GLOBAL RESEARCH INSTITUTE

DWS

November 2018 ESG Thematic Research

Green bonds explained

A key part of a portfolio aligned with the transition to a low carbon economy

Summary

With more than 2,000 investors, with assets under management in excess of USD70 trillion, committed to responsible investing, green bonds provide a relatively easy way to support this ambition.

Since its inception in 2007, the green bond market has grown significantly such that issuance is expected to reach between USD 180-210 billion this year. In terms of total green bonds outstanding this amounted to USD 389 billion at the end of June 2018 (CBI September 2018). A wider definition of 'climate aligned' bonds suggests that the total bonds outstanding reached an estimated USD1.45 trillion by mid-2018.

While the growth in green bond issuance was relatively modest in the early years, this has changed since the International Capital Market Association's Green Bonds Principles (GBP) were developed in 2014 and the Paris climate agreement was signed in 2015.

Allocations to the green bond market have also been supported by an increasing number of investors aiming to align their investments to the United Nations' Sustainable Development Goals.

Indeed green bonds could be a natural fit with the SDG agenda given the majority of green bond proceeds have been focused towards financing the clean transportation, efficient buildings, energy efficiency, renewable energies, water management and waste management sectors.

Guidelines and principles for green bond issuance have been developed at a country level for example in China, Brazil, Kenya, Nigeria, India and Japan. From a regulatory perspective, China has led the field. In 2014, China established a Green Finance Taskforce and their recommendations were adopted by the Central Council in 2015 which were turned into into green financial guidelines, including for green bonds in 2016. Green bond issuance by Chinese institutions expanded significantly thereafter.

In 2018, attention has turned to Europe, where the European Commission has announced its Sustainable Finance Action Plan. As part of this agenda, a sustainability taxonomy will be developed and adopted before the end of 2019. One of the aims is to help ensure integrity and trust in sustainable finance products such as green bonds.

At DWS, our proprietary ESG Engine implements a framework to assess the ESG risks and opportunities of bonds (at an issuer level) which finance specific ESG related/themed projects. This predominantly covers green bonds, but, aims as well to achieve coverage for blue, social and sustainability bonds as well.

In this article we explore the development of the green bond market and the risks and opportunities ahead. We expect a strengthening of standards for green bonds and the development of methodologies for assessing whether/how green bonds actually reduce carbon emissions. Investors also have a role in encouraging the growth of building related green bonds linked to energy efficiency.

Continued allocation to green bond funds is important to continue the green bond market's momentum and the wider positive influence it is having within the capital markets, with companies, governments and regulators.

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November 2018

Introduction

Defining the green, blue, climate-aligned, social and sustainability bond universe

Thematic fixed income investing is growing in popularity and can typically be broken down into green bonds, blue bonds, climate-themed investments and social themed bonds. Green bonds were created to fund projects that have positive environmental and/or climate benefits. They are differentiated from a regular bond by its label, which signifies a commitment to exclusively use the funds raised to finance or re-finance "green" projects, assets or business activities[1]. Green bond issuance has typically been focused on projects in the renewable energy, energy efficiency, clean transportation and the pollution prevention and control sectors.

The emerging blue bond market is a subset of green bonds that specifically finance water-related projects and assets such as the conservation in marine resources. Seychelles, a small archipelago nation in east Africa in the Indian Ocean, received a $20 million World Bank package in late September 2017 that includes loans, grants, and an EUR 5 million guarantee that will enable the future issuance of the world's first blue bond in support of ocean conservation.

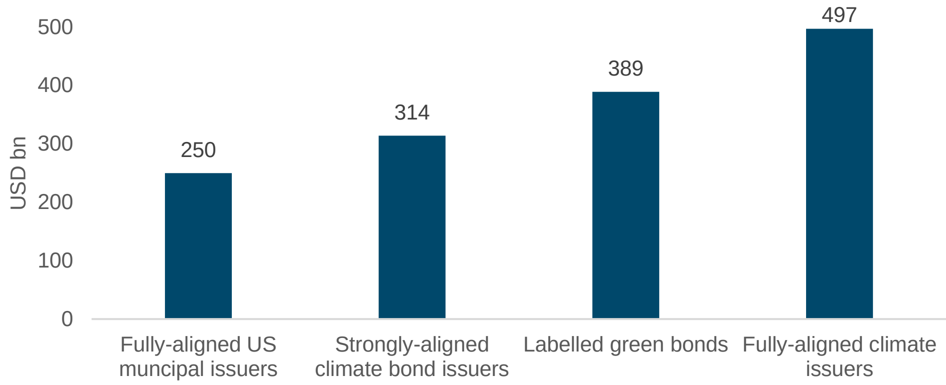
Climate bonds are aimed at projects and assets to reduce or avoid greenhouse gas emissions or to facilitate adaption and resilience to climate change. While not labelled green this set of bond issuance supports the transition to a low carbon economy. Examples include climate mitigation projects such as low-carbon energy generation and/or climate adaption projects which address climate impacts such as droughts or the effects of sea level rise.

Social themed bonds embrace a wider set of potential projects that aim to address or mitigate a specific social issue and achieve a positive social outcome for a target dis-advantaged population. Examples include social housing as well as issuance financing health care and education. Bonds that intentionally mix green and social projects are referred to as Sustainability Bonds.

In this paper we specifically examine the development of the green bond market, which has grown significantly over the past decade. Since 2015, the market has been given added impetus following the signing of the Paris Climate Agreement and the United Nations Sustainable Development Goals.

The Climate Bonds Initiative's (CBI) annual 'State of the Market' report, estimates the growth of the 'labelled' and 'unlabelled' green bond since 2012. Its most recent report, Figure 1, estimates a USD1.45tn climate-aligned bond universe. In comparison, CBI estimated in 2012 that there were USD174bn of bonds fully aligned with a low-carbon economy. 'Strongly-aligned' issuers are defined as including companies with at least 75% of their revenue related to green business activities, while fully-aligned climate issuers are companies with 95%+ of their revenue related to green business activities. Fully-aligned US municipal issuers are from authorities, agencies and US municipalities where 95% of the revenue is related to climate-aligned water, transport, waste, land use and renewable energy operations. While other definitions could be used to assess the size of the market, the CBI's major role in helping grow the green bond market makes their assessment an important reference point for the green bond sector.

FIGURE 1. ESTIMATING THE SIZE OF THE CLIMATE-ALIGNED BOND UNIVERSE



Source: Climate Bonds Initiative (September 2018)

According to the International Energy Agency, half of the world's population reside in cities, which are responsible for almost two-thirds of global energy demand and 70% of carbon emissions from the energy sector (IEA 2017). Consequently, green bonds will be an important vehicle to support cities and sovereigns meeting their climate targets set out in Paris.

On the investor side, an increasing number of institutional investors are adopting low-carbon commitments in their investment strategies. In many instances, these commitments include increasing investments in clean technologies, green infrastructure and green bonds.

From a regulatory perspective, China has led the field in terms of adopting measures to promote the greening of the financial system primarily due to the financial and social costs air, land and water contamination were inflicting on the economy. In 2014, the government established the Green Finance Taskforce and their recommendations were adopted by the Central Council in 2015 which translated into green financial guidelines in 2016 and, in that year, China become the largest green bond issuer.

In 2018, the focus has turned to Europe, where the European Commission has announced its Sustainable Finance Action Plan. It aims to drive capital towards sustainable activities so as to reach the EU's energy and climate goals by 2030. These include increasing the share of renewables to at least 27% of final energy consumption and cutting greenhouse gas emissions by a minimum of 40% compared to 1990 levels, which will an estimated EUR180 billion per annum of additional funding. To facilitate this process a sustainability taxonomy will be developed and adopted before the end of next year. One of the aims will help to ensure the integrity and trust of the sustainable finance market through new standards and labels for sustainable finance products such as green bonds. In time this will lead to more universal standards as they relate to green bonds.

More recently, at the Global Action Summit in San Francisco, the Global Green Bond Partnership (GGBP) was launched. The GGBP will support efforts of sub-national entities such as cities, states, countries, corporations and private companies, and financial institutions to accelerate the issuance of green bonds, such as through technical assistance for potential issuers.

Green Bond Standards

Building the integrity of the green bond market

As the green bond market has developed, there has been increasing efforts to ensure the integrity of the market. These include measures to deliver more robust procedures to avoid claims of green-washing, to ensure that only eligible green projects are financed and that there are measurable and clear environmental and/or climate benefits. These concerns have arisen given the list of issuers of green bonds, claims of fungibility and whether green bond proceeds are going directly towards environmental projects.

One example of the challenges around green bond labelling includes the issuance in May 2017 by Repsol, a global energy company, to help finance energy efficiency improvements in its petroleum and petro-chemical refineries and whether this can be classified as green.

The International Capital Market Association's Green Bonds Principles (GBP) developed in 2014 are one of many initiatives that aim to improve the transparency and structure to the green bond market. The GBP are a set of voluntary guidelines framing the issuance of green bonds and as such provide users with guidance on the key components involved in launching a reputable green bond; they also aid investors by promoting availability of information necessary to evaluate the environmental impact of their green bond investments; and they assist underwriters by moving the market towards expected disclosures that will facilitate transactions, (ICMA, June 2018.).

In terms of structure, the GBP have four core components:

1. use of proceeds,
2. project evaluation,
3. management of proceeds and
4. reporting.

Post issuance reporting is becoming increasingly critical since it facilitates investor demand to assess the extent to which their investments are contributing to the low-carbon transition.

Not surprisingly, guidelines and principles for green bond issuance have also developed at a country level for example in China, Brazil, Kenya, Nigeria, India and Japan, Figure 2. While some of these guidelines have drawn on the expertise of the ICMA's Green Bond Principles, there have also been increasing attempts to coordinate across countries and regions with the aim of establishing international best practise when it comes to the issuances of green bonds. For example, the ASEAN Green Bond Standards (AGBS) collaborated with the ICMA's GBP and includes not just the four components of the GBP, but, to secure the AGBS label it must ensure that the issuer or issuance has a geographical or economic connection to the Asia region and it specifically excludes fossil-fuel related projects.

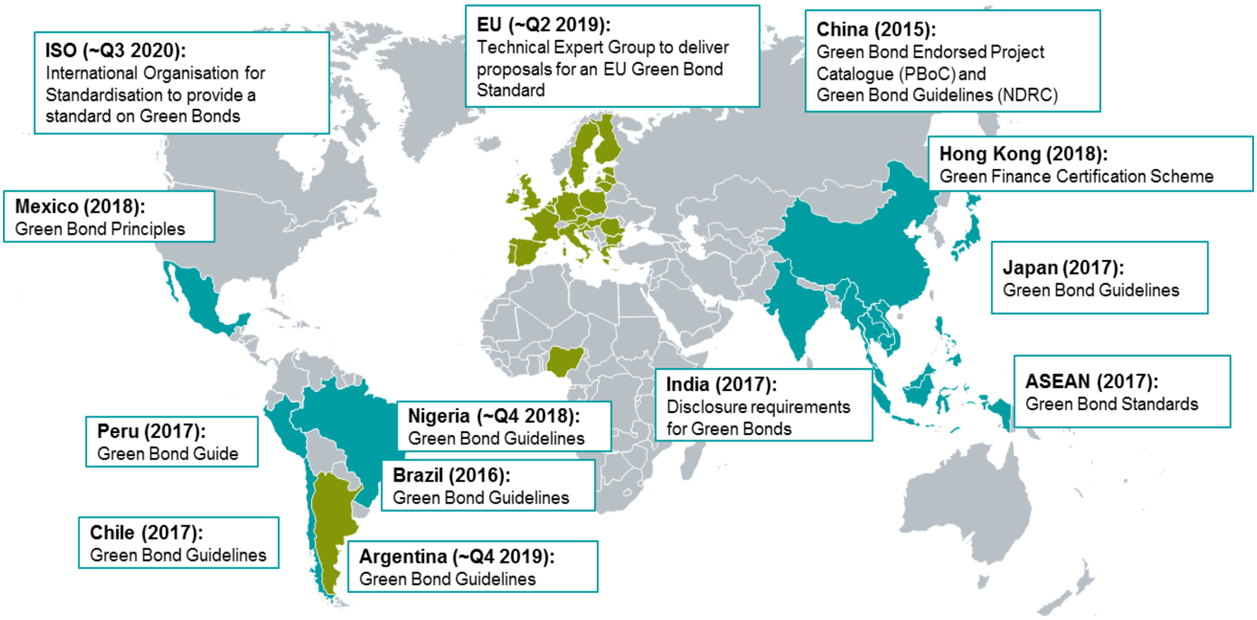
Alongside these initiatives, we have also seen the development of second party opinions and independent audits provided by organizations such as CICERO, Oekom, Sustainalytics, Vigeo-Eiris as well as rating agencies such as Moody's Green Bond Assessments and Standard and Poor's Green Evaluations, which provide information and/or assurances on issuers' green bond programmes.

One example is the Climate Bonds Standard and Certification Scheme, which provides a labelling scheme for bonds, applying scientific criteria to ensure the bond issue is consistent with the 2˚C limit set out in the Paris Climate Agreement. This has been developed by Climate Bonds Initiative an investor-focused not-for-profit, promoting large-scale investment for the global transition to a low-carbon economy. Part of this Climate Bonds Initiative process involves a climate bonds taxonomy that encourages common definitions for classifying green assets. As of October 2018, CBI and its partners have created sector specific technical criteria which have been developed for Water Infrastructure, Solar, Wind, Low Carbon Buildings, Geothermal Energy, Marine Renewable Energy and Low Carbon Transportation related green bonds. Criteria are also being developed for forestry, bioenergy, land use, land conservation/restoration, hydropower, waste management, electric grid, information technology/broadband, fisheries and agriculture related green bonds.

However, there still remain challenges in terms of what can be classified as green across jurisdictions and whether, for example, there should be different classifications of green projects according to the level of a country's economic development. Thankfully, we are seeing increasing global cooperation to standardise and formulate taxonomies as they relate to green bonds, most notably between the European Union and China where the EIB and the Peoples' Bank of China have partnered to look at harmonising the banks green bond guidelines, aiming for a harmonisation.

Further, in its Sustainable Finance Action Plan, the European Commission will develop an EU Green Bond Standard, which would help to monitor, evaluate and verify the environmental impact of green bonds. The aim will be to assess the degree to which green bonds are providing additional capital to green projects and activities and so aim to ensure that existing investments are not simply being re-labelled green as part of a green washing exercise. Figure 2 illustrates examples of local green bond frameworks that exist from regional and national authorities around the world. For example, the International Organization for Standardization (ISO) develop and publish international standards. The ISO is currently working on a standard for green bonds and a framework and principles for assessing and reporting investments and financing activities related to climate change. For green bonds, this will specify eligibility requirements and define procedures for evaluating the environmental performance of green bonds. The standard will also define requirements for green bonds monitoring and disclosure and provides guidance on assurance methods.

FIGURE 2. GREEN BONDS AND THE ARRAY OF LOCAL FRAMEWORKS FROM REGIONAL AND NATIONAL AUTHORITIES



Source: Environmental Finaince (non-exhaustive list) (October 2018)

DWS Minimum Green Bond Standards

A three step approach to deliver a green bond verdict

DWS's ESG Engine[4] implements a framework to assess the "ESG-ness" of bonds which finance specific ESG related/themed projects. This predominantly covers green bonds, but, aims as well to achieve coverage concerning sustainability or ESG themed bonds such as blue bonds, social bonds and sustainability bonds.

We adopt a multi-stage process in establishing a green bond assessment. First, the ESG Engine delegates the assessment as to whether or not a bond is green to a trusted third party who conducts due diligence. This is currently delegated to ISS-oekom research who focus the results of the issuer's ES rating and potential controversies as well as verification if the issuer respects the Green Bond Principles. Finally ISS-oekom research evaluates the environmental and social benefits of each financed project category and the eligibility criteria the issuer has chosen for identifying the projects to be financed. Second, any bond ISS-oekom designates as green is then judged whether or not it is compliant with our internal Minimum Environmental Social and Governance Standards (MSESG). That means the issuer must show at least an issuer ESG_SynRating of A, B C or D such that poor general quality ESG issuers, rated E and F, will be disqualified. The DWS SynRatings are an analysis of the issuer's general ESG quality and is based on the ESG data provided by ISS-oekom, MSCI and Sustainalytics. In addition, the issuer must not be involved in the production of controversial weapons (which is a DWS wide policy) or be in violation of international norms such as the UN Global Compact.

The third and final step derives DWS's A to F green bond rating/green bond verdict. It requires the necessary technical green bond conditions apply, for example compliant to the Green Bond Principles, followed by the sufficient conditions of broader ESG quality checks to ensure the issuer does not have severe norm compliance issues.

As of 2017, Oekom's Sustainability Bond Rating covered approximately 50% of green bond issuances. As a result, a bond for which no green bond rating is available but there is sufficient evidence that it would constitute a green bond, for example if it is a constituent of an index, a case by case defaulting is applied until dedicated evidence becomes available. This approach circumvents the challenges from still low coverage by third party data providers in the green bond rating space.

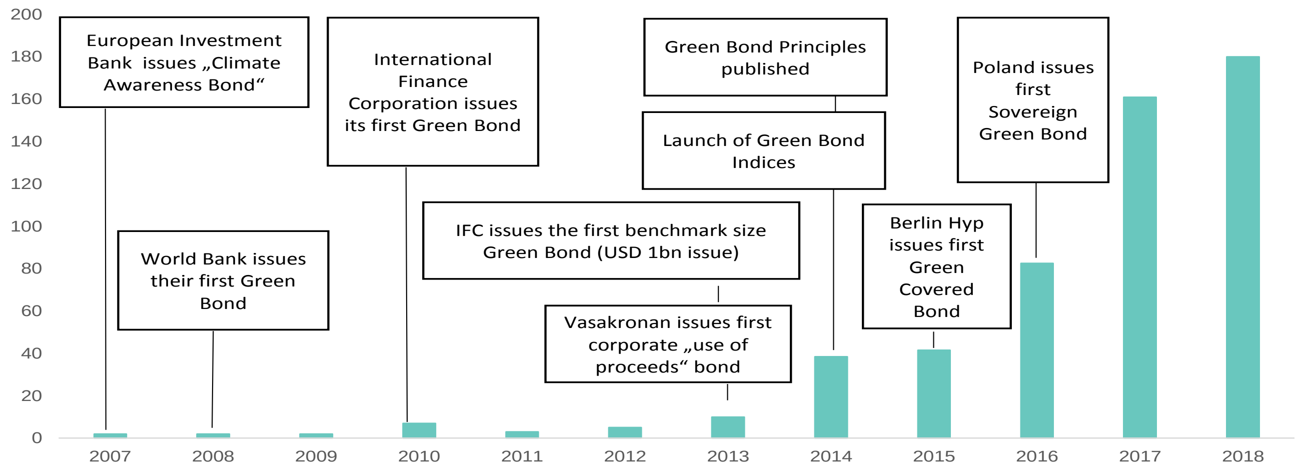
Green bond growth and diversification

Green bonds punching above their weight

The origins of the green bond market began with the European Investment Bank's climate awareness bond in 2007, which was then followed by the World Bank's first labelled green bond in 2008. As the market developed, issuance spread to other multilateral development banks (MDB) such as the International Finance Corporation and the African Development Bank. However, it was not until 2014 that green bond issuance started to gather momentum, helped by the establishment of a number of green bond frameworks, such that in 2017 issuance hit a new high of USD162.0 billion, according to data from Climate Bonds Initiative.

This represented a 78% increase on a year earlier with projections for 2018 indicating that issuance could reach around USD180 billion and potentially hitting the USD1 trillion mark by the end of 2020, Figure 3. If achieved, this would represent a more than tenfold increase in green bond issuance since 2016.

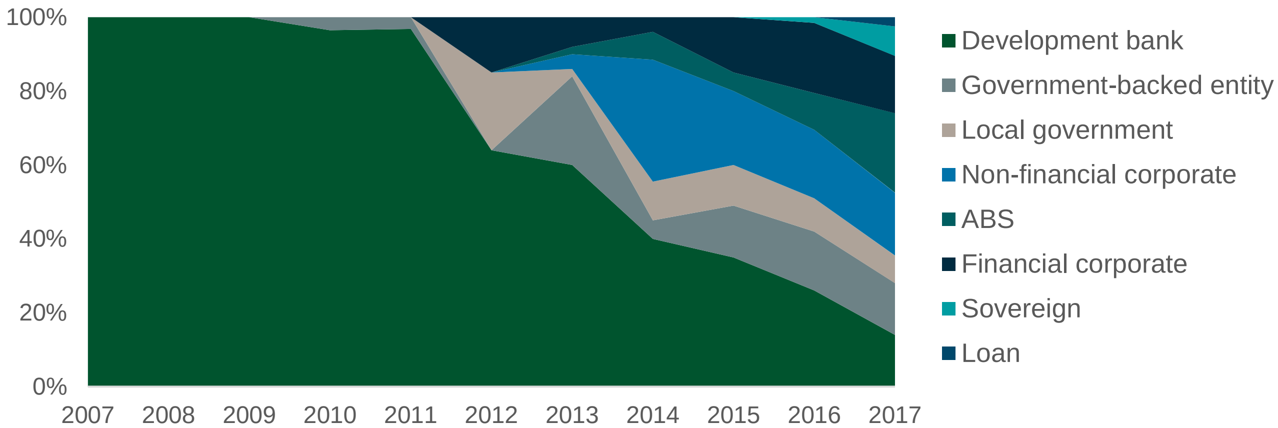
FIGURE 3. KEY EVENTS IN THE GREEN BOND MARKET SINCE 2007



Source: Climate Bonds Initiative, Bloomberg Finance LP, DWS (September 2018)

Compared to its early days of supranational issuance by the World Bank and IFC, issuer type within the green bond market has become broader to include sovereigns, sub-sovereigns, corporations, banks and utilities, Figure 4. From a country/regional perspective China (and specifically Chinese banks) and the EU (and specifically France) are the leading green bond issuers in terms of cumulative issuance over the past decade. (Imperial Business School, May 2018).

FIGURE 4. GREEN BOND ISSUANCE BY TYPE OF ISSUER SINCE 2007 (%)



Source: Climate Bonds (data as of August 2018)

While the U.S. has played a minor role in terms of sovereign issuance, in 2017 the US Federal National Mortgage Association (Fannie Mae) was the world's largest green bond issuer. In addition, the U.S. green-labeled muni bond market has grown significantly over the past few years to total USD22bn. CBI estimates that there are USD250bn of US municipal bonds where 95%+ of their revenue relate to green activities, even though they are not explicitly labelled as green bonds. We find that approximately 70% of total U.S. green bond issuance since inception has originated from California, New York, Massachusetts, Washington and Indiana with general government, public transit and water/sewer bonds from state, local government and utility issuers being the most prevalent.

On a global basis, we find that issuance is pre-dominantly investment grade, with a duration of around eight years. For surpanationals, issuance is typically denominated in USD or EUR while for EM entities issuance tends to be in local currencies. In 2016, Chinese domiciled organisations were the largest group of green bond issuers and this was primarily Chinese corporates. Since 2017, sovereigns have become a new and important part of green bond issuance.

The motivations and target sectors for green bond issuance

Green bonds are encompassing the SDG agenda through the clean transportation, efficient buildings, energy efficiency, renewable energies, water management and waste management sectors

It is no surprise that the acceleration in green bond issuance has also coincided with the signing of the United Nations' Sustainable Development Goals (SDGs) and the Paris climate agreement in 2015. These pivotal events were instructive to corporates, investors and civil society more broadly as it delivered a clear commitment of the direction of public policy over the next 15 years and beyond. Indeed it focused particularly attention on the need for future infrastructure investment, such as in the energy and transportation sectors, to be aligned to the 2 Degree scenario.

For instance, as of October 2018, 154 companies have committed to use 100% renewable energy, while 495 companies have committed to science based emission reduction targets (RE100 and Science Based Targets Oct 2018). Many of these companies could become green bond issuers (some already are).

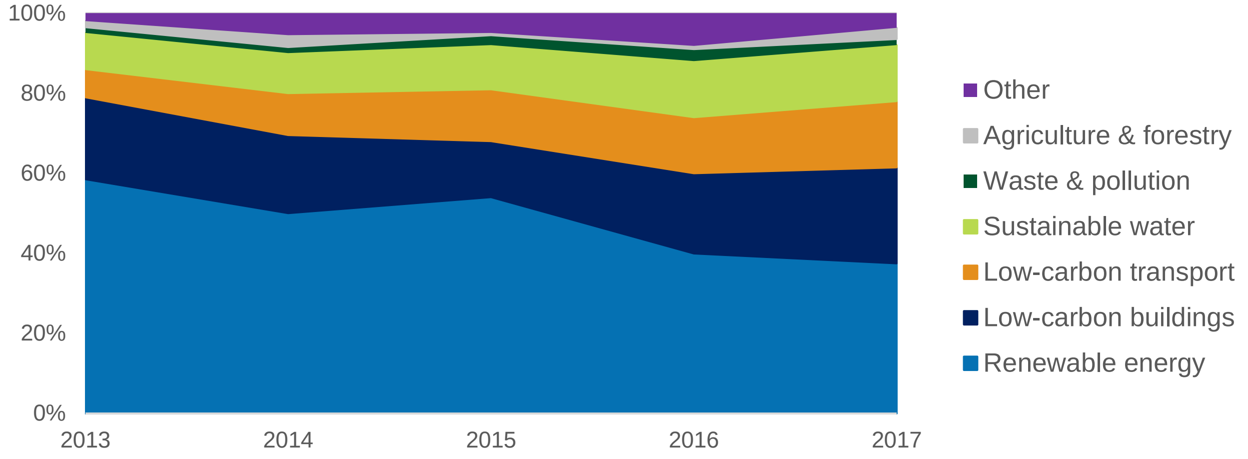
While there have been claims that the inclusion of green bonds could be part of a addressing environmental risk within a portfolio context, Moody's research finds that when examining the industry composition of green bonds, approximately 22.4% are issued in sectors with moderate or greater exposure to environmental credit risks, such as a wind farm in a flood zone, which is almost twice the percentage for that in the overall corporate debt market (BIS September 2017). As a result, allocations to the green bond market should not be viewed as a route to improve the environmental resilience of a portfolio. Indeed the majority of green bonds are secured on the balance sheet of issuers with diversified activities (OECD 2017).

More compelling is that allocations to the green bond market could support the objectives of an increasing number of investors to align their investments to the SDGs. Indeed green bonds could be a natural SDG fit given their focus has been towards financing clean transportation, efficient buildings, energy efficiency, renewable energies, water management and waste management. These activities overlap with SDGs #6, #7, #9, #11, #13 and #15.

From a sector perspective, the proceeds of green bonds have typically been concentrated in the renewable energy and low-carbon building sectors. Combined, these two sectors accounted for almost two-thirds of green bond proceeds last year, according to CBI.

However, just as issuer names have become more diversified so too have the sector recipients of green bond proceeds, with low-carbon transport and sustainable water projects witnessing strong growth over the past few years, Figure 5. However, examining the entire climate-aligned bond universe, transport has been the most dominant sector.

FIGURE 5. PRIMARY USE OF PROCEEDS FROM GREEN BONDS SINCE 2013 (%)



Source: Climate Bonds Initiative October 2018

Considerable work has taken place examining the financial characteristics of green bonds and specifically whether investors are willing to pay a premium for green bonds. In 2017, the Bank for International Settlements published work that revealed green bond issuers on average have borrowed at lower spreads than they have through conventional bonds. This study investigated a cross-section of green bonds issued between 2014 and 2017.

Meanwhile in its 2018 paper, HSBC identifies a halo effect for issuers of green bonds. Their analysis reveals that "*issuing a green bond for the first time more often than not has been accompanied by the whole curve to tighten, versus the curve of a comparable entity with no green bond outstanding",* HSBC (September 2018). This may help to explain why green bond outperformance versus non-green is marginal.

Responding to green bond criticisms

Green washing or vital green finance instrument? Assessing real world impact

Are green bonds "a tool for greenwashing" and "a fig leaf for corporate polluters to hide behind"? While we disagree with such a one sided view, the green bond market is facing questions regarding its real positive impact.

For instance, some market participants and NGOs have raised questions regarding whether a green bond can be linked to any 'new' green capital expenditure – are 'additional' projects being built, when bonds are primarily a refinancing tool?

Such questions are not new. Indeed JP Morgan's Head of Green Bonds argued in a 2015 op-ed, that for her, 'additionality' is represented by the fact that green bonds have expanded the conversation between issuers and investors on environmental issues, bringing the capital markets to the broader dialogue with governments and other institutions in society. While any particular green bond can be debated, often new types of investors are purchasing green bonds than otherwise would have been involved. "Over time, this can start to finance new environmental benefits" (Ceci 2015).

To contribute to the discussion on this topic, the news publication Environmental Finance (Feb 2018) published a long list of the broader benefits that the green bond market has created, Box 1.

BOX 1. BROAD BENEFITS OF THE GREEN BOND MARKET

- One of the few/only financial instruments that allows capital deployment towards green objectives ‘at scale’
- A new way to link green assets with investors who care about the kind of companies or projects they invest in
- The engagement of capital markets institutions on green topics has helped boost the prominence with which environmental matters are viewed in public policy making
- Improved dialogue between issuers and investors on sustainability issues
- Facilitated conversation around 'what is green?'. Green bonds have helped elevate discussions of sustainability within companies into the board room, often involving the finance/treasury departments for the first time
- Helped support the creation of dedicated ‘sustainable finance’ teams in investment banks, in asset managers’ debt teams, credit rating agencies, consultants, governments and financial supervisory authorities
- Bankers seeking to underwrite green bonds, suggest issuance with their senior corporate counter-parts, potentially helping companies to strengthen their policies and practices as part of strategy that includes green bond issuance
- Issuing a green bond or investing into a green bond fund can be a gateway for corporates and investors to consider adopting or strengthening their broader sustainability policies and strategies
- The green bond market infrastructure is facilitating the creation of social bonds and green loans
- Banks interested in issuing more green bonds have started to assess their wider loan portfolios for assets which can be re-financed in a green bond. This assessment may help facilitate wider portfolio climate risk assessment, which is a recommendation of the Task Force on Climate-related Financial Disclosures (TCFD)

Source: Environmental Finance, February 2018. “What has the green bond market ever done for us?”

HSBC’s Green Bond Handbook (May 2018) also addressed the question of additionality. HSBC’s analysts concluded that:

- Green bonds make it easier for investors to access bonds linked to green projects (search costs)
- Bond issuers, in the process of preparing a green bond, may become better informed about their operations, which may represent additional focus/action by the company
- Other bond issuers may become more inclined to invest in green technologies and to issue green bonds, if they see their competitors also doing so
- A final unexpected benefit is that “once a firm has issued a green bond, it will have to tilt its operations more towards a green strategy than in the past. If it does not, it will have to alternate between issuing green and non-green bonds, and its non-green bonds will be dirtier than the bonds it used to issue previously”

The term additionality stems from the UN regulated, project based, carbon offset market (the Clean Development Mechanism or CDM), which developed a set of ‘quasi-science’ rules including a tool-kit for assessing additionality. As many NGOs were involved in shaping some of those rules, it is natural to see how broader stakeholders may have high expectations for green bonds. However, the think-tank 2 Degrees Investing Initiative (2°ii) concludes that the CDM concept of additionality is of limited use for green bonds as bonds are primarily re-financing instruments so are not specifically linked to new projects and as the cost and availability of debt capital is only one factor in an investment decision-making process.

The 2°ii think-tank published a paper in March 2018 that attempted to assess the benefits of the green bond market. They concluded that evidence is lacking to support the conclusion that “use of proceeds” green bonds (which represent 95% of the market) actually contribute to scaling up investments in green projects. The 2°ii paper argues that green bonds may be great at raising awareness but that changes are necessary if green bonds are to live up to the expectations that have been raised regarding facilitating trillions of capital going towards emission reduction technologies.

To address these concerns, 2°ii suggest a series of somewhat linked actions to improve the green bond market's integrity:

1. **Develop an advanced taxonomy of green projects** – instead of relying on taxonomies of projects that are/are not 'green' (and thus eligible to be included in a green bond), a more advanced taxonomy could offer 'shades of green'
2. **Improve green bond impact measurement indicators** – green bond issuers are publishing reports but are using a wide variety of indicators but not on how the green bond contributes to scaling up investment in green projects, presumably by building on CBI sector specific standards
3. **Advanced labelling system** – Some investors are already distinguishing between different types of green bonds, and new reporting indicators could accelerate such a trend
4. **Potential policy incentives for green bonds could account for the above actions** – as the EU debates the potential for a change in capital requirements or incentive for green assets (a 'green supporting factor'), there should be some assurance of real world benefits

The 2°ii's suggestions are very reasonable and should be taken account of by policy makers and market participants.

From an official policy perspective, the European Commission formed a group of financial industry and sustainability experts to make recommendations for growing the market for all types of sustainable finance. The High Level Expert Group's (or HLEG) report highlighted that one of the green bond market's challenges is whether some bonds have been used to re-label existing investments.

The European Commission's Sustainable Finance Action plan adopted the HLEG recommendation to develop a Green Bond Standard. As of this report's writing, a Technical Expert Group is developing a green bond standard that will be reviewed in a targeted consultation of market participants starting in November 2018 with a broader consultation in March 2019.

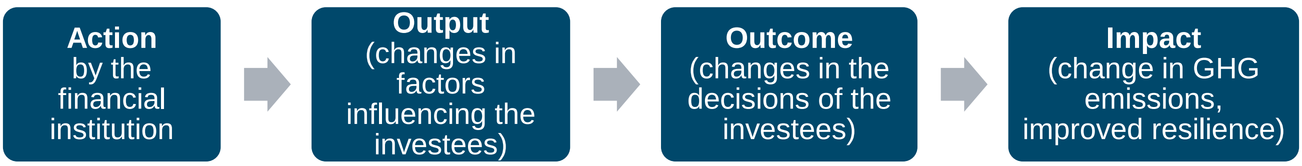
China is also working to strengthen its oversight of their green bond market with the People's Bank of China strengthening its supervision of green bond verifiers and more Chinese bonds being issued with verifications based on the stringent Climate Bonds Initiative standard. China is exploring aligning its green bond standard with the emerging European green bond standard, with strong support being provided by the Climate Bonds Initiative (HSBC May 2018).

Complementing the European Commission's work to create a green bond standard, and to contribute solutions to their own green bond criticisms, the 2°ii think-tank has formed a partnership with the UN Framework Convention on Climate Change (UNFCCC) Secretariat to create a framework (see Box 2) to "identify, assess, monitor and report on the impact of financial institutions' climate actions". The aim is to have an evidence basis for claims regarding how actions such as investing in green bonds or using shareholder influence to engage companies, actually contribute to real economy emission reductions or improved resilience to physical climate risks.

This is important as it can be miscommunicated or misunderstood (even within the financial sector) that changing an equity or bond portfolio's exposure to companies involved in certain activities, equates to changes in the real economy.
To overcome potential miscommunication, 2°ii and UNFCCC Secretariat suggest that financial institutions should describe (see Box 2) how its climate "*action*" (such as investing in green bonds) is expected to influence the decision-making of an investee ('*the output*'), and affect the activities of the investee ('*the outcome*'), in order to contribute to mitigation or adaptation ('*the impact*'). Action specific guidance (such as investing in green bonds) will be developed as a next step.

DWS hosted a workshop for the 2°ii think-tank in June 2018 to facilitate the development of this framework, which ultimately could become an International Standard (ISO 14097).

BOX 2. POTENTIAL FRAMEWORK FOR ASSESSING FINANCIAL INSTITUTIONS' CLIMATE RELATED ACTIONS



Source: 2 Degrees Investing Initiative, June 2018

The next horizon for green bonds: buildings

Aiming to help scaling up capital for energy efficiency in buildings from real estate companies, green mortgages and asset backed loan securitizations

Energy use in buildings account for ~40% of global emissions and two thirds of buildings currently standing will continue to exist in 2050. This illustrates the importance of reducing energy use in buildings to contribute to the Paris Agreement emission reduction goals. However, green bonds related to buildings was 24% of issuance in 2017, though only 6% of CBI's wider climate-aligned bond universe. Of the USD72bn of building related bonds in the climate-aligned bond universe, 57% related to green buildings certified with different green building labels (often issued by real estate companies) and 40% related to energy efficiency upgrades (CBI Oct 2018).

Three promising types of green bonds, Figure 6, could help reverse the low proportion of building related green bonds: mortgage backed securities, covered bonds and bonds linked to repayment of energy efficiency loans through local government taxes (Property Assessed Clean Energy or PACE which is described on the following page).

FIGURE 6. ENERGY EFFICIENCY RELATED GREEN BONDS

Source: Climate Bonds Initiative October 2018, PACENation June 2018

The largest issuer of green mortgage backed securities (MBS) has been the US government agency Fannie Mae and this was also the largest green bond issuer in 2017. Fannie Mae and Freddie Mac purchases mortgages from originating lenders according to energy efficiency upgrade criteria and refinance them in the MBS market.

Deutsche Bank's Community Development Finance team played a role in supporting Fannie Mae's focus on energy efficiency loans. Specifically, Deutsche Bank sponsored studies on energy efficiency loan underwriting in multifamily housing and was a founding member and continuing lender to the New York Energy Efficiency Corporation. NYEEC worked with Fannie Mae to support incorporation of energy efficiency in their mortgage lending (Deutsche Bank March 2014).
We believe that there is great potential to expand on this work which could lead to more green mortgage backed securities.

For instance, the Energy Efficient Mortgages Initiative is an EU funded program spearheaded by the European Mortgage Federation and European Covered Bond Council. The initiative aims to create a standardised "energy efficient mortgage", according to which building owners are incentivised to improve the energy efficiency of their buildings or acquire an already energy efficient property by way of preferential financing conditions linked to the mortgage. At the heart of the initiative is the assumption (based on market research) that energy efficiency has a risk mitigation effect for banks as a result of its impact on a borrower's ability to service their loan and on the value of the property.

We believe that evidence being generated from this initiative, could be assessed by financial regulators regarding whether energy efficient mortgages represent a lower risk on the balance sheet of banks and could, therefore, qualify for a better capital cost regulatory treatment (a green supporting factor). Many stakeholders could receive benefits if this initiative spreads, Figure 7.

The Energy Efficient Mortgages Initiative aims to facilitate the mortgage bond and covered bond[1] sectors in helping to accelerate the number of buildings being renovated with a private financing initiative, which is independent from but complementary to various public policies for energy efficiency. This is the first time a group of major banks and mortgage lenders, as well as data providers, companies and organisations from the building and energy industries and the valuation profession have proactively come together to discuss private financing of energy efficiency.

FIGURE 7. POTENTIAL BENEFITS OF ENERGY EFFICIENT MORTGAGES

Source: Energy Efficient Morgages Initiative June 2018

Thirty nine European banks are participating in the pilot Energy Efficient Mortgages Initiative, aiming to create energy efficient mortgages into their existing products and processes. This could lead to more green mortgage backed securities and covered bonds.

Investors could have a role in encouraging these banks to make the energy efficient mortgage initiative a success and for more banks to join the initiative.

A second potential avenue for more building related energy efficiency bonds is Property Assessed Clean Energy or PACE. PACE is a repayment mechanism that allows an energy efficiency loan to be repaid through the property's local government tax bill. PACE originated in California, expanding on legislation that is used to help finance local public benefits like sewage or road payments. PACE allows loan repayment to be linked to the property, rather than an individual, which may help overcome the split incentive between landlords and tenants. It also means that lenders' risk is related to individuals continuing to pay their taxes (a lien is placed on the property) and not a general individual credit risk. The US has seen a small but growing issuance of PACE green bonds. A EuroPACE initiative started in early 2018 to facilitate growth of a similar market.

To expand capital for energy efficiency upgrades in buildings, it is also necessary to have the right policy framework, not just a set of asset backed green bonds. One of the authors of this paper (Murray Birt) has played a role over the last several years, in encouraging the European Union to improve energy efficiency policies. For instance:

- DWS was a founding member of the European Energy Efficiency Financial Institutions Group (EEFIG), which published recommendations in 2013 on how efficiency policies should be prioritised.
- In February 2015, the European Commission adopted a new policy that prioritised "Efficiency First" as a guiding principle, adopting many of the EEFIG recommendations.
- In March 2016, the Institutional Investor Group on Climate Change (IIGCC) published recommendations (to which DWS contributed) to inform new EU legislation in this area.
- In November 2016, the EU proposed new legislation in a "Clean Energy for All Europeans", drawing on IIGCC recommendation

[1] Covered bonds are debt securities issued by a bank or mortgage institution and collateralised against a pool of assets (often mortgages) that, in case of failure of the issuer, can cover claims at any point of time.

- DWS played a role in cooperation with IIGCC in influencing the proposed legislation as it proceeded through the EU policy-making process. The Council of European member state ministers and the European Parliament finalised the new EU energy efficiency legislation in May and June 2018. Member states will now have to implement these policies into national law, which will help improve the framework for financing energy efficiency and in turn may support new green bond issuance.

Investors should continue to use their influence with governments to strengthen energy efficiency policies, green investment and related green bond issuance.

Conclusion

Green bonds are an important part of a portfolio that is aligned with the low-carbon transition

The green bond market has grown significantly from its early days a decade ago. This growth has been facilitated by a growing awareness of sustainability issues among corporates and sovereigns, but, also aided by ongoing improvements in green bond standards and principles. These market standards have been created through the cooperation of a broad range of market participants, working through organisations like the Climate Bonds Initiative and the International Capital Markets Association.

While it cannot yet be demonstrated that a specific green bond has accelerated investment in green technologies, the growth of the market has expanded investor and issuer understanding and focus on climate change and other societal issues.

This has in turn been an important factor for financial sector regulators to begin taking a variety of actions that will accelerate green investment and regulators encouraging/requiring financial sector acting to address the risks and opportunities of climate change and other social and environmental issues. These are important benefits of the green bond market that should not be discounted.

Continued allocation to green bond funds are important to continue the green bond market’s momentum and the wider positive influence it is having within the capital markets, with companies, governments and regulators. Indeed in the 12 months to July 2018, assets under management in dedicated Green Bond funds have doubled to total USD5.3 billion. In addition, the number of funds has risen to 38, an increase of approximately one third over the same period, accoding to Environmental Finance.

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