December 2018

HKEX
香港交易所

RESEARCH REPORT

THE GREEN BOND TREND: GLOBAL, MAINLAND CHINA AND HONG KONG

CONTENTS

Page

Chief China Economist's Office
Hong Kong Exchanges and Clearing Limited

13 December 2018

SUMMARY

Green bonds have become a new source of growth for the global bond market and their gross issuance continues to rise. There is a huge financing demand for supporting the global commitment of transition into green economies. These green projects usually have long investment periods and different cash recovery cycles. Green bonds are one of the major tools to cater the needs of green borrowers and investors, including potentially new ones, for reasonable funding costs and enhanced environmental disclosure. However, the definition of the "green" element differs around the world and there is no unified international standard. Green labels are usually verified through external reviews by a wide range of reviewers. Albeit green labels bring extra costs for review and certification, empirical evidence showed that the benefits to issuers and investors outweigh these costs.

Mainland China is a significant player in the global green bond market. In addition to global commitment of green economies, the Mainland authorities have given strong top-down support to the development of green bonds to finance green projects in the Mainland. The Mainland stock exchanges proactively support the listed green bond market by streamlining approval procedures, launching green bond indices and cooperating with international exchanges in enhancing transparency and disclosure. However, there are multiple green bond definitions under different official guidelines in the Mainland, which also differ from international standards. As international investors prefer green bonds that align with international standards, addressing the differences in definition may boost the global demand for Mainland green bonds. Conducting external review for green bond issuance, which is currently not mandatory in the Mainland but is a common way to show the bond's compliance with international standards, would help increase the bond's attractiveness. These potential improvements may encourage more inflows, facilitated through Northbound trading under Bond Connect. The bottom-up demand contributed to the growth of green bond issuance that has become remarkable after the authorities have developed related national guidelines. There are recently some signs of increasing offshore green bond issuance as well.

The development of green bonds in Hong Kong has picked up in recent years. The Government has a pivotal role to facilitate green projects in Hong Kong and expand the investor base. To cater the needs of green bond issuers and investors, the Government supported the Hong Kong Quality and Assurance Agency (HKQAA)'s development of an internationally recognised green finance certification scheme. It launched competitive grant schemes for green bonds issued and listed in Hong Kong and in addition the plan of world's largest sovereign green bond issuance program to show its commitment of greening the economy and developing the green bond market.

These developments will help boost Hong Kong's bond market by ways of green bond listing, trading and related product development. While the Hong Kong market has an efficient and effective bond listing regime, the regime can be further enhanced by introducing a dedicated green segment to display the information of green bonds in Hong Kong and the Mainland. Trading of over-the-counter bonds and listed bonds in Hong Kong can be boosted by tax incentives, cooperation among the different trading platforms, Southbound Bond Connect[1] and higher retail investor participation. Green bond indices are good trackers on the performance of green bonds. The Hong Kong market can take advantage of its convenient trading arrangements (e.g. Bond Connect) for international investors to participate in Mainland bonds onshore and facilitate the development of exchange traded funds on green bonds. As most green bonds issued in Hong Kong are denominated in foreign currencies, a wider range of listed foreign exchange derivatives should be developed to meet the hedging needs.

[1] Subject to regulatory approval.

1. THE ISSUANCE OF GREEN BONDS HAS GROWN AT A RAPID PACE GLOBALLY

1.1 Overview of green bonds

Green bonds are fixed-income securities under the scope of green finance. In other words, green bonds are conventional bonds with a clearly disclosed "green" use of proceeds. "Green finance" is a broad term that refers to capital raising and financial investments flowing into projects, products and companies that support the development of a more sustainable, low-carbon climate-resilient economy[2]. A green bond can be a project bond backed by the issuer or an asset-backed security (ABS) backed by the project.

The green bond market started without a universal green bond standard and the issuance was dominated by supra-nationals at the early stage. The first green bond is widely considered to be the "Climate Awareness Bond" issued in 2007 by the European Investment Bank (EIB) using its own green label with self-assessment. Subsequently, the World Bank issued its first green bond in 2008 to Scandinavian pension funds to support climate-focused projects and used its own green label subject to a second opinion from Center for International Climate Research (CICERO). They were followed by the green bond issuance by a number of supra-nationals, including the International Finance Cooperation and the European Bank for Reconstruction and Development.

Green bond issuance has grown quickly since the introduction of the first set of international standards for green bonds published in 2014 (see Figure 1). The International Capital Market Association (ICMA)[3] issued the Green Bond Principles (GBP) in January 2014[4], shortly after the issuance of the first corporate green bonds in 2013. The issuance of green bonds rose by about 1.6 times in value terms in 2014 and expanded dramatically in 2016 — recording a remarkable 250% compound annual growth rate (CAGR) during the period of 2012 to 2016. The GBP are voluntary process guidelines for the verification of green bonds that recommend transparency, disclosure and reporting regarding the issuance of a green bond. In the latest version of GBP[5], there are four core components, including the use of proceeds, the process for project evaluation and selection, the management of proceeds and reporting. The Climate Bonds Initiative (CBI) is a not-for-profit organisation established in 2009 with a mandate of facilitating the mobilisation of capital to support green bond projects. The CBI launched the Climate Bonds Standard (CBS) that converts the principle-based GBP into a set of assessable requirements and actions, including taxonomy and sector-specific standards for the certification of green bonds. Some credit rating agencies (e.g. Standard and Poor's and Moody's) also develop their green bond assessment frameworks with reference to GBP for green ratings, which do not constitute credit ratings.

---

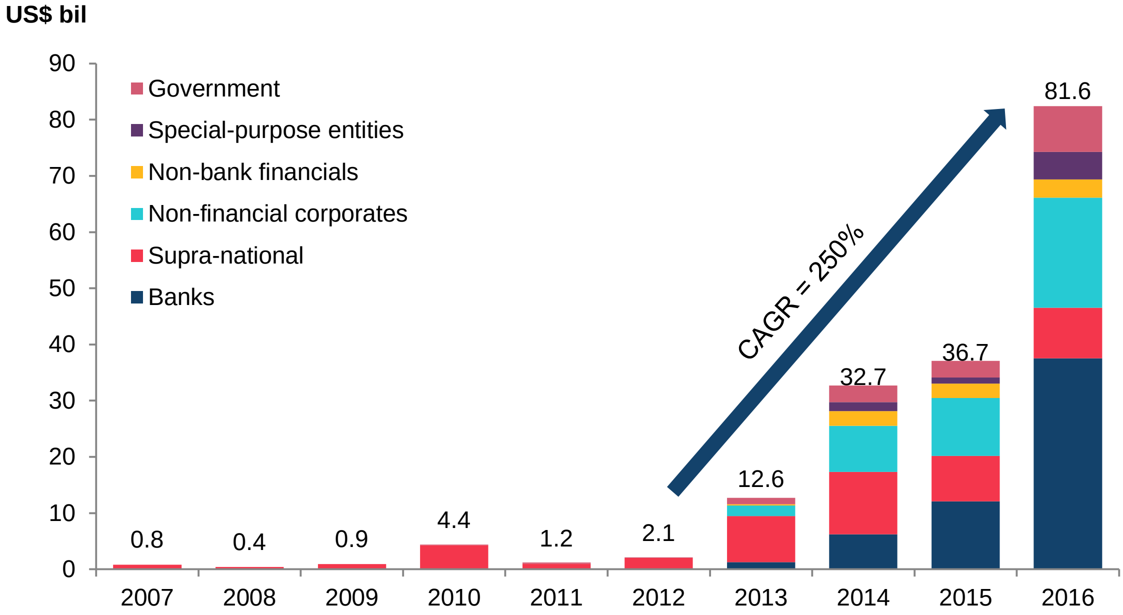
2 Source: Financial Services Development Council, Hong Kong. *Hong Kong as a Regional Green Finance Hub*, May 2016.

3 ICMA is a member association for a wide range of private and public members, with the aim to promote globally coherent cross-border debt securities markets.

4 *Green Bond Principles Governance*, issued by ICMA, January 2014.

5 *Green Bond Principles*, issued by ICMA, June 2018.

Figure 1. Gross issue amount of green bonds by issuer type (2007-2016)



Source: RBC Capital Markets. *Green Bonds: Green is the New Black*, April 2017.

1.2 Global landscape and policy initiatives to support the development of green bonds

The global commitment of green economy requires a significant amount of financing from the public and private sectors. Taking actions on climate change is one of the 17 new United Nations Sustainable Development Goals (UN SDGs) under the 2030 Agenda agreed by 193 countries in September 2015. In December 2015, France hosted and chaired the 21st session of the Conference of the Parties (COP21) to the UN Framework Convention on Climate Change (UNFCCC) and the Paris Agreement was signed with an aim to control the rise of global average temperature within 2℃ above the pre-industrialisation level. In 2016, the Group of Twenty (G20) launched the Green Finance Study Group co-chaired by China and the UK, at which the G20 finance ministers and central bank governors committed to explore ways to raise the funds required to achieve global sustainable development and climate objectives. **It was estimated in 2014 that the financing needs would be around US$90 trillion in the following 15 years between 2015 and 2030[6]. In other words, an average amount of about US$6 trillion would be required every year.**

Green bond will be a solution to mobilise private sector funding for green projects, given the current dis-alignment of national policies among countries. The Green Climate Fund (GCF) was established at UNFCCC in 2010 to assist developing countries in taking up adaptation and mitigation practices to counter climate change. Industrialised countries have pledged US$10.3 billion to the GCF since 2015, but only US$3.5 billion was allocated to 74 projects in 78 countries[7]. During the GCF board meeting in July 2018, no new projects were approved owing to "disputes over policies and governance among countries"[8]. In the light of this, green bond markets would be more efficient to provide a decentralised solution for the private sector to match a wide range of corporate issuers and investors for green projects, as explained below.

[6] Source: New Climate Economy. *Better Growth, Better Climate*, 2014.

[7] Source: GCF. *Seventh Report of the Green Climate Fund to the Conference of the Parties to the United Nations Framework Convention on Climate Change*, 8 June 2018.

[8] Source: Reuters. "Climate fund snags threaten opportunity to fight warming", 27 August 2018.

11

Firstly, green bonds offer net benefits to issuers over conventional bonds. On the cost side, the green bond label is not for free but involves extra costs (ranging from US$10,000 to US$100,000[9]) and time for verification or certification. However, green bond issuers can improve their corporate reputation by more disclosure on the strategic plan and performance regarding environmental, social and governance (ESG) issues. As investors with interest in green bonds would be more focused on long-term investment and ESG than those of conventional bonds, the issuance of green bonds would attract new investors. This is particularly beneficial to issuers for certain green infrastructure projects which are more difficult to get financing because of their long investment periods. For financing cost, some issuers enjoy lower yields at issuance for green bonds given the strong investor demand (see Section 1.3 below for detailed discussion).

Secondly, international investors responded positively to the global drive on listed companies' ESG disclosure for assessing climate-related risks and opportunities. In 2015, G20 asked the Financial Stability Board (FSB) to consider the impact of climate change in April and the FSB launched the industry-led Task Force on Climate-related Financial Disclosures (TCFD) in December to develop recommendations on climate-related financial disclosures for listed companies. In June 2017, the TCFD published its final recommendations focused on four areas — governance, strategy, risk management as well as metrics and targets. A combined 390 institutional investors representing more than US$22 trillion in assets signed a letter that called upon G20 leaders to support the TCFD recommendations[10].

Thirdly, global stock exchanges are looking for ways to further promote sustainable and transparent capital markets. Since 2012, the UN Sustainable Stock Exchanges (UNSSE) initiative, a peer-to-peer learning platform to enhance corporate transparency on ESG, has invited Partner Exchanges globally by making a voluntary public commitment to promote improved ESG disclosure and performance among listed companies. The HKEX has become a Partner Exchange in June 2018. The UNSSE initiative published in November 2017 a voluntary action plan for exchanges to grow green finance[11]. Nevertheless, it noted that there is no one-size-fits-all approach to address specific challenges, including insufficient supply to meet investor demand, insufficient liquidity of green products, terminology confusion (different "green" definitions), operational capacity constraints of exchanges, regulatory hurdles and poor availability of relevant data.

1.3 Recent trends in global markets of green bonds

The issuance of green bonds is still small relative to the size of the global bond market, but it continues to grow at a rapid pace with a diverse base of issuers. According to CBI, the issuance of green bonds accounted for only about 2.3% of the global bond market's total new issuance value in 2017[12]. Nevertheless, the issuance of green bonds jumped 84% to US$160.8 billion in 2017[13]. The US, China and France dominated the issuance in 2017, accounting respectively for roughly 27%, 14% and 14% of the total (see Figure 2). In the US, more than 50% of the issuance value in 2017 came from the green mortgage-backed securities issued by Fannie Mae. In Mainland China, commercial banks dominated the issuance, contributing 74% in value terms of total green bonds defined by international

9 Source: Organisation for Economic Co-operation and Development (OECD), ICMA, CBI, Green Finance Committee (GFC) of the China Society for Finance and Banking. *Green Bonds: Country Experiences, Barriers and Options*, September 2016.

10 Source: Global Investor Coalition on Climate Change. *Letter From Global Investors To Governments Of The G7 And G20 Nations*, 3 July 2017.

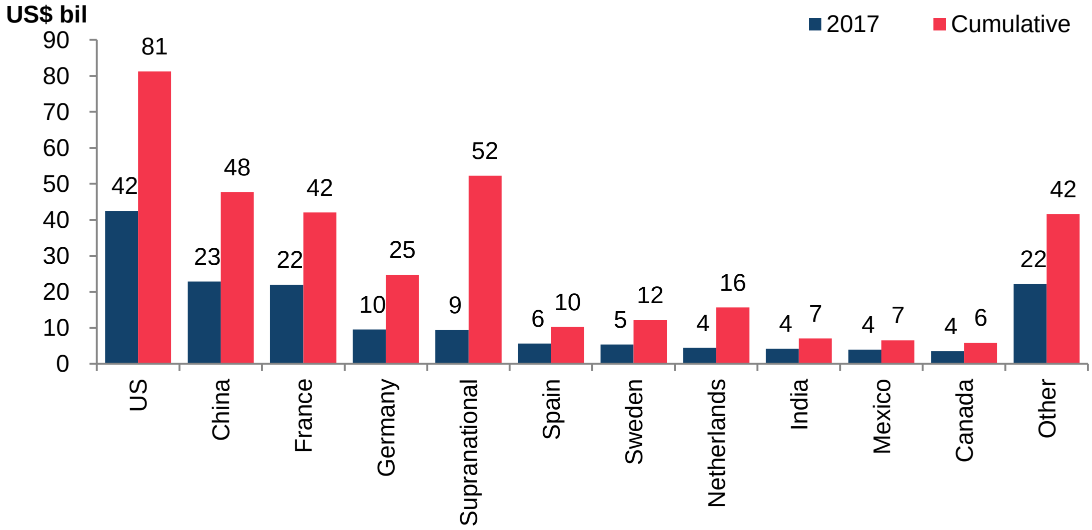
11 *How Stock Exchanges can Grow Green Finance*, issued by UNSSE, November 2017.

12 The percentage is calculated with reference to the global bond issuance of US$6.95 trillion in 2017 (source: *Singapore Corporate Debt Market Development 2018*, issued by Monetary Authority of Singapore, 28 August 2018).

13 Source: CBI. "Green Bonds Market Summary Q1 2018", April 2018.

standards. In France, sovereign issues by the Republic of France contributed about a half of the issuance value in 2017; nevertheless, the issuer base has become broader — 146 out of 239 issuers in 2017 were new to the green bond market. In addition, the first Green Sukuk[14] debuted in June 2017 in Malaysia to support green Islamic finance. It was predicted in January 2018 that the global issuance value of green bonds would increase further to US$250 billion[15] for the whole year of 2018. Given the moderate momentum of global issuance with an issue amount of US$76.9 billion during the first half of 2018[16], analysts revised the forecast of the issue amount in 2018 to between US$175 billion and US$200 billion[17].

Figure 2. Gross issuance of green bonds by country (2017 and cumulative amount)



Note: Green bonds are those as defined by the CBI's standards according to which at least 95% of the proceeds are dedicated to green projects.
Source: CBI. *Green Bond Highlights 2017*, January 2018.

International investors have become more interested in green assets. This was evidenced by the growth in exchange traded funds (ETFs) investing in ESG themes. A survey showed that the assets under management (AUM) of ESG-themed ETFs increased by 186% to US$11.2 billion in April 2017 from US$3.9 billion at the end of 2013, with the number of such ETFs more than doubled to 119 from 48 during the same period (see Figure 3). An industry survey[18] showed that global sustainable investments rose 25% to US$22.9 trillion in 2016 from US$18.3 trillion in 2014 and the share of their asset allocation to bonds rose to 64% in 2016 from 40% in 2014. Besides, the potential investors of green bonds include the signatories supporting the UN Principles for Responsible Investment (UNPRI), which reached 2,000 signatories with over US$82 trillion of assets as of July 2018[19]. Furthermore, a number of global banks have committed to pledge capital for sustainable and green financing, including €100 billion from the Spanish banking group, BBVA[20], US$100 billion from HSBC[21]

[14] Sukuk are Islamic securities whose terms and structures comply with Islamic Law (Sharia). Although commonly referred to as "Sharia-compliant bonds", Sukuk differ from conventional bonds in that they are asset-based securities, the holders of which share any loss and profit resulted from the underlying asset. The holders have no voting right on the underlying assets but have seniority to other creditors in case of default.

[15] Source: CBI. *Green Bond Highlights 2017*, January 2018.

[16] Source: CBI. "Green Bonds Market Summary H1 2018", July 2018.

[17] See Moody's, "Global green bond issuance rises in second quarter 2018, but growth continues to moderate", 1 August 2018.

[18] Source: Global Sustainable Investment Alliance. *Global Sustainable Investments Review 2016*, March 2017.

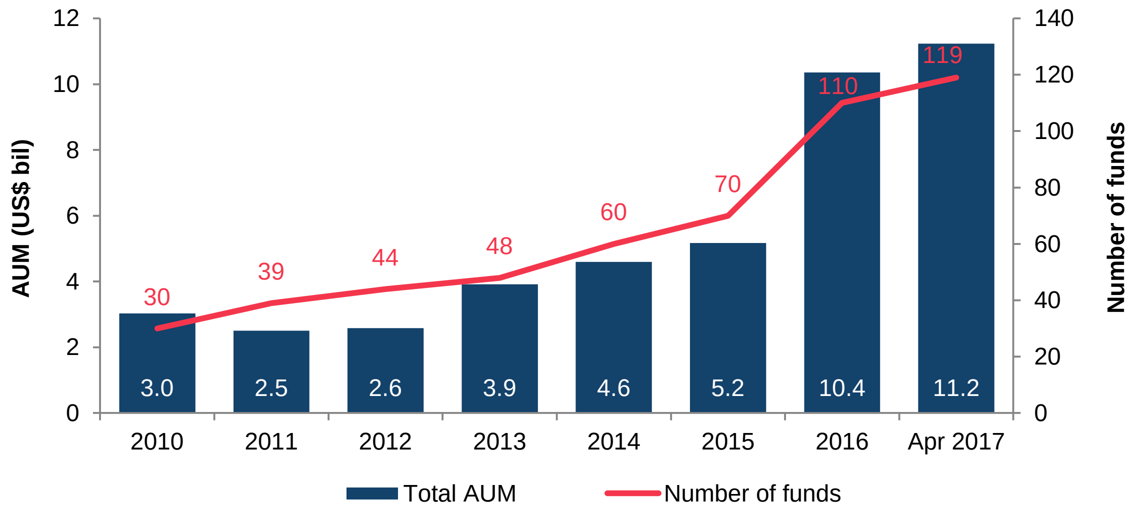
[19] Source: UNPRI. "Quarterly update: Climate action gathering momentum", 19 July 2018.

[20] Source: BBVA. "Pledge 2025", 28 February 2018.

[21] Source: "HSBC to help combat climate change with a $100 billion boost for sustainable financing", HSBC's media release on its website, 6 November 2017.

and US$200 billion from JP Morgan[22]. Among the investments in the green bond market, renewable energy remained the most common area for the use of proceeds in 2017 (33% of total issuance), followed by low carbon buildings/energy efficiency (29% of total issuance)[23].

Figure 3. AUM and number of ESG-themed ETFs (2010 – Apr 2017)



Source: JP Morgan, "Sustainable Investing is Moving Mainstream", 20 April 2018.

To better serve the growing global investments in green bonds, global green bond indices, with the use of foreign exchange (FX) derivatives for hedging currency risks, have been geared up to meet investor needs. Green bond indices track the performance of diversified portfolios of green bonds in the secondary markets. Currently, there are four major global green bond index series — Bloomberg Barclays MSCI Green Bond Index, BAML Green Bond Index, S&P Green Bond Index and Solactive Green Bond Index. The inclusion criteria of these indices are advertised to be consistent with ICMA's GBP (with some additional parameters). A recent study published in the Bank for International Settlements (BIS) Quarterly Review (BIS Study)[24] suggested that the returns of these global green bond indices during July 2014 to June 2017 have been similar to those of global bond indices of comparable credit ratings after currency exposures are hedged. In fact, the global green bond benchmark, Bloomberg Barclays MSCI Green Bond Index, tended to outperform the broad global bond benchmark, Bloomberg Barclays Global Aggregate Bond Index, over the recent few years after currency hedging (see Table 1). This also illustrates the importance of FX derivatives for hedging green bond investments against potentially adverse currency movements.

---

[22] Source: "JPMorgan Chase to Be 100 Percent Reliant on Renewable Energy by 2020; Announces $200 Billion Clean Energy Financing Commitment", JP Morgan's Fact Sheet on sustainability, 28 July 2017.

[23] Source: CBI. *Green Bond Highlights 2017*, January 2018.

[24] Ehlers, T. and Packer, F. (2017) "Green bond finance and certification", *BIS Quarterly Review*, September 2017, pp. 89-104.

Table 1. Comparison of returns between green bonds and global bonds (2015 – March 2018)

	Returns (USD hedged, in %)			Returns (EUR hedged, in %)		
	Global green bonds	Global bonds	Difference	Global green bonds	Global bonds	Difference
2015	1.05	1.02	0.03	0.75	0.68	0.07
2016	3.44	3.95	-0.51	1.95	2.44	-0.49
2017	3.98	3.04	0.94	1.99	1.06	0.93
2018 (up to March)	-0.83	-0.93	0.1	-1.22	-1.33	0.11

Note: The performance of "global green bonds" is measured by Bloomberg Barclays MSCI Green Bond Index and that of "global bonds" is measured by Bloomberg Barclays Global Aggregate Bond Index (that include the green bonds meeting the inclusion criteria).

Source: Allianz Global Investors. "Building the case for green bonds", 14 March 2018.

The attractive pricing to green bond issuers has been supported by the growing investor demand for green bonds in recent years. A number of literature showed that green bonds are issued at lower yields on average than conventional bonds. In the aforementioned BIS Study, the average yield spread was estimated to be around 18 basis points for a cross-section of 21 pairs of green bonds and conventional bonds issued by the same issuers at similar issuance dates between 2014 and 2017 and the spread was greater for riskier issuers. In fact, the average over-subscription rates of US dollar (USD)-denominated green bonds (2.5-2.8 times) has been higher than those of their conventional counterparts (1.5-2.8 times) since the second quarter of 2017 while the average over-subscription rates are comparable for Euro-denominated green bonds and conventional bonds[25]. Therefore, green bonds are mutually beneficial to both investors and issuers that investors are comfortable with the issuers' investments in green projects and issuers enjoy favourable pricing of their bonds.

2. MAINLAND CHINA ASSUMES A SIGNIFICANT ROLE IN GREEN BONDS

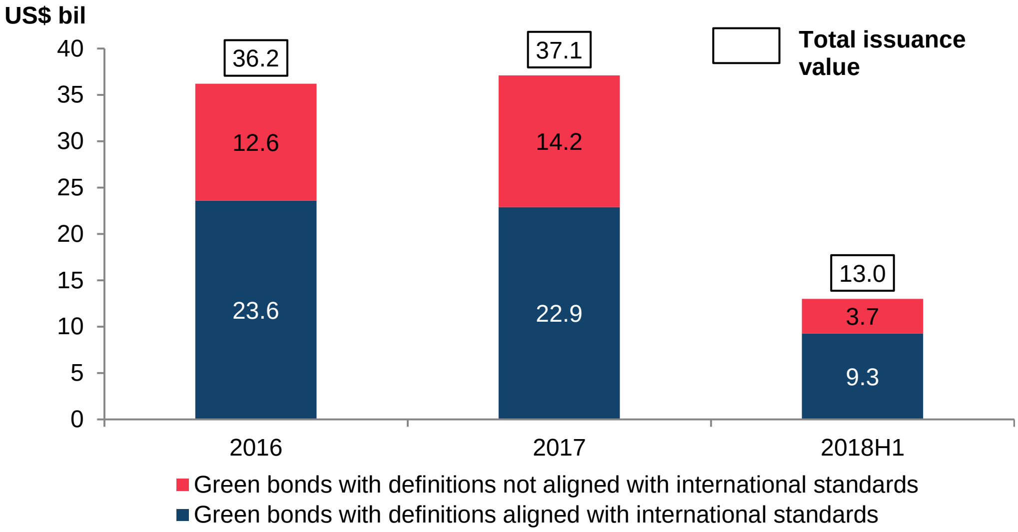
2.1 Current development of green bonds in the Mainland

Green bond issuance in Mainland China has grown from almost zero to currently the second largest in the world in just two years' time since late 2015. The first Chinese green bond was the 3-year bond issued in July 2015 by Xinjiang Goldwind Science and Technology (a renewable energy firm) through a Hong Kong-based subsidiary to raise US$300 million. The Mainland's domestic green bond market then started only after the official introduction of national green definitions for labelling in December 2015, which include the People's Bank of China (PBoC)'s Green Bonds Endorsed Project Catalogue (《綠色債券支持項目目錄》) and the National Development and Reform Commission (NDRC)'s Guidance on Green Bond Issuance (《綠色債券發行指引》). Under the Mainland's official green definitions, green bond issuance reached US$36.2 billion in 2016 and US$37.1 billion in 2017 (of which US$12.6 billion in 2016 and US$14.2 billion in 2017 did not align with international definitions)[26]. During the first half of 2018, green bond issuance in the Mainland grew by 14% year-on-year to US$13 billion (of which, US$3.7 billion did not align with international definitions) (see Figure 4).

25 Source: CBI. *Green Bond Pricing in the Primary Market*, 2017Q2, 2017Q3 and 2017Q4 issues.

26 Source: CBI. *China Green Bond Market Report*, 2016, 2017 and 2018H1 issues.

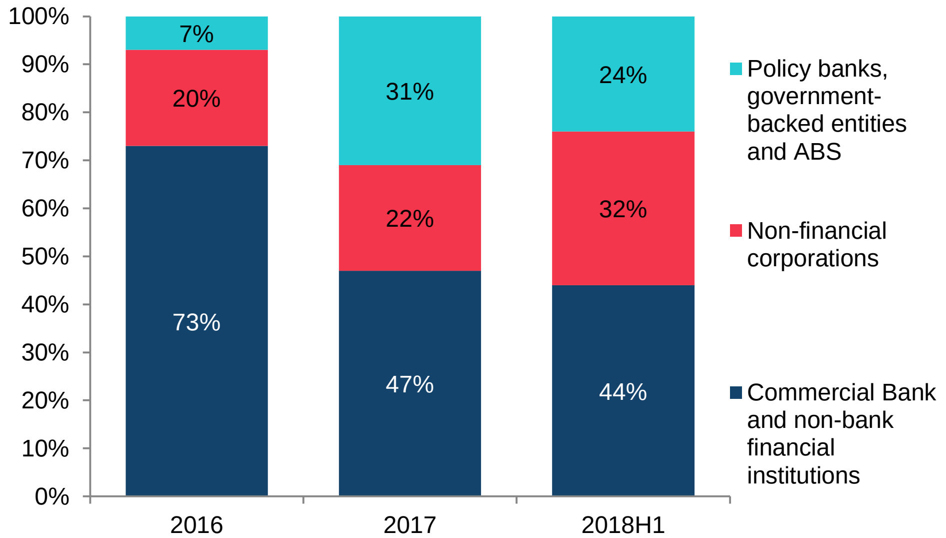
Figure 4. Green bond issuance in Mainland China (2016 – 2018H1)



Source: CBI. *China Green Bond Market Report*, 2016, 2017 and 2018H1 issues.

According to CBI, commercial banks and non-bank financial institutions remained the largest issuer type in terms of green bond issue amount over the years since 2016 while corporate issuers have become more active. Banks and non-bank financial institutions accounted for the biggest share of 47% of total green bond issuance in 2017 and 44% in 2018H1, though falling from 73% in 2016. Non-financial corporate issuers' share increased from 20% in 2016 to 22% in 2017 and further to 32% in 2018H1. Policy banks, government-backed entities (mainly local government financing platforms) and ABS accounted for a larger share at 31% in 2017 and 24% in 2018H1, compared to 7% in 2016 (see Figure 5). According to another source, the local banks — city commercial banks and rural commercial banks — had become dominant issuers among banks and other financial institutions, sharing 53.0% of this issuer type's total in 2017, up from 11.4% in 2016[27].

Figure 5. Green bond issuance in Mainland China by issuer type (2016 – 2018H1)

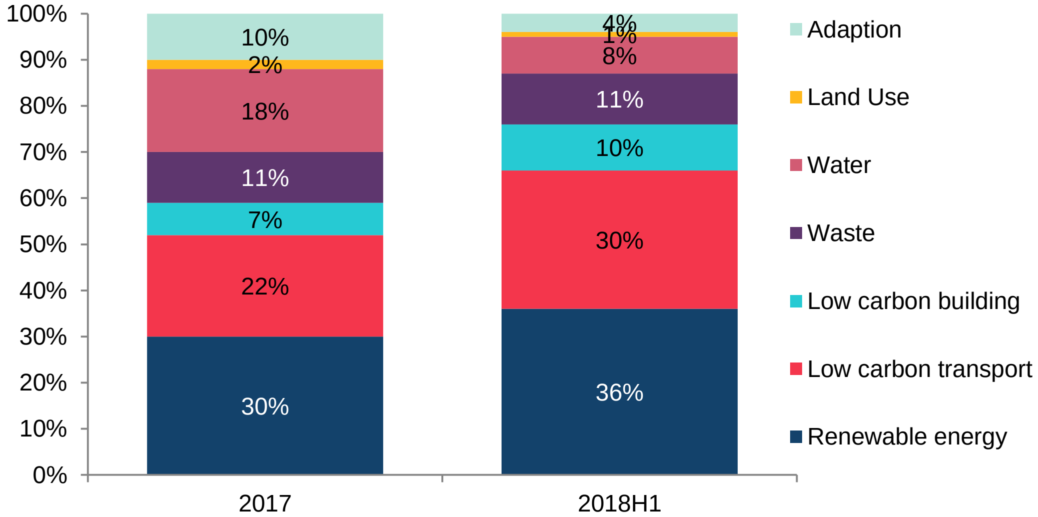


Source: CBI. *China Green Bond Market Report*, 2016, 2017 and 2018H1 issues.

[27] Source: 興業研究 (CIB Research). 《地方銀行發展綠色金融的方向》("Direction for green finance development of local banks"), 21 August 2018.

For the use of proceeds, renewable energy remained the largest category and low-carbon transportation projects of local government financing platforms have gained share. Among the eligible use of proceeds under the CBI's definitions, renewable energy accounted for 36% of total issuance in 2018H1, up from 30% in 2017. For low-carbon transportation, the share of issuance rose to 30% of the total in 2018H1, up from 22% in 2017. (See Figure 6.) This may be attributed to the rising issuance by local government financing platforms — their share in issue amount rose to 10% in 2017 from less than 1% in 2016, the proceeds of which were mainly for investments in low-carbon transportation[28]. During the first half of 2018, the issuance by government-backed entities (mainly local government financing platforms) increased by 1.5 times compared to that in the first half of 2017[29].

Figure 6. The use of green bond proceeds in Mainland China by category (2017 and 2018H1)



Note: The classification of the use of proceeds is based on CBI's definitions; the breakdown for 2016 is not available.

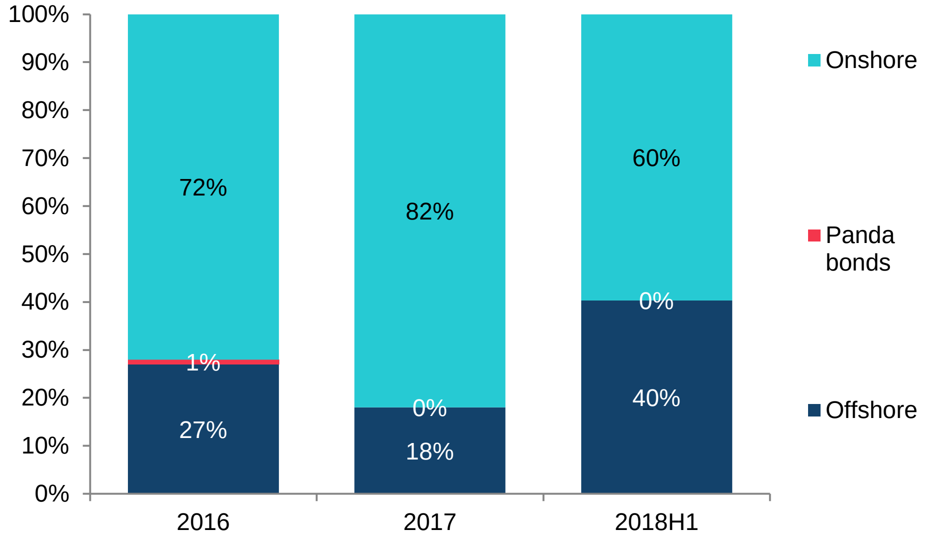
Source: CBI. *China Green Bond Market Report*, 2017 and 2018H1 issues.

Mainland's offshore green bond issuance was observed to have increased from 18% in 2017 to 40% in 2018H1 (see Figure 7). **This may imply more investments in offshore green projects**. The rise was driven by the bond listings of a total value of US$2.3 billion by ICBC (Asia) on the Stock Exchange of Hong Kong (SEHK), the HKEX's securities market, and by ICBC (London) on the London Stock Exchange (LSE). The proceeds are used for offshore green projects in the Guangdong-Hong Kong-Macao Greater Bay Area for the former and in the Belt-and-Road countries for the latter. The share of onshore issuance has eased to 60% of the total issuance in 2018H1 that includes issuance on the China Interbank Bond Market (CIBM) (46% of the total), the Shanghai Stock Exchange (SSE) (13% of the total) and the Shenzhen Stock Exchange (SZSE) (1% of the total). For offshore issuance, Mainland companies are required to register with, or get approval from, the NDRC regarding the use of proceeds before the bond issuance. Notwithstanding the higher flexibility for the use of proceeds of an offshore conventional bond (e.g. general purpose for the Belt and Road Initiative (BRI)), offshore green bond issuers have to disclose more details on the use of proceeds.

[28] See CBI, *China Green Bond Market Report*, 2017 issue.

[29] Source: CBI. *China Green Bond Market Report*, 2018H1 issue.

Figure 7. Green bond issuance in Mainland China by place of issue (2016 – 2018H1)



Source: CBI. *China Green Bond Market Report*, 2016, 2017 and 2018H1 issues.

The domestic green bond investor base has expanded to include retail investors. In addition to institutional investors which include banks, brokers, insurers and funds, the Mainland green bond market has opened up to retail investors. In September 2017, the first retail green bond was issued in the CIBM by China Development Bank for individual investors and non-financial institutional investors. The bond was sold through bank counters to retail investors who can only subscribe government bonds in the primary market previously. Retail investors are exempted from the 25% tax on interest income from the bonds issued by China Development Bank, which is applicable for institutional investors[30]. This first retail issuance of green bond set an example for future issuance of retail green bonds.

A wide range of international investors can invest in onshore green bonds through the Bond Connect scheme. Northbound trading of Bond Connect serves as a platform for international investors to participate in the primary and secondary markets of onshore green bonds. Since its launch in July 2017, the Bond Connect scheme has attracted 522 registered investors by end-October 2018. The average daily turnover of Northbound bond trading was RMB3.60 billion during January to October 2018[31]. The total foreign holdings had reached about RMB 1,689 billion for onshore bonds in CIBM as of end-September 2018. In late 2017, Agricultural Development Bank of China (ADBC) and Export-Import Bank of China (EXIM Bank) became the first issuers to offer RMB-denominated green bonds in CIBM to international investors under Bond Connect scheme. The investor demand has been strong. For the case of ADBC, the bank issued a RMB 3 billion green bond in November 2017 and another one of the same value in June 2018; the first bond was oversubscribed by 4.38 times and the second bond by 4.75 times .

[30] Subsequently, with effective from 7 November 2018, offshore institutional investors are exempted for the taxes related to onshore bond investments for 3 years. See 《關於境外機構投資境內債券市場企業所得稅增值稅政策的通知》(*Notice on the policy of corporate income tax and value added tax on offshore institutions' investments in onshore bond market*), issued by the Ministry of Finance on 7 November 2018.

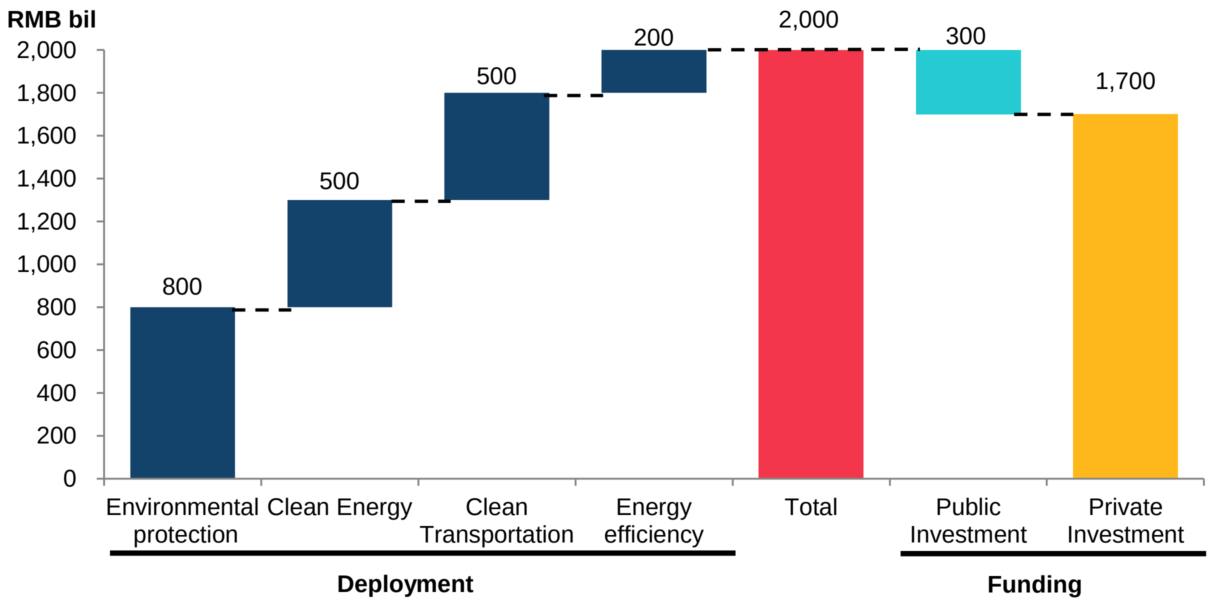
[31] Source: Bond Connect Company Limited (BCCL).

2.2 Strong financing demand and policy support for green bonds in the Mainland

Mainland China's green finance is supported by the state's policy framework with a top-down approach[32]. The authorities jointly promote the development of a green financial system, including green loans, green bonds, ESG disclosure and verification and certification. Although green loans accounted for the vast majority of green finance (about 90% in 2017[33]), the bottom-up funding demand has driven the diversity in funding channels. Green bonds have become one important channel of green finance in the Mainland.

The momentum of green bond issuance in the Mainland is underpinned by strong demand for green finance. According to the PBoC[34], it was estimated that an annual investment of at least RMB 2 trillion is required to achieve national environmental goals during the 13th Five-Year Plan period from 2016 to 2020. While 10%-15% of the investment is expected to come from the government, private capital will be needed to fund the remaining 85%-90% or at least RMB 1.7 trillion annually (see Figure 8).

Figure 8. The forecast deployment and funding of green bonds issued in Mainland China (2016-2020)



Source: Green Finance Task Force of PBoC. Establishing China's Green Financial System, April 2015.

The BRI contributes to the demand for green finance to fund infrastructure investments. It was estimated that the Mainland's outward investment balance for infrastructure in Belt-and-Road countries would rise to US$300 billion by 2030, more than doubled from US$129 billion in 2016[35]. Some of these projects will achieve the UN SDGs, including those on climate change. Besides, the Mainland Government issued the *Guiding Opinions on Promoting Green Belt and*

---

32 《落實〈關於構建綠色金融體系的指導意見〉的分工方案》*(Plan on the Division of Work in the Implementation of the Guiding Opinions on Building a Green Financial System)*, issued by the PBoC, 30 June 2017.

33 Source: PBoC. 《中國綠色金融發展報告（2017）》(*Development Report on Green Funding in China*), 6 September 2018.

34 Green Finance Task Force of PBoC. *Establishing China's Green Financial System*, April 2015.

35 Source: Standard Chartered. "China — Belt and Road is taking shape", November 2017.

Road[36] to support the use of green finance in BRI projects. In addition, *the Belt and Road Ecological and Environmental Cooperation Plan*[37] entails 25 green BRI pilot projects.

A pipeline of green projects from local governments is on the road. The State Council approved the launch of five pilot zones in June 2017 to promote green finance, including Guangdong, Guizhou, Jiangxi, Zhejiang and Xinjiang. The pilot zones have different focuses, for example, Guangdong will encourage innovative credit products to support energy saving and emission reduction. In Guangzhou, it was reported that there were at least 182 green-related financial products and 69 green projects seeking RMB 40 billion of financing as of May 2018[38].

Given the financing demand, the Mainland authorities started the domestic green bond market by publishing issuance guidelines in late 2015. The first guideline was issued by the PBoC in December 2015 — *Announcement on Matters concerning the Issue of Green Financial Bonds in the Interbank Bond Market* (《關於在銀行間債券市場發行綠色金融債券有關事宜的公告》) (the PBOC Guidelines) for financial institutions' issuance of green financial bonds in the CIBM. At the same time, the PBoC also published its green definitions, *Green Bonds Endorsed Project Catalogue* and the NDRC published the *Guidance on Green Bond Issuance*, as mentioned in Section 2.1 above. The NDRC's Guidance governs green enterprise bonds issued in the CIBM by corporate issuers, in which the eligible uses of proceeds are defined in a slightly different way from those in the PBoC's Catalogue. For exchange-traded corporate bonds, the SSE and the SZSE issued their notices on Green Bond Pilot Program respectively in March and April 2016. The National Association of Financial Market Institutional Investors (NAFMII) issued the *Guidelines on Green Notes of Non-Financial Enterprises* (《非金融企業綠色債券融資工具業務指引》) in March 2017 to cover green bond issuance by other non-financial corporates in the CIBM. Therefore, a broad range of issuers are now able to issue green bonds in the onshore market.

The important roles of the securities market in supporting green finance is highlighted in the Mainland policy guidelines. A policy document on green finance[39] issued in 2016 lays out the roles of the securities market in green finance: to adopt a unified set of domestic green bond standards; to support qualified green companies to raise funds via initial public offerings (IPOs) and secondary placements; to support the development of green bond indices, green equity indices and related products; and to gradually establish a mandatory environmental information disclosure system for listed companies and bond issuers. Stock exchanges in the Mainland have been actively supporting green finance in the following ways:

(1) **Enhancing disclosure and product development**. The SSE released its *Green Finance Vision and Action Plan 2018-2020* in April 2018. The objectives are to further promote listing and ESG disclosure for green equities, to develop green bonds and ABS, to develop green financial products (e.g. bond indices and ETFs) and to enhance cross-border cooperation and research and promotion for green finance.

(2) **Setting up a "green channel" in 2017 to improve the efficiency of the issuance and listing of green bonds.** For the SSE, 39 green bonds and green ABS were listed as of end-2017 and the cumulative issue amount reached RMB 90 billion[40]. For the SZSE, there

36 《關於推進綠色「一帶一路」建設的指導意見》, issued by the Ministry of Environmental Protection (MoEP), the Ministry of Foreign Affairs (MoFA), the NDRC and the Ministry of Commerce (MoC), 5 May 2017.

37 《「一帶一路」生態環境保護合作規劃》, issued by MoEP, 14 May 2017.

38 Source:〈廣州為 400 億元綠色產業項目提供融資對接〉, *Xinhua*, 5 May 2018.

39 《關於構建綠色金融體系的指導意見》 (*Guiding Opinions on Establishing the Green Financial System*), issued by the PBoC, the Ministry of Finance (MoF), NDRC, MoEP, China Banking Regulatory Commission (CBRC), China Securities Regulatory Commission (CSRC) and China Insurance Regulatory Commission (CIRC), 24 November 2016.

40 Source: SSE. 《上海證券交易所服務綠色發展推進綠色金融願景與行動計劃(2018-2020 年)》(*Green Finance Vision and Action Plan 2018-2020)*, 25 April 2018.

were 12 green-labeled fixed-income products with an outstanding value of RMB 6.2 billion as of July 2018[41].

(3) **Encouraging voluntary external reviews and enhancing market transparency.** Green bonds in the Mainland are issued in accordance with the official issuance guidelines that do not include external review as a mandatory requirement of issuance or listing. However, external reviews at pre-issuance and post-issuance stages are encouraged pursuant to the China Securities Regulatory Commission (CSRC)'s policy document[42] and the PBoC Guidelines. All listed green bonds and green ABS are designated with ticker symbols starting with G (short-form for "Green"). They are displayed on dedicated pages on the exchanges' bond market websites, so that they can be easily tracked and located by investors.

(4) **Collaborating with domestic index providers to develop green bond indices on Mainland green bonds.** The Shenzhen Securities Information Company Limited, a subsidiary of the SZSE, and the International Institute of Green Finance of the Central University of Finance and Economics (CUFE) jointly launched the CUFE China Green Bond Index Series for green bonds in the CIBM and Mainland exchanges in March 2017. The SSE and China Securities Index Company Limited (CSI) jointly launched SSE Green Bond Index, SSE Green Corporate Bond Index and CSI Exchange Green Bond Index in June 2017 for bonds listed on the SSE.

(5) **Cooperating with international exchanges to enhance market transparency for global investors.** The Mainland exchanges cooperate with Luxembourg Stock Exchange (LuxSE) to display the price information of green bond indices. The SZSE's CUFE China Green Bond Index Series and the SSE's SSE Green Bond Index and SSE Green Corporate Bond Index are displayed on the website of LuxSE. Besides, the SSE and the Luxembourg Green Exchange (LGX, the dedicated green bond segment of LuxSE) jointly launched a bilingual (both Chinese and English) information platform called Green Bond Channel in June 2018. The Green Bond Channel not only displays the price information of the green bonds listed on the SSE and CIBM but also the information on external reviews. To facilitate the listings of Chinese green bonds through the Green Bond Channel, the LuxSE revised its listing regime in January 2018 to allow bond listings without admission to its trading venues. Currently, the LGX displays the information of 15 SSE-listed green bonds and one green bond in the CIBM[43]. These bonds are traded through RMB Qualified Foreign Institutional Investors (RQFIIs), Qualified Foreign Institutional Investors (QFIIs) or Bond Connect.

2.3 The harmonisation of green standards is a key area for further growth

Both issuers and investors will benefit from the harmonisation of green bond standards. In the Mainland, there are two sets of official standards on green bond definitions, issued by the PBoC and NDRC respectively, plus another set issued by the China Banking Regulatory Commission (CBRC)[44] that is applicable only to green loans. While the two standards for green bonds are largely consistent with each other, there are some differences in the eligible green uses of proceeds. These differences may affect the lenders' choice and assessment of projects when they consider providing financing to the issuers. Some ESG investors may demand more clarity on green investment. For example, the inclusion criteria of a green bond index in the Mainland make reference to either one of the standards, such that certain green

[41] Source: Xinhua's website (http://greenfinance.xinhua08.com/a/20180730/1771204.shtml).

[42] 《中國證監會關於支持綠色債券發展的指導意見》(*Guiding Opinions of the China Securities Regulatory Commission on Supporting the Development of Green Bonds*), 2 March 2017.

[43] Source: Luxembourg Green Exchange's website (viewed on 31 October 2018).

[44] Now reorganised with CIRC into the China Banking and Insurance Regulatory Commission.

bonds may become ineligible to be included in the index. In the light of this, green finance is included in the authorities' standardisation plan for the finance sector[45]. The PBoC and the CSRC also jointly issued the *Interim Guidelines on the Assessment and Certification of Green Bonds* (《綠色債券評估認證行為指引》) in October 2017 to set out the guidelines for the certification of green bonds issued in the Mainland. In addition, the PBoC's Research Bureau established a task force in January 2018 to promote the standardisation of green finance.

Moreover, there is room for improvement in the Mainland's green definitions to narrow the gap with the international standards. As discussed above, ICMA's GBP is the most frequently used international standards for labelling a green bond. **Among Mainland green bonds, the share of those with definitions not aligned with international standards remained at about 20%-40% since 2016 and it was 28% in 2018H1.** There are three key areas of divergence — (1) the differences in the eligible green uses of proceeds (e.g. clean coal is included under the Mainland guidelines but not the international standards); (2) the maximum limit of proceeds used for the repayment of debt and general corporate purposes (50% of proceeds under the NDRC's guidelines and 5% under the international standards); and (3) information disclosure (external review is not required in the Mainland). To narrow the gap, the Green Finance Committee in the Mainland and the EIB launched a joint initiative to develop a clear framework for green finance and published a White Paper[46] in November 2017 on an international comparison of several green bond standards to pave way for enhancing the consistency of standards.

External review is in demand although this is not mandatory for issuing green bonds in the Mainland. To enhance issuer's disclosure, external review at pre-issuance and/or post-issuance, in addition to the issuer's first party (internal) review, is the most common way to verify that the proceeds of green bonds are used to finance qualifying green assets. The international practice of external review is mainly conducted through a second-party review and a third-party certification. While the independence of a second-party review is controversial as the second party often assists in developing the framework for managing the proceeds and reporting, third-party certification will help standardise the external review process as a third-party verifier reviews the framework against the criteria of a recognised set of standards (e.g. CBI's CBS). In fact, green bonds with CBS certification accounted for almost 16% in value terms of the total Mainland green bond issuance in 2017 (or 26% of Mainland green bonds with international-aligned definitions), higher than the 14% for global green bond market[47].

One driver for certifying green labels is that the alignment of the green label with the underlying investment can draw a stronger demand from international investors. An industry report[48] analysed a sample of 226 green funds sold to European investors, 165 of them were still active in 2017. The AUM of the European green funds rebounded to €22 billion in 2016 from a trough of €15 billion in 2013. While the majority of them were green equity funds, green bond funds recorded a two-fold increase in value annually in 2016. The study classified the funds into dark green funds (the theme implied by the fund's name matches its investment strategy and objective) and light green funds (the securities in the portfolio do not fully correspond to the fund's strategy and/or name). It was observed that, during 2013-2016, the AUM of dark green funds had a higher growth of 65% compared to the growth of 26% for light green funds.

45 《金融業標準化體系建設發展規劃（2016-2020 年）》(*The Development Plan for Building the Standardisation System for the Finance Sector (2016-2020)*), issued by the PBoC, CBRC, CSRC, CIRC and Standardisation Administration of the People's Republic of China, 8 June 2017.

46 "The need for a common language in Green Finance", issued by the EIB and the Green Finance Committee (GFC) of the China Society for Finance and Banking, 11 November 2017.

47 Source: CBI. *China Green Bond Market,* 2017 issue.

48 Novethic. *The European Green Funds Market*, March 2017.

Given the strong investor demand, green bond issuers with third-party certification may enjoy lower funding cost. The first Mainland green bond with third-party certification was the offshore bond issued by China Three Gorges Corporation in June 2017 and it is listed on the Irish Stock Exchange. At issuance, it was over-subscribed by 3.1 times. This 7-year bond has a coupon rate of 1.3% per annum, which is 40 basis points lower than that for the conventional 7-year bond issued in June 2015 by the same company in the same denomination (Euro) on the same exchange[49]. This compared to the decline of about 39 basis points for Eurozone's 7-year government bond yield during June 2015 to June 2017[50]. Separately, an Asian Development Bank (ADB) study[51] on a sample of 60 investment-grade green bonds observed a green discount of about 7 basis points for green bonds with an independent reviewer and 9 basis points for bonds with CBI certification, compared to paired conventional bonds.

3. HONG KONG IS WELL-POSITIONED TO DEVELOP GREEN BONDS

3.1 Hong Kong is already a gateway for Mainland issuers and international investors

Green bond issuance in Hong Kong picked up in 2018 after its gradual development in the past few years. Hong Kong's first green bond was the offshore issuance by Xinjiang Goldwind Science and Technology (Goldwind) in July 2015. During 2015 to 2017, there were only 9 green bonds issued in Hong Kong with an issue amount of about US$3.6 billion. Green bond issuance has become more active in 2018. During the first nine months of 2018, at least 17 green bonds with a total size of about US$7 billion were issued in Hong Kong. The bonds are mainly denominated in USD and more than half of them are listed on the SEHK. The issuers of these bonds range from supranationals to corporates from Hong Kong, the Mainland and the rest of the world (see Table 2).

The supply of green bonds in Hong Kong is expected to be boosted by the increasing number of listed corporate issuers from the Mainland and Hong Kong. Excluding the issuance by supranationals, most of the green bonds in Hong Kong were issued by Mainland and Hong Kong companies listed on the SEHK or by their subsidiaries. This reflects, to a certain extent, their business strategies supporting a green economy led by the transportation, real estate and energy sectors in Hong Kong and the Mainland. These business strategies are part of their ESG disclosure that investors use to evaluate the companies' ESG performance based on a number of key performance indicators. As green bonds are labelled with the green use of proceeds, the issuance of which shows the company's commitment to implement green business strategies. Listed issuers are subject to fewer requirements than non-listed issuers for listing their green bonds (e.g. listed issuers are exempted from requirements on net assets and two years of audited accounts). This may facilitate more listings of green bonds by listed issuers.

Mainland green bond issuers will benefit from lower funding costs for bonds issued in foreign currencies in Hong Kong. Some of the new issuers in 2018 are high-quality unlisted Mainland companies with strong state support, including Tianjin Rail Transit Group and Beijing Capital Polaris Investment Company Limited (an offshore arm of Beijing Capital Group). They had issued green bonds denominated in foreign currencies (USD or Euro), which may be used to finance their offshore green investments. In fact, Mainland companies are encouraged to issue green bonds in Hong Kong, possibly denominated in foreign currencies, to finance green

---

49 China Three Gorges Corporation issued the 7-year green bond in June 2017 for €650 million at 1.3% coupon rate (source: CBI, "China's first Certified Climate Bond: China Three Gorges Corporation: Funds wind energy in Europe", 26 July 2017), and a 7-year conventional bond in June 2015 for €700 million at 1.7% coupon rate (source: http://cbonds.com/emissions/issue/148221).

50 Source: Wind.

51 ADB. (2018) "The Role of Greenness Indicators in Green Bond Market Development: An Empirical Analysis", *Asia Bond Monitor*, June 2018, pp. 40-51.

BRI projects[52]. As Hong Kong is one of the most liquid foreign exchange markets in the world, the benchmark interest rates for foreign currencies in Hong Kong are expected to be lower than those in the Mainland. Therefore, Chinese issuers can enjoy more favourable terms for their foreign currency-denominated green bond issuance in Hong Kong.

Table 2. Green bonds issued in Hong Kong (July 2015 – September 2018)

Issue date	Issuer	Nature	SEHK-listed green bond	Issue size
Jul 2015	Goldwind New Energy (HK) Investment Limited*	Corporate	Yes	US$300 million
Jul 2016	Bank of China Limited*	Commercial bank	Yes	RMB 1,500 million
Jul 2016	The Link Finance (Cayman) 2009 Limited*	Corporate	Yes	US$500 million
Nov 2016	MTR Corporation (C.I.) Limited*	Corporate	Yes	US$600 million
Jul 2017	Castle Peak Power Finance Company Limited*	Corporate	Yes	US$500 million
Jul 2017	MTR Corporation Limited*	Corporate	Yes	HK$338 million
Sep 2017	MTR Corporation Limited*	Corporate	Yes	US$100 million
Nov 2017	China Development Bank*	Policy bank	Yes	EUR1,000 million
Nov 2017	China Development Bank*	Policy bank	Yes	US$500 million
Jan 2018	Swire Properties*	Corporate	Yes	US$500 million
Feb 2018	Modern Land (China) Co., Limited*	Corporate		US$350 million
Mar 2018	Tianjin Rail Transit Group	Corporate		EUR400 million
Mar 2018	Asian Development Bank	Supranational		HK$400 million
Mar 2018	Asian Development Bank	Supranational		HK$100 million
Mar 2018	Beijing Capital Polaris Investment Co Ltd	Corporate	Yes	RMB 630 million
Mar 2018	Beijing Capital Polaris Investment Co Ltd	Corporate	Yes	US$500 million
Apr 2018	European Investment Bank	Supranational		US$1,500 million
Apr 2018	World Bank	Supranational		HK$1,000 million
Apr 2018	Landsea Green Group Co Ltd*	Corporate		US$150 million
Apr 2018	Evision Energy Overseas Capital Co Ltd	Corporate		US$300 million
May 2018	Bank of China Limited, Hong Kong Branch*	Commercial bank	Yes	HK$3,000 million
May 2018	Bank of China Limited, London Branch*	Commercial bank		US$1,000 million
Jun 2018	Industrial and Commercial Bank of China (Asia) Limited*	Commercial bank	Yes	US$400 million
Jun 2018	Industrial and Commercial Bank of China (Asia) Limited*	Commercial bank	Yes	HK$2,600 million
Sep 2018	Capital Environment Holding Limited*	Corporate	Yes	US$250 million
Sep 2018	China Everbright Bank Hong Kong Branch*	Commercial bank	Yes	US$300 million

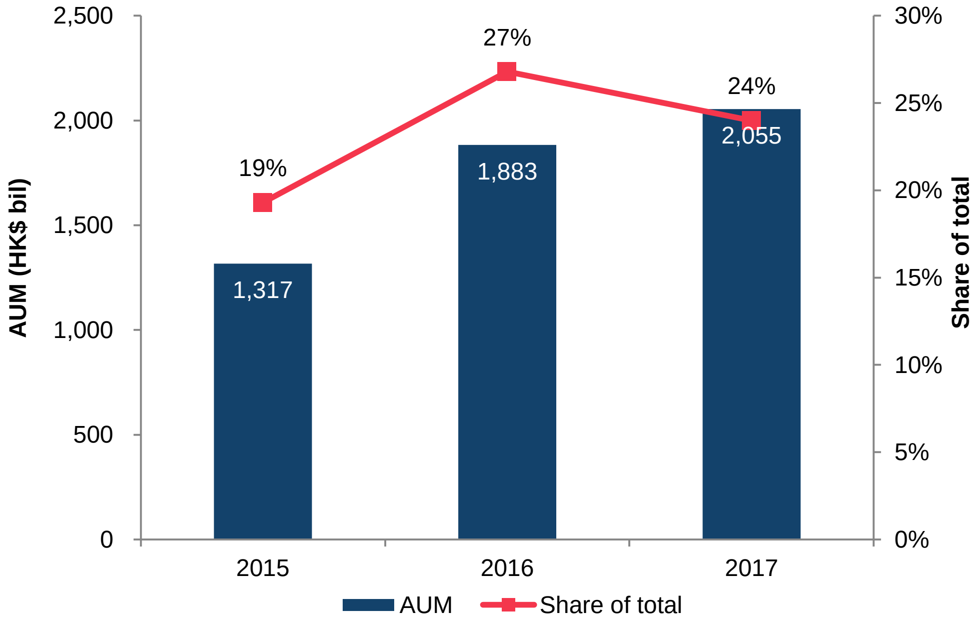
* Companies listed on the SEHK or their subsidiaries.

Source: Hong Kong Monetary Authority. “Green Finance: Hong Kong’s unique role”, 20 June 2018; Bloomberg. The list is non-exhaustive.

52 《國家發展和改革委員會與香港特別行政區政府關於支持香港全面參與和助力「一帶一路」建設的安排》(*Arrangement between the National Development and Reform Commission and the Government of Hong Kong Special Administrative Region for Supporting Hong Kong in Fully Participating in and Contributing to the Belt and Road Initiative*), issued by the NDRC, 14 December 2017.

The above green bond supply from issuers is met with the broad international investor base in Hong Kong which have an increasing investment appetite for green bonds. International investors are the major source of funding for Hong Kong's fund management business, accounting for about 66% of the total AUM[53]. For assets managed in Hong Kong, the allocation to bonds surged by 56% from HK$1,317 billion (19.3% of the total) in 2015 to HK$2,055 billion (24% of the total) in 2017 (see Figure 9). The appetite of bond investments may increase the demand for green bonds. In fact, green bond issues in Hong Kong are often over-subscribed, e.g. the first green bond by Goldwind (by about 5 times)[54] and the second green bond by Link REIT (by about 4 times)[55]. This reflects the increasing importance of ESG elements for investment funds in Hong Kong.

Figure 9. The fund allocation to bonds for assets managed in Hong Kong (2015 – 2017)



Source: Hong Kong's Securities and Futures Commission. *Fund Management Activities Survey* and *Asset and Wealth Management Activities Survey*, 2015-2017.

Furthermore, the Hong Kong Green Finance Association (HKGFA) was established on 21 September 2018 to promote the development of green finance in Hong Kong. The HKGFA is a non-profit organisation to promote green and sustainable banking, develop green capital markets and integrate ESG principles in investment decision-making by institutional investors[56]. Its members include 90 financial institutions in Hong Kong, environmentally-friendly organisations, service providers and other key stakeholders.

3.2 Hong Kong's internationally recognised green bond standards and government supportive measures can fuel the growth

Notwithstanding the potential supply and demand of green bonds, there are certain issues to overcome for the further development of the green bond market in Hong Kong. First, similar to the Mainland and global markets, more clarity on green labelling is required to align with international standards. Second, green labels are not for free and may increase the overall

53 Source: SFC. *Asset and Wealth Management Activities Survey, 2017 issue.*

54 Source: CBI. "First labelled green bond from Chinese issuer issued in US$ almost 5x oversubscribed", 20 July 2015.

55 Source: FinanceAsia. "Link holdings brings first green bond by Asia Reit", 4 September 2017,

56 Source: HKGFA. "Hong Kong Green Finance Association Announces Official Launch on 21st September", 3 September 2018.

funding cost. Third, potential issuers may prefer issuing conventional bonds to green bonds if they lack an understanding of the issuance process. To address these issues, the Hong Kong Government has taken the lead to push the development of green bonds in the following ways.

Firstly, an internationally recognised green bond certification and a dedicated list of certified green bonds are already in place to serve the issuers and investors in Hong Kong, the Mainland and overseas. Many well-known international reviewers have a presence in Hong Kong to provide external review services. Besides, with government support, the Hong Kong Quality Assurance Agency (HKQAA) has developed the Green Finance Certification Scheme (GFCS) to provide third-party certification for issuers as highlighted in the Policy Address 2017/18. The HKQAA standards make reference to the Mainland's national standards and a number of international standards on green finance[57]. The HKQAA certification can be issued at stages of pre-issuance and post-issuance and the certified green bonds are displayed at the HKQAA website on green finance. The pre-issuance certification validates the adequacy of the Environmental Method Statement[58] as of the date of certification while the post-issuance certification verifies the continuous implementation and effectiveness of the Environmental Method Statement.

Certified green bonds in Hong Kong appeared to enjoy a lower funding cost element — interest cost. During December 2017 to August 2018, the HKQAA granted pre-issuance certificates to 8 green bonds and loans, including the first HKQAA-certified green bond issued by Swire Properties in January 2018. The green certification was accompanied by lower coupon rate — Swire Properties' 10-year USD-denominated green bond has a coupon rate of 3.5%, which is lower than 3.625% for a comparable conventional bond issued in 2016[59].

The development of HKQAA's GFCS is in line with the development trend in global markets. In Luxembourg, the Ministry of Finance endorsed a new green bond label scheme launched in June 2017 by the independent non-profit Luxembourg Finance Labelling Agency (LuxFlag) and the label scheme is consistent with international standards such as ICMA's GBP and CBI's CBS. In Japan, the Ministry of Environment released green bond guidelines in March 2017, which align largely with ICMA's GBP. In India, the Securities and Exchange Board of India (SEBI) released a circular in May 2017 to set out definitions of green bonds and disclosure requirements for the issuance and listing of green bonds. In the UK, the government announced in September 2017 to work with the British Standards Institute to develop a new set of voluntary green and sustainable finance management standards.

Secondly, the Hong Kong Government offers subsidies to green bond issuers to lower the overall financing cost. The labelling of green bonds is not for free but adds an extra cost of around US$10,000 to US$100,000 for external reviews[60]. In the light of this, the Government launched the Green Bond Grant Scheme (GBGS) in June 2018 to subsidise eligible green bond issuers in obtaining certification under the GFCS established by the HKQAA. Eligibility criteria include a minimum issue size of HK$500 million and that the bond is to be issued in Hong Kong and to be listed on the SEHK and/or the Central Moneymarkets

57 The standards for reference include *Green Bond Endorsed Project Catalogue* of the PBoC, *Clean Development Mechanism* under the UNFCCC, ICMA's GBP, *ISO 26000: 2010 Guidance on Social Responsibility*, etc.

58 A green bond issuer who applies for the HKQAA certification is required to formulate and implement its Environmental Method Statement to produce positive environment effects. The statement include the information on the intended green category of the projects and positive environmental effect, the mechanism of selection and evaluation of green projects and the plan on the use and management of proceeds, disclosure, impact assessment and stakeholder engagement.

59 Swire Properties issued a conventional 10-year bond in 2016 for US$500 million at a coupon rate of 3.625% and issued a 10-year green bond in 2018 for US$500 million at a coupon rate of 3.5% (Source: cbonds.com. See http://cbonds.com/emissions/issue/185179 and http://cbonds.com/emissions/issue/399417 respectively).

60 Source: OECD, ICMA, CBI, GFC of the China Society for Finance and Banking. *Green Bonds: Country Experiences, Barriers and Options*, September 2016.

Unit operated by the Hong Kong Monetary Authority (HKMA-CMU). The grant will cover the full cost of external review with a cap at HK$800,000 per bond issuance, which would significantly reduce the extra cost incurred for green labelling. Besides, an issuer can benefit from the certification of a bond program in that the cost can be shared among different rounds of issuance.

In addition to green bond specific measures, the Government launched the Pilot Bond Grant Scheme (PBGS) in May 2018 to incentivise new bond issuers in Hong Kong. The eligibility criteria for getting a grant include first-time issuers (i.e. no bond issuance in Hong Kong in the past 5 years from May 2013), a minimum issue size of HK$1.5 billion with Hong Kong as the place of issuance and listing. The grant will cover 50% of the issuance expenses with a cap of HK$2.5 million for an issue rated by qualified credit rating agencies or HK$1.25 million otherwise. The subsidy can be claimed twice up to the total grant for each issuer.

Other markets, like Singapore, also offer such kinds of government subsidy. Similar to GBGS in Hong Kong, Singapore's grant scheme for green bond issuance has launched in June 2017. For green bonds issued and listed in Singapore with an external review, the grant will cover the full cost of the external review with a cap at S$100,000 (about HK$574,000) per bond issue. This is subject to a minimum issue size of S$200 million (about HK$1,148 million). Analogous to PBGS, Singapore has a grant scheme launched in January 2017 to attract first-time Asian issuers to issue and list longer-term (at least 3 years) green bonds in Asian local currencies or G3 currencies (i.e. USD, Euro and Japanese yen) in Singapore. The minimum issue size for this grant is S$200 million (about HK$1,148 million). The grant will cover 50% of the issuance costs, with a cap of S$400,000 (about HK$2.30 million) for a rated issue or S$200,000 (about HK$1.15 million) otherwise.

Thirdly, the Hong Kong Government is set to launch the world's largest sovereign green bond issuance program. According to the Budget 2018/19, the program set the maximum at HK$100 billion for green bonds issued by the Government. The proceeds can be used to fund green public works. The inaugural government green bond is expected to be issued between 2018 and 2019. In parallel, there has been increasing issuance of sovereign green bonds in global markets, including France, Belgium, Indonesia, Poland, Nigeria and Fiji, since late 2016[61]. This shows the governments' commitment to promoting their green bond markets and set a role model for potential issuers.

Authorities are supportive on the regulatory front. The Securities and Futures Commission (SFC) published the *Strategic Framework for Green Finance* in September 2018. The framework outlined an action plan to strengthen five areas of green finance, including listed companies' disclosure of environmental information, integrating ESG factors into investments of asset managers, widening the range of green-related investments, supporting investor awareness and capacity building and promoting Hong Kong as an international green finance centre.

Going forward, the Hong Kong Government would have a pivotal role in encouraging the initiations of green projects in Hong Kong and in expanding the green bond investor base. To drive the growth of the green bond market, the Government's firm commitment to a green economy in Hong Kong is the key. It may consider green projects in cooperation with real estate, transportation and energy sectors. It may also consider providing tax incentives to investors (like tax exemption for municipal bonds in the US) to help establishing a broad green bond investor base in Hong Kong.

[61] Source: CBI. "Sovereign Green Bonds Briefing", 3 March 2018.

3.3 Promoting green bond development in Hong Kong

3.3.1 Bond listing

A number of global stock exchanges have launched dedicated listing sections for green bonds since 2015 to support green financing and investment. According to the CBI, there are 10 stock exchanges having dedicated green bond segments as of October 2018 (see Table 3) that display green bonds with environmental disclosures. The disclosure requirements of listed green bonds are not homogeneous. For example, Luxembourg and the UK require external reviews as a listing requirement on their green bond segments. The LuxSE requires both independent external review and ex-post reporting from issuers. In the UK, the LSE requires an external review from the issuer in which the certifier must meet the criteria set out in the related guidelines[62] and encourages voluntary ex-post reporting. The emphasis on environmental disclosure helps attract more new green investors. This reinforces the benefit of bond listings in enhancing secondary liquidity. The listing status of green bonds would be important to attract institutional investors who are mandated to invest in listed securities.

Table 3. Dedicated green bond listing segments on global stock exchanges

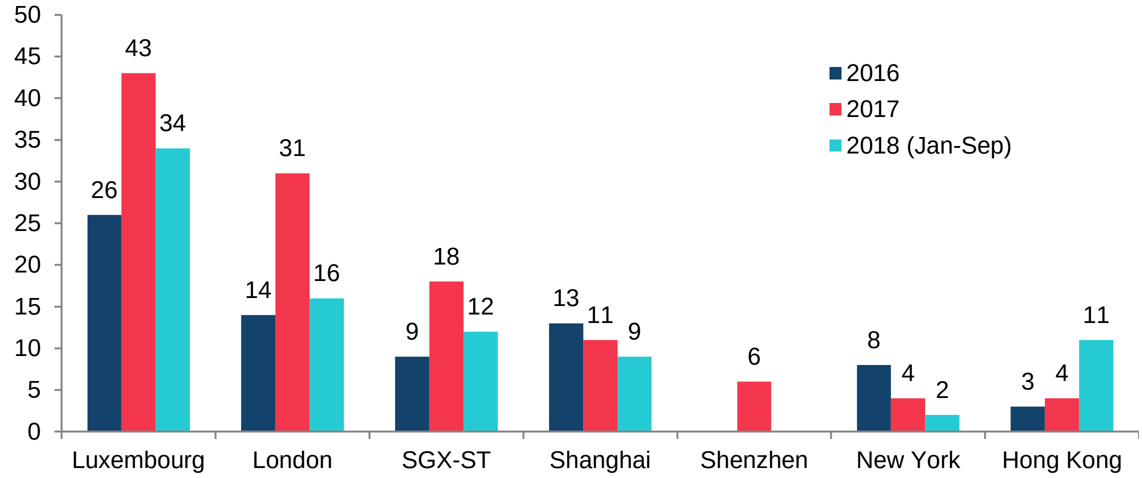
Name of stock exchange	Type of dedicated section	Launch date
Borsa Italiana	Green and social bonds	March 2017
Japan Exchange Group	Green and social bonds	January 2018
Johannesburg Stock Exchange	Green bonds	October 2017
London Stock Exchange	Green bonds	July 2015
Luxembourg Stock Exchange — Luxembourg Green Exchange	Green bonds, social bonds, sustainability bonds, Chinese domestic green bonds, ESG funds, green funds and social funds	September 2016
Mexico Stock Exchange	Green bonds	August 2016
Oslo Stock Exchange	Green bonds	January 2015
Shanghai Stock Exchange	Green bonds	March 2016
Stockholm Stock Exchange	Sustainable bonds	June 2015
Taipei Exchange	Green bonds	May 2017

Source: CBI's website, viewed on 31 October 2018.

While some European exchanges have dominated the market in terms of number of green bond listings, the Hong Kong market is picking up (see Figure 10). Although the listing requirements of green bonds are more stringent in Luxembourg and London, the number of listed green bonds in the two markets has been higher than those in Asia and New York. Hong Kong's number of green bond listings has more than doubled to 11 bonds during the first nine months in 2018 from 4 bonds in 2017 while the strong momentum was not observed in other exchanges.

[62] *Green Bonds Certification*, LSE, 8 October 2015.

Figure 10. Number of listed green bonds on selected stock exchanges (2016 – Sep 2018)



Note: These are bonds with green use of proceeds based on the information in Bloomberg's database.

Source: Bloomberg.

Hong Kong's listing regime is rather efficient and cost-effective to support green bond issuance. The listing requirements and the listing process are currently the same for green bonds and conventional bonds. Most of the currently listed green bonds in Hong Kong are only available to professional investors (these are bonds issued under Chapter 37 of the Listing Rules). The processing time takes about two business days. For a bond issuer listed in Hong Kong, the processing time can be as short as within one business day. Besides, the listing fee for Hong Kong issuance is a one-off payment of HK$7,000 to HK$90,000 without annual fee, which is one of the lowest in Asia Pacific.

To further support green bond development, the Hong Kong market may consider introducing a dedicated green bond segment with tailored-made environmental disclosure requirements. Empirical studies[63] showed that companies with more timely and detailed disclosure policies have lower costs of debt. A key reason is that the disclosure can fill the information gap between issuers and investors. For environmental disclosure, some evidence[64] suggested that it is positively associated with environmental performance. Studies[65] also found that companies with good environmental management enjoy lower costs of debt but companies with environmental concerns have higher costs of debt and lower credit ratings. These explain why green bonds usually have lower funding costs at issuance and stronger investor demand and also highlight the importance of corporate environmental disclosure. The statistics of listed bond markets with green bond segments and the HKEX bond market are summarised in the Appendix.

Hong Kong's listing regime of green bonds can be enhanced through more disclosure and higher transparency. The dedicated segment can be set up as a two-way information platform to provide a comprehensive list of green bonds in Hong Kong and the Mainland, with environmental disclosure of individual green bonds, including external reviews and/or ex-post reporting. The segment can not only display listed bonds but also bonds in over-the-counter (OTC) markets in Hong Kong and the Mainland. Reference

---

63 See, for example, Sengupta. (1998) "Corporate Disclosure Quality and the Cost of Debt", *The Accounting Review*, Volume No. 73, pp. 459-474; and Nikolaev and Lent. (2005) "The Endogeneity Bias in the Relation between Cost of Debt Capital and Corporate Disclosure Policy", *European Accounting Review*, Volume No. 14, pp. 677-724.

64 See Clarkson, Li, Richardson and Vasvari. (2008) "Revisiting the relation between environmental performance and environmental disclosure: An empirical analysis", *Accounting*, *Organizations and Society*, Volume No. 33, pp. 303-327.

65 See, for example, Bauer and Hann. (2010) "Corporate Environmental Management and Credit Risk", Working Paper.

could be made to cooperation between Mainland exchanges and LuxSE (see section 2.2 above).

With enhanced ESG disclosure requirements, the issuance and listing of green bonds by Mainland companies will be further promoted. A CSRC official noted that both listed companies and bond issuers in Mainland will have to implement mandatory ESG reporting by 2020 and the detailed framework will be set by the CSRC for listed companies and the PBoC for bond issuers respectively[66]. ESG reporting helps investors understand a company's approach to ESG issues and helps the company assess its ESG performance and identify gaps for improvement. Since the UNSSE launched its Model Guidance on ESG reporting for exchanges in September 2015, the number of exchanges with their own ESG reporting guidelines has increased from 14 in September 2015 to 38 in August 2018, including exchanges in the Mainland, Hong Kong, Luxembourg, Singapore and the UK[67]. The frameworks of ESG reporting are still fragmented across global markets and the FSB TCFD recommendations have provided a basis of convergence (see section 1.2). Hong Kong is considering further enhancing the ESG reporting of listed companies to align with the FSB TCFD recommendations[68]. The Mainland and UK have co-chaired the G20 Sustainable Finance Study Group (previously called Green Finance Study Group) since 2016 and they endorsed a group of financial institutions piloting the implementation of the FSB TCFD recommendations, including in the Mainland's environmental disclosure guidelines. These will help the development of mandatory ESG reporting of listed companies in the Mainland. The improvement of ESG reporting as a result of these initiatives is expected to increase the demand for green financing by corporate issuers and the demand for green investments.

3.3.2 Bond trading

Traditionally, corporate bonds are usually traded in OTC markets rather than on exchanges[69]. One of the reasons is the better price discovery in OTC markets. Different from stocks, corporate bonds are less frequently traded and the last traded price may not reflect all available information. In OTC markets, investors are usually more sophisticated and have more information and understanding of different bond structures (e.g. variable coupon rate, embedded option and guarantee, etc). The listing of bonds may mainly be driven by the need to cater for the demand of mutual funds and trusts which are subject to investment mandates that can buy listed bonds only. This may not be the case for green bonds because green labels usually come with much higher requirements of public disclosures. Although more disclosure cannot be directly translated into lower risk, it would help the price discovery of the bonds on an exchange. Another benefit to trade bonds on an exchange is pre-trade information (e.g. bid-ask quotes) and post-trade information (e.g. last traded price) transparency.

Hong Kong can consider various arrangements for trading green bonds in the OTC and exchange markets. Reference could be made to the trading arrangements in the UK. On the LSE, there are three dedicated green segments for the trading of listed bonds by retail and institutional investors and for the OTC trading of bonds. These include the green segments on the platforms of Orderbook for Retail Bonds (ORB, a platform of bonds issued by UK issuers for retail investors), Orderbook for Fixed Income Securities (OFIS, a platform of bonds listed on the LSE's Main Board and the board for professional investors and

66 Source: 〈上市公司及發債企業 2020 年將強制環境信披〉 ("Listed companies and bond issuers will be mandated to make environmental disclosure by 2020") (http://finance.caixin.com/2018-03-20/101223470.html), *Caixin*, 20 March 2018.

67 Source: "SSE campaign to close the ESG guidance gap", UNSSE website, viewed on 31 October 2018.

68 Source: SFC. *Strategic Framework for Green Finance*, 21 September 2018.

69 See: International Organization of Securities Commissions (IOSCO). *Transparency of Corporate Bond Markets*, May 2004.

bonds listed on other European exchanges) and Trade Reporting only (for off-book transactions in the OTC market).

A catalyst for the trading of OTC and listed bonds in Hong Kong can come from more cooperation between trading platforms. OTC bond transactions in Hong Kong are cleared and settled only through the HKMA-CMU. On the contrary, transactions of listed bonds in Hong Kong may be cleared and settled through the HKMA-CMU for some or through the HKEX's Central Clearing and Settlement System (CCASS) for others. It involves charges and time to move bonds from HKMA-CMU to CCASS. Therefore, the cooperation or connectivity of the two bond clearing and settlement platforms with streamlined clearing and settlement procedures would widen the investor base (to include both CMU members and CCASS participants). Trading arrangements of market makers or liquidity providers would further support liquidity. The secondary liquidity of bonds can be further enhanced through introducing Southbound trading under Bond Connect[70] for Mainland investors to participate in the Hong Kong bond market.

To promote bond market development in Hong Kong, the Government launched Qualifying Debt Instrument scheme (QDI) in 1996 that cut 50% of tax on interest income and trading profits of bonds. The scope of the QDI scheme that previously covered only OTC bonds in Hong Kong has been extended in April 2018 to cover also bonds listed on the SEHK.

The listing regime and trading arrangements of green bonds can be reviewed to encourage retail participation. For bond listing, as mentioned above, most listed green bonds in Hong Kong are only available to professional investors. It is because public offerings of listed bonds for retail subscription are subject to more requirements under Chapter 22 of the Listing Rules for protecting investors' interest. For bond trading, retail investors are constrained from trading bonds in Hong Kong due to their comparative disadvantages in terms of clearing and settlement and best execution[71]. As most bonds in Hong Kong are deposited in the HKMA-CMU, the trading of bonds is usually conducted among banks which provide no assurance to retail investors for continuous quotes or best execution prices. It may be worth considering providing higher flexibility to enable retail access to green bonds. This would be complementary to the development trend of retail issuance of green bonds in the Mainland since September 2017 (see section 2.1).

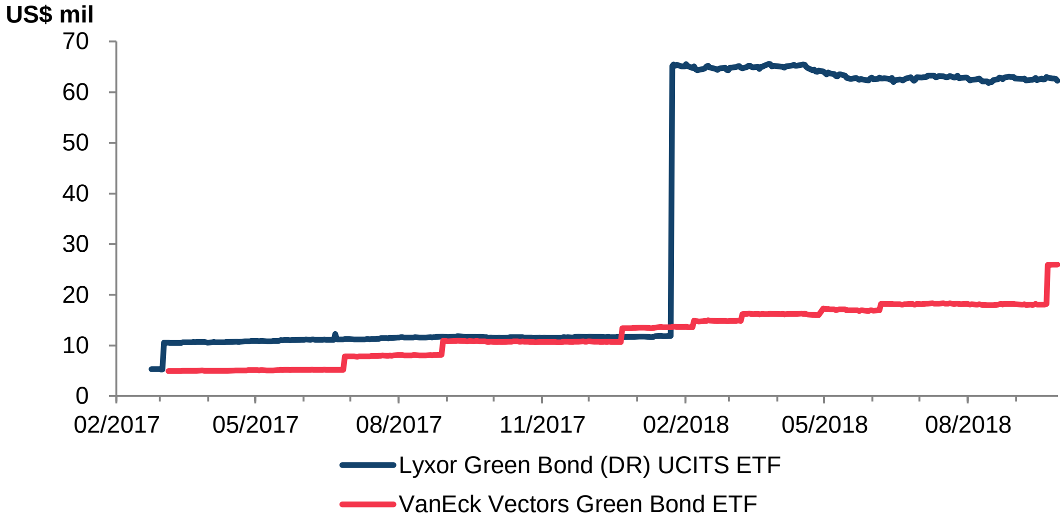
3.3.3 Index and related product development

Global green bond indices are tracked by ETFs. The first two green bond ETFs were launched in 2017 — Lyxor Green Bond (DR) UCITS ETF in February and VanEck Vectors Green Bond ETF in March — primarily listed in Europe and the US respectively. They track the performance of Solactive Green Bond EUR USD IG Index and S&P Green Bond Select Index respectively, which are the sub-indices of the global green bond indices mentioned in Section 1.3 above. The AUM of these two ETFs continued to grow (see Figure 11).

70 Subject to regulatory approval.

71 Source: "Why HK has no retail bond market", *Webb-site.com*, 13 May 2018.

Figure 11. AUM of the first two green bond ETFs (Feb 2017 – Sep 2018)



Source: Lyxor's website and Bloomberg.

In the Mainland, green bond indices cover green bonds in the CIBM and listed green bonds. For green bonds in CIBM, there are 3 green bond index series — ChinaBond China Green Bond Index, ChinaBond China Climate-aligned Bond Index and ChinaBond CIB Green Bond Index. For listed green bonds, the SZSE and CUFE's CUFE China Green Bond Index series covers labeled and unlabeled green bonds; and the SSE launched 3 green bond indices to cover green bonds listed on its market (see Section 2.2 above). **However, there has been no ETF available for tracking these green bond indices in the Mainland. The Hong Kong market can facilitate the development of green bond ETFs on these indices to enhance the liquidity of Mainland green bonds.** Hong Kong is well-positioned to offer green bond ETFs to international investors. ETF issuers can easily tap into the CIBM through Bond Connect and into the onshore exchange-traded bond markets through the RQFII and QFII schemes for their underlying green bond asset management and this would facilitate the development of green bond ETFs.

Hong Kong can consider the development of green bond indices to widen the investor base. As mentioned in section 3.2, the Hong Kong Government is pledged to issue green bonds regularly through the HK$100 billion green bond issuance program. If the bonds are issued with a range of different tenors, a benchmark yield curve will be established for issuers and a total return index of green government bonds will be useful for investors to track the performance. In addition to government bonds, there have been green bonds issued by a diverse base of Mainland and Hong Kong corporate issuers. It is worth considering a broad-based green bond index, like the CUFE China Green Bond Index series which include bonds issued in the CIBM and stock exchanges by the Mainland Government, policy banks, government-backed entities and high-quality (AAA-rated in the Mainland) financial and non-financial companies. Indices tracking green bonds of different scopes of coverage are suitable to be underlying assets for investment tools like ETFs that could meet the different investment targets and risk profiles of passive asset managers and retail investors. With the availability of local, Mainland and cross-border green bond indices, green bond ETFs tracking these indices can be developed.

In addition, enhancements to FX derivatives in Hong Kong would support the development of green bonds. Most of the green bonds issued in Hong Kong are denominated in USD or Euro. The tenors of some green bonds are very long. Although some issuers may have natural hedge provided by the denomination of their revenue and the use of funding in the same currency, the demand for liquid hedging instruments with a wider range of tenors and currency pairs is expected to increase for currency risk management. While issuers and investors may hedge their currency exposures by OTC FX derivatives, listed FX derivatives could offer a more liquid way of risk management with better protection by a central clearing mechanism. With the presence of market makers or liquidity providers, issuers and investors can hedge all or part of their positions on the exchange's listed market as desired. Besides, the counterparty risk is mitigated by central clearing. As the coverage of FX derivatives becomes more comprehensive, more investors may choose to manage their fixed-income portfolios in Hong Kong.

4. CONCLUSION

Green bonds have contributed an increasing share of the global bond market and the green bond market is expected to continue to grow in a relatively rapid pace. Countries are committed to the transition to a green economy for which the funding demand is huge. This has fostered the issuance of green bonds. Green bonds are not only supportive of the sustainable development of economies, but also give mutual benefits to both issuers and investors in terms of reputation, funding cost and investment return.

Mainland China has become the second largest green bond market in the world. With strong government policy support, the momentum of issuance has been and would remain strong. However, the harmonisation of domestic green standards and between domestic and international standards is a major issue to be addressed. Hong Kong has been playing a facilitator's role for connecting international investors with Mainland green bond issuers in: (1) bridging the gap for Mainland issuers in offshore green bond issuance, with its internationally recognised green bond certification scheme that make reference to international and Mainland standards; and (2) being a key gateway for international investors to access CIBM through Northbound Bond Connect.

In Hong Kong, the green bond market continues to grow with a diverse base of Mainland, Hong Kong and supranational issuers. The Government is set to launch the world's largest green bond issuance program and offers a range of incentives to attract corporate green bond issuers. Increasing institutional fund allocation to bonds is observed. As next steps, the Hong Kong listed market could consider launching a dedicated green bond segment to reinforce the benefits of listing for issuers and a review of bond clearing and settlement on different venues to streamline the processes for investors. The possible launch of Southbound trading under Bond Connect can further widen the investor base in Hong Kong and provide a new asset class to Mainland investors. Given the foreign currency denomination of green bonds in Hong Kong, listed FX derivatives could provide a liquid way of currency risk management for issuers and investors with better protection. For investors, green bond ETFs can be a convenient way to access diversified portfolios of green bonds in the Mainland and Hong Kong by tracking related green bond indices. These potential market developments would contribute to the growth of Hong Kong's bond market.

APPENDIX. STATISTICS OF BOND MARKETS WITH GREEN BOND SEGMENTS AND HONG KONG

Table A1. Outstanding number of bond listings (2012 – Sep 2018)

Exchange	2012	2013	2014	2015	2016	2017	Sep 2018
Bolsa Mexicana de Valores	743	807	783	838	809	863	862
Japan Exchange Group Inc.	325	326	331	344	358	361	362
Johannesburg Stock Exchange	1,452	1,539	1,650	1,731	1,666	1,671	1,723
LSE Group	19,490	21,486	17,835	17,225	16,205	13,676	13,783
Luxembourg Stock Exchange	27,839	26,684	26,251	25,674	30,550	30,344	31,437
Nasdaq Nordic Exchanges	6,006	7,086	7,789	8,079	7,691	7,558	7,992
Oslo Børs	1,384	1,569	1,669	1,719	1,911	2,064	820
Shanghai Stock Exchange	953	1,458	2,094	3,141	4,709	6,017	6,701
Taipei Exchange	1,189	1,273	1,323	1,440	1,519	1,563	1,662
HKEX	**269**	**403**	**640**	**762**	**892**	**1,047**	**1,155**

Note: LSE Group's figures comprise those of London Stock Exchange and Borsa Italiana. Nasdaq Nordic Exchanges' figures include those of Stockholm Stock Exchange. The latest number of bond listings in Oslo Børs was as of June 2018.

Source: World Federation of Exchanges.

Table A2. Total turnover of bonds (US$ million) (2012 – Sep 2018)

Exchange	2012	2013	2014	2015	2016	2017	Sep 2018
Bolsa Mexicana de Valores	212	184	256	171	50	118	30
Japan Exchange Group Inc.	1,571	1,766	549	1,255	947	368	196
Johannesburg Stock Exchange	2,804,748	2,123,266	1,732,616	1,766,205	1,850,483	2,083,337	1,777,855
LSE Group	4,575,453	3,953,090	3,028,141	2,256,767	9,321,120	9,195,948	216,800
Luxembourg Stock Exchange	439	483	228	134	120	136	99
Nasdaq Nordic Exchanges	3,031,086	2,536,905	2,280,408	1,785,424	1,710,937	1,704,374	213,714
Oslo Børs	505,094	675,201	635,238	696,847	713,150	1,041,233	637,513
Shanghai Stock Exchange	127,262	199,476	270,111	336,904	398,743	355,392	228,781
Taipei Exchange	351,628	267,114	269,670	282,684	268,729	239,736	171,051
HKEX	**357**	**575**	**785**	**1,210**	**2,743**	**7,758**	**4,508**

Note: LSE Group's figures comprise those of London Stock Exchange and Borsa Italiana. Nasdaq Nordic Exchanges' figures include those of Stockholm Stock Exchange.

Source: World Federation of Exchanges.

Table A3. Outstanding number of green bond listings (2012 – Nov 2018)

Exchange	2012	2013	2014	2015	2016	2017	Nov 2018
Bolsa Mexicana de Valores	0	0	0	0	1	1	1
Japan Exchange Group Inc.	5	6	7	8	9	10	11
Johannesburg Stock Exchange	0	0	1	2	2	3	6
LSE Group	2	6	24	40	62	106	127
Luxembourg Stock Exchange	31	40	67	80	99	132	172
NOMX Stockholm	0	2	15	22	47	79	127
Oslo Børs	0	1	6	11	12	19	23
Shanghai Stock Exchange	0	0	0	0	13	24	34
Taipei Exchange	0	0	0	0	0	9	23
HKEX	**0**	**0**	**0**	**1**	**4**	**8**	**20**

Note: LSE Group's figures comprise those of London Stock Exchange and Borsa Italiana.

Source: Bloomberg (as of 14 November 2018).

ABBREVIATIONS

ABS	Asset-backed security
AUM	Assets under management
BIS	Bank for International Settlements
BRI	Belt and Road Initiative
CBI	Climate Bonds Initiative
CBS	Climate Bonds Standard
CCASS	Central Clearing and Settlement System in Hong Kong
CIBM	China Interbank Bond Market
CSRC	China Securities Regulatory Commission
EIB	European Investment Bank
ESG	Environmental, social and governance
ETF	Exchange traded fund
FSB	Financial Stability Board
FX	Foreign exchange
G20	Group of Twenty
GBGS	Green Bond Grant Scheme in Hong Kong
GBP	Green Bond Principles
GCF	Green Climate Fund
GFC	Green Finance Committee
GFCS	Green Finance Certification Scheme
HKGFA	Hong Kong Green Finance Association
HKMA-CMU	Central Moneymarkets Unit operated by the Hong Kong Monetary Authority
HKQAA	Hong Kong Quality and Assurance Agency
ICMA	International Capital Market Association
LSE	London Stock Exchange
LuxSE	Luxembourg Stock Exchange
NDRC	National Development and Reform Commission in China
OTC	Over-the-counter
PBoC	People's Bank of China
SEHK	Stock Exchange of Hong Kong
SSE	Shanghai Stock Exchange
SZSE	Shenzhen Stock Exchange
TCFD	Task Force on Climate-related Financial Disclosures
UN	United Nations
UN SDGs	UN Sustainable Development Goals
UNFCCC	UN Framework Convention on Climate Change
UNSSE	UN Sustainable Stock Exchanges

Disclaimer