



Federal Ministry  
for Economic Cooperation  
and Development



# Green Bonds – Ecosystem, Issuance Process and Regional Perspectives

Brazil Edition

Implemented by







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Brazil Edition

Chapter 1 The Green Bond Market Ecosystem

Chapter 2 Issuing a Green Bond

Chapter 3 Green Bonds in Brazil



# Acknowledgements

This report is authored by:

- **Christopher Kaminker**  
Head of Research, Climate & Sustainable Financial Solutions, SEB
- **Christine Majowski**  
Advisor, Emerging Market Sustainability Dialogues – Finance, GIZ
- **Raquel Bonelli**  
Technical Assistant, Sustainable Finance Group, CEBDS

Expert review and input provided by:

- **Christopher Flensburg**  
Head of Climate & Sustainable Financial Solutions, SEB
- **Mats Olausson**  
Senior Advisor, Climate & Sustainable Financial Solutions, SEB
- **Samantha Sutcliffe**  
Senior Advisor, Climate & Sustainable Financial Solutions, SEB
- **Helena Doglia Colling**  
Deputy Head of Bond Syndicate, Investment Banking, SEB
- **Anders Torssander**  
Legal Counsel, Large Corporates & Financial Institutions, SEB
- **Yannick Motz**  
Lead, Emerging Market Sustainability Dialogues – Finance, GIZ
- **Diego Calderon**  
Project Assistant, Emerging Market Sustainability Dialogues – Finance, GIZ
- **Laura Albuquerque**  
Coordinator of Climate Change & Energy and Sustainable Finance Groups, CEBDS



## About the background of this publication

The publication was developed by GIZ and SEB within the framework of a Strategic Alliance (STA) on Green Bond Market Development in G20 Emerging Economies. The STA is a public-private-partnership that was established in April 2016 to support the development of prosperous and sustainable green bond markets in Brazil, China, India and Mexico. In order to promote environmental integrity and transparency in these markets, the STA offers various capacity-building activities including green bond symposia, technical workshops and tailored advisory support to key stakeholder groups, including policymakers and regulators, potential issuers, investors, underwriters and verifiers.

The Brazil edition of this publication was jointly written with the STA's local implementation partner in Brazil, the Conselho Empresarial Brasileiro para o Desenvolvimento Sustentável (CEBDS). In its Sustainable Financing Working Group, CEBDS gathers the largest financial institutions in Brazil and helps encourage them to take on their role in promoting sustainable development, stimulating the discussion of principles and better practices.

Through the develoPPP.de programme, the Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH works – on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ) – with the private sector to support innovative projects in developing and emerging economies for sustainable development. As service provider with offices in over 130 countries, GIZ has – in over 50 years of experience in international cooperation for sustainable development – built strong regional and technical expertise and close working relationships with governments, industries and NGOs across the globe.



Skandinaviska Enskilda Banken AB (publ) (SEB) is a Swedish universal bank, which has developed the green bond concept for institutional investors in cooperation with the World Bank in 2007/08. SEB is one of the leading knowledge providers and thought leaders with regards to green bond product and overall market development.

The content of this booklet was initially written in the context of a comprehensive publication on Green Bond Markets that will be published by the People's Bank of China, the Green Finance Committee of the China Society for Finance and Banking and the Central University of Finance and Economics later in 2017.

Further information can be found on:

- > [www.emergingmarketsdialogue.org](http://www.emergingmarketsdialogue.org)
- > [www.seb.se/greenbonds](http://www.seb.se/greenbonds)
- > [www.cebds.org](http://www.cebds.org)

# Foreword

As a strong advocate of a progressive and effective international climate action architecture, the German Government welcomed the adoption of the Sustainable Development Goals and the Paris Agreement on Climate Change in 2015 by governments worldwide as landmark achievements in formulating a global response to tackle climate change and promote sustainable growth.

Besides public climate finance contributions, the mobilization of private capital plays a pivotal role in meeting the massive investment needs for the transition to a low-carbon, climate-resilient development path. Therefore, having been one of the most active partners of developing countries and emerging markets in the field of climate action, the German Government supports its partner countries not only in financing but also in designing and implementing enabling environments and instruments that facilitate channeling capital flows towards sustainable investments.

Among such market instruments, green bonds have emerged as an effective and innovative vehicle that provides long-term, large-scale financing solutions needed for the required investments in green assets and projects such as in renewable energies, energy efficiency, clean transportation, and adaptation measures. Beyond this direct impact as financing tool, green bonds moreover make an immensely important contribution to triggering a deeper change in the financial sector by promoting accountability and transparency through better environmental disclosure, evaluation methodologies and a pragmatic dialogue within and between institutions in the financial sector.



**Natascha Beinker**

Deputy Head of Division Cooperation with the Private Sector/Sustainable Economic Policy at the German Federal Ministry for Economic Cooperation and Development (BMZ). She is also Troika Co-Chair of the G20 Global Partnership for Financial Inclusion (GPII) and Co-Chair for the GPII SME Finance Sub-Group.



We hope this publication contributes, alongside our other efforts in this field, to further enhancing the knowledge and dialogue on green bonds and thereby fostering international cooperation for sustainable development at a broader scale.

We want to express a special thanks to SEB, GIZ's partner in the develoPPP.de-funded Strategic Alliance on Green Bond Market Development in G20 Emerging Economies, whose pioneering spirit, deep expertise and dedicated engagement for multilateral dialogue in green bond markets globally has been essential to the fruitfulness of the joint work and ambitions.

Sincerely,  
Natascha Beinker

**I**t is with great honor that Skandinaviska Enskilda Banken (SEB) has contributed to this important publication on addressing how the financial industry actively can contribute to greening the overall economy.

We would like to highlight that most of the contribution we provided is a product of reflections from work done in collaboration with our partners. In particular, Heike Reichelt and her colleagues at the World Bank Group's capital market unit created an engine to financially support the Millennium Development Goals.

We would also like to express our gratitude to GIZ and to Dr. Ma Jun of the PBOC Research Bureau, who both, in their own ways, have played an important global role in enabling green growth and coordination and thereby established a foundation for the work that we do.

Finally, it is important to mention that Christopher Kaminker, who has acted as our author for this piece, recently joined SEB from the OECD and thereby also had an opportunity to include some insights from his tenure at the OECD in the following chapters.

We hope our contribution will provide you with value.

Sincerely  
Christopher Flensburg



**Christopher Flensburg**  
Head, Climate and  
Sustainable Financial  
Solutions, SEB

The Paris Agreement reinforced the importance of a consistent financial flow between the Parties towards a low carbon pathway. Climate change can pose a risk to the financial system, as weather events are becoming extreme with physical and transition impacts in societies and business as well. Therefore, it is clear that the financial system should be an agent of tackling climate change through a selection of financial instruments available to switch from “brown finance” to “green finance”. Among them, green bonds can be used to fill this gap and mobilize investments in activities with positive environmental and climate characteristics.

The Brazilian market is still relatively small in comparison with the global market. However, since 2015, the number of issuances have quickly increased. The potential of green bonds issuances in Brazil is large, especially regarding the three main sectors (agribusiness, forestry products and renewable energy) that are eligible activities to be considered in green projects. In addition, these are the most important sectors to help the country achieve its NDC targets.

CEBDS has been a pioneer when talking about green bonds in Brazil, building a robust pipeline for green investments together with the main private banks in the country and the national development bank. After the launch of “Guidelines for Issuing Green Bonds in Brazil” in 2016, the partnership with the Strategic Alliance was extremely important to provide capacity building in the country and knowledge to the potential issuers.

This publication, developed jointly with GIZ and SEB, seems suitable to continue our work to contribute with knowledge and influence to boost the green bonds market in Brazil and improve the green financial flow. I hope you enjoy the reading.

Sincerely,  
Marina Grossi



**Marina Grossi**  
President, Conselho  
Empresarial Brasileiro  
para o Desenvolvimento  
Sustentável  
(CEBDS)

# Content

Acknowledgements .....	5
Foreword .....	8
Introduction .....	15

## Chapter 1: The Green Bond Market Ecosystem

<b>I. Regulation</b> .....	18
International guidelines – the Green Bond Principles (GBP) .....	18
National regulation .....	20
International regulatory attention to green bond market development and growth .....	22
<b>II. Issuers</b> .....	23
Why issue a green bond? .....	23
Who issues green bonds? .....	30
- Supranational, sovereign & agency (SSA) and municipalities .....	31
- Non-financial corporates .....	35
- Financial institutions .....	36
Challenges and conclusions .....	37
<b>III. Investors</b> .....	38
Why invest in green? .....	38
Why green bonds? .....	41
Who invests in green bonds? .....	43
The relevance of green bond indices and stock exchange listings .....	45
Challenges and conclusions .....	46
<b>IV. External review</b> .....	49
What is the value of external reviews? .....	50
Second opinions .....	51
Third party verification or audits .....	53
Certification .....	54
Ratings .....	55
- CICERO’s Shades of Green methodology .....	55
- Oekom’s Sustainability Bond Rating .....	56
- Moody’s Green Bonds Assessment .....	56
- S&P’s Green Bond Evaluation Tool .....	57
Challenges and conclusions .....	57
<b>V. Underwriters</b> .....	58

## Chapter 2: Issuing a Green Bond

<b>I. Pre-issuance phase</b> .....	63
Meeting relevant preconditions .....	63
Designing a tailor-made green bond framework .....	63
Externally reviewing the green bond framework .....	68
Establishing structures for managing proceeds .....	69
Committing to frequent reporting .....	69
Developing a sales strategy .....	70
Preparing relevant legal documents and due diligence .....	70
Identifying suitable bond terms, market conditions and target market .....	70
Issuing in the domestic market .....	71
Issuing in international markets .....	72
Defining the bond type and structure .....	72
Marketing the green bond issue .....	72
Considering incentive mechanisms .....	72
Registering the green bond issue .....	73
<b>II. Launch phase and issuance</b> .....	74
Announcing the green bond issue .....	74
Book building .....	74
Pricing the green bond .....	75
Conducting the transaction .....	75
<b>III. Post-issuance phase</b> .....	76
Managing proceeds .....	76
Listing the green bond on a stock exchange .....	76
Monitoring and reporting the use of proceeds and environmental impact .....	76
Obtaining post-issuance external reviews .....	77
Trading on secondary markets .....	77
Repaying the bond .....	78

## Chapter 3: Green Bonds in Brazil

<b>I. Introduction</b> .....	80
<b>II. The Brazilian Green Bond market</b> .....	81
Market Development .....	81
Sustainable Energy Fund .....	86
Brazilian Council of Green Finance .....	86



<b>III. How to issue a green bond in Brazil</b> .....	87
Pre-issuance phase .....	87
Issuance .....	90
Post-issuance phase .....	91
<b>IV. Challenges and prospects</b> .....	92
Challenges for the development of the domestic green bond market .....	92
Market opportunities: priority sectors .....	93
- Agribusiness .....	95
- Forestry products .....	95
- Renewable energy and energy efficiency .....	96
- Transport, sewage and others .....	98
<b>V. Final remarks</b> .....	99
Disclaimer .....	100

# Introduction

## Green Bonds – An Introduction

Green bonds have emerged as an innovative financial instrument over the last decade that have been highlighted by international public and private sector leaders as a promising vehicle for financing projects and activities with environmental benefits, and more generally, facilitating the shift to a low-carbon, climate-resilient and resource-efficient global economy. This booklet aims to serve as a practical guide to new and prospective issuers of green bonds and to promote the continued growth in green financing globally.

The appeal of green bonds derives in many parts from their simplicity regarding structure, key elements and procedure that define the corner pillars of this type of debt security, while permitting a clear and transparent transfer of information from issuers to the investors regarding the use of proceeds and their environmental characteristics. The issuance process is in many ways similar to regular bond issuance, as green bonds are subject to the same overarching regulation and requirements concerning, for instance, the legal framework and corresponding documentation, as well as financial disclosure. When issuing a green bond, the issuer is, however, expected to incorporate a Green Bond Framework that provides additional disclosure and procedures geared at reassuring investors, for instance, on the green use of proceeds, which are described below alongside the standard steps of issuing a bond.<sup>1</sup>

1 See ICMA (2016), Green Bond Principles; SEB (2016), The Green Bond Framework, available at [http://www.emergingmarketsdialogue.org/dms/giz-emd/events/event18/presentations/3\\_Mats\\_Olausson\\_MX\\_GB.pdf?z=1481015925043](http://www.emergingmarketsdialogue.org/dms/giz-emd/events/event18/presentations/3_Mats_Olausson_MX_GB.pdf?z=1481015925043).





# Chapter 1

## The Green Bond Market Ecosystem

# I. Regulation

## > International guidelines – the Green Bond Principles (GBP)<sup>1</sup>

The Green Bond Principles (GBP) are a set of voluntary guidelines aimed at promoting transparency and disclosure for green bonds. The GBP have achieved broad market acceptance and legitimacy, as well as growing official recognition by policymakers and regulators. The Principles were first drafted in early 2014 and updated in March 2015, June 2016 and June 2017. As of June 2017, 135 green bond issuers, underwriters and investors have become members of the GBP and in excess of 110 organizations are observers. By extension, this community is also referred to as the GBP and brings together the majority of participants and stakeholders in the green bond market.

The GBP are coordinated by an Executive Committee of 24 members constituting a representative group of key issuers, investors and underwriters that oversee the annual update of the GBP. The International Capital Market Association (ICMA) acts as Secretary to the GBP advising on governance and other matters, as well as providing organizational support. The importance of the GBP's membership, as well as its dedicated governance structure and organization, explain its market legitimacy and growing recognition by the official sector.

The GBP define green bonds as any type of bond instruments where the proceeds will be exclusively applied to finance or re-finance in part or in full new and/or existing eligible green projects. They follow four principles which can be summarized as follows:

1. Use of Proceeds (which should be appropriately described in the legal documentation for the security and include designated green project categories).
2. Process for Project Evaluation and Selection (outlining the issuer's decision-making process in determining the eligibility of green projects, including environmental risk assessment criteria and external standards that have been applied, as well as by putting this information in the context of the issuer's overarching sustainability objectives and strategy).

<sup>1</sup> See ICMA (2017); OECD/ICMA/CBI/GFC (2016), Green Bonds: Country Experiences, Barriers and Options, input report prepared for G20 GFSG.

- 
3. Management of Proceeds (with the net proceeds of green bonds being credited to a sub-account, moved to a sub-portfolio or otherwise tracked by the issuer).
  4. Reporting (on the use of proceeds, the amounts allocated, the temporary investment of unallocated proceeds, and expected/actual environmental impacts).

The GBP also recommend that issuers use external reviews to confirm their alignment with the key features of green bonds. External review providers include specialized consultancies, accountancy firms, ESG analysts and academic organizations.

Concerning the definition of green, the GBP explicitly list several broad categories of potential eligible green projects aiming to address key areas of concern such as climate change, natural resources depletion, loss of biodiversity and/or pollution control. Updated in June 2017, these broad categories are:

1. renewable energy (including production, transmission, appliances and products);
2. energy efficiency (such as in new and refurbished buildings, energy storage, district heating, smart grids, appliances and products);
3. pollution prevention and control (including waste water treatment, reduction of air emissions, greenhouse gas control, soil remediation, waste prevention, waste reduction, recycling and energy/emission-efficient waste to energy, value added products from waste and remanufacturing, and associated environmental monitoring);
4. environmentally sustainable management of living natural resources and land use (including environmentally sustainable agriculture; environmentally sustainable animal husbandry; climate smart farm inputs such as biological crop protection or drip-irrigation; environmentally sustainable fishery and aquaculture; environmentally sustainable forestry including afforestation or reforestation, and preservation or restoration of natural landscapes);
5. terrestrial and aquatic biodiversity conservation, (including the protection of coastal, marine and watershed environments);
6. clean transportation (such as electric, hybrid, public, rail, non-motorized, multi-modal transportation, infrastructure for clean energy vehicles and reduction of harmful emissions);

- 
7. sustainable water and wastewater management (including sustainable infrastructure for clean and/or drinking water, wastewater treatment, sustainable urban drainage systems and river training and other forms of flooding mitigation);
  8. climate change adaptation (including information support systems, such as climate observation and early warning systems);
  9. eco-efficient and/or circular economy adapted products, production technologies and processes (such as development and introduction of environmentally friendlier products, with an eco-label or environmental certification, resource-efficient packaging and distribution);
  10. green buildings which meet regional, national or internationally recognized standards or certifications.

The GBP state that it will not provide detailed guidance on what is green, leaving this to either investors themselves or to other parties with special expertise. The GBP acknowledge a number of additional and complementary categories and sets of criteria defining eligible green projects in existence in the market and provide examples through links listed in the GBP Resource Centre. The Resource Centre also provides recommended templates framing issuer alignment with the GBP, the content of external reviews, the Green Bond database and FAQ.<sup>2</sup>

### > National regulation<sup>3</sup>

Governments have supported the development of standards, guidelines and definitions for green bonds. In such jurisdictions, where green bond markets are regulated by national authorities, issuers need to ensure compliance with the eligible project and asset categories.

In 2015, the Peoples' Bank of China (PBC, China's central bank) released the first country-specific green bond issuance guidelines along with a taxonomy in the form of a *Green Bond Endorsed Project Catalogue (or the Catalogue)* to guide financial

<sup>2</sup> ICMA (2017), GBP Resource Centre.

<sup>3</sup> OECD/ICMA/CBI/GFC (2016), Green Bonds: Country Experiences, Barriers and Options, input report prepared for G20 GFSG.

sector issuance on green bonds in China. The *Catalogue* specifies six categories with 31 sub-categories.<sup>4</sup> China's corporate green bond market is regulated by the National Development and Reform Commission (NDRC), which provided guidelines that are in line with PBC's *Catalogue* but focus on a list of twelve priority areas.<sup>5</sup> Listed companies are regulated by the China Securities Regulatory Commission (CSRC), which excludes high emissions or energy usage corporates from the issuance of green bonds.

In May 2017, India issued final rules that will govern the issuance of green bonds locally. The *Disclosure Requirements for Issuance and Listing of Green Debt Securities* established by the Securities Exchange Board of India (SEBI) include a list of broad project and asset categories for eligible use of proceeds, which are in line with international practice i.e. the GBPs.<sup>6</sup>

The *Guide to Issuing Green Bonds in Brazil* published by the Brazilian Federation of Banks (FEBRABAN) and the Brazilian Business Council for Sustainable Development (CEBDS), which represents a non-binding guide, does not include fixed definitions but provides examples of eligible activities for green bonds that are widely in line with the GBP and the Climate Bonds Taxonomy.<sup>7</sup>

The Moroccan Capital Markets Authority (AMMC) released a green bond guide in 2016, prepared with the support of the IFC.<sup>8</sup>

4 The categories comprise: (i) energy-saving, (ii) pollution prevention and control, (iii) resource conservation and recycling, (iv) clean transportation, (v) clean energy, (vi) ecological protection and adaptation to climate change. Some regional variations exist currently in markets where governments have regulated the green bond market. For instance, the guidelines for China's corporate domestic green bond market set by National Development and Reform Commission (NDRC) are in line with the PBoC's *Catalogue*, but include nuclear energy as an additional, eligible category. For more details, see chapter 2.

5 A harmonization of the different green bond regulations in China is currently being discussed by the responsible regulatory bodies including PBC, NDRC and CSRC.

6 SEBI (2017), [Disclosure Requirements for Issuance and Listing of Green Debt Securities](#).

7 FEBRABAN/CEBDS (2016), [Guide to Issuing Green Bonds in Brazil](#).

8 See AMMC (2016), [Green Bond Guidelines](#).



As part of the French *Energy Transition Bill and National Low-Carbon Strategy* (SNBC), an *Energy Transition for Climate* label that is consistent with the GBP will help identify investment funds that are investing in the green economy. A methodology for project selection under the Dutch *Green Funds Scheme* also exists.

### > **International regulatory attention to green bond market development and growth**

Regulators have also convened internationally, under the 2016 G20 Chinese Presidency, to examine and provide official recognition of the need to grow international and domestic green bond markets. These efforts culminated in a statement made by Leaders in September 2016. The *G20 Green Finance Synthesis Report*<sup>9</sup>, which was welcomed in the Leaders' Statement at Hangzhou, outlined voluntary options to enhance the ability of the financial system to mobilize private capital for green investment developed by the *Green Finance Study Group* (GFSG). The Leaders' Statement contains language referring to green bonds in paragraph 21: *"We believe efforts could be made to... provide clear strategic policy signals and frameworks, promote voluntary principles for green finance, support the development of local green bond markets and promote international collaboration to facilitate cross-border investment in green bonds"*.<sup>10</sup>

9 G20 Green Finance Study Group (2016), *Green Finance Synthesis Report 2016*.

10 G20 Leaders' Communique at the Hangzhou Summit (2016).

## II. Issuers

Since the initiation of the green bond market in 2007/08, issuance has increased rapidly, with a growing number of issuer types, products and currencies diversifying the market. This chapter will take a closer look at the supply side of green bond markets focusing on the most relevant issuers as well as the drivers and barriers green bond issuers face.

### > Why issue a green bond?

Globally, both the private and public sector experience a growing need to adapt to the challenges and risks imposed by environmental degradation and climate change impacts, while also seeking ways to harness the commercial opportunities that solving these challenges will create. There are physical risks (e.g. caused by extreme weather events), regulatory and policy shifts (stemming for instance from actions in support of the Paris Agreement), changing consumer behavior and potential reputational risks, energy transition risk related to technological evolution and disruptions, among others. These factors are increasingly reducing expected future profits of carbon- and resource-intensive assets and business activities. Implications for financing conditions of exposed companies and institutions can be considerable as credit ratings increasingly account for environmental, social and governance (ESG) risks.<sup>11</sup>

At the same time, sustainable investments and business opportunities (e.g. in infrastructure) become more attractive for governments and businesses alike as low-carbon energy sources and energy efficient technologies become more cost-competitive.<sup>12</sup>

The financing needs arising from addressing these challenges are enormous and this simultaneously presents a massive commercial opportunity commensurate with the scale of the challenge. The OECD (2017) finds that limiting the global temperature rise to below 2 degrees, in line with the Paris Agreement, will require USD 6.9 trillion per year in infrastructure investment between now and 2030, only 10% more than

11 In 2015, Moody's became the first of the big three rating agencies to launch a methodology to incorporate ESG risks into credit ratings. See Moody's (2015), Environmental, Social and Governance (ESG) Risks – Global: Moody's Approach to Assessing ESG Risks in Ratings and Research. S&P introduced a Green Bond Evaluation Tool in 2016.

12 Climate Policy Initiative (2015), Global Landscape of Climate Finance 2015; IEA (2016), World Energy Outlook 2016.



the carbon-intensive alternative. In addition, climate-friendly infrastructure is more energy-efficient and would lead to fossil fuel savings totaling USD 1.7 trillion annually, more than offsetting the incremental cost. Already since 2010, 50% of private finance in infrastructure (USD 1.3 trillion) has been directed to clean energy, and Bloomberg New Energy Finance estimates that an additional USD 14.6 trillion will be required for clean energy investments alone until 2040 under a 2 degree scenario.<sup>13</sup>

In recent years, green bonds have thereby emerged as an attractive public and private sector instrument that facilitates access to relatively cheap and long-term sources of debt capital funding for environmental and climate-related investments. Particularly for green projects such as wind power or urban infrastructure that require large up-front investments and generate steady returns over a long period of time, green bonds are considered a suitable financing instrument that can be issued by either public or private actors up front to raise capital to fund projects or for re-financing purposes, freeing up capital and leading to increased lending.

A 2016 background report<sup>14</sup> provided to the G20 Green Finance Study Group summarized the benefits of green bonds for public and private investment in green infrastructure as follows:

1. Providing an additional source of green financing.
2. Enabling more long-term green financing by addressing maturity mismatch.
3. Enhancing issuers' reputation and clarifying environmental strategy.
4. Offering potential cost advantages if and when government incentives are used.
5. Facilitating the "greening" of traditionally brown sectors.
6. Making new green financial products available to responsible and long-term investors.

13 OECD (2017), Investing in Climate, Investing in Growth; Bloomberg, New Energy Finance (2015), New Energy Outlook 2015.

14 OECD/ICMA/CBI/GFC (2016), Green Bonds: Country Experiences, Barriers and Options, input report prepared for G20 GFSG.



More specifically from the perspectives of issuers and investors, green bonds have a range of commonly cited advantages and some disadvantages which are important to consider. A report from the OECD summarized these factors in Table 1.1 below.

**Table 1.1: Advantages and disadvantages of green bonds as cited by investors and issuers**

For investors	
Advantages	Disadvantages
<i>Commonly cited</i>	
<ul style="list-style-type: none"> <li>• Investors can balance risk-adjusted financial returns with environmental benefits</li> <li>• Satisfies Environmental, Social and Governance (ESG) requirements and green investment mandates</li> <li>• Improved risk assessment in an otherwise opaque fixed income market through use of proceeds reporting</li> <li>• Potential use of pure-play, project and ABS as instruments to actively hedge against climate policy risks in a portfolio that includes emissions-intensive assets</li> <li>• Recognised by UNFCCC as non-state actor “climate action”</li> </ul>	<ul style="list-style-type: none"> <li>• Small and nascent (and potentially less liquid) market, small bond sizes</li> <li>• Lack of unified standards can raise confusion and possibility for reputational risk if green integrity of bond questioned</li> <li>• Limited scope for legal enforcement of green integrity</li> <li>• Lack of standardisation can lead to complexities in research and a need for extra due diligence that may not always be fulfilled</li> </ul>
<i>Infrequently cited</i>	
<ul style="list-style-type: none"> <li>• Engagement and private dialogue with issuers on ESG topics related to green bond issuance results in information that enhances credit analysis, through more comprehensive credit profiles of borrowers (BlackRock, 2015)</li> <li>• Added transparency of proceeds use and reporting requirements provides informational advantage otherwise unavailable (on spending efficiency, project details and updates, impact performance) which gives green bond investors a significant information advantage (Nikko, 2014)</li> <li>• Tracking of proceeds use and reporting leads to improved internal governance structures and a positive feedback loop which improves the overall credit quality of the issuer (Nikko, 2014)</li> </ul>	

## For issuers

### Advantages

### Disadvantages

#### *Commonly cited*

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Demonstrating and implementing issuer's approach to ESG issues</li> <li>• Improving diversification of a bond issuer's investor base, thereby expanding funding sources and potentially reducing exposure to bond demand fluctuations</li> <li>• Strong investor demand can lead to oversubscription and potential to increase issuance size</li> <li>• Evidence of greater proportion of “buy and hold” investors for green bonds which can lead to lower bond volatility in secondary market</li> <li>• Reputational benefits (e.g. marketing can highlight issuer's green credentials and support for green investment)</li> <li>• Articulation and enhanced credibility of sustainability strategy (putting one's “money where their mouth is”) leading to enhanced dialogue with investors</li> <li>• Access to “economies of scale” as majority of issuance costs are in setting up the processes</li> </ul> | <ul style="list-style-type: none"> <li>• Up front and ongoing transaction costs from labelling and associated administrative, certification, reporting, verification and monitoring requirements (cost estimates vary)</li> <li>• Reputational risk if a bond's green credentials are challenged</li> </ul> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### *Infrequently cited*

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Tracking of proceeds use and reporting leads to improved internal governance structures, communication and knowledge sharing between project side and treasury side of business (Nikko, 2014)</li> <li>• For municipalities, a tool to reach constituencies physically located close to the green project they intend to support and provide them with opportunities to invest in programs that have direct proximal impact (World Bank Group, 2015).</li> </ul> | <ul style="list-style-type: none"> <li>• Investors may seek penalties for a “green default” whereby a bond is paid in full but issuer breaks agreed green clauses (KPMG, 2014)</li> </ul> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Source: OECD (2017), *Mobilising bond markets for a low-carbon transition*.



One of the main benefits that draws a growing number of issuers to the market is the marketing effect green bonds have. The green label helps communicate the issuer's sustainability strategy both to investors, clients and the public. Such visibility and related reputational gain may, for instance, positively impact consumer demand for the issuer's products or services. Moreover, as an increasing number of investors search for green opportunities, funding sources for respective projects and assets can become prospectively better and cheaper as friction is reduced.<sup>15</sup>

Green bonds can also come with a variety of other benefits that stem from heightened demand for these securities among investors with environmental sustainability preferences (leading for instance to investor-base diversification for the issuer) and the potential for fiscal or monetary support in certain jurisdictions.

Issuing a green bond entails a modest additional cost. Such costs include the resources needed to develop a green bond framework, establish internal processes and structures for selecting eligible projects, earmarking and managing proceeds, monitoring and reporting as well as to obtaining external assurances.<sup>16</sup>

These additional costs may be offset in the longer run, as green bonds evidently attract a larger investor base which may strengthen the issuer's medium- to long-term financial position. If the green label succeeds in attracting new investors, this will result in investor base diversification which lowers the funding risk for the issuer. Additional investors conducting their due diligence with respect to both the bond's environmental credentials and its credit risk can also translate into a wider benefit, as investors are more likely to consider purchasing future regular bonds by the same issuer. Therefore, these extra costs may be viewed as an insurance premium that pays out during any future challenging market conditions when frictions in the financial system can be eased by a presumably more diversified and stable investor base.

15 For further details on investors' roles and rationale, see chapter 1.3.

16 For a detailed description of the green bond issuance process, see chapter 2.



With the exception of the ring-fencing or ear-marking of proceeds required by the green label, green bonds have financial characteristics that are essentially identical to conventional bonds from the same issuer, including the credit quality, yield and consequently, the price at which they are issued. This concept of “flat-pricing” has been central to the rapid expansion of the market driven by investor demand. Prices are said to be flat at issuance because the credit profile of a green bond is the same as any other of the most regular, simple and standardized (“plain vanilla”) bonds from the same issuer, so pricing differentials should be comparable.<sup>17</sup>

The future evolution of green bond pricing is uncertain, as the green label has not in itself conferred a pricing advantage at primary issuance, due to the concept of flat pricing. But there is some anecdotal evidence emerging that certain green bonds (for instance in the EU) price “a few basis points tighter” than conventional bonds at primary issuance due to strong demand and oversubscription, and they may also trade at a premium on the secondary markets.<sup>18</sup> S&P (2016)<sup>19</sup> argues that this is most likely due to the imbalance of supply and demand with insufficient quantities of green-labelled bonds available to meet investor demand and states that “although examples can be found of green bonds trading both above and below the credit curve of their non-green counterparts, the general consensus is that they largely trade in line with conventional bonds.” S&P argues that preferential pricing for green bonds could reduce the participation of mainstream investors in the markets unwilling to pay a premium for green benefits, potentially limiting market growth.

17 Source: OECD/Bloomberg Philanthropies (2015), Policy Perspectives, Green bonds: Mobilizing the debt capital markets for a low-carbon transition.

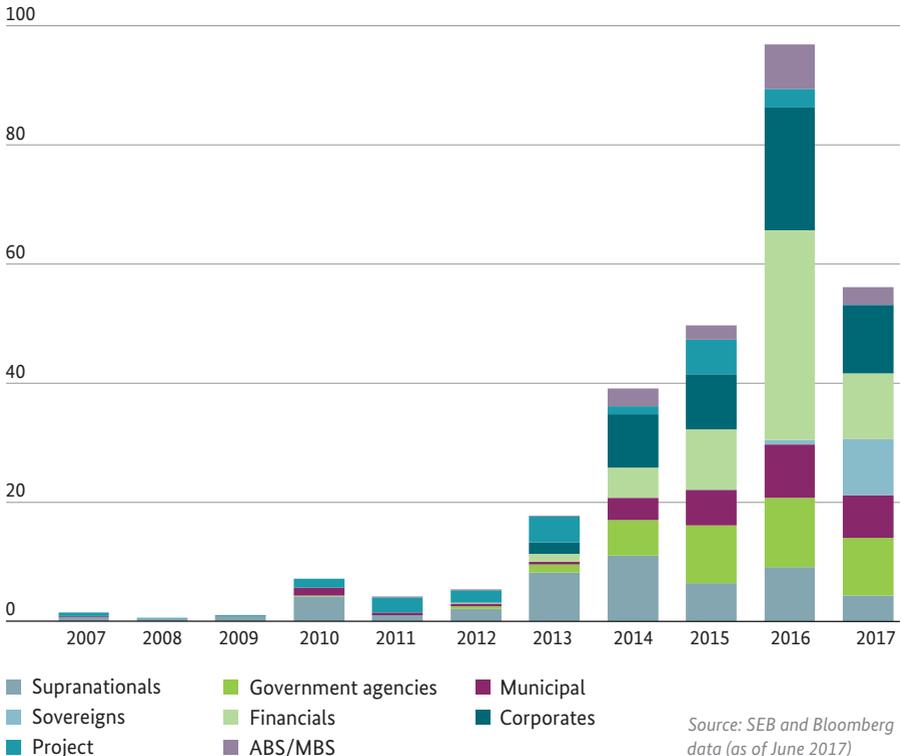
18 See, for example, Oliver D. Zerbib (2016), The Green Bond Premium; Climate Bonds Initiative (2016), Bonds and Climate Change: State of the Market 2016.

19 Standard & Poor’s (2016), The Corporate Green Bond Market Fizzes As The Global Economy Decarbonizes.

## > Who issues green bonds?

From 2007 until 2012, the supply side in global green bond markets was almost exclusively represented by multilateral development banks and some other public institutions until private sector companies and financial institutions started entering the market in 2013 contributing to its accelerating growth. The green bond market continues to grow exponentially, with USD 97 billion issued in 2016. China was the primary driver in 2016, setting a new annual issuance record of over USD 30 billion in the year.<sup>20</sup>

Figure 1.1: Amount of green bond issuance per year and by sector, (USD bn)



<sup>20</sup> BNEF (2017), Green Bonds 2016 in Review.

## Supranational, sovereign & agency (SSA) and municipalities

Supranational, sovereign and agency (SSA) issuers include multilateral and national development banks, regions and cities, sovereign governments and agencies (e.g. Export Credit Agencies, Export-Import Banks and Local Funding Authorities). These stakeholders have an important role in developing the market by stimulating both the demand and supply side in the early market stage, thereby increasing liquidity and size of issuances, building benchmark yield curves and establishing best market practices and minimum standards for future issuances.<sup>21</sup>

The Green Bond concept emerged in 2007/2008 through a variety of actions. In 2007, the European Investment Bank (EIB) launched a structured product, a *Climate Awareness Bond*. Instead of a fixed coupon, the bond's returns were linked to an equity index (such a bond is commonly referred to in the bond market as "structured").

In 2008, the World Bank and Skandinaviska Enskilda Banken (SEB) launched the first labeled green bond together with a group of Swedish investors with mainstream financial mandates to participate in climate financing and raise awareness on climate related risk. The inaugural World Bank *Green Bond* was the first climate-related fixed income instrument to attract mainstream portfolios in a larger way. It was designed as an investment vehicle that integrates the fiduciary element of fixed income products with climate mitigation and adaptation awareness, giving mainstream investors access to climate-related investment opportunities.<sup>22</sup>

In the green bond market, the EIB, the World Bank Group and other SSA actors have played a major role in supporting the market's development and promoting best practices in procedures and disclosure. As of mid-2017, with total cumulative issuance of over USD 20 billion in eleven currencies, the EIB was the largest issuer of green

21 See OECD (2016), *Green Bonds: Country Experiences, Barriers and Options*, input report prepared for G20 GFSG; OECD (2017), *Mobilising bond markets for a low-carbon transition*.

22 World Bank (2016), *Why did multilateral development banks (MDBs) issue the first green bonds?*



bonds worldwide.<sup>23</sup> In 2014, the German development bank KfW entered the market as an issuer. Since setting up its green bond programme, KfW has issued eleven green bonds amounting to EUR 11.5 billion making KfW one of the major and most active issuers in the space.<sup>24</sup> Among the largest issuers is also the World Bank (IBRD), with USD 10 billion equivalent in green bonds issued in 18 currencies through more than 125 transactions.<sup>25</sup>

These institutions typically issue green use of proceeds bonds to finance their multi-sector green portfolio. Outstanding green bonds and projects financed with green bond proceeds are transparently reported and publicly available on the respective websites, in their green bond reports and newsletters. Another significant SSA issuer is the International Finance Corporation (IFC), a member of the World Bank Group focusing on the private sector, which is one of the earliest (since 2010) and largest (total issuance volume of USD 5.4 billion)<sup>26</sup> green bond issuers as well. Further green bond issuance by multilateral or national development banks include such from the African Development Bank, the Asian Development Bank, the Inter-American Development Bank, New Development Bank, BNDES (Brazil), Korea Development Bank and Nacional Financiera (Mexico).

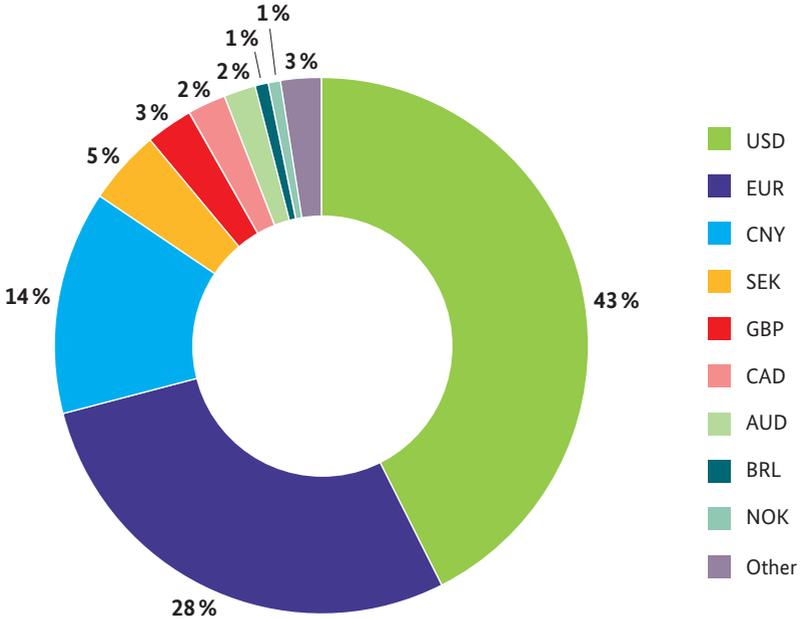
23 European Investment Bank as of 3 October 2016. As of 30 June 2016, CAB proceeds have been allocated to 145 projects in 47 countries. For the full list of CAB financed projects until H1 2016, see <http://www.eib.org/attachments/fi/projects-supported-by-cabs.pdf>.

24 KfW as of June 2017.

25 See World Bank as of December 2016.

26 IFC as of November 2015.

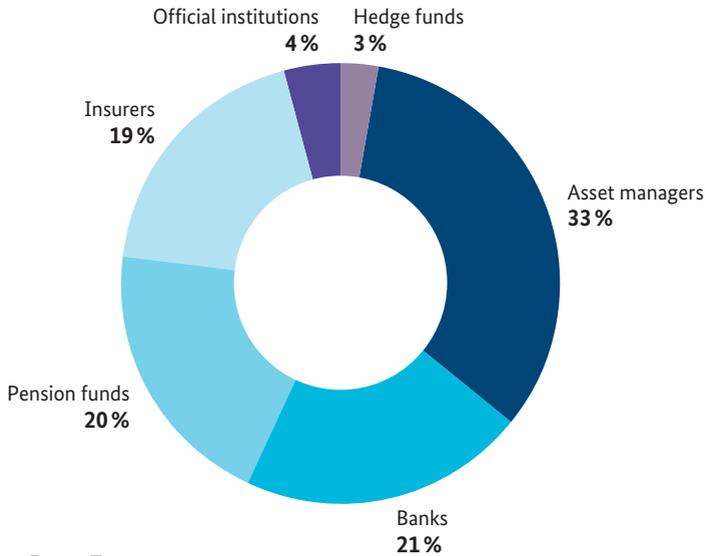
Figure 1.2: Currency split in the green bond market (2007-2017)



Source: Bloomberg and SEB

The first ever sovereign green bond was issued by Poland in December 2016. The EUR 750 million, five-year issuance with a coupon of 0.5% was raised to finance several national green projects such as in renewable energies, clean transport infrastructure, sustainable agriculture and afforestation. France followed in January 2017 with a record-breaking EUR 7 billion green OAT bond that received over EUR 23 billion of bids. With a maturity of 22 years, the Green OAT / 1.75% / 25 June 2039 issuance became both the largest and longest-dated benchmark green bond issued until date. It was placed with a very wide range of investors: asset managers (33%), banks (21%), pension funds (20%), insurers (19%), official institutions (4%) and hedge funds (3%). The bond was tapped for a further EUR 1.6 billion in June 2017.

Figure 1.3: Investor base diversification of the French Sovereign Green OAT Bond



Source: Agence France Tresor

Other sovereigns that had been cited as looking into issuing a green bond include Bangladesh, China, Germany, Kenya, Morocco, Nigeria and Sweden.<sup>27</sup> For governments, green bonds may represent an attractive tool to raise low-cost funding for implementing their green agendas such as defined in the *Nationally Determined Contributions* that governments have committed themselves to against the background of the Paris Agreement.<sup>28</sup>

At the sub-sovereign level, so called green muni bonds,<sup>29</sup> are already commonly used by both state-, county- and city-level governments, as well as other public funding authorities and agencies in order to satisfy the tremendous public investment needs

27 Environmental Finance (2016), Green Bond Comment: November.

28 UNFCCC (2016), Intended Nationally Determined Contributions.

29 US Green City Bonds Coalition (2015), Green Muni Bonds Playbook.



for a sustainable infrastructure as well climate mitigation and adaptation projects. The first green muni bond was issued by the Swedish City of Gothenburg in 2013. The first emerging market green muni bond was launched by the City of Johannesburg in 2014. Another notable green bond in Latin America is the USD 2 billion bond issuance by a government agency of Mexico City that will finance its new zero-emissions airport.

Green bonds have been issued by all four Scandinavian Local Funding Authorities (Kommuninvest in Sweden, Kommunalbanken in Norway, MuniFin in Finland and Kommunekredit in Denmark); by Export-Import banks in India and Korea; and Export Credit Agencies in Sweden and Canada. Other examples by agencies include the New York Metropolitan Transportation Authority (MTA), which issued raised USD 500 million in 2016 to renew the regional infrastructure including projects on New York City Transit, Long Island Rail Road and Metro-North Railroad.

Particularly in the United States, the market for green muni bonds has reached a considerable size, representing roughly half of its domestic green bond market in 2016.<sup>30</sup> Benefitting from tax exemption in many cases, the largest issuers of green U.S. muni bonds include New York, California and Massachusetts. Other examples can be found in the public transportation space with issuances from Seattle Transit Authority, and Transport for London Provinces have issued green bonds, from Ontario and Québec in Canada to Victoria in Australia.

### Non-financial corporates

In 2013, the Swedish real estate company Vasakronan was the first corporate to issue a green bond. In 2014 and 2015 aggregated issuance by corporates amounted to roughly USD 13 billion, while issuance roughly doubled to more than USD 25 billion in 2016. Among the earlier ground-breaking corporate green bond issues are Toyota's green asset backed security issued in 2014 to finance electric and hybrid vehicles (representing the first transport-only green bond) and Apple's USD 1.5 billion issuance in 2016, the first from a technology company. The world's most valuable company by market capitalization, which intends to use proceeds to green its operations including

<sup>30</sup> For a list of U.S. green muni bonds issued at state, county and city level, see OECD (2017), Mobilising bond markets for a low-carbon transition, page 46f.



its facilities, products and the supply chain, thereby set an important signal for other companies to follow suit, which it underlined with its second green bond issue in June 2017.<sup>31</sup> There have further been issues from a wide variety of corporate sectors including first issues for utilities (EDF), engineering (Skanska), real estate (Vasakronan), food (BRF), cosmetics and personal care (Unilever), and others.

### Financial institutions

Since loans provided by financial institutions represent in most countries by far the most important source of funding, bonds play a significant role in funding and refinancing of financial institutions' on-balance sheet lending activities.<sup>32</sup> Issuance from financial institutions has hence grown steadily since then. The major increase in 2016 stems particularly from the strong issuance by banks in China (green financial bonds made up 76 percent of the total amount of Chinese issuance in 2016), where non-financial corporates heavily rely on bank lending.<sup>33</sup> Based on an OECD estimate, in a 2 degree energy sector investment scenario, financial sector green bond issuance has the potential to continue growing strongly, that is to a total in outstanding bonds of up to USD 1 trillion in 2025 and USD 1.7 trillion in 2035.<sup>34</sup>

31 See Sustainalytics (2016), *Apple Inc. Green Bond, Second Opinion*.

32 In the US and EU, 42 percent and 48 percent respectively of outstanding debt securities were issued by financial institutions in 2014. The bond to loan ratio of commercial banks in both markets is at around 1:3 (McKinsey (2013), *Between deluge and drought: The future of US bank liquidity and funding*, McKinsey Working Papers on Risk, No 48; European Central Bank (2015), *Consolidated banking data, Database, ECB Statistical Data Warehouse*).

33 OECD (2017), *Mobilising bond markets for a low-carbon transition*.

34 OECD (2016), *Quantitative Framework: Analyzing Potential Bond Contributions in a Low-Carbon Transition*.

## > Challenges and conclusions

One of the major impediments for potential issuers to first enter the green bond market may be the lack of awareness of the benefits of green bonds, which 74 percent of participants of a survey by the G20 Green Finance Study Group named.<sup>35</sup> In connection to this, the initial costs related to building market knowledge and establishing internal expertise and procedures for issuing a green bond (namely, governance, management of proceeds, external review and reporting) represent a barrier as well (named by 41%). In this context, the lack of clearly set definitions in most jurisdictions for what qualifies as green project or asset (43%) leaves many issuers insecure about assigning the green label to their bond issue, particularly if risk averse with respect to potential reputational concerns in case the green labeling is publicly challenged.

Promoting capacity building initiatives as well as creating a conducive policy environment both for issuers and domestic and international investors may reduce such barriers and encourage more issuers to consider green bonds as a financing instrument. Such measures may include standardization of definitions and disclosure requirements, de-risking tools (e.g. guarantees, credit enhancements), tax incentives and capacity building measures.

35 The survey on “barriers to scaling up the green bond market” by the G20 Green Finance Study Group (GFSG) received responses from a group of 24 key investors, issuers and intermediaries in the green bond market. In OECD (2016), Green Bonds: Country Experiences, Barriers and Options, input report prepared for G20 GFSG.

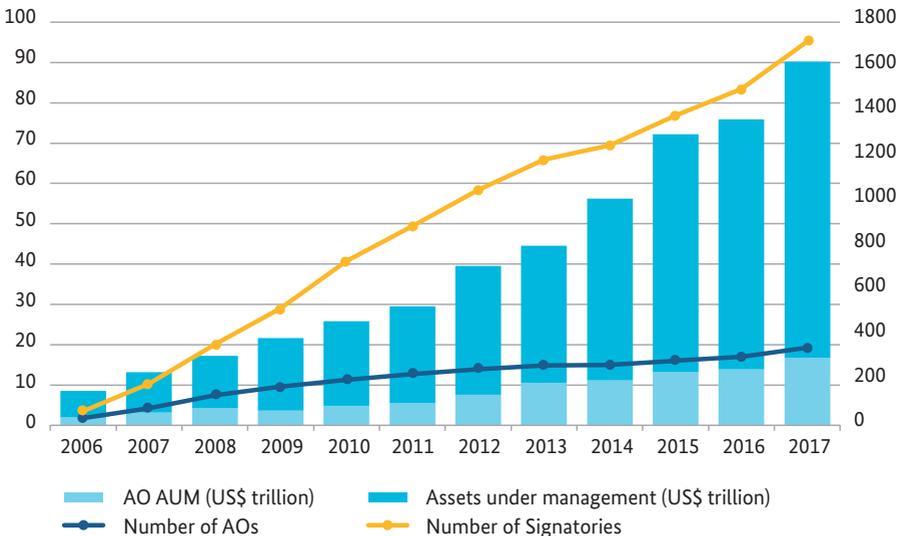
### III. Investors

On the demand side, there is an increasingly strong interest by investors in bonds identified from them by the green label. This chapter will scrutinize why green investments and specifically green bonds are so attractive for investors, what types of investors are engaged in the green bond market, and what reasons might inhibit others from investing in green bonds.

#### > Why invest in green?

Over the past ten years, the number of investors that have publicly committed to invest according to the UN-supported *Principles for Responsible Investment* (PRI) has grown to more than 1,700 signatories from over 50 countries. The aggregated volume of assets under management (AUM) represented by this group amounts to USD 73.5 trillion.<sup>36</sup> In order to comply with these pledges, investors seek attractive investments

Figure 1.4: Number of signatories to the Principles for Responsible Investment and assets under management



Source: PRI as of April 2017. Right axis: Number of signatories; left axis: AUM in USD trillion.

36 Principles for Responsible Investment as of April 2017; IMF (2013).



that meet their risk/return profile. Green bonds represent a potentially very powerful financial instrument in facilitating investors to access respective investment opportunities that fit within existing fiduciary mandates.

The PRI were launched in 2006 to guide investors in integrating environmental, social and governance (ESG) factors into investment decisions and ownership practices. By signing the Principles, investors commit to adopt the six principles, where consistent with the investors' fiduciary duty. Accounting for the information asymmetry between asset managers and their clients, the fiduciary duty obliges the former to act loyally and prudently in the best interest of their clients.<sup>37</sup> For a long time, this fiduciary duty had been viewed as barrier for asset managers to account for ESG factors given their potential diminishing impact on returns. This perspective has however increasingly been challenged. A common understanding has emerged that integrating ESG factors into the investment decision is both "clearly permissible and arguably required" as first stated in the Freshfield report of the United Nations Environment Programme – Finance Initiative (UNEP FI).<sup>38</sup> A recent study by the OECD strongly supports this view but calls for regulatory clarification in order to dispel doubts on investors' duties.<sup>39</sup> France has already taken action when it introduced new regulation in 2017 that requires asset owners and asset managers to report on their portfolio's integration of ESG factors, climate risks, and contribution to the transition to a low-carbon economy, or to explain why they have not done so. This change in perspective reflects the increasing understanding and recognition that ESG factors may significantly impact the long-term risk and return performance of issuers and investments.<sup>40</sup> A recent, very

37 UN Global Compact, UNEP, UNPRI (2015), Fiduciary Duty in the 21st Century.

38 United Nations Environment Programme Finance Initiative (2005), A Legal Framework for the Integration of Environmental, Social and Governance Issues into Institutional Investment.

39 OECD (2016), OECD Analytical report on investment governance and the integration of ESG factors.

40 See for the rating agencies' perspective, for instance, Moody's (2015), Environmental, Social and Governance (ESG) Risks – Global: Moody's Approach to Assessing ESG Risks in Ratings and Research. For the investor perspective see, for instance, the Global Investor Statement on Climate Change, signed by 409 investors with more than USD 24 trillion AUM, or the Paris Green Bond Statement (Dec 2015) signed by investors with AUM of USD 10 trillion. Among the institutional investors that already require their investment managers to incorporate ESG factors into investment processes and to regularly report on these is, for instance, the California Public Employees' Retirement System (CalPERS), the second biggest pension fund in the United States.



important signal set by investors in this regard was the PRI supported *Statement on ESG in Credit Ratings* signed by 100 investors with AUM of USD 16 trillion and six credit rating agencies, who intend to “enhance systematic and transparent consideration of ESG factors in the assessment of creditworthiness.”<sup>41</sup>

Particularly for institutional investors with a long-term investment horizon financially material ESG considerations should be considered an integral part of the fiduciary duty to their clients and beneficiaries. The underlying factors affecting the risk/return considerations with respect to environmental factors include in particular:

- **Regulatory and policy risks:** Increased global efforts and commitments for combatting climate change increase stranded asset concerns, hence putting carbon-intensive assets and investments at a higher risk.
- **Policy incentives:** Changing policies on taxation and subsidies that increasingly favor renewable energy sources over fossil fuels alter relative prices of energy-related assets.
- **Increased competitiveness of low-carbon energy sources and technologies:** The growing efficiency of maturing clean technologies, storage and transmission capacities as well as further technological innovations improve the cost-competitiveness of renewable energy sources compared to fossil fuels, altering the relative return profile.<sup>42</sup>
- **Long- vs. short-termism:** Growing awareness and concerns about negative effects of short-termism in business practices on medium- to long-term company performance and investment returns influence investment strategies.
- **Improved availability of adequate data and risk assessment methodologies:** Insufficient, non-transparent information and disclosure of environmental risks and externalities result in distorted relative prices of environmental services and assets; in recent years, a number of initiatives have been launched in order to better measure, assess and report environmental risks.<sup>43</sup>

41 UN PRI (2016), *Statement on ESG in Credit Ratings*.

42 Climate Policy Initiative (2015), *Global Landscape of Climate Finance 2015*.

43 See, for example, the Financial Stability Board’s Task Force on Climate-related Financial Disclosures (2017), *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures*, or UNEP (2016), *Environmental risk analysis by financial institutions – a review of global practice*.

- **Changing consumer and client expectations:** Customers and clients are becoming more and more conscious and demanding of where and how their money is being invested, thus requesting more transparency regarding climate change and environmental damage, labor conditions, corruption and further critical business practices.

Consequently, in order to better manage risks and enhance financial returns in the long run, investors increasingly search for investment opportunities in projects and assets that are resilient to environmental and climate related risks and meet the demands of their increasingly environment conscious clients.

### > Why green bonds?

The concept of green bonds was developed in response to investor demand for a simple yet effective fixed-income instrument that helps to identify and access green investment opportunities that fit within fiduciary mandates. The green label thereby works as a signaling function that lowers transaction costs for investors for the following reasons:

- Disclosure of the bond's use of proceeds with assurance through external review facilitates the identification of green assets and projects, thus lowers search costs;
- Reporting on use of proceeds and environmental impacts through the issuer facilitates the monitoring of investment allocations and reporting towards clients;
- The green label works as communication tool in demonstrating compliance with responsible investment commitments and mandates to clients and the public.

Given these benefits, the peculiar strength of green bonds lies in the instrument's potential to be easily adopted not only by dedicated sustainable or green investors but by mainstream investors. As a result, green bonds are attracting more and more investments as reflected in a widening range of investor types and frequent oversubscriptions of issuances.<sup>44</sup> This strong appetite of investors for green bonds is also expressed in a number of industry initiatives that have been formed in the past few years, most notably including:

44 KPMG (2016), Green Bonds – The Process.

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- The signatories of the *Paris Green Bond Statement* declared their “responsibility (as investors and fiduciaries) to address threats to the future performance of [their] investments from climate change as well as a responsibility to secure [their] clients’ savings through sustainable and responsible investments.”<sup>45</sup> Moreover, they stated their “believe that green bonds can be part of [their] strategy to accomplish both of these aims.” The statement was signed in December 2015 in the context of the Paris Climate Agreement by investors with USD 10 trillion of assets under management including Allianz Global Investors, Aviva Investors, AXA Investment Managers, BlackRock, California Teachers’ State Retirement System, Legal & General Investment Management, Zurich Insurance Group and others.
  - The signatories of the *Statement of Investor Expectations for the Green Bond Market* – comprising 26 large global investors such as Allianz SE, AXA Group, BlackRock, CalSTRS, PIMCO, Zurich Insurance Group under Ceres’ *Investor Network on Climate Risk* – “see a growing investor appetite for green bonds that help fund the transition to a low carbon, sustainable economy,” encourage “consistency in standards and procedures helpful to the development of a robust Green Bond market and view adherence to the GBP to be an essential step in this direction.”<sup>46</sup>
  - The *Green Infrastructure Investment Coalition* aims to bring together investors, governments and development banks to help increase the flow of institutional investors’ capital to green infrastructure investments, with green bonds being advocated as a suitable instrument to this end.<sup>47</sup> Members include, among others, the Institutional Investor Group on Climate Change (IIGCC), Legal & General Investment Management and the European Investment Bank (EIB).

45 Climate Bonds Initiative (2015), [Paris Green Bond Statement](#).

46 Ceres, 2015, [Statement of Investor Expectations for the Green Bond Market](#).

47 Climate Bonds Initiative, UN PRI, International Cooperative and Mutual Insurance Federation and UNEP Inquiry into the Design of a Sustainable Financial System (2015), [Green Infrastructure Investment Coalition Statement](#).

Despite the fact that green bond markets are miniscule when compared to the size of the global bond market, these statements including their recognizable list of signatories make clear that green bonds are considered a relevant instrument by the large mainstream investors, which are examined in more detail in the following segments of this chapter.

### > Who invests in green bonds?

Institutional investors, specifically pension funds and insurance companies as well as banks and investment funds, have been the main drivers in the growth of green bond markets. Pension funds and insurers typically seek long-term, low-risk investment opportunities that offer predictable, steady returns to match their liabilities. Green bonds very often provide these features:<sup>48</sup>

- **Asset-liability matching:** The average maturity of green bonds is between three and ten years matching the long-term investment horizon of many institutional investors. Roughly 28 percent have maturities of more than ten years.
- **Low risk:** Though not an inherent feature of green bonds per se, 82 percent of issuances are rated investment grade, i.e. classified as BBB- or higher.
- **Comparable yields:** Where data is available, evidence suggests that green bonds are priced in line with regular bonds.
- **Portfolio diversification through diverse currencies:** Although over 80 percent of green bond issuances are in US dollars or Euros, green bonds have been issued in 25 currencies, among them the Chinese Renminbi with growing significance.

Additionally, one of the major benefits of green bonds to investors is their value in communicating their sustainability strategy and commitments to clients and the public without having to bear significant extra costs.

Among the banks, insurers and asset managers that have declared to allocate USD 1 billion or more into green bonds, respectively, are for instance Barclays, Credit Agricole, Deutsche Bank, HSBC, KfW, Actiam, Aviva, AXA and Zurich.<sup>49</sup>

48 Climate Bonds Initiative (2016), *Bonds and Climate Change: State of the Market in 2016*, and OECD (2017), *Mobilising bond markets for a low-carbon transition*.

49 OECD (2017), *Mobilising bond markets for a low-carbon transition*.



At the same time, strong demand comes, inter alia, from the large mainstream asset managers. From the list of the top 20 asset managers globally (by AUM), six are among the signatories of the above mentioned *Paris Green Bond Statement and the Statement of Investor Expectations for the Green Bond Market*. These include BlackRock, the largest asset manager globally with AUM of USD 4.4 trillion, State Street Global Advisors (USD 2.1 trillion), PIMCO (USD 1.3 trillion), Legal & General Management (USD 1.0 trillion), Amundi (USD 985 billion) and AXA Investment Managers (USD 669 billion).<sup>50</sup> Among the top 50 are also BNP Paribas Investment Partners, Allianz Global Investors, APG, AllianceBernstein, Aviva and Natixis Asset Management.

Among the largest pension funds that engage in green bond markets are, for instance, California Teachers' State Retirement Systems, North Carolina Retirement System, University of California, Swedish AP-Fonden<sup>51</sup> and South Africa's Government Employees Pension Fund.

Attracted by the long maturities and high credit quality green bonds very often show, another source of demand stems from sovereign wealth funds (SWF) such as the Norwegian Government Pension Fund Global (with USD 885 billion of AUM the largest SWF), which entered the green bond market in early 2014 and allocated USD 6.3 billion in environment-related investments in 2015.<sup>52</sup> A significant segment of demand for green bonds also stems from governments (e.g. Central Bank of Peru, Central Bank of Bangladesh,<sup>53</sup> Treasury of California State), development banks as well as corporate investors (e.g. Apple).

Opportunities to invest in green bonds (including for retail investors) are offered by a growing number of dedicated green bonds funds. The larger ones with over USD 100 million under management included BlackRock (which also has a green bond index fund), Storebrand, Foresight, the Brazilian development bank BNDES, Humanis SEB,

50 IPE (2016), [Top 400 total global AUM table 2016](#).

51 The Swedish pension fund AP2 committed to allocate one percent of its portfolio in green bonds.

52 Government Pension Fund Global (2015).

53 Bangladesh's central bank invests parts of its foreign exchange reserves in green bonds. See Bangladesh Bank's [press release](#).



AXA Investment Managers, and Amundi. The largest green bond fund, IFC's USD 2 billion *Green Cornerstone Bond Fund*, which was set up jointly with the asset manager Amundi in mid-2017, will invest in green bonds issued by local banks in developing countries. By providing a first loss tranche and additional capacity building measures, the fund aims to build local green bond markets in selected countries. Further green bond funds include those managed by Mirova, Calvert, Erste Asset Management, Raiffeisen Capital Management, Allianz, State Street, Columbia Threadneedle, NN Investment Partners, and Nikko AM.<sup>54</sup> As of early 2017, there were green bond Exchange Traded Funds (ETFs) launched by Lyxor and VanEck. Such ETFs facilitate access to green bond investments for both retail and institutional investors.

Furthermore, there were several cases of green muni bonds in the United States that allowed retail investors to directly place orders, e.g. in the cases of Massachusetts State and New York's Metropolitan Transportation Authority (MTA).

### > **The relevance of green bond indices and stock exchange listings**

Green bond indices measure the financial performance of a group of green bonds that must fulfill certain criteria (e.g. regarding qualifying green categories) to be included in the index. Such indices thereby serve investors both to identify green bonds that meet their requirements concerning specific aspects of the bond and to track their performance. Moreover, the establishment of dedicated green bond indices contributes to scaling up green investments as they allow passive funds such as ETFs, which track certain, specified indices for investment, to invest in green bonds. As of December 2016, the following green bonds indices exist:

- Bank of America Merrill Lynch Green Bond Index<sup>55</sup>
- Bloomberg MSCI Green Bond Index<sup>56</sup>
- S&P Green Bond Index
- Solactive Green Bond Index<sup>57</sup>

54 OECD (2017), Mobilising bond markets for a low-carbon transition.

55 Bank of America Merrill Lynch's Green Bond Index is aligned to Bloomberg's green bond definition.

56 Bloomberg MSCI Green Bond Index excludes for instance large-scale hydro projects.

57 The indices by Barclays MSCI, S&P and Solactive are aligned with the Climate Bonds taxonomy.

- ChinaBond China Green Bond Index and ChinaBond China Green Bond Select Index
- CUFE-CNI Green Bond Index Series<sup>58</sup>

With partly similar implications, dedicated green bond listings and segments have been introduced by twelve stock exchanges, namely those of London, Luxemburg, Mexico City, Oslo, Shenzhen, Paris, Borsa Italiana, Riga, Amsterdam, Lisbon, Johannesburg and Stockholm.<sup>59</sup> They serve to enhance visibility and data access data, facilitate secondary market trading and can impose certain requirements such as the obtainment of a second opinion.

Both indices and listings can have a shaping impact on the development of common definitions (e.g. by setting eligibility and in- or exclusion criteria for projects and project categories) and common practices, for instance by making the use of external review and regular reporting mandatory, thereby guiding investor decisions significantly.

### > Challenges and conclusions

There are several, commonly named challenges and risks for green bond investors.<sup>60</sup> One of the most frequently cited is the risk of “green washing”, which is partly a function of the lack of clarity regarding definitions, binding regulation and legal enforcement of the environmental credentials in widely self-regulating green bond markets. The GBP, which represent internationally the most recognized reference for market participants (see 1.1), have largely contributed to building a framework for a common and sound governance process recommending transparency and disclosure on its four core components: the use of proceeds, process for project evaluation and selection, management of proceeds and reporting. While giving quite clear guidance on process criteria, the GBP do not provide clear definitions for eligible projects but instead give

58 [Luxemburg Stock Exchange \(2017\), Shenzhen and Luxembourg partner with Beijing’s Central University of Finance and Economics to launch new Green Bond Index Series.](#)

59 [Sustainable Stock Exchanges Initiative \(2016\), 2016 Report on Progress.](#) Sustainable Stock Exchanges Initiative(2016), Fact Sheet: Bolsa Mexicana de Valores,

60 See, for instance, OECD (2016), Green Bonds: Country Experiences, Barriers and Options, input report prepared for G20 GFSG; or Climate Bonds Initiative (2016), Scaling up Green Bond Market Issuance.



broader orientation for eligible project categories that shall “provide clear environmental benefits.”<sup>61</sup> Outside of China, where regulation clarifies eligible green projects, this approach leaves the definition of what qualifies as green to issuers, verifiers, indices and investors. While thereby allowing for a more dynamic evolution of qualifying projects and assets and accounting for regional conditions, some stakeholders may feel insecure about the greenness of projects and assets. Indeed, the survey by the G20 Green Finance Study Group, which explored the barriers to scaling up the green bond market, found that 43 percent named the “lack of local definitions of green bonds” as a challenge.<sup>62</sup>

Defining green through national regulation may, however, not necessarily improve clarity for international investors as transactions costs for understanding and managing regulatory differences across legislations increase with fragmentation in national regulations. Fostering harmonization and transparency of practices and standards through initiatives from policymakers and non-governmental initiatives – such as initiated by Chinese regulators and the EIB in early 2017 – therefore remain key issues for investors in this dynamically growing market. Transparency can, for instance, be enhanced through green bond indices and listings, which help investors to identify green bonds according to their requirements. The still insufficient availability of indices and listings, as well as ratings was still identified by more than half (56 percent) of the surveyed investors, issuers and intermediaries as a barrier. Lacking or low credit ratings are indeed very often a limiting factor for investors seeking green opportunities, particularly in emerging markets.

Related to credit quality concerns, another restriction for international investors, who want to diversify their portfolio, may be a limited access to local green bond markets (67 percent), for instance due to differing disclosure requirements, a lack of adequate risk mitigation instruments, capital controls or other regulatory restrictions for non-domestic investors. Regulatory reform, such as China’s opening of the domestic bond

61 ICMA (2017), *The Green Bond Principles*; for the list of Green Project categories, see chapter 1.1.

62 See the results of the GFSG survey on “barriers to scaling up the green bond market”, which received responses from a group of 24 key investors, issuers and intermediaries in the green bond market. In OECD (2016), *Green Bonds: Country Experiences, Barriers and Options*, input report prepared for G20 GFSG.



market for international investors, and policy support, for instance through anchor investments and credit enhancement programs offered by development banks such as IFC (inter alia through its Green Cornerstone Bond Fund) and KfW, are important measures to lower such barriers for international investors.

With respect to demand side constraints, on the other hand, three out of four survey participants pointed out the “lack of awareness of environmental risks and green bond benefits” as a major impediment for green bond market expansion. Initiatives to raise awareness and provide technical assistance in order to enable the integration of environmental factors into investment decisions are, therefore, key in this still nascent stage of the market. Lastly, providing more policy clarity on the compatibility of environmental considerations and the fiduciary duty, as examined above, is another important step in order to align institutional investors’ investment mandates with green investment strategies. International initiatives such as the previously mentioned work by the G20 Green Finance Study Group and the FSB Task Force on Climate-related Financial Disclosure have significantly contributed lifting the topic’s appearance on the agenda of decision-makers worldwide.

## IV. External review

External reviews, assessments or verification of green bonds or associated frameworks play a critical role in assessing relevant information on the bond's green credentials. The GBP (2017), which recommend the use of external review of project evaluation/ selection and management of proceeds, distinguish four types of external review:

1. **Consultant review and second opinion:** An issuer can seek advisory support from a consultant or consulting firm with recognized environmental climate finance expertise, which revises and assesses the issuer's green bond framework, typically in form of a second opinion prior to the issuance.
2. **Verification or auditing:** An issuer can have its green bond, the associated framework or individual parts independently verified or assured by qualified third parties (usually audit firms) against certain internal or external reference criteria.
3. **Certification:** An issuer can have its green bond, the associated framework or individual parts certified by a qualified third party (usually an accredited certifier) against an external standard.
4. **Rating:** An issuer can have its green bond or associated framework rated by qualified third parties, usually rating agencies or specialized consulting firms.

The different types of external review serve different purposes and interests of issuers and investors, which will be assessed in more detail below. The most common form of external reviews of green bonds are second opinions, which about 70 percent of green bonds have, while 20 percent use other forms of assurance such as audits or certification.<sup>63</sup> Only few issuers choose to seek more than one form of external review, mostly because of the related costs, though it might be desirable from the investors' point of view to attain both pre- and post-issuance reviewed information on the bond's green features and impact.<sup>64</sup>

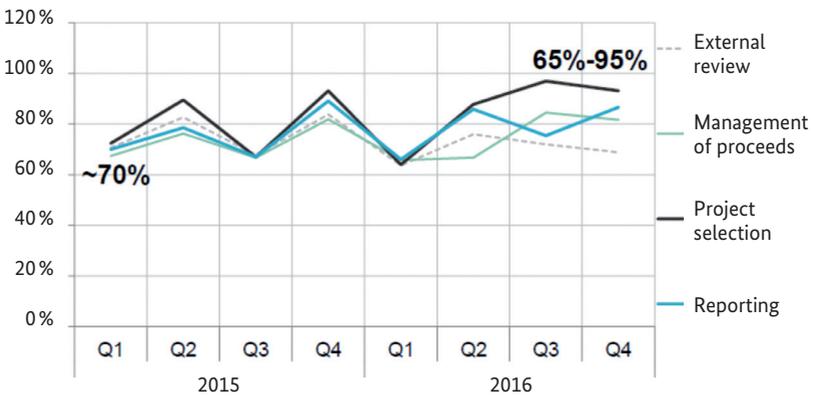
Bloomberg LP has established a process to track any green bond disclosure relevant to the GBP. These are disclosures related to project selection, management of proceeds, reporting (both of proceeds and environmental impact) and external review (assurance provision). The additional disclosures have been widely adopted by the green bond

63 CBI/HSBC (2015) as of October 2015.

64 Costs may vary between USD 10,000 and 100,000. See OECD (2016), Green Bonds: Country Experiences, Barriers and Options, input report prepared for G20 GFSG.

market. The percentage of labelled green bonds that have delivered, or have at least committed to these additional disclosures has increased from around 70 percent in Q1 2015 to 80 percent in Q4 2016. There is still a lag in the number of green bonds that seek an external review as the figure below shows.

Figure 1.5: Percentage of labelled green bonds disclosing additional information as catalogued by Bloomberg LP



Source: BNEF

### > What is the value of external reviews?

While green bonds are in most jurisdictions subject to the same regulation and legal supervision as regular bonds, there are – with the exception of China and India – no regulatory bodies that supervise the greenness of these bonds from a legal perspective. In the absence of such regulation but also in the presence of national standards that diverge from international practices, external review providers assume an important role in safeguarding the environmental integrity of the market and hence the credibility of the product. By enhancing transparency and soundness of the environmental features of the green bond, external reviews significantly contribute to mitigate concerns of “green washing”, that is the risk of a green bond to fail achieving the declared environmental benefits.



Moreover, by contributing to provide more and independently reviewed information on the greenness of the bond, external reviews lower transaction costs for investors, particularly for those with more limited technical and financial capacities to make such an assessment in-house, and hence facilitate a wider range of investors to access green bond markets and navigate in different jurisdictions.

### > **Second opinions**

A second opinion, which represents the common form of a consultant review for green bonds, is a pre-issuance assessment of the green bond or, more specifically, its associated framework. Conducted upon the issuer's request by external consultants or consultancies with environmental and climate expertise, a second opinion has the purpose to provide investors (and the public) with the relevant information on the greenness and governance features of the bond that they need in order to make their initial investment decision. The consultancy thereby reviews relevant documents and engages in a dialogue with the issuer. In this process, the consultancy may take an advisory role in revising and refining the issuer's green bond framework.

The green bond framework is a first-party opinion by the issuer, which usually contains – typically in adherence to the GBP – information on the definition of green projects or project categories, for which proceeds are intended to be used, as well as internal processes of project selection/evaluation, management of proceeds and reporting practices. The framework, which is drafted by the issuer, represents the most central document for review. Further relevant documents that are typically assessed in addition include, for instance, the issuer's sustainability reports, if available, or other information on the issuer's green and general business profile and strategy. Based on this information, a second opinion typically comprises a qualitative assessment of the robustness, credibility and transparency of procedures and practices established by the issuer for issuing a green bond – alongside with a brief description of the issuer and the characteristics of the bond, the applied underlying assessment approach or methodology and the list of documents reviewed.

Most second opinion providers present findings in a descriptive way correspondent to the GBP. A few providers seek however a more analytical approach by evaluating strengths and weaknesses and deducting recommendations (e.g. CICERO). Moreover,



second opinions by different providers vary with respect to the granularity (Sustainalytics and oekom, for instance, provide relatively comprehensive assessments), the use of quantitative indicators or rating methodologies (only CICERO and oekom) and the availability of post-issuance review updates. Notably, some second opinion providers evaluate specific projects, for which green bond proceeds are used (e.g. oekom), while others assess the internal processes and governance structures of how the issuer defines eligible project categories, selects projects, and monitors and reports on the use and impact of proceeds (e.g. CICERO).

About 70 percent of externally reviewed green bonds have a second opinion. The most prominent second opinion providers include CICERO (with over 60 opinions provided as of January 2017)<sup>65</sup>, DNV GL, Sustainalytics, Vigeo, oekom, and KPMG. Costs range from USD 10,000 to higher costs that may vary on a reviewer and transaction-specific basis.

Both the GBP and the regulators in China and India do not require but recommend issuers to attain a second opinion in order to provide investors with transparent and sound information, beyond national standards and peculiarities, and to promote environmental and procedural integrity in the green bond market. Despite to broad use and recognition of second opinions, there are, however, some limitations and challenges related to second opinion provision: First, there may arise conflicts of interest given that second opinion providers are directly commissioned by the issuer and often advise the latter in developing the green bond framework, which will then be assessed by the same consultancy. This approach has the benefit that both parties can work together to build and enhance a solid framework that provides the information required by investors in an adequate way. Identifying shortcomings at an early stage allows issuers to correct the framework prior to the issuance. On the other hand, the independency of the final assessment through the second opinion provider may be questioned. The strongest control in this potential conflict of interest is probably the reputational risk that particularly non-for-profit and dedicated environmental consultancies would face in the case of allegations of neglecting their due diligence obligations.

65 [CICERO's Second Opinions on Green Bonds](#).

Secondly, a lack of standardization of second opinions might cause uncertainty and hence create additional transaction costs both for investors and issuers. With the launch of the Green Bond Principles in 2014 and their broadly achieved recognition, methodologies by second opinion providers increasingly converge towards a more harmonized approach but differences remain, for instance with respect to the depth of assessment, the environmental expertise and the use of quantitative measures as depicted above, hence limiting comparability and transparency for investors. In order to support the standardization of external reviews, the GBP Research Centre provides a template on its website.<sup>66</sup>

Third, although second opinions take into consideration whether structures and practices of reporting on the use and management of proceeds and environmental impacts are in place, post-issuance review for verification of these aspects including an environmental impact assessment are neither offered by all second opinion providers nor is there a strong external pressure on issuers to obtain one. Such post-issuance review may certainly be conducted in form of audits by specialized audit firms, which is however not yet a common practice, or often limited to the audit of the management of proceeds, and leaves a somewhat fragmented landscape for external review services.<sup>67</sup>

### > **Third party verification or audits**

Conducted by accredited auditing firms (such as KPMG, PwC, EY and Deloitte), third party verification refers to the both pre- and post-issuance regular auditing of the entire green bond process or parts of it, such as the allocation of proceeds. In line with national and/or international professional standards such as the International Standard on Assurance Engagements 3000 (ISAE 3000) such audits may represent the most independent form of assurance to investors that processes are in line with the statements made by the issuer. However, audits may have a stronger focus on procedural and managerial features of the bond issuance and not necessarily cover the assurance of the environmental objectives of the bond.

66 The Green Bond Principles (2017), External Review Form.

67 See, for instance, Bank for International Settlement (2016), Green Bonds – certification, shades of green and environmental risks.

## > Certification

In the absence of a national regulation and supervision in most green bond markets, a green bond issuer may want to obtain a green bond certificate that verifies the green credentials of the bond against an externally established standard. Such a label may give investors greater security and, moreover, raise the visibility of the bond.

As of end of June 2017, the Climate Bonds Standard (CBS), which was released by the Climate Bonds Initiative (CBI) in its second version in December 2015, represents the only internationally recognized green or climate bond certification scheme.<sup>68</sup> The CBS basically converts the principles established by the GBP into requirements that an issuer needs to satisfy when deciding to obtain the certificate for his bond issue. Differently from the GBP, the associated *Climate Bonds Taxonomy* defines clear sector-specific eligibility criteria for qualifying projects comprising eight categories with several sub-categories. The eight main categories cover energy, low-carbon buildings, industry and energy-intensive commercial, waste and pollution control, transport, information technologies and communications, nature based assets and water management. In order to ensure that the green bond project level criteria are aligned with a two degrees scenario,<sup>69</sup> the taxonomy provides detailed, science-based technical *sector specific standards* that require projects to meet certain criteria such as emissions intensity thresholds.<sup>70</sup> Regarding the management of proceeds, the CBS requires earmarking or ring-fencing. Instruments that are eligible for temporary investment of unallocated proceeds include cash or cash equivalent instruments, within a treasury function, and must exclude greenhouse gas intensive projects. Moreover, the CBS requires issuers to allocate funds within a 24 months settlement period.

In order to obtain the certification, a pre-issuance *readiness assessment* against the CBS by an accredited third party verifier is required. Accredited institutions, which need approval from CBI's board, comprise 22 institutions as of June 2017 including Carbon Trust, DNV-GL, EY, KMPG, oekom, PwC, Sustainalytics, SynTao, Trucost, Vigeo Eiris,

68 See Climate Bonds Initiative (2015), *Climate Bond Standard*, Version 2.0.

69 That is based on current international standards and research such as IPCC, IEA, Climate Science Framework.

70 For example, the emission baseline for green buildings is set at the top 15 percent of city-level emissions performance.



and others.<sup>71</sup> Within one year after issuance, issuers need to acquire an *engagement assurance* that confirms the ongoing eligibility in order to maintain the certification status. This post-issuance assurance focuses on the actual use of proceeds and unallocated funds. Furthermore, issuers are required to disclose at least annually to investors and the public the use and management of proceeds as well as the environmental objectives and impact based on reporting standards recommended by the GBP. As of December 2016, 25 green bonds with an aggregated volume of USD 8.5 billion have been certified against the CBS.<sup>72</sup>

The benefit of such a certification scheme is that it provides both issuers and investors with a clear and technically specified catalogue of what qualifies as green while imposing the challenge on the certifier of having to continuously update the catalogue according to the latest technological developments in the various sectors.

## > Ratings

Green bond ratings serve to qualitatively and particularly quantitatively evaluate different aspects of the bond issue according to a defined rating scale. Ratings may, for instance, refer to the actual or expected environmental impact of the project or project category, the governance structures and/or the transparency aspects related to the green bond, or all aspects jointly. The benefit of a rating lies for investors (and the public) particularly in the relative ease of comparing different green bonds – given that the rating is conducted under the same methodology. The different approaches and objectives pursued by different agencies do currently, however, leave a fragmented landscape that may require larger harmonization as green bond rating practices become more common over time.

### CICERO's Shades of Green methodology

As integral part of CICERO's second opinion, the independent non-for-profit climate research institute assesses the expected environmental impact of the defined green bond project categories with respect to their short, medium and long term contribution

71 For a full list of approved verifiers under the Climate Bond Standard, see CBI's website.

72 For a full list of certified Climate Bonds, see CBI's website (as of 13 December 2016).



towards a low-carbon, climate-resilient economy. Based on a thorough scientific approach using the latest climate and environmental science, CICERO's *Shades of Green* methodology expresses this in a light, medium or dark green shading.<sup>73</sup> With a pronounced dynamic approach, CICERO intends to impede rebound and lock-in or other external effects.

### Oekom's Sustainability Bond Rating

Besides CICERO, oekom, one of the world's leading rating agencies in the area of sustainable investment, is another second opinion provider that incorporates a rating into its review.<sup>74</sup> Through its *Sustainability Bond Rating*, which is based on a detailed ESG analysis of both the green bond and its issuer (the latter being expressed in oekom's *Corporate Sustainability Rating*, oekom assesses the added sustainability value and performance of the projects and assets financed by the green bond proceeds using standardized criteria and quantitative indicators. Differently from CICERO, oekom assesses the green bond on project-level.

### Moody's Green Bonds Assessment

Moody's *Green Bonds Assessment* (GBA) represents a forward-looking opinion on the issuer's practices and procedures towards managing, administering and allocating proceeds as well as reporting on financed projects.<sup>75</sup> The assessment consists of the scoring of the performance in five weighted key factors – *Organization, Use of Proceeds, Disclosure on the Use of Proceeds, Management of Proceeds, and Ongoing Reporting and Disclosure* – according to a scale ranging from GB1 (Excellent) to GB5 (Poor).<sup>76</sup>

73 CICERO (2016), Framework for CICERO's Second Opinions on Green Bond Investments.

74 Oekom Second Party Opinion.

75 Moody's, 2016, Green Bonds Assessment (GBA), Moody's Investor Service.

76 For instance, to reach a score of GB1 (Excellent) in the category Use of Proceeds, which receives a weight of 40 percent in the final score, 95 percent of proceeds need to be allocated to eligible project categories according to the issuer's definition in alignment with the Green Bond Principles and other applicable taxonomies.

### S&P's Green Bond Evaluation Tool

In September 2016, the rating agency Standard & Poor's (S&P) has proposed a green bond evaluation framework and scoring methodology that seeks to provide a qualitative and quantitative lifecycle assessment of the environmental impact of projects and assets financed by the bond.<sup>77</sup> The net environmental impact, which is calculated in relation to a business as usual baseline scenario, is expressed in a Mitigation score. In the case that bond proceeds are used for adaptation projects, an *Adaptation score* is calculated according to the resilience benefit, that is the reduction of expected social, environmental and financial damages caused, for instance, by extreme weather events, relative to accrued financing costs for respective measures. The final overall score furthermore incorporates a *Transparency score* (focusing on the quality of disclosure, reporting and management of proceeds) and a *Governance score* (focusing on internal structures to manage certification, impact assessment and risk monitoring and management).

### > Challenges and conclusions

This sub-chapter provided an overview on the different forms of external review, which all have their value and significance in promoting transparency and environmental integrity in green bond markets. At the same time, there are, as described, various limitations in this still emerging and fragmented field, often leaving issuers with uncertainty which form of review and provider to choose and how to sufficiently encounter skepticism from investors and the public. As green bond markets are expanding further, the need for a universal use of harmonized independent, high-quality review procedures is becoming more pronounced. This process may be accelerated indirectly, for instance, by fostering knowledge building on the value and benefits of external review, possibly by subsidizing the use of external review under certain conditions and more directly, by promoting standardization and obligatory use of external reviews for labelled green bonds by regulation, stock exchanges and index providers.

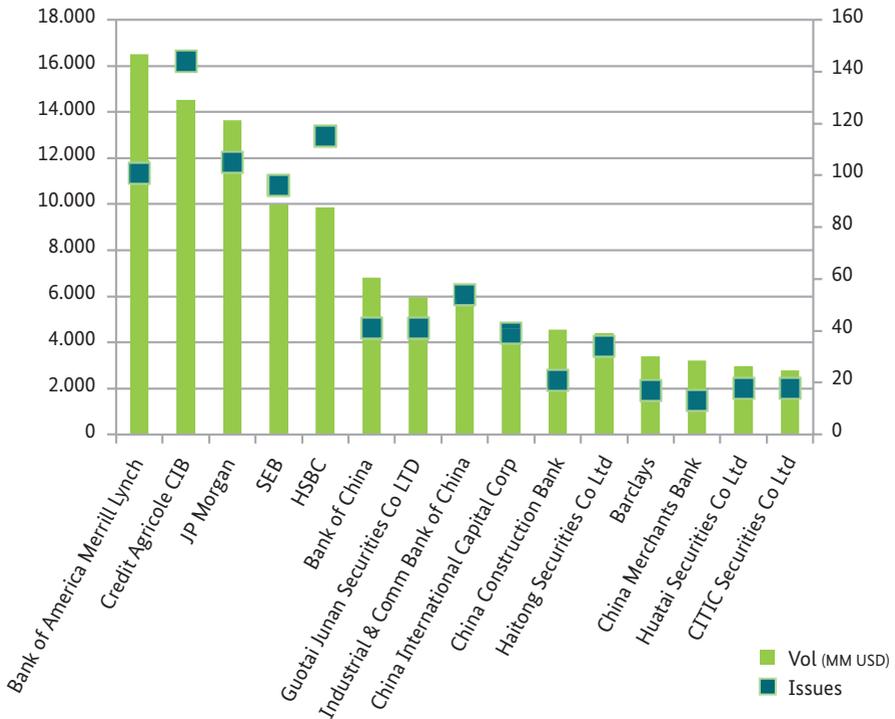
77 S&P (2016), Proposal For A Green Bond Evaluation Tool.

# V. Underwriters

As discussed in detail in chapter 2, issuers in the green bond market mandate investment banks to arrange and structure their green bonds. This process generally involves appointing a green structuring advisor, and arranging a series of fixed income investor meetings across relevant geographies for the upcoming green bond transaction.

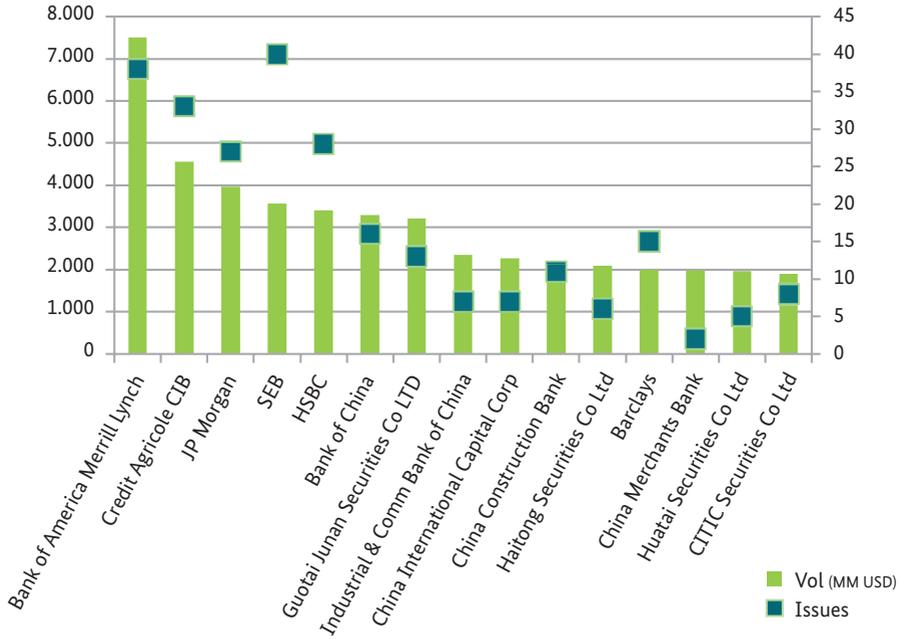
As shown in the historic league table in figure 1.6, a wide variety of investment banks are active in the market. The league tables, which are available on the Bloomberg terminal and other media, reflect the increasing proportion of Chinese green bonds issued in the market with Chinese banks entering the underwriting market in 2015 and building market share significantly over 2016 as shown in Figure 1.7.

Figure 1.6: Top 15 green bond underwriters 2007 – 2017 by volume and number of issues



Source: Bloomberg (excluding ABS, project and US municipal bonds due to data availability)

Figure 1.7: Top 15 green bond underwriters in 2016 by volume and number of issues



Source: Bloomberg (excluding ABS, project and US municipal bonds due to data availability)





## Chapter 2

# Issuing a Green Bond



# I. Pre-issuance phase

## > Meeting relevant preconditions

The preliminary internal decision to issue a green bond requires that three preconditions are in place: First, that proceeds are intended to be used to finance or refinance green projects or activities that align with a set of defined green criteria. Depending on the region or jurisdiction, these criteria are either imposed by the regulator or need to be internally defined by the issuer. Second, that bonds have been identified as the most suitable instrument to raise funding for the respective projects or assets. Third, that the issuing institution needs to be able to meet the legal, regulatory and financial prerequisites required to issue a bond. Having ensured these preconditions are met, the issuer will approach one or more investment banks to serve as advisors in the bond issuance process (regular and green aspects). In any event, in most cases new issues come to market through a syndicate, or group of banks. The issuer mandates one or several lead managers, i.e. investment banks with particular expertise in the green bond market, to prepare and conduct the deal, in effect acting as an intermediary between the issuer and the investing public.

## > Designing a tailor-made green bond framework

It is critical that a green bond issuer provides a green bond framework. The green bond framework describes the commitment from the issuer to the investors regarding the green features of the bond. It should be concise and transparent. Each green bond issuer is unique and the framework should be tailored to reflect the issuer's specific circumstances and green commitments to the investors.

The framework is typically developed jointly with environmental consultants and/or a structural advisor, ideally one of the lead-managing banks, and based on a standardized template such as codified by the Green Bond Principles (GBPs).<sup>1</sup> The Green Bond Framework shown in Table 1 was established by SEB, the leading advisor in the green bond market as well as a leading underwriter, and consists of five pillars and sub-processes as well as key considerations that align with the four principles of the GBP and its templates.

1 See GBP Resource Center (2016), External Review Form, available at <http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/green-bonds/gbp-resource-centre/>.

Table 1:  
Constructing a sample  
Green Bond Framework  
*Source: SEB*

**1**      **Definition  
Use of proceeds**

**Identification and definition of investment areas/assets which are eligible for Green Bond financing**

- > The Green Bond universe is divided into the following areas that target climate and other environmental stress:
  - 1) Mitigation
  - 2) Adaptation
  - 3) Environmental

**2**      **Selection  
Process for project  
evaluation**

**The Green Bond selection process ensures the right assets in line with the Green Bond framework are evaluated and selected**

- > Establish procedures and secure ongoing monitoring
- > It is recommended to include climate competence in the selection process
- > Climate competence function(s) often has veto right in the selection process

3

### Traceability Management of proceeds

**The proceeds raised via the Green Bond should be earmarked to support lending to the established eligible Green criteria**

- > There are several ways an issuer can earmark Green Bond proceeds, for example
  - Earmarked account
  - Balanced earmarked positions
  - Virtual Green balance sheet

4

### Transparency Reporting

**To uphold credibility it is essential to be transparent towards investors and the market**

- > Obtained via an annual publically available investor letter
  - > The letter should include a list of areas financed, a selection of project examples and a summary of the investor's Green development
  - > Identification of relevant impact measurements

5

### Verification Assurance through external review

**Credibility is essential for the long-term development of the Green Bond market**

- > Second opinion conducted by an independent third party specialist
  - > The primary objective is to verify the 'Greenness' of the investor's projects/areas
  - > Additionally, external assurance providers to verify the selection process in line with the Green Bond framework



Such a framework elaborates on the issuer's approach towards defining eligible green project or asset categories and establishing internal processes for selecting eligible projects in the issuer's portfolio, managing proceeds and reporting. In order to define qualifying categories in case these are not determined by the respective regulator<sup>2</sup>, the GBPs provide a comprehensive though not exhaustive list of green bond project categories that covers different areas of climate change mitigation and adaptation as well as environmental preservation and may serve as orientation.<sup>3</sup> The categories can be adapted and defined by the issuer, depending on the issuer's portfolio and sector. Specific industry standards may serve issuers as further reference such as LEED and BREEAM for green buildings, FSC and PEFC for sustainable forestry or clean transportation in the Climate Bonds Initiative's Taxonomy.<sup>4</sup>

Moreover, environmental laws and issuer-specific overall and environmental policies need to be taken into account. In jurisdictions, where green bond markets are regulated by national authorities, issuers need to ensure compliance with the eligible project and asset categories. In China, the *Green Bond Endorsed Project Catalogue (or the Catalogue)* introduced for financial institutions in China's interbank market by the People's Bank of China (PBC), specifies six categories with 31 sub-categories.<sup>5</sup> China's corporate green bond market is regulated by the National Development and Reform Commission (NDRC), which provided guidelines that are in line with PBC's

- 2 As is the case in the Chinese context with a defined catalogue of green bond eligible projects.
- 3 The GBP's Green Project categories should "provide clear environmental benefits" and include, but are not limited to: (i) renewable energy, (ii) energy efficiency; (iii) pollution prevention and control; (iv) sustainable management of living natural resources; (v) terrestrial and aquatic biodiversity conservation, (vi) clean transportation, (vii) sustainable water management, (viii) climate change adaptation, (ix) eco-efficient products, production technologies and processes. See ICMA (2016), *The Green Bond Principles*, available at [www.icmagroup.org/Regulatory-Policy-and-Market-Practice/green-bonds/green-bond-principles/](http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/green-bonds/green-bond-principles/).
- 4 The Climate Bond Taxonomy by the Climate Bonds Initiative gives further guidance on sector-specific standards.
- 5 The categories comprise: (i) energy-saving, (ii) pollution prevention and control, (iii) resource conservation and recycling, (iv) clean transportation, (v) clean energy, (vi) ecological protection and adaptation to climate change. Some regional variations exist currently in markets where governments have regulated the green bond market. For instance, the guidelines for China's corporate domestic green bond market set by National Development and Reform Commission (NDRC) are in line with the PBoC's Catalogue, but include nuclear energy as an additional, eligible category.



Catalogue but focus on a list of twelve priority areas.<sup>6</sup> In India, the *Disclosure Requirements for the Issuance and Listing of Green Bonds* drafted by the Securities Exchange Board India (SEBI) do not define fixed criteria but “may be as specified by SEBI from time to time.”<sup>7</sup> The *Guide to Issuing Green Bonds in Brazil* published by the Brazilian Federation of Banks (FEBRABAN) and the Brazilian Business Council for Sustainable Development (CEBDS), which represents a non-binding guide, does not include fixed definitions but provides examples of eligible activities for green bonds that are widely in line with the Green Bond Principles and the Climate Bonds Taxonomy.<sup>8</sup>

The use of standards to define what is green brings the benefits of simplifying the process which can facilitate faster growth of the green bond market. The disadvantage of using specified definitions may, however, be that flexibility in two dimensions is missed: First, the relevant threshold for what should be regarded as, for instance, green transportation solutions may vary between different geographies (compare Calcutta and Oslo for instance) and, second, that thresholds and stringencies may evolve over time (e.g. for energy use in green buildings).

Furthermore, while the use of clear standards may encourage a more simple entry gate to issuance of green bonds, the use of tailor made definitions enables issuers and investors alike to evaluate the appropriate thresholds of green in a process that fosters enhanced competence building and understanding of the environmental consequences of real and financial investment decisions. This, in turn, helps mobilizing the human capital which is essential for driving the necessary reallocation of capital towards improved environmental performance, climate resilience and resource efficiency.

6 A harmonization of the different green bond regulations in China is currently being discussed by the responsible regulatory bodies including PBC, NDRC and China Securities Regulatory Commission (CSRC).

7 See note from the SEBI board meeting as of 11 January 2016, available at [www.sebi.gov.in/sebiweb/home/detail/32793/yes/PR-SEBI-Board-Meeting](http://www.sebi.gov.in/sebiweb/home/detail/32793/yes/PR-SEBI-Board-Meeting).

8 FEBRABAN/CEBDS (2016), *Guide to Issuing Green Bonds in Brazil*, available at [http://cebds.org/wp-content/uploads/2016/10/Guia\\_emissa%CC%83o\\_ti%CC%81tulos\\_verdes\\_ING-2.pdf](http://cebds.org/wp-content/uploads/2016/10/Guia_emissa%CC%83o_ti%CC%81tulos_verdes_ING-2.pdf).



The procedure of defining categories, identifying potential green projects in the issuer's portfolio and eventually selecting eligible ones, requires assigning appropriate staff from both financial and sustainability departments within the issuing organization to engage in a dialogue. In order to ensure the environmental integrity of the issue in the absence of environmental in-house expertise, it is recommended to either consult external experts or to design the criteria in a way that allows for external environmental assurance.

### > Externally reviewing the green bond framework

The green bond framework and relevant associated documents are recommended to be externally reviewed by a mandated, independent second opinion provider, a third party auditor or a green bond certifier. Soliciting an independent review of the issuer's green bond framework provides investors with transparent and sound information, beyond national standards and peculiarities on the environmental and procedural credentials of the bond. It does not, however, take into account the financial features of the issuance nor an ex-post assessment of the environmental results and benefits of the projects financed with the green bond proceeds.

Investors typically possess the appropriate capabilities to evaluate the financial risk and return metrics, but often lack the relevant capacity to judge if the green features meet adequate, scientific criteria. The second opinion serves the purpose of providing such information to make an informed investment decision possible for the investors, both from a financial and an environmental point of view.

For an assessment of the financial creditworthiness of the issue, which is conducted independently from the green label of the bond, ratings agencies provide credit ratings that are essentially based on the risk and return profile of the issuer and/or the financed project and assets.<sup>9</sup>

9 For green use of proceeds bonds applies the same credit rating as for the issuer given that full recourse is to the issuer. On the other hand, green project bonds, green use of proceeds revenue bonds and green securitized bonds would require a separate rating as recourse is to the project's assets and balance sheets or to the cash flow of the assets.



The rating determines both the risk premium and the pool of investors buying the bond given that many institutional investors are mandated or required by regulatory restrictions to allocate funds only to investment grade assets, which comprise the four highest rating categories. Although usually not being mandatory by regulation (for instance for some private placements<sup>10</sup>), a credit rating is typically requested or even required by many market participants as it reduces uncertainties related to the investment and issuer profile. Consequently, issuers are usually advised to obtain a rating provided that the expected reduction in borrowing costs is larger than the costs related to the rating.

### > **Establishing structures for managing proceeds**

In an additional step, as defined in the issuer's green bond framework, the green bond issuer needs to open a separate earmarked (sub-) account or put in place other procedures to ensure the tracking of proceeds. Ideally, both the settlement period for allocation and eligible temporary investment vehicles and assets ensuring the exclusion of non-green projects and assets are specified in the green bond framework.

### > **Committing to frequent reporting**

In connection to issuance of regular bonds, investors do not expect any specific reporting on the use of proceeds. However, when issuing green bonds, issuers commit to allocating the use of proceeds exclusively to specified projects or project categories with environmental benefits. Hence, investors expect to receive information about how their money has been used on a regular (typically annual) basis. This information should be made publically available (since the original buyers of the bonds may have traded them on the secondary market) and should, to the extent feasible, include information on the environmental impact of the investments. For more details, refer to the Reporting section in the GBPs.

<sup>10</sup> A private placement is different from the public offering of securities in terms of the regulatory requirements that must be satisfied by the issuer.



### > **Developing a sales strategy**

Based on the various features of the bond, issuer and market conditions, the book runners together with the issuer develop a sales strategy including pricing, marketing and syndication plans. The risk and new issuance premium or the spread is determined by the group of lead managers in consultation with the issuer based on the type and rating of the issuer and bond, expected liquidity and overall market conditions. Unless the green feature of the bond has a tangible effect on the financial risk and return profile, i.e. if it is a project bond or equivalent, a green bond is typically priced according to the same criteria as a regular bond. The bond is priced according to either outstanding bonds with a similar maturity and/or a base rate plus a risk and new issue premium.<sup>11</sup>

### > **Preparing relevant legal documents and due diligence**

The respective roles for preparation and launch of the bond, i.e. coordination of legal requirements and term sheet, trade documentation, marketing and press coverage, book keeping as well as booking and delivery, are usually assigned by the issuer who determines an individual lead manager to take care of the respective tasks. With regard to the legal framework, the documentation is subject to due diligence which is carried out by both the issuer's and the lead manager's legal advisors. Furthermore, the green bond framework and review document, i.e. second opinion, are important documents that should be provided to investors and the public prior to the launch or the issuance of a green bond. Issuing a green bond does not require any additional legal documents compared to issuing a regular bond. The specific use of proceeds should, however, be specified in the terms and conditions or final terms, as applicable, of the green bond. This can be done through reference to the green bond framework or inclusion of relevant use of proceeds language.

### > **Identifying suitable bond terms, market conditions and target market**

Depending on the nature of the bond transaction (i.e., strategic placement versus opportunistic selling), the group of lead managing banks advises the issuer in the pre-issuance phase on numerous topics in order to realize the best funding conditions. Currency and maturity of the bond as well as the target investor group are examples

<sup>11</sup> The base or benchmark rate is usually the most actively traded treasury security in the jurisdiction showing the lowest perceived risk that has the closest maturity gap to the bond issue.



of some of the aspects an issuer has to determine in order to identify the respective target market for issuance. This assessment is made by taking into account expected returns and risks (such as credit and liquidity risks as well as macro-economic risks such as interest rate environment and inflation). For international investors, sovereign and exchange rate risks are relevant as well, particularly when investing in emerging markets. Additionally, the green label of the bond represents another relevant feature to specify the investor types most likely to invest in the bond.

### > Issuing in the domestic market

When issuing in the domestic market, the issuer has various benefits such as avoiding potential costs from cross-currency swaps and currency hedges as well as higher name recognition which lowers marketing costs compared to an international placement. These cost advantages may facilitate access to the debt capital market particularly for smaller issuers, and also enable smaller issuance sizes. On the other hand, domestic markets may be less developed than international markets, which may be a derivative of underdeveloped financial and capital markets generally, or resulting from factors such as limited legal and macroeconomic stability.<sup>12</sup>

In cases where there is less breadth and depth with regards to the issuer and investor base there can be limits to liquidity levels in the domestic bond market, which results in higher capital costs and more volatile trading prices. Therefore, to identify the potential appetite for any bond a careful assessment of domestic market conditions, particularly regarding risk and return profiles, investment restrictions and asset portfolios of different types of domestic and international investors (e.g. insurance companies, pension funds, asset managers, sovereign wealth funds, banks and corporates, and other types of “qualified investors”) is an important prerequisite for the decision, in which market to issue the bond.

12 Berger and Warnock (2004), Foreign Participation in Local-Currency Bond Markets, Board of Governors of the Federal Reserve System International Finance Discussion Papers, Number 794, available at [www.federalreserve.gov/pubs/ifdp](http://www.federalreserve.gov/pubs/ifdp).



### > Issuing in international markets

In the case where the above mentioned limitations apply in domestic markets, “tapping” international markets might be more attractive for some issuers. This may allow further diversification of the existing investor base and the potential to issue larger volumes at longer maturities. The risks may then include potential foreign exchange fluctuations and higher transaction costs stemming from additional marketing, regulatory and documentation needs.

### > Defining the bond type and structure

Provided that the issuer is able to meet the regulatory and disclosure requirements in the jurisdiction of issuance, the issuer and lead managers agree on the type<sup>13</sup> and structure of the green bond issuance, depending on the financing needs as well as the issuer’s profile and overall market conditions. The structure or terms of the bond refer to the bond’s target size, tenure, spread, coupon, payment mode and currency.<sup>14</sup>

### > Marketing the green bond issue

Given the keen attention green bonds have received in the market, especially from mainstream investors, the green label should play a crucial role in the marketing strategy that is developed by the lead managers. The label itself can be viewed as a “discovery tool” which allows investors with green preferences to identify bonds that align with their investment preferences out of a vast volume of fixed income issuance globally.

### > Considering incentive mechanisms

Credit enhancement options should be considered carefully with respect to their cost-effectiveness; i.e., whether the lower targeted risk premium outweighs the cost of the enhancement. Credit enhancements mechanisms are frequently offered for project bonds by a variety of institutions including public financial institutions and under

13 For a description of the different types of green bonds, i.e. green use of proceeds bonds, green revenue bonds, green project bonds, green securitized bonds, see ICMA (2016), The Green Bond Principles, available at [www.icmagroup.org/Regulatory-Policy-and-Market-Practice/green-bonds/green-bond-principles/](http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/green-bonds/green-bond-principles/).

14 Issuers may also embed options to call or convert the bond. Callable bonds can be paid back before maturity, while convertible bonds can be converted into shares of the issuing institution.



international programs such as the *EU Project Bond Initiative* and the *Asian Credit Guarantee Investment Facility (CGIF)*. Guarantees by a parent group, governments, commercial banks or international financial institutions, as well as insurance provided by insurers may be alternative options to lower bond-related risk.<sup>15</sup> More-over, in some jurisdictions fiscal incentives for green bond issuers and investors are in place. In the United States, green municipal bonds can benefit from tax exemption. Furthermore, China's Green Finance Committee is exploring the potential for incentive structures to support domestic green bond market growth.

### > Registering the green bond issue

Prior to the launch, the green bond issue is subject to the same regulatory requirements as a regular bond which may include registration at the responsible supervisory authority, which may vary depending on the jurisdiction of issuance and the type of issuer and bond. For registration relevant documents such as the preliminary prospectus, financial records and statements from the issuing institution must be submitted and approved by the supervisor. In some jurisdictions, the prospectus (which includes information on the business and management profile of the issuer, a list of main investors, the terms of the bond issuance and financial risks) needs approval by the supervisor prior to distribution. In other jurisdictions, the marketing may begin after the registration statement is filed but before it becomes finally approved by the supervisor.

<sup>15</sup> For example, the Overseas Private Investment Corporation (OPIC), the U.S. Government's development finance institution, offers green guarantees to eligible US investors in domestic debt capital markets.

## II. Launch phase and issuance

### > Announcing the green bond issue

Lead managers will organize meetings in the context of *road shows* for groups of institutional investors. Following the marketing period, the lead managers make a public announcement of the upcoming transaction and thereafter solicit orders from investors and “build a book” for the issue within spread parameters. Other issue details, such as size and maturity, also can change as a result of investor feedback received during the marketing campaign. Before launch, the syndicate might be enlarged to include banks with good placing power among specialized investor groups, depending on the market, size of issuance, etc.<sup>16</sup>

Following a joint “go-/no-go call” between the issuer and lead managers, the issuance has to be announced to the public through the respective channels (that is Reuters, Bloomberg and other market data providers) typically starting with “initial price thoughts”. In a public offer the (preliminary) prospectus must be provided to the public.

An alternative to a public offering is to issue the bond through a private placement in which case one or a few investors, via the lead managing bank(s) agree(s) on the terms of the transaction with the issuer. This can be on the initiative of either party involved. While potentially convenient and efficient, this process limits the publicity and branding effect for the issuer, something that often is an aspiration of the issuer, especially in connection to the issuance of the inaugural green bond.

### > Book building

Once the order book has been officially opened, the respective sales teams of the book runners contact their accounts and potential investors to explore their interest in participating in the transaction. As long as the order book is open, the group of joint lead managers provides the issuer with updates on the development of the order book and with guidance regarding strategy and pricing of the bond. The price of the bond normally correlates negatively with the overall amount of orders. Market participants receive updates throughout the book building process.

<sup>16</sup> Fabozzi, et al. (2012), *The Handbook of Fixed Income Securities*, McGraw-Hill.



### > Pricing the green bond

After the book building process has been finalized, the issuer will decide on the quantity allocated to each investor and the price of the issue. Since the final price is determined at the time of selling, current market conditions are priced in. Not all bonds are underwritten using the traditional syndicate process. Variations in the United States, the Euromarkets, and other markets include for example the bought deal, the auction process, and continuous offerings of medium term notes.

### > Conducting the transaction

On issuance parties first sign a subscription agreement and the listing authority or relevant stock exchanges approve the prospectus if the bond is to be listed. Secondly, at the closing of the deal, the remaining documents are signed, and the bond is delivered to the bondholders, while the payment is (simultaneously) made to the issuer through a national depository or a clearing system.

### III. Post-issuance phase

#### > **Managing proceeds**

After the deal has been settled and an amount equal to the net proceeds of the issue has been transferred to the earmarked (sub-) account, the issuer can start to allocate the proceeds. The earmarked account will be managed by the issuer according to the regular liquidity management practices and the defined commitment regarding the management of unallocated proceeds as described in the green bond framework, if different. With respect to the bondholder, the issuer needs to ensure the timely payment of the coupon on a regular, usually semi-annual or annual basis, and of the principal at maturity.

#### > **Listing the green bond on a stock exchange**

If the bond is to be listed and traded on a stock exchange, the respective listing authority will be contacted. As of December 2016, dedicated green bond listings and segments have been introduced by twelve stock exchanges, namely those of London, Luxemburg, Mexico City, Oslo, Shenzhen, Paris, Borsa Italiana, Riga, Amsterdam, Lisbon, Johannesburg and Stockholm.<sup>17</sup> Moreover, depending on the requirements in the respective jurisdiction, the settlement of the transaction needs to be prepared through a national depository or clearing system.

#### > **Monitoring and reporting the use of proceeds and environmental impact**

In order to maintain transparency towards investors and the public regarding the compliance of the terms of the issue, green bond issuers are expected to monitor and regularly report the allocation of proceeds including a list of financed projects with a brief project description, amounts allocated, and use of unallocated proceeds. Issuers should further monitor and report the expected or actual environmental impact, based on qualitative and, if feasible, quantitative indicators. Potential channels to publically disclose this information include a dedicated Green Bond investor letter, the annual report or sustainability report as well as the issuer's or project's website. It is recommended to apply standardized reporting procedures and criteria,

17 Sustainable Stock Exchanges Initiative (2016), 2016 Report on Progress, available at [www.unepfi.org/fileadmin/documents/SSE\\_RoP\\_2016.pdf](http://www.unepfi.org/fileadmin/documents/SSE_RoP_2016.pdf); Sustainable Stock Exchanges Initiative (2016), Fact Sheet: Bolsa Mexicana de Valores, available at [www.sseinitiative.org/fact-sheet/bmv/](http://www.sseinitiative.org/fact-sheet/bmv/).

possibly against the GBP and based on the *Harmonized Framework for Impact Reporting*, in order to increase comparability between different bonds and mitigate transaction costs for issuers and investors.<sup>18</sup> The *World Bank Green Bond Newsletter* and *Impact Report* is often referred to as a best practice example that incorporated these standards.<sup>19</sup>

### > Obtaining post-issuance external reviews

Ongoing eligibility of projects, management and allocation of proceeds, impact reporting as well as credit ratings are recommended to be reviewed and verified on a regular basis by respective parties, that is second opinion providers, auditors, certifiers and/or rating agencies.<sup>20</sup> The credit rating is typically reviewed annually by a rating agency, which generally requires a rating maintenance fee. Any change in the rating generally needs to be reported to bondholders.

### > Trading on secondary markets

It is in the secondary market that bonds that have been issued previously are traded, mostly *over the counter* (OTC) but also on some exchanges. In the secondary market, an issuer may obtain regular information about the value of the bonds it has issued. The periodic trading of a bond issue reveals to the issuer the consensus price that the bond commands in an open market. Thus issuers can observe the prices of their bonds and the implied interest rates investors expect and demand from them.<sup>21</sup>

18 The Harmonized Framework for Impact Reporting was published in December 2015 by eleven multinational and national development banks with the objective to promote transparency and harmonize the disclosure of environmental and climate related impacts of projects and assets that are financed by green bond. The document is available here: <http://treasury.worldbank.org/cmd/pdf/InformationonImpactReporting.pdf>.

19 The World Bank Green Bond Newsletters are available at <http://treasury.worldbank.org/cmd/htm/WorldBankGreenBondNewsletters.html>.

20 Note that the second opinion is a one-off, pre-issuance report and regular post-issuance assurance of processes and/or verifications of achieved environmental impacts may follow.

21 Fabozzi, et al. (2012), *The Handbook of Fixed Income Securities*, McGraw-Hill.



Investors may hold the bond or trade it on the secondary market. The secondary market trading therefore requires the above described ongoing disclosure, both on the financial and the green features of the bond.

### > Repaying the bond

At the date of maturity, the debt will cease and the borrower will redeem the issue by paying the face value, or principal.<sup>22</sup> Payment of interest and redemption of principal, record keeping, etc. are the responsibility of the issuer but the execution of these tasks are usually handled on behalf of the issuer by a fiduciary agent (generally a bank) that acts as the trustee for the bonds.<sup>23</sup>

22 Bonds may also contain arrangements by which the issuing firm either can or must retire the debt early, in full or in part.

23 Thau (2010), *The Bond Book*, 3rd edition, McGraw-Hill Education.



## Chapter 3

# Green Bonds in Brazil

# I. Introduction

Brazil, known for its abundance in natural resources and an economy strongly reliant on its agricultural production, has committed itself to the 2 degree goal of the Paris Climate Agreement with ambitious national targets. In its *Nationally Determined Contribution* (NDC), the country pledged to cut greenhouse gas emissions by 37% until 2025 and by 43% until 2030 in comparison to 2005 levels. Moreover, Brazil defined specific targets for its energy sector, land use, forests, agriculture, industry and transportation sectors.<sup>24</sup>

To translate the ambitious targets into action and build a low carbon infrastructure and economy, massive investment will be required over the coming years. As public funds are highly constrained, private capital needs to be mobilized urgently and at scale. Green bonds can play a pivotal role in tapping the trillions managed by domestic and international institutional investors in search of yield at predictable risks. Attracting international capital while fostering a robust domestic green capital market will help Brazil achieve its goals and lead the way among its peers towards a low-carbon, resource efficient economy.

The objective of this chapter is to give an overview of the Brazilian green bond market, its key market stakeholders and regulatory environment, the issuance process as well as market challenges and prospects. The chapter is based on the *Guidelines for Issuing Green Bonds in Brazil 2016* developed by the Brazilian Business Council for Sustainable Development (CEBDS) and the Brazilian National Federation of Banks (FEBRABAN).<sup>25</sup>

24 BRAZIL (2015), Intended Nationally Determined Contribution towards achieving the objective of the United Nations Framework Convention on Climate Change.

25 CEBDS/FEBRABAN (2016), Guidelines for Issuing Green Bonds in Brazil 2016.

## II. The Brazilian green bond market

### > Market Development

Green bonds have emerged quite recently in Brazil with the first company to issue a labeled *green* bond in 2015, followed by four other companies and the Brazilian Development Bank BNDES. As of September 2017, the outstanding volume of the Brazilian green bond market amounts to approximately USD 3.83 billion.<sup>26</sup>

In May 2015, BRF S.A., one of the biggest producers of refrigerated and frozen protein foods in the world, issued a seven-year senior note of EUR 500 million, the first green bond from Brazil. The bond was issued with a coupon of 2.75% per annum and a second opinion from Sustainalytics. The proceeds are being used for energy efficiency improvements, reduction of greenhouse gas emission, renewable energy projects, sustainable water and waste management, sustainable packaging and sustainable forest management.<sup>27</sup>

In July 2016, Suzano Papel e Celulose, a forestry company that produces and sells eucalyptus pulp and paper products, issued Brazil's second green bond, a ten-year senior note of USD 500 million. The bond was issued with a coupon of 5.75% per year and has a second opinion from Sustainalytics. The proceeds were allocated to projects in sustainable forest and water management, renewable energy, reduction of greenhouse gas emission, energy efficiency, and development of environmental preservation areas and restoration of native forests.<sup>28</sup>

Subsequently, Suzano Papel e Celulose issued in November 2016 its second green bond over BRL 1 billion (USD 294 million), the first Brazilian green bond issued in local currency. Domestically known as a CRA (Agribusiness Receivables Certificate),

26 SEB/Bloomberg as of September 2017.

27 BRF (2015), Relatório do Green Bond 2015.

28 Sustainalytics (2016), Suzano Papel e Celulose S.A.: Green Bond framework overview and second opinion by Sustainalytics.



the proceeds of the bond with a tenure of eight years and 96% of the CDI<sup>29</sup> interest rate were allocated to projects of sustainable forest management.<sup>30</sup> The second opinion was provided by Sitawi, the first domestic verifier to enter the market. A third green bond by Suzano Papel e Celulose was issued in September 2017, corresponding to a re-tapping of the senior notes issued in July 2016. The issuance conditions and use of proceeds are the same as the established in the green bond issued in July 2016.<sup>31</sup>

Among the Brazilian corporate green bond issuers, there is also Fibria, an eucalyptus pulp producer, which issued in January 2017 a USD 700 million ten-year note with a coupon of 5.5% per year. Once again, Sustainalytics provided the second opinion of the bond, with proceeds financing the long-term sustainability goals of the pure-play<sup>32</sup> company.<sup>33</sup>

The second green bond issued in local currency came in March 2017 from CPFL Renováveis, a renewable energy provider. The BRL 200 million green debenture, which will finance projects primarily in the wind farm constructions of Campos dos Ventos and São Benedito, received a second opinion from Sitawi and a Climate Bonds Certificate, the first in South America.<sup>34</sup> Santander Brazil acted as underwriter for the deal.

In May 2017, the Brazilian Development Bank BNDES issued a USD 1 billion green bond to finance environmentally sustainable projects focusing on wind and solar energy projects. The issuance had a coupon of 4.8%, lower than the 5.25% expected

29 CDI is the Certificate of Interbank Deposit. The average rate of CDI is calculated daily and very similar to the Brazilian economic base rate – Selic. CDI is very relevant in the interbank market, since it is considered as a benchmark for other interbank rates. It is also known as the Brazilian risk-free rate that is it has the lowest default risk in the fixed income securities market. Because of this, CDI is used in most post-fixed income security issuances, usually linked to instruments as CDB, LCI, LCA (see below), always when issued by banks.

30 Climate Bonds Initiative (2016), 1st Green Bond in Brazilian Currency: Suzano Papel & Celulose, BRL1 bn (USD 294m), No2 from Suzano, accessed on April 23, 2017.

31 Suzano Papel e Celulose (2017), Notice to the market.

32 A pure-play company is characterized by having exclusively green activities.

33 Fibria (2017), Fibria ends 2016 with higher sales, strong net income growth and robust cash position, accessed on April 23, 2017.

34 CPFL Renováveis (2017), Release: CPFL Renováveis é a primeira empresa da América Sul a emitir título verde com certificação internacional.



due to a five times oversubscription. It was an important issuance since it attracted attention of European green bonds funds.<sup>35</sup> According to the bank, the issue provides a number of benefits, such as encouraging other Brazilian issuers to access the market, promoting the dissemination of best practices of social and environmental management, and building a new reference point in its structure for international interest rates.

The green bond issuance by BNDES was the first of a Brazilian bank in the international market. Until date, no private Brazilian financial institution has acted as an issuer in the green bond market despite the important role financial institutions can play in financing the country's green investment needs, for instance by refinancing or on-lending of the proceeds of a green bond issuance to their clients that do not have direct access to capital markets themselves.<sup>36</sup>

In September 2017, Klabin Finance S.A., a subsidiary of paper and packing company Klabin S.A., issued the latest green bond in Brazil. The USD 500 million issuance, which proceeds will finance the sustainable management of eucalyptus and pine forest plantations needed for the paper production, has a ten year tenure and a 4.875 per cent coupon. The second opinion was provided by Sustainalytics.<sup>37</sup>

35 BNDES (2016), BNDES aprova criação do Fundo de Energia Sustentável.

36 CEBDS/FEBRABAN (2016), Guidelines for Issuing Green Bonds in Brazil 2016.

37 Klabin S.A. (2017), Klabin S.A. announces the issue of U.S.\$500 million 4.785 % Notes due September 19, 2027. Sustainalytics (2017), Klabin Green Bond.

Table 3.1: Brazilian green bond issuances

Issuer	Issuance model	Issue date	Financial Instrument	Currency
<b>BRF</b>	Corporate green investment programme	June 2015	Senior notes 2.75% p.a. 7 years	EUR 500 mn
<b>SUZANO PAPEL E CELULOSE</b>	Corporate green investment programme	July 2016	Senior notes 5.75% p.a. 10 years	USD 500 mn
<b>SUZANO PAPEL E CELULOSE<sup>38</sup></b>	Corporate green investment programme	November 2016	CRA (Agribusiness Receivables Certificates) 96% of CDI 8 years	BRL 1 bn
<b>FIBRIA</b>	Corporate: pure play	January 2017	Notes 5.5% p.a. 10 years	USD 700 mn
<b>CPFL RENOVÁVEIS</b>	Corporate: pure play; specific projects	March 2017	Green debentures	BRL 200 mn
<b>BNDES</b>	Development bank	May 2017	- 4.8% p.a. 7 years	USD 1 bn
<b>SUZANO PAPEL E CELULOSE</b>	Corporate green investment programme	September 2017	Senior notes 5.75% p.a. 9 years	USD 200 mn
<b>KLABIN FINANCE S.A.</b>	Corporate green investment programme	September 2017	Green debentures 4.875% p.a. 10 years	USD 500 mn

38 Climate Bonds Initiative (2016), 1st Green Bond in Brazilian Currency: Suzano Papel & Celulose, BRL1 bn (USD 294m), No 2 from Suzano, accessed on April 23, 2017.

External review	Use of resources
Sustainalytics	Energy efficiency, GHG emission reduction, renewable energy, waste management, use of sustainable and efficient packing, forest management and reduction of raw materials
Sustainalytics	Forest management, restoration of native forest, establishment of environmental protection areas, energy efficiency, renewable energy, water management, GHG emission reduction
Sitawi	Sustainable management of certified forests
Sustainalytics	Investment in projects with environmental benefits for the company's long-term sustainability goal
Sitawi Climate Bonds Standard Certification	Wind farms of Campos dos Ventos and São Benedito, in Rio Grande do Norte, with 231 MW of installed capacity
Sustainalytics	Finance sustainable projects, mainly in wind and solar energy
Sustainalytics	Forest management, restoration of native forest, establishment of environmental protection areas, energy efficiency, renewable energy, water management, GHG emission reduction
Sustainalytics	Capital and operating expenses For sustainable management of eucalyptus and pine forest plantations.

Sources: CEBDS & FEBRABAN (2016); Fibria (2017); CPFL Renováveis (2017); BNDES (2017); Suzano Papel e Celulose (2017); Bloomberg/SEB and CBI database.



### > Sustainable Energy Fund

Prior to its own first green bond issuance, BNDES launched the *Sustainable Energy Fund* in November 2016 in order to boost the supply of local green bonds for infrastructure investments. The BRL 500 million fund is intended to invest over a 15-years period in low-carbon infrastructure projects according to the definitions established by the Climate Bonds Standards.<sup>39</sup> The fund is a Receivables Investment Fund (Fundo de Investimento em Direitos Creditórios – FIDC), a type of fund widely used in Brazil’s credit market. More than half of its net asset value is composed of receivables from several shareholders.<sup>40</sup> BNDES intends to boost the local green bond market through the fund’s activities but is aware that the capital pool is not sufficient to absorb the estimated BRL 1.8 billion to be issued over the next 18 months just for wind energy projects, providing further investment opportunities at scale.

### > Brazilian Council of Green Finance

An important private sector initiative in the development of the domestic green bond market represents the Brazilian Council of Green Finance (former Brazilian Market Development Council) that was created in partnership between CEBDS and the Climate Bonds Initiative in September 2016. The main goal of this council is to build a platform of public and private sector actors to discuss the major needs for boosting green investments in Brazil and build a robust pipeline of opportunities, specifically in three key sectors of the Brazilian transformation, including renewable energies, agribusiness and transport infrastructure.<sup>41</sup>

39 BNDES (2016), BNDES aprova criação do Fundo de Energia Sustentável.

40 BM&F BOVESPA (2017), Fundos de Investimentos.

41 Climate Bonds Initiative (2017), Brazil Market Development Council, accessed on May 10, 2017.

### III. How to issue a green bond in Brazil

As green bonds are not subject to a distinct regulation in Brazil, the same regulatory requirements and oversight as for regular bonds apply to them from a legal perspective. There are mainly four entities that regulate the fixed income securities market: The *Brazilian Securities Commission* (CVM) and the Central Bank of Brazil (BACEN) are the bodies in charge of any operation related to securities and fixed income bonds, while the *Private Insurance Superintendence* (SUSEP) and the *National Superintendence of Pensions* (PREVIC) regulate operations of insurance companies and pension funds in the capital market.

In order to provide guidance for green bond issuers and other market participants in Brazil, CEBDS and FEBRABAN published the *Guidelines for Issuing Green Bonds in Brazil* in September 2016. The voluntary guidelines are closely aligned with the Green Bond Principles (see chapter 1) and focus on outlining the issuance process in Brazil over the pre-issuance, issuance and post-issuance phase.

As in the international market (see chapter 2 for details), the issuance process in Brazil is basically the same as for regular fixed income instruments. When issuing a green bond, it is however essential to explicitly define the projects or project categories for which the proceeds will be used. In addition, issuers should obtain a robust external review and establish monitoring and reporting processes, which are considered to be highly relevant to safeguard environmental integrity that is to ensure that proceeds are used in accordance with the defined eligibility criteria.<sup>42</sup>

#### > Pre-issuance phase

The first step of the green structuring is to design a green bond framework. The framework represents the central document outlining the bond's green elements throughout the lifetime of the bond. A central element of the green bond framework is the *definition* of the project eligibility criteria. Eligible projects must be “related to actions either to mitigate negative environmental/climate-related impacts or to adapt to its

42 CEBDS/FEBRABAN (2016), *Guidelines for Issuing Green Bonds in Brazil 2016*.

effects.”<sup>43</sup> Table 3.2 presents an extensive though not exclusive list of eligible activities or categories that can be financed by green bonds in Brazil, resembling to a large extent the project categories proposed by the Green Bond Principles (see chapter 1).

Table 3.2 – Examples of eligible activities to be financed by green bonds in Brazil

Categories	Examples
<b>Renewable Energy</b>	<ul style="list-style-type: none"> <li>• Generation, transmission, storage, or usage of solar, Wind, bio, hydro, tidal or geothermal Power.</li> </ul>
<b>Energy Efficiency (equipment and products)</b>	<ul style="list-style-type: none"> <li>• Sustainable buildings (retrofit and new)</li> <li>• Efficient storage systems</li> <li>• Efficient heating systems</li> <li>• Smart grids</li> </ul>
<b>Pollution prevention and control</b>	<ul style="list-style-type: none"> <li>• Effluent treatment</li> <li>• Emission control (GHGs and others)</li> <li>• Soil decontamination</li> <li>• Recycling and production of high value-added products</li> <li>• Power generation from waste</li> <li>• Environmental analysis and monitoring</li> </ul>
<b>Sustainable management of natural resources</b>	<ul style="list-style-type: none"> <li>• Low carbon agriculture and livestock</li> <li>• Sustainable forestry and Forest management</li> <li>• Native vegetation conservation, restoration and recovery</li> <li>• Recovery of degraded areas</li> <li>• Sustainable fishing and aquaculture</li> </ul>
<b>Biodiversity conservation</b>	<ul style="list-style-type: none"> <li>• Protection of terrestrial, coastal, marine, fluvial and lacustrine habitats</li> <li>• Sustainable usage of biodiversity</li> <li>• Deployment of wildlife corridors</li> </ul>
<b>Clean transportation</b>	<ul style="list-style-type: none"> <li>• Production and use of electric and hybrid vehicles</li> <li>• Non-motorized vehicles</li> <li>• Railway and subway</li> <li>• Multimodal</li> <li>• Infrastructure for clean vehicles</li> </ul>

43 CEBDS/FEBRABAN (2016), Guidelines for Issuing Green Bonds in Brazil 2016.

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**Sustainable management of water resources**

- Water treatment and cleaning
- Impounding and storage infrastructure
- Distribution infrastructure
- Basin protection
- Sustainable urban drainage systems
- Flood control systems

**Adaptation to climate change**

- Climate monitoring or early warning
- Resilience infrastructure (dams and other structures)
- Development/Usage of varieties resistant to extreme weather conditions

**Products, production Technologies, and eco-efficient processes**

- Eco-friendly stamps/Sustainability certificates
  - Development of biodegradable or renewable source technologies/products
  - Eco-efficient products/processes
- 

Source: CEBDS & FEBRABAN (2016).

Green bond proceeds can also be used for working capital given that business operations are specifically related to eligible activities showed in table 3.2, which may be the clearest case for pure-play green companies. In addition, issuers can allocate proceeds into research & development (R&D) activities if they serve the deployment of green projects.<sup>44</sup>

Once the eligibility criteria are defined, the issuer can outline the process for evaluation and selection of the projects that will be financed with the green bond proceeds. Moreover, the issuer is must outline the structures that are put in place for managing the use of proceeds, including periodic monitoring and reporting of the allocation of proceeds and its environmental impact.

It is important to ensure transparent disclosure throughout the process, since investors need all the information to decide whether the framework set up by the issuer suffices the investor's requirements on environmental and governance standards.

44 CEBDS/FEBRABAN (2016), Guidelines for Issuing Green Bonds in Brazil 2016.



After having established the green bonds framework, it is highly recommended to obtain an external review that verifies the green credentials of the bond. An external review assesses both at the green definitions and the process for selection and evaluation of projects, as well as the structures for managing proceeds, monitoring and reporting. While the green bond framework (or first opinion) is typically developed with support from an environmental expert, the external review should be undertaken from a separate, independent specialized consultancy. More details on the relevance and different forms of external reviews, including second opinions, third-party verification, certification and green ratings, can be found in chapter 1.4.

### > Issuance

The rules and procedures for issuing a green bond in Brazil follow the type of financial instrument chosen by the issuer among the ones used in the Brazilian fixed income securities market.<sup>45</sup> The term, currency and warranties will vary according to several factors such as financing purposes, market conditions and issuer specifics.

Underwriters, which are responsible for structuring the offer and executing the issuance, usually require nine to twelve weeks to complete the process of preparing the deal. They are in charge of performing a due diligence, in which all the information relevant to investors during the roadshow is compiled. This information will also be included in the issuance prospectus.<sup>46</sup>

45 Public securities or government bonds, which represent more than 50 percent of the securities market in Brazil, primarily include National Treasury Bills (LTN), Treasury Financial Bills (LFT) and National Treasury Notes (NTN) issued by the National Treasury. The instruments used by financial institutions include Bank Deposit Certificates (CDBs), Interbank Deposit Certificates (CDIs), Receipts for Bank Deposit (RDB), and Mortgage Notes (LH). Non-financial corporates can obtain short-term funding through the Bill of Exchange (LC), Promissory Notes (NP), and Commercial Papers (CP) and for long term funding needs through debentures and securities issued abroad. For more details, see BOVESPA (2012), *Mercado e Título de Renda Fixa no Brasil*, Instituto Educacional BM&F Bovespa. Further financial instruments include Agribusiness Receivable Certificates (CRA), Real Estate Receivable Certificates (CRI), Agribusiness Credit Bills (LCA) and Real Estate Credit Bills (LCI), which are income tax-exempt for foreign and retail investors. The same is applicable to debentures destined to infrastructure investments. See CBI (2016), *State of the Market: Brazil Edition*.

46 Associação Nacional das Instituições de Mercado Financeiro (ANDIMA) & Associação Brasileira das Companhias Abertas (ABRASCA) (2008), *Abertura de Capital e Emissão de Debentures*.

## > Post-issuance

After the green bond is issued, the issuer needs to assure that proceeds are allocated to the defined projects. The use of proceeds needs to be monitored and the achieved or expected outcomes reported at least on an annual basis. The report can be included in the company's annual report, its sustainability report, an exclusive green bond report, or the investor letter. Besides reporting the use of proceeds, including a list or examples of financed projects, it is recommended to include environmental performance indicators in form of qualitative and quantitative measures, when feasible.

The reporting process is extremely important for the credibility and reputation of the issuer towards investors and the market. Since there is no binding legal or regulatory standard in the Brazilian or international market that enforces the use of proceeds as specified in the framework, it is the issuer's responsibility to honour his commitment towards the investor and communicate it transparently.<sup>47</sup> The disclosure of the use of proceeds and impacts plays a pivotal role in meeting implicit accountability standards.

After the issuance, it is however viable to exclude a project listed in the initial issuance offer or framework. For instance, if a project ceases to be classified as green, the project is not eligible to receive funds from the green bond anymore. Proceeds would need to be re-allocated to eligible green projects and investors have to be informed.

The costs related to issuing a green bond are somewhat higher than for a regular bond, differing mainly in the additional costs regarding the external review, responsible for the warranty of the green credentials of the bond. Further costs may arise for establishing structures for the management of proceeds, monitoring and reporting.

47 CEBDS/FEBRABAN (2016), Guidelines for Issuing Green Bonds in Brazil 2016.

## IV. Challenges and prospects

### > Challenges for the development of the domestic green bond market

The overall fixed income market in Brazil amounts to BRL 5.07 trillion as of March 2016, of which more than 50 percent account for federal public bonds issued by the central government or other government agencies. Although the market for private securities has grown in the past years, it is still very small in comparison to the public sector.<sup>48</sup> Among the major impediments are the overall political uncertainty and a difficult macroeconomic environment, related weak credit ratings, and a general lack of depth in the financial market given the low activity of issuers and domestic institutional investors.

Besides these persistent challenges in the general corporate bond market, green bonds face additional barriers that impede the market to grow at a faster pace. For the green bond market to reach scale at a faster pace, the following measures can be addressed by the public sector (such as policymakers, regulators and development banks), and other market actors (e.g. including stock exchanges):

- Define a methodology and requirements for green bond information disclosure, reporting, and external review or auditing; such requirements could also be introduced on a general asset-/project-level in order to enhance transparency and diminish the additional costs of green bonds compared to regular bonds and other financial instruments; meanwhile, a grant scheme that subsidizes external reviews could be introduced, such as showcased by the Monetary Authority of Singapore;
- Introduce or enhance fiscal or other policy incentives, such as tax exemptions for bonds financing sustainable housing;
- Improve access to credit enhancing instruments, for instance by means of partial guarantees;
- Given the restriction for municipalities to issue bonds, a national body with adequate technical capacities that acts as an intermediary and issues bonds on behalf of the municipalities could facilitate green bond financing of public projects;

48 Climate Bonds Initiative (2016), *State of the Market: Brazil Edition*.

- Support the growth of a pipeline of investable green projects and assets; this includes promoting new market segments and product innovations, e.g. mechanisms to aggregate small-scale projects in order to allow funding through the bond market;
- Support domestic banks in building or enhancing internal capacity on how to assess portfolios and green bond projects for selection, how to structure and issue green bonds, how to establish sound internal systems for monitoring and reporting, and provide adequate and needed advisory services to their clients, hence, functioning as multiplier in the domestic market;
- Promote the listing of green bonds;
- Support building a domestic green investor base, for instance by clarifying the compliance of investments in green bonds and other green asset classes with investors' fiduciary duty towards their clients and beneficiaries, or by strengthening environmental risk management requirements across the real economy and financial sector;
- Raise awareness and build knowledge and technical capacity among market stakeholders – both on issuer and investor side, as well as among verifiers – through trainings, research, and other formats of dialogue and knowledge exchange.

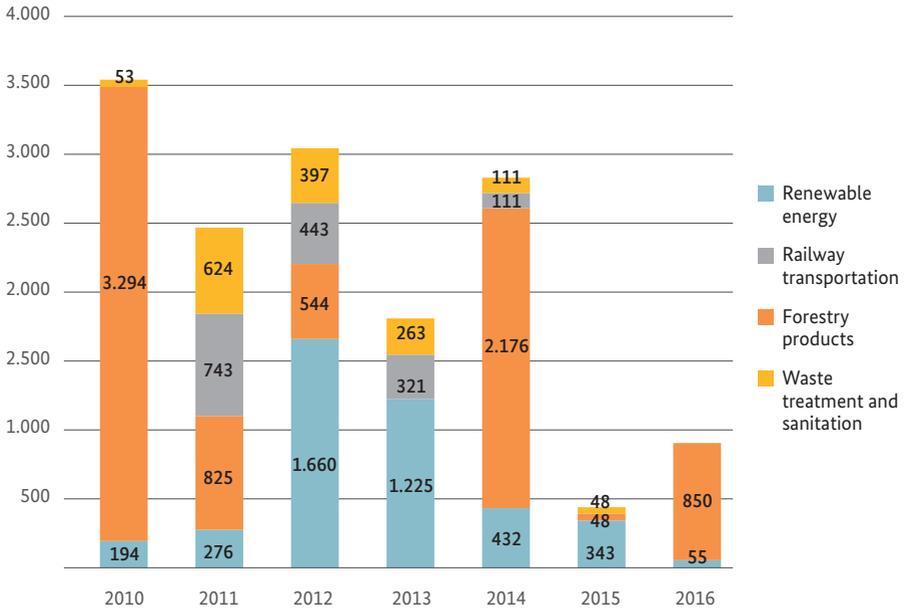
While the challenges are quite extensive, taking action could unleash a huge potential for green bond financing in key sectors relevant for Brazil's economy and green transition, as the following sub-chapter outlines.

### > **Market opportunities: priority sectors**

Analyzing all fixed income securities that have been issued by Brazilian companies since 2010 shows that a considerable number of issuances could potentially have been labelled green, since funds were used in sectors with a high prevalence of eligible green projects such as in renewable energies, railway transportation, forestry products, waste management and sanitation.<sup>49</sup>

49 Based on Bloomberg data. See CEBDS/FEBRABAN (2016), Guidelines for Issuing Green Bonds in Brazil 2016.

Figure 3.2: Fixed income securities issued in Brazil since 2010 with potential green bond eligibility



Source: CEBDS & FEBRABAN (2016).

Three of these sectors, foremost agribusiness, forestry products and renewable energy, which are generally very suitable for green bond financing, are not only highly relevant for the Brazil’s economic growth but also essential to achieve the national climate targets, as outlined in this sub-chapter.<sup>50</sup>

50 See also: Climate Bonds Initiative (2016), *State of the Market: Brazil Edition*, Climate Bonds Initiative.

## Agribusiness

The Brazilian agricultural sector is the core of the country's economy, since it is a major exporter of sugar, corn, coffee, soybean, beef and other agricultural products.<sup>51</sup> Brazil's NDC propose to:<sup>52</sup>

- “Strengthening the Low Carbon Emission Agriculture Program (ABC)<sup>53</sup> as the main strategy for sustainable agriculture development;
- Restoring an additional 15 million hectares of degraded pasturelands by 2030;
- Enhancing 5 million hectares of integrated cropland-livestock-forestry systems (ICLFS) by 2030.”

## Forestry products

Brazil holds the second largest forestland in the world with approximately 516 million hectares,<sup>54</sup> including the Amazon Rainforest, one of the most important forests in the world due to its natural resources abundance and habitat of a rich variety of species. Moreover, the Atlantic Rainforest plays an important role in regulating the regional climate. In total, Brazilian forests store 59,222 million metric tons of carbon<sup>55</sup> while representing an important economic sector. For instance, Brazil is one of the main exporters of paper and pulp<sup>56</sup> and the fourth biggest producer of fiber.<sup>57</sup>

The NDC state the following targets for the sector:<sup>58</sup>

- “Strengthening and enforcing the implementation of the Forest Code, at federal, state and municipal levels;

51 United States Department of Agriculture( 2017), Brazil overview, accessed on May 16, 2017.

52 BRAZIL (2015), Intended Nationally Determined Contribution towards achieving the objective of the United Nations Framework Convention on Climate Change.

53 The Low Carbon Emission Agriculture Program (ABC) is part of the Sectorial Plan for Mitigating and Adapting to Climate Change, elaborated in accordance with Decree 7390/2010, article 3 (MAPA, 2012).

54 Ministry of Environment of Brazil (2017), Brasil detém segunda maior área florestal do planeta, accessed May 17, 2017.

55 Global Forest Watch (2017), Brazil, accessed on May 10, 2017.

56 CEBDS/FEBRABAN (2016), Guidelines for Issuing Green Bonds in Brazil 2016.

57 Climate Bonds Initiative (2016), State of the Market: Brazil Edition. Climate Bonds Initiative.

58 BRAZIL (2015), Intended Nationally Determined Contribution towards achieving the objective of the United Nations Framework Convention on Climate Change.

- Zero illegal deforestation by 2030;
- Compensating for greenhouse gas emissions from legal suppression of vegetation by 2030;
- Restoring and reforesting 12 million hectares of forests by 2030, for multiple purposes;
- Enhancing sustainable native forest management systems, through geo-referencing and tracking systems applicable to native forest management, with a view to curbing illegal and unsustainable practices.”

Until date, half of the green bonds issued from Brazil are from companies of this sector including Suzano and Fibria.

### Renewable energy and energy efficiency

Renewable energies accounts for 41 percent of the total energy used in Brazil.<sup>59</sup> When looking at the electric energy mix, renewable energy sources such as hydropower, biomass, wind, solar account even for 75.5 percent in comparison with the 21 percent of renewable energy share on global level.<sup>59</sup> In the Latin America context, Brazil is a comparably big producer of wind energy that generates 71 percent of the total installed capacity of wind power in the region.<sup>60</sup> However, it is important to note that 64 percent of the total electricity generated in Brazil comes from hydropower (EPE, 2016), which is an energy source often responsible for adverse social and environmental effects, such as changes in water quality, fragmentation of river ecosystems, siltation and displacement of local communities.<sup>61</sup> Beyond these critical concerns stemming from large hydropower projects, Brazil’s dependence on this particular energy source makes its economy highly vulnerable to droughts and other forms of water shortages as seen in the water crisis in 2014/2015 in the Southeastern region. Related to this, Brazil’s NDC highlight the necessity to invest in alternative energy sources such as solar, wind and biomass that currently account for only 11.6 percent of the electricity generated.<sup>62</sup>

59 Empresa de Pesquisa Energética (2016), Balanço Energético Nacional 2016, Ministério das Minas e Energia.

60 Climate Bonds Initiative (2016), State of the Market: Brazil Edition.

61 Von Sperling (2012), Hydropower in Brazil: overview of positive and negative environmental aspects, Energy Procedia, Vol. 18, pp. 110 – 118.

62 Empresa de Pesquisa Energética (2016), Balanço Energético Nacional 2016, Ministério das Minas e Energia.

The following targets were set for the energy sector:<sup>63</sup>

- “Achieving 45% of renewables in the energy mix by 2030;
- Expanding the use of renewable energy sources other than hydropower in the total energy mix to between 28% and 33% by 2030;
- Expanding the use of non-fossil fuel energy sources, increasing the share of renewables (other than hydropower) in the power supply to at least 23% by 2030, by raising the share of wind, biomass and solar;
- Achieving 10% efficiency gains in the electricity sector by 2030.”

The related required investment for small hydro dams, wind, solar and biomass stated in the 10-year Energy Plan developed by the Energy Research Company (Empresa de Pesquisa Energética, or EPE), amount to BRL 155.8 billion by 2024.<sup>64</sup>

Regarding the energy efficiency target, Brazil could even achieve a higher goal of additional 20 percentage points with actions in the residential, commercial and industrial sectors.<sup>65</sup> A study published by the World Bank highlighted that one-fifth of Brazil’s energy efficiency target could be achieved just with the introduction of LED technology in the Brazilian street lighting,<sup>66</sup> a project that could be realized through green bond financing in public-private-partnerships as Brazilian municipalities cannot issue bonds.<sup>67</sup>

63 BRAZIL (2015), Intended Nationally Determined Contribution towards achieving the objective of the United Nations Framework Convention on Climate Change.

64 Empresa de Pesquisa Energética (2015), Plano Decenal de Expansão de Energia 2024, Ministério das Minas e Energia.

65 CEBDS (2016), Consumo eficiente de energia elétrica: uma agenda para o Brasil. Conselho Empresarial Brasileiro para o Desenvolvimento Sustentável.

66 CEBDS/FEBRABAN (2016), Guidelines for Issuing Green Bonds in Brazil 2016.

67 This is due to the Law of Fiscal Responsibility from 2000 that prohibits states, municipalities and federal districts to issue bonds; the only exemption is the federal government that is allowed to issue public securities. See Brasil (2000), LEI COMPLEMENTAR Nº 101, DE 4 DE MAIO DE 2000: Estabelece normas de finanças públicas voltadas para a responsabilidade na gestão fiscal e dá outras providências.

### Transport, sewage and others

As the transport sector is a large emitter of carbon dioxide, investments in this sector are essential to build a low carbon infrastructure while fostering economic growth.

As of the Brazilian NDC, the following targets apply:<sup>68</sup>

- “Increasing the share of sustainable biofuels in the Brazilian energy mix to approximately 18 percent by 2030, by expanding biofuel consumption, increasing ethanol supply, including by increasing the share of advanced biofuels (second generation), and increasing the share of biodiesel in the diesel mix.”

Investments in infrastructure have experienced a boom during the period previous to several large international events in the country such as the World Cup in 2014 and the Olympic Games in 2016, with the government having promoted investments and partnerships. In that context, the government launched in 2015 the second phase of its *Logistics Investment Plan* (PIL), with an estimated investment needs of approximately BRL 86.4 billion for new railway concessions alone.<sup>69</sup>

Besides the priority sectors listed above, green bonds can finance a variety of other climate and environmentally sustainable projects such as in waste, water management and sewage. According to the *National Plan for Basic Sanitation* of 2014, there is demand for investments of approximately BRL 87.5 billion over the next five years, BRL 168.2 billion over the next ten years and BRL 304 billion over the next 20 years.<sup>69</sup> Moreover, a number of further sectors can benefit from mobilizing funding through green bond issuances such as demonstrated by the food producer BRF.<sup>69</sup>

68 BRAZIL (2015), Intended Nationally Determined Contribution towards achieving the objective of the United Nations Framework Convention on Climate Change.

69 CEBDS/FEBRABAN (2016), Guidelines for Issuing Green Bonds in Brazil 2016.

## V. Final remarks



While the Brazilian green bond market is developing and dedicated initiatives have been launched, there are still a substantial number of challenges and barriers that need to be tackled. An important step is the development of the *National Strategy for the Implementation and Financing of Brazil's NDCs* by the Ministry of the Environment and the Inter-American Development Bank.<sup>70</sup> The recently published consultation paper seeks to translate Brazil's NDCs into an action plan by analyzing relevant sectors such as agribusiness, biofuels, energy, forestry and industry. In a next step, this analysis would need to be aligned with a comprehensive and consistent climate finance strategy to facilitate the investments needed. Creating this link, accompanied by forming an enabling policy environment for green bond financing, will be essential to provide the sectors with an adequate flow of financial resources and hence accelerate the country's green transition. In such an environment, the opportunities for the domestic green bond market will be large as Brazil moves towards achieving its climate targets.

<sup>70</sup> Ministry of the Environment of Brazil (2017), *Estratégia Nacional para a Implementação e o Financiamento da NDC do Brasil*.

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Registered offices

Bonn and Eschborn, Germany

Friedrich-Ebert-Allee 36+40  
53113 Bonn, Germany  
Tel. +49 (0) 228 44 60 - 0  
Fax +49 (0) 228 44 60 - 17 66

Dag-Hammarskjöld-Weg 1–5  
65760 Eschborn, Germany  
Tel. +49 (0) 61 96 79 - 0  
Fax +49 (0) 61 96 79 - 11 15

[develoPPP@giz.de](mailto:develoPPP@giz.de)  
[www.develoPPP.de](http://www.develoPPP.de)

Editors

Christine Majowski, Advisor, Strategic Alliance on Green Bond Market  
Development in G20 Emerging Economies  
([christine.majowski@giz.de](mailto:christine.majowski@giz.de); +49 (0) 61 96 79 - 72 77)

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Addresses of the BMZ offices

BMZ Bonn  
Dahlmannstraße 4  
53113 Bonn, Germany  
Tel. +49 (0) 228 99 535 - 0  
Fax +49 (0) 228 99 535 - 35 00

BMZ Berlin | im Europahaus  
Stresemannstraße 94  
10963 Berlin, Germany  
Tel. +49 (0) 30 18 535 - 0  
Fax +49 (0) 30 18 535 - 25 01

[poststelle@bmz.bund.de](mailto:poststelle@bmz.bund.de)  
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