



CONTENTS

Executive Summary	01
1. Introduction: A day late and a dollar short	11
2. What are green bonds?	19
2.1 Definition and structure of green bonds	20
2.2 Review of green bond issues	21
2.3 Issuance procedure of green bonds	30
2.4 Pricing of green bonds	31
3. Global green bond market	32
3.1 Development of global green bond market	33
3.2 Notable market developments across the globe	37
4. Green bond market in China	40
4.1 Overview	41
4.2 Recent development of green bond market in China	43
5. Green bond market in Hong Kong	47
5.1 Overview	48
5.2 Green bonds issued in Hong Kong	48
5.3 Government initiatives	50
6. Environmental needs behind green bonds	52
6.1 Paris Agreement	53
6.2 Environmental needs of China	55
6.3 Environmental needs of Hong Kong	60

7. Considerations	62
7.1 Framework	63
7.2 Consideration 1: Establish a Qualifying Green Bond (QGB) scheme	64
7.3 Consideration 2: Provide subsidy for Qualifying Green Bonds (QGBs)	67
7.4 Consideration 3: Issue government green bonds	68
7.5 Consideration 4: Align HKMA investments with the UNPRI	74
7.6 Consideration 5: Encourage the Hong Kong Stock Exchange to be green	78
7.7 Consideration 6: Establish an inter-departmental committee	81
7.8 Consideration 7: Enhance communication with the Chinese Central Government and international promotion	83
7.9 Other considerations: Provide tax incentives for Qualifying Green Bonds (QGBs)	85
Appendix I:	87
Special tax treatments related to bond investments	

Executive Summary

INTRODUCTION: A DAY LATE AND A DOLLAR SHORT

This report outlines the importance of green bonds with a detailed landscape study on the global and Chinese green bond markets. Based on our study, we propose several developmental strategies for the HKSAR Government (the Government) to consider.

Pollution, global warming and climate changes are threatening mankind. Green bonds serve to channel capital from both private and public sectors to finance green projects for mitigating life-threatening environmental problems.

Signatories of the Paris Agreement have agreed to limit the increase of global temperature well below 2 °C above pre-industrial levels. Global Commission on the Economy and Climate estimates that cumulative investment of around USD 90 trillion would be required till 2030 to avoid the 2 °C limit.

China is currently the largest greenhouse gas emitter. It is estimated that an annual investment of at least CNY 2 trillion will be needed for the environmental targets in the remaining period of 13th Five Year Plan. The Chinese Central Government can only provide 15% of the required green investments.

Green bond is a major tool to finance the financing gaps mentioned above. We have observed a rapid

development in the global green bond market, notably in China, France, Poland, London and Singapore. Hong Kong is equipped with the financial expertise which is an essential element to the development of green bonds, and the Government should formulate concrete policies to catch up with this megatrend.

GLOBAL GREEN BOND MARKET

In 2016, Green Finance Study Group (GFSG) was established under China's Presidency of the G20 meeting. The GFSG is co-chaired by China and the UK.

Luxembourg Green Exchange (LGX) was established in 2016 and it is now the world's largest exchange for listed green bonds, contributing to almost half of the listed green bond market. LGX has a listing of over 125 green bonds to date.

In December 2016, the Polish government issued the world's first sovereign green bond with total face value of EUR 750 million and five-year maturity.

In January 2017, the French government issued the world's largest green bond with total face value of EUR 7 billion and maturity of 22 years. Total investor demand was more than EUR 23 billion, representing oversubscription of more than three times.

The London Stock Exchange (LSE) has already seen the listing of more than 40 green bonds, including the Green Covered Bond issued by Bank of China in 2016.

Singapore is one of the invited countries at the GFSG. In March 2017, Monetary Authority of Singapore (MAS)

has announced the Green Bond Grant Scheme to offset the cost of external review incurred during green bond issuance.

In 2017, the People's Bank of China (PBC) and the European Investment Bank (EIB) have started an initiative to harmonize Chinese and global green bond standards.

As of today, most large stock exchanges are already Partner Stock Exchanges of United Nations' Sustainable Stock Exchanges (SSE) initiative, with the notable exceptions of the Hong Kong Stock Exchange (SEHK) and the Tokyo Stock Exchange.

GREEN BOND MARKET IN CHINA

The Chinese Central Government has considered environmental impacts for its long-term development plan. In 2015, The State Council of The People's Republic of China announced the "Integrated Reform Plan for Promoting Ecological Progress" which includes green finance as a major element.

In August 2016, the PBC, the Ministry of Finance, and other five authorities co-published the "Guidelines for Establishing the Green Financial System" which provide 35 recommendations, outlining the overall strategies in developing China's green finance market.

China issued about USD 25 billion of green bonds in the year of 2016 and was the largest issuer in 2016 in terms of annual issuance. China ranks third in terms of year-to-date amount issued in 2017.

In June 2017, the pilot zones for green finance were established in five provinces in China.

Shenzhen Stock Exchange (SZSE) and Shanghai Stock Exchange (SSE) have collaborated with LGX to launch green bond indices.

GREEN BOND MARKET IN HONG KONG

There are so far three public green bonds in Hong Kong issued by Xinjiang Goldwind, Link REIT and MTR.

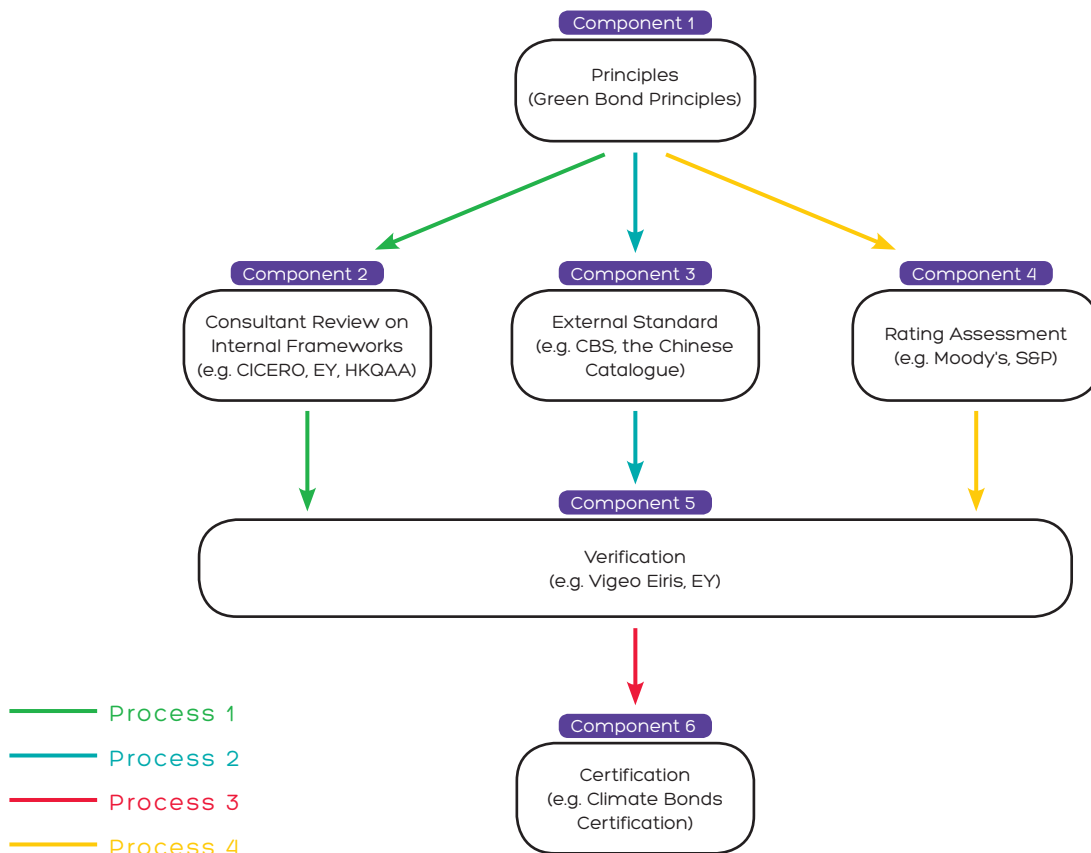
In July 2017, Castle Peak Power Finance Company Limited issued the first Energy Transition Bonds with face value of USD 500 million under CLP's Climate Action Finance Framework.

WHAT ARE GREEN BONDS?

A green bond differs from a traditional bond with its external review process to ensure the use of proceeds on green projects. There are four types of processes for external review as described in Figure A. Process 1 involves consultant review in which opinions are offered by independent consultants on the issuer's internal framework, as well as verification against this framework. Process 2

involves a third party to verify a green bond against external standards. The Climate Bonds Standard (CBS) and the Green Bond Endorsed Project Catalogue are well-recognized standards in the world and mainland China respectively. Process 3 refers to certification of a bond which has been verified. Currently, only the CBS can be verified against. Process 4 is a green rating assessment with verification.

Figure A. Processes for external review



CONSIDERATIONS FOR FUTURE ACTIONS OF THE GOVERNMENT

To catch up with the global development of green bonds as mentioned above, the research team has suggested 7 strategies to be considered by the Government.

Consideration 1: Establish a Qualifying Green Bond (QGB) scheme

The Government can establish a Qualifying Green Bond (QGB) scheme by recognizing qualified parties for external review of green bonds for Process 1 and standards of green bonds for Process 2. Process 1 and Process 2 are represented by the green and blue arrows respectively in Figure A. QGBs may enjoy incentives to be discussed in Consideration 2 and Other Considerations. For Process 2, green bonds verified against the CBS and the Green Bond Endorsed Project Catalogue should be recognized as QGBs. For Process 1, we also suggest the Government recognize independent consultants as qualified parties, and bonds which have obtained review from these parties can qualify as QGBs.

Hong Kong Quality Assurance Agency (HKQAA), an experienced local conformity service providers, is developing a Green Finance Certification Scheme which can tailor to local needs. HKQAA is worthy of consideration to be recognized as a qualified party for the QGB scheme. The Government should have a balanced policy between facilitating the development of green bond market with external standards and promoting local green bond scheme, which can help develop Hong Kong's accreditation services.

Consideration 2: Provide subsidy for Qualifying Green Bonds (QGBs)

Hong Kong can also provide a subsidy on costs of external review of green bonds which would be reimbursed to issuers upon successful verification against standards under QGBs or review by qualifying parties recognized under QGBs.

Consideration 3: Issue government green bonds

Having immense fiscal surplus is not a sufficient reason for the Government not to issue bonds. Government green bonds can set a benchmark for the green bond market and take advantage of the current low cost of financing.

All new public housing projects and new major government buildings are expected to meet at least Gold level standard under BEAM Plus, a local green building certification scheme.

The Government projected total construction costs for new public housing projects to be HKD 117.8 billion in the period from 2016-17 to 2025-2026, but the Housing Authority (HA) currently only has a cash and investment balance of HKD 57 billion. The Government can, therefore, consider financing the construction

costs by issuing government green bonds.

Retrofitting of government and public buildings can be financed via issuance of government green bonds. Interests incurred, together with the extra costs, can be covered by energy savings.

The Government can establish a wholly-owned company with initial paid-up capital for green projects. The company will issue green bonds to finance the projects. The Government can then act as a guarantor for the bond issues.

The Hong Kong Mortgage Corporation (HKMC) can issue long-term green bonds to acquire owner-occupied residential mortgage from banks. The underlying properties of the mortgages should be rated Gold or above under BEAM Plus.

Consideration 4: Align HKMA investments with the UNPRI

Although the primary purpose of the Hong Kong Monetary Authority (HKMA) is to ensure stability of the currency of Hong Kong, it should align its investment decisions with the

Principles for Responsible Investment supported by the United Nations (UNPRI). Moreover, the HKMA should uncover more opportunities for sustainable investments within other

asset classes under management. The HKMA can also disclose its ESG policy.

The HKMA can consider including the endorsement of the UNPRI as a major area of assessment for its future Requests for Proposals. This would be a huge step for the HKMA as currently the HKMA employs external managers for around 26% of the Exchange Fund's assets.

The HKMA can specifically be more flexible with its investments decisions on at most 33% of its assets, part of which can be invested in green bonds.

Consideration 5: Encourage the Hong Kong Stock Exchange to be green

The Hong Kong Stock Exchange (SEHK) can be more active in listing green bonds because of the following reasons:

- Liquidity of the secondary market will affect investment decisions in the primary market;
- Pricing of new green bond issues can refer to similar listed green bonds;
- Listing green bonds also provides more sustainable investment options to mainland investors if Southbound Trading of Bond Connect is launched.

In the future, the SEHK could work with the index companies on local green bond indices to enable easy reference to the prices of overall green bond market or green bonds in particular sectors. It can also encourage development of green bond index funds or other related financial instruments. Criteria for inclusion of the indices should be equivalent to that of the QGB scheme.

The SEHK should join the UN's SSE initiative as a Partner Exchange.

The current ESG Reporting requirements for listed companies in Hong Kong should also include investments in/issuances of QGBs.

Consideration 6: Establish an inter-departmental committee

Development of the green bond market requires substantial effort from both public and private sectors with expertise in finance, environmental protection and architecture.

An inter-departmental committee should, therefore, be established to facilitate comprehensive development of green bonds. The committee should include officials of different policy areas, including finance, environment, housing

and architecture. The chairman of the committee must be able to coordinate different bureaus under the Chief Secretary and the Financial Secretary, and hence, the most suitable person for the role would probably be the Chief Executive.

Practitioners in the financial sector, as well as research experts, should also be included in the committee.

Consideration 7: Enhance communication with the Chinese Central Government and international promotion

China is expected to have enormous demand for green capital which has to be financed by issuing green bonds, while demand for sustainable investment from the EU and the US is also substantial.

As a leading offshore RMB center with well-established financial infrastructure, Hong Kong definitely has competitive advantages in being a global green bond hub, linking the green bond issues from China and investments from the EU and the US. Such competitive advantages should be well promoted

to stakeholders in China, the EU and the US.

The Southbound Trading should also be launched as soon as possible to offer mainland investors global sustainable investment opportunities.

Other considerations:

Provide tax incentives for Qualifying Green Bonds (QGBs)

There is currently no clear and direct financial advantage in issuing green bonds over conventional bonds to both issuers and investors, while generally such issuances come with extra administrative and labour costs, as well as financial costs for external review and costs for post-issuance reporting. The Government can initiate a discussion of financial incentives for QGBs. Below are some ideas for discussion:

- Super tax deduction can be considered for the interest payments of QGBs. Interest expenses for green bonds which are already deductible for tax should be able to enjoy tax deduction which exceeds the amount of expense item. This would provide financial incentives for corporations to issue QGBs.
- Exemption of profits tax can also be considered on both trading profits and interest income derived from all QGBs. This would provide financial incentives to green bond investors.



1

Introduction:
A day late and
a dollar short

1

INTRODUCTION: A DAY LATE AND A DOLLAR SHORT

Pollution, global warming and climate changes are threatening mankind. Green bonds are financial instruments with proceeds particularly invested in projects which improve energy efficiency, reduce greenhouse gas emission and provide other solutions for mitigating environmental problems.

As to be discussed in Chapter 6, it is estimated that around USD 90 trillion would be needed over the next fifteen years in order to limit the increase of global temperature below 2°C above pre-industrial levels and China need at least CNY 2 trillion for the remaining period of 13th Five Year plan with the Chinese government providing only 15% of the required investment. That is why green bond emerges to channel capital from both private and public sectors to finance green projects.

Since the European Investment Bank (EIB) launched the world's first green bond in 2007, the green bond market had been stagnant and dominated by supranationals and multilateral agencies until its turning point in 2012 during which the first corporate green bond was launched (IFC, 2016).

2016 is regarded as the Year of Green Finance. Green finance, which generally refers to financial instruments (i.e. bonds, equities, loans and derivatives) issued for the purpose of delivering positive environmental impact, took the spotlight of the G20 meeting and the agenda of China, London, Singapore and Hong Kong that year. Green bond issuance in China surged from USD 1 billion in 2015 to USD 25 billion in 2016 (Climate Bonds Initiative, 2017), making the global green bond market grow by 92% in the same period.

While the Financial Services Development Council (FSDC) has outlined the opportunities of green finance in its 2016 report (FSDC, 2016), progress of green finance development in Hong Kong has been minimal and lagged behind compared to mainland China, London and Singapore. China is expected to be the future leading issuer of green financial instruments, and London and Singapore are striving to be global green finance hubs. Nascent forms of collaboration are observed between London and China. Hong Kong should catch up with major efforts now to avoid being marginalized under this megatrend of green finance.

Green finance is not a marketing campaign, but a core strategic development of China

In 2015, the State Council of the People's Republic of China published the "Integrated Reform Plan for Promoting Ecological Progress" (hereinafter referred to as "the Ecological Process Plan" in this chapter) which outlines China's strategy to integrate environmental impacts in its future development. The Ecological Process Plan clearly indicates its intention of developing the green financial system in Clause 45 (The State Council of P. R. China., 2015). It was the first time green finance being mentioned officially in China.

After announcing the Ecological Process Plan, the People's Bank of China (PBC), the Ministry of Finance, the National Development and Reform Commission (NDRC), the Ministry of Environmental Protection, the China Banking Regulatory Commission, the China Securities Regulatory Commission and the China Insurance Regulatory Commission co-published the "Guidelines for Establishing the Green Financial System" (hereinafter referred to as "the Green Financial System Guidelines" in this chapter) in August 2016 which include 35 recommendations, outlining the overall strategies in developing China's green finance market (Ministry of

Environmental Protection of P. R. China, 2016). Coverage of the Green Financial System Guidelines is comprehensive, which includes, but is not limited to:

- Policy framework for green financing;
- Green assessment mechanism and stress tests for banks;
- Securitization of green-related loans;
- Legal responsibilities of borrowers;
- Green data sharing for financial institutes;
- Rules and regulations related to green bonds;
- Reduction of financing cost for green bonds;
- Third party verification and standards for green bonds;
- Green bond indices;
- Disclosure of environmental impact data from listed companies and green bond issuers;
- Attracting institutional investors for green financial products;
- Public-private partnership for green-related industries; and
- Carbon trading

Accompanying the Green Financial System Guidelines was a list of internal targets and responsibilities for each of the key authorities which are mostly co-publishers of the Green Financial System Guidelines. Most of the targets have to be completed by the end of 2020.

China has pushed forward its influence in green finance by leading the Green Finance Study Group (GFSG) in G20, which was launched in 2016. The GFSG has already launched two reports outlining the essential development of global green finance markets as well as including in-depth discussion on Environmental Risk Analysis (ERA) and Publicly Available Environmental Data (PAED).

While the current Chinese and international frameworks for green investment standards are different, the PBC and the EIB have started an initiative to harmonize the two practices (European Investment Bank, 2017). In June 2017, the following pilot zones for green finance were established (The State Council of P. R. China, 2017):

- Guangzhou in Guangdong;
- Huzhou and Quzhou in Zhejiang;
- Guian New Area in Guizhou;
- Hami, Changji Hui Autonomous Prefecture, Karamay in Xinjiang; and
- Ganjiang New District in Jiangxi

China is currently the largest carbon emitter and its current development is not sustainable if environmental disruptions are not well-controlled. Yet, the public budget is far from sufficient in providing capital for all related green projects. Therefore, green finance is a crucial element of the master development plan of China.

Has Hong Kong missed the chance of a lifetime?

The FSDC has indicated the opportunities of green finance for Hong Kong in its visionary 2016 report which was launched even earlier than the Green Financial System Guidelines. However, green finance development in Hong Kong has been sluggish afterward and is facing competition from other financial centers, especially London and Singapore.

In fact, neither Hong Kong, London nor Singapore was a pioneer in green finance. The Luxembourg Stock Exchange (LuxSE) has already seen the listing of the first green bond in 2007 and the newly formed Luxembourg Green Exchange (LGX) is currently the largest exchange for listed green bonds.

In 2016, the City of London established the Green Finance Initiative with participants from the public and private sectors, such as HM Treasury, HSBC and London Stock Exchange (LSE) (Green Finance Initiative, n.d.). Being a Partner Exchange in the Sustainable Stock Exchanges (SSE) initiative of the United Nations (UN), LSE has already seen the listing of 40 green bonds in total, with 14 green bonds listed in the year of 2016 alone. Its first listed

RMB-denominated green bond was issued by Agriculture Bank of China in 2015 and its first listed Chinese Green Covered bond was issued by Bank of China in 2016 (London Stock Exchange Group, 2016). The International Finance Corporation (IFC) also had its first RMB-denominated green bond listed on LSE in 2017 (London Stock Exchange Group, n.d.). The “UK - China Collaboration on Growing a Global Green Bond Market” report was launched in 2016 to outline the collaboration between the PBC and the Bank of England, as well as between the Green Finance Committee in China and the Green Finance Initiative in London. London has not only intended to be a green finance hub but also a leading fundraising partner for Chinese green bonds.

Singapore has actively participated in the G20’s initiatives for green finance, even though it is not a member country of the G20. Singapore is one of the invited countries at the GFSG under the presidency of China (The UN Environment Inquiry, 2017) and helped launch the GreenInvest platform under Germany’s G20 presidency (GreenInvest, 2017). Singapore Exchange (SGX) has joined the UN SSE initiative and Monetary Authority

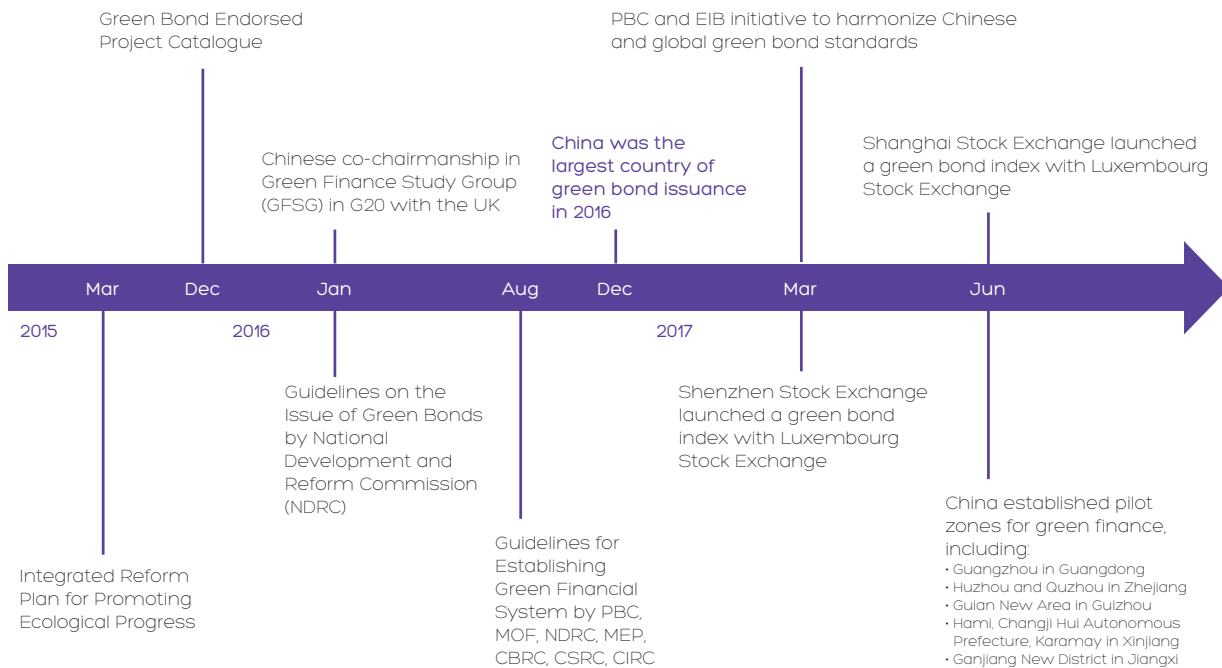
of Singapore (MAS) has already announced the Green Bond Grant Scheme to offset the costs of external review incurred during green bond issuance.

Not only is Hong Kong competing with other global cities, it is also challenged by financial centers in mainland China, namely Shenzhen and Shanghai.

Having established China Emission Exchanges in 2010, Shenzhen has the first pilot emission trading system (ETS) in China (International Carbon Action Partnership, 2017; China Emissions Exchange, n.d.). It is among the first pilot areas for developing low-carbon cities in China. In March 2017, Shenzhen Stock Exchange (SZSE) and LuxSE partnered with Central University of Finance and Economics (CUFE) in Beijing to launch the first Chinese Green Bond Index which synchronizes green bond trading data between China and Europe (Luxembourg Stock Exchange, 2017). In June 2017, Shenzhen Green Finance Committee¹ (深圳綠色金融專業委員會) was established. Due to Shenzhen's experience in green trading and its strategic location in the Guangdong-Hong Kong-Macao Bay Area, Hong Kong is losing to its neighbor in terms of leadership in green finance in southern China.

Shanghai is also experienced in green finance. Shanghai Environment and Energy Exchange was established in 2011 as a trading platform for debts, equities, intellectual properties, etc. that are related to environment and energy use. Shanghai Stock Exchange (SSE) is a Partner Exchange of the UN SSE initiative. In June 2017, SSE signed an agreement with LuxSE for establishing a green bond index (LuxSE, 2017). In July 2017, the Management Board of Lujiazui Green Finance Development Centre² (陸家嘴綠色金融發展中心理事會) is inaugurated and its establishment is regarded as a step to implementing the Green Financial System Guidelines.

Figure 1.1.1 Timeline for recent development of green finance in China



Global and Chinese developments of green finance do create bountiful opportunities. Yet, these opportunities are not exclusive to Hong Kong. There are a number of breakthroughs globally for green finance in 2016 and the first half of 2017, but Hong Kong has been relatively slow in capturing this opportunity compared to other financial centers.

Act now or too late

It is always better late than never, but actions have to be timely. Green finance has been mentioned in the 2017-18 Budget (Chan, 2017), but no action plan has been outlined yet.

A more concrete plan is required to make up for lost time. Green bond is currently the focus among all other elements of green finance and is, therefore, the backbone of this research report. The research team has conducted extensive literature review and interviewed a number of stakeholders from the financial industry, environmental groups, the HKSAR Government (the Government), NGOs and academia to arrive in a set of feasible policy considerations to facilitate further development of Hong Kong's green bond markets.

This report will first cover definitions and mechanism of green bonds, followed by global, Chinese and Hong Kong's green bond markets, as well as the environmental needs behind green bond issues. Considerations will be discussed in the last section of this report.

1. Official English name of the committee is not available yet. Please refer to the official Chinese name, "深圳綠色金融專業委員會".

2. Official English name of the committee is not available yet. Please refer to the official Chinese name, "陸家嘴綠色金融發展中心理事會".



2

What
are
green
bonds?

2

WHAT ARE GREEN BONDS?

2.1 Definition and structure of green bonds

While the green bond market has grown exponentially in recent years, there are no standard academic definitions on what a green bond is. In general, green bonds are bond instruments that fund green projects with the proceeds raised from the issue. Since there is a wide range of definitions on what constitutes a green project, different entities may have differing views on whether a bond is truly a “green bond”. Furthermore, depending on the issuer’s decision to brand or label the issue as “green” or not, a bond can be classified as a “labeled green bond” or an “unlabeled green bond”. Climate Bonds Initiative regards bonds issued from companies with more than 95% of revenue derived from green projects as “unlabeled green bonds”. For example, unlabeled green bonds in China have mainly been issued by China Railway Corporation. For discussion purposes, “labeled green bonds” will be used interchangeably with “green bonds” in this report.

In terms of structure, a green bond is no different from other regular conventional bonds (vanilla bonds), which may be structured to fit the issuer’s needs. The majority of green

bonds are green use of proceeds bonds, which, aside from funding green projects, are identical to vanilla bonds, and hence a single credit rating for the issuer can usually apply to both conventional bonds and green use of proceeds bonds.

Other common structures include green use of proceeds revenue bonds, green project bonds and green securitized bonds. A green use of proceeds revenue bond is nonrecourse and is exposed to the pledged cash flows, such as revenue streams. A green project bond can be recourse or nonrecourse for single or multiple green projects to which the investor has direct exposure. Finally, a green securitized bond is a bond collateralized by one or more projects with repayment backed by cash flows of assets.

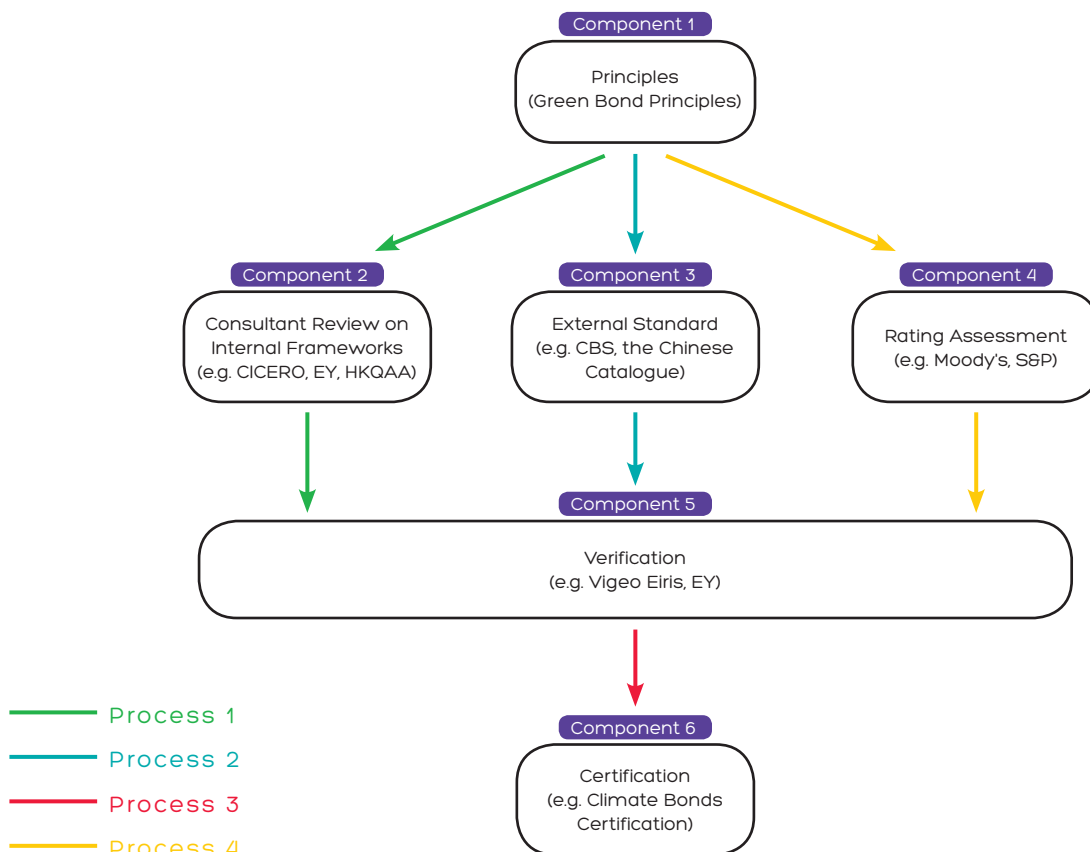
The most important difference of green bonds from traditional bonds is the external review process to guarantee the use of proceeds on green projects, which will be discussed in the following section.

2.2 Review of green bond issues

Before issuance, the issuer (first party) can disclose information on how proceeds will be managed and allocated, as well as its internal frameworks and processes. After issuance, the issuer can disclose how the proceeds are actually allocated and used, as well as the environmental performance of the projects.

Issuers can also consider incorporating independent pre-issuance and post-issuance external review since this improves the credibility of the green bond issues, which is an important consideration for some deep green investors across the globe. External review can be conducted under one of the four processes as shown in Figure 2.2.1.

Figure 2.2.1 Processes for external review



2.2.1 Process 1 (green arrows: 1 -> 2 -> 5)

Component 1 (Principles):

The Green Bond Principles (GBP) are the most commonly referred and the most widely adopted guidelines for green bond issues, which also shed light on various definitions of green bonds. The GBP consist of four main elements (ICMA, 2017):

- **Use of Proceeds:**

Bond proceeds have to be used on green projects

- **Process for Project Evaluation and Selection:**

The process for determining eligible green projects, including the eligibility criteria and sustainability objectives, has to be outlined

- **Management of Proceeds:**

Bond proceeds should be properly tracked by being credited to a sub-account, sub-portfolio or via other methods

- **Reporting:**

Before full allocation, information on use of proceeds should be updated annually

However, apart from recognizing broad categories for eligibility for green projects,

the GBP does not truly address the question of “what is green”.

The GBP are fundamental for most of the external review processes.

Component 2 (Consultant Review):

Independent consultants, such as ESG (Environmental, Social and Governance) research providers (e.g. Sustainalytics) and scientific experts (e.g. CICERO), will provide opinions on the issuer’s internal green bond framework, mostly based on the GBP and/or their own in-house assessment framework (such as the Shades of Green methodology of CICERO). Some service providers may be involved in developing the issuer’s green bond framework as well. This type of service providers are usually regarded as second parties.

Component 5 (Verification):

An external verifier (usually regarded as third parties) will then verify the issue against the issuer’s internal framework.

2.2.2 Process 2 (blue arrows: 1 -> 3 -> 5)

Component 1 (Principles):

Same as Section 2.2.1.

Component 3 (External Standards):

There are a number of external standards developed based on GBP, including Climate Bonds Standard (CBS) and Green Bond Endorsed Project Catalogue.

The CBS is developed by Climate Bonds Initiative and it fully incorporates the GBP but with clear eligibility criteria for green projects in various categories such as solar, water, and low carbon buildings. On top of the GBP, the CBS provides a detailed taxonomy which outlines eight areas of green projects with 46 subareas in total. So far the criteria have been approved for 11 subareas which are listed in Table 2.2.1.

Table 2.2.1 Criteria for CBS and its relation with GBP

GBP	CBS	
	Area	Sub areas
Use of Proceeds	Energy	Solar
		Wind
		Geothermal
Process for Project Evaluation and Selection	Transport	Rail
		Vehicles
		Mass transit
		Bus rapid transport
Management of Proceeds	Water	Built (grey) infrastructure
Reporting	Low carbon buildings	Residential
		Commercial
		Retrofit

Source: Climate Bonds Initiative, 2017

The criteria are under development for 16 other subareas of the CBS.

The Green Bond Endorsed Project Catalogue (hereinafter referred to as “the Chinese Catalogue” in this chapter) is developed by the Green Finance Committee of China Society for Finance & Banking. It refers to both GBP and CBS, but with tailored categories to align with China’s development. The Chinese Catalogue is currently the most widely used green bond standard in China.

The Chinese Catalogue serves as a supplement to the “Guideline on the issue of Green Bonds” by the People’s Bank of China (PBC) (The People’s Bank of China, 2015). The Chinese Catalogue has taken reference from GBP and CBS. It classifies green projects into 6 primary categories and 31 secondary categories, covering energy, transportation, green building, etc. The Chinese Catalogue has some categories different from CBS and has taken into account the economic situation in China. For example, “clean coal” is considered to be green in the

Chinese Catalogue, but is excluded in the CBS and is controversial among green investors. Similar to the CBS, the Chinese Catalogue provides criteria for eligible projects in each category.

EY is currently the largest verifier for green bonds in China with market share of 44.6%, followed by Deloitte with 12.6%, Climate and Energy Finance Centre at Central University of Finance and Economics 8.6% and China Energy Conservation and Environmental Protection Consulting Co. Ltd 3.5% (CBI, 2016).

Component 5 (Verification):

Issuers can employ a third party to verify their green bonds against external standards, including CBS and the Chinese Catalogue.

2.2.3 Process 3 (blue / green and red arrows: 1 -> 2 or 3 -> 5 -> 6)

Component 1 (Principles):

Same as Section 2.2.1.

Component 2 (Consultant Review):

Same as Section 2.2.1.

Component 3 (External Standards):

Same as Section 2.2.2. Only the CBS can be certified against, but not the Chinese Catalogue.

Component 5 (Verification):

Same as Section 2.2.2, but only those independent verifiers recognized by CBI can be employed.

Component 6 (Certification):

Green bonds verified against the CBS can obtain a certificate from CBI. CBI is currently the only organization certifying green bonds. There are 22 approved verifiers for Climate Bonds Certification as listed in Table 2.2.2.

As demonstrated in Table 2.2.2, a number of verifiers, such as Sustainalytics, KPMG, EY, PwC and Deloitte, are leading ESG and management consultants. Sustainalytics and KPMG are the most commonly employed third

party verifiers for Climate Bonds Certification. The market share of verifiers for Climate Bonds Certification is shown in Figure 2.2.2.

The CBS provides eligibility criteria for different categories of projects. The criteria of water is shown here in Table 2.2.3 as an illustration for the CBS. A scorecard is used for assessing bonds related to water and there are 4 sections with a total of 56 items in the scorecard.

In order to be certified, the duration of the funded project must be longer than 20 years and the project has to score more than 60% in each section.

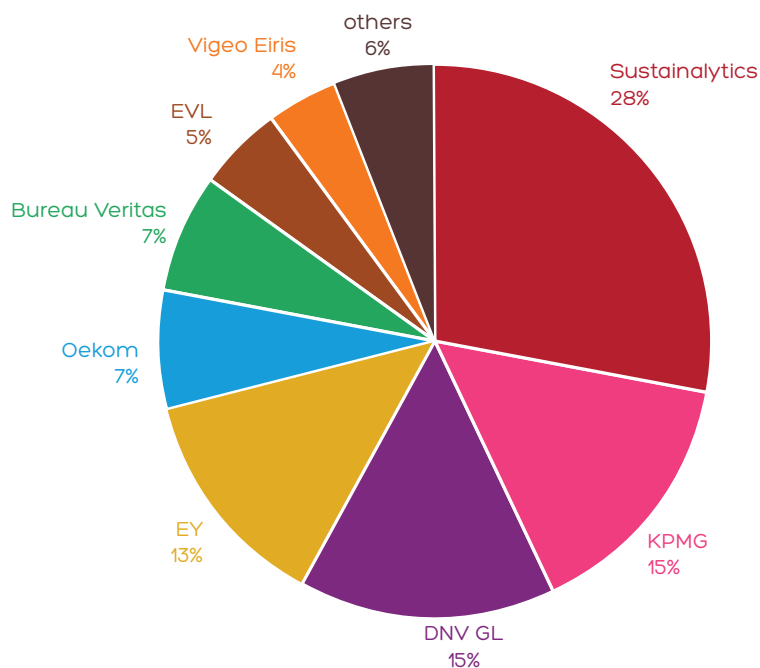
Some consultants may provide certification as well, such as the certification of Hong Kong Quality Assurance Agency (HKQAA) which will be discussed in Chapter 7.

Table 2.2.2 Approved verifiers for Climate Bonds Certification

Bureau Veritas	First Environment
DNV GL	SynTao Green Finance
EPIC Sustainability	Vigeo Eiris
EthiFinance	BDO India
EY	Zhongcai Green Financing Consultants Ltd
KPMG	Carbon Trust
Oekom Research AG	Emergent Ventures India
Sustainalytics	PwC
Trucost	Lianhe EIA
TUV NORD CERT	NSF
Atelier Ten	Deloitte

Source: Climate Bonds Initiative, 2017

Figure 2.2.2 Market share of verifiers for Climate Bonds Certification



Data from Climate Bonds Initiative (2017).

Table 2.2.3 Scorecard of Climate Bonds Certification for water projects

Section	Number of items	Max. Score
Allocation	12	18
Governance	15	15
Technical Diagnostics	24	24
Adaptation Plan	5	5
Total	56	62

Source: Climate Bonds Initiative, 2016

2.2.4 Process 4 (yellow arrows: 1 -> 4 -> 5)

Component 1 (Principles):

Same as Section 2.2.1.

Component 4 (Rating Assessment):

Two major credit rating agencies, Moody's and S&P, have launched green rating assessment frameworks in 2016 and 2017 respectively. Both frameworks align with the GBP. Akin to current credit rating services, both the "Green Bond Assessment" (GBA) of Moody's and S&P Global Ratings Green Evaluation provide a final score based on their own scale. Both rating agencies take no responsibility on verification which should be completed by another third party.

Component 5 (Verification):

Same as Section 2.2.2. Currently, Process 1 and Process 2 are the most

common approaches for external review. Not many green bonds have been certified (Process 3) and rated (Process 4) to date.

Table 2.2.4 shows the most commonly used standards among the largest 40 green bond issues to date.

Among the 40 largest green bond issues, most issues employ Process 1 with the GBP serving as the major guideline. All Chinese green bonds are verified against the Chinese Catalogue (Process 2). Only bonds from SNCF (ranked 21 and 29) are certified against CBS. Bonds from Tennet Holdings (ranked 21) and Mexico City Airport (ranked 30) are rated by Moody's as GB1 and S&P as E1 which are the best ratings in both scales.

Table 2.2.4 Commonly used standards among the largest 40 green bonds

Name	Amount Issued (original currency)	Equivalent amount issued (USD)*	Issue Date	Maturity	Independent External Reviewer	Guideline/Standard	Moody's GBA**	S&P Green Evaluation**	OHKF Process
Republic of France	EUR 7,000,000,000	8,327,095,000	Jan-17	Jun-39	Vigeo Eiris***	GBP	-	-	1
Bank of Communications	CNY 20,000,000,000	3,033,700,000	Nov-16	Nov-21	Deloitte	The Chinese Catalogue	-	-	2
SPD Bank	CNY 20,000,000,000	3,033,700,000	Jan-16	Jan-19	EY	The Chinese Catalogue	-	-	2
KfW	EUR 2,000,000,000	2,379,170,000	May-17	Jun-25	CICERO	GBP & CICERO (SPO)****	-	-	1
SPD Bank	CNY 15,000,000,000	2,275,275,000	Mar-16	Mar-21	EY	The Chinese Catalogue	-	-	2
SPD Bank	CNY 15,000,000,000	2,275,275,000	Jul-16	Jul-21	EY	The Chinese Catalogue	-	-	2
EDF	EUR 1,750,000,000	2,081,773,750	Oct-16	Oct-26	Vigeo Eiris***	GBP	-	-	1
Bank of Beijing	CNY 12,000,000,000	1,820,220,000	Apr-17	Apr-20	EY	The Chinese Catalogue	-	-	2
KfW	EUR 1,500,000,000	1,784,377,500	Jul-14	Jul-19	CICERO	GBP & CICERO (SPO)****	-	-	1
KfW	EUR 1,500,000,000	1,784,377,500	Oct-15	Oct-20	CICERO	GBP & CICERO (SPO)****	-	-	1
EDF	EUR 1,400,000,000	1,665,419,000	Nov-13	Apr-21	Vigeo***	GBP	-	-	1
GDF Suez	EUR 1,300,000,000	1,546,460,500	May-14	May-26	Vigeo***	-	-	-	1
Bank of Communications	CNY 10,000,000,000	1,516,850,000	Nov-16	Nov-19	Deloitte	The Chinese Catalogue	-	-	2
EIB	USD 1,500,000,000	1,500,000,000	May-17	May-27	None	GBP	-	-	1
EIB	USD 1,500,000,000	1,500,000,000	Apr-16	Apr-26	None	GBP	-	-	1
KfW	USD 1,500,000,000	1,500,000,000	Nov-16	Nov-21	CICERO	GBP & CICERO (SPO)****	-	-	1
Enel	EUR 1,250,000,000	1,486,981,250	Jan-17	Sep-24	Vigeo Eiris***	GBP	-	-	1
GDF Suez	EUR 1,200,000,000	1,427,502,000	May-14	May-20	Vigeo***	-	-	-	1
NWB Bank	USD 1,250,000,000	1,250,000,000	Mar-16	Mar-26	CICERO	GBP & CICERO (SPO)****	-	-	1
EDF	USD 1,250,000,000	1,250,000,000	Oct-15	Oct-25	Vigeo***	GBP	-	-	1
AFD	EUR 1,000,000,000	1,189,585,000	Sep-14	Sep-24	Vigeo***	GBP	-	-	1

Name	Amount Issued (original currency)	Equivalent amount issued (USD)*	Issue Date	Maturity	Independent External Reviewer	Guideline/Standard	Moody's GBA**	SSP Green Evaluation**	OHKF Process
Iberdrola	EUR 1,000,000,000	1,189,585,000	Apr-16	Apr-26	Vigeo Eiris***	GBP	-	-	1
SNCF	EUR 1,000,000,000	1,189,585,000	Mar-17	Oct-18	Oekom	CBS (certified)	-	-	3
EIB	EUR 1,000,000,000	1,189,585,000	Jul-17	Nov-47	None	GBP	-	-	1
KfW	EUR 1,000,000,000	1,189,585,000	May-16	May-24	CICERO	GBP & CICERO (SPO)****	-	-	1
Iberdrola	EUR 1,000,000,000	1,189,585,000	Mar-17	Mar-25	Vigeo Eiris***	GBP	-	-	1
NWB Bank	EUR 1,000,000,000	1,189,585,000	Sep-15	Sep-25	CICERO	GBP & CICERO (SPO)****	-	-	1
TenneT Holdings	EUR 1,000,000,000	1,189,585,000	Apr-17	Apr-25/ Apr-29	Oekom	GBP	GB1	E1/95	1 and 4
SNCF	EUR 900,000,000	1,070,626,500	Nov-16	Nov-31	Oekom	CBS (certified)	-	-	3
KfW	USD 1,000,000,000	1,000,000,000	Nov-15	Nov-20	CICERO	GBP & CICERO (SPO)****	-	-	1
Mexico City Airport	USD 1,000,000,000	1,000,000,000	Sep-16	Oct-46	Sustainalytics	GBP	GB1	E1/77	1 and 4
Mexico City Airport	USD 1,000,000,000	1,000,000,000	Sep-16	Oct-26	Sustainalytics	GBP	GB1	E1/77	1 and 4
IFC	USD 1,000,000,000	1,000,000,000	Nov-13	Nov-16	CICERO	GBP & CICERO (SPO)****	-	-	1
IFC	USD 1,000,000,000	1,000,000,000	Feb-13	May-16	CICERO	GBP & CICERO (SPO)****	-	-	1
Bank of America	USD 1,000,000,000	1,000,000,000	Nov-16	Nov-20	None	GBP	-	-	1
EIB	USD 1,000,000,000	1,000,000,000	Oct-14	Oct-24	None	GBP	-	-	1
BNDES	USD 1,000,000,000	1,000,000,000	May-17	May-24	Sustainalytics	GBP	-	-	1
Bank of China	USD 1,000,000,000	1,000,000,000	Jul-16	Jul-21	EY	GBP	-	-	1
Apple INC	USD 1,000,000,000	1,000,000,000	Jun-17	Jun-27	Sustainalytics	GBP	-	-	1
Central Puget Sound Transit Authority	USD 942,840,000	942,840,000	Sep-15	Nov-50	Sustainalytics	GBP	-	-	1

Data from Climate Bonds Initiative (2017).

Notes:

* Exchange rates as of 31 August 2017.

** Vigeo and Eiris completed their merger to become Vigeo Eiris in January 2016.

*** Only two issuers, namely TenneT Holdings and Mexico City Airport, have applied for green rating assessments so far.

****While CICERO acts a provider of second party opinion (SPO) and offers reviews based on the GBP (Process 1), it also uses an in-house framework, the Shades of Green methodology, to evaluate green bond issues at the same time.

2.3 Issuance procedure of green bonds

As for the procedure of green bond issuance, it is more complicated than conventional bond issuances in most cases as having to allocate proceeds to green projects requires extra work for the issuer. While most issuances may differ in practice, for most instances there are a number of steps which issuers must go through:

(1) Reviewing financing options; (2) Establishing green project selection process; (3) Developing controls for use and management of proceeds; (4) Allocation of proceeds; and (5) Monitoring and reporting.

(1) Reviewing financing options

This step refers to initial preparatory stages of any green bond issue. There are a number of factors that every issuer must determine, including objectives of issuance, current business operations and projects, corporate sustainability strategies, etc. Expected challenges should also be taken into account. The above factors must provide early justification for the green bond issue.

(2) Establishing green project selection process

A rigorous process, which covers early screening and establishing frameworks for identification of environmental impact, must be established. The

projects which are selected from the process would then be eligible for being funded by the green bond issue.

(3) Developing controls for use and management of proceeds

Controls are necessary so as to assure future investors that the proceeds are to be used according to the terms of the green bond. Since the use and management of proceeds are major concerns of investors, this step is essential to any green bond issue.

(4) Allocation of proceeds

The issuer needs to allocate funds to eligible green projects which are selected with its framework after receiving the proceeds from the bond issuance. In order to earmark the proceeds for green projects, a special account can be established and the funds can then be invested accordingly.

(5) Monitoring and reporting

Regular post-issuance monitoring and reporting have to be conducted. This is to demonstrate to investors how the green projects are being funded and implemented. Environmental impact can also be reported with appropriate indicators.

2.4 Pricing of green bonds

There has been no conclusive evidence on whether green bonds incur any positive or negative spread over conventional bonds. In fact there are a number of factors which may affect the pricing of green bonds. First, since green bonds have identical credit qualities to conventional bonds of the same issuer, the two types of bonds have similar spreads.

Second, the additional feature of being green may attract a wider investor base, especially when investors are increasingly aware of the long-term climate risks of their investments. Increased interest in subscription may help lower the financing cost for issuers. However, this green investor base is still relatively small, so the impact on pricing has been limited.

All of the above factors account for green bond pricing. The factors are also subject to different market conditions on geographical level at the time of issuance.



3

Global
green
bond
market

3

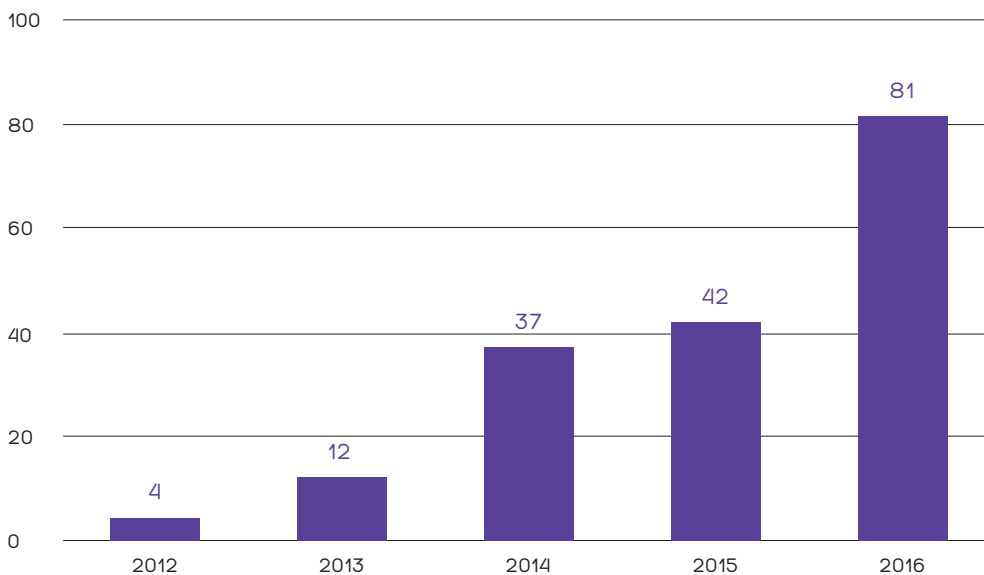
GLOBAL GREEN BOND MARKET

3.1 Development of global green bond market

The global green bond market has seen rapid growth in the past few years (Figure 3.1.1). While the green bond has not been a new concept,

it has only truly taken flight in 2013 when corporate and municipal entities started to participate in green bond issuance.

Figure 3.1.1 Annual issuance of green bonds (USD billion), 2012-16



Data from Climate Bonds Initiative (2017).

The green bond concept was first embraced by supnationals and multilateral agencies and both of the two earliest issues were in Europe. In 2007, the European Investment Bank (EIB) issued a EUR 600 million Climate Awareness Bond, which was considered a pioneering financial innovation at the time. Instead of paying investors a fixed coupon, it was

linked to an equity index and hence the bond was also considered a structured bond (World Bank, 2015). In 2008, the World Bank partnered with Skandinaviska Enskilda Banken AB and other Scandinavian institutional investors and issued the first labelled green bond amounting to SEK 3.35 billion (around USD 440 million) (World Bank, 2015). The proceeds derived from

the bond issue were then used for climate change mitigation and adaptation projects. Both of the two early issues were of investment grade.

A number of issues of multilateral agencies (mostly development banks) and other supranationals followed the two early issuances. Due to the strong financial position of these issuers, these issues also enjoyed good credit ratings. The green bond market reached its turning point in 2013 when corporate issuers (including financial institutions) started to tap into the market as well. The month of November saw the entrance of three corporate issuers, namely Électricité de France, Bank of America and Vasakronan (*"History / Climate Bonds Initiative"*, 2017). Municipal issuers also contributed to the growth of the green bond market as the first green muni bond was issued in the year of 2013. In June 2013, Massachusetts issued the first green muni bonds worth USD 100 million (Long, 2013), whereas Gothenburg issued the first green city bond for SEK 500 million in October 2013 (*"Gothenburg Green Bonds"*, 2014).

Sovereign green bonds may be the next source of growth of the green bond market. While there have been announcements from a number of countries, including Morocco, Nigeria, Sweden and Kenya, on planned green

bond issues, there have only been two issues of green sovereign bonds to date from Poland and France (Hussain & Hauman, 2017). Poland surprisingly became the first sovereign to issue green bonds in December 2016 when it issued a EUR 750 million five-year green bond (Pronina & Krajewski, 2016). Poland, which uses coal to generate about 90% of its power, attracted huge investor demand of EUR 1.5 billion with its green bond (Climate Bonds Initiative, 2016). Based on its green bond framework reviewed by Sustainalytics, the green bond will be used to finance projects in renewable energy development, clean transportation, sustainable agricultural operations, afforestation, national parks and reclamation of heaps (The State Treasury of the Republic of Poland, 2016).

Later in January 2017, France issued the largest green bond to date as it borrowed EUR 7 billion with the issue which is set to mature in 22 years (Gouvernement.fr., 2017). Total investor demand was more than EUR 23 billion, representing oversubscription of more than three times. The green bond framework of the issue was approved by Vigeo Eiris, an independent international ESG services and research agency, and the proceeds will be allocated to sectors such as state aid for energy efficiency, clean

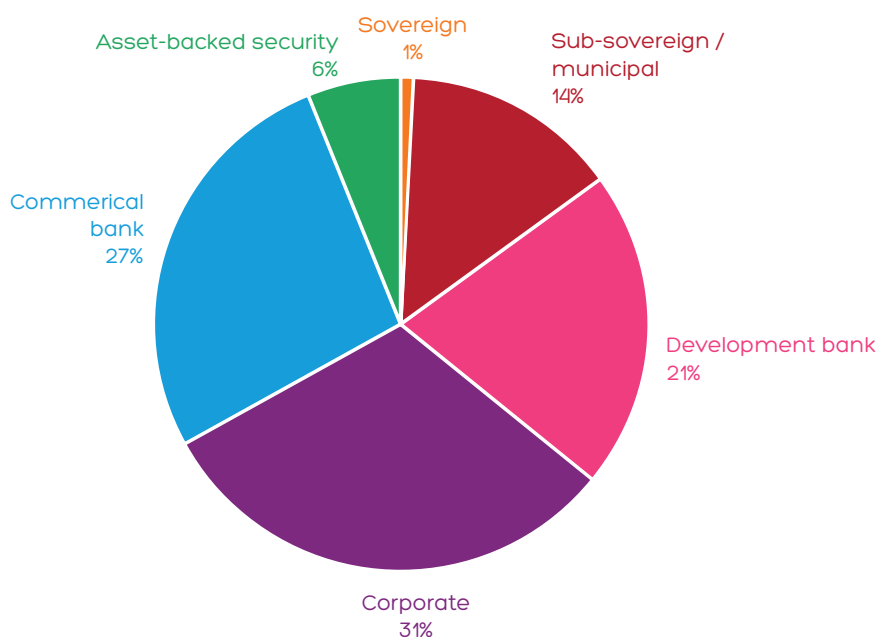
transport, research on renewable energy sources and protection of biodiversity (Gouvernement.fr., 2017).

As shown in Figure 3.1.2, the corporate sector (excluding financial institutions) is now the most significant contributor to the green bond market (Climate Bonds Initiative, 2017). The commercial banking sector is now the second largest sector (with the major Chinese banks amongst the most active

Chinese issuers), followed by development banks and sub-sovereigns & municipals.

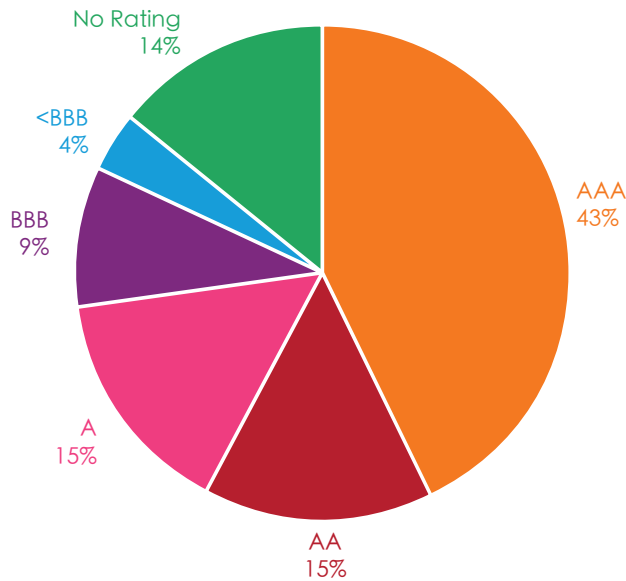
Unlike multilateral agencies which mostly have good credit ratings, some corporate issuers may not be able to obtain top credit ratings, and yet the overall green bond market has still seen a whopping 82% which is of investment grade in 2016 as demonstrated in Figure 3.1.3.

Figure 3.1.2 Green bond issues by sector of issuer, 2016



Data from Climate Bonds Initiative (2017).

Figure 3.1.3 Green bond issues by credit rating, 2016

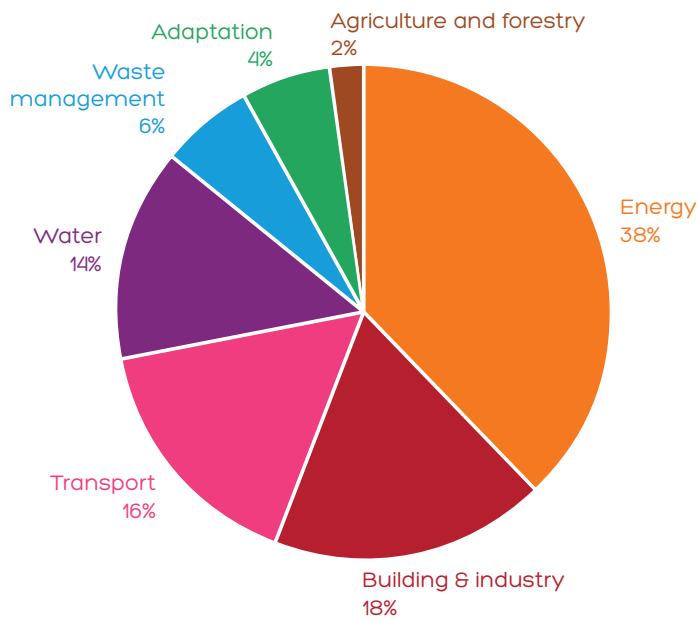


Data from Climate Bonds Initiative (2016).

In terms of use of proceeds, green bonds are used to finance a wide range of projects. In 2016, according to Climate Bonds Initiative (CBI) (2017), out of all project categories, energy was the project category most commonly

financed by green bonds, followed by building & industry, transport and water projects, whereas waste management, agriculture & forestry and adaptation projects contributed less to green bond issues (Figure 3.1.4).

Figure 3.1.4 Green bond issues by category of green projects, 2016



Data from Climate Bonds Initiative (2017).

3.2 Notable market developments across the globe

While corporate issuers have contributed significantly to the green bond market, the effect of government policies should also be analyzed as they create various incentives for developing the market. Some private sector or voluntary initiatives can be references for Hong Kong as well. A few more significant examples are listed as follows:

(1) France

In 2015, the French government passed an Energy and Green Growth act which aims at reducing energy consumption by 50% in 2050 compared to 2012 and fossil fuel consumption by 30% in 2030 compared to 2012 (Ma, Kaminker, Kidney, & Pfaff, 2015). At the same time, Article 173 of the Act introduces mandatory climate reporting for publicly traded companies, banks, credit providers, asset managers and institutional investors (including insurers, pension or mutual funds and sovereign wealth funds) (*"Art. 173: France's Groundbreaking Climate Risk Reporting Law - Four Twenty Seven"*, 2017). Depending on size and nature, entities can have different reporting obligations. More significantly, Article 173 requires large institutional investors to report on exposure to both physical risks (how climate change affects their portfolio) and transition risks (how

transition to a low-carbon economy affects their portfolio).

(2) Singapore

In order to develop the local green bond market, the Monetary Authority of Singapore (MAS) is launching a Green Bond Grant Scheme in June 2017 which can offset up to SGD 100,000 (~USD 73,000) of costs incurred from obtaining an independent review based on international green bond standards (Hui, 2017). To qualify for the scheme, the bonds can be denominated in any currency but must be issued and listed in Singapore, have a minimum size of SGD 200 million (~USD 146 million) and tenure of at least three years. The MAS will also promote a series of sustainability-oriented initiatives across banking, asset management, insurance and capital markets, among which the green bond market is a starting point.

(3) Luxembourg

Luxembourg has always been a pioneer in the development of green bonds. In 2007, the Luxembourg Stock Exchange (LuxSE) saw the listing of the first ever green bond, the Climate Awareness Bond of the European Investment Bank (EIB) (*"Green Bonds"*, 2017). In 2016, Luxembourg Green Exchange (LGX) was launched and

is now the world's largest exchange for green bonds with more than 125 listed green bond issues (contributing to almost half of the listed green bond market by amount issued) (LGX, 2017). LGX has a number of restrictions on listed green bonds: (1) Bond proceeds must be 100% used for financing or refinancing green projects as defined by the Green Bonds Principles or Climate Bonds Standard or equivalent; (2) An independent assessment, which can take a variety of forms, must be provided; and (3) Post-issuance reporting must be conducted at least once one year after the issuance.

(4) Japan

Japan is catching up with the trend of green finance. In response to the Paris Agreement and "2030 Agenda for Sustainable Development" adopted by the United Nations (UN), the Ministry of the Environment of Japan (MOEJ) released the "Green Bond Guidelines, 2017" to spur green bond issuance and investment in March 2017 (MOEJ, 2017). MOEJ is also working on producing its own green bond principles, which are expected to be close to the GBP. In November 2016, the Tokyo municipal government issued the "Tokyo Environment Supporter Bond" as a pilot program for its future green financing as the city is preparing to host the 2020 Olympic Games (MOEJ, 2017).

(5) The California Public Employees' Retirement System (CalPERS)

The California Public Employees' Retirement System (CalPERS) is the largest public pension fund in the US. In CalPERS' Environmental Investment Initiative, strategies were outlined for sustainable investments in low carbon energy production, energy efficiency and energy management, environmental and land use management, resource conservation, and climate finance (CalPERS, 2014).

(6) Collaboration originating from G20: UK-China collaboration on growing a global green bond market

The UK has been one of the global hubs of green finance while China has emerged as a huge potential market of sustainable investments. In 2016, the UK and China reached consensus on cooperation on the development of green finance at The City of London G20 (CBI, 2016). The UK and China have agreed to promote cross-border green bond issuance and translation of strategies into green project pipelines. Bilateral research collaboration and joint efforts to increase market awareness are also anticipated.

The UK and China also co-chair the G20 Green Finance Study Group (GFSG) with UN Environment as the secretariat. The GFSG was established under China's Presidency of the

G20 meeting in 2016 to improve the financial system for green finance (G20 GFSG Document Repository, n.d.). The first meeting was held in Beijing in 2016, followed by meetings in Frankfurt, Germany and Basel, Switzerland this year.

Besides G20 countries, other countries such as Chad, Egypt, Kazakhstan, Laos, Singapore, Spain, and Switzerland were also invited to the GFSG in 2016. Singapore has also been working on protocols and guidelines of green bonds.

(7) United Nations Environment Programme - Finance Initiative (UNEP FI)

United Nations Environment Programme - Finance Initiative (UNEP FI) is a partnership between the UNEP and the international financial sector. The UNEP FI currently has over 200 Member institutions from over 40 countries (*"UNEP FI"*, n.d.), including banks, insurance companies and institutional investors (*"UNEP FI"*, n.d.). All members of UNEP FI must sign and adhere to the UNEP Statement of Commitment by Financial Institutions on Sustainable Development. By adhering to the Statement, the Members support sustainable development, endorse sustainability management and commit to promoting public awareness and communication (*"UNEP FI"*, n.d.).

(8) Sustainable Stock Exchanges (SSE) initiative

The UN's Sustainable Stock Exchanges (SSE) initiative aims to facilitate dialogues between stock exchanges on how exchanges can enhance corporate transparency and performance on ESG issues and promote sustainable investment (*"SSE Initiative"*, n.d.). Stock exchanges can become a Partner Exchange by voluntarily making a public commitment to sustainability (*"SSE Initiative"*, n.d.). The SSE is co-organized by the United Nations Conference on Trade and Development (UNCTAD) Division on Investment and Enterprise, United Nations Global Compact, UNEP FI and UN's Principles for Responsible Investment (UNPRI) (*"SSE Initiative"*, n.d.). Most large stock exchanges are already Partner Exchanges, with the notable exceptions of the Hong Kong Stock Exchange and the Tokyo Stock Exchange (*"SSE Initiative"*, n.d.).

4

Green bond market in China

4

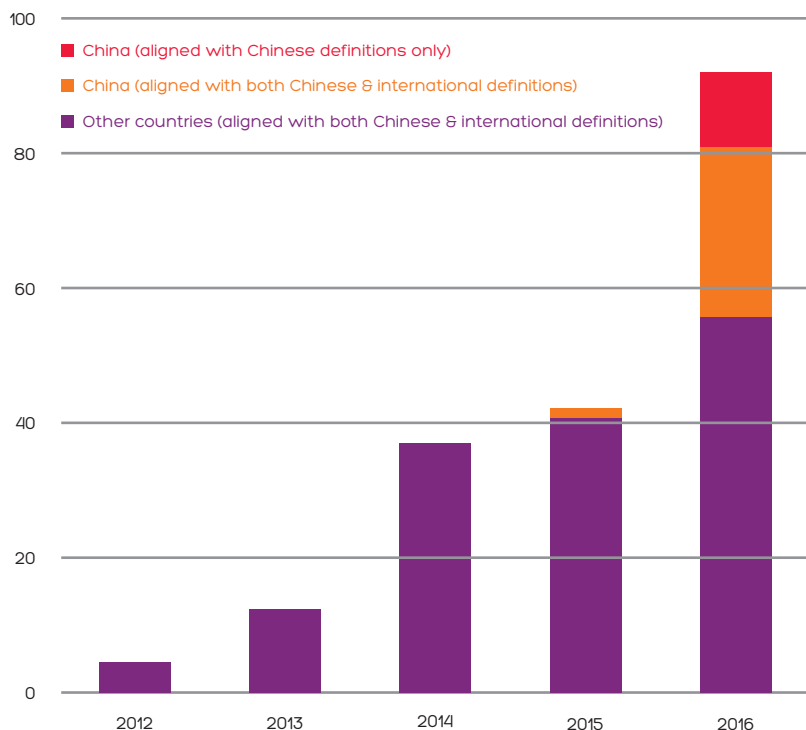
GREEN BOND MARKET IN CHINA

4.1 Overview

Compared to zero presence in the early stages, China reached the top spot of annual issuance of green bonds in 2016. The Chinese green bond market has started to grow rapidly in 2016 as issuers issued USD 25 billion of green bonds which align with both Chinese and international standards and USD 12 billion of green bonds which align with Chinese definitions only (Figure 4.1.1). China also became the third largest country in terms of

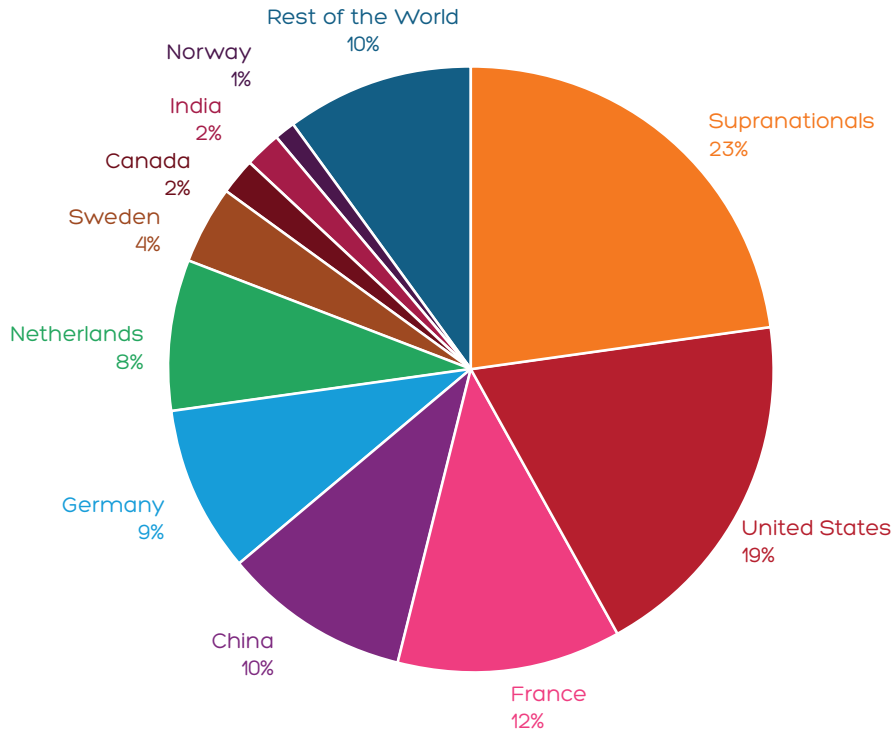
nationality of issuers of outstanding green bonds in 2016 (Figure 4.1.2). In the first half of 2017, China ranks third in terms of year-to-date amount issued in the period. While there has always been huge potential in the Chinese financial markets, such significant boom should be attributed to the marked improvement of the market infrastructure (Figure 4.1.3). The development will be discussed in more detail in Section 4.2.

Figure 4.1.1 Annual issuance of green bonds (USD billion), 2012-16



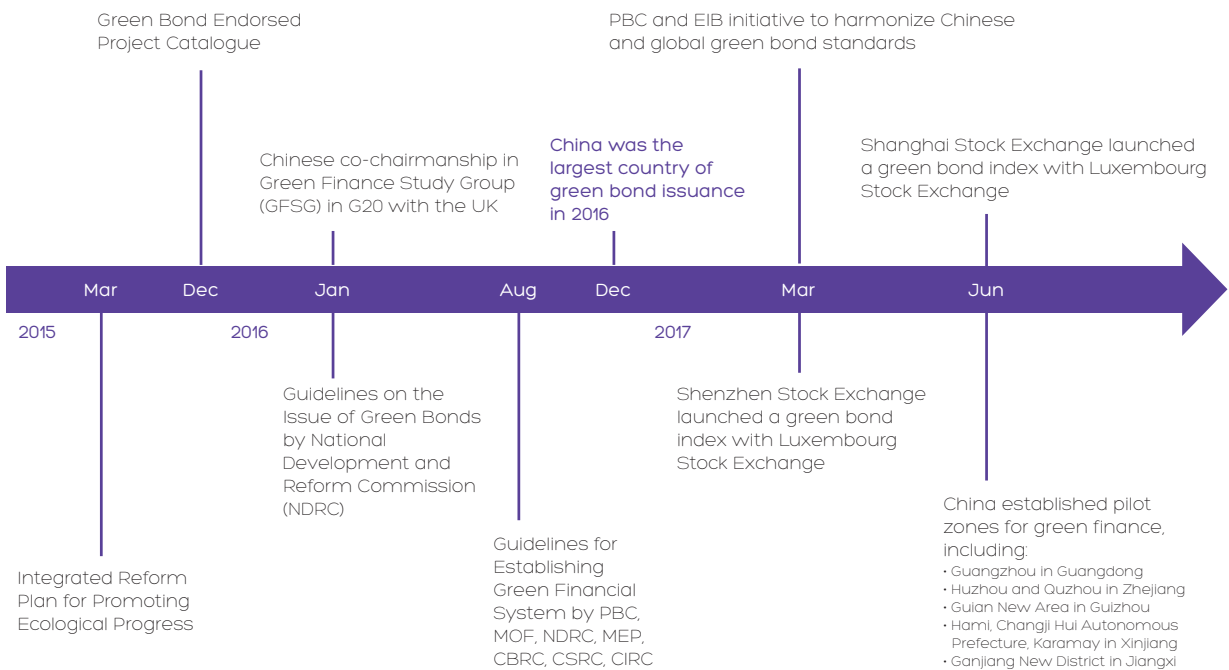
Data from Climate Bonds Initiative (2017).

Figure 4.1.2 Outstanding green bonds by nationality of issuer, 2016



Data from Climate Bonds Initiative/HSBC (2016).

Figure 4.1.3 Timeline for recent development of green finance in China



4.2 Recent development of green bond market in China

In 2014, the Green Finance Task Force was convened by the Research Bureau of the People's Bank of China (PBC) with the support of the United Nations Environment Programme Inquiry into the Design of a Sustainable Financial System. It involved experts from ministries, financial regulators, academics, banks and other financial institutions. In April 2015, the Green Finance Task Force published a report titled "Establishing China's Green Financial System" as the outcome of the process (Green Finance Task Force, 2015). In addition, 16 background papers were also published to provide more details on the theoretical framework, lessons from international experiences and the 14 recommendations in the main report (Green Finance Task Force, 2015).

In July 2015, Xinjiang Goldwind Science & Technology (Goldwind), a wind turbine manufacturer, became the first Chinese green bond issuer with a USD 300 million issue in Hong Kong. The issue had a tenure of three years and a rating of A1 with credit enhancement. While at the time there were no official regulations, Goldwind still engaged DNV GL for second party opinion and ensured the adherence to the Green Bond Principles (GBP). It should be noted

that the issue was different from standard use of proceeds bonds which have the proceeds earmarked for eligible green projects. Instead, the proceeds from this issuance could be used for any purpose due to the issuer being a pure-play company (with over 95% of revenues are from climate-aligned assets). This model is generally acceptable by the international investor community and was previously adopted by the Danish wind turbine manufacturer Vestas as well (Kidney, 2015).

In September 2015, the State Council of the People's Republic of China published "Integrated Reform Plan for Promoting Ecological Progress" (hereinafter referred to as "the Ecological Process Plan" in this chapter) which outlines China's strategy to integrate environmental impacts in its future development. The Ecological Process Plan clearly indicates, in Clause 45, China's intention of developing the green financial system (The State Council of P. R. China., 2015). Specifically, it has been stated that "studies will be undertaken to explore the issuance of green bonds by banks and enterprises". It was the first time green finance (and green bonds) being mentioned officially in China.

There was a major breakthrough of the Chinese green bond market in late 2015 and early 2016 as the PBC and the National Development and Reform Commission (NDRC) launched guidelines on green bonds respectively. In December 2015, the People's Bank of China (PBC) issued a notice on green bonds (PBC Document No.39 [2015]) (PBC, 2015). The notice only applies to the financial institutions for any issuances in the interbank market. The notice states that any proceeds from the issuances should be deposited in special accounts and the issuers should use the proceeds for funding green projects. The issuers should also provide regular reports on the use of proceeds. As for external review, issuers are encouraged to provide pre-issuance and post-issuance reports from independent verifiers. In addition to the notice itself, the Green Bond Endorsed Project Catalogue (hereinafter referred to as "the Chinese Catalogue" in this chapter) (Green Finance Committee of China Society of Finance and Banking, 2015) was introduced at the same time and should be used for defining green projects. The Chinese Catalogue covers six sectors and thirty-one sub-sectors, incorporating both the GBP and the Climate Bonds Standard (CBS). While China is one of the few countries with such detailed definitions of green projects, international investors

have reservation on whether some activities, such as clean coal, in the Chinese Catalogue should have been included in the first place.

In January 2016, the NDRC launched the Guidance on Green Bond Issuance (hereinafter referred to as "the NDRC Guidance" in this chapter) (NDRC, 2016). Opposed to the notice of the PBC which focuses on financial institutions, the NDRC Guidance targets the broader corporate sector and states the limitations on corporate issuers. While the NDRC Guidance does not provide a clear definition on green projects, it lists twelve categories of green projects that would receive policy support. At the end, the NDRC Guidance also gives policy recommendations to local governments.

In March 2016, the 13th Five Year Plan (hereinafter referred to as "the Plan" in this chapter) officially endorsed green finance as a key policy direction. Indeed, the Plan has listed "improving the overall quality of the bioenvironment" as a target (Xinhua Net, 2016). Specifically, Chapter 48 of the Plan has identified developing green finance as a strategy to grow the provision of environmental products and services (Xinhua Net, 2016).

In March and April 2016, the Shanghai Stock Exchange (SSE) and the

Shenzhen Stock Exchange (SZSE) (SSE, 2016; SZSE, 2016) launched the green corporate bond pilot initiative respectively. The Chinese Catalogue is used to define the project eligibility for the green bonds. Similar to the notice issued by the PBC, special accounts are required for the proceeds and the issuers should use the proceeds for funding green projects. Also, issuers are encouraged to provide reports from independent verifiers. The two exchanges are committed to establishing green corporate bond indices with other institutions in the future.

In April 2016, China Central Depository & Clearing and CECEP Consulting launched the first green bond indices in China, ChinaBond China Green Bond Index and ChinaBond China Green Bond Select Index (ChinaBond, n.d.). The indices incorporate the Chinese Catalogue, the NDRC Guidance, the GBP and the CBS as inclusion criteria. ChinaBond China Green Bond Index includes any green bonds that meet one of the four standards, while ChinaBond China Green Bond Select Index requires the bond to meet all four standards.

In August 2016, the PBC, the Ministry of Finance, the NDRC, the Ministry of Environmental Protection, the China Banking Regulatory Commission,

the China Securities Regulatory Commission and the China Insurance Regulatory Commission co-published the “Guidelines for Establishing the Green Financial System” (hereinafter referred to as “the Green Financial System Guidelines” in this chapter) which provide 35 recommendations, outlining the overall strategies in developing China’s green finance market (Ministry of Environmental Protection of P. R. China, 2016).

In June 2017, the following pilot zones for green finance were established (The State Council of P. R. China, 2017):

- Guangzhou in Guangdong;
- Huzhou and Quzhou in Zhejiang;
- Guian New Area in Guizhou;
- Hami, Changji Hui Autonomous Prefecture, Karamay in Xinjiang; and
- Ganjiang New District in Jiangxi

The initiative for each pilot scheme is tailored to the local economy. For example, Huadu district will be an early test area in Guangzhou. Due to its proximity to Hong Kong and Macao, it will support financial institutions from the two cities to set up joint venture securities, funds, futures and insurance companies to expand green financing channels in the district.

Apart from major developments of China, the various regional initiatives of the direct competitors of Hong Kong,

namely Shenzhen and Shanghai, are also worth referring to when devising policies for Hong Kong. Even before recent years, Shenzhen and Shanghai have always aggressively built different types of infrastructure which pave the way for the rise of green finance in China. Having established China Emission Exchange in 2010, Shenzhen has the first pilot emission trading system (ETS) in China (International Carbon Action Partnership, 2017; China Emissions Exchange, n.d.). It is among the first pilot areas for low-carbon cities in China. In March 2017, SZSE and Luxembourg Stock Exchange (LuxSE) partnered with Central University of Finance and Economics (CUFE) in Beijing to launch the first Chinese Green Bond Index which synchronizes green bond trading data between China and Europe, the CUFE China High-level (CUFE-CNI) Green Bond Index Series (LuxSE, 2017). The index series is made up of three different indices, namely the CUFE-CNI High Grade Green Bond Index, the CUFE-CNI High Grade Unlabelled Green Bond Index and the CUFE-CNI High Grade Labelled Green Bond Index. The indices include green bonds that are traded in the inter-bank and

stock exchange markets in Shenzhen and Shanghai¹. The bonds must align with the Chinese Catalogue in order to be included in the indices. In June 2017, Shenzhen Green Finance Committee² (深圳綠色金融專業委員會) was established.

Shanghai is also experienced in green finance. Shanghai Environment and Energy Exchange was established in 2011 as a trading platform for debts, equities, intellectual properties and etc. related to environment and energy use. Shanghai Stock Exchange (SSE) is a partner exchange of the Sustainable Stock Exchanges initiative of the United Nations (UN). In June 2017 (two months later than SZSE), SSE signed an agreement with LuxSE for establishing a green bond index (LuxSE, 2017). The series consists of two indices, namely SSE Green Bond Index and SSE Green Corporate Bond Index. The indices include green bonds that are listed on the SSE. In July 2017, the Management Board of Lujiazui Green Finance Development Centre³ (陸家嘴綠色金融發展中心理事會) is inaugurated and its establishment is regarded as a step to implementing the Green Financial System Guidelines.

1. 10% of China's onshore green bonds are issued at Shanghai Stock Exchange.

2. Official English name of the committee is not available yet. Please refer to the official Chinese name, "深圳綠色金融專業委員會".

3. Official English name of the committee is not available yet. Please refer to the official Chinese name, "陸家嘴綠色金融發展中心理事會".



5

Green bond
market in
Hong Kong

5

GREEN BOND MARKET IN HONG KONG

5.1 Overview

Compared to the markets discussed in previous sections, the Hong Kong green bond market is still in its early stages. So far the local market has only seen three issuances of public green bonds with two local issuers (Link REIT and MTR) and one Chinese

issuer (Xinjiang Goldwind Science and Technology), with total issue size amounting to USD 1,400 million. Table 5.1.1 summarizes the details of the three issues which will be further discussed in Section 5.2.

Table 5.1.1 Public green bonds issued in Hong Kong

Year of issuance	Issuer	Original maturity	Currency	Amount issued (original currency, million)	Equivalent amount issued (HKD million)	Interest rate
2015	Xinjiang Goldwind	3	USD	300	2,340	2.500%
2016	Link REIT	10	USD	500	3,900	2.875%
2016	MTR	10	USD	600	4,680	2.500%

5.2 Green bonds issued in Hong Kong

As discussed in Section 4.2, the USD 300 million bond of Goldwind in July 2015 is the first ever green bond issue in China. Since Goldwind has already been listed on the Stock Exchange of Hong Kong (SEHK), its green bond issue was also listed on SEHK and made available to professional investors. The bond was nearly five times oversubscribed (Tsanova, 2015).

The second green bond issue in Hong Kong was the USD 500 million green bond of Link Real Estate Investment Trust (Link REIT) in July 2016. Link REIT, one of the largest retail focused REITs in the world, used the proceeds raised from the issuance in three major categories of projects, including green building development, renovation of existing buildings and energy efficiency projects across its portfolio. It was the

first green bond issue from a Hong Kong enterprise and the first issue from an Asian property company (Link REIT, 2016). Link REIT enjoyed a rating of A (S&P)/A2 (Moody's) for the issue, which was identical to its corporate credit rating. Before issuance, Link REIT obtained a second party opinion from Sustainalytics and its green bond framework was verified against the Green Bond Principles (GBP). It has also committed to regular post-issuance reporting with external review by an independent third party on the allocation of proceeds (Link REIT, n.d.). There was much enthusiasm for the issue as it was around four times oversubscribed (Horne, 2016).

In October 2016, MTR issued its USD 600 million green bond which was rated AAA and Aa1 by S&P and Moody's respectively, both on par with the sovereign ratings of the HKSAR Government (the Government). Similar to Link REIT, MTR engaged Sustainalytics for second party opinion and the green bond was prepared according to the GBP (MTR, 2016). The proceeds were used for the development of the Kwun Tong Line Extension and South Island Line (East). For post-issuance reporting, MTR provides information in its annual sustainability report, as well as including an assurance report on the earmarking of proceeds and

environmental KPIs from Deloitte. According to its annual sustainability report, the two development projects can reduce 37,900 tons of CO₂ emissions per year (MTR, 2016). It is also worth mentioning that more recently, in June 2017, MTR issued a ten-year AUD 115 million green medium term note under private placement. The issue met the strong demand for green investments in Asia Pacific, particularly that of Australian and Japanese investors.

Apart from standard green bonds, one local issuer opts for a slightly different form of financing for climate-related projects. In July 2017, the wholly-owned subsidiary of Castle Peak Power Company Limited (CAPCO), Castle Peak Power Finance Company Limited, issued USD 500 million of senior unsecured notes due 2027 under Castle Peak Power Finance Company Limited's Medium Term Note Programme (CLP, 2017). Since CAPCO is a joint venture between CLP (70%) and China Southern Power Grid International (30%), the USD 500 million notes are the first Energy Transition Bonds issued under CLP's Climate Action Finance Framework. Under the Framework, there are two types of bonds that can be issued, namely Energy Transition Bonds and New Energy Bonds (CLP, n.d.). The use of proceeds derived

from Energy Transition Bonds is to develop natural gas fired power plants where the opportunities to develop renewable energy are limited, whereas New Energy Bonds support the development of renewable energy, efficiency improvement projects and low carbon transport infrastructure.

The Framework and its assessment conducted by DNV GL mostly align with the requirements of the GBP, with the only exception being the use of proceeds derived from Energy Transition Bonds due to gas not being a common use of proceeds for green bonds.

5.3 Government initiatives

While these issues can serve as references for future issuers, the market still has much more growth potential and the Government shall come up with new incentives to facilitate issuances as well. So far we have observed positive communication between the Chinese Central Government and the Chief Executive of Hong Kong, Mrs. Carrie Lam, for matters related to green finance. The new term of government has also taken the initiative to promote green finance in Hong Kong.

Budget Speech, it was also suggested that the Airport Authority would “explore the feasibility of financing through green bonds” (Tsang, 2016). In the replies to initial questions raised by Finance Committee Members in examining the Estimates of Expenditure, the Permanent Secretary for Financial Services and the Treasury (Financial Services), Andrew HY Wong, also stated that “the government and regulatory authorities will continue to keep in view the global development in green finance” (Wong, 2017).

Moreover, the significance of green finance has been recognized in official documents. In the 2017-18 Budget Speech, it is stated that the Government “will step up...efforts to promote...competitive capital market and encourage the sector to explore opportunities brought by green finance” (Chan, 2017). In the 2016-17

To support the development of green finance in Hong Kong, the Financial Services Development Council (FSDC) published a report titled “Hong Kong as a Regional Green Finance” in May 2016. The report lays out the global green finance market and the role of China and Hong Kong in green finance, as well as making a number

of recommendations for action, such as issuing government bonds, establishing a Green Finance Advisory Council, hosting a Global Conference on green finance, building a pipeline of green finance professionals and establishing a Green Labelling Scheme (FSDC, 2016).

The Principles of Responsible Ownership are also worth mentioning as they help promote responsible investments in Hong Kong. They were introduced by the Securities and Futures Commission (SFC) in 2016. The Principles are a set of principles which guide investors on meeting ownership responsibilities. The Principles are voluntary and investors are encouraged to disclose to stakeholders how they have applied the Principles or why certain aspects do not or cannot apply to them (SFC, n.d.). While some of the respondents to the Consultation on the Principles thought public asset owners (such as the Hong Kong Monetary Authority, the Hospital Authority and Mandatory Provident Fund providers) should be required to disclose whether or not they comply with the Principles (SFC, 2016), at the end SFC did not make the Principles a requirement for certain organizations.



Environmental needs behind green bonds

6

6

ENVIRONMENTAL NEEDS BEHIND GREEN BONDS

6.1 Paris Agreement

The 21st session of the Conference of the Parties in 2016 has resulted in the establishment of the Paris Agreement (United Nations Framework Convention on Climate Change, 2015), which has been signed by 195 members of the

United Nations Framework Convention on Climate Change (UNFCCC), 166 of which have ratified the Agreement.

It is stated in Article 2 of the Agreement that:

"This Agreement, in enhancing the implementation of the Convention, including its objective, aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by:

- (a) Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change;
- (b) Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production;
- (c) Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development."

(UNFCCC, 2015, p.22)

The Agreement has officially recognized the two degree scenario as a last threshold for climate change, as well as highlighting the need for climate mitigation and adaptation efforts. Notably, the Agreement

also recognizes the importance of finance flows towards low emissions and climate resilient development (UNFCCC, 2015).

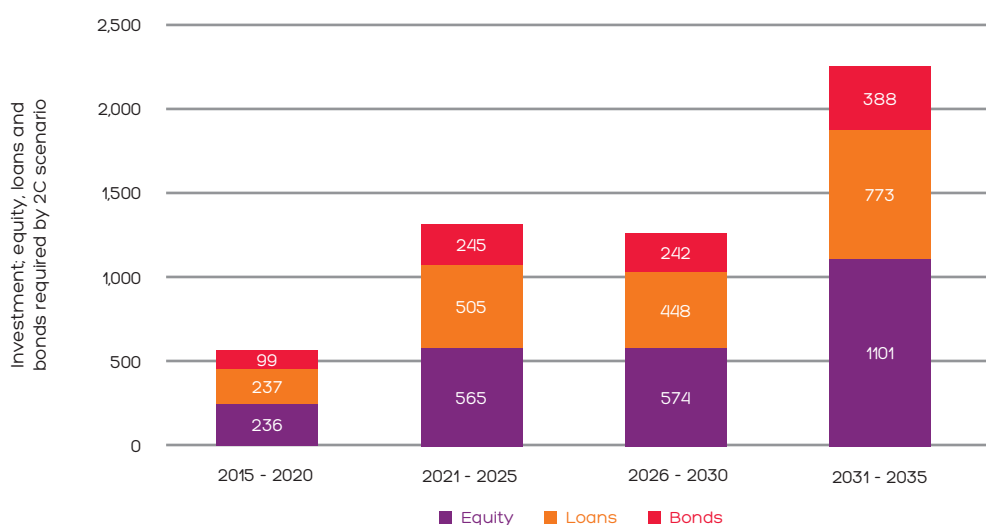
In regard to the investment needs of

the two degree scenario, the Global Commission on the Economy and Climate estimates that around USD 90 trillion would be needed over the next fifteen years, which is about USD 6 trillion per year on average till 2030 (Global Commission on the Economy and Climate , 2016).

According to the International Energy Agency, a cumulative USD 44 trillion will be needed for investment in global energy supply whereas an extra USD 23 trillion is required for improvements in energy efficiency (International Energy Agency, 2016). Based on the projections of the International Energy Agency on renewable energy, energy efficiency and low-emission vehicle

sectors which account for 80-90% of total investment, the Organization for Economic Co-operation and Development (OECD) estimated the contribution of asset classes to the investment needs. Results of the analysis suggest that by 2035 in a two degree scenario, bonds financing and refinancing the three sectors in the four markets studied have the potential to scale to as much as USD 4.7- 5.6 trillion in outstanding securities globally and USD 620-720 billion in annual issuance with the ranges representing a base-case “low securitization” scenario and an “enhanced securitization” scenario respectively (OECD, 2016). Investment breakdown of total financing is shown in Figure 6.1.1.

Figure 6.1.1 Investment breakdown of financing needed, 2015-35 (USD billion, 2012)



Data from OECD (2016) based on IEA (2014, 2012).

Note: Financial sector bonds that raise proceeds for on-lending not shown but represented in loan figures.

6.2 Environmental needs of China

6.2.1 Overview

China is currently the largest country by carbon dioxide emissions, nearly doubling that of the second largest country, the US (Global Carbon Atlas, n.d.) (Figure 6.2.1). In terms of carbon intensity (carbon dioxide emissions per GDP), China also ranks higher

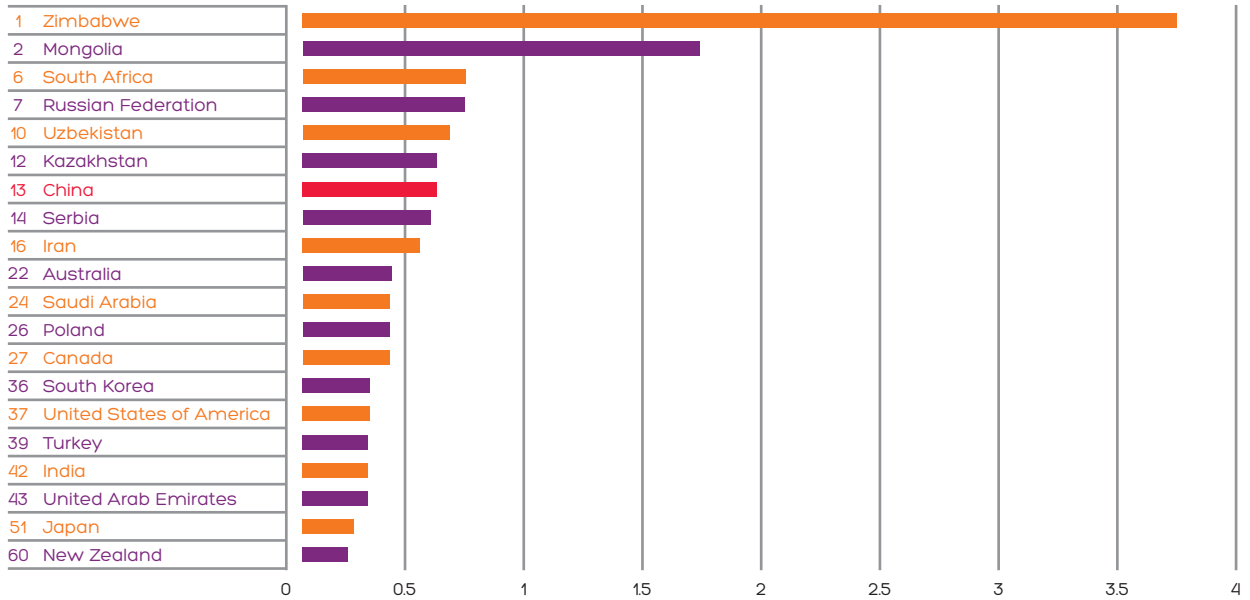
than most larger economies (Global Carbon Atlas, n.d.) (Figure 6.2.2). This demonstrates that any global attempt in tackling climate change must involve significant participation from China.

Figure 6.2.1 Largest carbon emitters by total emissions, 2015 (Mt CO₂)

1	China	10357
2	United States of America	5414
3	India	2274
4	Russian Federation	1617
5	Japan	1237
6	Germany	798
7	Iran	648
8	Saudi Arabia	601
9	South Korea	592
10	Canada	557
11	Indonesia	537
12	Brazil	515
13	Mexico	472
14	South Africa	462
15	United Kingdom	417
16	Australia	400
17	Turkey	386
18	Italy	361
19	France	340
20	Poland	316

Data from Global Carbon Atlas.

Figure 6.2.2 Carbon intensity of selected countries, 2015 (kgCO₂/GDP in USD)

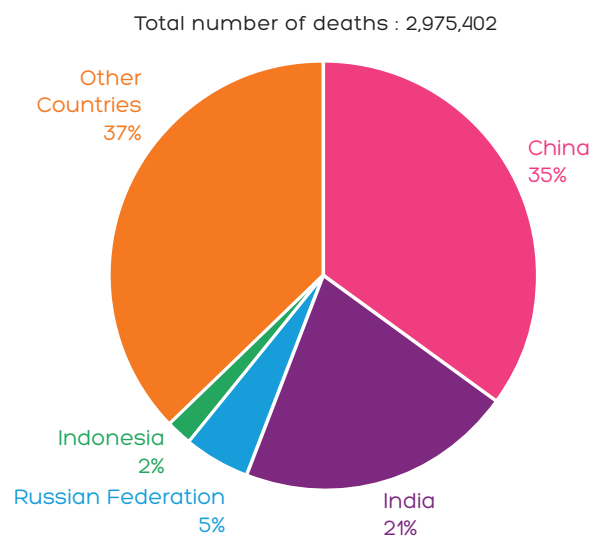


Data from Global Carbon Atlas.

It should be noted that the sources of greenhouse gas emissions, such as fossil fuel combustion, also tend to be sources of air pollutants. Hence reducing greenhouse gas emissions may also help in reducing air pollutant emissions as well. An analysis by the World Health Organization in 2016 has estimated that a total of 1,032,833 deaths (equivalent to 76 deaths per 100,000 capita) were caused by air pollution in China in 2012, which is the worst-performing country in the study (Figure 6.2.3) (Vaughan, 2016). The impact on health and the resulting loss of labor productivity would pose significant financial costs to the national economy. Another study by RAND Corporation suggests that such costs amounted to 6.5% of the national

GDP between 2000 and 2010, while water pollution and soil degradation cost 2.1% and 1.1% of GDP respectively (Crane & Mao, 2015).

Figure 6.2.3 World's deadliest countries for air pollution



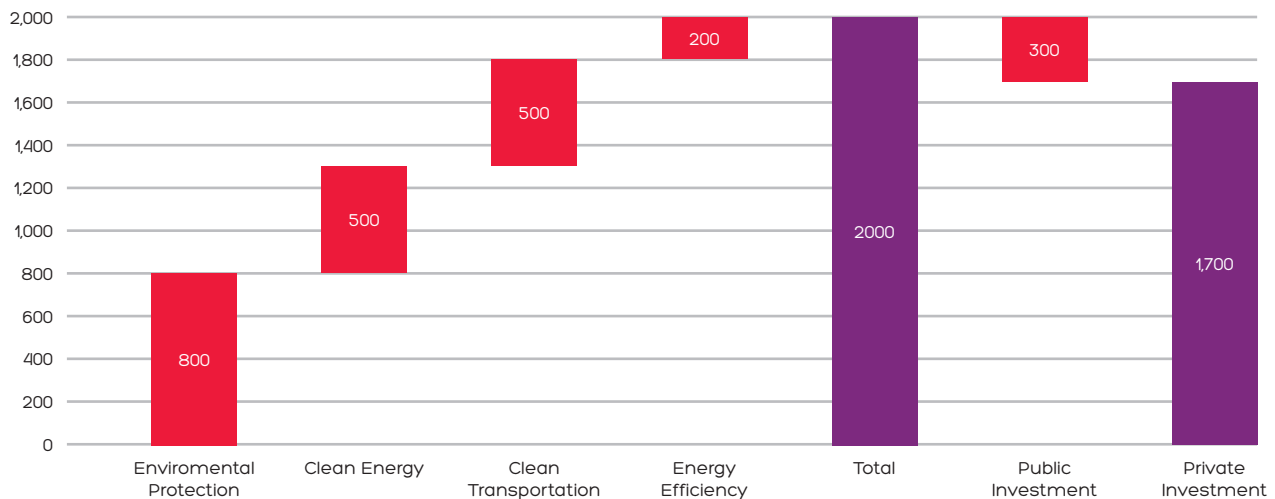
Data from Vaughan (2016).

6.2.2 13th Fiver Year Plan

The Green Finance Task Force has provided an estimate on green investment needed for meeting the environmental targets in the 13th Five Year Plan (hereinafter referred to as “the Plan” in this chapter). It is estimated that an annual investment of at least CNY 2 trillion will be needed for the next five years. The Chinese

government can be expected to provide only 10-15% of the green investment, while the private sector has to contribute the remaining 85-90% (Figure 6.2.4) (Green Finance Task Force, 2015). This presents a huge opportunity for the financial market to provide the private capital needed for green investment.

Figure 6.2.4 Annual green investment needed estimated by the Green Finance Task Force (CNY billion)



Data from Green Finance Task Force (2015).

At policy level, the Chinese Central Government has been supportive of green financing as well. As discussed in Section 4.2, the Plan has officially endorsed green finance as a key policy direction in March 2016. The Plan has listed “achieve an overall improvement in the quality of the

environment and ecosystems” as one of the major targets (Xinhua Net, 2016). The environmental targets have been quantified and listed (Table 6.2.1). For example, the Plan aims at reducing the carbon intensity (carbon emissions per GDP) by 18% within the five-year period. The Plan has also identified

developing green finance as a strategy to grow the provision of environmental products and services (Xinhua Net, 2016). Green bonds, green credit and

green development funds are the three financial instruments named in the Plan.

Table 6.2.1 Targets of the 13th Five-Year Plan

Indicator	Cumulative change for 5-year period
Water use reduction per 10,000 yuan of GDP	23%
Energy consumption reduction per unit of GDP	15%
CO ₂ emissions reduction per unit of GDP	18%
Forest coverage	1.38% increase
Forest growing stock	1.4% increase
Days of good or excellent air quality in cities at and above the prefectural level (% of the year)	3.3% increase
Reduction in PM2.5 intensity in cities at and above the prefectural level missing the target	18%
Surface water quality (Grade III or better)	4% increase
Surface water quality (Worse than Grade V)	4.7% reduction
Aggregate major pollutant emissions reduction	Ammonia nitrogen, 10% Sulfur dioxide, 15% Nitrogen oxide, 15%

6.2.3 The Belt and Road Initiative

The Belt and Road Initiative refers to the Silk Road Economic Belt and 21st Century Maritime Silk Road. It is a development strategy of China which aims at promoting cooperation among countries along the routes. It was first proposed in September and October

2013 by Xi Jinping, President of China, when he visited Kazakhstan and Indonesia (Central Policy Unit, 2015). In March 2014, the Belt and Road Initiative was also first included in the annual report on the Work of the Government (Li, 2014).

The Belt and Road Initiative is structured along six corridors and the maritime silk road as follows:

- New Eurasian Land Bridge Economic Corridor;
- China-Mongolia-Russia Corridor;
- China-Central Asia-West Asia Economic Corridor;
- China-Indochina Peninsula Economic Corridor;
- Bangladesh-China-India-Myanmar Economic Corridor;
- China-Pakistan Economic Corridor;
- and
- Maritime Silk Road

The Initiative covers more than 60% of the global population in more than 60 countries across Asia, Europe and Africa, as well as covering 30% of the global GDP and 35% of international trade (Hong Kong Trade Development Council, 2014).

In March 2015, the National Development and Reform Commission (NDRC), the Ministry of Foreign Affairs, and the Ministry of Commerce issued the Vision and Actions on Jointly Building Silk Road Economic Belt and 21st Century Maritime Silk Road (NDRC, 2015). Environmental protection is an important element in the document, especially under cooperation priorities. It is stated that the Chinese Central Government would aim at building a "green silk road".¹ Areas of cooperation

include conserving eco-environment, protecting biodiversity, cooperation in agriculture, forestry and fisheries, development of renewable energy sources, etc. The "green silk road" is a timely proposal, as according to Ma (2015), Chief Economist at the People's Bank of China (PBC), the countries along the Belt and Road consume energy and wood and produce carbon both at a rate 1.5 times higher than the global average on a per GDP basis, as well as at least doubling the global average in terms of per GDP steel, cement, non-ferrous metals and water consumption (Ma, 2015). Financial integration is another focus under cooperation priorities. Both panda bonds (renminbi bonds issued in mainland China by foreign governments, companies and institutions) and dim sum bonds (renminbi bonds issued outside mainland China) are encouraged in the document so that the funds raised can be used back in countries along the Belt and Road.

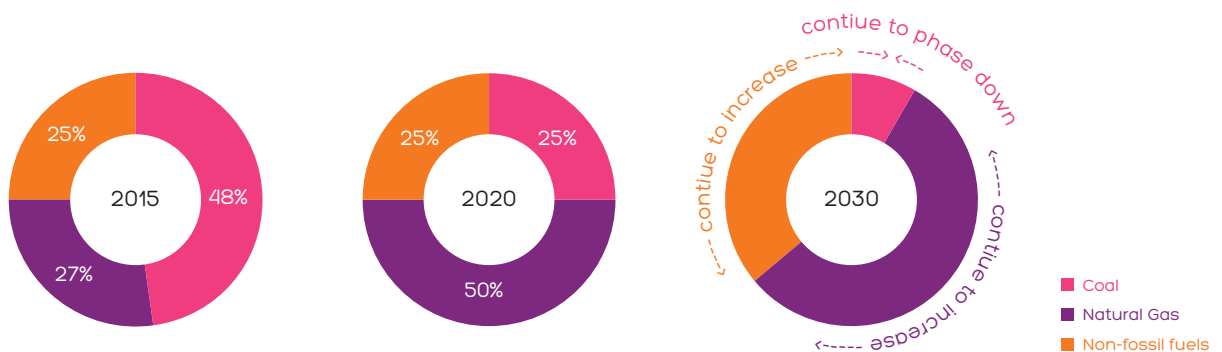
6.3 Environmental needs of Hong Kong

The HKSAR Government (the Government) has set a reduction target for carbon intensity of 65-70% from the 2005 base level by 2030, which would be equivalent to a 26-36% absolute reduction. The current decarbonization efforts would lead to an expected reduction in carbon intensity of around 50% by 2020 from the 2005 base level, which is a significant step in reaching the 2030 target (Environment Bureau, 2017).

Currently, around 70% of the carbon emissions in Hong Kong are produced by electricity, while transport accounts for 16%, and waste and others, 14%. Out of the emissions from electricity, 90% (or 63% of total emissions) are due to buildings (Environment Bureau, 2017). Hence, electricity generation and energy-efficient buildings should be two major focuses of any local environmental policy.

For electricity generation in 2015, around half of the electricity generated is from coal, while natural gas accounts for 27% of the energy mix. The rest is contributed by non-fossil fuels. The Government expects a shift towards natural gas, which is a cleaner source than coal, and non-fossil fuels (Figure 6.3.1). While it seems to be an environmentally friendly change, most of the generation from non-fossil fuels is expected to be nuclear energy. At the moment, renewable energy contributes to around only 1% of the energy mix and is estimated to contribute 3-4% of the energy mix at most by 2030 if the energy potential is realized. Potential wind energy sites at South West Lamma and South East Ninepin can also at most provide extra 1.5% of total electricity consumed, albeit at a more expensive price than natural gas (Environment Bureau, 2017).

Figure 6.3.1 Target energy mix of Hong Kong, 2015-30



Data from Environmental Bureau (2017).

Another policy focus is the energy use of buildings. One major policy is to promote green buildings in new development. The Government currently provides at most 10% gross floor area concession for green and amenity features if a private development project undergoes Building Environmental Assessment (i.e. BEAM Plus). The Government has also led by example by adhering to the BEAM Plus standards with public sector buildings, as well as new public housing projects (Environment Bureau, 2017). In the 2017 Policy Address, it is stated that the Government will consider requiring a project to reach certain standards of green performance for the concession, or adopting performance-based and site-specific approaches for granting the concession (Leung, 2017). Green

buildings will be further discussed in Section 7.4.2.

In order to address electricity generation and building issues, the Government has been promoting the installation of photovoltaic systems on buildings as well. The Government currently has the largest number of photovoltaic installations with public sector buildings and facilities. In its new Scheme of Control of Agreements with Hongkong Electric and CLP Power Limited which will come into effect in January 2019 and October 2018 respectively, the Feed-in Tariff Scheme will be introduced. Subject to the terms of the Scheme, customers who have installed qualified renewable energy systems are to be paid for each unit of electricity generated by the systems (Environment Bureau, n.d.).

1. Original text is “共建綠色絲綢之路”.



7

Considerations

7

CONSIDERATIONS

7.1 Framework

The core of the considerations is the introduction of a Qualifying Green Bond (QGB) scheme, which will include green bonds recognized by the HKSAR Government (the Government). Building on the initiative, different financial incentives will be provided to both investors and issuers of QGBs. The Government should consider issuing government green bonds which qualify as QGBs. Finally, the Government should also align

with the United Nations-supported Principles of Responsible Investment (UNPRI) with its investments at the Hong Kong Monetary Authority (HKMA) and encourage the Hong Kong Stock Exchange (SEHK) to be green, as well as establishing an inter-departmental committee for green finance and enhancing communication with the Chinese Central Government and international promotion.

Figure 7.1.1 Framework

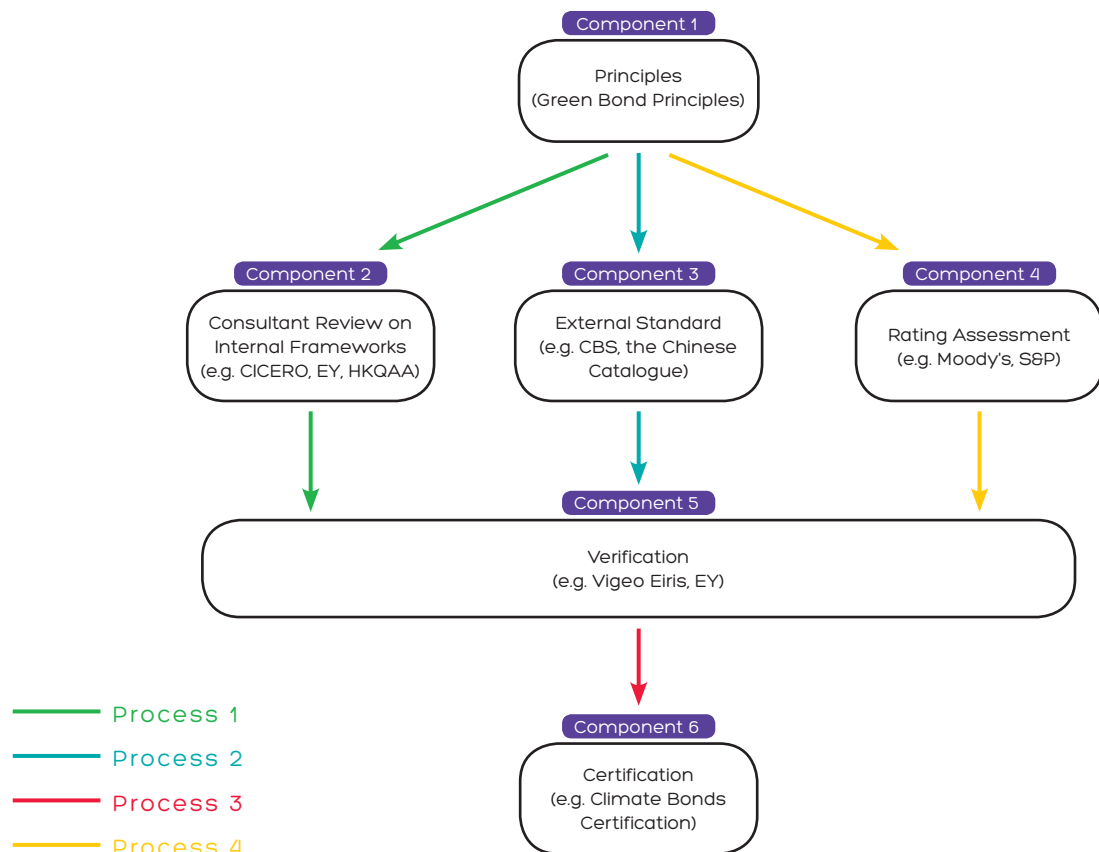


7.2 Consideration 1: Establish a Qualifying Green Bond (QGB) scheme

The Government is suggested to establish a Qualifying Green Bond (QGB) scheme by recognizing standards/qualified parties of green bonds. Bonds classified as QGBs can enjoy the subsidy to be discussed in Consideration 2 under Section 7.3.

In order to qualify as a QGB, a bond has to be externally reviewed against selected standards or by a qualified party. According to Section 2.2, flow of external review can be generally classified into four processes, which are shown again in Figure 7.2.1.

Figure 7.2.1 Processes for external review



7.2.1 Recognize standards along Process 2

Process 1 and Process 2 are currently the most widely used processes for external review. For Process 2, the Climate Bonds Standard (CBS) and the Green Bond Endorsed Project Catalogue (hereinafter referred to as “the Chinese Catalogue” in this chapter) are well-recognised standards in the world and China respectively. For Hong Kong to be a global hub of green bonds, we should have policies to facilitate the issuance and investment of bonds meeting these global/regional standards. We, therefore,

suggest the Government include bonds verified against the CBS and the Chinese Catalogue under the QGB scheme.

Since the People’s Bank of China (PBC) and the European Investment Bank (EIB) are collaborating efforts to harmonize the Chinese and global green bond standards, we believe that a new unified standard will be developed in the near future and can be considered as new criteria for the QGB scheme.

7.2.2 Recognize independent consultants along Process 1

For Process 1, most of the independent consultants have their own in-house frameworks. The Government should evaluate each consultant case by case as a qualified party under the QGB scheme. Bonds which are reviewed by qualified parties with proper verification can then qualify as QGBs.

Apart from globally renowned sustainability consultants, such as CICERO, Vigeo Eiris and Sustainalytics, Hong Kong Quality Assurance Agency (HKQAA) should be one of the candidates to be considered. The Green Finance Certification Scheme to be launched by HKQAA can be considered as new criteria for the QGB scheme when it comes

to market. The development of the proposed certification scheme of HKQAA will make reference to various international standards and specifications, including but not limited to ISO 26000:2010 Guidance on Social Responsibility, Clean Development Mechanism (CDM) of United Nations Framework Convention on Climate Change (UNFCCC) and the Green Bond Principles (GBP) etc. Recognizing the lack of scientific standards for some environmental subjects, the proposed certification scheme will adopt measurable qualitative approach to confirm if the green bond projects will produce positive effect in environmental performance by establishing and implementing

Environmental Method Statement for respective green bond projects.*

Moreover, HKQAA can leverage its local expertise to tailor its green bond framework to local needs. For example, local climate conditions, such as temperature and humidity, are crucial considerations for green buildings, but may not be well covered

by international standards. Therefore, apart from globally recognized standards, such as Leadership in Energy and Environmental Design (LEED) and Building Research Establishment Environmental Assessment Method (BREAAM), HKQAA also takes into account of existing local green standards, such as BEAM Plus, for measures of local conditions.

7.2.3 Promote balanced development along Processes 1 and 2 for Hong Kong

The Government should adopt a balanced strategy to develop Hong Kong green bond market along Process 1 and Process 2.

Recognizing global/regional standards along Process 2 solely for the QGB scheme makes green bonds issued in Hong Kong more credible to international investors, especially those aiming to invest in China. However, it forgoes the opportunity to grow the local accreditation industry. In contrast, making HKQAA a qualified party for the QGB scheme creates a new market for local accreditation industry. Yet, HKQAA has to compete with those globally renowned consultants, such as CICERO, Vigeo Eiris, EY and Deloitte. If the eligibility criteria for

the QGB scheme only recognize the HKQAA framework and exclude other international standards/consultants, the overall success of Hong Kong's green bond market will be highly linked to the international competitiveness of HKQAA and its scheme.

By including both international standards and local schemes, the eligibility criteria for the QGB scheme can strike a balance between realizing the potential for local accreditation and mitigating the risk of international competition. Therefore, we suggest the Government focus its future green-bond-related policies, not limited to our suggested ones in this report, on QGBs.

* Based on interview with HKQAA. The Scheme will assess the adequacy and implementation effectiveness of the proposed Environmental Method Statement. The applicant will also be required to perform impact assessment and stakeholder engagement exercises for green bond projects in order to determine suitable balance between the stakeholders' interest and the effectiveness of environmental improvement. The applicant will also need to disclose key information of green bond projects for achieving high transparency towards the stakeholders.

7.3 Consideration 2:

Provide subsidy for Qualifying Green Bonds (QGBs)

As discussed in previous sessions, Monetary Authority of Singapore (MAS) has announced a Green Bond Grant Scheme in early 2017. The scheme provides subsidy up to SGD 100,000 per issuance external review of green bonds (Wong, 2017). The scheme relieves partially, but not all, the hurdles of issuing green bonds.

Issuing green bonds currently does not guarantee any financial advantage over traditional corporate bonds. Yet, it incurs monetary costs for external review, which can hold potential issuers back. Administrative and labor inputs are two other major intangible costs, which cannot be eliminated via the grant, for preparing the issue and its subsequent regular reporting. But still, off-setting the monetary cost of verification is a cost-effective approach to incentivize the issuers. The cost is about 1 to 10 basis points relative to the face value which can be a determinant on issuing a green bond against a traditional bond, but the amount of subsidy is not significant from the government's perspective. Even if all global green bonds in 2016 were issued in Hong Kong, the total subsidy cost (assumed to be 10 basis points) would

be about HKD 630 million which is minimal compared to the HKD 3 trillion Exchange Fund.

Hong Kong can employ a similar approach to incentivize green bond issues and provide subsidy for external review of green bonds. The subsidy should be reimbursed to issuers for bonds which have their green bond frameworks successfully reviewed against recognized standards or by qualified parties under the QGB scheme and the bonds could be denominated in any currency. The subsidy should not be limited to listed green bonds, but also include those traded over-the-counter (OTC).

7.4 Consideration 3: Issue government green bonds

7.4.1 Issuing government bond is worthy of consideration despite fiscal surplus

Having immense fiscal surplus is not a sufficient reason for the Government not to issue bonds. However, this cash accounting mindset may neglect the efficiency in achieving policy objectives (Audit Commission, 1999). For the case of green bonds, issuing government bonds can establish a benchmark for the green bond market and such effect cannot simply be revealed by the Government's fiscal surplus. With the Government Bond Programme, the current yield curve in Hong Kong is up to 15 years only, which means that there is no benchmark for corporate bonds with maturity over 15 years.

There have been some notable issues in the government green bond sector recently. While there has been a number of issues by municipalities and state governments, the first ever sovereign green bond was launched by Poland in December 2016 with face value of EUR 750 million. One month later, France issued its sovereign green bond in January 2017. The French sovereign green bond is currently the world's largest green bond with face value of EUR 7 billion and then-longest

maturity of 22 years. The demand of the French bond was over EUR 23 billion. Proceeds of both Polish and French green bonds will be used to finance their green projects, particularly on green energy.

However, Hong Kong has different financial needs compared to Poland and France. Budget deficit has occurred in Poland for the past two decades and in France since 1970s. The prolonged budget deficits, together with their commitment to the Paris Agreement, have made their green bond issuances a logical move. The Government has experienced fiscal surplus since 2004 and sees no necessity in financing its expenditure via raising debt. Yet, with the Linked Exchange Rate System, Hong Kong is enjoying low financing costs. Issuing long-term government green bonds enables locking in the current low interest rate and can minimize the limitations posed by the lack of a benchmark yield curve for the development of green bonds.

7.4.2 Green buildings can be financed by green bonds

To align with the standards of green bonds, proceeds from government green bonds have to be invested in particular green projects. Although availability of green projects in Hong Kong is not comparable to Poland and France, green buildings can be potential green projects such that Hong Kong can meet its local environmental targets mentioned in Section 6.3.

All new public housing projects and new major government buildings are expected to meet at least Gold level standard in BEAM Plus (Legislative Council, 2015).

For public housing, the Government aims at supplying 280,000 units in the period from 2016-17 to 2025-2026.

However, the Government projected total construction cost to be about HKD 117.8 billion. Provided that the Housing Authority (HA) currently only has a cash and investment balance of HKD 57 billion, funding support from the Government is essential in the long term (HA, 2017). The Government can, therefore, consider financing the construction cost of the new public housing projects by issuing green bonds.

Issuing green bonds for new government buildings is also economically justifiable. According to the Hong Kong Green Building Council (HKGBC) (2017), typically Gold or above projects achieve an annual energy reduction of around 21% or more. HKGBC (2017) has assessed 452 BEAM Plus projects and provided the following energy reduction data in Table 7.4.1.

Table 7.4.1 Energy reduction of selected 452 BEAM Plus projects

Achieved Rating	Average Annual Energy Reduction
Platinum	27%
Gold	21%
Silver	18%
Bronze	16%

Source: HKGBC, 2017

Although achieving BEAM Plus standards comes with costs, the example of Holiday Inn Express Hong Kong Soho, which was rated Platinum,

demonstrates that the energy savings of green buildings can help achieve cost effectiveness (Wong, 2014).

Table 7.4.2 Cost effectiveness of Holiday Inn Express Hong Kong Soho

Name of the Building:	Holiday Inn Express Hong Kong Soho
Location:	77-85 Jervois Street, Sheung Wan, HK
BEAM Plus rating:	Platinum
Gross Floor Area:	9,163 m ²
No. of Floors:	36
Energy Saving:	58.5%
Reduced Energy Consumption:	2,070,381 kWh
Saved Energy Bill:	HKD 3.33 million per year
Extra Cost to Achieve the Rating:	HKD 13.26 million
Payback Period:	4 years

Source: Wong, 2014

As shown in Table 7.4.2, although extra cost (HKD 13.26 million) was required to satisfy the Platinum rating, break-even can be achieved in 4 years because of the energy bill saved (HKD 3.33 million per year). The data on the example can economically justify the use of green bonds to help the Government accomplish the energy efficiency targets of government and other public buildings. Green bonds can, therefore, finance the construction or retrofitting costs for these green government

buildings. Interests incurred, together with the extra cost, can then be covered by energy bill saved. In the long term, net public saving can be realized after the payback period.

In addition to government buildings, Environment Bureau (2017) also indicated that “Schools & Universities” account for 4% share of consumption of the commercial sector. Hence, revamp of electricity systems in schools can also be financed via public green bonds.

7.4.3 Suggested mechanism for issuing government green bonds

The Public Finance Ordinance poses a technical challenge for issuing this kind of green bonds. According to the Public Finance Ordinance (Cap.2) section 3 and section 4, unless provided by other enactments, any amount of money raised by the Government should be part of general revenue to which no expenditure can be charged. In this case, proceeds from bonds issued by the Government cannot be allocated to any particular project. This contradicts with the GBP, which specifically requires use of proceeds on green projects.

In view of the restrictions, the Government can establish a wholly-owned company with initial paid-up capital for a specific group of green projects. The green bonds issued by the company can be used to finance these projects and the Government can then act as a guarantor of the issued green bonds.

Other than the wholly-owned company of the Government, some statutory bodies, such as the Airport Authority Hong Kong (AAHK), can issue bonds in accordance with the ordinance which establishes them. Since they have more flexibility in

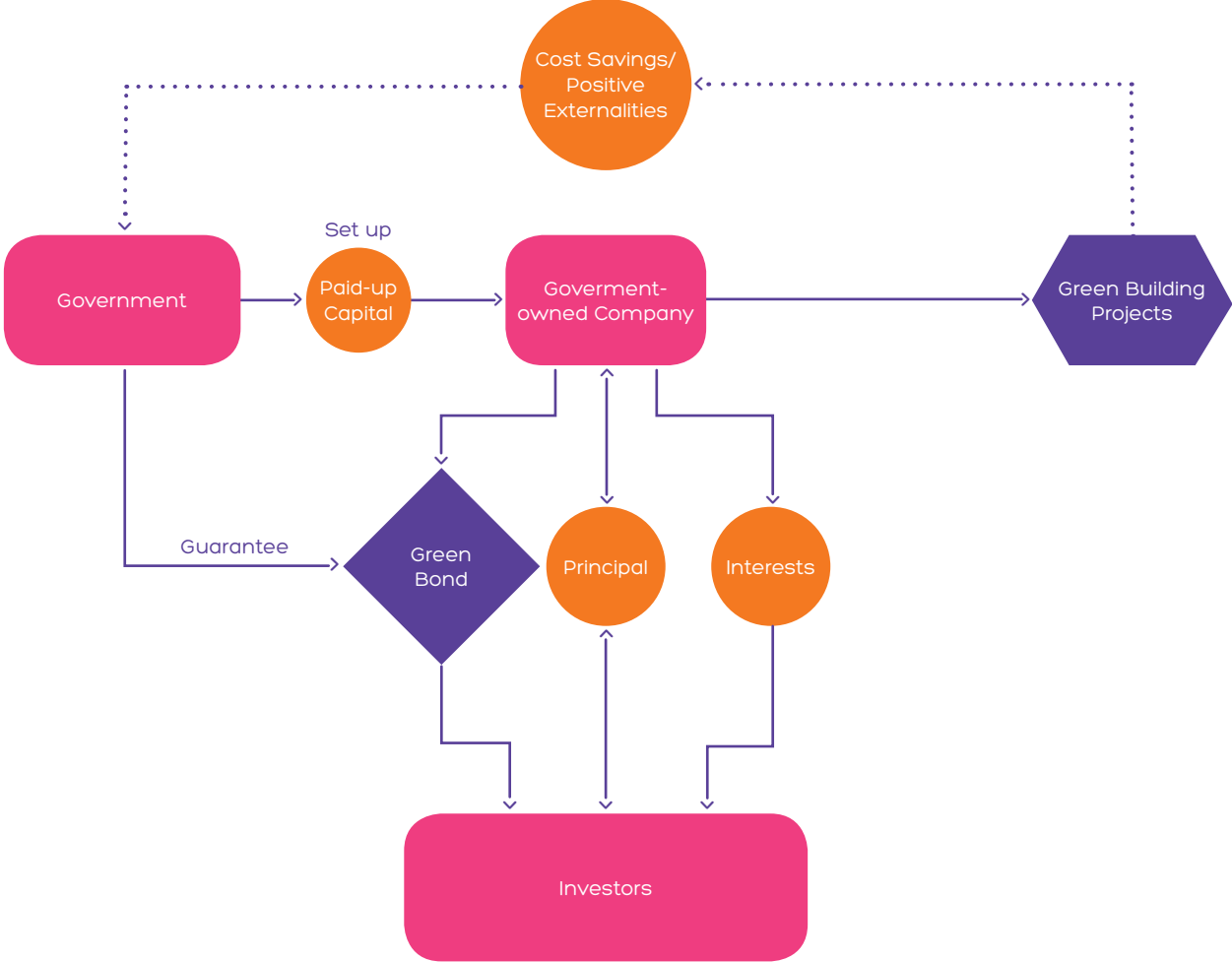
allocating bond proceeds to green projects, these statutory bodies are suggested to issue green bonds for financing green projects. However, statutory bodies with such flexibility are rare in Hong Kong.

One point to note is that energy savings in green public sector building projects cannot be directly transferred to bond investors as interests. Therefore, interest payments and repayment of principal have to be sourced from the paid-up capital of the government-owned company or other sources.

The suggested mechanism of issuing government green bonds for green buildings is summarized in Figure 7.4.1.

The green bonds issued via this mechanism should be verified or certified as discussed in Consideration 1 under Section 7.2.

Figure 7.4.1 Suggested mechanism for issuing government green bonds



7.4.4 Purchase green-related mortgages

As mentioned previously, the current yield curve in Hong Kong is up to 15 years only. Not only does it restrict the issuance of corporate bonds, it also limits the development of green bonds with maturity longer than 15 years since there are no reference non-green government bond issues.

A solution can be formulated with reference to Lau, Shui and Xiong (2016) who proposed the idea that the Hong Kong Mortgage Corporation Limited (HKMC), which is wholly owned by the Government through the Exchange Fund, can issue long-term bonds to acquire owner-occupied residential mortgage from banks.

The idea can be further enhanced to deliver positive environmental impacts. By requiring the underlying mortgages to be used for purchasing properties with Gold or above rating in BEAM Plus, the bonds can be classified as green bonds. The banks can then essentially mitigate the liquidity risks of these mortgages. Acharya and Pedersen (2005) had pinpointed the positive relation of risk and illiquidity. Purchasing green-related mortgage can, therefore, boost the demand of

properties with good BEAM Plus ratings by reducing liquidity risks for banks and can incentivize property developers to adopt BEAM Plus.

A similar approach can be referred to in the USD 217 million securitization of Renew Financials. The securitization is backed by residential Property Assessed Clean Energy (PACE)* assets and was assigned a rating of GB1 (Excellent) under Green Bond Assessment of Moody's (Moody's, 2017).

* Property Assessed Clean Energy (PACE) is a financing mechanism for enhancing energy efficiency for property owners.

7.5 Consideration 4:

Align HKMA investments with the UNPRI

The Exchange Fund is established under control of the Financial Secretary according to the Exchange Fund Ordinance. The HKMA was authorized by the Financial Secretary in an exchange of letters for the use and investment management of the Exchange Fund (HKMA, 2003). The

HKMA is the most significant public institutional investor in Hong Kong with HKD 3.7 trillion of total assets as of December 2016 (HKMA, 2017) due to its nature as the manager of the public money.

7.5.1 HKMA should align its investments with the UNPRI

The HKMA has a huge role to play as it can take the lead by allocating part of its assets to sustainable investments or green bonds. Although Section 1 of the Exchange Fund Ordinance has stated clearly that the primary purpose of Exchange Fund is to affect the exchange value of currency of Hong Kong, the HKMA should align its investments with the United Nations-

supported Principles of Responsible Investment (UNPRI) which could guide the decision-making processes on investments of Exchange Fund. The six Principles, developed by investors, have 1,821 signatories currently, representing around USD 70 trillion of assets under management (Principles of Responsible Investment, n.d.). The six Principles are as follows:

Principle 1

We will incorporate ESG issues into investment analysis and decision-making processes.

Principle 2

We will be active owners and incorporate ESG issues into our ownership policies and practices.

Principle 3

We will seek appropriate disclosure on ESG issues by the entities in which we invest.

Principle 4

We will promote acceptance and implementation of the principles within the investment industry.

Principle 5

We will work together to enhance our effectiveness in implementing the principles.

Principle 6

We will each report on our activities and progress towards implementing the principles.

7.5.2 External managers should endorse the UNPRI

Apart from aligning its investment decisions with the UNPRI, the HKMA should consider introducing the endorsement of the UNPRI as a major area of assessment for its future Requests for Proposals. This would be a significant step towards sustainable investments for the HKMA as currently the HKMA employs external managers for around 26% of the Exchange Fund's assets (HKMA, 2016).

While the HKMA currently does have its own internal ESG policy, it is not available to the general public. The HKMA should also consider disclosing its ESG policy.

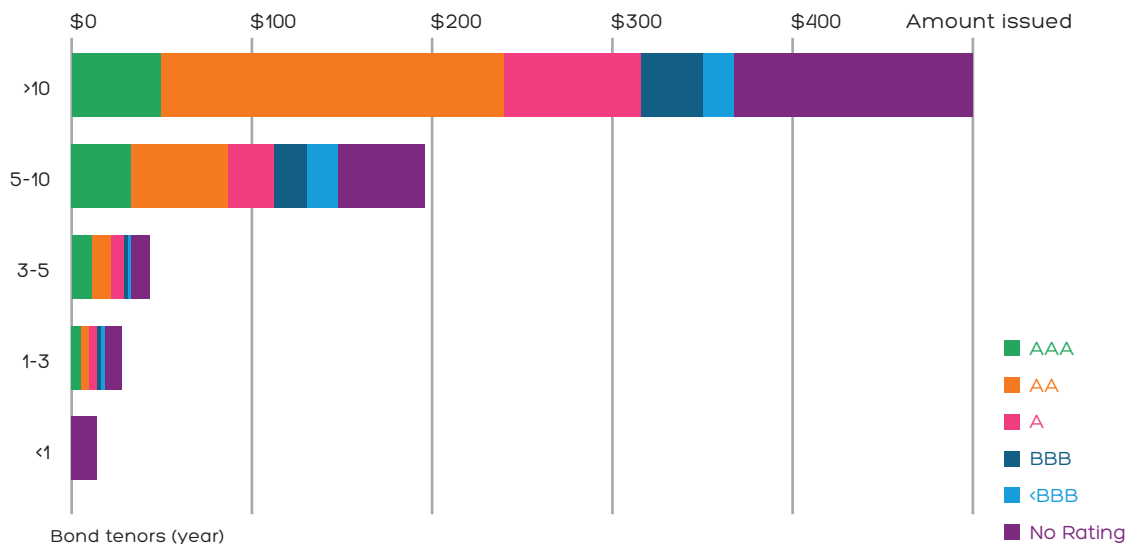
7.5.3 There is room for HKMA to invest in green bonds

To fulfil its primary purpose, the HKMA has established the Backing Portfolio, which consists of liquid USD-denominated assets with high credit qualities, such as US Treasuries, to provide full backing to the Monetary Base with a Backing Ratio between 105% and 112.5%, under Currency Board Operations.

While USD-denominated bonds are commonplaces of the green finance universe, most green bonds are not as liquid as conventional bonds, as well as having generally longer tenor than the liquid assets sought by the Backing Portfolio (Figure 7.5.1) (Climate Bonds Initiative, 2016).

Figure 7.5.1 Tenor of green bonds, 2016 (USD billion)

The majority of bonds have tenors of 10 years or more



Data from Climate Bonds Initiative (2016).

However, having taken the primary purpose and liquidity needs into consideration, we believe the HKMA can specifically be more flexible with its investments decisions on at most 33% of its assets*, part of which can be invested in green bonds.

* Currently, about 52.4% of the Exchange Fund’s liabilities are that of Currency Board Operations, and the Exchange Fund has to maintain enough assets to meet such liabilities based on the Backing Ratio range. Moreover, a majority of placements by Fiscal Reserves and placements by HKSAR Government funds and statutory bodies have maturity of less than 1 year, which account for about 27.8% of the Exchange Fund’s liabilities. Therefore, a total of 80% of the Exchange Fund’s liabilities require assets of higher liquidity for matching purposes, which are estimated to amount to 67% of assets of the Exchange Fund. Hence, the HKMA can be more flexible with investment decisions on the remaining 33% of the Exchange Fund’s assets.

7.5.4 Establish a green credit guideline for banks

Although not directly related to green bonds, the HKMA can also consider establishing a green credit guideline since financing via bank loans is the preference of most corporates in Hong Kong, rather than issuing bonds. The China Banking Regulatory Commission has already issued the Green Credit Guideline in 2012 which focuses on the environmental and social risk in bank lending. Bangladesh, Brazil, Colombia, Indonesia, Kenya, Mexico, Mongolia, Nigeria, Peru, South Africa, Turkey and Vietnam have also launched similar guidelines/policies. The PBC has also issued a report, with United Nations Environment Programme, which outlines the design of the green banking system in China, having incorporated the Equator Principles. The Equator Principles provide an environmental and social risk management framework for financial institutions. Prominent banks in Hong Kong, such as Standard Chartered Bank, Citibank, HSBC and Crédit Agricole, have adopted the principles, which have laid the foundation for the HKMA to issue a green lending guideline for local banks. Moreover, green credit can also encourage companies to pay more attention to environmental issues which in turn facilitates the development of the green bond market.

Furthermore, banks should be incentivized to provide interest discounts on green loans which fulfil the requirements in the green credit guideline.

7.6 Consideration 5:

Encourage the Hong Kong Stock Exchange to be green

A financial exchange provides a secondary market where market participants can freely trade financial instruments. While most bonds are traded OTC, the presence of bond trading at financial exchanges provides market signals of the bond market.

Furthermore, since the development of green bonds, a relatively new asset class, would appreciate greater liquidity

in the secondary markets, green bond trading at financial exchanges would be beneficial to the overall development of green bonds.

The Hong Kong Stock Exchange (SEHK) should be more active in embracing the development of green bonds and three approaches will be proposed in this section.

7.6.1 Promote listing of green bonds under the QGB scheme

The SEHK can first consider listing of green bonds which qualify as QGBs, which has the following three advantages for developing green bond markets:

- Liquidity of the secondary market affects investment decisions in the primary market. Investors in the primary market may demand a higher yield due to the liquidity risk, increasing the financing cost of issuers and potentially collapsing the deal. Listing green bonds which qualify as QGBs provides much higher liquidity in the secondary market and can reduce liquidity risk for investors in the primary market.

- Moreover, pricing in secondary markets is based on demand and supply, which enables market mechanism to adjust bond prices to a more rational level. Pricing of new green bond issues can refer to similar green bonds listed.
- Listing green bonds also provides more sustainable investment options to mainland investors if Southbound Trading of Bond Connect is launched.

In order to encourage issuances at the SEHK, SEHK can consider offering discounts to the listing of bonds which can fall under the requirements for QGBs. This would help lower the cost of listing for issuers of QGBs.

7.6.2 Establish green bond indices

When the number of listed green bonds is sufficient, the SEHK can consider collaborating with index companies to establish green bond indices because of the following reasons:

- Referring to the second advantage in Section 7.6.1, green bond indices can provide references to the public with the prices of the overall green bond market or green bonds in particular sectors. It also enables comparison

between the general prices of green bonds and conventional bonds.

- Green bond indices encourage the development of green bond index funds, index derivatives and tracker funds which allow for more approaches of green bond investment and risk management.

Criteria for inclusion of the green bond indices should be equivalent to that of the QGB scheme.

7.6.3 Participate in the UN's Sustainable Stock Exchanges initiative

The SEHK should consider joining the UN's Sustainable Stock Exchanges (SSE) initiative as a Partner Exchange. As discussed in Section 3.2, most large stock exchanges have already joined the SSE initiative, apart from the SEHK and the Tokyo Stock Exchange.

Not only does it enable SEHK to learn from its peers around the world about sustainability issues, this also demonstrates to other market players and the general public its determination in promoting green finance as a role model in the industry.

7.6.4 Include investment in and issuance of QGBs as one of the aspects under the environmental area of ESG Reporting

Starting from 1 January 2016, listed companies in Hong Kong are required to report annually according to "comply or explain" provisions in ESG Reporting. Unlike previous voluntary reporting, companies have to report

whether they have complied with the provisions, or otherwise, any reason of not complying. The current areas and aspects covered by ESG Reporting are listed in Table 7.6.1.

Table 7.6.1 Current areas and aspects covered by ESG Reporting

Areas	Aspects
Environmental	Emissions
	Use of Resources
	The Environment and Natural Resources
Social	Employment and Labour Practices
	Health and Safety
	Development and Training
	Labour Standards
	Supply Chain Management
	Product Responsibility
	Anti-corruption
	Community Investment

Source: Hong Kong Exchanges and Clearing Limited, 2015

The “comply or explain” provision for each of the above aspects states the general disclosure required, while some of the aspects clearly indicate the required Key Performance Indicators (KPIs), such as Emissions and Use of Resources. Apart from “comply or explain” provisions, there are also recommended disclosures which are not compulsory reporting requirements.

The ESG Reporting requirement essentially compels listed companies to pay attention to their impacts on the environment and the society. We, therefore, suggest including the investment in and issuance of QGBs

in ESG Reporting as an aspect under the environmental area. The “comply or explain” provisions should be composed of the following elements:

1. General disclosures on the investment/issuance strategy of QGBs; and
2. Amount of investment in/issuance of QGBs

The suggested aspect can increase the demand for green bonds which fulfil certain environmental standards. The environmental impacts of the reported information are guaranteed by standards and qualified parties recognized under the QGB scheme.

7.7 Consideration 6: Establish an inter-departmental committee

Compared to other debt instruments, the green bond is different in the sense that it involves selecting green projects to be financed by the issue. This means that expert opinion on environmental issues would be needed to facilitate comprehensive development of the asset class. Under the structure of public administration, this requires inter-departmental collaboration between the ministries for finance and environmental affairs.

At the same time, the public sector alone cannot successfully drive the market development. A significant number of issuers and investors are indeed from the private sector. Therefore, to fully incorporate stakeholder opinions into its decision-making process, the Government should proactively reach out to and communicate with different industry players.

Hence, we hereby suggest the establishment of an inter-departmental committee, the chairman of which must be able to coordinate different bureaus under the Chief Secretary and the Financial Secretary. The most suitable person for the role would then be the Chief Executive - also due to the

high-level collaboration required with the mainland authorities.

A number of our suggestions in previous chapters can only be implemented by the Financial Secretary, the Financial Services and Treasury Bureau and the HKMA. For example, issuance of government green bonds falls under the portfolio of the Financial Secretary.

The Environment Bureau should be involved in providing technical advice on the standards that should be recognized by the Government for the QGB scheme.

In Section 7.4.2, we have discussed the use of green bonds in financing the costs of green government buildings and green public housing projects which are under the management of the Transport and Housing Bureau and the Architectural Services Department.

Lastly, the committee should involve the Central Policy Unit, universities and research institutes in order to provide practical and sustainable long-term advice on the development of green market.

The members of the committee should, therefore, include the following:

1. Chief Secretary for Administration;
2. Financial Secretary;
3. Chief Executive of the Hong Kong Monetary Authority (HKMA);
4. Secretary for Financial Services and the Treasury;
5. Secretary for the Environment;
6. Secretary for Transport and Housing;
7. Director of Architectural Services, Architectural Services Department (ASD);
8. Head of Central Policy Unit;
9. Representatives from Financial Leaders Forum; and
10. Experts from universities and research institutes

7.8 Consideration 7:

Enhance communication with the Chinese Central Government and international promotion

Not only has China become one of the largest countries in terms of annual issuance of green bonds (Section 4.1), the Belt and Road Initiative also presents a huge opportunity for Hong Kong. It is estimated that USD 1.7 trillion per year is needed to maintain Asia's growth momentum until 2030 based on a report recently published by the Asian Development Bank (ADB) (ADB, 2017). The estimate doubles ADB's forecast of USD 75 billion in 2009 mainly due to the inclusion of climate change as a key factor. Combined with the Chinese Central Government's goal of building a "green silk road", there will be a huge green financing gap for the Belt and Road initiative, which provides an unprecedented market for Hong Kong. China is expected to have enormous demand for green capital which has to be financed by issuing green bonds.

At the same time, investors from the EU and the US have long been educated on the importance of environmental sustainability and can relate well to the concept of green financing. The EU and the US are, in fact, pioneers in the development of green bonds. The US is the

largest issuing country in terms of outstanding green bonds while the combined amount issued by France and Germany surpasses that of the US (Figure 4.1.2 in Chapter 4). Among the 1,821 signatories of the UNPRI, 1,103 signatories are from Europe and 343 signatories are from the US. Only 8 signatories are from China. This demonstrates the substantial demand for sustainable investments in the EU and the US.

The Government should, therefore, market the following competitive advantages of Hong Kong in being a global green bond hub which links green bond issues from China and investor communities from the EU and the US:

- Leading offshore RMB center;
- Well-established financial infrastructure for developing green bonds;
- Free flow of capital;
- Cluster of financial institutions;
- Gateway for foreign investors who aim at the Chinese market

Such efforts should include:

- Communication with the Chinese Central Government for issuing long term Chinese government green bonds in Hong Kong;
- Communication with the Chinese Central Government to encourage Chinese firms to issue green bond in Hong Kong;
- Promotion to foreign investors on the opportunities of investing in Chinese green projects via the green market in Hong Kong; and
- Promotion of the opportunities created by Bond Connect. The Southbound Trading should also be launched as soon as possible to offer mainland investors global sustainable investment opportunities.

7.9 Other considerations:

Provide tax incentives for Qualifying Green Bonds (QGBs)

7.9.1 Incentives for issuers

From the perspective of issuers, there is no clear and direct financial advantage in issuing green bonds over conventional bonds. An indirect financial incentive is that green bonds can reach out to a new group of potential green investors and may result in a price advantage, but the margin is not significant.

However, issuing green bonds comes with extra costs. Apart from administrative and labour costs during the issuance process, substantial financial cost is incurred to obtain third party verification. The regular reporting after issuance is another administrative burden to issuers. Apart from resulting in a better corporate image, issuers are not incentivized and will be held back.

One option is to implement super tax deduction for the interest payment of QGBs. Interest expenses on bond obligations can already be deducted by issuers for tax currently and the suggested super tax deduction refers to tax deduction which exceeds the amount of the expense item. A similar, but not identical, approach is employed by US's Qualified Energy Conservation Bonds (QEGBs) program in which interest payments of green bond issuers are subsidized. While there has been no application in green bonds yet, there is super tax deduction for research and development (R&D) expenditure in China and Singapore, which both offer 150% tax deduction for certain R&D expenses (State Administration of Taxation of P.R. China, 2015; EY, 2017).

7.9.2 Incentives for investors

Profits tax is generally chargeable on all kinds of profits unless they are capital in nature. In terms of bond investments, it can be chargeable on interest income and/or trading profits. The tax rate is currently 16.5% for

corporations or 15% for unincorporated businesses.

As Hong Kong adopts a territorial principle of taxation (i.e. only profits sourced from Hong Kong are taxable),

only interest income derived from Hong Kong is taxable. For non-financial institutions, in order to determine the source of interest income, the “provision of credit” test is normally employed, i.e. the source of the income is the place where the funds from which interest is derived were lent to the borrower - or in the case of bonds, the source is normally the place where the bonds were issued. In other words, only interest income from bonds issued in Hong Kong is taxable. The determination of source of interest income for financial institutions will be discussed in Appendix I.

Even though the interest income is derived in Hong Kong, taxability of interest income depends further on whether the receipt of interest income constitutes the carrying on of a business in Hong Kong. If such interest income is indeed derived from a local business, it is then subject to profits tax. Whether it arises from the carrying on of a business has to be determined by the circumstances of each case.

Whether the trading profits are taxable mainly hinges on the location where the bonds which the profits are derived from are traded. For non-financial institutions, only profits from bonds that are traded in Hong Kong are taxable. For the derived trading profits to be taxed, the location of

the stock exchange where the listed bonds are traded or the location where the contracts of purchase and sale of unlisted bonds effected must be in Hong Kong. The tax treatment for financial institutions will be discussed in Appendix I.

There are a number of special treatments which can exempt bond investors from taxes. For example, mutual funds which are “collective investment schemes” are exempted from profits tax, and bonds under the Qualifying Debt Instrument (QDI) scheme can be fully exempted from profits tax if the tenor is 7 years or more (50% exempted if shorter than 7 years). These special treatments are outlined in Appendix I.

Although Hong Kong has already provided certain exemptions for bond investors, the Government can further eliminate the tax burden for green bonds with a tax exemption scheme for QGBs. For all QGBs, profits tax on both trading profits and interest income should be exempted. This will attract more institutional investors to invest in the asset class.

About Our Hong Kong Foundation

Our Hong Kong Foundation (OHKF) is a Hong Kong non-profit organization registered in September 2014, with a mission to promote the long-term and overall interests of Hong Kong through public policy research, analysis and recommendation. Pooling together local, mainland and international talent, the Foundation studies Hong Kong's development needs, offering multidisciplinary public policy recommendations and solutions to foster social cohesion, economic prosperity and sustainable development.

Disclaimer

This report is provided for information purposes only. It is not a complete analysis of every material fact with respect of any industry or economy. Statements of fact have been obtained from sources considered reliable but no representation is made by Our Hong Kong Foundation or any of its affiliates as to their completeness or accuracy. All estimates, opinions and recommendations expressed herein constitute judgements as of the date of this report. Our Hong Kong Foundation accepts no liability whatsoever for any direct or consequential loss arising from the use of this report or its content. This report should not be relied upon in connection with any contract or commitment whatsoever.

