews is largely due to the rise of SPOs, which are provided by a diverse set of environmental consultants – many of which are Chinese – as opposed to a relatively small group of assurance providers.

The top local reviewers include Lianhe Equator, China Bond Rating, CCX, CECEP, iGreenBank, and Golden Credit. All of these were able to increase their volumes considerably in 2019. HKQAA (Hong Kong Quality Assurance Agency) benefits from four Hong Kong or Singapore listed Chinese deals, including issuance from ICBC Financial Leasing, GSP renewables, Jiangxi Provincial Water and ADBC.

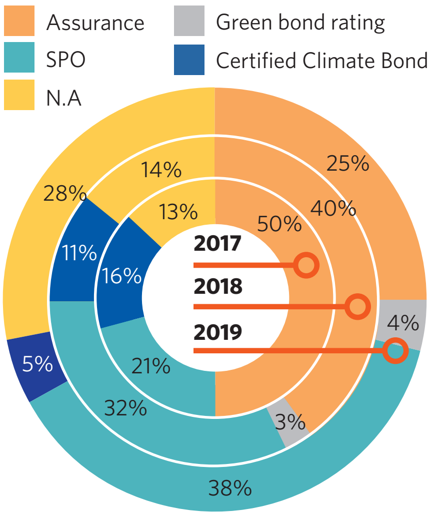
Ranking of external reviewers



Data source: Climate Bonds Initiative

External review types

See appendix on the differences of all types of external reviews, including green bond assurance, green bond SPO, Climate Bonds Certification and green bond rating.



Data source: Climate Bonds Initiative

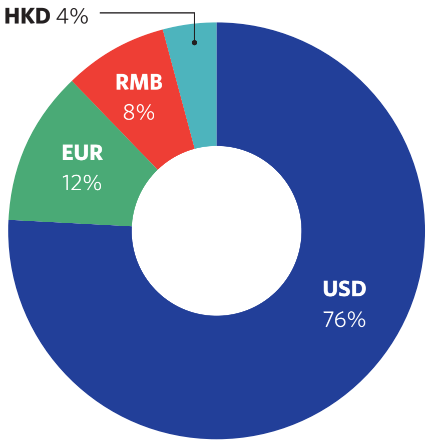
22% of green bonds were issued in the offshore market

Fifteen issuers raised a total of USD12.5bn (RMB87.2bn) through offshore green bonds. The volume increased by 30% year-on-year. Following issuers are new to the offshore green bond market: ICBC Financial Leasing, Jiangxi Provincial Water Conservancy Investment, Rongshi International Finance, Zhuhai Dahengqin Investment, China Jinmao Holdings, GSP Renewables, Shanghai Pudong Development Bank, and ShuiOn Development. Transport is the most funded sector (35%), closely followed by low carbon building at 32%.

More than three quarters of the deals were denominated in USD. EUR ranked the second (12%), followed by RMB (8%) and HKD (4%).

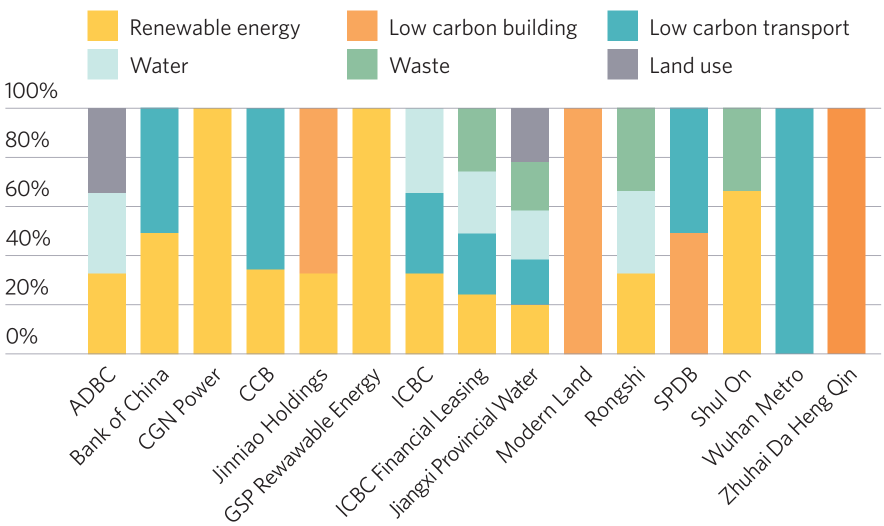
ICBC Leasing and Jiangxi Provincial Water Conservancy Investment have the most diversified use of proceeds, while others tend to use funds for dedicated projects.

Denominated currencies of offshore issuance



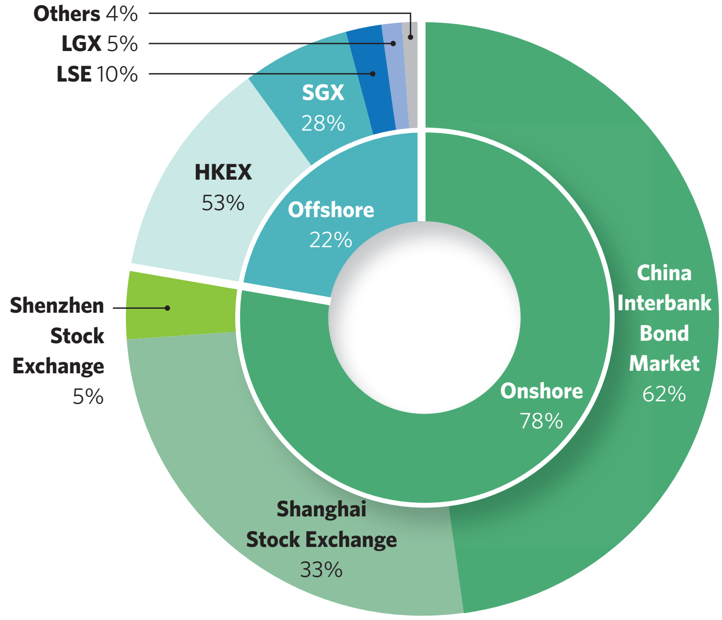
Data source: Climate Bonds Initiative, Refinitiv

2019 offshore green bonds and proceeds allocation



Data source: Climate Bonds Initiative

Onshore and offshore green bonds trading venues



Data source: Climate Bonds Initiative, Refinitiv, Wind

Financing vehicles are sometimes used by Chinese issuers in the offshore market. For example, State Development & Investment issued a senior unsecured green bond through its financing vehicle - Rongshi International Finance. Projects that are included in the renewable energy category include two wind farms in the United Kingdom - Beatrice Offshore Wind Power Project and Afton Wind Power Project. This is another example of a Chinese green bond financing wind farms in the UK.

Hong Kong Exchange (HKEX) remained the largest listing venue for Chinese offshore green bonds, accounting for 53% of the total offshore volume. Singapore is the second largest offshore market for Chinese deals, London Stock Exchange being the third.

China remains one of the largest global sources of Certified Climate Bonds

In 2019, Chinese issuers brought four Certified deals to the market, totalling USD3bn (RMB21bn).

Jiangsu Financial Leasing has issued a RMB1bn Certified Climate Bond, making the transaction the first Certified one in China's domestic market.

China Construction Bank (Hong Kong)'s USD1.589bn equivalent deal was the bank's second Certified Climate Bond, following its inaugural issuance from the Luxembourg branch in September 2018. The deal is Certified against the Wind and Low Carbon Transport criteria of the Climate Bonds Standards, with proceeds going to projects such as a wind farm in China's northern Inner Mongolia Automatous Region and the adjacent Hebei Province, as well as national passenger railway and urban metro projects.

Bank of China is the other repeat issuer of Certified Climate Bonds. The fourth Certified deal issued in 2019 through its Macau Branch is an expansion of its offshore bond program that started in 2017. Denominated in three currencies (USD, EUR, and CNY) and listed on HKEX, the USD963m equivalent bond is going to finance 18 renewable energy and low carbon transport projects across mainland China. Added to the previous deals from its Paris, London and Tokyo branches, this takes Bank of China's total Certified amount issued to USD3.8bn, making it the largest Chinese Certified Climate Bonds issuer.

Both Bank of China and China Construction Bank have developed a Green Bond Framework. This will allow them to Certify more issuances in the future as part of a broader Green Bonds Programme through their global networks.

Shanghai Pudong Development Bank (SPDB) had already been a big player in the green bond market with RMB50bn (USD7bn) green bonds issued domestically. Its inaugural Certified Climate Bond was brought by the London branch in October 2019. The USD300m private placement deal finances for Low Carbon Buildings and eligible transportation projects in China.

Certified Climate Bonds USD100bn milestone

The share of Certified Climate Bonds showed a steady increase from 10% in 2016 to 17% of global annual issuance in 2019. Cumulative Certified green issuance under the Climate Bonds Standard reached USD101.5bn (RMB700bn) by the end of 2019, a significant market milestone for the international assurance scheme established by the Climate Bonds Initiative in 2011. Certified green bonds and loans have been issued by over 100 organisations from over 30 nations across 21 currencies, shaping the direction of global green finance markets in both developed and emerging economies.

China has contributed USD13.5bn (RMB87.9bn) cumulatively to the total, standing as the fourth largest source of Certified Climate Bonds.

2019 featured four Certified Climate Bond deals

Data source: Climate Bonds Initiative

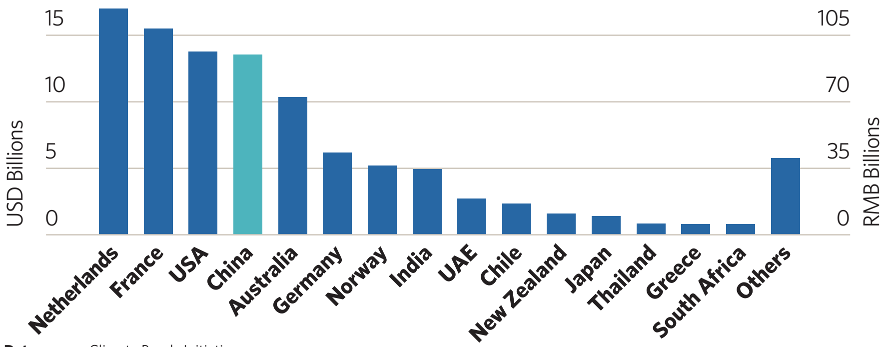
Issuers	Date	Size (in issuance currency)	Size (USD)	Sector Criteria	Climate Bonds Approved Verifier
Shanghai Pudong Development Bank	October 2019	USD300m	USD300m	Low Carbon Transport, Low Carbon Buildings	Sustainalytics
China Construction Bank	October 2019	EUR500m	USD1.589bn	Wind	EY China
		USD1bn		Low Carbon Transport	
Bank of China	October 2019	EUR300m, RMB2bn, USD350m	USD963m	Low Carbon Transport, Wind, Solar	EY China
Jiangsu Financial Leasing	April 2019	RMB1bn	USD149m	Solar	CCX Management

The Climate Bonds Standard

The Climate Bonds Standard and Certification Scheme is a labelling scheme for bonds, loans & other debt instruments. Rigorous scientific criteria ensure that it is consistent with the goals of the Paris Climate Agreement to limit warming to under 2°C.

The Scheme is used globally by bond issuers, governments, investors and the financial markets to prioritise investments which genuinely contribute to addressing climate change.

Cumulative issuance of Certified Climate Bonds



Data source: Climate Bonds Initiative

Use of proceeds (UoP)

Climate Bonds Initiative's definitions

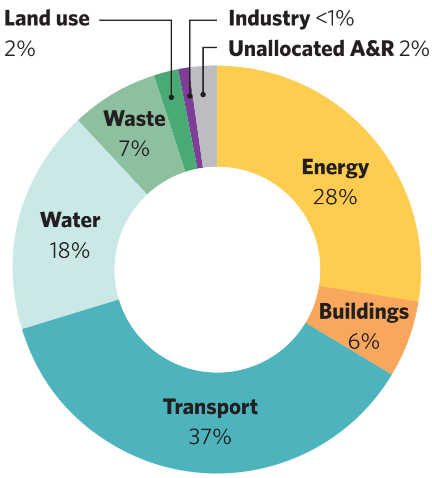
Transport is the largest theme among bonds aligned with Climate Bonds Initiative's definition, followed by Energy. However, while Energy-related issuance remained almost the same, Transport has continued to show a robust increase, this time by 11% from USD10.1bn (RMB70.5bn) to USD11.2bn (RMB78.1bn).

Transport is the only category to have increased every year since the beginning of the market. Banks have once again been the top financiers of this category. The largest deal to solely finance Transport was China Construction Bank USD1bn deal certified against Climate Bonds Transport sector criteria.

The other use of proceeds category to show a significant increase in 2019 was Water, rising to USD5.3bn (RMB37bn), or 18% of the market. The largest issuers were banks, namely Industrial Bank, ICBC, China Development Bank and Shanghai Pudong Development Bank, while Beijing Enterprises Water Group was the largest non-financial corporate issuer to only finance water projects.

On the other hand, allocations to Buildings, Waste and Land Use fell compared to 2018 levels. The share of Waste has fallen every year since 2015, even though it increased in absolute terms. The largest decrease was in Land Use.

Use of proceeds by CBI definitions



Data source: Climate Bonds Initiative

Within smaller sectors, Industry experienced a three-fold increase in volume versus 2018 – although still representing a small share, it is expected that green investments related to Industry to grow globally, and given China's industrial and manufacturing landscape, there is considerable potential in the country. Meanwhile, allocations to Adaptation (unallocated to other categories) continue to fall year-on-year, whereas ICT has yet to be financed.

China's domestic definitions

PBoC's Green Bond Endorsed Project Catalogue (2015) include Energy Saving, Pollution Prevention and Control, Resource Conservation and Recycling, Clean Transportation, Clean Energy, and Ecological Protection and Climate Change Adaptation. It has been recognised as one of the most important green bond guidelines from a Chinese regulator.

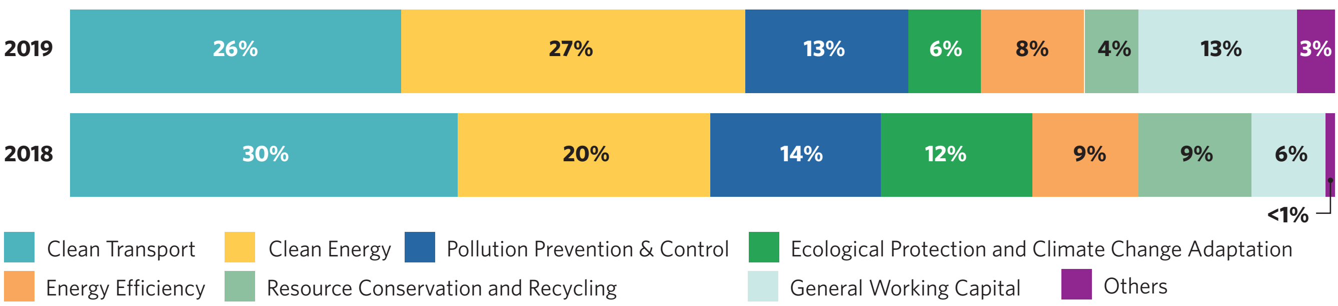
In CBI's research on Chinese green bonds, UoP allocation in accordance with the catalogue has been analysed even if a bond issuer is not subject to PBoC's regulation, for example, Enterprise Bond.

The share of Clean Transport that fits PBoC definitions fell to 26% - this was despite the increase in absolute volume from USD11.8bn (RMB82.3bn) to USD14.4bn (RMB100.5bn).

The share of proceeds raised to support Ecological Protection & Climate Change Adaptation and Resource Conservation & Recycling also experienced a fall as compared to 2018.

The largest increase came from the Clean Energy sector, whose amount issued almost doubled from USD7.8bn (RMB54.4bn) to USD15bn (RMB104.7bn) year on year.

Use of proceeds by China's domestic definition



Data source: Climate Bonds Initiative

Tenor & Rating

In 2019, 60% of China's domestic market is composed of bonds with term up to 5 years and these are primarily issued by Financial Corporates. Bonds with a tenor of 5-10 years make up 33% of the total, and Non-financial Corporates dominate this bracket. Government-backed entities such as LGFVs tend to issue bonds with a longer maturity.

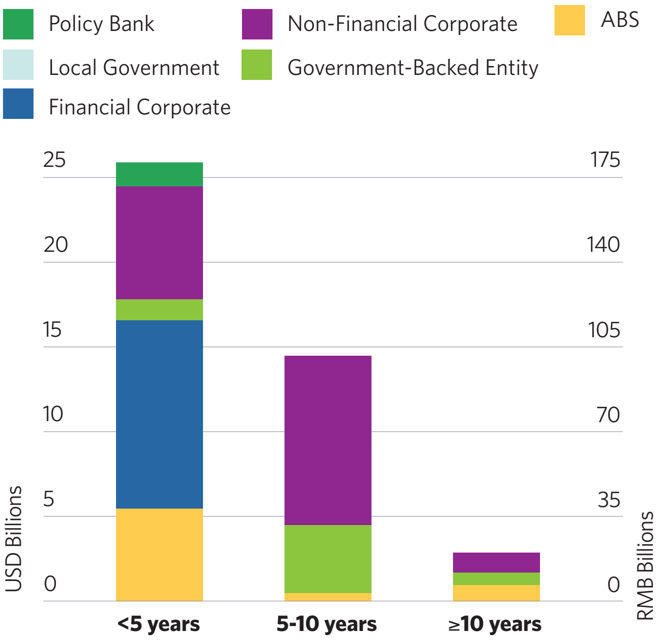
China's first municipal green bond from Jiangxi Province has the longest tenor (30 years), reflecting the long-term investment vision for government-led infrastructures. The bond finances utility tunnels, falling into the green building infrastructure category in Climate Bonds Taxonomy.

All the other bonds that have a tenor longer than 15 years are financing transport infrastructures. These include two bonds from Wuhan Metro that support local metro expansions as well as the A1 tranche of a green ABS deal issued by Beijing Rail Transit Daxing Line Investment, which is backed by ticket fee revenues from the express transit line that connects Beijing's new built Daxing airport to downtown.

In the overseas market, 45% of bonds from Chinese issuers have a tenor between 5 to 10 years.

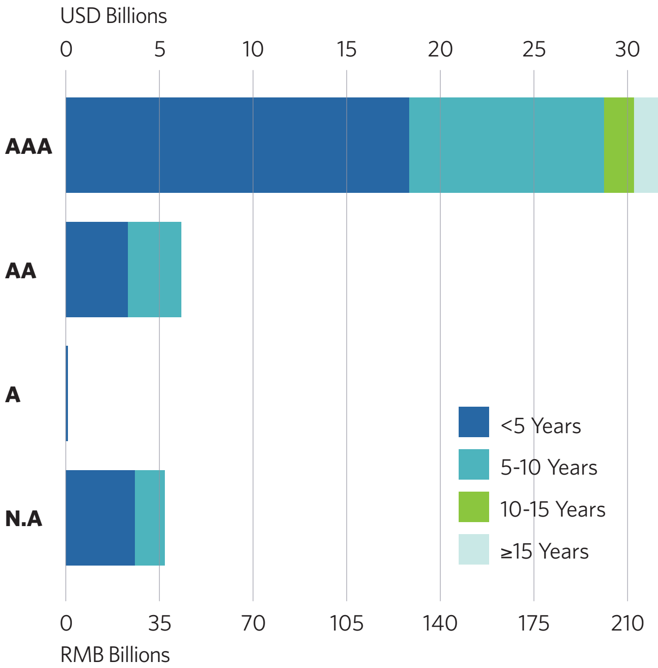
Most green bonds are rated AAA by Chinese domestic rating agencies. All green bonds on China's domestic market received ratings at A or above from domestic rating agencies, except for the 12% that are not rated. In the offshore market, the highest bond rating achieved is A, and all offshore issuance uses at least one international rating agency such as Moody's, S&P or Fitch.

60% of all onshore green bonds have a tenor less than 5 years



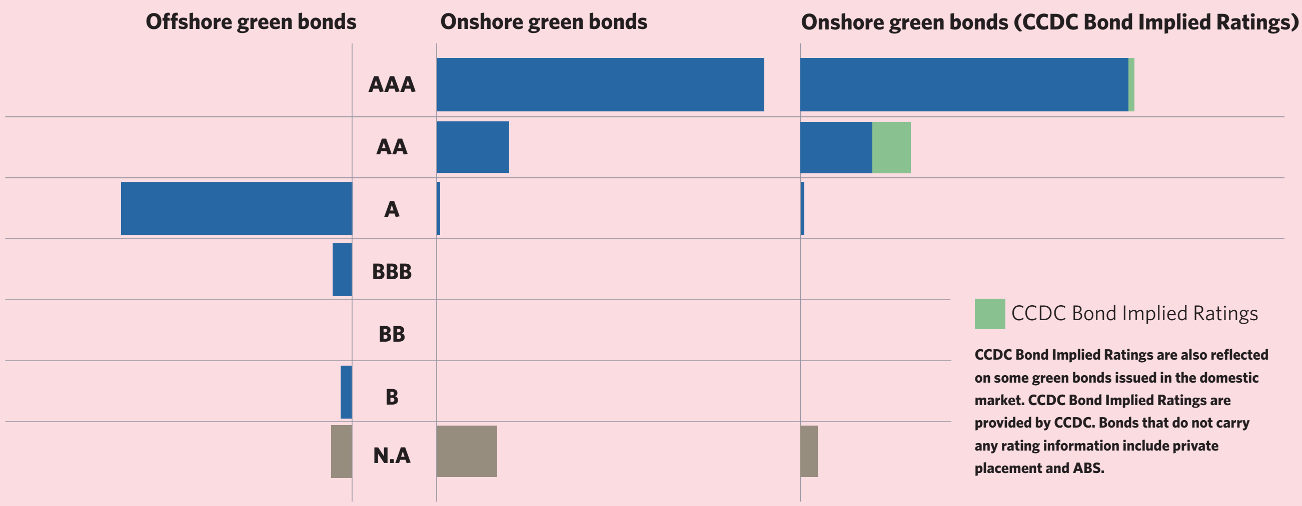
Data source: Climate Bonds Initiative, Refinitiv, Wind

73% of all onshore green bonds are AAA-rated



Data source: Climate Bonds Initiative, Refinitiv, Wind

In offshore markets the highest bond rating achieved is A. All offshore issuers use at least one international ratings agency



CCDC Bond Implied Ratings are also reflected on some green bonds issued in the domestic market. CCDC Bond Implied Ratings are provided by CCDC. Bonds that do not carry any rating information include private placement and ABS.

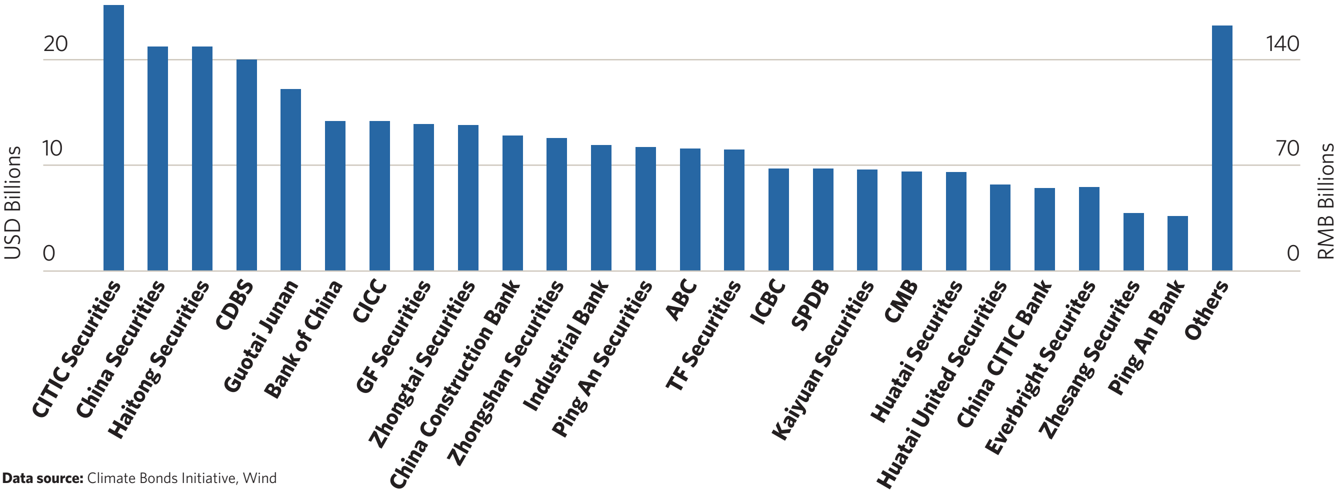
Data source: CCDC, Climate Bonds Initiative, Refinitiv

Onshore green bonds underwriters league table

CITIC Securities was the top green bond underwriter on the domestic market with USD2.5bn (RMB17.7bn) in underwritten deals in 2019. China Securities follows with USD2.12bn (RMB15bn) in total and Haitong Securities ranking third (USD2.11bn /RMB14.9bn).

We find the ranking of green bond dealers consistent with the league table for overall domestic bond market in China, where the large securities companies such as Guotai Junan, CITIC and Haitong, and the Big Four banks – ICBC, Agricultural Bank of China, Bank of China, and China Construction Bank – top the rankings. New entrants into the top 25 underwriter league table are China Development Bank Securities, China International Capital Corporation, Zhongshan Securities and Pingan Securities.

Underwriters league table for China's onshore green bond market



Data source: Climate Bonds Initiative, Wind

Onshore green bond coupon rates

According to CCDC's analysis, green bond coupon rates on the domestic market decreased in 2019. Fixed coupon bonds make up the majority, but there are also deals with step-up coupons and floating rate notes.

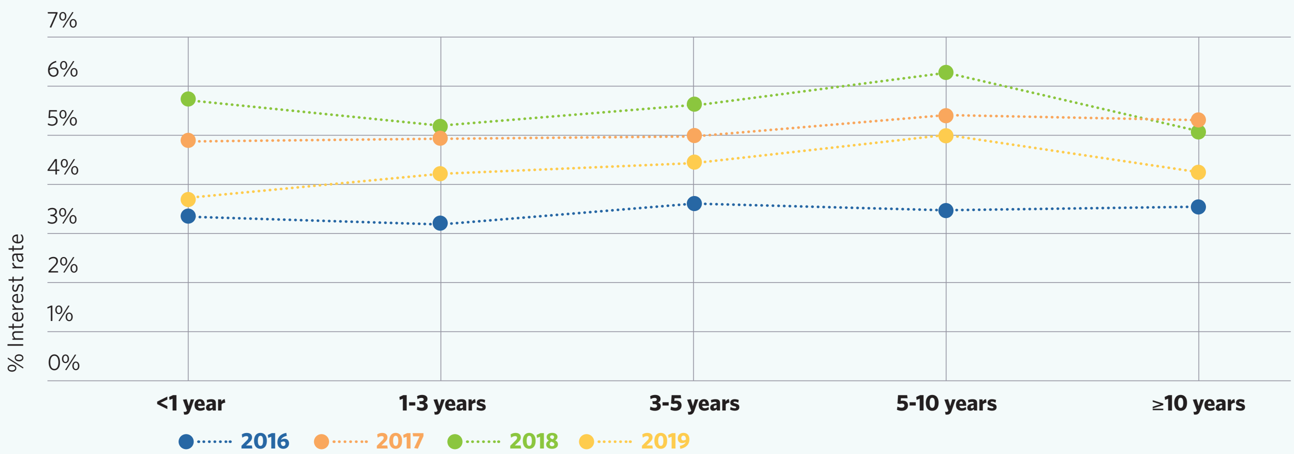
AAA green bond coupon rates

In 2019, the average coupon of AAA-rated bonds with a maturity of one to three years was 4.22%, which is 96bp lower than in 2018. The average rate for AAA-rated bonds with a maturity from three to five-years was 4.43%, down 117bps from 2018.

Coupon					
	Maturity <1year	1-3 years	3-5 years	5-10 years	≥10 years
AAA	3.71	4.22	4.43	4.98	4.25
AA+	-	5.32	5.74	6.46	6.50
AA	-	5.62	6.81	6.72	6.50
AA-	-	4.60	-	7.50	-
A+	-	4.30	4.60	-	-

Data source: CCDC, WIND Financial Terminal

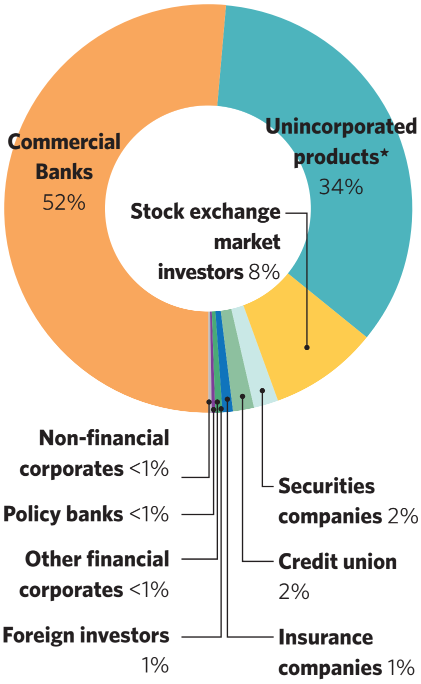
Coupon rates of AAA rated green bonds



Data source: CCDC, WIND Financial Terminal

Green Bond Investors

Types of investors in the onshore green bond market



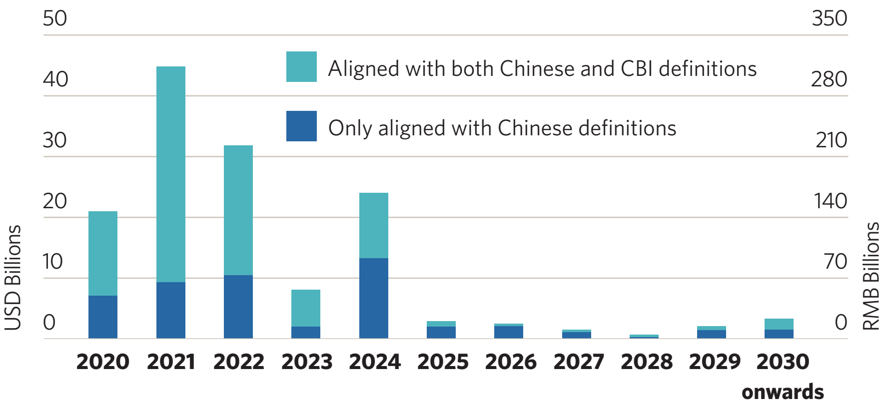
* Unincorporated products include but not limited to securities investment funds, insurance company funds, and social security funds.

Data source: CCDC

Maturity profile of the onshore green bond market

By the end of 2019, the total outstanding amount of China's domestic green bond market stood at USD140bn (RMB977.2bn), including USD90bn (RMB628.2bn) of CBI-aligned green bonds and USD50bn (RMB349bn) of bonds which only comply with China's local definitions. A total of USD124bn (RMB865.5bn) worth of green bonds in China reach maturity in the next 5 years, representing 88% of the total outstanding – this reflects that most Chinese bonds are medium- or short-termed. Meanwhile, the maturity profile suggests a significant opportunity for green bond refinancing. The potential of future increase could also be coupled with the potential of green bond labelling from climate-aligned issuers. This would naturally be further encouraged by policy incentives by providing more incentives to green bond issuers.

Maturity profile of China's onshore green bonds



Data source: Climate Bonds Initiative, Wind

Climate aligned bond market

Climate-aligned bonds are bonds which finance assets and activities for climate change solutions. The climate-aligned bond universe is composed of unlabelled bonds from issuers that derive more than 95% of revenues from "green" business lines. Such issuers are defined as "fully-aligned" issuers. Issuers that derive 75 - 95% of revenues from "green" business lines are defined as "strongly-aligned" issuers. In 2019, we identified more than USD250bn (RMB1745bn) worth of unlabelled climate-aligned bonds from Chinese issuers.

Fully-aligned issuers are mainly composed of issuers from the Transport, Energy and Water sectors. For example, NIO Inc, a new joiner as a fully aligned EV manufacturer with the ambitious plan to build 1100 battery swap stations across China by 2020, is a major climate-aligned issuer and could potentially be a large issuer in the labelled green bond market. It currently has USD750m (RMB5.23bn) worth of unlabelled bonds outstanding.

In the Renewable energy sector, fully aligned issuers include Jolywood Suzhou Sunwatt, which has 99% of its revenue coming from solar batteries, and HECIC New-energy, which has 98% of its revenue coming from wind power and wind farm operation.

Shenzhen Water Group is an example in the Water sector. The company has USD238m (RMB1.64bn) worth of climate-aligned bonds, since it has been identified as a fully-aligned issuer with 64.5% of its revenue from water supply, 19.8% from water treatment, 10% construction of supporting infrastructure (water pipeline and others) and 2% from sludge treatment.

A detailed research on unlabelled climate aligned bond will be released in the second half of 2020.

SDGs, sustainability and social bonds continue their ascent

The labelled bond market continues to expand beyond green, with sustainability and social bonds becoming more prominent, issuers and investors are increasingly adopting policies and strategies linked to the SDGs. 2019 has witnessed a continuing rise in Sustainability and SDG bond frameworks, which distinguish between green and social eligibility criteria and allow the issuer to classify a bond as "green", "sustainability" or "social" depending on the use of proceeds.

Such frameworks allow the issuer to make a distinction between bonds that finance environmental and/or social projects, while also making it easier for investors with a dedicated mandate to identify bonds that comply with their investment criteria.

Sustainability and SDG bonds stood at USD65bn in 2019, representing a more than three-fold rise against the USD21bn in 2018. Social bond issuance also grew in 2019, albeit less dramatically. USD20bn worth of deals came to the market, representing a 41% increase versus 2018. Adding sustainability and social bonds to green volumes yields an annual total of USD342.8bn, 69% above 2018 volumes.

According to CBI's most recent research, the social bonds market in China will expect an unprecedented surge in 2020, as there had been more than 400 bonds issued and labelled as Pandemic Prevention and Control bonds in China from February to April 2020.

Some Chinese green bonds only comply with local definitions

Similarities and differences between Chinese and international green definitions

China's domestic and international green bond guidelines find common ground in promoting green and sustainable development. However, discrepancies still exist on the definitions of some projects, as a result of the different focuses between domestic and international guidelines in guiding green investment and financing activities. Specifically, the international guidelines pay more attention to climate change mitigation and adaptation, while the domestic ones also emphasise on environmental benefits such as pollutant reduction, resource conservation, and ecological protection in addition to the reduction of greenhouse gas emissions.

1. **International guidelines such as the Climate Bonds Taxonomy, Climate Bonds Standards, and the EU Sustainable Finance Taxonomy** which was recently launched by the European Commission's Technical Expert Group in June 2019, are consistent with the goals of the Paris Climate Agreement to limit warming to under 2 degrees. Therefore, these definitions focus on assets and projects that contribute to climate change mitigation and adaptation, such as renewable energy projects that replace fossil energy.

2. **The focus of China's domestic green project catalogue is to support projects with significant environmental benefits and in line with industrial policy guidance.** On the basis of coping with climate change, it also try to solve a series of challenges such as serious domestic environmental pollution, increased resource constraints, and ecological degradation. For example, coal clean utilisation projects can achieve the reduction of nitrogen oxides, sulfides and other pollutant gases through washing and processing or coal gasification technologies, thereby reducing air pollution, so they are currently recognised as pollution prevention projects that meet the domestic definition.

The difference in the definition of green reflects the different challenges faced by different countries and regions, but bridging the difference is the trend, especially in the context of climate change becoming a global issue. At present, all parties at home and abroad are actively promoting the convergence of Chinese and foreign green standards.

Currently, discrepancies still exist between China's local green bond guidelines and the international ones. Taking the Climate Bonds Initiative's methodology as an analytical framework, some Chinese green bonds show the following features:

1. Proceeds allocated to working capital that is not linked to green projects/assets;

2. Proceeds used for financing projects that are not in line with Climate Bonds Taxonomy, and

3. Lack of information on the use of proceeds.

Proceeds allocation to general working capital

As best practice accepted by international investors, at least 95% of green bond proceeds should be clearly linked to specified green assets or projects. However, this threshold requirement has been relaxed in Chinese domestic markets. For example, NDRC – the regulator overseeing China's Enterprise Bond market - allows green bond issuers using up to 50% of bond proceeds to fund general working capital. The Shanghai Stock Exchange also sets rules for green Corporate Bonds listed on its platform, allowing issuers with more than 50% of operating revenue generated from defined green industries to issue green Corporate Bonds without specifying the underlying green projects, and requiring that at least 70% of the funds raised are used in green sectors[1].

As the market share of green Enterprise Bonds and green Corporate Bonds continued to soar in the recent years, the issue of non-alignment became more notable. In 2019, over USD17bn (RMB117.6bn) worth of labelled green bonds had more than 5% proceeds allocation to general working capital.

The share of bonds financing non-aligned projects has continued to fall

In 2019, USD6.6bn (RMB46bn) worth of bonds use proceeds in projects that are not defined as eligible by Climate Bonds Initiative. However, the share (by volumes) in the overall non-aligned categories continued to fall. Typical non-aligned projects include "clean" utilisation of coal and retrofits of fossil fuel power stations such as "Shang da ya xiao" (replacing small coal-fired power plants with bigger ones). Another common type of non-aligned category is hydropower projects that are subject to controversies or ones without proper disclosure of the project power density.

Other emerging project types that are not accepted by Climate Bonds Initiative include electronic toll collection (ETC). Although considered eligible under China's local green bond definitions as a faster alternative to toll booths, the technology does not make it into the list of eligible projects in our definition, as it does not directly contribute to the decarbonisation of the ICE vehicles.

A small amount of bonds have insufficient information

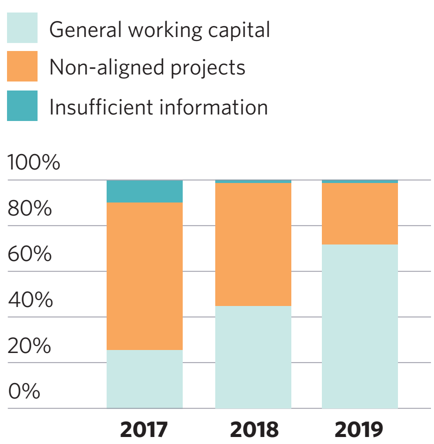
USD822m (RMB5.6bn) worth of Chinese green bonds had insufficient disclosure on the use of proceeds. Issuers should provide transparency on proceeds allocation, including but not limited to:

1. Specifying the use of proceeds category definitions, e.g. energy efficiency financing should be linked to a sector such as buildings, transport, grids, etc;

2. Clarifying if social programmes also have specific green objectives or benefits, e.g. energy efficiency upgrades to social housing; and

3. Confirming that no financing is directed towards fossil fuel power generation or related technologies.

Categories of non-aligned green bonds

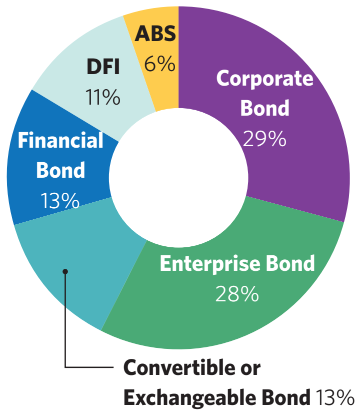


Data source: Climate Bonds Initiative

Corporate Bond and Enterprise Bond together account for 60% of all non-aligned bonds by volume

In 2019, Corporate Bonds make up 29% of the segment of Chinese green bonds that are not in line with CBI's definition of green, followed by Enterprise Bond (28%) and Financial Bonds (13%).

The rest is composed of other debt instruments such as Convertible or Exchangeable Bonds, Debt Financing Instrument (DFI) and ABS.



Data source: Climate Bonds Initiative

Enterprise bond vs Corporate bond in China's context

In China's context, Enterprise bonds issuance is subject to administrative approval from the National Development and Reform Commission (NDRC).

In contrast, Corporate bonds are regulated by the China Securities Regulatory Commission (CSRC).

International definitions of 'green' – where the Climate Bonds Initiative stands

From the Paris Agreement to the EU Taxonomy: the phasing out of fossil fuels

Under the Paris Agreement, governments committed to limiting global temperature rise to below 2°C and called for more drastic actions to keep the increase to 1.5°C. To meet this pledge, the vast majority of fossil fuels will need to remain in the ground, with all countries requiring a shift to clean energy systems. There is a growing consensus that one crucial step policy-makers must take to incentivise this transition to remove financial support and subsidies for fossil fuels. [2]

In May 2018, the European Commission established the technical expert group (TEG) to drive forward the ten-point Sustainable Finance Action Plan. In June 2019, the TEG issued three reports, among which the EU Sustainable Finance Taxonomy aims to provide policy makers, industries and investors with practical tools for identifying environmentally sustainable economic activities and investment opportunities.

The report contains technical screening criteria for 67 activities that can make a substantial contribution to six environmental objectives.

Fossil fuel retrofit projects are excluded from the eligibility criteria as it may contribute to the "lock-in" of further Greenhouse Gas (GHG) emissions.[3]

Climate Bonds Initiative CEO Sean Kidney has been a representative in the TEG. Some of the work of Climate Bonds Initiative in creating a climate-aligned Taxonomy and the efforts of technical and industry expert groups developing the science-based Climate Bonds Standard has informed the TEG discussions and provided working practice and market-based examples for consideration.

Investors value green credentials and transparency at issuance

In 2019, Climate Bonds Initiative surveyed 48 of the largest Europe-based fixed income asset managers to gain a comprehensive understanding of how the fixed income investment community is addressing or intending to address climate change through investment decisions.

The respondents, with total assets under management (AUM) of EUR13.7tn, supported all use of proceeds (UoP) categories defined under the Climate Bonds Taxonomy. The Taxonomy excludes certain assets and projects that are not ambitious enough to be aligned with a 2°C future, most notably investments in fossil fuel power generation and related technology, given the existence of a viable alternative (renewables).

Among many findings, the survey identified that the most important factor for making a green bond investment decision is "satisfactory green credentials at issuance". Seventy-nine percent of respondents stated they would not buy a green bond if the proceeds were not clearly allocated to green projects at issuance.

The application of Climate Bonds Initiative screened data

Climate Bonds Initiative's internationally aligned green bond database has been used by almost 20 data partners globally, including green bond investors, stock exchanges, and green bond index providers. The Climate Bonds Taxonomy and eligible green bonds screened against it play an important role in their decision-making and product development. The following green bond indices adopts Climate Bonds Initiative screened data.

S&P Green Bond Indices are comprised of a universe of global bonds labelled "green" by Climate Bonds Initiative.[4]

Solactive Green Bond Index comprises green bonds that are defined as eligible by Climate Bonds Initiative.[5]

FTSE Chinese (Onshore CNY) Internationally-aligned Green Bond Index is designed to measure the performance of the onshore labelled Green bond universe, whose use of proceeds have been mapped against the Climate Bonds Initiative use of proceeds taxonomy. The Climate Bonds Taxonomy is an internationally recognised guide to climate aligned assets and projects and is designed to assist investors understand how a bond's use of proceeds will facilitate the transition to a low carbon economy. [6]

Compared with green bonds that only comply with local guidelines, internationally aligned green bonds that are included in the leading global green bond indices would benefit from enhanced visibility and exposure to investors, in particular those institutional investors that use passive investment strategies or invest in green bond ETFs.

Proceeds allocations that are potentially aligned with CBI definitions

If more than 5% of proceeds is used for general working capital, projects or assets that fail to meet the eligibility criteria defined by the Climate Bonds Taxonomy, or there is insufficient information on use of proceeds, the bond will be recognised as not in line with CBI definition (or only comply with China's domestic definitions).

Our data-based forensic research on the proceeds allocation of non-aligned bonds uncovers that within the USD24.5bn (RMB169.4bn) of Chinese green bonds that failed to meet the inclusion criteria in 2019, at least USD12.4bn (RMB85.7bn) were in fact allocated to eligible green projects. In other words, more than USD12.4bn (RMB85.7bn) of proceeds that otherwise meet international definitions were "confused" by the non-aligned component of the proceeds allocation, or the lack of transparency on proceeds used as general working capital.

Avoid being "confused" by non-aligned projects

To further accelerate China's green bond market and expand the internationally aligned universe, regulators could introduce measures to reduce the cases of "confusion" of green bond proceeds in future issuances. A green bond issuer can also improve the integrity of their issues by paying closer attention to the gap between Chinese and international definitions.

As an example, Great Wall Guoxing Financial Leasing intended to use 15% of funds (on a pro rata basis) on coal efficiency projects, while allocate the remaining funds to low carbon transport and wind/solar farms. As the proportion of non-aligned use exceeded the 5% threshold, the whole bond is excluded from Climate Bonds Initiative's Green Bond Database despite only 15% not being eligible (i.e. 85% of the proceeds were eligible and thus confused). However, to make the bond attractive to investors with a mandate on the green credentials, the issuer could either remove the non-aligned component from its green bond framework or replace it with eligible assets.

Improve transparency

Improve transparency and clarity on proceeds allocation is also key to the green credentials of a bond. In 2019, USD17bn (RMB117.6bn) of Chinese bonds were not included in Climate Bonds Initiative's green bond database due to the lack of clarity on proceeds to be allocated to working capital. If more information on the allocation was made available in the future, more bonds could potentially be considered eligible, especially when the issuer is a pure-play green company – as the allocation to general corporate purposes may be eventually linked to its green business.

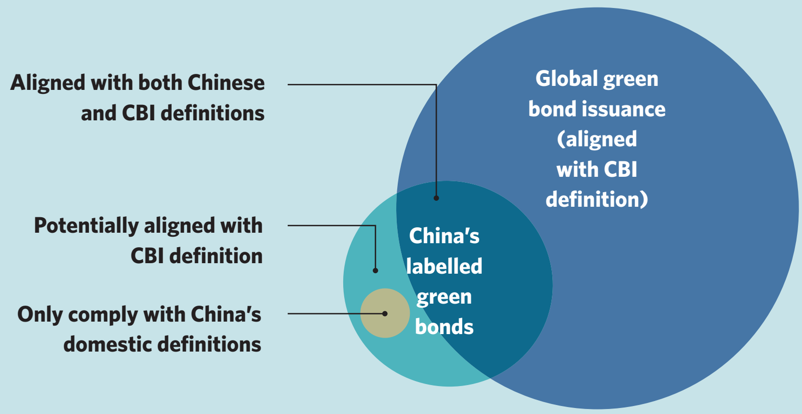
Climate Bonds Initiative has also conducted research on the revenue stream of all non-aligned issuers. Ten pure-play green companies were identified. For example, Beijing Enterprises Clean Energy Group Limited is a green pure-play with 99% of its revenue coming from solar and wind energy. However, two of its labelled green bonds use 27% and 30% of proceeds respectively for general corporate purpose, and are therefore not included in Climate Bonds Initiative's internationally-aligned green bond database due to the ambiguity on general working capital.

Climate Bonds Initiative supports the contribution made by green pure-plays to address the climate change and we fully support such issuers in providing more transparency on how the proceeds are linked to green assets or projects.

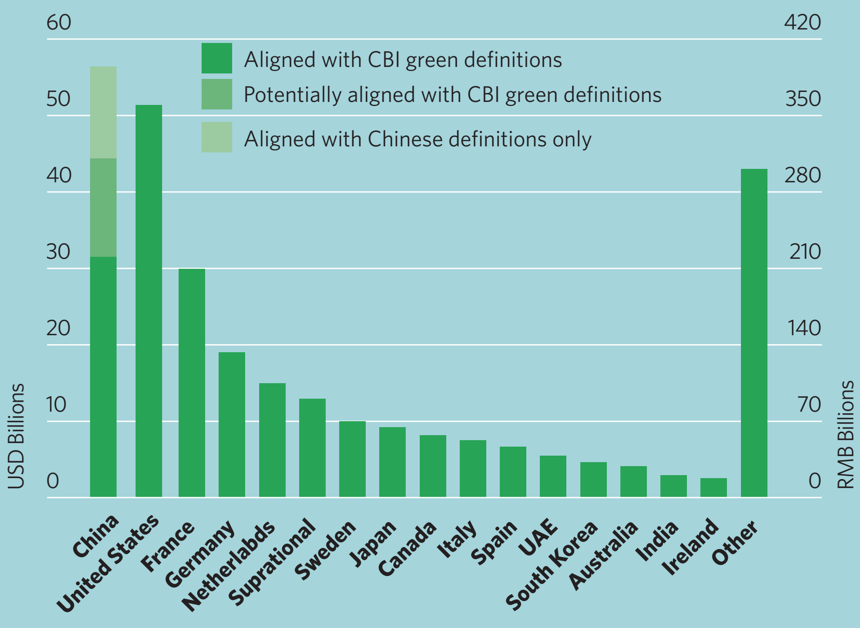
More potential could be released

Our analysis shows that if the issue of confusion of eligible green proceeds had been avoided, there could have been another USD12.4bn (RMB85.7bn) released to the market, and the total CBI-aligned allocation of proceeds could have reached USD43.7bn (RMB302.4bn) in 2019.

Volume of proceeds potentially aligned with CBI definition



Volume of proceeds potentially aligned with CBI definition



Data source: Climate Bonds Initiative

Green Bond Policy Development

2019 marks a year of systemisation of policies governing the green bond market undertaken by the nation's top regulators, as well as more fiscal incentives introduced at the local level. The long-waited rules around the standardisation of the green bond verifiers market are still in the process of being developed. We have identified several noteworthy policy developments as follows.

Green Industry Guiding Catalogue

In March 2019, seven Ministries including the National Development and Reform Commission, the People's Bank of China, and the Ministry of Ecology and Environment came together to publish the ground-breaking Green Industry Guiding Catalogue (2019). The new guiding document covers six broad categories of activities in the green sector ranging from energy saving and environmental protection, clean energy, cleaner production, eco-environmental industry, sustainable infrastructure to services such as third-party verification and consulting that support green development. It provides a plan to develop and encourages local governments and regulators to enact policies and measures on investment promotion, pricing mechanisms, green finance systems, and tax incentives to accelerate green finance.

Importantly, the industry catalogue also provides an underlying framework to determine clear standards on green assets and green activities in China, and can serve as the basis for the further harmonisation of China's domestic green bond standards. Regulators including PBoC and China Banking and Insurance Regulatory Commission (CBIRC), which are in the process of updating their own respective list of eligible green assets, are likely refer to the industry catalogue as an important reference. The clearer and broader definition of green goods and services from the Catalogue will also aid China's aspiration to harmonise its domestic definitions and guidelines with accepted international practices. Nonetheless, categories such as clean coal production, coal efficiency and coal plant retrofits remain in the Catalogue and could pose a challenge.

Notice by the People's Bank of China of Supporting the Issuance of Green Debt Financing Instruments in Green Finance Reform and Innovation Pilot Zones

In April 2019, China's central bank issued a Notice to support non-financial enterprises in the five green finance pilot zones to launch debt financing tools in the inter-bank market to finance green eligible assets according to the Green Bond Endorsed Project Catalogue. This guidance encourages local governments to promulgate financial incentives and supports the use of green debt financing tools such as private placement note (PPN) and green asset-back securities (ABS) among urban infrastructure developers. The National Association of Financial Market Institutional Investors (NAFMII), supervised by the PBoC, will also open a "green channel" to facilitate the service.

Fiscal incentives announced by municipal governments

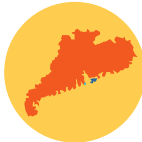
China's fast-growing green bonds market is entering a new stage with more substantive policy incentives – known as measures delivered in "real gold and silver" – have started to emerge.

In August 2019, China's Jiangsu Province announced that it would provide an interest subsidy of up to 30% (up to RMB2m, or USD290k equivalent) for every green bond issued by non-financial corporates. In the following month, the Huzhou City – arguably the most ambitious among China's eight "green pilot cities" - announced that it would offer a RMB1 cash reward for every RMB1,000 in proceeds raised through green bonds (up to RMB500,000 or USD72,000 equivalent) from local enterprises and banks.

In China's Guangdong Province, the city of Guangzhou and Shenzhen both promised cash subsidies for green bond issuers. In Guangzhou this is in the form of 15% of the issuance fee (capped at RMB1m or USD145k equivalent), whereas in Shenzhou the subsidy amounts to 2% of proceeds (capped at RMB500,000 or 72,000 USD equivalent).

In January 2020, CCDC and Shanghai Clearing House also introduced measures to reduce issuance registration fees.

The Outline Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area



The CPC Central Committee and the State Council released a sweeping Outline Development Plan in February. The plan outlines its support to Hong Kong in developing into a green finance hub in the Greater Bay Area through setting up, inter alia, an internationally recognised institution for green bond certification. It will also support the city of Guangzhou to develop a pilot green finance reform and innovation zone and to establish an innovative futures exchange that takes carbon emission as its primary trading commodity. Other key cities such as Macao will consider the feasibility of launching a green finance platform denominated and cleared in RMB. Shenzhen is expected to enhance its cooperation with Hong Kong in the area of green finance.

Investment quota limit for QFII and RQFII cancelled

In September, the State Administration of Foreign Exchange announced it would cancel the investment quota limit for Qualified Foreign Institutional Investors (QFII) and RMB-Qualified Foreign Institutional Investors (RQFII). This will likely facilitate the participation of foreign investors in China's domestic financial market, making it more easily accessible. The QFII program, established in 2002, allow global institutional investors to invest in China's capital market on a selective basis. RQFII was launched in 2012, as a modified version of QFII, allowing foreign investors to use RMB to purchase securities, while a QFII uses their foreign home currency.

CBIRC's ground-breaking new Guidelines

China's Banking and Insurance Regulatory Commission (CBIRC) has been pushing the banking sector for more than ten years to stop lending to companies with environmental infringements and to develop green financial products to support China's low-carbon transition.

On January 3, 2020, it upped the ante, issuing "Guiding Opinions of the China Banking and Insurance Regulatory Commission on Promoting the High-Quality

Development of the Banking and Insurance Industry." Notably, the new guidance places heavy emphasis on the banking and insurance sector's responsibility and role in addressing climate and environmental risks. For the first time in a public guiding document, the CBIRC asks China-based banks and non-banking financial institutions to establish and improve environmental and social risk management systems, incorporate environmental, social, and governance (ESG) requirements into their entire credit granting process, and strengthen ESG-related information disclosure, reporting and interaction with stakeholders.

The regulator further encourages banks and other financial institutions to improve their professional service and risk management capabilities in green finance through the establishment of dedicated green finance divisions and branches, and to speed up the development of green financial products such as energy efficiency credits, green bonds and green asset securitisation.

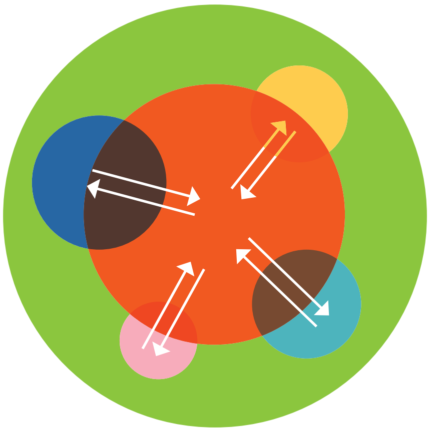
Through securitisation tools such as asset-backed securities (ABS) and collateralised loan obligations (CLO), which form a considerable part of China's RMB8tn (USD 1.15tn) green loan volume[7], credit products can be turned into tradeable assets for insurance companies and pension funds, allowing banks to recycle that capital into new lending. This would release a large amount of much-needed liquidity into China's outstanding green bond market.

Conclusion and key recommendations

2019 has been another strong year for China's green bond market with labelled green bond issuance registering an impressive 33% of year-on-year growth. Chinese regulators have continued to stimulate market growth through fiscal and monetary policy incentives, as well as seeking to improve market integrity through a series of new measures.

However, the gaps that remain between Chinese and international green bond definitions have the potential to dent foreign investors' enthusiasm in the booming Chinese market.

Going forward, the government's role in providing consistent and credible policy signals will continue to be paramount for the sustained and orderly growth of China's domestic green bond issuance volume. Successful policy measures need to be stimulatory while ensuring investor confidence in market integrity. In this vein, we have identified a number of recommendations for supporting the further development of the world's second largest green bond market, as well as increasing financing for the country's momentous transition to a low-carbon, sustainable economy.



1. Further improve green bond regulations

1.1 Bring China's green definitions closer to international ones

Industry standards generally provide a crucial reference point for due diligence, investment integrity and the reputation of market participants. However, current definitions of what constitutes as an investable green asset or project are fraught with diverse interpretations across the globe. This hinders investors' ability to assess the "greenness" of the underlying assets in a harmonised way such that the scale and speed needed for low carbon investment can grow unfettered, especially cross-border.

The booming Chinese green bond market provides overseas investors with great opportunity to gain better returns as well as meet their green investment mandates. Although it has seen incongruences in some areas of definitions, green taxonomies and disclosure practices that have precluded or hindered overseas investment, we support the following development:

1) Efforts have been made to standardise domestic definitions

In tackling the incongruences, China's central government has stated that it would ramp up its push to standardise the country's domestic green bond standards, which are currently regulated by multiple bodies. Chinese regulators, such as the PBoC, have signalled that further aligning Chinese domestic and international green definitions would help enhance the attractiveness and credibility of China's domestic green financial products in the global market. It could also help reduce the transaction costs and regulatory barriers which currently impede cross-border green capital flows.

2) EU-China common definitions

With the further opening up of China's financial sector and deeper integration of China's bond market to the world, the gap between international and China's domestic definitions of green is expected to the bridged. An internationally harmonised taxonomy would ensure robust definitions of "green" that adequately address environmental challenges and support China's engagement in global green initiatives.

China and the EU – both champions of green finance and home to the world's largest green financial markets – have the opportunity to create a China-EU common definition of green activities that could become a global reference point. At present, China is in the process of amending its green definitions to identify green assets for both bond markets as well as bank lending. In June 2020, People's Bank of China (PBoC), the China Securities & Regulatory Commission (CSRC) and the National Development & Reform Commission (NDRC) have announced an updated "Green Bonds Endorsed Projects Catalogue" to govern China's green bonds market in a significant consolidation that has implications for investors as the market grows.

In the EU, the European Commission's proposed Taxonomy on Sustainable Economic Activities is undergoing review. Under this backdrop there is a good opportunity and impetus for facilitating the harmonisation of green definitions. We envisage a two-step approach:

Step1: Identify the low-hanging fruit – e.g. the areas not already in sync but requiring minor work - and work to increase the proportion of commonalities between Chinese and European standards. This could result in a mutually recognised regime for the assessment and certification of green projects. Bond-funded projects that fall into scope could enjoy the benefits such as simpler disclosure requirements and cost for certification in Chinese and European markets.

Step 2: In areas where the definitions still differ - estimated to make up 30-50% of the existing taxonomies - China and the EU could work to reduce the misalignment through a bilateral dialogue and negotiations. The PBoC, for instance, has suggested that projects not covered by European standards but supported by Chinese standards should be included in European standards; whereas for projects such as "clean coal" that are outside EU definitions, China could gradually reduce their policy support to zero. The revised "Green Bonds Endorsed Projects Catalogue" have excluded "clean utilisation" of coal.[8]

1.2 Encourage more transparency around proceeds allocation

Aside from a divergence in the definitions of "green" projects, the lack of clarity on proceed allocation to working capital adds to foreign investors' confusion over the credibility and transparency of green bonds issued in the Chinese market. In fact, our research uncovered that allocating green bond funds to general working capital – instead of clearly tying them to a specific green project or asset - is the primary cause for a Chinese green bond to be considered not internationally aligned.

Without changing current rules and thresholds that allow green bond issuers allocating proceeds to supplement working capital, regulators such as NDRC and CSRC could encourage issuers to link working capital to pre-specified green assets, projects or activities. This could potentially grow the pool of internationally aligned green bonds from China, as discussed in previous sections of this report.

1.3 Harmonisation of post-issuance reporting

In China, post-issuance reporting requirements for green bonds vary across different types of issuers. While both CSRC and NAFMII require corporates and non-financial corporates to report on allocation of proceeds semi-annually, PBoC stipulates quarterly and annual reporting from financial institutions and prescribes templates for green bond disclosures. For state-owned enterprises, reporting frequency depends on the trading venues. The harmonisation of post-issuance reporting frequency and the level of detail of the disclosure would enhance the consistency and transparency of information, thus reassuring investors of the green credentials of the bonds.

1.4 Provide further guidance on the implementation of ex-ante and ex-post verifications of green bonds

The European Commission Green Bond Standard (EU GBS) as proposed by the Technical Expert Group on Sustainable Finance ("EU TEG") in 2019 makes verification of EU green bond issuance mandatory. Issuers are required to assign external reviewers to undertake verification of their Green Bond Framework before or at issuance. Verification for allocation reporting is also required once bond proceeds are fully allocated.

In China, the 'Green Bond Assessment and Verification Guidelines' were jointly launched by PBoC and CSRC in late 2017; the first time that a government had introduced such a supervisory scheme. The Guidelines require pre-issuance verification and post-issuance tracking of green bonds, and verifiers should follow either domestic or international standards recognised by the Green Bonds Standard Committee. Further guidance on the actual implementation of the Guidelines would help to promote the transparency and integrity of the Chinese green bond market.

1.5 Mobilise the financial sector to support 'brown-to-green' transition

Encouraging greenhouse gas-intensive industry sectors such as materials, chemicals and transportation, to shift to "greener" business activities is key to the global effort to keep the increase in the global average temperature to well below 2°C.

Despite the the lack of clear evaluation frameworks beyond the clearly demarcated "green" investment activities, global green finance markets have scrambled to explore the potential to facilitate "brown-to-green" transitions for highly polluting and high-emitting sectors through bond issuance.

Transition bonds, an emerging new labelled debt instrument, are targeted at emission intensive industries. They allow companies in brown industries to raise capital with the goal of gradually decarbonising their value chains by allocating proceeds to pre-defined, climate transition-related activities. Examples include energy efficiency investments, such as the use of recycled raw materials in the metal and cement industries, or gas-powered combined heat and power (CHP) in the energy sector.

Climate Bonds Initiative is also working with regulators, investors and other key market stakeholders to activate brown-to-green transition finance for segments that have largely been absent but offer huge emissions reductions potential. The share of issuance and investment that is made in emerging economies like China, India and Indonesia is crucial.

2. Support green bond market development

2.1 The government could provide smart, tailor-made policy incentives to green bond market players, both at national and local level

In order to ensure continued market expansion and improved market liquidity in China, developing green bond markets at the local level is vital. Diversifying the domestic investor base to include insurers, asset managers and pension funds will also play a key role. In combination, this could provide more investment opportunities for international investors, and help tap into the great potential of Chinese investors to invest in green bonds.

While China's green bond market is currently being steered by a multitude of guidelines and measures, further growth could be spurred by tailored regulation and policy support. Different market participants have a varied need for green bond-related policies and incentives: issuers expect more sweeping subsidies and fast-tracked approval, whereas investors need better information disclosure and policy incentives.

All market actors would benefit from clearer and unified standards. We have provided examples of policy mechanisms for key market participant groups below.

The market as a whole

Improving market integrity by incorporating international best practice on company and investor disclosures, such as the Task Force on Climate-Related Financial Disclosures (TCFD). A recent example is the EU regulation requiring sustainable assets disclosure based on the EU Taxonomy as part of the TCFD implementation.

Striving to include new green products to the regulatory framework - policies introduced by PBOC and CBIRC that support product innovation have led to the strong growth of new instruments, such as green ABS and green MTN.

Harmonising rules around encouraging external reviews for green enterprise bond issuance.

Issuers

Local governments can provide detailed measures specifying how corporate can issuers apply for the existing subsidies administered by many provincial and municipal governments. The current "green channel" for green products needs to be able to provide fast-tracked approval.

Corporate bond issuers can consider asset tagging to show alignment to green disclosure policies, such as the TCFD (see above).

Investors

Associations such as the Asset Management Association of China (AMAC) and the Insurance Asset Management Association of China (IAMAC) can provide clear market guidelines on green debt instruments, as well as integrating "green" considerations into the assessment and ranking of institutional investors.

Underwriters

The Securities Association of China could integrate "green" considerations into its annual review and ranking of bond underwriters.

2.2 Further develop investor education

Investors from Asia can play a much greater role in driving the green bond market forward. Government programmes to increase awareness of the benefits of green bonds, including a diversifying investor base and positive reputational effects, would support market development. This in combination with making the issuance process clear for issuers, could facilitate more potential issuers coming to market.

The Climate Bonds Initiative is planning to conduct Chinese Green Bond Treasurer and Investor Surveys to gain a comprehensive understanding of how the fixed income investment community is addressing or intending to address climate change through investment decisions. We also hope to identify the challenges and drivers of green bond issuance in China, as well as recommending tools and incentives to encourage Chinese green bond issuers and investors to further engage in green finance.

2.3 Bring pension funds to what has been a bank dominated market

Pension funds, along with other institutional investors, have an important role to play in scaling up the green bond market. In most OECD pension funds, bonds remain by far the dominant asset class in portfolio allocations, accounting for 50% of total assets under management on average. Many of them are likely to increase their asset allocation to these instruments via green bonds. For example, Japan's Government Pension Investment Fund (GPIF), the largest Japanese public investor and the world's largest pension fund by assets under management (YPN159tn/USD1.6tn), has begun allocating substantial amounts of money to green bonds.

In China, banks are the dominant investor group in the bond market, followed by insurance companies. This shares the same investor structure in the global market. However, despite the traditionally low-risk, low-return strategy of leaving the funds in banks or investing in treasury bills, Chinese pension funds have already begun investing in bonds and equities. Shanghai, Beijing and other provinces have entrusted their pension funds to the National Council for Social Security Fund (NCSSF) for investment.

Although provincial governments are not allowed to invest in financial products such as equities and bonds, the NCSSF is. Local pension funds and NCSSF could establish a framework for green bond investing, which could further influence other institutional investors in China and deepen the market for green bonds.

2.4 Establish a common green standard for BRI

The Belt and Road Initiative (BRI) established by China is creating huge investment opportunities with possible implications for green bond issuance within China and across borders. President Xi Jinping has stressed the need to "green" the BRI. Raising Chinese investors' awareness of green investment and leveraging capital from international investors can help scale up the investment in green infrastructure in BRI countries.

A common China-EU standard could help attract more green capital to the "Belt and Road" project development and reduce its investment and environmental risks.

With the talk of the convergence of green definitions, regulators and market participants can explore the opportunity of extending the scope of work to Asia, Europe, Latin America and parts of Africa. This could bring together key markets in driving the low carbon transition.

Work to promote inter-regional cooperation and a common language on green bond standards in the BRI is already underway. Inter-governmental cooperation mechanisms, such as the ASEAN+3 Bond Market Forum (ABMF), for example, has been promoting the harmonisation and standardisation of bond market infrastructures - including a segment dedicated to green and climate bond products - among the finance ministries, central banks and financial supervisors from the ASEAN+3 (China, Korea and Japan) countries.

Top Chinese lenders have also begun issuing green bonds: for example, the Industrial and Commercial Bank of China (ICBC) brought its inaugural green bond to market in April 2019 to support the development of green projects under the BRI and to boost the inter-bank regular cooperation in the region. According to ICBC, the Green Belt and Road inter-bank regular cooperation (BRBR) Bond was offered in Chinese yuan, the U.S. dollar and the Euro. It followed both Chinese and European green bond standards, and prioritised underwriting banks from BRI countries.

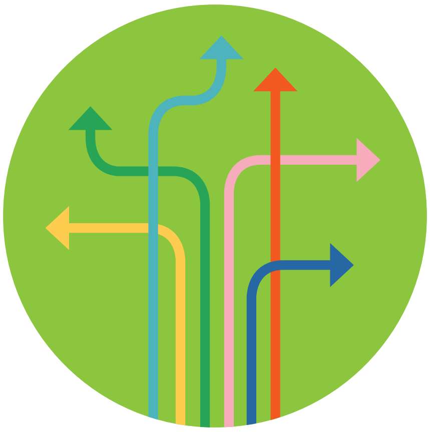
2.5 Issue a green sovereign bond

A sovereign green bond can signal a country's commitment to its sustainable, low-carbon growth strategies. It can have a positive impact on the private sector investment case for green assets and projects.

Increased collaboration between different departments in government (traditionally treasury and sustainability) is one of the positive spill-over effects of issuing a green bond; inter-ministerial collaboration can support ongoing efforts to implement a country's long-term low-carbon growth strategy.

A green sovereign bond can also set up a benchmark price for the domestic green bonds market. Driven by high demand and an increasingly diversified investor base, several treasuries have reported better pricing of their green bonds compared to past issuances.

China could bring a demonstration sovereign green bond issuance to the market to further incentivise its domestic market.



3. Diversify green instrument types

3.1 Regulation released to guide green ABS development

Green asset-backed securities (ABS) have increased dramatically in recent years and have become an important component of China's green debt market. Green corporate ABS is the largest section.

Regulation on green ABS is not unified in China. Green ABS is divided into three categories and under different regulations. CBIRC and PBoC are the regulators of green credit ABS, with green loans as the underlying assets; CSRC and Shanghai Stock Exchange set rules for green corporate ABS (with the original owner of underlying assets is corporate); and NAFMII is the regulator of green ABN (Asset-backed Notes) in the inter-bank market.

All regulators require the use of proceeds of green ABS to be aligned with the Green Bond Endorsed Project Catalogue (2015).

Besides the Catalogue, the only other guidelines dedicated to green ABS were released by the Shanghai Stock Exchange in 2018. The regulations on green credit ABS and green ABN are not separated from current regulatory frameworks for green bonds.

Dedicated regulations need to be developed to guide and ensure the continued growth of green ABS.

3.2 Growing green municipal issuance

Green municipal bonds ("munis") have increasingly been used as a financing tool to close the vast infrastructure, climate mitigation and adaptation investment gaps.

Local governments across the world, including in the United States, Australia, New Zealand, South Africa and Sweden, have issued green munis to finance green and climate-resilient projects. Looking ahead, green munis can also lend themselves to support the green initiatives in China's Fourteen Five period.

This would be further supported by additional regulatory support from Chinese authorities for example by allowing the rollover of municipal debts into green bonds when they are tied to green infrastructure investments, and allowing local governments to raise foreign debt. The latter would help attract long-term investors and cheaper funds from the international capital market into China's green infrastructure projects.

Appendix 1 Terminology

Terminology

Labelled green bonds

In China's domestic market, labelled green bonds are either approved by regulators or registered at stock exchanges with a green label in the bond name. In the overseas market, issuing documents or external review reports are used to identify the green label.

Aligned green bonds

Only bonds with 95% or more of proceeds dedicated to green assets or projects that are aligned with the Climate Bonds Taxonomy are included in Climate Bonds Initiative Green Bond Database. These bonds are referred to as green bonds aligned with CBI definitions in this report.

Non-aligned green bonds

If a bond's use of proceeds (UoP) is not aligned with the Climate Bonds Taxonomy, the bond is not included in the Climate Bonds Initiative Green Bond Database. The same applies if more than 5% of proceeds are expected to be used for general corporate purposes, working capital, social assets or projects/assets that are not aligned with the Climate Bonds Taxonomy. Lack of sufficient information to determine the alignment of use of proceeds also results in exclusion. These bonds are also referred to as excluded green bonds, non-aligned green bonds or green bonds only aligned with local definitions.

Certified Climate Bonds

Climate Bonds Initiative administers the Climate Bonds Certification Scheme. Issuers can certify their green issuance under the Climate Bonds Standard and Sector Criteria. Independent approved verifiers provide a third-party assessment that the use of proceeds comply with the objective of capping global warming at 2°C.

Unlabelled Climate-aligned bonds

The term refers to bonds that support the transition to a low carbon economy but have not been labelled as "green" by the issuing entity.

These go beyond the green label and indicates a much larger set of bonds issued by entities that have at least 75% of revenue derived from "green" business lines in at least one of the climate themes defined by Climate Bonds Taxonomy.

Appendix 2 Climate Bonds Taxonomy

Climate Bonds Taxonomy

ENERGY	TRANSPORT	WATER	BUILDINGS	LAND USE & MARINE RESOURCES	INDUSTRY	WASTE	ICT
Solar	Private transport	Water monitoring	Residential	Agriculture	Cement production	Preparation	Broadband networks
Wind	Public passenger transport	Water storage	Commercial	Commercial Forestry	Steel, iron & aluminium production	Reuse	Telecommuting software and service
Geothermal	Freight rail	Water treatment	Products & systems for efficiency	Ecosystem conservation & restoration	Glass production	Recycling	Data hubs
Bioenergy	Aviation	Water distribution	Urban development	Fisheries & aquaculture	Chemical production	Biological treatment	Power management
Hydropower	Water-borne	Flood defence		Supply chain management	Fuel production	Waste to energy	
Marine Renewables		Nature-based solutions				Landfill	
Transmission & distribution						Radioactive waste management	
Storage							
Nuclear							

CLIMATE BONDS STANDARD CERTIFIED

Certification Criteria approved

Criteria under development

Due to commence

12/2019

Appendix 3 Index performance

With regard to the identification method of index sample bonds, CCDC made three innovations. Firstly, the index goes beyond the labelled green bond and identified non-labelled bonds that are actually financing green assets. It encourages and guides investment in broader green sectors.

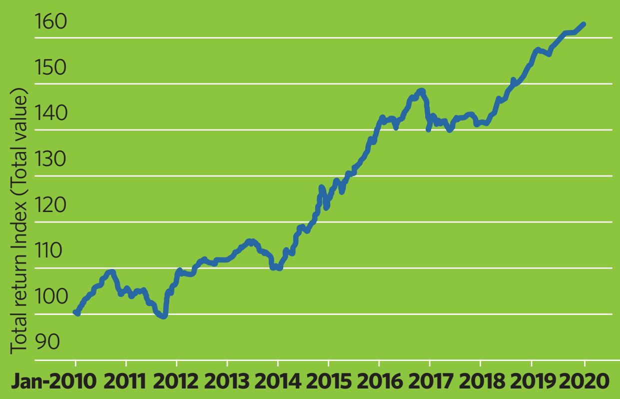
Secondly, is to propose solutions to the differences in the identification of clean fossil energy projects and pollution prevention projects among the four green bond standards prevailing at home and abroad, that is, to fully consider the positive effects of these projects on the current environmental benefits.

The third is to dig deep into the green information of stock financial bonds, define the scope of "green loans" and other factors based on loan investment projects, and calculate the proportion of bonds raised to green project loans in the funds raised from bonds, thus achieving the identification and classification of green financial bonds purpose.

ChinaBond China Climate Aligned Bond Index

As of 31 December 2019, there were 357 constituent bonds included in the ChinaBond China Climate-aligned Bond Index with a total outstanding amount of RMB1.31tn. The average duration is 3.79 years and the 1-year total return of the index was 4.90%. 99.99% of the proceeds of index constituents were allocated to green projects.

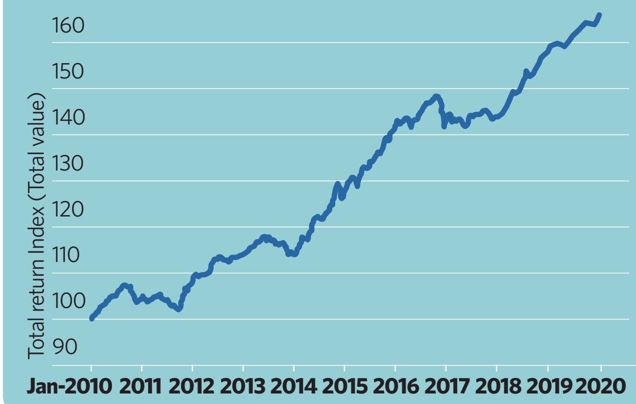
Total return: Chinabond China Climate-aligned Bond Index



ChinaBond China Green Bond Index

As of 31 December 2019, there were 1343 constituent bonds included in the ChinaBond China Green Bond Index with a total outstanding amount of RMB3.25tn. The average duration is 3.78 years and the 1-year total return of the index was 5.06%. 89.48% of the proceeds of index constituents were allocated to green projects.

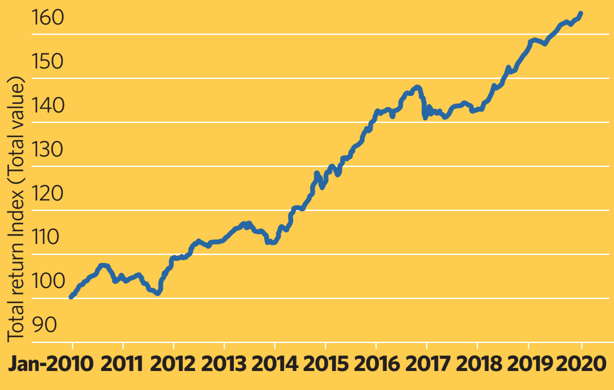
Total return: ChinaBond China Green Bond Index



ChinaBond China Green Bond Select Index

As of 31 December 2019, there were 1201 constituent bonds included in the ChinaBond China Green Bond Select Index with a total outstanding amount of RMB3.06tn. The average duration is 3.87 years and the 1-year total return of the index was 5.07%. 90.15% of the proceeds of index constituents were allocated to green projects.

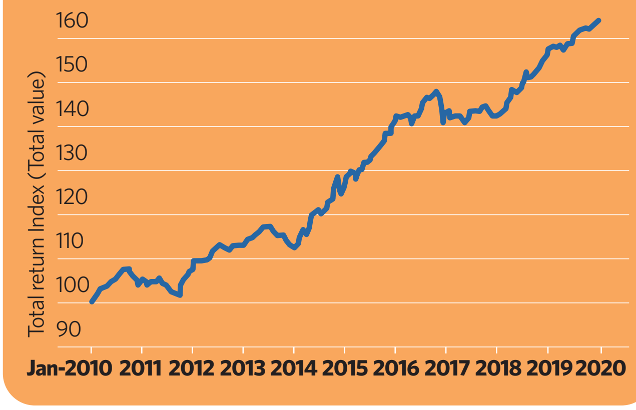
Total return: Chinabond China Green Bond Select Index



ChinaBond CIB Green Bond Index

The index was launched jointly by CCDC and China Industrial Bank. Eligible projects have to be confirmed by China Industrial Bank's Green Finance Criteria (2016). As of 31 December 2019, there were 318 constituent bonds with a total outstanding amount of RMB728.62bn. The average duration is 1.76 years and the 1-year total return of the index was 4.69%. 92.37% of the proceeds of index constituents were allocated to green projects.

Total return: ChinaBond CIB Green Bond Index



Data source: all index performance data is provided by CCDC

Note: all the four indices are Fortune Indices

Appendix 4 External review types

Type of review	What it covers	Service Providers
Third party Assurance	Assurance reports state whether the green issuance is aligned with the Green Bond Principles and the Climate Bonds Standard	Audit firms
Second Party Opinion	Provide an assessment of the issuer's green bond framework, analysing the "greenness" of eligible projects/ assets. Some second party opinions also provide a sustainability rating, giving a qualitative indication	Environmental Social Governance (ESG) service providers (such as Oekom, Sustainalytics, Vigeo Eiris, DNV GL) and scientific experts (such as CICERO, CECEP Consulting). Other environmental consultants and assessment organisations.
Green Bond Rating	A number of rating agencies assess the bond's alignment with the Green Bond Principles and the integrity of its green credentials	Rating agencies such as Moody's, S&P Global Ratings, JCRA, R&I, RAM Holdings
Pre-issuance verification of the Climate Bonds Certification according to the Climate Bonds Standard	The Climate Bonds Standard is the only Paris Agreement aligned standard available in the market. Independent verification confirms that the use of proceeds adhere to the Climate Bonds Standard and sector specific criteria (e.g. Low Carbon Transport)	Verifiers approved by the Climate Bonds Standard and Certification Scheme

Appendix 5

Taiwan Xinguang Investment Trust Issues ChinaBond 10-Year Treasury Green Related Bond Index Products

In September 2018, the ChinaBond 10-Year Treasury Bond and Policy Bank Bond Green Enhancement Index was released to the public. In February 2019, Shin Kong Investment Trust successfully issued the Shin Kong China 10-year Treasury Bond and Policy Finance Additional Green Bond ETF tracking the index in the Taiwanese market. The scale of the product has been growing rapidly since its issuance, and its assets reached nearly RMB6bn by the end of the first quarter of 2020.

Appendix 6

Report on Green Bonds Environmental Benefits Disclosure

In 2017, entrusted by the Green Finance Professional Committee of the Chinese Finance Society, CCDC and China Energy Conservation Consulting jointly conducted a study on the disclosure metrics of green bond environmental impact. The research developed indicators at both basic indicators and sub-sectors indicators.

Basic indicators are applied to all green bonds, while the sub-sector indicators are used types of green industries and key environmental benefit characteristics involved in fundraising projects are selected for disclosure in the corresponding part of the indicators.

The index system by field is constructed based on industry environmental risk and environmental performance characteristics, and strives to reflect the core characteristics of the industry in environmental performance and environmental risk with the fewest indicators, which not only meets the scientific requirements of information disclosure, but also does not add too much extra burden to the issuer. Through comprehensive analysis and research on the environmental benefit information disclosure system and disclosure index system, the project provides technical support for the healthy development of the green bond market and lays the foundation for further research and formulation of green bond related systems. See more details.

Appendix 7

List of CCDC Pioneer Green Bond Issuers, Investors and Underwriters

CCDC evaluated and released a list of pioneer member organisations in leading the China's domestic green bond issuance, investment and underwriting in 2019. This encourages the market players to further develop the green bond universe and promotes a standardised and well-functioning green bond market. See more details: Innovation-Valuation

Endnotes

1. http://www.sse.com.cn/assortment/bonds/corporatebond/latest/c/4694310.pdf

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Highlights of China's green bond market in 2019

- The total amount of Chinese green bonds issued on both domestic and overseas market reached USD55.8bn (RMB386.2bn), representing a 33% increase from the USD42bn (RMB282.6bn)achieved in 2018.
- China, the USA and France led the country rankings once again by the total amount of labelled green bonds. China was the largest source of labelled green bonds.
- China also remains one of the largest global sources of Certified Climate Bonds. In 2019, Chinese issuers brought four Certified deals to the market, totalling USD3bn (RMB21bn).
- 2019 has been marked by new developments in China's profile of issuer types. The most noticeable is the strong growth in the total volume of green bonds issued by Non-Financial Corporates that have increased by 54% year-on-year. The first municipal green bond was issued in 2019, reflecting Chinese local governments' ambitions to address climate change and local environmental issues.
- Transport is the largest theme among bonds aligned with Climate Bonds Initiative's definition, followed by Energy.
- By the end of 2019, the total outstanding amount of China's domestic green bond market stood at USD140bn (RMB977.2bn). A total of USD124bn (RMB865.5bn) worth of green bonds in China reach maturity in the next 5 years, representing 88% of the total outstanding.

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Design: Godfrey Design

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