

Catalysing green bonds in ASEAN+3 countries to mobilise finance for energy market transformation

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1. Introduction

The Paris Agreement brought together developed and developing countries in a common attempt to keep global average temperature rise well below 2°C above pre-industrial levels (and strengthening this limitation to 1.5°C) by the end of the century. As a primary source of production, energy is one of the central pillars of achieving these temperature goals. Additionally, energy efficiency is a critical measure to make a contribution to the transition towards low-carbon and climate resilient economies. Enabling energy markets to support the shift towards a sustainable energy paradigm is therefore essential.

Nowadays, traditional oil and gas energy industries are facing multiples challenges. From rising competitiveness of renewable energies thanks to lower upfront costs, to an increased engagement of institutional investors in climate change policies and subsequent rising concerns over the sustainability profile of conventional energy companies' business models, the traditional energy sector is currently under pressure. Furthermore, the global energy demand is expected to grow by 30% in the next twenty years and, as a consequence, an annual investment of USD 2.7 trillion in energy supply and energy efficiency to 2040 will be required to meet the increased demand for energy (Biro1, 2016). Building sustainable energy infrastructure required for a 2°C scenario is also expected to cost around USD 25 trillion over the coming 15 years (NCE, 2016). The urgency to tap new sources of capital to live up with the ambitious goal of transforming energy markets therefore has never been so clear.

Southeast Asia energy demand, which increased by 60% in the past fifteen years, is expected to further rise by two-thirds over the next twenty years, thus accounting for one-tenth of global energy demand by 2040 (IEA, 2017). The investments needed to meet a growing energy demand in the ASEAN region will call for the mobilisation of both the public and the private sector. In Southeast Asia, while the banking sector has traditionally played the major financing role, stricter capital adequacy requirements and maturity mismatches may have constrained lending. It is therefore imperative to explore new and innovative financial instruments to engage the private sector and consequently expand the investment base. Capital markets can complement bank financing and provide an alternative intermediation mechanism between investors and project developers for climate and SDG aligned projects.

Green bonds are a debt capital market instrument to connect investors seeking impact investments to projects in emerging countries. Currently accounting for USD 160.8 billion compared to USD 92 billion of total issuance last year, the global green bond market is set to grow. Present trends show increasing issuance as well as the emergence of a variety of market participants, many of them from developing countries, with China and India taking the lead (CBI, 2017a). Out of USD 160.8 billion, more than 60% (approximately USD 100 billion) of green bonds went to energy-related investments including USD 51 billion (31%) for renewable energy and USD 45 billion (29%) for low-carbon buildings and energy efficiency (CBI, 2018a).

Although still relatively quiet, the market for green bonds in Southeast Asia is also reporting some activity. The recently released ASEAN Green Bond Standards (ASEAN GBS) and the sovereign issuance by the Government of Indonesia and several corporate issuances are clear steps towards the development of a rich and dynamic regional green bond market.

Given the potential of green bonds to contribute to the transition towards sustainable energy markets, this paper aims to conduct a survey of the use of green bonds for enabling energy market transformation in ASEAN+3 countries and therefore bring about best practices or recommendations that could help developing countries, in particular in the ASEAN region, to take advantage of the green bond market to address challenges of energy transformation.

2. Methods

As a starting point, we conducted a survey aiming at collecting and synthesizing information on green bonds, in order to understand their relevance as a financial instrument to raise low-cost capital for green projects in the ASEAN+3 region. Our survey examined a diversity of documents, from various guidelines for green bonds (including the Green Bonds Principles, the Climate Bonds Standards, ASEAN Green Bond Standards, China's green bond related regulations and guidelines, and Japan's Green Bond Guidelines 2017), to reports from international financial institutions and organisations. We then proceeded to stakeholder mapping in selected ASEAN+3 countries (Malaysia, Singapore,

Cambodia, Lao PDR, Thailand, Viet Nam, China, Japan, and Korea). Exploring the landscape of national stakeholders led us to conduct in-depth analysis of national policy frameworks for green growth and, where relevant, the guidelines for green bonds. Based on stakeholder mapping, we successfully conducted interviews with major stakeholders in the green bond market.

The ultimate goal of our project is to identify regional stakeholders that may be interested in engaging in green bonds activities but lack knowledge or capacity. We are focusing on the following four types of stakeholders:

- **Issuers:** We will identify interested institutions in ASEAN developing capital market and in the mature market to transfer knowledge on green bonds and offer tailored one-on-one structural advisory support for exemplary green bond issuances.
- **Policymakers and regulators:** We will support the adaptation and enhancement of a regulatory framework by advising on international standards while considering country-specific conditions.
- **Investors:** We will provide in-depth knowledge and tailored advice on the risks and opportunities offered by green bonds as an asset class for investment.
- **Domestic Second Party Opinion providers:** We aim to enable domestic institutions to deliver second opinions based on international best practices to ensure environmental integrity.

3. Status of green bond development

3.1 Green bond development in 2017

The global green bond market is showing encouraging signs of growth, led in part by increased issuances coming from emerging economies, namely China and India, as well as new issuances in the ASEAN region. Global issuance of labelled green bonds reached USD 160.8 billion, showing year-on-year growth of 80% from 2016 (CBI, 2018b). A major portion of 2017 issuances have come from financial corporates, and the trend has been one of sustained growth from 2013 onwards (Fig. 1). Importantly, 146 issuers made their debut this year indicating that the market is attracting a larger and wider issuer base each year.

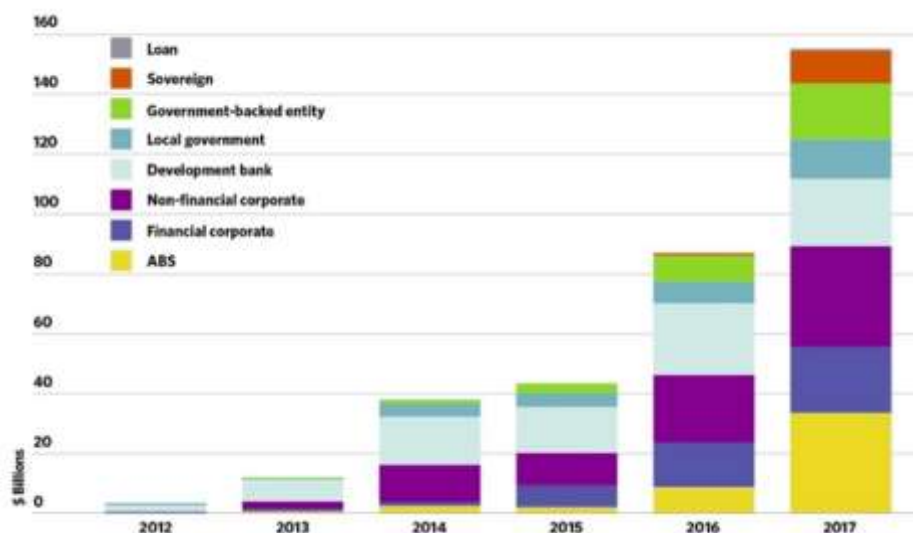


Fig. 1. The growing labelled green bond market

Source: CBI, 2018a

Global green bond issuance has continued to grow in 2017 and while this growth was definitively led by the United States, with over USD 40 billion in green issuance, emerging markets also form a significant portion of global issuance. In fact, China, together with the United States and France, accounted for approximately 56% of 2017 issuance. Additionally, Indian issuers more than doubled their volumes to reach USD 4.3 billion, which enabled the country to break into the Top 10 issuers of 2017.

Fiji, in 2017, became the first developing country to issue a sovereign green bond and demonstrated that green capital markets can be created in developing economies, and that all countries, regardless of the size of their economy, can access green finance opportunities. The year closed on a positive note with another new entrant to the market, namely Nigeria, becoming the first African nation to issue a sovereign green bond, which was also the first Certified Climate

Bond by a sovereign. Indonesia issued a green sukuk in March, 2018 and became the first Asian countries that issued a sovereign green bond.

Investments in energy-related areas continue to be the most common use of proceeds (Fig. 2). Although the share of renewable investments dropped in 2017 compared to 2016, renewable investments amounted to USD 51 billion, accounting for 33% of total use of proceeds in 2017. In contrast, the allocations to low-carbon buildings and energy efficiency rose 2.4 times year-on-year and reached to USD 45 billion (accounting for 29% of the total) in 2017.

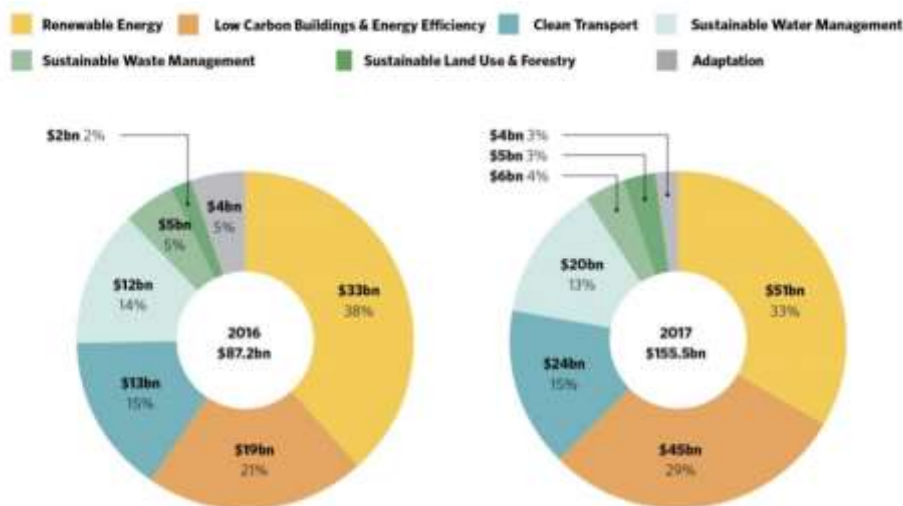


Fig. 2. The use of proceeds

Source: CBI, 2018a

3.2 Green bond development in ASEAN

The growth of green bonds is promising in ASEAN. The ASEAN Capital Markets Forum (ACMF), a forum which comprises capital market regulators from 10 ASEAN jurisdictions¹, released the ASEAN Green Bond Standards (ASEAN GBS) in November, 2017—a critical move to make green bond issuances more harmonised in ASEAN. The release of ASEAN GBS will enhance the transparency for issuers of green bonds and provide guidance on the use and management of proceeds as well as processes for project evaluation, selection, and reporting. Fully aligned with the Green Bond Principles (GBP), the additional features of the ASEAN GBS include (ACMF, 2017):

1. **Eligible issuers**—the issuer must be an ASEAN entity or alternatively, green projects must be located in any of the ASEAN countries in the case of a non-ASEAN issuer. Additionally, the green bond issuance must be listed on any of the ASEAN capital markets.
2. **Ineligible projects**—fossil fuel power generation projects are excluded to mitigate green washing of projects and protect the ASEAN Green Bonds label.
3. **Continuous accessibility to information**—upon request by investors, the issuer is required to disclose information on the use and management of proceeds as well as the process for project evaluation and selection. Such information should be available not only in the issuance documentation, but also on a website designated by the issuer throughout the tenure of the green bond.
4. **Encouragement of more frequent reporting**—issuers are encouraged to provide more frequent periodic reporting—in addition to annual reporting—to increase transparency and enhance investor confidence in ASEAN green bonds.
5. **External review**—although the appointment of an external review is voluntary which is in line with the GBPs, the external reviewer must have relevant expertise in the area of review and their credentials and scope of review must be made publicly accessible from a website designated by the issuer during the tenure of the green bond.

As of 30 April, 2018, a handful of ASEAN entities issued green and SDG-aligned bonds (Appendix 1). The sovereign green bond issued by Indonesia and green bonds issued by four corporates aligned their green bond frameworks with ASEAN GBS. Financial institutions are yet to issue green bonds in line with ASEAN GBS.

¹ 10 ASEAN jurisdictions are Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam.

3.3 Green bond development in China

3.3.1 The Chinese green bond market

After a record-breaking year for the Chinese green bond market in 2016, China carried on the momentum in 2017 with a 4.5% increase in total green bond issuance year-on-year from 2016. In 2017, China issued 123 green bonds, amounting to USD 36.4 billion in total, of which 62% were aligned with international definitions of green (CBI, 2018c).

1. China firsts in 2017

China recorded several “firsts” in 2017, including the first certified climate bond (i.e., China Three Gorges Group’s offshore bond amounting to EUR 650 million for two wind power projects in Germany and Portugal), the first green retail bond (i.e., China Development Bank’s bond to finance water resources protection along the Yangtze River Economic Zone, which was sold to individual investors and non-financial institutional investors over the counter), and the first green bond issued through the Bond Connect Scheme, which is a convenient channel for foreign investors to invest in China’s onshore market by removing certain investment hurdles (CBI, 2018c). Agricultural Development Bank’s RMB 3 billion (USD 450 million) green bond used the Bond Connect Scheme to enable foreign investors to make requests-for-quote via an electronic trading platform and was oversubscribed by 4.38 times (CBI, 2018c).

2. Chinese green bonds aligned with international standards

Another major takeaway from the Chinese market in 2017 is that Chinese issuers are already moving ahead in exploring and benefiting from green capital markets, and more importantly aligning frameworks with international definitions. To illustrate, in addition to the 62% international standard aligned bonds issued by China, USD 6.1 billion of issuance was Climate Bonds Certified. Specifically, in October of 2017, the Industrial and Commercial Bank of China (ICBC) issued its first green bond to support projects in domestic provinces and foreign countries which are key to China’s One Belt One Road (OBOR) initiative. This is an important issuance because it was the inaugural green bond issuance from ICBC, the world’s largest bank. It additionally marks the biggest single tranche in EUR-denominated green bonds by a Chinese issuer and is certified by the Climate Bonds Initiative (CBI) indicating adherence to best-in-class international and local standards. The issuance of this CBI certified and verified bond by the largest bank is a clarion call for the rest of the world to follow.

3. Offshore issuances

Indeed, 2017 saw five offshore green bond issuances, which reached USD 6.6 billion and accounted for 18% of the total issuances from Chinese issuers. Offshore issuance helps issuers to attract international investors and raise funding overseas. It seems that European investors are the favourites for Chinese issuers, as most Chinese offshore green bonds were listed in European stock exchanges (i.e., Luxembourg, Frankfurt, Dublin, and Euronext); and 69% of offshore issuances was denominated in EUR, 28% was in USD, and 3% in other currencies (CBI, 2018c). It is also encouraging to see that 4 out of 5 offshore green bonds were CBI certified. CBI certified climate bonds amounted to USD 6.1 billion, accounting for 98% of the total offshore green bonds from Chinese issuers in 2017. These include China Three Gorges (EUR 650 million; issued on 21 June, 2017); ICBC (3 tranches: USD 450 million, USD 400 million, EUR 1.1 billion; issued on 12 October, 2017); China Development Bank (2 tranches: EUR 1 billion, USD 500 million; issued on 16 November, 2017); and Bank of China (3 tranches: USD 500 million, RMB 1 billion, EUR 700 million; issued on 22 November, 2017).

4. Issuance from sub-national levels

Chinese commercial banks have emerged as major players in green bond issuance, in both onshore and offshore markets. A total of 25 Chinese commercial banks and non-bank financial institutions (FIs) issued 44 green bonds, which amounted to the total volume of USD 20 billion and accounted for 55% of China’s green bond volume in 2017. City-level commercial banks were the driving force of the growth of the Chinese green bond market. A surge of city-level commercial banks tapped into the market in 2017.

The increasing number of green bonds issued by financial vehicles set up by local governments is another emerging trend in 2017. Such financial vehicles usually serve as special purpose entities to finance infrastructure projects and made up 10% of total China’s green bond issuance in 2017 (compared to less than 1% in 2016). The largest green theme financed by local government’s financial vehicles is low-carbon transportation, followed by adaptation themes such as water infrastructure and flood control.

5. Green bond indices

Finally, a broad range of green and SDG-aligned bond indices, which make it easier for investors to track financial performance of green bonds and compare returns and volatility with other investments, are appearing in China. Five indices—established by bond market custodians, stock exchanges, and international organisations—have been launched

to provide greater transparency and facilitate access to China's green bond market for both domestic and international investors. For example, the SSE Green Corporate Bond Index—a cooperation between Shanghai Stock Exchange (SSE) and Luxemburg Stock Exchange (LuxSE)—is displayed on both exchanges' websites for investors in Europe interested in Chinese green securities.

3.3.2 Regulations, guidelines, standards, and policies in China

The surge in Chinese issuance over the last two years has at its foundation a strong regulation base. This base was established with the guidelines released by the People's Bank of China (PBoC) at the end of 2015 for green bond issuance in the China interbank market, which provided guidance for financial institutions on how to issue a green bond. This was followed by a slew of policy developments to promote green bonds from state-own enterprises during 2016. The policy momentum continued in 2017, with the release of notable guidelines for issuances by Chinese listed companies by China Securities Regulatory Commission (CSRC), and guidelines for verifiers by PBoC and CSRC. China's green bond-related regulations, guidelines, standards, and policies are summarised in Appendix 2.

The gap between Chinese green bond standards and international standards lies in differences in terms of project eligibility and use of proceeds. For domestic investors, projects such as retrofits of fossil fuel power stations, clean coal and coal efficiency improvements, electricity grid transmission infrastructure that carries fossil fuel energy, and large new hydro power projects would continue to be considered eligible green projects in China; however, this is not the case for international investors. Furthermore, National Development and Reform Commission (NDRC)² guidelines allow issuers to use up to 50% of proceeds to repay bank loans or finance working capital and still be considered green, while internationally the threshold—for example labelled green bonds aligned with CBI definitions—is set at 5% of proceeds.

China is already working towards harmonising their local green bond standards with international standards. To drive the desired shift towards harmonised green bond standards, the Chinese Finance Committee, with the support of PBoC and the European Investment Bank (EIB) launched a White Paper in 2017 comparing several green bond standards. Indeed, more than 60% (amounting to USD 22.9 billion) of Chinese issuance in 2017 excluded coal and certain large-scale hydro power projects, and was aligned to international green bond standards indicating an increasing inclination in the market for international definition green bonds.

3.3.3 Deep dive—ICBC's Luxembourg issuance

The game changer for green infrastructure financing in the region came when the Chinese government decided to promote green development along with the OBOR initiative. China's OBOR initiative, covering 69 countries and territories across Asia, Africa, and Europe, is a major infrastructure and economic development programme in countries along the Silk Road Economic Belt and the Maritime Silk Road. The Chinese government has committed over RMB 800 billion (USD 126 billion) to OBOR-related investments in the coming years. In 2017, the government published the Guidance on Promoting Green Belt and Road, which emphasises the need for OBOR investments in low-carbon and climate resilient infrastructure to protect the ecosystem and reduce negative environmental risks of infrastructure projects (GFI, 2017). The scale of the initiative and the planned shift away from initial investments of more traditional infrastructure projects like gas or coal power plants at that scale marks a significant opportunity for the development of green finance in China. The ICBC issuance is the first green bond dedicated to financing green development in line with the OBOR initiative.

ICBC issued its first certified climate bond for USD2.15 billion listed on the Luxembourg Green Exchange. The best-in-class assurance features and a green bond framework in alignment with latest Chinese and international green bond standards evidently attracted investors. All three tranches of ICBC's Luxembourg issuance were oversubscribed and ICBC was able to successfully diversify the investor base to bring in not only ESG investors but also sovereign funds, insurance companies, and cooperate investors.

Moreover, the ICBC green bond is certified by CBI, has a second opinion from CICERO with a "dark green" rating, and a verification reporting from Beijing Zhongcai Green Financing Consultant Corporation acting as Climate Bonds approved verifier. In addition to these strong international credentials, the ICBC green bond also commits to reporting and verifying use of proceeds on an annual basis. The Chinese green finance market is only in its early stages, and the ICBC issuance sets an example for the rest of the world to follow. The factsheet (Box 1) gives further details on this issuance.

² NDRC was integrated into the newly established Ministry of Ecology and Environment in March, 2018.

Box 1. Fact sheet—ICBC’s Luxemburg Issuance

Source: Synthesis by the author from various online sources

The issuer	General information	ICBC is the world’s biggest bank and is also the world’s biggest listed company.				
	Moody’s rating	A1				
	Green credential	ICBC has integrated green financing in its long-term strategy. Over the years, ICBC has become the largest underwriter of green bonds in China and one of the largest lenders in the green economy. In addition, the Bank promotes responsible banking while advancing China’s OBOR Initiative.				
	ESG portfolio	By the end of 2016, ICBC saw a lending balance of RMB 978.6 billion to energy-saving, environmental-friendly projects and services, taking 14.2% in all corporate lending, with a growth of 6.8 percentage points higher than the overall growth of lending to corporates in China.				
Key actors	Global coordinators	Bank of America, Credit Agricole CIB, HSBC and ICBC (Asia)				
	Structuring advisors	Credit Agricole CIB and HSBC				
	Underwriters	BNP Paribas, Citi ICBC International, ICBC, Standard Chartered, SEB, SG CIB and UBS				
	Second opinion provider	The Center for Climate and Environmental Research, Oslo (CICERO)				
	Pre-issuance verifier	Beijing Zhongcai Green Financing Consultant Ltd.				
Green Bond Framework	ICBC adapted best-in-class practices in structuring its green bond framework, in alignment with the latest international and Chinese standards.					
External reviews	This issuance is the first Chinese one that received “dark green” shading for its green bond framework by CICERO. The Climate Bonds Initiative certified this bond as climate bond.					
Listed place	LuxSE’s Euro MTF market and on the Luxembourg Green Exchange					
Issuance date	30 October, 2017					
Total amount	USD 2.15 billion equivalent					
Tranches	<p><u>First tranche:</u> USD 450 million, a three-year floating rate note priced at par with a coupon of 77bp over three-month Libor;</p> <p><u>Second tranche:</u> USD 400 million, a five-year fixed rate note with a coupon of 2.875%;</p> <p><u>Third tranche:</u> EUR 1.1 billion, a three-year floating rate note priced at par with a coupon of 55bp over three month Euribor.</p>					
Subscription	<p><u>First tranche:</u> Oversubscribed at 1.46x, attracting an order book of USD 660 million from over 47 accounts;</p> <p><u>Second tranche:</u> Oversubscribed at 1.525x, attracting an order book of USD 610 million from over 32 accounts;</p> <p><u>Third tranche:</u> Oversubscribed at 1.63x, attracting an order book of Euro 1.8 billion from 82 accounts</p>					
Investor geographic composition (%)	Tranche	European investor		Asian investor		
	First	74		26		
	Second	16		84		
	Third	71		29		
Investor institutional composition (%)	Institution					
	Tranche	Bank	Fund manager	Corporate	Sovereign wealth fund	Insurance
	First	36	27	17	14	6
	Second	83	14	3		
Third	26	56	8	7	3	
Use of proceeds	Green projects following the OBOR Initiative in China’s domestic provinces and in foreign countries key to the OBOR Initiative.					
Eligible categories	Proceeds will finance and refinance projects linked to renewable energy, low-carbon and low emission transportation, energy efficiency, and sustainable water and wastewater management.					

3.4 Green bond development in Japan

3.4.1 Japanese issuers

Since the inaugural green bond issuance by the Development Bank of Japan (DBJ) in 2014, fewer than 10 Japanese issuers have issued green bonds. In 2017, issuances from Japanese issuers amounted to a total of USD 2.6 billion (in both onshore and offshore markets), which is less than a tenth of the amount issued by Chinese issuers. The slow takeoff of the Japanese market is attributed to the scarcity of eligible environmental projects in Japan as well as the cumbersome procedures of green verification and certification (Onishi et al., 2018). In addition to pure green bonds, DBJ issued three sustainable bonds with a focus on corporate social responsibilities while including certain green elements; and Japan International Cooperation Agency issued one social bond. Appendix 3 summarises green and SDG-aligned bond issuances from Japanese issuers as of 30 April, 2018.

3.4.2 Japanese investors

Contrary to the sluggishness at the issuer side, Japanese investors are eager to take part. Japan's Government Pension Investment Fund (GPIF), the world's largest pension fund with USD 1.3 trillion under management, announced that it had selected three environmental, social, and governance (ESG) indices—two broad indices covering all of the ESG factors, and one thematic index focusing on the gender diversity among social factors—to track for around JPY 1 trillion (USD 9 billion) in Japanese equity investment (GPIF, 2017).

Additionally, life insurance companies are leading the Japanese market for ESG-themed bonds. Nippon Life Insurance, Japan's largest life insurer, has plans to buy up to JPY 200 billion (USD 1.8 billion) of green and ethical bonds in fiscal years 2017 to 2020 (Onishi et al., 2018). Meiji Yasuda has expanded its target for sustainability investments and loans from JPY 400 billion to JPY 500 billion (USD 4.5 billion) (Okamoto, 2017); and Japan Post Insurance purchased World Bank's first Shogun green bond, a Japanese domestic bond denominated in US dollars amounting to USD 100 million (World Bank, 2016).

Similar to the green appetite of institutional investors, Japanese retail investors have a genuine interest in being environmentally friendly, which makes green themed products a perfect “selling hook” for retail bond salesmen (Bell, 2017). Indeed, it was environmentally-themed Uridashi bonds (non-JPY denominated bonds sold directly to Japanese individual investors) that kicked off Japan's green bond market and have invigorated the domestic market, making it clear that there is a strong investor demand for Japanese green bonds (Kidney, 2011).

The huge investor demand can be the catalyst to kick-start the growth of Japan's green bond market. However, considering that Japan is already environmentally friendly and its small geographical size limits the country's potential for large-scale solar and wind projects, it is the building sector and the property market that are foreseen to have the most potential source of green investment projects.

3.4.3 Japan's Green Bond Guidelines

In addition to the push from the investor side, the release of Japan's Green Bond Guidelines in March 2017 by the Ministry of the Environment (MOEJ) is another catalyst for a breakout of Japanese green bonds. Since most of the Second Party Opinion providers are not Japanese, the language barrier—in addition to the extra work to justify green credentials—is considered to be an obstacle for many domestic issuers (Bell, 2017).

Japan's Green Bond Guidelines are in line with ICMA's GBPs. Key features of the Japanese version include: (1) the balance between securing credibility of green characteristics and reducing issuers' costs and administrative burdens; and (2) the use of different wordings—“should”, “recommended”, and “to be considered”—to indicate the level of consistency with international standards; and (3) the use of examples and diagrams to enhance practicality of the Guidelines. Specifically,

- **To prevent green washing:** Issuers should include information regarding negative impacts (i.e., how they are assessed, what the issuers do to curb them) to investors, in cases where Green Projects have incidental negative environmental impacts along with the alleged environmental benefits. The disclosure of potential negative impacts is a unique requirement of Japan's Guidelines and has not been seen in standards and guidelines published by other countries or regions.
- **To align with international standards** (MOEJ, 2017):
 - The Guidelines use the term “should” to describe those elements that would be labelled as green bonds according to internationally standards.

- The Guidelines use the word “recommend” to describe those elements which bonds labelled as “green” are considered to be better to have, although it is still acceptable that a bond which does not have these elements is labelled as “green”.
- The Guidelines use the phrase “to be considered” as the examples of possible approaches and interpretations related to green bonds.
- In practice, Second Party Opinion providers have assessed the alignment between issuers’ green bond frameworks and the “should” items outlined in the Guidelines (Sustainalytics, 2017a, 2017b, 2018).
- **To enhance practicality:** The Guidelines use examples of use of proceeds, examples of model cases, and examples of checklists, with an attachment of illustration diagrams, to help readers consider and visualise approaches.

However, one criticism of Japan’s Guidelines is the lack of explicit language to exclude fossil fuel power generation projects, as what is described in ASEAN GBS. It is arguable that fossil fuel projects do not exist in the examples of eligible projects in Japan’s Guidelines, which indicates—in an implicit way—that such projects are not eligible. Nevertheless, adding a list of ineligible criteria—such as upgrades to coal-fired power stations including clean coal; large hydropower electricity generation; and bonds with more than 5% of proceeds allocated to general corporate purposes rather than disclosed green assets—will greatly enhance the credibility of Japan’s Guidelines.

3.5 Green bond development in Korea

Korea’s green bond market is tiny. As of 30 April, 2018, only 4 Korean issuers issued 7 times, with a total issuance of USD 2 billion in green bonds. These include the inaugural issuance of USD 500 million from Korea Export-Import Bank (KEXIM) in 2013 to finance renewable energy, water management, energy efficient lighting, and CDM related projects; followed by another 3 issuances from KEXIM at values of USD 400 million in February 2016, USD 300 million in July 2017, and INR 3.1 billion (USD 49 million) in August 2017, respectively.

Additionally, Hyundai Capital Services, the subsidiary of Hyundai Motor Company, issued a USD 500 million green bond to finance a range of Hyundai and Kia hybrids and electric vehicles in March, 2016. Korea Development Bank debuted in the green bond market with a deal of USD 300 million in July 2017 to finance renewable energy (solar, wind, and biomass). Hanjin International, a new Korean issuer, issued a USD 300 million bond to refinance the costs associated with a LEED Gold building in September 2017. Although the building is located in the United States, Hanjin International is a Korean entity and the bond was guaranteed by KEXIM (CBI, 2018d).

Korea is a very late-comer to the green bond market, considering the size of Korea’s capital market, its strong investor base, the variety of supportive climate and SDG-related policies, and the availability of robust project pipeline. Specifically, Korea has a large and well-functioning capital market, with the proportion of bond issuance in GDP standing at 105.7% in 2013. Korea’s domestic investor base is also big and has pension funds managing assets in excess of USD 400 billion (Wang, 2014). Korea’s climate and SDG-aligned policies are all in place and it was the first Asian country to implement a national-wide emissions trading scheme. Finally, Korea is fully industrialised and has a strong issuer base in areas such as electric vehicles, LED lighting, energy efficient products, and renewable energy. Although the Korean market is set to blossom, key barriers to growth may be attributed to the lack of market awareness on the issuer and investor sides, the lack of guidelines and standards to alleviate market confusion, and the language barrier and additional cost associated with verifying green credentials (CBI, 2018d).

4. Discussion

4.1 Various approaches to market growth

The rapid growth of green bond markets in ASEAN+3 countries benefits from the adoption of various approaches that fit in with each country’s national priorities and match with the status and capacity of each capital market. These include the regulatory approach of China, the voluntary approach of Japan and ASEAN, and the incentive approach of Malaysia and Singapore.

1. Regulation

Regulation has played a crucial role in sparking the Chinese green bond market. The official launch of China’s domestic green bond market was marked by the regulatory developments in late 2015 when PBoC released guidance on how financial institutions (FIs) can issue green bonds, together with the publication of the Green Bond Endorsed Project

Catalogue 2015. PBoC regulates FIs—both Chinese FIs (i.e., development banks, policy banks, commercial banks, and other FIs) and international FIs which wish to issue RMB denominated bonds in China. PBoC’s green bond guidance quickly built up momentum and made 2016 a record-breaking year for China—Chinese issuances accounted for approximately 45% of global issuances in 2016 (CBI, 2017b).

Following PBoC, various Chinese regulatory authorities have released policies and guidance targeting different types of issuers (Appendix 2). These include NDRC’s Guidance for State-Owned-Enterprises in January 2016; Shanghai Stock Exchange and Shenzhen Stock Exchange’s Notice for corporates with listed equity in March 2016; a joint release in August 2016 by PBoC, Ministry of Finance, NDRC, Ministry of Environmental Protection, China Banking Regulatory Commission (CBRC), CSRC, and China Insurance Regulatory Commission (CIRC) on 35 measures to push the development of a green financial system in China; CSRC’s updated Guidance for supporting green bond development in March 2017; and finally, the Guidelines for non-financial enterprises published by the National Association of Financial Market Institutional Investors (NAFMII) in March 2017.

After focusing on regulations on the issuer side, China has initiated regulations for other market players. In December 2017, PBoC and CSRC jointly released the Green Bond Assessment and Verification Guidelines, a set of guidelines for green bond verifiers and verification activities in China (PBoC & CSRC, 2017). Additionally, China is in the process of setting up a new Green Bonds Standard Committee, which will supervise green bond verifiers and their verification activities, including the required qualification and credentials, verification methods, and reporting requirements. Green bond verifiers will have to undertake both pre-issuance verification and post-issuance tracking under this new set of Guidelines.

2. Guidelines and Standards

In contrast, a voluntary approach of publishing guidelines and standards has been adopted by Japan and ASEAN. In March 2017, Japan’s MOEJ published a set of green bond Guidelines that are legally non-binding and impose no legal penalties. The Guidelines with illustrative examples of specific approaches and interpretations tailored to Japan’s bond market aim to catch up with other countries in terms of green bond issuances, hence encouraging investments in particular those from private funds to take environmental considerations into the decision-making process and helping to achieve international goals including the temperature goals of the Paris Agreement and the conservation goals of protecting oceanic and terrestrial ecosystems stipulated in UN’s 2030 Agenda for Sustainable Development.

Additionally, ASEAN GBS, released by ACMF in November 2017, seek to promote greater integration and connectivity of regional capital markets and enhance consistency and uniformity of green bond issuances in ASEAN. In line with GBPs, ASEAN GBS give voluntary guidance elaborated by capital market regulators from ASEAN Member States under the coordination of ACMF as its secretariat and provide specific guidance on how GBPs are to be applied across ASEAN in order for green bonds to be labelled as ASEAN green bonds. Although the lack of guidelines in general does not prevent the market from developing, it has been seen in the Japanese case and the ASEAN case that Guidelines and Standards have improved the architecture of the domestic markets and have enabled the markets to move at a scale to reach out to a wider range of participants.

3. Incentives

Complementarily, Malaysia and Singapore have put together a number of incentives to spur the market growth. The Securities Commission of Malaysia has allowed tax deduction on costs related to issuing green sukuk; tax incentives for deploying green technologies in energy, transportation, building, waste management and supporting services activities; and financial incentives under the Green Technology Financing Scheme with a total allocation of MYR 5 billion (USD 1.2 billion) until 2022 (SCM, 2017).

The Monetary Authority of Singapore (MAS) launched the Green Bond Grant Scheme to cover 100% of the cost of verifying green bonds for qualifying issuances, up to SGD 100,000 (USD 73,400) per issuance (Hui, 2017). Qualifying criteria include that the bond has to be issued and listed in Singapore and has a minimum size of SGD 200 million and a tenure of at least three years. Although the bond can be denominated in any currency and the issuer can come from any country, the issuer must hire a verifier who is based in Singapore or has business in Singapore under the grant scheme.

Furthermore, tools for credit enhancement—such as guarantee facilities—are available to help issuers boost their bond ratings to investment grade level. Sindicatum Renewables, a Singapore-based renewable energy developer, used GuarantCo Ltd, a private infrastructure development group company, to provide an unconditional and irrevocable guarantee to cover 100% of the principal and interest of its recent Indian Rupee denominated green bond (GuarantCo, 2018). GuanratCo’s guarantee ensured that Sindicatum Renewables is not exposed to currency risk and the resulting A1

rating by Moody's and AA- by Fitch made Sindicatum's green bond feasible for institutional investors who are generally mandated to mainly invest in investment-grade bonds.

Additionally, the Credit Guarantee and Investment Facility (CGIF)—a guarantee facility established and funded by ASEAN+3 countries and ADB—provides guarantees for local currency denominated bonds and is keen to assist issuers of green and social themed bonds to tap local bond markets to secure longer-term financing and reduce their dependency on short-term foreign currency borrowing to mitigate currency and maturity mismatches. CGIF provided credit enhancement to AP Renewables, a Philippines based renewable power company operating geothermal plants, for the issuance of its inaugural green bond at PHP 10.7 bn (USD 225 million), which is also the first Climate Bonds Certified bond from Asia and the Pacific in 2016 (Kidney, 2016).

4.2 Potentials for new issuers

1. Cambodia

Although Cambodia's debt capital market is yet to be developed, the Securities Exchange Commission of Cambodia (SECC) launched a series of regulations to kick off the country's corporate bond market in late 2017. The year of 2018 therefore could be a leapfrogging year for Cambodia—seeing the country's first issuances of corporate bonds ever and first green bonds at the same time.

The Cambodian green and social bond market is set to kick start. On the regulator side, SECC approved and adopted ASEAN GBS, which could provide investors with a credible reference point and help issuers attract investors with an ESG mandate. The Cambodian Government also provides tax incentives to companies listed on the Cambodian Stock Exchange and public investors who hold and/or trade government, equity, and debt securities on the securities market (Thy, 2017). On the corporate side, several financial institutions have received credit ratings from Moody's, Fitch, or local rating agencies. Meanwhile, several supportive schemes are available—CGIF is willing to provide credit guarantees for Riep denominated (Cambodia's local currency) bonds, and IFC was reported to have proposed to invest in Cambodia's first bond (Gaung, 2018). Finally, life insurance companies are eager to diversify their investment portfolios and invest in corporate bonds, as they do not have other investment options at the moment and have saved almost 100% of premium incomes in banks.

On the other hand, Cambodia lacks the infrastructure required for the energy sector to match the pace of socio-economic growth. Cambodia imported approximately 40% of electricity from neighbouring countries in recent years and domestically produced most of the electricity from heavy fuel oil and diesel generators—indeed, 90% of power produced within Cambodia was generated in this way (Jona, 2012). Heavy dependence on imported fossil fuels and imported electricity makes Cambodia's electricity price one of the highest in ASEAN and in the world (CFDC, 2015).

Cambodia's national priority is to enable electricity access for all Cambodian villages by 2020. However, electricity had only reached 66 per cent of villages as of 2015, a huge lag behind the planned target (Chandara, 2016). The complete electrification is estimated to cost close to USD 1 billion, a sum that the government does not have and requires the private sector to play a crucial role (Chandara, 2016). Green bonds therefore can be an ideal instrument for energy corporates to expand their debt investor base and help Cambodia shape the clean, market-oriented power system of future.

2. Lao PDR

Lao PDR does not have its own debt capital market. However, the Lao government has launched sovereign bonds in Thailand to support investment in infrastructure projects since 2013 and has encouraged corporates to tap the Thai capital market. Relying on Thailand as a financial hub—including soliciting Thai investors' interest in green bonds—can be Lao PDR's strategy for bringing funds to the country for its green and sustainable investment needs.

Lao PDR is situated in the centre of the Greater Mekong Subregion (GMS), with approximately 80% of the country being covered by forest and woodland with rugged mountains—an ideal geological feature for hydroelectric generation. Lao PDR's power supply is expected to grow 60%, from 6,441 MW in 2016 to 10,277 MW in 2020 (EDL-Gen, 2017). In addition to the fast-growing domestic need for power supply, high demand growth comes from other countries in the GMS—the GMS demand is forecasted to increase by more than 40% in 2015 to 2020, from 148,371 MW in 2015 to 212,005 MW in 2020 (ADB, 2010). Indeed, Lao PDR exports two-thirds of its electricity to the neighbouring countries (EDL-Gen, 2017) and power export is one of Lao PDR's key export industries that have need for foreign investment as well as the potentials for green projects.

Lao PDR's power sources consist of 70.5% hydro, 29% coal, and 0.5% biomass (EDL-Gen, 2017). Lao PDR has the largest catchment area, contributing 35% of the water to the Mekong River, and relies mainly on rainfall—not water from the Mekong River—for electricity generation. Considering high upfront investments for capital infrastructure required for hydropower projects, green bonds can serve ideally as a refinancing instrument for Lao energy companies and banks—creating a financing conveyor belt to allow early risk-taking investments to exist and lower the cost of capital.

Specifically, EDL-Generation Public Company (EDL-Gen) is an electricity energy firm in Lao PDR that operates 10 wholly-owned hydropower plants, one solar plant, and 5 Independent Power Plants (IPPs) (EDL-Gen, 2017). Several of EDL-Gen's hydropower plants received ASEAN best renewable energy project awards, DAS Certification Environmental Management System, and ISO 9001 Certification. The company issued two bonds—one Thai Baht denominated issuance at THB 6.5 billion (USD 205 million) in 2014 and one USD denominated issuance at USD 340 million in 2017—in the Thai capital market. Based on these experiences, EDL-Gen could consider issuing an ASEAN green bond either in the Thai capital market or in other capital markets to attract a wider range of investors.

Additionally, the Banque Pour Le Commerce Exterieur (BCEL), a state-owned bank, is in the process of being rated by a credit rating agency. As a bank focusing on cooperate customers, BCEL lends 60% of loans to energy companies, and hence could consider issuing a green bond to free up its balance sheet for other early-stage project financing. It is noteworthy that securing a power purchase agreement with a state-owned agency (i.e., Electricity Generating Authority of Thailand) to include certain schemes that offset foreign currency risks can be critical for bond ratings and for international investors (Boey, 2017).

3. Thailand

Thailand has a functioning bond market, a strong investor base, and a robust project pipeline. However, Thailand has yet to issue the country's first green bond. The reasons that Thailand has not played a leading role in the ASEAN green bond markets may be attributed to the lack of awareness among investors and issuers, as well as a lack of incentive schemes for Thai issuers.

Thailand has a large domestic investor base. Assets under management by Thailand's mutual funds have amounted to THB 4.52 trillion (USD 144 billion) as of September, 2017 (Eu, 2018); and direct premium incomes of the insurance industry totalled at THB 690 billion (USD 22 billion) in 2016 (TRG, 2017). Although Thailand's Securities and Exchange Commission (SEC) drafted the Investment Governance Code: I Code for Institutional Investors, which underscores ESG criteria, Thai institutional investors have yet to be bound by ESG mandates or obligations for their investments. In particular, Thailand's Government Pension Fund has not taken steps and has not announced a plan to dedicate certain percentage of its assets under management for green and sustainable investments.

On the issuer side, Thai banks and corporates are not aware that the green label will help expand the investor base and can increase the likelihood of attracting international investors. As demonstrated by other countries, the green label has enabled the inflow of international investments. For example, the Fijian sovereign green bond succeeded in attracting foreign investor participation—for the first time—for a Fijian dollar denominated bond listed in the domestic bond market (Germanetti, 2018). Although foreign investors have favoured Thai sovereign bonds (Koosakul, 2016), Thai corporate issuers could use the green and sustainable label as a hook to attract international investors who are not conventional buyers of Thai corporate bonds.

On the regulator side, no incentive schemes are available for Thai issuers who wish to issue green bonds domestically. Although incentives are not a required element to boost a green bond market, Thai issuers still have old mind-sets and are waiting for the government to take the first step. In fact, Thai banks need to pay certain fees—including the Financial Institutions Development Fund fee, deposit insurance, and tax withholding—when issuing a bond, and consider the verification fee of green credentials to be an extra financial burden. On the other hand, several banks, such as Kasikorn Bank, Bangkok Bank, and Krungthai Bank, offer green loans with lower rates to those engaging in eco-friendly projects and do not necessarily need green bonds as another instrument to achieve their ESG goals.

Thailand's Energy 4.0 (2015-2036) includes five energy blueprints—the Power Development Plan, the Energy Efficiency Plan, the Alternative Energy Development Plan, the Gas Plan, and the Oil Plan. In particular, the government recognises that dependence on imported fossil fuels is not economically and ecologically sustainable and exposes the country to the unpredictability of global commodity markets (Pornavalai, 2017). A robust project pipeline therefore is needed to support the transformation of the country's energy system based on ecology, economy, and energy security principles.

4. Viet Nam

Viet Nam has a small bond market with little liquidity. Government and government guarantee bonds account for more than 95% of the bond market, while the share of corporate bonds represents less than 5% (Akiyama, 2016). To diversify the investor base, the government has focused on lengthening maturities of government bonds to attract investments from insurance and pension funds, and to reduce the amount held by banks. To this end, the government reduced the share of less than 3 years bonds by 30% and increased the share of longer than 10 years by 10%, which led to the increase of average maturity of government bonds from 2.8 years in 2013 to 5 years in 2016 (Akiyama, 2016).

Additionally, the government is encouraging several tariff mechanisms, including:

- Feed-in-tariff for onshore wind power (US 8.77 cents/kWh),
- Feed-in-tariff for offshore wind power (USD 9.97 cents/kWh),
- Avoided-cost-tariff for small hydropower projects (US 2.82-3.1 cents/kWh, depending on season and daily peaks),
- Feed-in-tariff for grid-connected biomass power projects (US 5.8 cents/kWh),
- Feed-in-tariff for grid-connected waste to energy (US 10.05 cents/kWh),
- Feed-in-tariff for utility-scale solar PV (USD 9.35 cents/kWh).

Considering that Viet Nam has a nascent corporate bond market but a more active market on the government side, a sovereign issuance could be an option for Viet Nam to kick-start its green bond market. Recently, the State Securities Commission of Viet Nam (SSC Viet Nam) hosted the inaugural ASEAN GBS Roundtable to engage with market participants, including banks, securities firms, and fund management companies.

5. Conclusion

Catalysing private investment is critical for energy transformation in the ASEAN+3 countries. While the banking sector has traditionally played the major financing role, stricter capital adequacy requirements and maturity mismatches may have constrained lending. Bank domination, while not an issue per se, nevertheless creates limitations for green project financing, notably regarding:

- *Maturity*: Renewable energy projects require long-term loans to avoid refinancing risk;
- *Credit limit*: Banks typically have single borrower limits to avoid the concentration of risks on a few counterparties;
- *Pricing*: Bank regulations, such as those of Basel III, tend to make loans more expensive through stricter rules in terms of provisions.

These limitations make loans for green and development projects more expensive than they need to be. This implies a substantial reduction in costs in emerging markets could be achieved by providing means to exit loan positions via bond market rather than hold loans for 10-15 years.

Furthermore, and more specifically, bank financing does play a key role, especially in the initial phase of a project where the risk is typically high and requires gradual disbursement of funds in line with the needs of the project. However, after the construction phase, when the risk is greatly lowered, the ideal financing scheme then is to refinance projects through bonds, and releasing loan funding for new projects. Such refinancing will allow banks to free up limited bank balance sheet capacity for early-stage project financing and other important infrastructure lending.

Capital markets can complement bank financing. Green bonds, unlike loans, can leverage institutional investors. Mobilising institutional investors' resources can be a "game changer" for green development. A shift of only 5% in Asian institutional investors' allocation in favour of green investments over the next 10 years can create an additional annual flow of climate aligned finance of around USD 80 billion. However, this requires the availability of sufficient investable green projects (assets) in the region and a structural change in institutional investors' behaviour. This is possible as the long-term nature of many green projects matches the long-term liabilities of institutional investors. Investors also have the possibility of investing directly in green projects by acquiring equity in the Special Purpose Vehicles created for these projects as well as through project-based green bonds.

One of the main challenges when issuing green bonds in underdeveloped markets lies in the lack of, or low, credit ratings of issuers. Achieving the necessary rating to make green and project bonds attractive to investors therefore requires reducing the risk of the debt component of a green project. In addition, the lack of consensus regarding what constitutes "green" is another source of uncertainty when assessing long-term investment options in developing countries. In essence, the green label is the icing on the cake; investors are looking for investment grade bonds. Issuers' strategic signal of being green, being environmentally friendly, and being socially responsible in the long term—rather than aiming at one-shot issuance—is more critical for and appealing to long-term investors.

Appendix 1 Green and SDG-aligned bond issuances in ASEAN as of 30 April, 2018

Country	Issuer	Value	Issuance date	Type of review ³	ASEAN GBS alignment	Issue details
Indonesia	Star Energy Geothermal (Wayang Windu)	USD 580mn	24 April, 2018	Second Party Opinion by Carbon Trust	Yes	This bond is labelled as a green bond. Carbon intensity threshold set by the issuer is aligned with the Geothermal Criteria of CBS ⁴ and demonstrates a high level of ambition.
Indonesia	Republic of Indonesia	SGD 1.65 bn (USD 1.25bn)	1 March, 2018	Second Party Opinion by CICERO	Yes	This bond is labelled as a Green Sukuk. Not enough information is released regarding what share of proceeds are allocated to projects that do not align with CBI's Climate Bonds Taxonomy, such as social programmes (public health management, food security), rerouting roads, green tourism and R&D investments.
Indonesia	TLFF I Pte Ltd	USD 95 mn	23 Feb, 2018	Second Party Opinion by Vigeo Eiris	No	This bond is labelled as a sustainable bond. In addition to social components, environmental components such as sustainable agriculture, conservation of nature corridors for endangered species, and restoration of degraded land are in line with the Nature Based Assets category of CBI's Climate Bonds Taxonomy.
Malaysia	Mudajaya Group Berhad (Sinar Kamiri)	MYR 245 mn (USD 62.8 mn)	30 Jan, 2018	Green Bond Rating by RAM Holdings	No	This bond is labelled as a Sukuk bond. Its framework is aligned with Securities Commission Malaysia's Sustainable & Responsible Investment (SRI) Sukuk Framework and ICMA's GBP. RAM Holdings assigned this issuance a Tier-1 Environmental Benefit rating, the highest of three rating levels indicating "the project is an important component of low-carbon future and has clear, demonstrable environmental benefits."
Singapore	Sindicatum	INR	19 Jan,	Second Party	Yes	This bond is labelled as a

³ Pre-issuance reviews include the following types: (1) First Party Green Bond Framework provided by the issuer, (2) Independent Third Party Assurance provided by audit firms, (3) Second Party Opinion provided by environmental social governance (ESG) service providers, (4) Green Bond Rating provided by rating agencies, and (5) Climate Bonds Certification verified by the Climate Bonds Standard scheme.

⁴ CBS stands for Climate Bonds Standard, which was established by the Climate Bonds Initiative and is backed by the Climate Bonds Standard Board of investor representatives.

	Renewable Energy	2.5 bn (USD 39.7 mn)	2018		Opinion by Sustainalytics		green bond. Proceeds will finance renewable energy projects including but not limited to solar, wind, waste to energy, and bagasse-cogeneration (i.e., waste recycling of agricultural waste from sugar mills).
Malaysia	Segi Astana Sdn Bhd	MYR 415 mn (USD 103.7 mn)	8 Jan, 2018		Green Bond Rating by RAM Holdings Berhad	Yes	This bond is labelled as an ASEAN green bond. The proceeds will finance a property certified as LEED Silver (not according to the market best practice threshold) and received a Tier-3 Environmental Benefit rating, the lowest of three rating levels indicating “the project has minimal contributions towards low-carbon future and has minimal demonstrable environmental benefits.”
Malaysia	Permodalan Nasional Berhad	MYR 1.87 bn (USD 461 mn)	29 Dec, 2017		First Party GB Framework	Yes	This bond is labelled as an ASEAN green bond. Proceeds will finance a 118-storey building aiming to secure a LEED 2009 Core and Shell certification. However, the issuer did not specify the tier (Certified, Silver, Gold or Platinum).
Philippines	BDO Unibank	USD 150mn	11 Dec, 2017		Insufficient information	Insufficient information	This bond cannot be labelled, as sufficient information is not available.
Listed in Singapore (SGX)	Manulife Financial	SGD 500 mn (USD 368.8 mn)	21 Nov, 2017		Second Party Opinion by Sustainalytics and Climate Bonds Certification	No	This bond is CBI certified and the world’s first green bond from an insurance company. Proceeds will finance renewable energy, green buildings, sustainably-managed forests, energy efficiency, clean transport, sustainable water management and/or pollution prevention and control.
Malaysia	Quantum Solar Park	MYR 1 bn (USD 246.5 mn)	9 Oct, 2017		Second Party Opinion by CICERO	No	This bond is labelled Green Sukuk and received a Dark Green rating from CICERO. Proceeds will be utilised to construct three solar PV plants in three Malaysian districts.
Listed in Singapore (SGX)	IREDA	INR 19.5 bn (USD 300 mn)	29 Sep, 2017		Climate Bonds Certification	No	This bond is the first Green Masala Bond (i.e., a bond issued abroad but denominated in rupees) by a financial institution. It was dual listed on LSE and SGX.
Malaysia	Tadau Energy	MYR	27 July,		Second Party	No	This bond is labelled as the

		250 mn (USD 58.5 mn)	2017	Opinion by CICERO		first ever Green Sukuk and received a Dark Green rating from CICERO. Proceeds will support solar power development.
Singapore	DBS Bank	SGD 685 mn (USD 500 mn)	25 July, 2017	Second Party Opinion by Sustainalytics	No	This bond is labelled a green bond. Proceeds will be used to finance or refinance projects of green buildings, sustainable transportation, renewable energy, energy efficiency, waste management, and climate change adaptation.
Singapore	City Development Limited (CDL)	SGD 100 mn (USD 71.4 mn)	4 April, 2017	Second Party Opinion by Sustainalytics and Climate Bonds Certification by KPMG	No	This bond is labelled as Singapore's first certified green bond. Proceeds will be allocated towards the repayment of SGD 100 mn loan extended by CDL to its subsidiary, which financed 12 retrofit and upgrading projects for the Republic Plaza building.
Philippines	AP Renewables	PHP 10.7bn (USD 225mn)	March, 2016	Second Party Opinion by DNVL-GL	No	This bond is Asia-Pacific's first CBI certified. ADB provided a credit enhancement by guaranteeing 75% of the bond and provided a PHP 1.8bn (USD 37.7mn) direct loan. Proceeds are allocated to develop geothermal power plants.

Source: Synthesis by the author based on CBI's fact sheets and market blogs as of 30 April, 2018

Appendix 2 China's green bond related regulations, guidelines, standards, and policies

Policy maker	People's Bank of China (PBoC)		National Association of Financial Market Institutional Investors (NAFMII)		China Securities Regulatory Commission (CSRC)	National Development and Reform Commission (NDRC)
Policy document	PBoC Announcement no. 39 [2015] & GB Endorsed Project Catalogue (2015 Edition) ⁵		Guideline for non-financial enterprise green note ⁶		Guidance for Supporting GB Development ⁷	Guidelines for GB Issuance ⁸
Release date	22 December 2015		22 March 2017		2 March 2017	31 December 2015
GB issuers	Chinese issuers		Panda issuers		Chinese issuers	Panda issuers
GB issuers GB types	Development banks, policy banks, commercial banks, and other financial institutions	International financial institutions that issue RMB-denominated GB in China	Green private placements and other non-listed enterprises	International non-financial enterprises that issue RMB-denominated GB in China	Corporates with listed equity	State-owned-enterprises
	Green financial bond	Green debt financing instrument	Green corporate bond	Green enterprise bond		
Use of proceeds	PBoC GB Catalogue, including: <ul style="list-style-type: none"> • Upgrades of coal-fired power stations including clean coal; • Large hydropower electricity generation greater than 50 MW 					NDRC catalogue with 12 types ⁹ ; allows issuers to use up to half of green bond proceeds to repay bank loans and add to working capital
Management of proceeds	A specialised account has to be established to clearly track the management of proceeds					Unspecified
Project evaluation and selection	External review is encouraged. Specifically, annual post-issuance verification by an independent third-party is encouraged.					No need of external review; Regulator decides
Reporting	Notify the market on the use of proceeds <u>each quarter</u> and last year report of the use of funds; special auditor report <u>before 30 April each year</u> and reporting to PBoC	Disclose to the market the use of proceeds and the development of green projects <u>every half year</u>	At least disclosure <u>once a year</u> . A guidance is in preparation	Unspecified		

Source: Synthesis by the author from various sources

⁵ PBoC Announcement no. 39 [2015](<http://www.pbc.gov.cn/goutongjiaoliu/113456/113469/2993398/index.html>)

⁶ (<http://www.nafmii.org.cn/ggtz/gg/201703/P020170322639776098176.pdf>)

⁷ CSRC guidance for Supporting GB Development (<http://www.csrc.gov.cn/pub/zjhpublic/G00306201/201703/p020170303534078925053.pdf>)

⁸ NDRC guidelines for GB Issuance (<http://cjs.ndrc.gov.cn/zcfg/201601/W020160108524131094428.pdf>)

⁹ NDRC was in the process of unifying with PBoC's Catalogue and is expected to complete the synthesis process by March, 2018.

Appendix 3 Green and SDG-aligned bond issuances from Japanese issuers as of 30 April, 2018

Issuer	Value	Issuance date	Type of review ¹⁰	GB Framework Alignment	Issue details
Mitsubishi UFG	EUR 500mn (USD 604mn)	29 Jan., 2018	Second Party Opinion by Sustainalytics	Alignment with MOEJ's GB Guidelines 2017	This bond is labelled as a green bond. Proceeds are allocated to renewable energy projects.
Hitachi Capital Management China (Hitachi Capital's subsidiary in Hong Kong)	USD 100mn	15 Dec., 2017	Second Party Opinion by DNV GL	Alignment with GBPs	This bond is labelled as a green bond. Proceeds are allocated to water treatment and water use efficiency upgrades, solar PV, construction, upgrades of BEAM certified green buildings, and circular economy adapted production technologies and processes.
Toda Corp.	JPY 10bn (USD 90mn)	14 Dec., 2017	Second Party Opinion by Sustainalytics	Alignment with GBPs	This bond is labelled as a green bond. Proceeds will finance construction of an offshore wind farm with expenditures including wind turbines, floating bodies and grid connections.
Japan Railway Construction, Transport and Technology Agency	JPY 20bn (USD 180mn)	28 Nov., 2017	First Party GB Framework	Alignment with MOEJ's GB Guidelines 2017	This bond is labelled as a green bond. Proceeds are allocated to the Urban Railway Convenience Enhancement Project to reduce the number of passengers travelling by car or bus.
Tokyo Metropolitan Government	JPY 10bn (USD 90mn)	31 Oct., 2017	Second Party Opinion by Oekom	Alignment with GBPs	This bond is labelled as a green bond. Proceeds are allocated to smart energy and urban development, sustainable resource & waste management, natural environmental conservation, improvements of living environment, and adaptation for climate change.
Development Bank of Japan	USD 1bn	18 Oct., 2017	Second Party Opinion by Sustainalytics	Alignment with GBPs	This bond is labelled as a sustainable bond and is DBJ's third sustainable bond. Proceeds are allocated to environmentally rated loan programme and green building certification. Since DBJ does not use green pure-play businesses as criteria for loans (instead DBJ uses CSR criteria), this bond focuses on CSR rather than just green ¹¹ .
Mizuho Financial Group	EUR 500mn (USD)	16 Oct., 2017	Second Party Opinion by Sustainalytics	Alignment with MOEJ's GB Guidelines	This bond is labelled as a green bond. Proceeds are allocated to renewable energy, clean

¹⁰ Pre-issuance reviews include the following types: (1) First Party Green Bond Framework provided by the issuer, (2) Independent Third Party Assurance provided by audit firms, (3) Second Party Opinion provided by environmental social governance (ESG) service providers, (4) Green Bond Rating provided by rating agencies, and (5) Climate Bonds Certification verified by the Climate Bonds Standard scheme.

¹¹ *Development Bank of Japan (DBJ) issued EUR 300m sustainability bond for green buildings and loans based on (non-green) CSR criteria.* Climate Bonds Initiative, 2016. Available at: <https://www.climatebonds.net/2016/03/update-1st-gb-mexico-nafin-climate-bonds-certified-3-reasons-get-excited-about-canada-gb%E2%80%99s>

	604mn)				2017	transportation, and pollution prevention and control.
Sumitomo Mitsui Banking Corp	EUR 500mn (USD 604mn)	6 Oct., 2017	Second Party Opinion by Sustainalytics	Alignment with MOEJ's GB Guidelines 2017		This bond is labelled as a green bond. Proceeds are allocated to renewable energy, energy efficiency, green buildings, clean transportation, and pollution prevention and control.
Development Bank of Japan	USD 500mn	7 Oct., 2016	Second Party Opinion by Sustainalytics	Alignment with GBPs		This bond is labelled as a sustainable bond and is DBJ's second sustainable bond. Proceeds are allocated to environmentally rated loan programme and green building certification.
Nomura Research Institute	JPY 10bn (USD 90 mn)	16 Sep., 2016	Second Party Opinion by Vigeo Eiris	Alignment with GBPs		This bond is labelled as a green bond. Proceeds will finance part of the "Yokohama Nomura Building" targeting low-carbon and environmental certifications including CASBEE class S (excellent), LEED Gold, DBJ Green Building Certification, and SEGES.
Mitsubishi UFG	USD 500mn	6 Sep., 2016	Second Party Opinion by Sustainalytics	Alignment with GBPs		This bond is labelled as a green bond. Proceeds are allocated to renewable energy generation—specifically investment in photovoltaic, solar thermal and wind energy projects.
Japan International Cooperation Agency	JYP 35bn (USD 315mn)	24 Aug., 2016	Second Party Opinion by Japan Research Institute	Alignment with ICMA's Social Bonds—Guidance for Issuers		This bond is labelled as a social bond. Proceeds are allocated to poverty eradication, world peace, and sustainable society.
Sumitomo Mitsui Banking Corp	USD 500mn	20 Oct., 2015	First Party GB Framework	No alignment		This bond is labelled as a green bond. Proceeds will finance renewable energy (small run-of-river hydro under 25MW), energy efficiency (new building constructions following LEED /BREEAM/CASBEE standards; ships or vessels with energy efficient design such as IMO Energy Efficiency Design Index and Ship Energy Efficiency Management Plan), and resource productivity (i.e., recycling).
Development Bank of Japan	EUR 300mn (USD 363mn)	7 Oct., 2015	Second Party Opinion by Sustainalytics	Alignment with GBPs		This bond is labelled as a sustainable bond and is DBJ's first sustainable bond. Proceeds are allocated to environmentally rated loan programme and green building certification.
Development Bank of Japan	EUR 250mn (USD 300mn)	7 Oct., 2014	Second Party Opinion by DNV GL	Alignment with GBPs		This bond is labelled as a green bond. Proceeds are allocated to green buildings, as defined by DBJ's own Green Building Certification Scheme.

Source: Synthesis by the author based on CBI's fact sheets and market blogs as of 30 April, 2018

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