

UNDERSTANDING GREEN BONDS



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Imperial College Business School and TheCityUK wish to recognise Dr. Bob Buhr for his generous support and inputs to the drafting and editing of this report.

UNDERSTANDING GREEN BONDS

GREEN BOND MARKET IS GROWING

UP **78%** SINCE 2016 TO **\$155.5BN** IN 2017



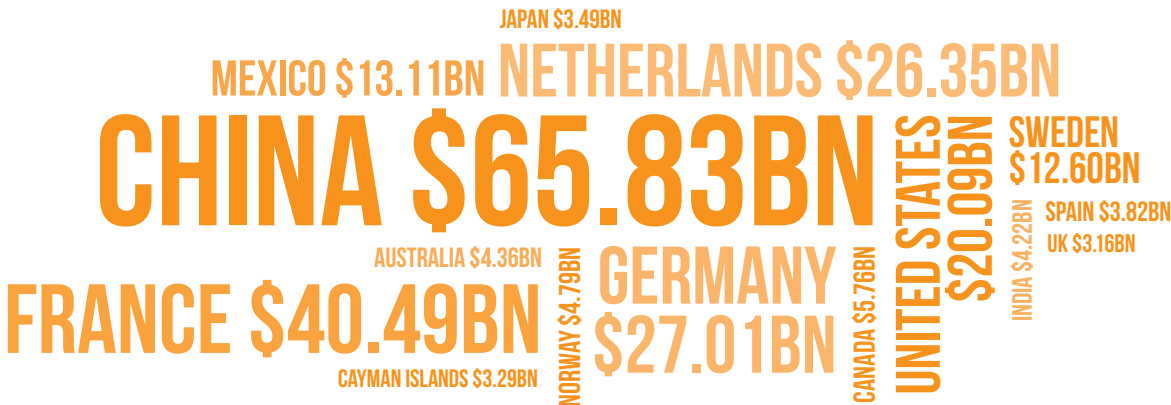
26 GREEN BOND OPEN-ENDED INVESTMENT COMPANIES (OEICs) & UNIT TRUSTS IN THE UK

27 NEW GREEN BONDS LISTED ON THE LSE IN 2017

= **\$10.1BN**



CUMULATIVE GREEN BOND ISSUANCE BY COUNTRY



LARGEST CORPORATE ISSUERS OF GREEN BONDS

BANKS



\$63.92BN

SUPRANATIONALS



\$43.42BN

UTILITIES



\$33.79BN

LARGEST GREEN BOND ISSUER IN 2017

US FEDERAL NATIONAL MORTGAGE ASSOCIATION (FANNIE MAE) SOLD

\$24.9BN

GREEN MORTGAGE BACKED SECURITIES



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FOREWORD

Since the launch of our report 'Growing green finance' six months ago, interest in this field has continued to grow rapidly. Financial market participants, governments, and regulators alike are now more aware than ever of the need to tap mainstream capital markets to underwrite a transition towards more sustainable economic development.

While there is a range of innovation on display within the sector, green bonds are by far the most sizeable part of the green finance market. With this in mind, we have focused this second output of our ongoing collaboration on this area. Our report seeks to set out in clear language what makes green bonds different from conventional bonds and explores the questions of who buys green bonds, and for what reasons.

Our research reveals that granular data on the nature of green bond demand and the motives of buy-side market participants remains elusive. We will continue to explore this aspect of the market in future research and look forward to continued engagement with all parts of the industry. Our aim is to bring together financial and academic perspectives in a way that fosters a broader understanding of this exciting new asset class.



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EXECUTIVE SUMMARY

TheCityUK and Imperial College Business School have undertaken joint research to further the understanding of the green bond market. This report seeks to bring clarity to the question of what differentiates green bonds from other types of bonds and to explore some of the supply/demand dynamics of the green bond market. The key points covered in this report are:

- The differentiating factor between green bonds and other types of bonds is the specification that the proceeds raised will be used for environmentally-friendly projects.
- The market for green bonds has been growing steadily. According to the Climate Bonds Initiative (CBI), labelled green bond issuance rose by 78% between 2016 and 2017, reaching \$155.5bn in 2017.
- The range of entities issuing green bonds has broadened over time. Historically, green bonds were mainly issued by multilateral institutions, along with a few municipalities and national development banks. More recently, the green bond label has come to encompass bonds issued by corporates (including by financial institutions) and by sovereigns.
- Demand for green bonds comes from institutional investors, either by purchasing directly or by investing in green bond funds. Green bond underwriters support the process of issuance and investment. Government policy has been an important driver of demand for green bonds.
- Green bonds are mostly denominated in US dollars or euros. In the UK, the London Stock Exchange (LSE) saw 27 new green bonds listed in 2017, which raised \$10.1bn; the proportion of sterling-denominated green bonds is extremely low.
- The LSE and the Luxembourg Stock Exchange are examples of exchanges that are establishing dedicated green bond listing requirements that require second-opinion verification. The International Organization for Standardization (ISO) has entered the arena and is currently seeking comments on a proposed ISO standard for green finance.
- The exact financial contribution of the green bond market to sustainable economic development remains unclear. It is nearly impossible to ascribe the additionality of any source of green finance, including green bonds, due to the complexities of baseline setting, measurement and verification.
- The most important feature of green bonds is that they build awareness of sustainability aims and generate the potential for positive spillover effects. TheCityUK and Imperial College Business School will continue to explore these issues in future research.

INTRODUCTION

Green bonds have become a lively topic of discussion among financial market participants and public policy institutions. Growing interest in green bonds has been driven by several factors, including:

- The need to raise significant private sector capital to meet the challenges of sustainable economic development.
- The relative ease with which financial markets seem to have adopted the green bond concept.
- Accelerating growth of green bond issuance.

The value of new green bonds issued this year is likely to exceed the \$155.5bn in 2017. The market continues to attract new and more diverse issuers. Despite these positive signals, the green bond market often remains poorly understood by non-specialists. Moreover, doubts have been raised about whether green bonds are a new source of environmental financing or are just a re-branded element of existing bond markets.

Green bonds were conceived as a way to mobilise private capital to towards the realisation of well-recognised environmental goals, such as the UN

Framework Convention on Climate Change (UNFCCC) Paris Agreement.¹ However, there is scepticism about whether 'use of proceeds' bonds bring new money into the sector. So are green bonds an example of genuine financial innovation, or simply repackaging an old product in a different wrapper?

While it is nearly impossible to determine whether green bonds are bringing new money to the financing of sustainable economic development, it is certain that individual issuers are benefiting from the increased participation of a broader range of investors in their bond deals. With the aim of helping to resolve some of the common misunderstandings about green bonds, this report sheds light on the following issues:

- In what ways are green bonds different from other kinds of bonds?
- Who buys green bonds, and for what reasons?

The primary audience for this report is financial market participants and policymakers seeking to understand the basic principles, and challenges, of the green bond market.

¹ The UNFCCC Paris Agreement was an agreement in December 2015 bringing together 195 countries to address climate change and adapt to its impacts.

GREEN BONDS

What are green bonds?

A green bond is a fixed-income financial security sold with a promise to devote the funds raised to environmentally beneficial projects. According to the Green Bond Principles established by the International Capital Markets Association, green bonds are “any type of bond instrument where the proceeds will be exclusively applied to finance or re-finance...green projects”.² Green bonds were initially designed by large supranational organisations such as the World Bank and the European Investment Bank (EIB). The EIB issued the first Climate Awareness Bonds in 2007. The proceeds of green bonds are used to finance a wide range of activities including renewable energy, energy efficiency, sustainable waste management, sustainable land use, biodiversity conservation, climate change adaptation and clean transportation.³

Green bonds are generally ‘self-labelled’ by the issuer. Index providers such as Bloomberg and international organisations such as the Climate Bonds Initiative (CBI) have generally classified green bonds as such if they have been labelled green by the issuer. However, there are exceptions. Repsol’s self-labelled green bond was excluded from many indices due to buy-side concerns over the use of proceeds.⁴ Adding to the complexity is the existence of ‘unlabelled’ green bonds, for which there also appears to be robust buy-side demand.

The offering circular of a traditional bond issue will usually include a ‘Use of Proceeds’ section. The language is often fairly general – for example, “general corporate purposes.” In the case of green bonds, the use of proceeds may be highly specific. However, while the borrowers’ environmental objectives may be spelled out in great detail, the statements are not legally binding. Bond covenants do not mandate that the use of proceeds be ‘green’ in their nature.

On the other hand, there is presumed to be a self-regulating mechanism. An issuer of a green bond that did not use proceeds as promised may be hard-pressed to bring another green bond to market, although it is often the case that bond markets have short memories.

The importance of the use of proceeds is reflected in the methodology of Moody’s Green Bond Assessments (GBAs). These assessments are not traditional credit ratings, but instead provide scores reflecting the ‘effectiveness of an issuer’s approach to managing, administering, allocating proceeds to and reporting on environmental projects financed with green bond proceeds’.⁵

Data from the CBI provides an analysis of the use of proceeds of green bonds.⁶ The percentage of proceeds going to energy has declined in relative terms in the past five years, while that of transport and water has increased. However, overall issuance continues to increase in each of these categories in absolute terms (Figure 1).

The Climate Bond Initiative asserts that common practice is that terms green bond and climate bond are used interchangeably.⁷ At a more technical level, differences in definitions do exist but have limited impact on market behaviour.

² International Capital Markets Association, ‘The Green Bond Principles’, (April 2018), available at: <https://www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/Green-Bonds-brochure-150616.pdf>

³ TheCityUK and Imperial College Business School Centre for Climate Finance and Investment, ‘Growing Green Finance’ (September 2017), p.11.

⁴ For further detail, see TheCityUK and Imperial College Business School Centre for Climate Finance and Investment, ‘Growing Green Finance’ (September 2017), p.10.

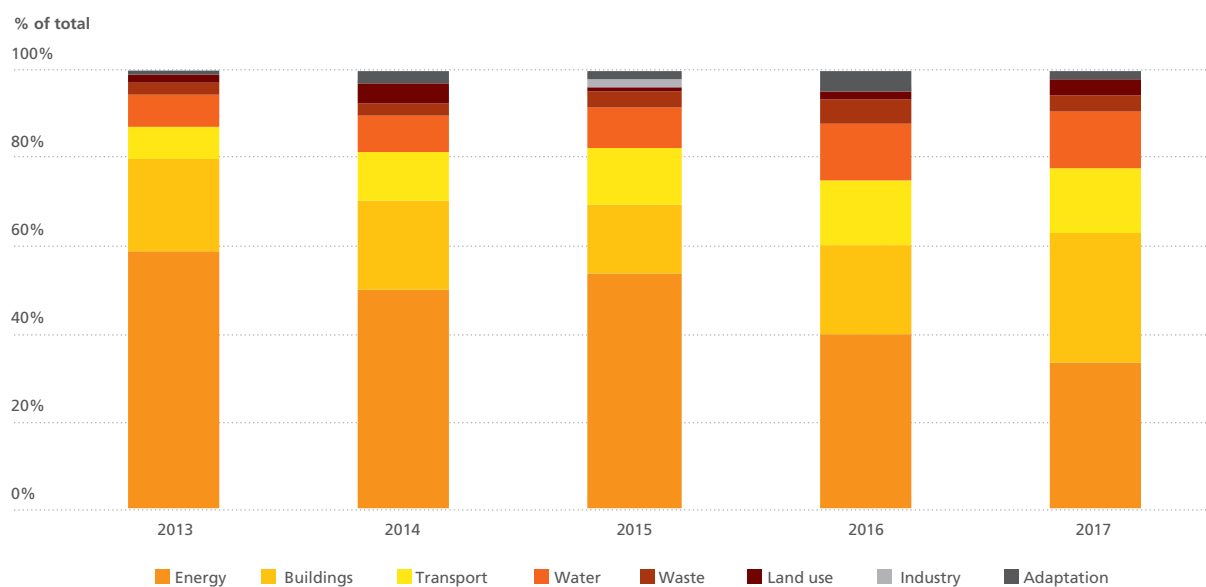
⁵ Moody’s Investors Service, ‘Green Bond Assessment Methodology’, (March 2018).

⁶ Climate Bonds Initiative.

⁷ Climate Bonds Initiative, ‘Climate Bonds for Beginners’, (April 2018), available at: <https://www.climatebonds.net/resources/overview/climate-bonds-for-beginners>

Figure 1: Green bonds use of proceeds – project types are diversifying

Source: Climate Bonds Initiative.



What green bonds are not

There is nothing unique about green bonds other than their use of proceeds. Bond categories have well-established sets of criteria. In some cases, there are very explicit legal criteria (for example, Equipment Trust Certificates from railways and airlines in the US). It is, therefore, something of an oddity of the green bond market that a bond is green if an issuer calls it so. Such flexibility is only observed in the green bond market. Corporate bond markets and municipal bond markets in the US, for example, are strictly and legally separated by the type of issuer.

Green bonds are not project bonds, although undoubtedly project bonds can be 'green'. Project bonds fund a specific infrastructure project and are nearly always secured by named assets. They are sold in over-the-counter markets to institutional investors and not traded on exchanges. In the case of project bonds, interest and principal are contingent on the cash flows from specified projects. The interest and principal for green bonds are generated by the operating cash flows of the issuer.

In fact, there is no unitary class of bonds that can be called green bonds. 'Green' is simply a label, albeit a convenient one, for a wide range of bond types. Many green bonds have nothing to do with each other – legally, structurally, or with respect to who buys them.

Who issues green bonds?

The range of entities issuing green bonds has broadened over time. Over the period 2007-2012, green bonds were mainly issued by multilateral institutions such as the World Bank, the EIB and the International Finance Corporation (IFC), along with a few municipalities and national development banks. For example, the IFC has issued some \$5.8bn of green bonds and has indicated it will remain a constant issuer as part of its expanding green finance program.

More recently, the green bond label has come to encompass bonds issued by corporates (including by financial institutions) and sovereigns. The label has also stretched to include asset-backed securities (ABS), Real Estate Investment Trusts (REITs), residential mortgage-backed securities (RMBS), and convertibles.

In the case of many supranational issuers, and of municipal issuers in the US, green bonds are issued in the context of the guidelines of the organisation’s mission or municipality’s legal responsibilities for infrastructure. There have been several green bond issues where funds were

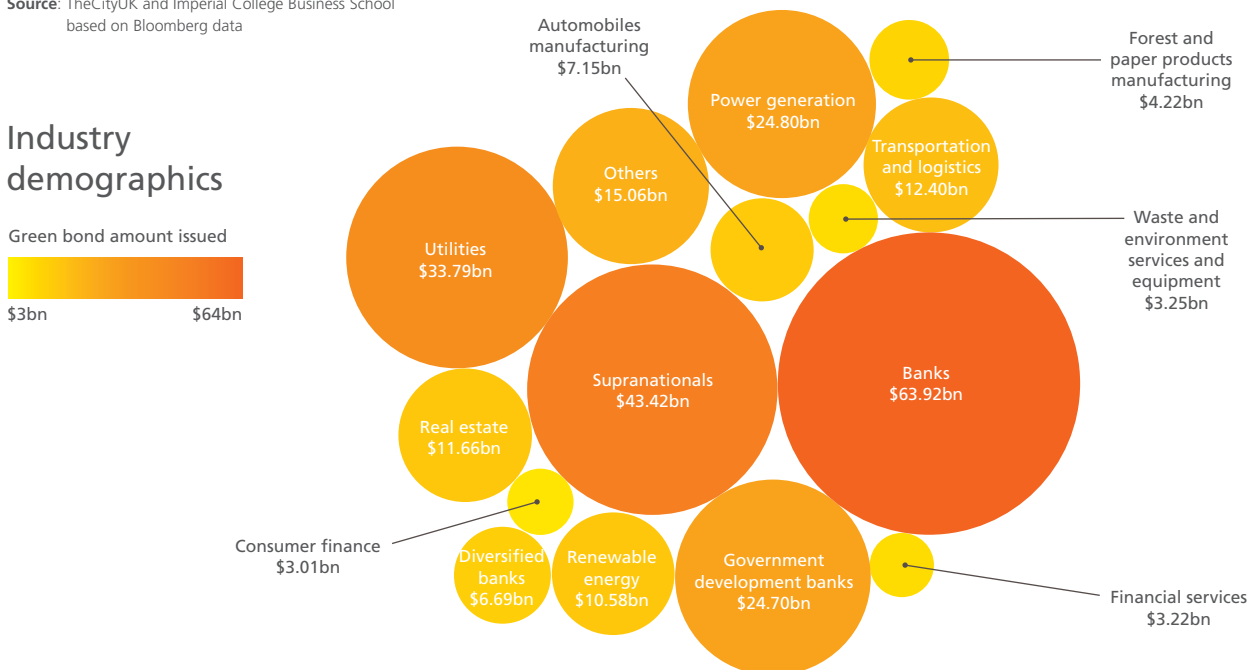
destined for upgrading water projects and infrastructure, for example. Corporates often have a wider range of activities to be funded, but again, these are expected to be related to environmental improvements.

In many cases, the rationale for issuing green bonds is clear. Utilities want to migrate to renewable energy sources and find green bonds a ready source of financing for the process. Property companies want to upgrade their properties to higher levels of energy efficiency, and green bonds are useful for this as well. Typically, there is a pre-existing set of industry standards for property that can be targeted and met, and these are relatively straightforward to monitor. Development banks, both supranational and national, have projects they wish to finance, many of which involve increasing energy efficiency, reducing carbon generation, or increasing water use efficiency.

Many of these fit elegantly into a green bond framework. In fact, some of these domains make so much sense for green bonds – refinancing the development of wind farms, for example – that in some cases investors do not appear particularly distressed not to be receiving independent verification.

Figure 2: Corporate issuers by industry as of Q1 2018

Source: TheCityUK and Imperial College Business School based on Bloomberg data



More controversial is whether there are quantifiable financial benefits from issuing a green bond. One potential benefit has been described as a 'halo effect', in which a company issuing green bonds subsequently benefits from lower borrowing costs on both its green and non-green debt financing. Research from NatWest Markets asserts that by issuing a green bond, a company broadens its overall pool of investors, which has the effect of increasing demand for its debt, thereby raising the price of its bonds and lowering the yield.⁸

The evidence about whether green bonds have a pricing advantage over a conventional comparator is not yet conclusive. The Organisation for Economic Co-operation and Development (OECD) stated in 2017 that the financial characteristics of green bonds and conventional bonds produced by the same issuer are identical on the issue date ('flat pricing') because investors are not willing to pay a premium.⁹ Rating agencies have generally taken a similar view. Other reports from Barclays (2015)¹⁰, Bloomberg (2017)¹¹ and HSBC (2016)¹² tackle the issue of green bonds in the secondary market. Barclays and Bloomberg find negative green bond premiums (-17 basis points and -25 basis points, respectively). HSBC asserts that the existence of positive or negative premiums does not necessarily mean a systematically negative premium.

The small sample size often employed in studies of green bond pricing presents challenges in extrapolating conclusions to the wider universe of existing green bonds. Corporate green bonds with sufficient liquidity for this type of analysis represent a minority of total green bond issuance volume. Furthermore, it requires very sophisticated modelling to control for differences in liquidity between green and conventional bonds. A recent study by NN Investment Partners¹³ performed a comparison on yields and stated that green bond yields have been lower than conventional issuances. However, at 1.1 basis points, the difference in the yield is extremely small.

Who buys green bonds?

Demand for green bonds comes from institutional investors, either by purchasing directly or by investing in green bond funds. Examples of direct institutional investment include the following:

- Barclays has invested £1bn in green bonds and has committed to investing another billion.¹⁴
- Zurich, which has a green bond portfolio worth over \$2bn, has invested in over 120 green bonds from 75 issuers in seven currencies.
- AXA has invested €1bn in the green bond market and has its own AXA WF Planet Bonds fund, a green bond fund.

Green bond index funds offer another important way of gaining exposure to this asset class. For example, the World Bank's IFC and Amundi, a France-based asset manager, launched such a fund, the Amundi Planet Emerging Green One, in March 2018. The IFC committed \$256m in investment in the fund, which is intended to focus on investments in emerging markets. The world's largest asset manager, BlackRock, launched a fund in March 2017 that tracks the Bloomberg Barclays MSCI Global Green Bond Index.

Retail investment in green bonds still accounts for a small proportion of overall demand. According to data from Morningstar, there are 26 green bond open-ended investment companies and unit trusts available in the UK; key players include Allianz, iShares, JSS, Mirova, and Parvest.¹⁵

⁸ Financial Times, 'I can see your (green) halo', (30 January 2018), available at: <https://ftalphaville.ft.com/2018/01/30/2198226/i-can-see-your-green-halo/>

⁹ OECD, 'Mobilising Bond markets for a Low-Carbon Transition' (2017).

¹⁰ Barclays, 'The Cost of Being Green', (18 September 2015), available at: https://www.environmental-finance.com/assets/files/US_Credit_Focus_The_Cost_of_Being_Green.pdf

¹¹ Bloomberg, 'Investors are willing to pay a "green" premium', (2017).

¹² HSBC, 'Green Bonds 2.0', (2016).

¹³ NN Investment Partners, 'Unravelling the Green Bond premium', (2017).

¹⁴ Barclays, 'Barclays Green Bond Framework Investor Presentation', (September 2017), p.3, available at: <https://www.home.barclays/content/dam/barclayspublic/docs/InvestorRelations/FixedIncome/Investor%20Presentation%20Final%20Website.pdf>

¹⁵ Morningstar, 'Fund Quickrank', (April 2018), available at: <http://www.morningstar.co.uk/uk/fundquickrank/default.aspx>

Green bond underwriters support the process of issuance and investment. Bank of America Merrill Lynch topped the league table in 2017, with underwriting \$8.2bn, followed by Credit Agricole (\$7.6bn) and HSBC (\$7.4bn); for more information see Figure 3.¹⁶

Figure 3: Top ten green bond underwriters in 2017

Source: Climate Bonds Initiative

Rank	Company name
1	Bank of America Merrill Lynch
2	Credit Agricole
3	HSBC
4	Citi
5	BNP Paribas
6	JP Morgan
7	Barclays
8	Morgan Stanley
9	Société Générale
10	SEB

Assuming there is no significant price differential between green and conventional bonds issued by the same entity, reputational factors are then the most important driver of green bond demand. If investors do not pay a premium for holding them, then green bonds act as a costless signal to shareholders (in the case of institutional investors) and clients (in the case of funds) of a firm’s commitment to improving the environmental performance of their portfolio.

The big question going forward is how government policy will further stimulate the market. The Chinese government has explicitly endorsed green finance as an integral part of the country’s economic development. Official support for the green bond market there has encouraged rapid development and propped up demand among investors.¹⁷ In Europe, France’s law on The Energy Transition and Green Growth is now more than two years old. Article 173 of the law, which took effect in January 2016, introduced a requirement for institutional investors to disclose ‘how ESG [Environmental, Social and Governance] criteria are considered in their investment decisions [and] how their policies align with the national strategy for energy and ecological transition.’¹⁸ Meanwhile, in March 2018 the European Commission launched an action plan on sustainable finance which includes the creation of an EU Green Bond Standard and a sustainable finance classification system.

Yet as of today, it appears that the majority of green bond investors are not buying to fulfil an ESG mandate. A recent survey of corporate treasurers who issue green bonds¹⁹ indicated that around half of investors buy green bonds because they are green. Roughly half buy them because they are bonds that have the credit quality, duration, and other financial characteristics they seek for their portfolios. Thus, much of the growth of the green bond market has primarily been driven by bond buyers who may well be indifferent to the environmental characteristics of the bonds.

¹⁶ Climate Bonds Initiative, ‘Underwriter League Table for 2017’, (1 February 2018), available at: <https://www.climatebonds.net/2018/02/underwriter-league-tables-2017-baml-tops-both-q4-full-year-cr%C3%A9dit-agricole-hsbc-2nd-3rd-full>

¹⁷ Wang, Yao and Zhang, Ricco, ‘China’s green bond market’, ICMA International Capital Market Features, Issue 44, (First Quarter 2017).

¹⁸ Principle for Responsible Investment and Mirova Responsible Investing, ‘French Energy Transition Law: Global Investor Briefing’, (2016), p.7, available at: <https://www.unpri.org/download?ac=1421>

¹⁹ Climate Bonds Initiative, ‘Green bond pricing in the primary market: July-September 2017’, (Q3 2017), p.5, available at: <https://www.climatebonds.net/files/files/Greenium%20Q3-Final-20180219.pdf>

THE GROWTH OF THE GREEN BOND MARKET

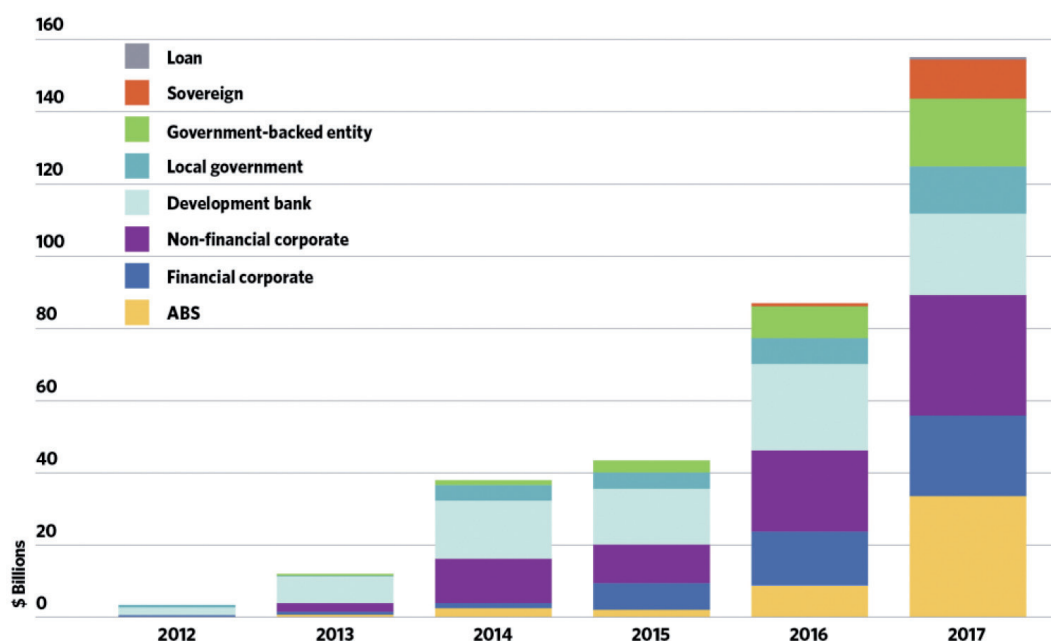
Investors have been generally receptive to the green bond concept and have supported the growth of the market. The EIB – which pioneered green bonds in 2007 – is one of the world’s most prolific issuers of green bonds, with over €15bn raised across 11 currencies as of end-2016.²⁰ In 2017, the US Federal National Mortgage Association (Fannie Mae) was the world’s largest green issuer, having sold to the market \$24.9bn of green mortgage-backed securities.

Market sizing

The market for green bonds has been growing robustly, although growth rates across bond types are not uniform. According to Climate Bonds Initiative, labelled green bond issuance rose 78% between 2016 and 2017, reaching \$155.5bn in 2017 (Figure 4).²¹

Figure 4: The labelled green bond market is growing rapidly

Source: Climate Bonds Initiative



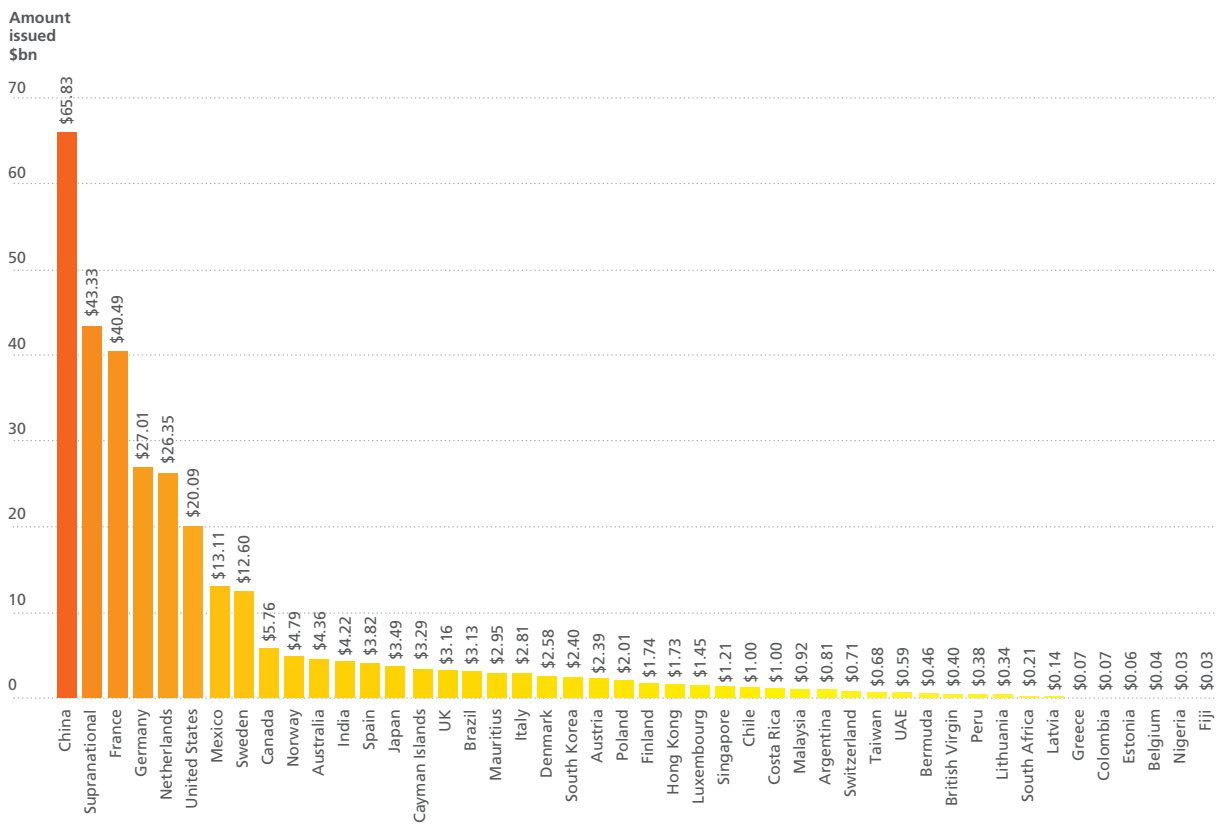
²⁰ European Investment Bank, 'Climate Awareness Bonds', (August 2017), available at: www.eib.org/eib.org/investor_relations/cab/index.htm

²¹ Climate Bonds Initiative, 'Green Bond Highlights 2017', (January 2018), p.1, available at: <https://www.climatebonds.net/files/reports/cbi-green-bonds-highlights-2017.pdf>

Geographical diversity

Figure 5: Cumulative green bond issuance by country from 2010 to February 2018

Source: TheCityUK and Imperial College Business School, based on Bloomberg data



The chart opposite depicts the geographical distribution of cumulative green bond issuance from 2010 to February 2018.

In China, the global leader, banks continued to dominate the green bond market, accounting for 74% of total domestic green issuance. In France, the other leading country, the major contributor to issuance was its €7bn sovereign bond issue in January 2017, which accounted for 53% of the value of issuance from the country; however, corporates account for 32%, agencies 10%, and financial institutions and municipals the remaining 5%.²²

The major green bond indices are usually denominated either in US dollars or euros. These two currencies combined account for 88% and 86.5% of total currencies for the Bloomberg Barclays MSCI Green Bond Index and the BAML Green Bond Index, respectively. The pound sterling only accounts for a small proportion (5% and 4.3% of the two indices, respectively); for more information see Figure 6.²³

Figure 6: Two examples of green bond indices

Source: International Capital Market Association

	EUR	USD	GBP	Other
Bloomberg Barclays MSCI Green Bond Index (as of 31 May 2017)	52.0%	36.0%	5.0%	7.0%
BAML Green Bond Index (as of 13 April 2017)	49.3%	37.2%	4.3%	9.2%

In the UK, the LSE saw 27 new green bonds listed in 2017, which raised \$10.1bn. Most listed green bonds on the LSE are denominated in US dollars, euros and Swedish krona. The proportion of listed bonds denominated in sterling remains extremely low (Figure 7).

Figure 7: Currency denomination of green bonds listed on the London Stock Exchange, as of the end of 2017

Source: TheCityUK calculations based on data from the London Stock Exchange

Currency	Funds raised in national currency (millions)	US dollar equivalent of amount raised at date of issue (millions)	Number of bonds listed
US dollar	8,587	8,587	17
Euro	5,490	6,388	12
Swedish krona	25,910	2,979	26
Pound sterling	1,350	1,951	5
Indian rupee	42,650	649	3
Mexican peso	750	44	1

²² Ibid.

²³ International Capital Market Association, 'The Green Bond Principle Databases and Indices Working Group – Summary of Green Fixed Income Indices Providers' (June 2017), p.7-15, available at: <https://www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/Green-Bond-Indices-Summary-Documents-190617.pdf>

THE GREEN BOND PRINCIPLES AND STANDARDS

Green bond ratings

Green bonds are evaluated by credit rating agencies such as Moody's, Standard & Poor's (S&P) and Fitch. Credit ratings on green bonds will vary according to the corporate credit quality of the issuer. Green bonds can encompass the entire rating spectrum, although we note that high-yield green bonds are still somewhat rare.

In recent years, an extension of the debt-rating industry has emerged to evaluate the environmental characteristics of green bonds and green assets. Unlike traditional services, which assess the quality of the issuance as measured by the ability (and willingness) of the issuer to service its debt obligations, green ratings are broader in scope. The following section provides a non-exhaustive overview of the leading providers of this service.

Moody's

Moody's Green Bond Assessment (GBA) scores green bonds by taking five factors into consideration:

- organisation (15% weighting)
- use of proceeds (40%)
- proceeds disclosure (10%)
- management of proceeds (15%)
- ongoing reporting (20%).

The ratings offer a 'relative ranking on [the] use/management of proceeds'. As of March 2018, 31 issuances had received GBAs.²⁴

S&P

S&P started its green evaluation service in April 2017. The service measures the green impact of assets and is independent of credit ratings. Sectors covered are renewable energy, energy efficiency, green transportation, environmentally compliant buildings, fossil fuel projects, nuclear, and water. Their approach is based on a weighted average of three factors:

- transparency
- governance
- mitigation or adaptation.²⁵

Fitch

Fitch is the outlier among the three main rating agencies. It does not provide environmental ratings, but instead rates green bonds "based on the underlying credit risk in line with relevant sector criteria". Fitch applies only its traditional credit-rating service to the evaluation of green bonds.

Aside from the established players, specialised agencies have been established in recent years.

Sustainalytics

Sustainalytics is a Netherlands-based research house and rating agency focusing on ESG and corporate governance. The rating agency analyses and monitors companies' ESG issues and rates their ESG performance. Sustainalytics also provides second-party opinions for green bonds.²⁶

Cicero

Cicero, a Norwegian climate-research institute, evaluates bonds upon request using a 'shades of green' methodology. Introduced in 2015, this methodology (which does not represent a credit rating) reflects "the climate and environmental ambitions" of bonds. Dark green shading means that Cicero believes it provides long-term environmental solutions, whereas light green implies short-term improvements only.

Other examples include Oekom Research, a sustainable investment rating agency based in Germany and China's Dagong Global Credit Rating Group, which rates green debt as well as conventional bond issues. Finally, some of the major accounting firms are beginning to develop their own green metrics for this type of evaluation.

²⁴ Moody's Investors Service, 'Green Bond Assessment Methodology', (March 2018).

²⁵ S&P Global Ratings, 'S&P Global Ratings Green Evaluation: Time to Turn Over a New Leaf?', (2017), available at: <https://www.spratings.com/documents/20184/1481001/Green+Evaluation/bbcd37ba-7b4f-4bf9-a980-d04aceffa6b>

²⁶ Sustainalytics, 'ESG Research & Ratings', (2018), available at: <https://www.sustainalytics.com/esg-research-ratings/>

IN FOCUS: SOVEREIGN GREEN BOND ISSUANCE

This month Lithuania became the seventh country in the world to issue a sovereign green bond, following Poland (2016 and 2018); France, Fiji, and Nigeria (2017); and Belgium and Indonesia (2018).

With total planned issuance of €68m over three years, the Lithuanian issue is small in comparison (France's sovereign issue was for €7bn), but notable for its mechanics. In this case, the sovereign issuer worked with supranational institutions to affirm the environmental characteristics of the projects financed by the bond proceeds and to ensure ongoing management of the funds.

The funds raised by Lithuania will be used to modernise residential buildings to make them more energy efficient. The government will lend the proceeds of the bond issue to the Public Investment Development Agency (VIPA); these will in turn back subsidised loans to owners of multi-apartment buildings for building renovations via the Fund for Modernisation of multi-apartment buildings (DNMF).

The role of VIPA and DNMF in managing the green bond proceeds represents the latest stage of an ongoing process of funding improvements to residential buildings' energy efficiency. Since 2009, VIPA has been the financial intermediary for a fund operated by the EIB. In 2017 VIPA also received a €50m loan from the European Bank for Reconstruction and Development (EBRD) for residential building renovations to increase energy efficiency. The green bond proceeds are being allocated to this ongoing renovation programme, which is also aligned with the 2014-2020 EU structural investment funds programme; DNMF is part of this programme, managing €74m under the European Regional Development Fund. (One of the EU programme's investment priorities is "Supporting energy efficiency, smart energy management and RES [renewable energy sources] use in public infrastructures, including in public buildings, and in the housing sector"²⁷).

The 156 building-renovation projects that have been selected for funding from the green bond proceeds have already been vetted by the European Commission, given the alignment of the broader programme with the EU structural funding programme. The involvement of supranational institutions in selecting and approving the projects has served, in effect, as a sort of de facto green bond rating in the absence of a formal assessment from a rating agency.

²⁷ Operational Programme for the European Union Funds' Investments in 2014-2020, (2014), p.70, available at: <http://www.esinvesticijos.lt/en/documents-2014>

Tightening of principles and future standards for green bonds

There have been a variety of definitions and taxonomies offered for green bonds. In part, this reflects the necessity of a granulated definition for those entities that track issuances. It also represents the range of stakeholders seeking to influence the future direction of the market. Our previous research noted that while a diversity of opinion about green definitions is inevitable, for green to become a widely appreciated attribute of investment, there must be a shared set of standards.²⁸ Six months later, we see progress being made.

Both the LSE and the Luxembourg Stock Exchange are establishing dedicated green bond listing requirements that require second-opinion verification. The Luxembourg Stock Exchange has introduced a set of green bond standards that need to be fulfilled by issuers to qualify for a listing. To what extent these various proposals on standards will get universally adopted remains unclear. The ISO has entered the arena and is currently seeking comments on a proposed ISO standard for green finance.

The Financial Stability Board (FSB), chaired by Bank of England Governor Mark Carney, has undertaken to reform the disclosure and reporting of environmental risks. The June 2017 report from the FSB's Taskforce on Climate-related Financial Disclosures has significantly advanced the thinking around standardisation of such risks, and this will eventually have an impact on risk assessment by issuers and regulators. These guidelines may eventually help standardise the range of activities eligible for green bond financing.

Transparency with risk disclosures is necessary but insufficient for corporate reporting on projects. Greater transparency on the expected impact of green investments holds value to asset managers and asset owners, and thus there is a strong push by them to encourage impact reporting at many different levels. Various organisations, such as the International Capital Market Association, have already introduced guidelines on how to report on energy efficiency, renewable energy, water as well as wastewater projects.²⁹ However, industry-wide standardisation of impact reporting frameworks for investors and asset managers is still desirable.

²⁸ For further detail, see TheCityUK and Imperial College Business School Centre for Climate Finance and Investment, 'Growing Green Finance', (September 2017), p.10.

²⁹ ICMA Group, 'The Green Bond Principles', (2017).

CONCLUSION

This report highlights that the sole feature that differentiates green bonds from other types of bonds is the specification of the use of proceeds. Within the green bond universe, there is great diversity concerning offering size, issuer, structure, and other parameters. In this sense, 'green bond' is simply a label and not a designation of a unitary class of bonds.

While green bonds are the best known and most developed segment of green finance, granular data on green bond demand remains elusive. Investments in green bonds are predominantly made by institutional investors (via direct purchases and index funds), but many important questions remain about the buy-side of the market.

While green bonds are consistent with a transition to a greener economy, the exact nature of their contribution to sustainable economic development is far from clear. In theory, green bonds will only help achieve sustainability goals when the market becomes a channel for investors to finance projects that would not otherwise have occurred (or would have otherwise attracted a higher cost of capital). In practice, it is nearly impossible to ascribe the additionality of any source of green finance due to the complexities of baseline setting, measurement, and verification. More fundamentally, we believe that seeking to apply measures of additionality to the green finance market would be a mistake. Such an approach fails to recognise the dynamics of capital mobility within the global financial system.

Our review of the green bond market has led us to believe that its most important features are how it generates awareness of sustainability aims and may create positive spillover effects. Enhanced reporting and disclosure commitments are another important contribution, benefiting investors by increasing transparency about the use of proceeds.

While the green bond market in its current form is not yet a mechanism for transformational change in the global financial system, hopes that it will become one in the future may be misplaced. The green bond market should grow and thrive, but so too should efforts to open debt capital markets, in all of their forms, to the needs of more ecologically sustainable economic development. In that respect, the green bond market is off to a great start.

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