ROADMAP FOR CHINA: **SCALING UP GREEN BOND MARKET ISSUANCE**

Climate Bonds Initiative

IISD International Institute for Sustainable Development

Foreign & Commonwealth Office

Contents

This issues paper contains the following sections:

The foundations for rapid growth in Chinese green bond issuance have now been established

Official green bond guidelines have been developed, in the last 6 months the first handful of pioneering Chinese issuers has entered the market and final approval has been granted to the 13th Five Year Plan[1] with its increased emphasis on environmental issues and green development.

The next step is to build on these foundations to accelerate green bond issuance from Chinese issuers

This paper provides a roadmap for China to scale up the issuance of green bonds in the domestic market and develop the overseas RMB denominated-market by identifying and addressing the current challenges that limit green bond issuance.

The roadmap sets out actions that can enable an increase in the issuance of green bonds in the near term, as well as actions that will ensure a steady stream of projects suitable for green bond financing will be available over time.

This is the second in a series of four 2016 discussion papers issued by the Climate Bonds Initiative and the International Institute for Sustainable Development (IISD) on prospects for the Chinese green bond market.

The four papers are:

- Green Bond Guidelines (Paper 1)
- Roadmap for China's Green Bond Market-Scaling up Issuance (Paper 2)
- Roadmap for China: Using green securitisation, tax incentives and credit enhancements to scale green bonds (Paper 3)
- Extending the Joint Leadership of China and the UK on Green Finance (Paper 4)

This 2016 series of discussion papers follow the March 2014 "*How to Grow Green Bonds in China*" report[2] and the "*Growing a green bonds market in China: Key recommendations for policymakers in the context of China's changing financial landscape*" report of March 2015.

Structure of this paper

Section 1 provides an introduction to the current foundation for green bond issuance in China.

Section 2 describes current challenges for green bond issuance.

A roadmap of relevant actions for China to boost green bond issuance based on international experience is presented in Section 3.

The conclusion is outlined in Section 4.

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1. Introduction: building on the green bond foundations

China's green transition requires a large volume of private capital

The rapid economic growth achieved in China over the last few decades has primarily been reliant on coal-based energy consumption, road-based transportation and a carbon-intensive industrial structure. This had led to China now facing a vast number of domestic environmental issues, including air, water and soil pollution, along with the growing impact of climate change. China's government is recognising that there is a need for China to change its high-pollution and energy-intensive growth model and transit towards a greener and sustainable economic model.

An annual investment of at least RMB 2-4 trillion (USD 320-640 billion) will be required to address environmental issues and climate change.[3] China's central bank, the People's Bank of China (PBoC) has made a clear statement that public investment alone is not sufficient to meet this investment requirement: public funds would only contribute 10% to 15% of the required funding, with the private sector expected to be by far the largest source of capital for the green transition, contributing 85% to 90%.[4]

Green bonds are proving successful in tapping into private sector capital

Labelled green bonds are bonds of which the proceeds are used for green assets and projects and are labelled accordingly. They primarily fund climate change mitigation and adaptation projects and are increasingly considered an ideal vehicle for accessing private sector capital. Green bond issuance has been growing rapidly in recent years, from USD 11 billion (RMB 72.4 billion) of issuance in 2013, to USD 36.8 billion (RMB 242 billion) in 2014 and USD 41.8 billion (RMB 275 billion) in 2015.

In 2016, China expects to issue RMB 300 billion (USD 46 billion) of green bonds.[5]

The foundations for rapid growth in Chinese green bond issuance have been established

Official green bond guidelines have been established in China

China has established official guidelines for green bond development in order to build a robust structure that ensures strong green credentials of the labelled bonds and to reduce the risk of inappropriate environmental claims and fraud:

- In December 2015, PBoC established regulations for green financial bonds, including guidance on, and requirements for green definitions, management and use of bond proceeds, and reporting.[6] PBoC is the regulator overseeing the interbank bond market, which accounts for 93% of outstanding bonds in China.
- China's macroeconomic management agency, the National Development & Reform Commission (NDRC) also set guidelines for green corporate bonds, providing a list of qualifying green projects and proposals for policy incentives.[7]
- Shanghai Stock Exchange set up rules for its green bond pilot program[8] for listed companies and private placement from Small and Medium Enterprises (SME), which are similar to the requirements from PBoC.
- Other regulatory authorities such as the National Association of Financial Market Institutional Investors (NAFMII) and the China Securities Regulatory Commission (CSRC) are also working on green bond guidelines for other bond types in China.

These official guidelines set the foundations for Chinese issuers to bring green bonds to market, and in the first months after release have seen a significant amount of issuance with USD 7.83 billion (RMB 51.8 billion) of green bonds issued in the first quarter of 2016.

China's interbank market opened to foreign investors in February 2016

The potential for green bond market growth in China are further boosted by the opening of the interbank market to foreign investors, announced in February 2016.[9] Institutional investors outside of China, in the US and Europe in particular, are increasingly seeking investments with positive environmental impacts, including green bonds, and now have improved access to investing in China. The recent regulatory changes are a significant step in the gradual opening of China's interbank market to international investors, a process that has been on-going since 2010.[10]

The interbank market, regulated by the PBoC, accounts for the vast majority (93%) of China's debt market.[11] The announcement in February 2016 removed all quotas for qualifying foreign investors. Qualifying foreign investors include most real money institutional investors, including insurance companies, pension funds, most commercial banks, fund/asset managers, endowment funds and charities.[12]

The process for foreign investors to register with the Chinese authorities to be formally approved for investments was also simplified.[13] Foreign hedge funds and retail investors are not eligible to invest.

Next step: scaling green bond issuance in China

With the foundations for rapid growth in Chinese green bond issuance established, the next step for China is scaling up the issuance of green bonds. Enabling a wide range of issuers to enter into the green bond market and issue at scale is essential for green bonds to play a material role in helping meet China's environmental investment needs.

2. Challenges to scaling China's green bond issuance

A lack of green bond demonstration issuance across all sectors

Initial green bond demonstration issuance from well-known and trusted entities provide good examples for other potential issuers to follow. Initial demonstration issuance of green bonds from Chinese has occurred in 2015 and 2016, however, ensuring that demonstration issuance occurs across different sectors and types of issues remains a challenge to scale the market. To date, the vast majority of green bond demonstration issuance in China has been from large banks.

There is a lack of awareness of how to issue green bonds

Many potential issuers have limited knowledge of the green bond issuance process

To achieve the desired scale of issuance, one challenge is to encourage issuers that currently have portfolios of suitable green projects to access the green bond market to finance their projects. There is a need for capacity building amongst issuers in the present early stage of China's green bond market development. To increase interest in issuing green bonds, issuers may need to have a better understanding of the benefits and differences of green bonds compared to standard bond issuance.

Potential issuers may not be aware that green bonds can be used to refinance existing green projects or assets

Funds raised from green bond issuances can be allocated to new projects or be used to refinance existing green assets. The main role of bonds in the financial markets is generally to refinance existing loans, which implies refinancing should, over time, account for the largest share of the green bond market.

Awareness amongst potential issuers that green bonds can be a tool to refinance pools of existing green projects or assets, and that many issuers have immediate potential for green bond issuance may be poor. This information gap is a potential hindrance to short term market growth. For example, large existing portfolios of green loans in China's major banks (RMB 5.72 trillion; USD 920 billion) indicate immediate potential for green bonds in China provided all potential issuers are made aware of the opportunity.

Identifying a future pipeline of green projects suitable for green bond issuance

In the short-term, the challenge is to identify which projects within established and announced infrastructure project pipelines qualify as green. For example, in December 2015, NRDC announced a list of infrastructure projects for public-private partnerships, but it's not yet clear which of these planned infrastructure projects can be financed through green bonds.

One future challenge for policy makers in China is to integrate the identification of green assets earlier on in the process of infrastructure project pipeline development. This would help improve investor transparency around upcoming green investment pipelines and help ensure that a sufficient amount of green infrastructure projects are developed to meet environmental targets.

Limited early stage involvement of international investors in the development of pipelines of specific green projects in China could also hinder foreign investment in these projects in the future. Limited clarity about upcoming green project pipelines among the international investor community in terms of number and type of potential projects available makes it difficult for investors to plan long term and build internal commitment.

If international investor capabilities to invest in green bonds are not supported by robust planning, transparency and commitment to market development, capital flows may be weak or intermittent. Chinese issuers and government entities will then have less certainty around to what extent international investors are ready to provide capital for the green projects being developed, creating a negative cycle.

Limited liquidity in China's green bond market

When the market liquidity is low, investors find it difficult to match investment demand with supply and therefore their transaction costs will increase.[14] Low liquidity would be a barrier for investment in green bonds.

Currently, the green bond market in China is still a nascent market. The transaction level and therefore the market liquidity is comparatively lower than the international green bond market. A higher level of market liquidity could help reduce the transaction cost and make it easier for investors to find investment opportunities and for issuers to raise capital with lower cost.[15]

Additional challenges to enabling a wider range of issuers and projects

Enabling a wide range of issuer types and projects to access the green bond market is important to facilitate scale, as well as diversification. The significant amount of small-scale investments and lack of aggregation mechanisms in the green investment space is a challenge to bond market access for these projects. Some potential issuers will find it difficult to access the green bond market due to low credit ratings.

In China, this is particularly a challenge for non-state-owned entities. These challenges and solutions are covered in-depth in a separate paper (Paper 3), which looks at instruments and incentives for green bonds.

3. Roadmap for China to scale green bond issuance

Table 1 An overview of roadmap for China to scale green bond issuance

Challenge	Action area	Actions	Actors
Many potential issuers have limited knowledge of the green bond issuance process	(A) Improving potential green bond issuers' knowledge of the green bond issuance opportunity	Encourage strategic green bond demonstration issuance from public entities and large commercial players Market education activities for capacity building Explore the potential of back-labelling bonds that could qualify as green that have already been issued but not yet labelled	Domestic development banks (policy banks); multilateral development where China has a strong role such as AIIB; large commercial banks; municipalities and city-linked entities such as utilities; green banks; Ministry of Finance Development banks, stock exchanges are examples PBoC and other bond market regulators could explore in collaboration with partners
Lack of a concrete long-term pipeline of green projects to facilitate scaling green bond issuance over time	(B) Building a long-term pipeline to facilitate scaling green bond issuance over time	Identify a priority list of specific strategic green projects Ensure financial viability of green projects Ensure pipeline transparency for investors	Ministry of Finance and NDRC Ministry of Finance and NDRC Ministries, development banks, institutional investors (domestic and international)

(A) Improving potential green bond issuers' knowledge of the green bond issuance opportunity

Action: Encourage strategic green bond demonstration issuance from public entities and large commercial players

Strategic green bond issuance from trusted and well-recognised entities can play an important role in leading the initial development of China's green bond market. Such demonstration issuance can help engage investors and educate them about the asset class with greater comfort, since the issuer would be a high profile entity. Demonstration issuance is also important to creating early momentum and building market confidence.

It is important to note that the pool of potential issuers is vast, as the green credentials of the green bonds are based on the specific assets the funding is earmarked for, rather than the green credentials of the bond issuer as an entity. This means any issuer with green projects can issue a green bond.

Several waves of demonstration issuance can have a surge effect, each time encouraging potential issuers to test the market and providing investors with additional opportunities. Each surge contributes towards more depth and liquidity, needed to reach the objective of achieving market scale in a relatively short time period.

Chinese issuers have already come to market with several green bonds in 2015-2016 providing the first demonstration issuances to the market (see Table 2).

More is planned in the near future. Bank of Zhengzhou is waiting for approval to issue RMB 5 billion (USD 770 million) of green bonds. Bank of Communications has received approval for a green bond issuance quota of RMB70bn (USD10.8bn), the largest green bond issuance quota approved per March 2016.[16]

Further demonstration issuance of green bonds in China can come from a range of entities, both public and private.

Demonstration issuance from public entities also plays an important signalling effect to other potential domestic issuers and international investors that the government is committed to developing green bond markets as part of its strategic financial response to address environmental and climate issues.

International experience: development banks and municipalities have provided green bond demonstration issuance

In the international green bond market, development banks and municipalities have been the most active public entities in providing demonstration issuance of green bonds.

Development banks

Development banks, both domestic and multilateral, represent key strategic issuers that can provide important demonstration transactions for green bonds. Their established status and generally high credit ratings provide investors with an introduction to the green bond asset class without being exposed to significant financial risk.

The European Investment Bank (EIB) issued the first-ever labelled green bonds in 2007, and as of March 2016 they have issued USD 14.6 billion of green bonds, making EIB the largest issuer in the market. The World Bank and the IFC have also been pioneers in creating the green bond market, issuing USD 8.5 billion and USD 4 billion by March 2016, respectively.

All three development institutions have credit ratings of AAA, making their green bonds safe investment-grade bonds that can introduce institutional investors to green projects without being exposed a significant level of financial risk.

Domestic development banks that have issued green bonds include the German development bank KfW, who issued 4 green bonds between July 2014 and January 2016 for a total of USD 7.7 billion.

In emerging economies, the Mexican development bank NAFIN provides an example of a successful demonstration issuance of green bonds. NAFIN issued Mexico's first green bond, which was Climate Bonds certified to give the market comfort of its green credentials, in October 2015.

Table 2: Summary of green bonds issued by Chinese entities as at March 2016

Domestic Market	Dim Sum market (Hong Kong)	Overseas Market
Industrial Bank of China, RMB 2.6 billion (USD 0.4 billion) green ABS Industrial Bank of China, RMB 10 billion (USD 1.5 billion) Shanghai Pudong Development Bank, RMB 35 billion (USD 5.3 billion) Bank of Qingdao, RMB 4 billion (USD 0.6 billion) Concord New Energy RMB 200 million (USD 30.9 million)	Xinjiang Goldwind Science and Technology USD 0.3 billion	Agricultural Bank of China USD 1 billion with one RMB-dominated tranche of RMB 0.6 billion (USD 91.2 million)
Total issuance RMB 51.8 billion (USD 7.83 billion)	**Total issuance** RMB 2 billion (USD 0.3 billion)	**Total issuance** RMB 6.6 billion (USD 1.0 billion)

Municipalities and municipality-linked entities

Municipalities, cities, and city-affiliated entities such as utility companies can be important strategic issuers of green bonds at the sub-sovereign level. Green bonds can be an important tool for municipalities and cities to raise finance to meet their increasing climate infrastructure requirements. Cities are key players in addressing the climate-friendly infrastructure challenge, accounting for 70% of emissions – and this share is growing as the world becomes increasingly urbanised in the next decades, especially in emerging markets.[17]

Issuance of green city and municipal bonds in the green bond market has been most significant in the US and Europe, with one Green City Bond issued in emerging markets.[18] The City of Johannesburg in the Republic of South Africa (RSA) issued the first emerging market green city bond in June 2014, with proceeds of the bond allocated to renewable energy, waste-to-energy and low-carbon transport.

In February 2016, Swindon Community issued the first UK council green bond for a solar farm project, which allows direct investment from local residents.

Importantly, green bonds can also be issued by city-affiliated entities, such as utilities.

New York's Metropolitan Transportation Authority (MTA) issued its inaugural green bond of USD 782.5 million (RMB 5.15 billion) in February 2016 to raise funds for upgrades to its electrified rail assets and supporting infrastructure. The bond is certified against the Climate Bonds Standard's Low Carbon Transport Criteria, giving investors confidence in the environmental credentials in the use of bond proceeds. Another example is DC Water, the municipal-linked water utility for Washington DC in the US, who issued USD 350 million of labelled green bonds in 2014, and USD 100 million in 2015.

Green banks and sovereigns

Green banks and sovereigns can also issue green bonds; however, as yet there are no examples of issuance from these players internationally.

China has the potential to be a pioneering issuer in these segments of the market.

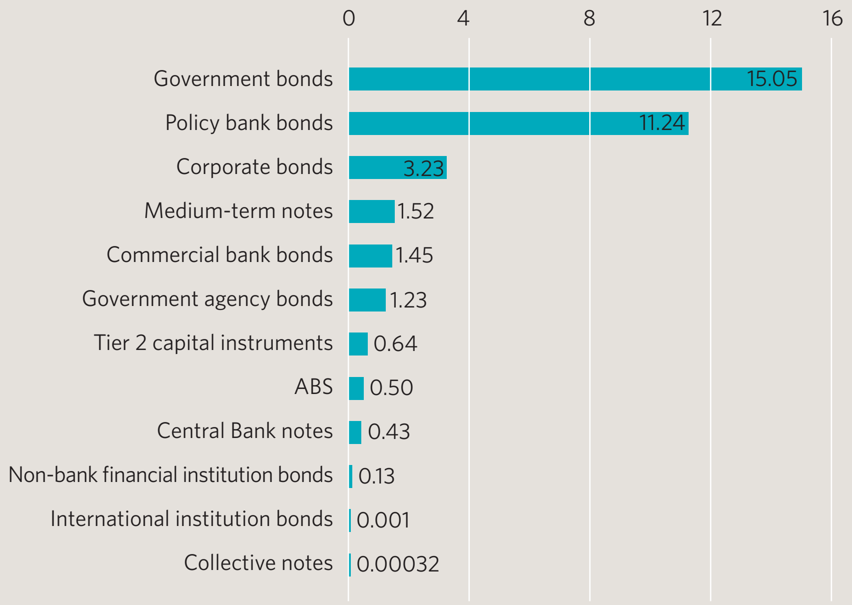
Roadmap for China: wide range of entities well placed for green bond demonstration issuance

The current breakdown of bond issuers in the Chinese market provides guidance for what entities are best suited to provide green bond demonstration issuance.

The largest share of bonds issued in the Chinese market are issued by financial institutions and corporates (Figure 1), although the majority of bond issuing entities in each of these categories are State-Owned Enterprises (SOEs) .

The fully state-owned policy banks account for the largest share of bond issuance from financial institutions, and bond issuance from SOEs make up the largest share in the corporate bond segment of the market.

Figure 1: The size of Chinese bond types outstanding as of February 2016 (RMB trillion)[19]



Large commercial banks: immediate potential for refinancing green credit

In China, big commercial banks that hold a large amount of green loans on their balance sheets could also play a significant role in providing demonstration issuance to the green bond market. These banks could issue green bonds to refinance their outstanding existing green loan portfolios.

Using green bonds to refinance green assets or projects is equally as accepted by investors as using funds raised from green bonds for investment in new projects or assets. The primary role of bonds in the financial markets is generally to recycle existing capital through loan refinancing of existing loans. It is expected that this would be replicated over time, the implication being that refinancing should eventually account for the largest share of the green bond market.

The immediate potential for green bond issuance against outstanding green loan portfolios in China's largest commercial banks is evident when examining existing loan profiles.

Under the China Banking Regulatory Commission (CBRC)'s green definition for green credit there was RMB 5.72 trillion (USD 920 billion) of outstanding green loans in the largest 21 Chinese banks in 2014.

This pool of green loans would qualify for green bond issuance under the official guidelines from PBoC, as the green definitions endorsed by PBoC's for qualifying green bond projects is aligned with the CBRC's definition of green credit.

In October 2015, the Agricultural Bank of China (ABC) issued China's first RMB-dominated green bond in the London-markets. The first green bonds in Chinese market were issued by commercial banks in the domestic market in January 2016, when Industrial Bank of China (CIB) and Shanghai Pudong Development Bank (SPDB) issued green bonds for a total amount of RMB 30 billion (USD 4.5 billion) in China's domestic green bond market.[20] In March 2016, Bank of Qingdao (BQD) issued green bonds as well. Industrial and Commercial Bank of China (ICBC) also plans to come to market later in 2016. They provide examples for China's other commercial banks to follow.

Domestic development banks (policy banks)

China's domestic development banks (called policy banks) are also well placed to provide demonstration issuance of green bonds to the Chinese market alongside the large commercial banks.

There are three main policy banks in China: China Development Bank (CDB), the Export-Import Bank of China (also known as the China Exim Bank) and the Agricultural Development Bank of China (ADBC).

Strategic green bond issuance from policy banks can provide high investment-grade bonds, very valuable in the early stages of the market to provide comfort to investors as they are becoming familiar with the green bond concepts. The policy banks are also of sufficient size to issue larger benchmark sized bonds, which, at the early stages of the market is an important factor in creating liquidity for investors. Already, China's policy banks are significant players in the traditional bond market; accounting for 27% of total outstanding bonds in China's domestic market per 2014 (RMB 9.7 trillion; USD 1.6 trillion).[21]

The China Development Bank (CDB) is the leading player in the green finance space, and the bank has large volumes of green loans on its books that could be refinanced through green bond issuance. CDB is the largest development bank in the world and has already invested USD 80 billion in renewable energy projects.[22] It also has massive investments in railway, agriculture, forestry and water resources through loans.[23]

Other policy banks in China, especially the Agriculture Development Bank of China (ADBC) which also has invested in water infrastructure, agriculture, forestry and land use,[24] could participate in green bond demonstration issuance. It is relatively easy for these policy banks to identify green assets within their existing portfolios, and issue green bonds to refinance these assets.

Non-financial state-owned enterprises (SOEs)

Alongside large commercial banks and the development banks SOEs are also well positioned to undertake early stage issuance in the green bond market. Given the strategic importance and size that many SOEs occupy, green bond issuance would be underpinned by their implicit guarantees from the central government, a factor which enhances their credit ratings and adds to investor confidence. At early stage market development high investment-grade bonds are crucial to providing comfort to investors and spreading familiarity with green bond concept amongst other potential market participants on both the buy and sell side.

Strategic green bond issuance from SOEs is another plank in building market momentum. As many SOEs are of sufficient size to issue larger benchmark sized bonds, this contributes directly to market liquidity. The diversity of SOEs as potential issuers is also a positive factor in market depth and diversity due to the widespread scope of sectors that green bonds could be sourced from.

Municipalities, cities and city-affiliated entities, such as utilities and transport companies
China is encouraging the green development in cities: The State Council of China has published policy for green urbanisation.[25] The Green Finance Committee[26] is promoting the establishment of green financial systems in pilot cities, including the development of green financial institutions, green financial products and services, and green finance supporting policies.

The increasing policy momentum for green urbanisation presents an opportunity for green bond issuance to finance this shift.

Green bond issuance for green urban infrastructure investment can come directly from municipalities and cities, since the 2014 and 2015 reforms now enable provincial-level governments, including some municipalities, to access the bond market directly. The overall bond market for local governments bonds is expected to grow rapidly, fuelled by a debt-swap programme in combination with allowances for new direct bond issuance from local governments.

The growth of a significant market for local government bonds indicates a specific green local government bond market sector could be of substantial scale. Significant issuance here is expected to come later in the wider green bond market development trajectory, after the market has been started by the large commercial banks and policy banks.

City-affiliated entities, such as utilities and urban transport companies, are also potential major green bond issuers in China.

Together, these different channels create solid foundations for green bond issuance at the city-level in China.

However, it must be acknowledged that sub-national entities might not be well positioned for immediate bond issuance and could benefit from specific measures to plan and prepare for entry into the market and to support initial issuance.

Support measures could include:

- Capacity building to ensure robust fiscal and debt management policies and practices,
- Governance standards to ensure adequate and transparent financial management and accounting practices;
- Credit enhancement from governments / multilateral institutions;
- Potential provision of tax incentives for an initial period to foster market development.

Some examples of these efforts include World Bank's City Creditworthiness Initiative[28] and Green City Bond Coalitions[29], both of which help to build capacity of sub-sovereign issuers.

Public-Private Partnerships (PPP)
As a complement to direct bond issuance from local governments, a complimentary source of bond issuance from local governments could arise from PPPs. Already, the PPP model[30] figures prominently in both discussion and current practice around infrastructure investment in due to municipalities now barred from issuing debt through Local Government Investment Vehicles. Xinhua in 2015 reported the move from LGIVs to municipal bonds will still leave an infrastructure investment gap estimated at RMB1.4 trillion.[31]

PPPs can help to fill this gap, as municipalities are allowed to issue special purpose bonds for profitable public projects such as PPPs, as a complement to issuing ordinary municipal bonds for non-profit public projects.

Box 1 GFC's framework of establishing local green financial systems in China[27]

Barriers:
Awareness of environmental issues, local capabilities to develop and coordination between different policy support at local and central level, and coordination with financial and industrial policies.

Framework:
1. Organisation – bringing traditional financial institutions into lending to green by establishing green branches or establish new institutions specific for green (green banks) at the local level as an alternative to a national green bank.

And establish local level green fund by local governments; they can capitalise through green bond issuance.

2. Green financial products and services: green credit, securitisation, and insurance, green project database at the city level, and green credit rating

3. Policy support system at the local: tax incentives, interest discount, and currency risk support.

PPPs are particularly suited for infrastructure projects and public services that fall under government responsibility and are manageable as market-based operations.[32]

A variety of projects including waste treatment facilities, water reticulation and conservation, rail and urban transit networks may be suitable. Similarly, to China's bond market as a whole, transparent regulations governing infrastructure investment are essential for providing a stable framework for PPPs.

However, the sheer scale of PPPs the government envisages rolling out to finance infrastructure is massive. In December 2015, NDRC announced a list of 2,125 projects to be funded and constructed through public-private partnerships (PPP), with a total value of RMB 3.5 trillion (USD 531.9 billion).[33] It is an indicator of the size of opportunity if green PPPs were to be adopted on a widespread basis.

Hence, the opportunity for green bonds from PPPs is significant and deserves specific attention as does the opportunities to incorporate initiatives on the NRDC list into planning and development of long tail green project pipelines.

Green Banks

China has proposed to establish a national green bank, the China Ecological Development Bank, which would only provide financial services for green industry. This green bank could, over time, also be a prominent issuer of green bonds, taking advantage of its government-backed credit rating.

The establishment of this green bank is still in its formative stages: it was one of the recommendations included in the policy proposals from Green Finance Task Force of the PBoC and the UNEP Inquiry in April 2015. The proposals explicitly open up the opportunity for future green bond issuance to capitalise the prospective green bank.[34]

China is also considering establishing local green banks as a part of its plan to develop local green financial systems, building on the efforts of some local commercial banks in China that have already developed green financial products and services.[35] These local green banks would also be potential green bond issuers.

Local green bank branches, of which the development is also within the local green financial system development framework, can also help develop local green bond market. Similar to the Science and Technology Bank Branches set up by local banks, who provide financial services specifically for science and technology companies, local green bank branch could also be established to provide financial services for green industry only.

These branches could raise capital through green bond issuance, which help develop the local green bond market.

Sovereign issuance of green bonds at the national level

The national government is one of the largest established issuers of bonds in China, and could serve as a strategic issuer of green bonds. This would entail the Ministry of Finance issuing a sovereign bond, whose proceeds would be earmarked to finance a specific green program. Government bond issuance is regulated jointly by PBoC, China Securities Regulatory Commission (CSRC) and the Ministry of Finance. PBoC has published green bond guidelines, and CSRC are also developing green bond guidelines.

The release of CSRC's guidelines may over time be an enabler for government green bond issuance.[36]

Action: Market education activities for capacity building

This includes educating issuers about the benefits and challenges of green bond issuance compared to standard bond issuance and how to issue.

Chinese issuers need step-by-step guidance on green bond issuance, and how the process may differ depending on whether issuance is planned for the domestic or international market.

Potential green bond issuers may also need assistance to easily navigate the official green bond guidelines published by PBoC, NDRC and Shanghai Stock Exchange. If the issuer is aiming to attract international capital, they may need additional support in navigating international green bond standards and guidelines, such as the Climate Bonds Standard and the Green Bond Principles.

Multilateral development banks, which have been active in the green bond market, can play a role here.

For example, the International Finance Corporation (IFC) is developing a Green Bond Advisory Package to enable the Green Bond Principles to be adopted in a credible way in emerging markets.

The Green Finance Committee, who has already been undertaking research on green bond development including green definitions and supporting policies, could play a role in educating issuers about how to issue green bonds. This could also be done through the cooperation with international organisations who have experience in the global green bond market, such as the Climate Bonds Initiative. Regulators such as PBoC and NDRC could also provide more guidance on green bond issuance.

Action: Explore the potential of back-labelling bonds that could qualify as green that have already been issued but not yet labelled

Identifying and labelling bonds outstanding in the market, which are not yet labelled but comply with the definitions for green used in the green bond markets, could dramatically increase the overall market size and rapidly increase liquidity of the green bond market.

The market liquidity refers to the abilities of the buyers and sellers of securities to transact efficiently at a lower cost and with a limited price impact.[37] When the market liquidity is high, investors will find it easier to seek for investment opportunities and thus their transaction costs will decrease. In an illiquid market, investors may require higher liquidity risk premium, thus higher interest rate, as a compensation for difficulty or cost they will encounter for selling their investment.[38] This will become barriers for green bond issuance. Therefore, the market liquidity is important to scaling up the green bond market.

There is no relevant international experience in this area; China has the potential to pioneer this strategy.

Roadmap for China

PBoC is exploring the possibility of back-labelling bonds that were not labelled as green at issuance, but that would comply with Green Bond Endorsed Project Catalogue, the green definitions endorsed by PBoC. PBoC could collaborate with partner organisations who already have green bond expertise to help identify which bonds in the market could be back-labelled as green based on this methodology.

For example, outstanding bonds issued by China Railway, which totals RMB 1.1 trillion (USD 171.5 billion),[39] are currently not labelled as green, but would qualify as green bonds based on the PBoC-endorsed Green Bond

Project Catalogue: all rail projects are included in this catalogue. Rail projects are also in line with the international Climate Bonds Standard.

PBoC could also delegate other organisations such as research institutions to work on back-labelling. International organisations who are experienced in labelling green bonds such as the Climate Bonds Initiative could also play a role through the international cooperation.

(B) Building a long-term pipeline to facilitate scaling green bond issuance over time

Action: identify a priority list of specific strategic green projects

Having a robust pipeline of green projects suitable for green bond financing is a foundational action to enable scaling of China's green bond market over time. This requires translating high-level targets and strategic priority investment areas, such as low-carbon transport and renewable energy, into specific projects.

Roadmap for China

In the short-term, China could firstly identify which projects in established infrastructure project pipelines qualify as green

In the infrastructure investment space more broadly, China has developed a pipeline of specific infrastructure projects. NDRC has established a list of 2,125 projects to be funded and constructed through public-private partnerships (PPP), covering water conservancy, transport, municipal facilities, public services, and ecological environment. It is however not clear which of these projects qualify as green under official green guidelines.

The Green Finance Committee has developed a detailed Catalogue of which types of projects are considered green, that is endorsed by the PBoC for green bond issuance.[40]

This Catalogue sets the foundations for the market to identify which assets and projects in established project pipelines – such as the pipeline of public-private partnerships announced by the NDRC - qualify as green. This is a necessary step to identifying a pipeline of green assets and projects suitable for green bond issuance in China over time. Work is required to implement this identification process in practice.

To do this, the Green Finance Committee, or another entity, could examine the current pipeline and apply the criteria of the Green Bond Endorsed Project Catalogue to identify and prioritise qualifying green projects.

In the future, the identification of green assets can be integrated at earlier stages the process of infrastructure project pipeline development

China has already established processes for translating high-level infrastructure development targets into a specific listing of investable projects at various stages of development as a measure highlight to the market where the investment opportunities will be and what they will look like. This pipeline development process also includes projects that qualify as green, based on the official green definitions developed by the Green Finance Committee. Future pipeline development processes could identify at an early stage which projects comply with these definitions of green, so that a specific green project pipeline can be presented to market players.

To do this, the NDRC and Ministry of Finance, who are in charge of developing new pipelines of specific infrastructure projects could undertake a comprehensive review of the Green Bond Endorsed Project Catalogue from the beginning, to develop a distinct pipeline of qualifying green projects. This would provide transparent guidance to the market on the future potential for green investment, including green bonds.

For example, the Green Bond Endorsed Project Catalogue sets out public transport projects as a green investment area. The next phase would see China to develop a list of specific public transport projects they want financed to provide the private sector with an indication of the size and nature of the investment opportunities and disclose to the market that these projects are green and suited for green bond financing.

China can also access technical assistance to improve planning and pipeline development in green infrastructure, including the Green Climate Fund's Program for Readiness and Preparatory Support, the Global Green Growth Institute (GGGI), and UNEP PAGE.

Action: ensure financial feasibility of green projects

Financial viability is a crucial element to ensure project attractiveness to investors. This is not a policy action that is specific to the bond market, but a critical upstream financial assessment in bond financing decisions. Revenue sources of a project are a key consideration and may require support from the government in terms of revenue guarantees to complement and cover any shortfalls in market demand.

An example of revenue support for infrastructure projects in the international market is the Colombian government provision of availability payments to toll-road projects, to offset shortfalls in user fees as part of its on-going toll road development program. Similar revenue support mechanisms can be replicated in the low-carbon transport space to boost financial feasibility of green infrastructure projects, where required.

There are also options for governments to ensure financial viability through other channels such as increased collaboration between planners, policymakers, the private sector and investors. An interesting example of such a mechanism exists in the low-carbon transport sector through land-value capture (Box 2).

Roadmap for China

In China, NDRC has proposed local governments to provide investment subsidies and guarantees to green project bonds.[41] For example, guarantees can be offered to issuers when their projects revenues cannot cover the total investment, and repayment of the bond. Local governments are also encouraged to set up green bond guarantee funds to provide guarantees specifically for green bond issuance.

Box 2 Land value capture can improve the financial viability of low-carbon projects

Public transport, such as metro systems, bus rapid transit and rail, remains underfunded because it is difficult to capture the full value of these developments in the revenue streams of projects. Passenger payments are one source of revenue for transport projects, but in addition, one of the largest financial benefits of increased public transit is from its land value premium.[42] Access to public transit is an immediate boost to adjacent land values, which is a positive externality usually captured by private actors.

It is crucial to find relevant strategies so that a share of the value can be captured by the transport project itself rather than being absorbed only by property developers. Land value capture tools include tax increment financing districts, development charges, development rights, and joint development. For example, development charges can be raised by additional taxation on private developers to help finance transit-oriented development.[43]

In Hong Kong, Mass Transit Railway Corporation (MTR) is an example of a company that can finance public transport through value capture from property near metro lines. When MTR began in 1975; the Hong Kong government sold or gave land to MTR with the understanding that the revenue from property development would help support the transport system without public subsidy. MTR is already working to build on its value capture transportation model in mainland China.

Action: Ensure pipeline transparency for investors

Making the pipeline of green projects deals clear to investors has benefits. Investors are incentivised to develop stronger internal capabilities for investing in green projects if they know there is a strong pipeline of attractive green bond investment propositions in various stages of a development and planning schedule for coming to market. As investors take up initial issuance and look to the potential for larger future commitments, this in turn provides an incentive for green project planners to scale up the pipeline of investable projects. Planners have confidence with the knowledge that there is strong investor interest and a growing pool of participants on the buy side all with a level of demand for their projects.

Roadmap for China: explore joining the Green Infrastructure Investment Coalition (GIIC)

One potential pathway for China to test demand, to begin the first steps in developing pipelines against commitments and match projects directly with international investors would be to join the Green Infrastructure Investment Coalition.

The Green Infrastructure Investment Coalition (GIIC) is designed to initiate collaboration at a national and international level between institutional investors, governments and development banks on green infrastructure pipelines.

Established in 2015, the Coalition is brought together by the Climate Bonds Initiative, PRI, UNEP Inquiry and the International Cooperative Mutual Insurers Federation (ICMIF).

The aim of the Coalition is to bring together investors, governments and development banks to help increase the flow of institutional investor capital to green infrastructure investments around the world.

The primary activity of the Coalition will be to undertake forums and facilitative events where stakeholders could discuss government green investment plans, including specific pipelines being developed by State Owned Entities (SOEs), review emerging investment green bond market opportunities and jointly understand market scale, trends and potential developments.

Participants could:

- Better understand the forward pipeline of green infrastructure investments;
- Examine barriers to capital flows and propose solutions
- Shape the capital market instruments needed to ensure capital flows.
- The Coalition will also support investors to review asset allocation strategies to make sure they will be able to take advantage of the huge deal flow on the horizon.

In China, potential participants include government, financial market regulators and carbon emission exchanges who are close to corporates with green assets and projects. For example, Shanghai Municipal Finance Bureau is considering joining.

Joining the GIIC would bring about increased interaction and engagement involving major international investors, deepen direct relationships with potential Chinese issuers and increase overall transparency in the Chinese green bond market.

The importance of the engagement, review of market trends and transparency factors inherent in the GIIC process cannot be over emphasized when seeking to rapidly grow a green bond market and attract significant levels of international capital over relatively short timeframes.

To successfully accelerate the establishment a liquid, robust market requires an interactive stakeholder process that the GIIC concept is uniquely placed to provide.

4. Conclusion

The foundations for rapid growth in Chinese green bond issuance have been established

Official green bond guidelines have been established in China

China has established official guidelines for green bond development in order to build a robust structure that ensures strong green credentials of the labelled bonds and to reduce the risk of inappropriate environmental claims and fraud.

China's interbank market is opening to foreign investors

The potential for green bond market growth in China are further boosted by the opening of the interbank market to foreign investors. The PBoC announcement in February 2016 removed all quotas for qualifying foreign investors. Institutional investors outside of China now have improved access to investing in China.

Next Step for China: scaling up the issuance

With the foundations for rapid growth in Chinese green bond issuance established, the next step for China is scaling up the issuance of green bonds. Enabling a wide range of issuers to enter into the green bond market and issue at scale is essential for green bonds to play a material role in helping meet China's environmental investment needs.

The main challenges to scaling green bonds in China

Limited knowledge of the green bond issuance

To increase interest in issuing green bonds, issuers may need to have a better understanding of the benefits and differences of green bonds compared to standard bond issuance.

Lack of a concrete long-term pipeline of green projects to facilitate scaling green bond issuance over time

In the short-term, the challenge is to identify which projects within established and announced infrastructure project pipelines qualify as green. Future challenges include the identification of green assets and involvement of international investors at the early stage of infrastructure project pipeline development.

Roadmap to scale green bond issuance in China, based on international experience

(A) Improving potential green bond issuers' knowledge of the green bond issuance opportunity

Encourage strategic green bond demonstration issuance

Green bond demonstration issuance can help engage investors and educate them about the asset class with greater comfort. In China, there are wide range of entities well placed for green bond demonstration issuance, including: large commercial banks; domestic policy banks; non-financial state-owned enterprises; municipalities, and city-affiliated entities; Public-Private Partnerships (PPP); local green banks; and national government.

Market education activities for capacity building

Chinese issuers may need step-by-step guidance on green bond issuance. Potential green bond issuers may also need assistance to easily navigate the domestic official green bond guidelines, and the international green bond standards and guidelines, such as the Climate Bonds Standard and the Green Bond Principles.

Explore the potential of back-labelling existing bonds that could qualify as green

Identifying and labelling existing bonds which are not yet labelled but comply with the green definitions, could dramatically increase the overall market size and liquidity of the green bond market. PBoC is exploring the possibility of back-labelling. This could be done by collaboration with partner organisations.

(B) Building a long-term pipeline to facilitate scaling green bond issuance over time

Identify a priority list of specific strategic green projects

In the short-term, China could firstly identify which projects in established infrastructure project pipelines qualify as green. The Catalogue developed by the Green Finance Committee sets the foundations for the market to identify which assets and projects in established project pipelines. In the future, the identification of green assets can be integrated at earlier stages the process of infrastructure project pipeline development.

Ensure financial viability of green projects

Options to ensure financial viability includes revenue support mechanisms, collaboration between planners, policymakers, the private sector and investors. In China, NDRC has proposed local governments to provide investment subsidies and guarantees to green project bonds. Local governments are also encouraged to set up green bond guarantee funds to provide guarantees specifically for green bond issuance.

Ensure pipeline transparency for investors

With clear pipeline of green projects deals, investors will be incentivised to develop stronger internal capabilities for investing in green projects. Planners will have confidence with the knowledge that there is strong investor interest and a growing pool of participants on the buy side all with a level of demand for their projects. One potential pathway for China would be to join the Green Infrastructure Investment Coalition (GIIC).

Appendix 1: Refinancing – the role of bonds in the capital pipeline

The largest share of bond issuance is used to refinance debt rather than providing initial debt to a new project. This is the role of bonds in the capital pipeline generally, and will therefore also be the main role of bonds in financing green projects.

Bonds can lower total project cost of capital

Refinancing through bond issuance allows companies to take on short term bank lending for the construction phase of a project and then pay the loan back by issuing bonds once the construction phase is over. As construction is usually the highest risk part of a project, bond issuance post-construction can provide a longer-term lower cost of capital.

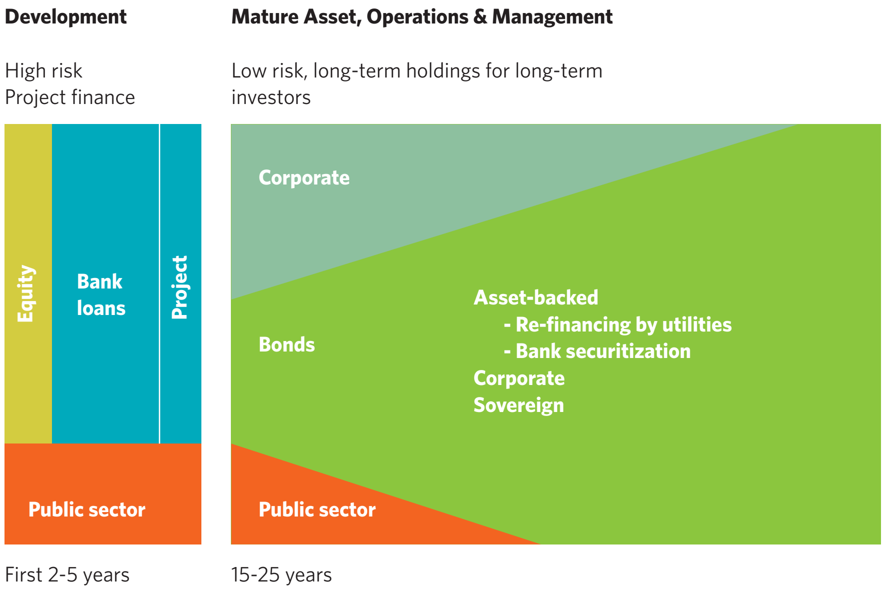
Bonds allow lenders to recycle funds to new projects

Moreover, given that few institutional investors are comfortable with taking on construction risk in a large part of their portfolio, this allows the banks (and the smaller pool of institutional investors with a higher risk appetite) to more quickly recycle their funds into new projects. Having an exit strategy gives banks an incentive to create an increased pipeline for these types of loans. The easier it is for loans to be offloaded, the more likely banks are to lend more and for longer terms.

Bonds are particularly suited for low-carbon projects

Refinancing and obtaining lower-cost debt is particularly attractive for low-carbon infrastructure assets as they have a particularly low operating risk post-construction compared to the construction phase. This means that the difference between the cost of capital for low-carbon projects before and after construction could be significant.

Figure 3; Bonds are mainly used to finance the lower risk, mature assets post-construction



Appendix 2 - Regulatory system of the Chinese bond market

1. Based on market type of sectors under the Climate Bonds Standard

Market type	Regulatory authority
Inter-bank bond market (93% of outstanding bonds listed here)	PBoC
Stock exchange bond market	CSRC

2. Based on bond types under the Climate Bonds Standard

Bond type		Regulatory authority
Government bond		PBoC, Ministry of Finance, CSRC
Central bank bond		PBoC
Financial bond	Policy bank bond, special financial bond	PBoC
	Commercial bank bond, non-bank financial institution bond	CBRC, PBoC
	Securities company corporate bond, security company short-term financing bond	PBoC, CSRC
Short-term financing bond, medium-term notes		NAFMII
Asset-backed securities (ABS)		CBRC, PBoC
Corporate bond		NDRC, PBoC, CSRC
International institution bond		PBoC, Ministry of Finance, NDRC, CSRC
Convertible bond		PBoC, CSRC
Listed-company bond		CSRC
SME private placement bond		Stock Exchange

PBoC: People's Bank of China

CSRC: China Securities Regulatory Commission

CBRC: China Banking Regulatory Commission

NDRC: National Development and Reform Commission

NAFMII: National Association of Financial Market Institutional Investors

Appendix 3 - China's actions on green finance

China's actions on green finance

2007: Green Credit Guidelines were the start of green financial reforms

In China, green finance reforms commenced in the banking sector in 2007 with the first iteration of Green Credit Guidelines. Published by China's banking regulator (CBRC) the new guidelines aimed to encourage banks to increase lending to green projects. A revised version of the guidelines was published in 2012.

2013: Notice for Green Credit Statistics, launched by the CBRC

This initiative identified 11 categories of environmental investments that can be classified as qualifying for green credit, providing clearer guidance to the market.

2014: Green Finance Task Force established in collaboration with UNEP Inquiry

In 2014, the PBoC established a Green Finance Task Force in conjunction with the United Nations Environmental Programme Inquiry into the Design of a Sustainable Financial System (UNEP Inquiry). The Green Finance Task Force spans regulators, government departments, financial market actors, and local and international experts working on the establishment of a green financial system in China. The first report published by the Task Force, in April 2014, contained 14 detailed recommendations including use of green bonds, developing green credit ratings and establishment of a national green bank and more.[44]

2015: Green Finance Committee established

Following the landmark report from the Green Finance Task Force, PBoC established a Green Finance Committee (GFC)[45] in April 2015. The members of the GCF represent more than 65% of the assets under management (AUM) in China. The GFC has set up several working groups to undertake research on how to implement the PBoC's vision for a green financial system in China.

Two examples of working groups are a group incorporating environmental factors into stress testing in the banking system, and a group conducting research on green credit ratings.

The Green Finance Committee has also developed an environmental benefits evaluation system, which enables the assessment of environmental impact of projects financed by green financial products. Recently, the GFC is pushing the development of local green financial system in cities.

2015: PBoC Releases first official green bond guidelines

China has established official guidelines for green bond development in order to build a robust structure that ensures strong green credentials of green labelled bonds and to reduce the risk of inappropriate environmental claims and fraud:

- PBoC has established regulations for green financial bonds, including guidance on, and requirements for green definitions, management and use of bond proceeds, and reporting.[46] PBoC is the regulator overseeing the interbank bond market, which accounts for 93% of outstanding bonds in China.
- China's macroeconomic management agency, the National Development & Reform Commission (NDRC) also set guidelines for green corporate bonds, providing a list of qualifying green projects and proposals for policy incentives.[47]
- Shanghai Stock Exchange set up rules for its green bond pilot program[48] or listed companies and private placement from Small and Medium Enterprises (SME), which are similar to the requirements from PBoC.
- Other regulatory authorities such as the National Association of Financial Market Institutional Investors (NAFMII) and the China Securities Regulatory Commission (CSRC) are also working on green bond guidelines for other bond types in China.

2016; Green finance now prominent in China's 13th 5-year plan

In September 2015, China's State Council included the establishment of a green financial system as part of the national plan for ecological civilisation, encouraging the development of green credit, green bonds, green securitisation and more.[49] The development of a green financial system has also been included in China's 13th Five Year Plan, the long-term national economic development plan, which gained final, formal endorsement by the National People's Congress on the 16th March 2016.

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