

CHINA GREEN BOND MARKET 2016



The role of green bonds in solving environmental challenges in China

Over the past three decades China's economy has proved a global success as an economic powerhouse and, through both economic and social policies, has raised a billion people out of poverty. This vast economic success has, however, come at an immense cost to the environment - a cost that current generations are beginning to deal with and one that will continue to have major health and quality of life implications for future generations.

In China, the importance of ensuring that new developments and infrastructure are green is increasingly understood, as major cities are grappling with intense air pollution and clean water problems.¹

On a global scale, climate change poses further risks, with the current trajectory of projected to lead to a global warming of 4-6°C. This will in turn lead to rising sea levels, increased severity of hurricanes, droughts, wildfires, typhoons and substantial changes in agricultural patterns and yields.

Increasing global infrastructure and making it green

While emissions need to decrease, global infrastructure investment is expected to amount to RMB624tn (USD90tn) over the next 15 years - more than the entire current infrastructure stock.²

To facilitate the global transition to a low-carbon economy, an estimated RMB42-9tn (USD6-7tn) in annual investment will be needed globally over the next 15 years.³

In China, infrastructure investment required by China's urbanisation and economic growth is estimated at RMB42tn (USD6.74 tn) from 2014-2020

alone.⁴ The People's Bank of China (PBoC) estimates that an annual investment of at least RMB2tn-4tn (USD320bn-640bn) will be required to address environmental and climate change issues.⁵

The good news is that the solutions to environmental challenges are well understood and the technology is available to be deployed. The key challenge, now, is financing these solutions.

Green bonds are critical to mobilising capital

Traditional sources of capital for infrastructure investment (governments and commercial banks) are insufficient to meet capital requirements; institutional investors are increasingly being called upon to fill these financing gaps.

In China, the PBoC has made a clear statement that public investment alone is not sufficient to meet the investment required for environmental and climate change solutions - public funds will contribute only 15% of the capital required.⁶

Green bonds have emerged as a valuable tool to mobilise the global investment community. While they account for less than 0.2% of all bonds issued globally and 2% in China, the potential for scaling up is tremendous. The market now needs to grow much bigger, and quickly.

The green bond market has shown strong growth over the last 3 years, driven by strong investor demand which continues to outstrip supply.

A number of leading investors have made public commitments to large green bond portfolios while others are building up portfolios without making explicit commitments. In December 2015, investors representing RMB77.3tn (USD11.2tn) of assets under management committed to work to grow a green bond market.⁷ Signatories to the Principles for Responsible Investment (RMB415tn assets under management represented) have also shown growing interest in green investment across asset classes.

While specific green mandates are essential to kick-starting the market, the key feature underpinning demand is that green bonds are attractive to investors without green mandates. This is because they are identical to other bonds in almost

all ways (corporate backing, structure, coupon etc.) except that proceeds are directed to green projects.

As international institutional investors seek investments with an environmental impact, they could act as an important source of capital to finance China's green transition.

The improved access to China's interbank bond market and the encouragement of cross-border green bond issuance and investment by the Chinese government^{8,9} will help to stimulate investor interest in green investments within China.

"To investors, green bonds offer a stable, rated and liquid investment with long duration. To issuers, they could tap the USD100tn (RMB690tn) global institutional fixed income investor base."

Mark Carney, Governor of the Bank of England and FSB Chair

Notes:

1. http://usa.chinadaily.com.cn/china/2017-01/03/content_27842489.htm
2. The Global Commission on the Economy and Climate (2016). The Sustainable Infrastructure Imperative: Financing for Better Growth and Development. http://newclimateeconomy.report/2016/wp-content/uploads/sites/4/2014/08/NCE_2016Report.pdf
3. New Climate Economy (2015). Seizing the Global Opportunity. <http://2015.newclimateeconomy.report/misc/downloads/>.
4. The Global Commission on the Economy and Climate. Better Growth, Better Climate. www.newclimateeconomy.report
5. <http://finance.china.com.cn/money/bank/yhyw/20160317/3631992.shtml>
6. Ma Jun, Simon Zadek (2016). G20 Must 'Reset' Global Economy to Fund Low-carbon Development <http://english.caixin.com/2016-09-01/100984235.html>
7. <https://www.climatebonds.net/resources/press-releases/Institutional-Investors-Paris-Green-Bonds-Statement>
8. <http://www.pboc.gov.cn/tiaofasi/144941/144959/3021203/index.html>
9. The People's Bank of China, The Ministry of Finance, National Development and Reform Commission, The Ministry of Environment Protection, China Banking Regulatory Commission, China Securities Regulatory Commission and China Insurance Regulatory Commission (2016). Guidelines for Establishing the Green Financial System

Green bond market developments: global

Regulatory developments in China in late 2015 marked the official launch of China's domestic green bond market. Over the course of 2016, China came to dominate the market.

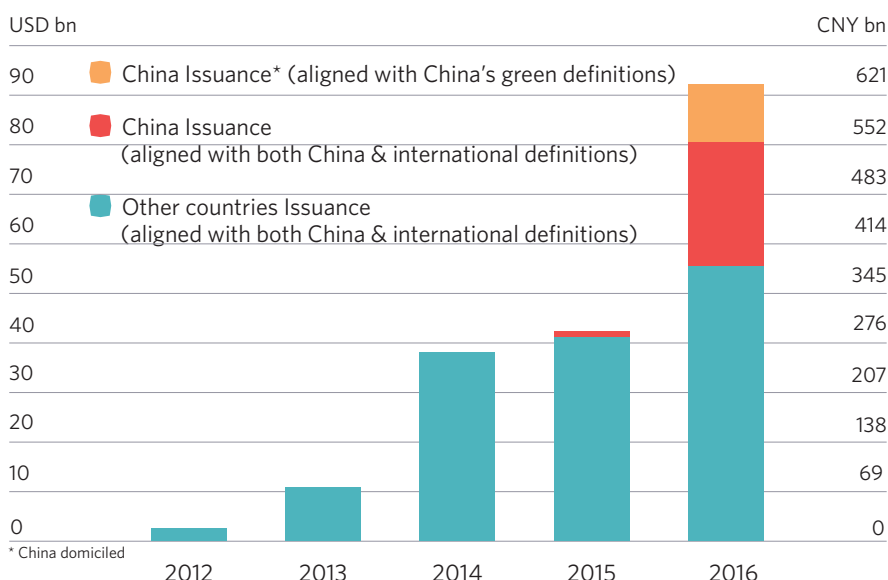
The green bond market emerged in 2007-2008 with bonds issued by the World Bank and European Investment Bank (EIB). From 2007-2012, the market mainly featured development banks such as the EIB, IFC and World Bank.

2013 saw the first bond issued by a corporate entity which spurred more active participation from private sector issuers including corporates and commercial banks.

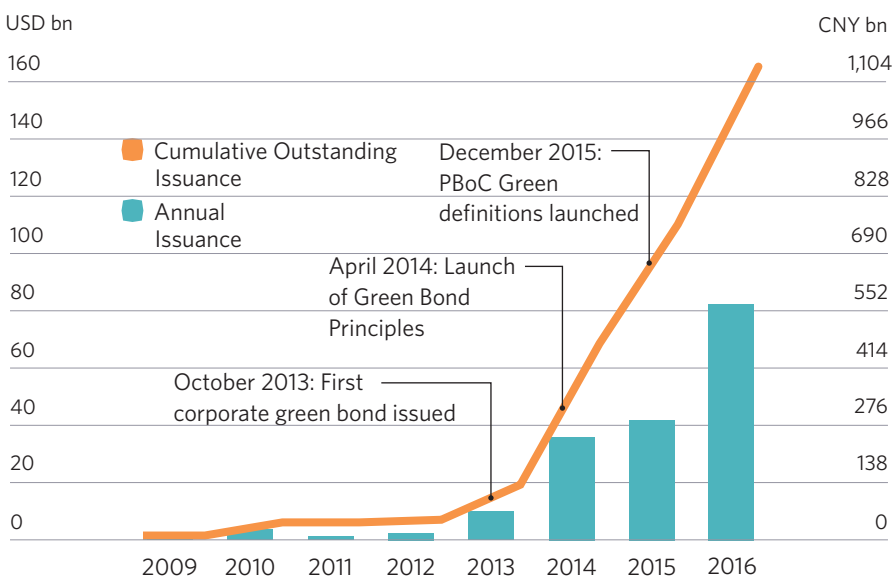
In early 2014, the Green Bond Principles (GBP) were launched as a set of voluntary principles for the market to encourage best practice around transparency and reporting. The first corporate bonds and the launch of the GBP were strong catalysts for market growth, as annual issuance of green bonds rose from just RMB21bn (USD3bn) in 2012 to RMB559bn (USD81bn) in 2016 with issuance occurring in 14 of the G20 markets. As the market has grown, there has been increasing diversification of both issuers and investors.

Global green bond issuance for 2016 reached RMB552bn (USD80bn), with much of this growth coming from Chinese issuers in the market.

Global growth in green bond issuance was driven by China in 2016



Annual and cumulative green bond issuance



What is a green bond?

Green bonds are regular bonds with one distinguishing feature: proceeds are earmarked for projects with environmental benefits, primarily climate change mitigation and adaptation. A green label is a discovery mechanism for investors. It enables the identification of climate-aligned investments with limited resources for due diligence. By doing so, a green bond label reduces friction in the market and facilitates growth in climate-aligned investments.

Benefits for investors

Green bonds can:

- balance financial returns with environmental benefits
- satisfy Environmental, Social and Governance (ESG) requirements or green investment mandates
- enable direct investment in the 'greening' of brown sectors
- enable hedging against climate policy risks

Benefits for issuers

- provide an additional source of green financing
- match maturity with project life
- improve investor diversification and attract buy and hold investors
- enhance issuer reputation
- attract strong investor demand leading to oversubscription

Green bond market developments: China

Green bond issuance from China increased in 2016 from almost zero to RMB238bn (USD36.2bn), accounting for 39% of global issuance in 2016.

Issuance began in late 2015 with the Agricultural Bank of China issuing a green bond in the London market.

In December 2015 the PBoC published regulations for green bond issuance in the China interbank market (China's largest bond market). A few weeks later the National Development & Reform Commission (NDRC) published guidelines for the state-owned enterprise sector.

Since then the market has grown rapidly, led by large issuers such as Shanghai Pudong Development Bank, Industrial Bank and Bank of Communications. Issuance has also been diverse, including asset-backed securities (ABS) and a covered bond issued by Bank of China.

The Chinese market can be classified in the following ways:

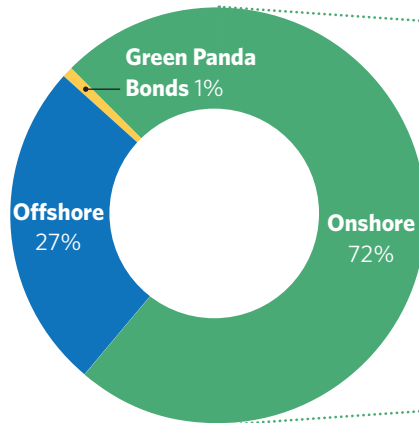
1. Meets international green definitions or local green definitions: China's local market context means that some projects that are considered green in China are not considered green by international investors. The reasons for this are:

(a) <95% of proceeds are allocated to green projects or refinancing green projects. The NDRC regulation (see page 7) allows issuers to use up to 50% of bond proceeds to repay bank loans and invest in general working capital. Internationally, at least 95% of proceeds must be linked to green assets or projects.

(b) Different definitions of green: The PBoC and NDRC green definitions (see page 8) include some project types that would not be considered green by international standards. These include:

- Retrofits to fossil fuel power stations
- "Clean" coal
- Electricity grid transmission
- Infrastructure that carries fossil fuel as well as renewable energy
- Large (>50 MW) hydropower electricity generation (currently under

Most bonds are issued onshore



review by the Hydropower Technical Working Group¹⁰ under the Climate Bonds Standard, which is developing criteria for climate-friendly investment in hydropower)

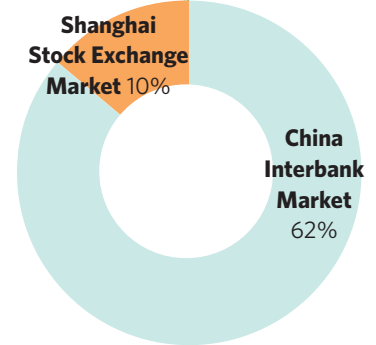
Approximately RMB83bn (USD12.6bn) in Chinese green bonds - 34% of total issuance - did not meet international definitions in 2016. This is made up of 76% banks and 24% corporates.

Many bonds that are not currently aligned with international green definitions could quite easily become so. For example, green bonds issued by Industrial Bank contain clean coal projects that are not in line with intentional green definitions. If these were excluded however, the remaining proceeds allocation on other green sectors would still make this an attractive bond.

2. Offshore or onshore bonds. Offshore bonds are issued by Chinese issuers on international stock exchanges. Onshore bonds are issued in RMB in mainland China and are available to domestic investors and qualifying international investors. In 2016, 27% of green bonds were listed offshore with the largest one issued by the Bank of China in three currencies (USD, RMB and EUR). Green panda bonds are RMB-denominated bonds from a non-Chinese issuer sold in mainland China - classified by CCDC as onshore. For example, the green bond issued by the BRICs bank New Development Bank in July 2016.

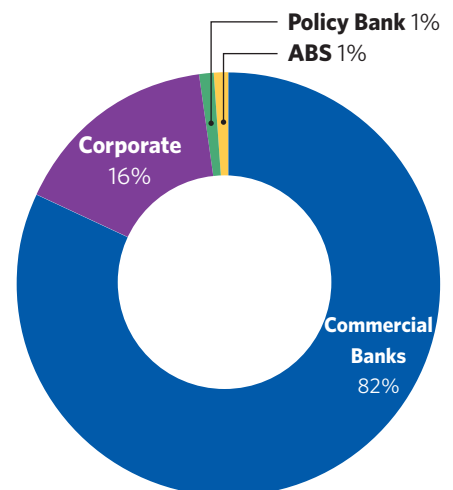
The following analysis includes bonds issued onshore and offshore that meet international definitions.

10. <http://www.climatebonds.net/hydropower>



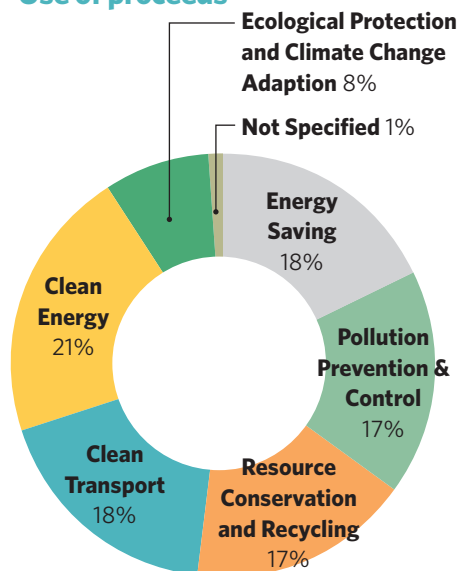
Commercial banks make up the largest proportion of issuance. Commercial banks have been the driving force behind the growth of the Chinese market to date making up 82% of all Chinese green issuance in 2016. This is partly due to the release of the PBoC's announcement No. 39 [2015] on the issuance of green financial bonds, which refers to the securities issued by financial institutions. Corporates are playing a growing role - they accounted for 16% of total issuance in 2016. One of the 3 policy banks in China, the Export-Import Bank, also came to market in early December 2016. While 35 new Chinese issuers entered the market in 2016, the two largest issuers, Shanghai Pudong Development Bank and Industrial Bank made up approximately 43% of all Chinese issuance between them. These two were also the largest green bond issuers globally in 2016.

Banks are the largest issuers



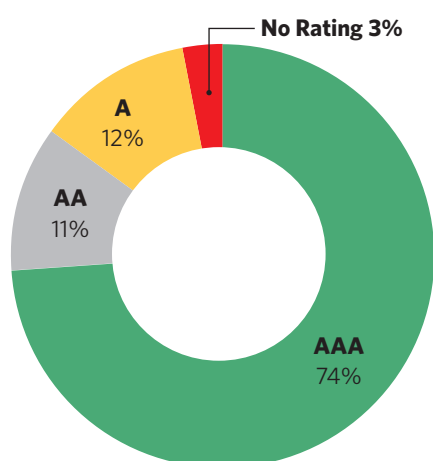
Clean Energy is the largest theme under the PBoC's Green Bonds Endorsed Project Catalogue, followed by Clean Transportation and Energy Saving. Ecological Protection and Climate Change Adaptation are the smallest themes.

Use of proceeds



Investment-grade green bonds dominate Chinese issuance. Only 3% of bonds have no ratings; the other Chinese green bonds are all graded as A- or above. Prime-rated bonds (AAA) make up 74% of the total 2016 issuance. Most of the Chinese issuers use local rating agencies, while offshore issuance such as BoC's green covered bonds usually have ratings from international agencies.

AAA-rated issuance dominates



50% of Chinese green bonds have tenors from 5 - 10 years. The average tenor for Chinese green bonds is approximately 4 years. This is lower than both the global green bond market which is approximately 6.8 years and Chinese government and policy bank bonds which have an average tenor of 6.3 years.¹¹ 1% of Chinese green bonds have tenors of 10 years or longer.

The release of official guidelines has driven the development of China's green bond market

Various regulatory authorities and stock exchanges in China have played crucial roles in sparking the development of the green bonds market by releasing policies and guidance. The following are key developments in the China market:

- **22 December 2015:** the PBoC released the guidance on issuance of green financial bonds (The Announcement)¹² and the Green Bond Endorsed Project Catalogue. This provides guidance for financial institutions on how to issue a green bond.
- **13 January 2016:** NDRC released Guidance on Green Bond Issuance stating which projects are eligible as green projects, and outlining the requirements for bond issuance approval and other relevant policies.
- **March /April 2016:** Shanghai Stock Exchange and Shenzhen Stock Exchange published the Notice on Green Bond Pilot Program, indicating that green bonds can be listed on stock exchanges in addition to the interbank bond market.
- **31 August 2016,** Guidelines for Establishing the Green Financial System were jointly released by the PBoC, Ministry of Finance, NDRC, Ministry of Environmental Protection, China Banking Regulatory Commission (CBRC), China Securities Regulatory Commission (CSRC), and China Insurance Regulatory Commission (CIRC). It proposed 35 measures to push the development of the green financial system.

China's 13th Five Year Plan requires a "green financial system" to be developed

In March 2016 the 13th Five Year Plan was approved by National People's Congress (NPC). The plan states the importance of a "green, open and shared" development and incorporates a strategy for establishing a green financial system into the National Ecological Civilisation Construction Plan.

The 13th Five Year Plan (FYP) also proposes to develop green bonds, to improve green credit policies and to set up green development funds through market mechanism innovations.

Economic and financial reforms provide potential to develop green bonds

In recent years the Chinese government has adopted a model for development called the 'New Economic Norms in China'¹³, requiring 'minimal impact' on the natural environment. This is helping to accelerate a 'green transformation' of development, and terms like 'green economy' and 'green finance' have now become mainstream policy positions.

This green financial system push is generating a variety of initiatives, from banking regulator rules restricting bank lending to any company with environmental violations, to a national environmental court. Green bonds, with their headline-grabbing figures, are the most visible of these. There is also a push to curtail investment in projects with negative impacts on the environment - for example 18 provinces have been instructed to stop all plans for new coal-fired power stations.

The Chinese bond market has undergone major reform around market architecture, which has opened up the opportunity to introduce green bond issuance as a market innovation. The planned growth of the securitisation market provides another opportunity for green bonds.

International policy leadership

Under its presidency of the G20, China has shown leadership on green finance internationally by establishing the G20 Green Finance Study Group (GFSG), creating a green finance work stream around the world.¹⁴ The G20's green finance work will continue under Germany's presidency in 2017 and under future G20 presidencies.

China's Belt and Road Initiative¹⁵ is a development strategy to build infrastructure networks and cooperation among countries in Eurasia. It is creating huge investment opportunities for infrastructure projects with possible implications for green bond issuance within China and across borders.

11. https://www.yieldbook.com/x/ixFactSheet/fact-sheet_monthly_cngpbi.pdf

12. People's Bank of China Announcement No.39 [2015].

13. The "New Economic Norms" in China was first proposed by President Xi. It signalled a shift in economic development in China compared to the last three decades. E.g. the pace of the economic development has been reduced and there has been a shift to growing service industries rather than manufacturing. http://news.xinhuanet.com/world/2014-11/09/c_1113174791_2.htm

14. Ma Jun, Simon Zadek (2016). G20 Must 'Reset' Global Economy to Fund Low-carbon Development <http://english.caixin.com/2016-09-01/100984235.html>

15. Also known as "One Belt One Road".

Maintaining market integrity

International green bonds market practice

From the foundation of the green bond market, there has been a strong focus on the integrity of the green label. This includes both the green credentials of projects and assets financed, as well as reporting arrangements, management of proceeds, and external reviews.

Green Bond Principles

The Green Bond Principles (GBP)¹⁶ are voluntary guidelines intended for broad use by the market that recommend transparency and disclosure, and promote integrity in the development of the green bond market. They have achieved broad market acceptance as well as recognition by policy-makers and regulators. The four GBP core principles cover: use of proceeds, processes for evaluation and selection, management of proceeds, and reporting.

Climate Bonds Standard

The Climate Bonds Standard is a tool that allows investors and intermediaries to easily assess the environmental integrity of bonds. Fully integrated with the GBP, the Standard provides detailed sector criteria outlining the types of assets or projects that are in line with a low carbon and climate resilient economy.

Sector criteria are developed by key experts from academia, international agencies, industry and NGOs. Bonds that meet the requirements of the Climate Bonds Standard can be certified after a verification process (see more details below) under the associated certification scheme. The Standard is governed by a board of international investor representatives that represent RMB235bn (USD34tn) of assets under management.

External reviews

External reviews of green bonds are intended to provide investors with confidence in the issuer's claims on the

environmental credentials of the bond. There are two types of external reviews:

- **A second party opinion is an** assessment of the green credentials of a bond provided by an organisation with environmental expertise and commissioned by the issuer. Often the second party is engaged early in the process, and works with the issuer to develop a green bond framework and then evaluates that framework.
- **Third party verification** can be used to certify a bond against an existing standard using an approved verifier.

Currently, the Climate Bonds Standard is the only tool in the market offering this model. In the verification process, a licensed verifier is chosen by the issuer to review the bond against relevant sector-specific criteria for the environmental impact of projects and assets, as well as the Standard's criteria for management of proceeds and reporting. Issuer compliance is then checked post issuance by the verifier.

Green ratings

Green ratings address an emerging demand for a graduated approach to 'greenness' where light green indicates minimal environmental benefit and dark green represents significant benefit.

Internationally, this approach has been led by CICERO (Shades of green¹⁷), Moody's (Green Bonds Assessment¹⁸) and more recently Standard & Poor's¹⁹.

Market infrastructure

Stock exchanges

Stock exchanges can stimulate green bond investment by enabling issuers access to a wide range of investors and encouraging increased disclosure on use of proceeds, reporting and external reviews.

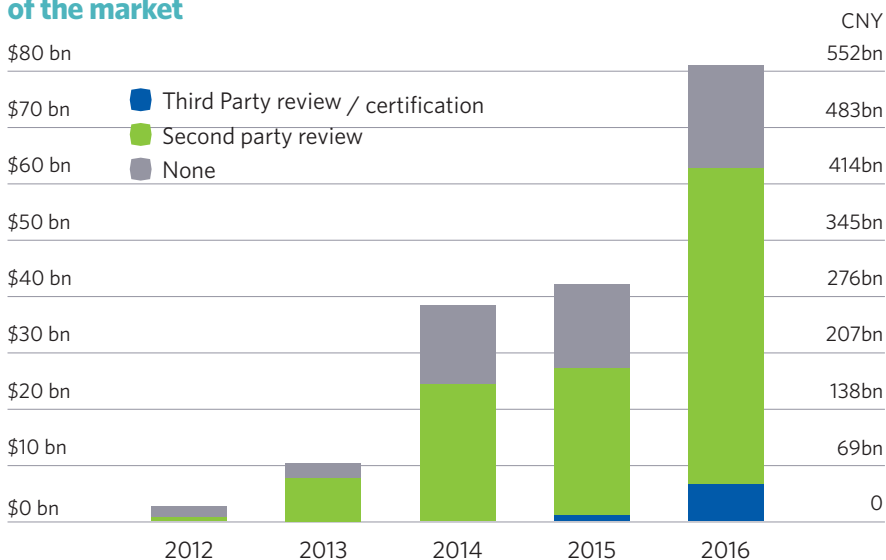
Stock exchanges can also promote green bonds by setting up a green bond list or segment – an easily identifiable section of green bonds listed on that exchange that can help investors to discover green investment opportunities.

Currently, 4 global stock exchanges have dedicated green bonds lists: Luxembourg Stock Exchange, Oslo Stock Exchange, London Stock Exchange and Bolsa Mexicana de Valores (BMV). Both the Shenzhen Stock Exchange and Shanghai Stock Exchange launched green bond pilot programmes in early 2016. The Stockholm Stock Exchange has a list of sustainable bonds which include social impacts.

Green bond indices

Green bond indices enable the measurement of the financial performance of a portfolio of green bonds against that of regular bonds. International green bond indices are produced by Solactive, S&P DJI, Barclays & MSCI and Bank of America Merrill Lynch. Broader indices which include bonds not labelled as green also exist – e.g. the ChinaBond China Climate-aligned index (see page 9).

Second and third party reviews make up a growing proportion of the market



China green bond market practice

While the integrity of the international green bond market is based largely on voluntary principles, in China, the market is regulated by different government bodies (as described in section 3).

For a green bond to be issued on the onshore market, it must be approved by the relevant regulatory authorities such as the PBoC, NDRC and CSRC. Approval requires that bonds meet guidelines covering: eligible green projects, management of proceeds, disclosure requirement and external verification.

Currently, green bond guidelines differ between regulatory authorities as they focus on different aspects of 'green'.

The PBoC Guidance focuses on categorisation of green projects, and provides more detailed requirements on project categories, eligibility criteria, management of proceeds, information disclosure and third party verification. It is applicable to both the interbank bond market and exchange markets.

The NDRC Guidance provides more detail about the key green sectors that green bonds should support and puts forward several policy incentives.

A summary of the two guidelines is provided below.

1. ELIGIBLE GREEN PROJECT CATEGORIES

Both the PBoC and NDRC broadly outline the types of projects that are eligible for green bond funding but they use different criteria. The NDRC Guidance identifies 12 project categories, while the PBoC Catalogue outlines 6.

The PBoC Catalogue was China's first guidance document defining eligible green projects, and provides more detail at sub-sector levels of project classification and eligibility criteria within each of the 6 broad categories. The country's two stock exchanges both use the Catalogue, as a reference when determining the scope of green projects.

Both sets of guidelines are dynamic and can be altered over time as necessary.

2. MANAGEMENT OF PROCEEDS

Both guidelines have set up some requirements for management of proceeds. The PBoC requires issuers to use ring-fencing or earmarking to track the use of proceeds.

The NDRC Guidance lays out some requirements for allocation of proceeds during the bond term. For example, issuers can use up to 50% of the bond proceeds to repay bank loans and invest in working capital.²⁰ However, it does not establish rules for management of proceeds and tracking.

3. REQUIREMENTS ON INFORMATION DISCLOSURE

The PBoC requires that reporting is published on a quarterly basis and that the issuer discloses detail on the use of proceeds in the annual report and special auditor's report from the preceding year, as well as details on the use of proceeds in the first quarter of the year before 30 April each year. The annual report on use of proceeds must be reported to PBoC. NDRC does not have any specific rules.

4. REQUIREMENTS ON THIRD PARTY VERIFICATION

While the PBoC does not require external reviews within its green bonds regulation, it has been made clear to issuers that a review is expected. As a result, reviews have become the norm. Issuers are also encouraged to publish an annual third party verification/assessment report during the bond term.

Reviewers are a mix of international and domestic agencies.

5. POLICY INCENTIVES

The PBoC and NDRC both provide incentives to develop the green bond market. The PBoC allows green bonds issued by financial institutions to be used as collateral for low-interest central bank loans which gives banks a strong incentive to issue green bonds.

The need for harmonisation between China guidelines

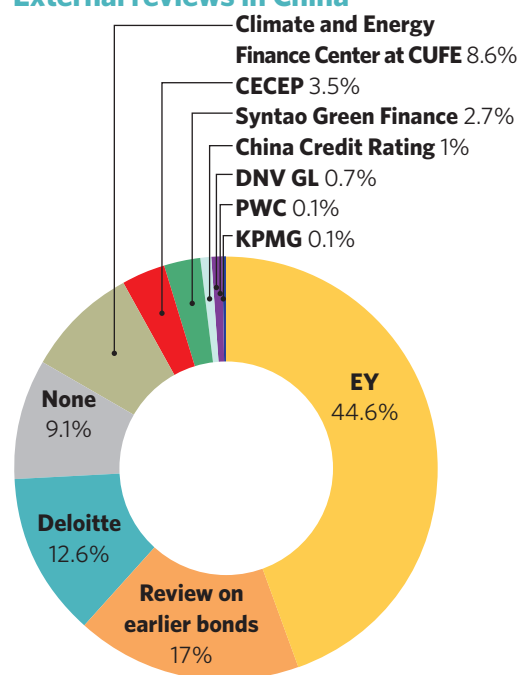
Currently NDRC allow 50% of bond proceeds to be directed to repaying bank loans and investing in working capital.

This is different from the PBoC guidelines and international green bond market practice which require that the full bond is directed to green projects (most international investors allow for up to 5% of the issuance to cover transaction costs). This is an example of where harmonisation of guidelines will have positive outcomes for the China market as it will lead to better comparability and alignment of bonds within the China market as well as between the Chinese and global markets.

NDRC Guidance proposes incentives for dealing with the simplification of the issuance and approval process for corporate issuers, including:

- **Allowing for private placements and aggregation for certain project types²¹ and under certain circumstances.**
- **Adjusting corporate bond issuance approval conditions.** For example, proceeds can account for up to 80% of the total investment of a project.
- **Supporting issuers to use green bond proceeds to improve their capital structure:** issuers are allowed to use less than 50% of the bond proceeds to repay bank loans and invest in working capital. Issuers with a credit rating of AA+ and good operational performance could use green bond proceeds to replace high-cost debt for existing green projects under construction.

External reviews in China



16. <http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/green-bonds/>

17. <http://www.cicero.uio.no/en/posts/single/cicero-grades-second-opinions-with-shades-of-green>

18. https://www.moodys.com/research/Moodys-publishes-methodology-on-Green-Bonds-Assessment--PR_346585

19. https://standardandpoors.co1.qualtrics.com/CP/File.php?F=F_392eOoFpTZv1TBr

20. The requirements on proceeds in the NDRC Guidance are: proceeds from bonds can account for up to 80% of the total investment of the project; issuers are encouraged to use green bond proceeds to optimise debt structure; issuers can use less than 50% of the bond proceeds to repay bank loans and invest in working capital; issuers with a credit rating of AA+ and good operational conditions can use proceeds to replace high-cost debt generated from existing green projects that are under construction.

21. For regional pollution control projects implemented by third party enterprises, and for energy saving and water saving projects implemented through Energy Performance Certificates.

China market infrastructure

Green bond rating methodologies in China

Credit rating agencies in China have developed three rating tools for green bonds:

- The Green Bond Assessment Methodology from China Cheng Xin (CCX);
- The Green Bond Assessment Framework from Golden Credit Rating;
- The Green Bonds Assessment and Verification System from China Credit Rating.

These tools mainly focus on the use/management of proceeds, alignment with policies and regulations, reporting and disclosure and environmental impacts of the underlying projects/assets, with differences in the details and weightings of each aspect.

In common with international green rating methodologies,²² the results of these green ratings tools are not related to credit rating of the bond.

Standardising metrics and targets of environmental impacts

The emergence of a range of green rating methodologies, while positive in general, has also introduced additional complexity into the market.

Each methodology has its own metrics and targets for environmental impacts meaning that the rating will vary depending on which methodology is applied. This could reduce the comparability among green bonds, and potentially increase transaction costs for investors.

To enhance standardisation and comparability, green bond guidelines in China could introduce uniform metrics and thresholds for defining green projects.

Green rating tools could then use these uniform metrics and targets when rating green bonds. This may also reduce the costs for rating agencies as there is no need for them to develop their own metrics and targets to define the level of greenness of the bond.

Indices

CCDC has developed a suite of green bond indices which increase transparency, enhance issuer reputation and promote the development of the green economy. The suite of green bond indices include: ChinaBond China Green Bond Index, ChindBond China Green Bond Selected Index and ChinaBond China Climate-Aligned Bond Index. They are available on Bloomberg, Thompson Reuters, FinChina and Wind.

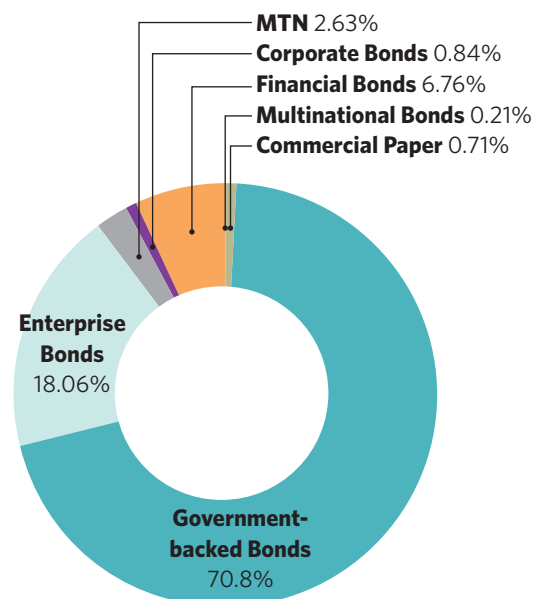
The ChinaBond China Climate-Aligned Bond Index is a collaboration between CCDC, China Energy Conservation and Environmental Protection Consulting Co. Ltd (CECEP) and the Climate Bonds Initiative (CBI). During the research process, CBI and CECEP surveyed bonds listed on the China interbank bond market and stock exchanges to analyse whether at least 95% of the proceeds are aligned with the Climate Bonds Taxonomy and the PBoC Catalogue. Bonds with proceeds being directed to general corporate purposes or refinancing are only included if the company is a pure play (i.e. 95% of its revenue is generated from green industries). More detail on the breakdown of this index has been provided on page 11.

The ChinaBond China Green Bond Index and the ChinaBond China Green Bond Selected Index were compiled by CCDC and CECEP and launched on 15 April 2016.

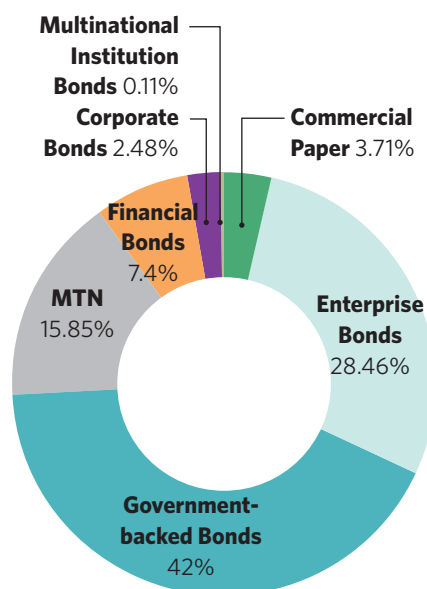
Constituents of these two indices are identified by third party green certification or comprehensive evaluation. For inclusion into the ChinaBond China Green Bond Index, more than 50% of bond proceeds or 50% of the issuer's revenue must be in line with one of the four guidelines. For inclusion into the ChindBond China Green Bond Selected Index, more than 50% of proceeds or 50% of the issuer's revenue must be in line with all of the following four guidelines:

- PBoC: China Green Bond Endorsed Project Catalogue (2015 Edition), The Green Finance Committee of China Society of Finance and Banking;
- Green Bond Issuance Guidelines from NDRC;
- Green Bond Principles from the International Capital Market Association;
- Climate Bonds Standard from the Climate Bonds Initiative.

ChinaBond China Climate-Aligned Bond Index composition



ChinaBond Green Bond Index composition



22. These include Moody's Green Bond Assessment and S&P's Green Bond Evaluation Methodology.

Future of the green bond market in China: Action points for the road ahead

The current scale and urgency of climate challenges, the need for low carbon and climate resilient investment, and the policy momentum to establish a green economy around the world, require the rapid growth of the green bond market. The following tools can be used in China to encourage rapid growth.

8-point plan for policy-makers

Policy tools have proven effective for stimulating growth, particularly in China.

• Simplify the approval process for green bonds.

In China, most green bond issuance requires approval from PBoC and CBRC prior to issuance. To encourage more issuance, this process could be shortened and made more efficient by enabling approvals from CBRC and PBoC to take place concurrently rather than successively. Additionally, programmatic approval could take place, allowing approval of a large programme of eligible assets which could then be issued over a given period. This would enable financial institutions to respond to market changes quickly and issue when it is opportune.



- **Incorporate green bonds into the scope of collateral for Standing Lending Facility and Medium-term Lending Facility.** These allow banks to borrow from the central bank through repurchase agreements. They must be secured by assets such as qualifying bonds. Including green bonds will encourage banks to both generate and invest in them.

- **Lower the regulatory cost of green financial bonds** when conducting a Macro Prudential Assessment²³. The Macro Prudential Assessment system monitors financial risks in the market, aiming to ensure the stability of the monetary financial system.
- **Provide guarantees and credit enhancement.** A dedicated fund set up by a government body to provide guarantees for green bonds with lower credit ratings would provide external credit enhancement and make them more attractive to institutional investors with regulated risk requirements.
- **Require investors to have a minimum exposure to green bonds.** Regulators can set requirements for minimum ratios of green bonds within bond portfolios. This will ensure strong demand for green bonds.
- **Provide early stage incentives for green projects.** Green projects tend to have high upfront costs and long payback periods. Price support, interest discounts, and investment subsidies could be applied to qualifying green projects.
- **Harmonise green bonds standards and disclosure.** The coordination of policies to push for market standards for green bonds will simplify the issuance process and encourage new issuers. Harmonisation should also be promoted between domestic and international guidelines. Requirements on information disclosure could also be harmonised to define the frequency and type of information expected in post-issuance reporting, including impacts and use of proceeds. Rules should allow for both flexibility and comparability.
- **Demonstration issuance from local government** could facilitate the transformation of local economic development and demonstrate the issuance process for smaller issuers and local governments.
- **Attract foreign investors** through Qualified Foreign Institutional Investor (QFII) and Renminbi Qualified Foreign Institutional Investor (RQFII) systems. QFIIs and RQFIIs must currently comply



with long capital lock-up periods, but shorter periods could be considered for green bonds to make them more attractive to international investors.

Asset managers

- Form an investor network or coalition for collaboration and information sharing.
- Create dedicated green bond funds to maintain high demand for green bonds.
- Raise awareness among other investors through investor associations.

Other market players

Index providers

- Create a suite of green bond and climate-aligned bond indices. Index providers should look to produce more diverse green bond indices.
- Promote the development of green bond index derivatives such as exchange-traded funds (ETFs). This could mobilise more private capital to support green bond development.



Rating agencies and third party verifiers

- Use existing international standards to develop green rating tools. In the future, an integrated rating scheme should be developed to incorporate environmental impacts into the credit rating assessment.
- Provide issuer training on eligible green sectors.



Industry Associations

- Support the development of existing green project eligibility criteria to provide integrity and scientific backing.
- Set up investor training and issuer training with verifiers on green eligibility criteria and the issuance process.

²³. <http://cn.reuters.com/article/zhaesmb-id-CNSH009681120120215>

Detailed analysis and charts: China green bond indices

ChinaBond China Climate-Aligned Bond Index

The ChinaBond Climate-Aligned Bond Index was designed by CCDC, CECEP, and the Climate Bonds Initiative, and was launched in September 2016. The index goes beyond the labelled green bond market to include bonds that have proceeds being directed to green projects, but that are not labelled as such.

Basic inclusion criteria:

- 95% revenues aligned with Climate Bonds Initiative taxonomy or
- the company generates 95% of revenue from green industries
- bond does not require a green label.

As of 31 December 2016, there were 308 constituents in the index from 93 issuers with a total amount outstanding of RMB1.45tn (USD210bn).

Issuance formats include short term financing bills, MTN's, enterprise bonds, corporate bonds, multinationals, and government-backed bonds. Government-backed bonds comprise the largest chunk at 70.8%.

Tenors range from 6 months to 30 years. The average tenor is 8.86 years.

Industrials, financial institutions, and utilities are the largest sectors. The majority of bonds (86.27%) are classified as Industrials.

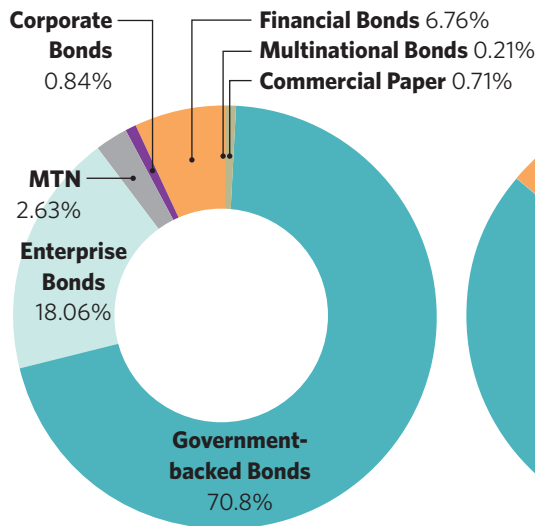
Credit ratings range from AAA to AA-. 87.19% of constituents are rated AAA, while AA- accounted for 0.66%.

The average coupon of constituents issued during 2016 was 3.55%, which is slightly lower than the that of vanilla bonds.

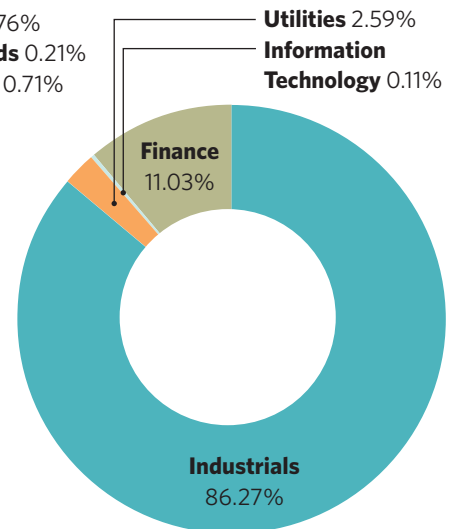
The issuance premium (defined as issue rate - market rate) of the constituents is -1.0 bps. This suggests that climate-aligned bonds are experiencing tighter primary pricing.

The 1-year total return of the ChinaBond China Climate Aligned Bond Index was 1.27%. 96% of the use of proceeds of index constituents were allocated to green projects.

The majority of bonds are issued by entities backed by the government



The Industrials sector accounts for 86% issuance



Ratings distribution



Total Return - ChinaBond China Climate-Aligned Bond Index



Total return index of ChinaBond China Climate-Aligned Bond Index

Total return index	1 month	1 year	3 years	5 years	YTD
ChinaBond China Climate-Aligned Bond Index	-1.43%	1.10%	30.50%	34.66%	1.10%

ChinaBond China Green Bond Index

The ChinaBond Green Bond Index was designed by CCDC and CECEP and launched in April 2016. Similar to the ChinaBond China Climate-Aligned Bond Index (page 10), the scope of this index extends beyond the labelled green bond market. However, the revenue threshold is lower at 50%. Other differences are outlined on page 8.

As of 31 December 2016, there were 1020 constituents in the ChinaBond Green Bond Index. These come from 376 issuers with a total amount of RMB2.78trn (USD404bn).

Among the current constituents are short term financing bills, medium term notes, enterprise bonds, corporate bonds, multinational bonds financial bonds and government-backed institutional bonds of which, government-backed institutional bonds and corporate bonds account for 42.0% and 28.46% respectively.

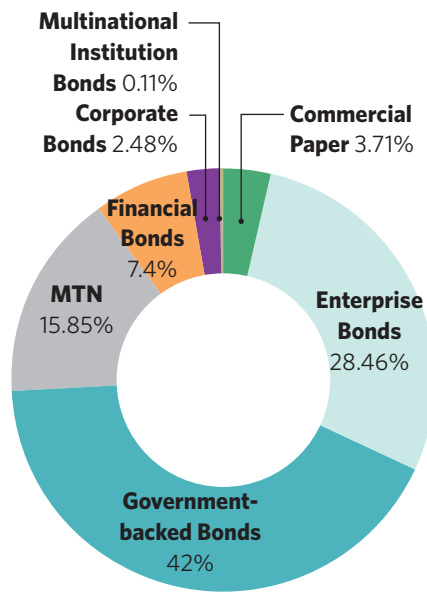
Tenors range from 6 months to 30 years. The average tenor is 7.29 years.

Industrials and finance are the largest sectors, comprising 70.69% and 14.13% respectively.

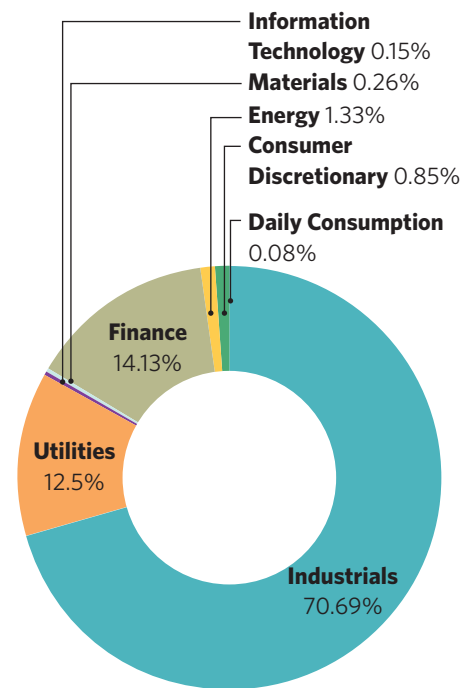
The average coupon of the constituent bonds issued during 2016 was 3.74%, slightly lower than vanilla bonds. The issuance premium (defined as issue rate - market rate) of the constituents is -4.1bp. As before, this indicates that bonds financing green projects are experiencing tighter pricing in the primary market.

The 1-year total return of the ChinaBond China Green Bond Index was 1.39%. 92.06% of the use of proceeds of index constituents was allocated to green projects.

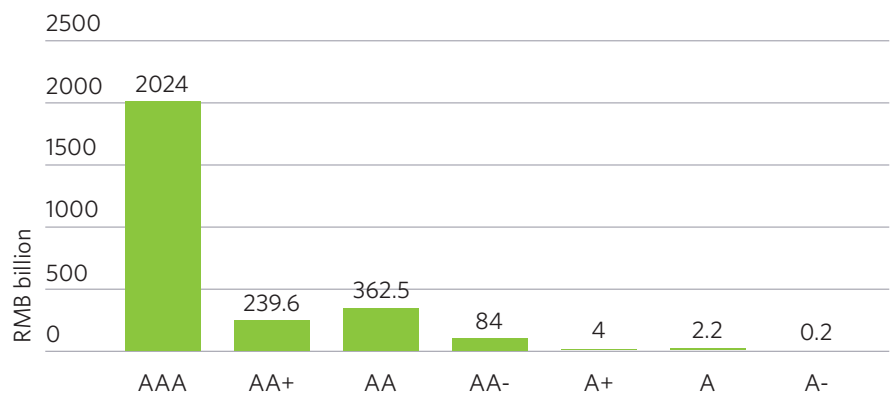
The majority of bonds are issued by entities backed by the government



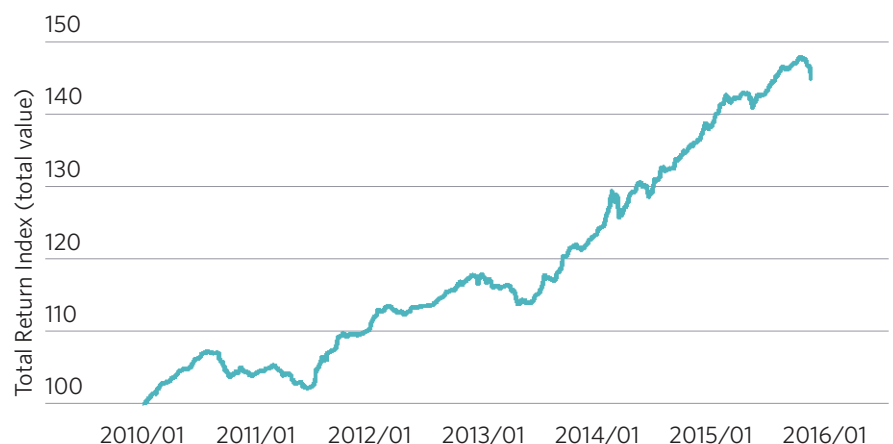
Sector breakdown



Rating distribution



Total Return - ChinaBond China Green Bond Index



Total return index of ChinaBond China Green Bond Index

Total return index	1 month	1 year	3 years	5 years	YTD
ChinaBond China Green Bond Index	-1.08%	1.39%	26.17%	33.65%	1.39%

ChinaBond China Green Bond Selected Index

The ChinaBond China Green Bond Selected Index was launched by CCDC and CECEP along with the the ChinaBond Green Bond Index in April 2016.

While the two indices are similar, the Selected Index needs to be aligned with additional external guidelines (detail on page 8).

As of 31 December 2016, there were 626 constituent bonds in the ChinaBond China Green Bond Selected Index. These come from 204 issuers with a total amount outstanding of RMB2.22tn (USD320bn).

The types of bond issuance include short term financing bills, MTNs, enterprise bonds, corporate bonds, multinationals, and government-backed bonds. Government-backed bonds make up the largest proportion (52.44%).

Tenors range from 6 months to 30 years. The average tenor is 7.34 years.

The majority of bonds (78.38%) are classified as Industrials.

Credit ratings range from AAA to AA-. 82.30% of constituents are rated AAA.

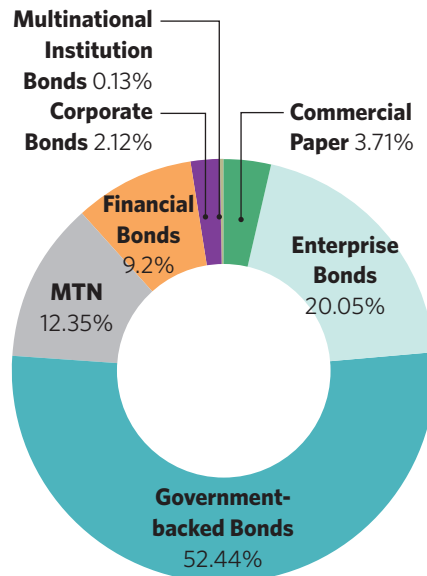
Issuance premium (issuing rate minus market rate) of the constituents is -2.7bp.

The average coupon of constituents issued during 2016 was 3.69%, which is slightly lower than the vanilla bonds.

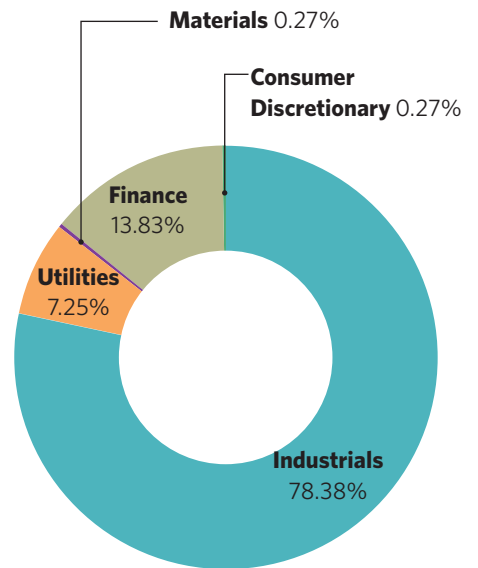
The issuance premium (defined as issue rate - market rate) of the constituents is -2.7 bps. This suggests that green bonds are experiencing tighter primary pricing.

The 1-year total return of the ChinaBond China Green Bond Selected Index was 1.27%. 96% of the use of proceeds of index constituents were allocated to green projects.

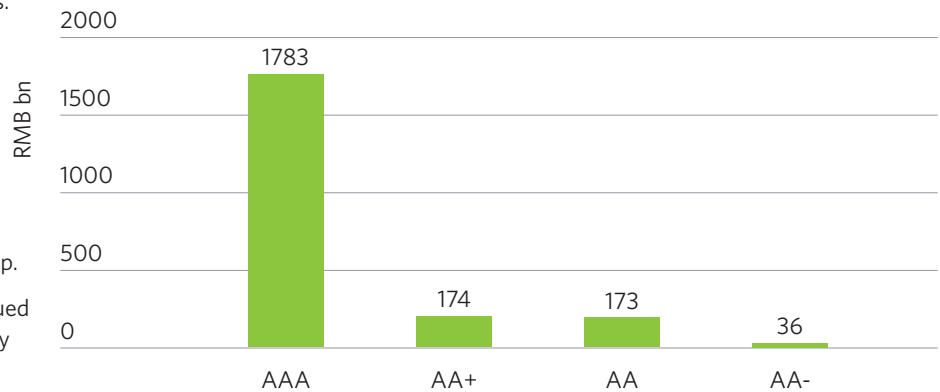
Constituents



Sector breakdown



Rating distribution



Total Return - ChinaBond China Green Bond Selected Index



Total Return-ChinaBond China Green Bond Selected Index

Total Return Index	1 month	1 year	3 years	5 years	YTD
ChinaBond China Green Bond Selected Index	-1.18%	1.27%	27.44%	33.66%	1.27%

Comparison table

	Labelled green bonds	ChinaBond China Climate-Aligned Bond Index	ChinaBond China Green Bond Index	ChinaBond China Green Bond Select Index
Amount issued	RMB0.20tn	RMB1.45tn	RMB2.78tn	RMB2.22tn
Bond types	Financial bonds, enterprise bonds, corporate bonds, MTN, ABS and Multi-national. Financial bonds make up the largest proportion (76.81%)	Short term financing bills, MTNs, enterprise bonds, corporate bonds, multi-national, and government backed bonds. Government backed bonds make up the largest proportion (70.80%)	Short term financing bills, MTNs, enterprise bonds, corporate bonds, multi-national, and government backed bonds. Government backed bonds make up the largest proportion (42.00%)	Short term financing bills, MTNs, enterprise bonds, corporate bonds, multi-national, and government backed bonds. Government backed bonds make up the largest proportion (52.44%)
Tenor	From 1 year to 15 years. Most are 3 years (44.17%) or 5 years (48.65%)	From 6 months to 30 years. Most are 10 years (47.76%)	From 6 months to 30 years. Most are 10 years (34.03%)	From 6 months to 30 years. Most are 10 years (38.40%)
Bond rating	Including AA-, AA, AA+, AAA. AAA makes up the majority (88.16%)	Including AA-, AA, AA+, AAA. AAA makes up the majority (87.19%)	Including A-, A, A+, AA-, AA, AA+, AAA. AAA makes up the majority (74.52%)	Including AA-, AA, AA+, AAA. AAA makes up the majority (82.30%)
Coupon rate	Average coupon rate is 3.50%	Average coupon rate is 3.55%	Average coupon rate is 3.74%	Average coupon rate is 3.69%
Industry	Financial, utilities, industrials, materials, and consumer discretionary . Financial industry makes up the majority (78.55%)	Transportation, buildings and utilities. Transportation makes up the majority (86.27%)	Transportation, buildings and utilities. Utilities make up the majority (70.68%)	Transportation, buildings and utilities. Transportation makes up the majority (78.38%)
Inclusion criteria	Only Bonds labelled as 'green' with 100% proceeds to green projects	- Labelled green bonds or - 95% of issuer revenue in line with Climate Bonds Taxonomy	- Labelled green bonds or - 50% of issuer revenue in line one of the four specified guidelines	- Labelled green bonds or - 50% of issuer revenue in line all of the four specified guidelines
Largest issuers	Industrial Bank Shanghai Pudong Development Bank	China Railway Group	China Railway Group	China Railway Group

Four useful facts about China's green bond market

1 76% of all bonds issued by Chinese issuers are in line with international definitions of green and the CBI Taxonomy.

2 Commercial banks and corporates are the major issuers of green bonds that meet international definitions. 79% of issuance is made up of commercial bank bonds.

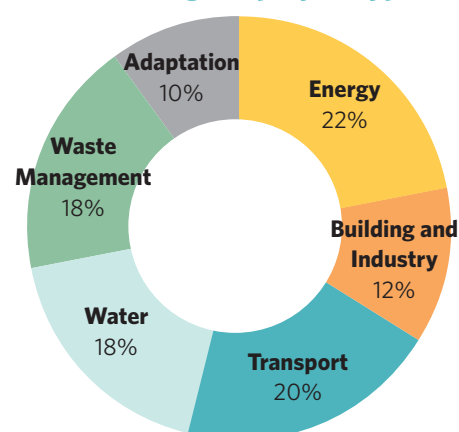
3 Among the Chinese green bonds that are in line with international definitions, 17% were issued offshore. This includes the Bank of China's green covered bonds that are listed on London Stock

Exchange as well as the Zhejiang Geely's USD400m bond listed in Singapore.

4 China's domestic market is still the market of choice for Chinese issuers with 74% of issuance on the Interbank market and 17% of issuance on Shanghai Stock Exchange.

We expect the percentage of bonds aligned with international definitions to remain high, especially as green bond guidelines become more harmonised across markets.

Use of proceeds are directed to a broad range of project types



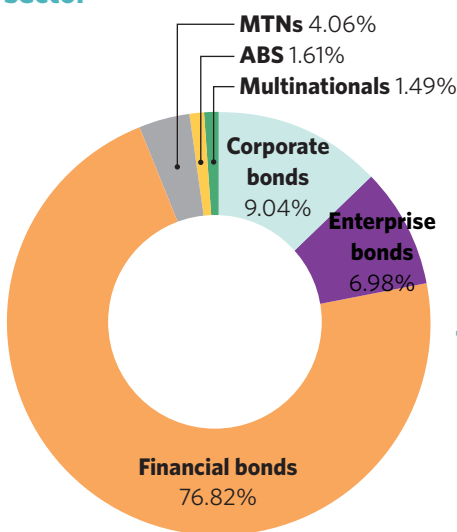
Detailed analysis and charts: China Onshore green bonds

China's onshore green bond market grew rapidly in 2016, with issuance reaching RMB201.7bn (USD29.2bn) in 2016.

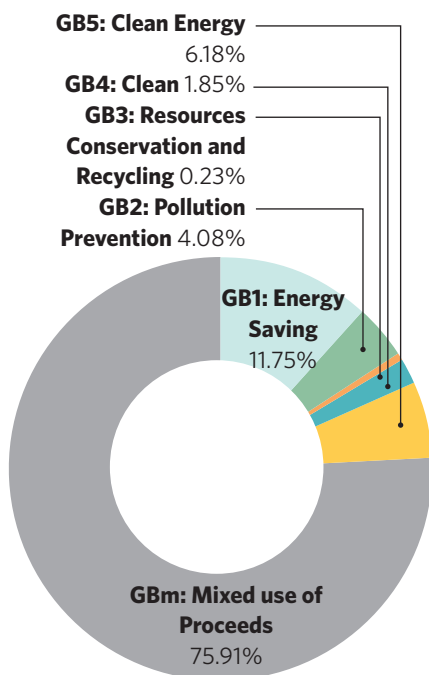
This is made up of 66 issuances from a range of bond types, including green financial bonds, green corporate bonds, green enterprises bonds, green MTN and green ABS, which come from 29 issuers.

Financial bonds account for 77% of the total amounting to RMB155bn.

Financial bonds is the largest sector

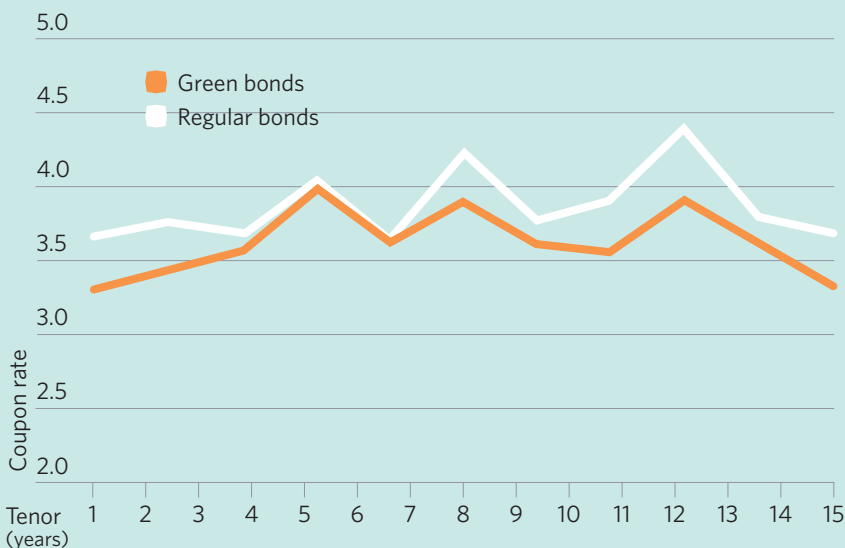


Onshore green bonds issuance by PBoC's Categories

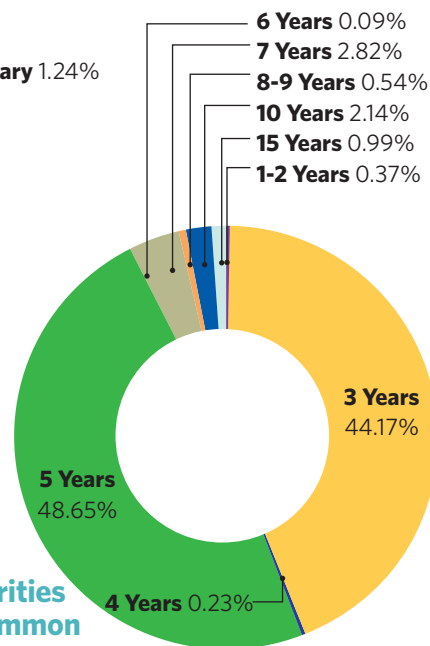
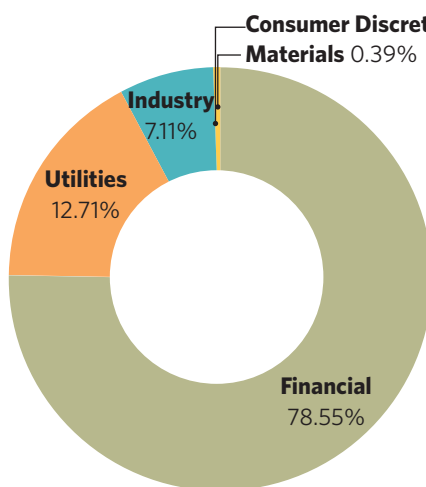


Green Bond coupons lower than regular bonds

CCDC analysis indicates that for bonds with the same ratings, coupon rates of green bonds are slightly lower than regular bonds. This will really drive issuance!



The finance sector dominates



Mid-term maturities are the most common

Average coupon rates for rating by maturity

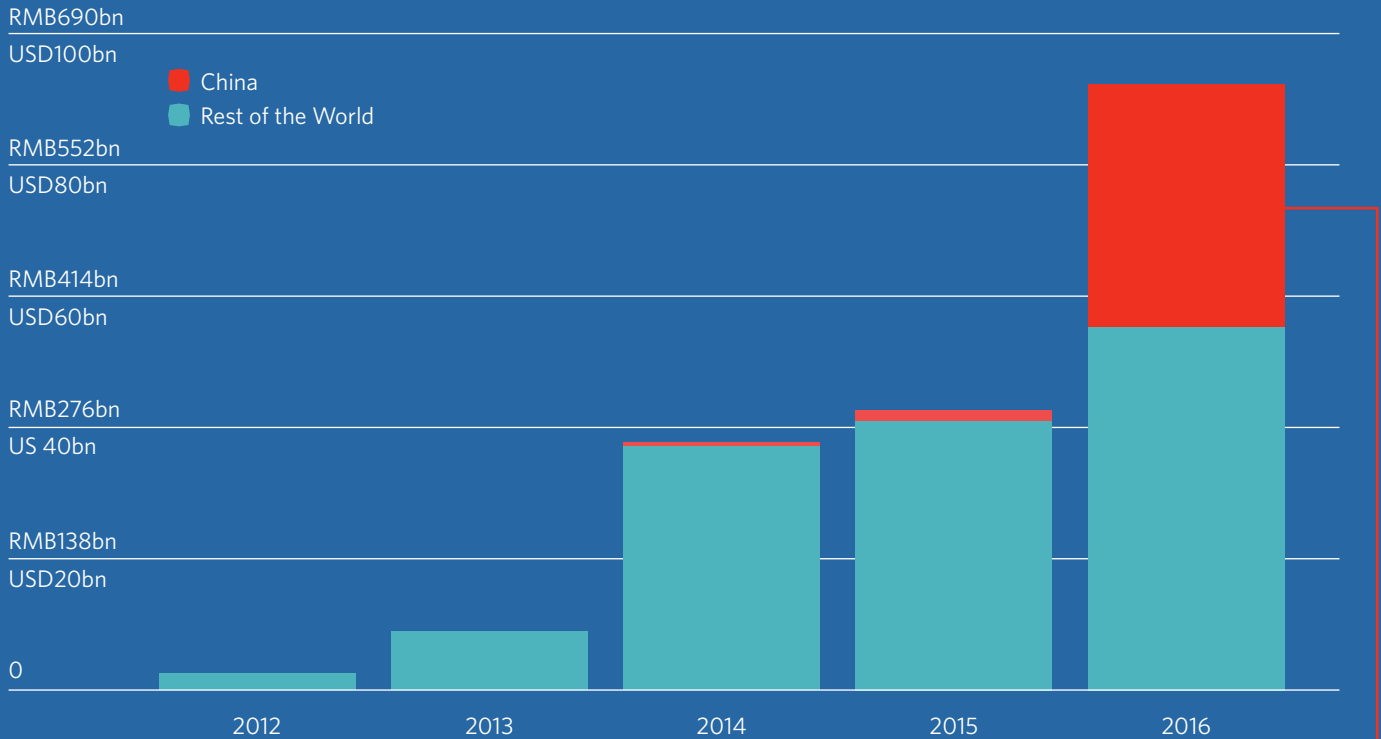
Tenor	<1 year	1-3 years	3-5 years	5-7 years	>10 years	Average
AAA	3.33	3.24	3.43	3.48	3.54	3.35
AA+		3.29	3.54			3.59
AA		4.71	4.05	4.47		4.44
Average	3.33	3.45	3.52	3.98	3.54	3.50

Detailed analysis and charts: 2016 issuer list

All issuers in 2016				
Issuer	Number of bonds	Amount issued	Issuer type	Alignment with international definitions
Industrial Bank	8	RMB 53bn	Commercial Bank	80%
Shanghai Pudong Development Bank	3	RMB 50bn	Commercial Bank	100%
Bank of Communications	2	RMB 30bn	Commercial Bank	100%
Bank of China	6	RMB 25.3 bn	Commercial Bank	100%
China Three Gorges	2	RMB 6bn	Corporate	0%*
State Grid	2	RMB 10bn	Corporate	12%
Bank of Jiangxi	4	RMB 8bn	Commercial Bank	<50%
Bank of Qingdao	4	RMB 8bn	Commercial Bank	100%
Agricultural Development Bank of China	1	RMB 6bn	Policy Bank	100%
Beijing Enterprise Water Group (China)	2	RMB 5.6bn	Corporate	100%
CECEP Group	4	RMB 5bn	Corporate	100%
New Development Bank	1	RMB 3bn	Dev. Bank	100%
Xinjiang Glodwind	3	RMB 2.8bn	Corporate	100%
Zhejiang Geely Holding	1	RMB 2.8bn	Corporate	100%
BAIC Motor Group	2	RMB 2.5bn	Corporate	100%
China Datang Renewables	3	RMB 2bn	Corporate	100%
Wuhan Metro	1	RMB 2bn	Corporate	100%
Wuxi Public Transport	1	RMB 2bn	Corporate	100%
Huaneng Renewables	1	RMB 1.1bn	Corporate	100%
BJ SPC Environmental	1	RMB 1.1bn	Corporate	<50%
BJ Jingneng Clean Energy	1	RMB 1bn	Corporate	<50%
Dunan Holding	1	RMB 1bn	Corporate	100%
Export-Import Bank of China	1	RMB 1bn	Policy Bank	100%
Guangdong Huaxing Bank	1	RMB 1bn	Commercial Bank	100%
Beijing Enterprise Water Group	1	RMB 700mn	Corporate	100%
GEM Holding	1	RMB 500mn	Corporate	<80%
Bank of Urumqi	1	RMB 500mn	Commercial Bank	100%
Jiangsu Nantong Rural Bank	1	RMB 500mn	Commercial Bank	100%
Yunnan Energy	1	RMB 500mn	Corporate	N/A
Zhejiang Jiahua Energy	1	RMB 300mn	Corporate	<50%
Poten Environment	1	RMB 300mn	Corporate	100%
Century Concord Wind	1	RMB 200mn	Corporate	100%
Jiangsu Guoxin Investment	1	RMB 200mn	Corporate	50%

* Pending outcome of the Climate Bonds Initiative's Hydropower Technical Working Group. <http://www.climatebonds.net/hydropower>

China was the world's biggest green bond market in 2016 - driving issuance around the world



- In 2016 China became the world's largest green bond market, taking just 1 year to accomplish what in other markets has taken over 5 years.
- Growth has been spurred by key policy developments and incentives put in place by the PBoC and NDRC.
- China, through these policy developments, has proven what Climate Bonds Initiative and other market players have long been saying - that policy tools are essential for the growth of green finance and the green bond market.
- China has led the way in 2016. In 2017, it needs to push to harmonise standards to facilitate even further issuance. Then, it is up to the rest of the world to follow.



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Report prepared by the Climate Bonds Initiative. Written by Bridget Boule, Lily Dai & Alan Meng with help from the Climate Bonds Initiative team.
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