The Green Bond Market
Is the fixed income fulcrum tilting green?

In collaboration with the Climate Bonds Initiative

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Market Overview

Green bonds are fixed-income instruments specifically issued in order to fund projects that can have positive environmental outcomes and/or potential climate benefits. Green bond issuance has been growing at a rapid pace since 2007, when the European Investment Bank (EIB) issued the first security in the asset class (see Graphs 1 and 2).

Interest continues to mount in all things associated with sustainability, particularly sustainable investing. The green bond market makes up ~1.5% of the total bond market, with current cumulative issuance at ~$1.75 trillion*. We expect green bond issuance to continue accelerating as investors’ ESG and climate concerns are rightly tackled head-on. According to the Climate Bonds Initiative, a globally recognised expert in this area, the average annual growth rate for green bond issuance since the market’s inception some 14 years ago stands at approximately 850%.

As at 13 August 2021, year-to-date issuance already accounted for 100% of 2020’s total issuance.

Graph 1: Green bond issuance since 2007

~850% average annual growth since first green bond issued in 2007

Source: LGIM, Climate Bonds Initiative, August 2021

Graph 2: Growth comparison – green bonds versus broader bond market

There has been considerable green bond issuance which – apart from in 2020, due to the pandemic – has seen far stronger growth relative to the wider bond market.

Source: LGIM, Climate Bonds Initiative, Bloomberg, August 2021

Past performance is not a guide to the future.
Green Bond Market

The green bond market continues to drive the growth of the broader sustainable bond market*. This is a market which, rightly in our view, is demanding investor attention on a global scale.

We believe both green bond issuers and investors are starting to think of this market as a first point of call, rather than a tick-box exercise in sustainability. The climate commitments we are seeing at both government and corporate levels emphasise the strategic significance of the green bond market.

Figure 1: Use of proceeds (UoP)

Energy, Buildings and Transport increased further in 2020, to a record 85% of the total.

Breaking down the sustainable bond market*

$1,753 bn
Green bond
Proceeds are used exclusively to finance green projects, or projects with clear environmental benefits.

$351 bn
Social bond
Proceeds are used exclusively to finance eligible social projects as defined by the relevant international standards used.

$257 bn
Sustainability bond
Proceeds are used exclusively to finance any combination of eligible green and social projects as defined by the relevant international standards used.

$67 bn
Sustainability-linked bonds
Forward looking, performance-based bond instruments where the issuer is committing to future improvements in sustainability outcomes within a predefined timeline, in accordance with relevant international standards.

$913 bn
Green revenues
$913 bn in bonds outstanding issued by issuers whose activities are climate aligned (a minimum of 75% of the issuer’s revenue must be aligned with the Climate Bonds Initiative taxonomy).

*Green bond market data provided by Climate Bond Initiative as at Aug 21. Remaining market data source: Bloomberg as at Aug 21. Sustainable market herein refers to green, social, sustainable and sustainability-linked bonds.
Green finance is growing in strategic significance

Climate commitments from governments and businesses alike indicate the important role green finance will continue to play going forward.

**By 2035**

- The **UK** has enshrined a new target in law to slash emissions by 78%.

**By 2040**

- China has pledged to peak its emissions by 2030, and achieve carbon neutrality by 2060.

**Short term**

- **By 2030**
  - The **EU** has committed to cut carbon emissions by 55%.
  - **Russia** has pledged to reduce greenhouse gas emissions by as much as 70% from 1990 levels.
  - The **United States** has committed to reduce carbon pollution to at least 50-52% below 2005 levels.
  - **India** has committed to cut the greenhouse gas emissions intensity of its gross domestic product by 33%-35% and increase non-fossil fuel power capacity to 40% from 28% in 2015 and substantially boost forest cover to manage carbon dioxide.
  - **Japan** has committed to cut climate emissions by 46-50%.

**Long term**

- **By 2050**
  - The **EU** is committed to climate neutrality.

1. [https://www.climatebonds.net/2021/05/europe-reaches-500bn-green-investment-climate-bonds-market-intel-reports](https://www.climatebonds.net/2021/05/europe-reaches-500bn-green-investment-climate-bonds-market-intel-reports)
2. [https://www.carbonbrief.org/chinas-2060-climate-pledge-is-largely-consistent-with-1-5c-goal-study-finds](https://www.carbonbrief.org/chinas-2060-climate-pledge-is-largely-consistent-with-1-5c-goal-study-finds)
The Climate Bonds Initiative is an international, investor-focused not-for-profit organisation.

It was founded in 2010 to promote large-scale investments that aim to deliver a low-carbon and climate-resilient global economy. The Climate Bonds Initiative seeks to mobilise investors, industries and governments to catalyse green investments at the speed and scale required to avoid dangerous climate change and meet the goals of the Paris Climate Agreement.

The Certification Scheme allows investors, governments and other stakeholders to identify and prioritise ‘low-carbon and climate-resilient’ investments and avoid ‘green washing’.

The Climate Bonds Standard & Certification Scheme aims to provide the green bond market with the trust and assurance that it needs to achieve scale. We believe activating the mainstream debt capital markets to finance and refinance climate-aligned projects and assets is critical to achieving international climate goals; robust labelling of green bonds and green loans is a key requirement for that mainstream participation.

**Expected benefits**

**Investor**

Certification is a screening tool that labels bonds or loans as Certified Climate Bonds, Certified Climate Loans or Certified Climate Debt Instruments respectively. It reduces the burden for investors having to make subjective judgements during their due diligence on the green attributes of green-labelled investments.

**Issuer**

Certification is a voluntary initiative, which allows the issuer to clearly demonstrate to the market that their bond or loan meets science-based standards for climate integrity, and best-practice standards for the management of proceeds and transparency.
Institutional investors are increasingly indicating their support for action to address climate change. However, we believe there are too few tools to help ensure that their investments are making a significant impact, particularly for debt-based strategies. In our view, the market needs independent, science-driven guidance on which assets and activities are consistent with a rapid transition to a low-carbon economy. The Climate Bonds Taxonomy identifies the assets, activities and projects needed to deliver a low-carbon economy consistent with the goals of the Paris Agreement. It has been developed based on the latest climate science, including research from the Intergovernmental Panel on Climate Change (IPCC) and the International Energy Agency (IEA), and has benefited from the input of hundreds of technical experts from around the world. It can be used by any entity looking to identify which assets and activities, and associated financial instruments, are compatible with a trajectory to net zero by 2050.

The taxonomy is the foundation used by the Climate Bonds Initiative to screen bonds to determine whether the assets or projects underlying an investment are eligible for green or climate finance. This independent, detailed review adds credibility and trust to the asset class and reduces the risk of greenwashing. The Climate Bonds Initiative has developed specific eligibility criteria where detailed analysis has been developed. A full breakdown of all sectors within this taxonomy can be accessed here.

Figure 2: Climate Bonds Initiative taxonomy

A traffic-light system has been adopted to indicate whether identified assets and projects are considered to be automatically compatible with a two-degree decarbonisation trajectory.

Further work is required to determine which traffic light colour is appropriate for a specific subset of assets or activities

Incompatible

Potentially compatible, depending on whether more specific criteria are met

Automatically compatible

Fully certified, fully aligned with the Climate Bonds Initiative taxonomy. "Detailed analysis of a sector has been undertaken and specific eligibility criteria have been developed; bonds in that sector can be Climate Bonds Certified"

The Climate Bonds Initiative has an active role in developing international green bond policy and keeps up to date with the latest climate science and low-carbon development trajectories through its Technical Working Groups and through external engagement and research.
Climate mitigation and adaptation underpin meeting the UN’s Sustainable Development Goals (SDGs). All the goals are reinforced by a series of targets, some financial and some outcome-based as part of the 2030 Agenda.

The Climate Bonds Initiative has identified six of the 17 SDGs where increased green investment and growth in green bond markets provides direct benefits, particularly in emerging economies. Figure 3 below illustrates which SDGs could receive the largest boost from green bonds.

Figure 3: Green bonds’ alignment with UN’s Sustainable Development Goals

Green bonds naturally align with the United Nations’ Sustainable Development Goals

Source: LGIM, Climate Bonds Initiative, September 2021
Due to the rapid increase in the size of the universe of green bonds, the index is diversifying and the correlation of returns to the broader fixed income market is increasing. We would naturally expect that adding green bond exposure would improve a portfolio’s climate impact, and we can show that this has not recently meant sacrificing returns versus the wider fixed income market. The J.P. Morgan Green Bond index is the non-ESG baseline index of the J.P. Morgan ESG Green Bond index, which is a multi-dimensional index comprising credit and rates green bonds denominated in USD, EUR, and GBP. It is a market-cap green bond index with the addition of weight-tilting according to ESG scores. The J.P. Morgan Global Aggregate Bond index represents several distinct asset classes: Developed Market Treasuries, Emerging Market Local Treasuries, Emerging Market External Debt, Emerging Market Credit, US Credit, Euro Credit, and other agency bonds.

Graph 3 illustrates the total return gap between the already very ‘green’ baseline green bond index and its ESG-focused derivative, alongside the J.P. Morgan Global Aggregate Bond Index (we have selected this index as we believe the overall credit grade and securities mix are well suited for such a comparison).

### Graph 3: Five-year total return performance of the ESG Green Bond Index versus the baseline Green Bond index and the J.P. Morgan Global Aggregate Bond Index

<table>
<thead>
<tr>
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<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021*</th>
</tr>
</thead>
<tbody>
<tr>
<td>J.P. Morgan ESG Green Bond index</td>
<td>2.0%</td>
<td>12.4%</td>
<td>-3.5%</td>
<td>7.8%</td>
<td>22.3%</td>
<td>-5.0%</td>
</tr>
<tr>
<td>J.P. Morgan Green Bond index</td>
<td>1.7%</td>
<td>11.6%</td>
<td>-3.5%</td>
<td>7.5%</td>
<td>21.2%</td>
<td>-4.5%</td>
</tr>
<tr>
<td>J.P. Morgan Global Aggregate Bond index</td>
<td>3.0%</td>
<td>7.3%</td>
<td>-1.3%</td>
<td>7.7%</td>
<td>17.0%</td>
<td>-3.1%</td>
</tr>
</tbody>
</table>

Source: LGIM, J.P. Morgan, data to 6 August 2021.

Past performance is not a guide to the future. The value of an investment and any income taken from it is not guaranteed and can go down as well as up; you may not get back the amount you originally invested.
To further analyse the performance detailed above, we calculated the monthly total return (USD) correlation over a three-year period between the J.P Morgan Green Bond Index and other notable fixed income markets. The overall improvement in correlation over a three-year period is illustrated in Graph 4.

**Graph 4: Green bond index cross-correlation timeline versus other notable fixed income indices**

Correlation snapshots taken semi-annually and are based on monthly total return (USD) correlation over a three-year period.

Source: LGIM, J.P. Morgan, data to 30 August 2021.

*Past performance is not a guide to the future.*
Graph 5 illustrates green bond issuance by country as a percentage of overall green bond issuance for each time period. ‘Country’ herein is defined as country of risk of the respective fixed income instruments.

Countries whose 2021 year to date (YTD) issuance is already at or surpassing 2020 green bond issuance are: the US (accounting for +16% of total 2021 YTD green bond issuance), China (accounting for +16% of total 2021 YTD green bond issuance), Germany (accounting for +12% of total 2021 YTD green bond issuance), and France (accounting for +10% of total 2021 YTD green bond issuance). Countries contributing materially to 2020 total issuance of green bonds were: supra-nationals (accounting for +26% of total 2020 green bond issuance), the US (accounting for +16% of total 2020 green bond issuance), France (accounting for +8% of total 2020 green bond issuance), Germany (accounting for +7% of total 2020 green bond issuance), and the Netherlands (accounting for +6% of total 2020 green bond issuance).

Additionally, each country’s cumulative green bond issuance since inception is marked in brackets on the horizontal axis.

Graph 5: Countries materially contributing to current global green bond issuance

Europe continues to dominate this market, taking the lion’s share when it comes to currency split in green bond issuance with 40% of total issuance in EUR. The US dollar is gaining momentum and now accounts for 33% of total issuance.

Source: LGIM, Climate Bonds Initiative, August 2021. Past performance is not a guide to the future.

Graph 6: Market share – currency denomination %

Source: LGIM, Climate Bonds Initiative, August 2021. Past performance is not a guide to the future.
Green bond issuance is growing rapidly and that in turn equates to a larger universe, which we believe will require careful external review in order to sort the green wheat from the brown chaff (self-labelled but uncertified green bonds).

We decided to address the scepticism around outstanding green bonds with a particular focus on how 'green' green bonds really are. Graphs 7 & 8 illustrate the levels of external review in 2020 and beyond.

Bonds self-labelled but not certified as green bonds are the lowest in the green-ness hierarchy (see Figure 4). These are instruments that have not been independently reviewed via any of the following channels:

- Certified green bonds have been certified under the Climate Bonds Standard and Certification Scheme (see Figure 2 for more details on the certification taxonomy)
- Second Party Opinion (SPOs) provide an assessment of the issuer’s green bond framework, analysing the green-ness of eligible projects/assets. Some also provide a sustainability “rating”, giving a qualitative indication of aspects of the issuer’s framework and planned allocation of proceeds
- Third Party Assurance reports state whether the green issuance is aligned with a reputable international framework, such as the Green Bond Principles (GBP) or Green Loan Principles (GLP)
- Green Bond Rating – a number of rating agencies assess the bond’s alignment with the Green Bond Principles and the integrity of its green credentials

Graph 7: External review 2020 in focus

Figure 4: External review hierarchy

Graph 8: Historic external review
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Excess demand

As it stands, the excess investor demand is currently not being met by green bond issuance (see Graph 9).

While we fully appreciate that an exact comparison between a constructed green bond index and a traditional corporate bond index is challenging, we have identified securities which we found to be very similar and worthy of illustrating the excess demand we have seen in green bond issuance. By taking two indices of highly correlated securities issued between February 2019 and July 2021, we delved into the total amount issued across both indices.

Our findings were obvious – the total amount issued by green bond issuers and corporate bond issuers equated to ~€9,000 million. We then studied the respective tranche book sizes of each index (tranche books here refer to the reported amount ordered by investors on a particular tranche, as of the deal pricing date). The tranche book sizes that were reported were €53,000 million for the green bond index and ~€20,000 million for the corporate bond index. This effectively illustrated that in this particular example there was more than 2.5 times the excess demand in favour of green bonds over their traditional corporate bond counterparts. This equated to a 5.8 times coverage ratio for the green bond index versus a 2.3 times coverage ratio for the corporate bond index.

Graph 9: Excess demand – order book volume of deals at pricing date versus actual amount issued

The covered ratio (indicated by red dots) displays the excess demand for the respective index – i.e. the green bond index was 5.8 times oversubscribed, which clearly illustrates the current strong appetite among investors for green bond issuance.

Source: LGIM, Bloomberg, analysis between February 2019 and July 2021.
Past performance is not a guide to the future.

We believe this excess demand suggests that there remains significant appetite for further issuance, which we expect in turn to create a more diversified global green bond exposure that should increasingly resemble the exposure of the current overall fixed income market.
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Conclusion

With significant growth since the inception of the green bond market in 2007 and the increasingly important emphasis on responsible investing with a focus on climate-change initiatives, we expect the green bond market to continue growing apace.

A hypothetical shift of 5% overall market cap in favour of green bond issuance over their non-green counterparts would equate to a ~$6 trillion increase in green bond market cap. This seems very plausible: thanks to the magnitude of beneficial factors, such as the ongoing drive by investors to integrate ESG criteria into portfolios and invest in a sustainable and responsible manner, we are seeing a consistent and rapid rise in green bond interest.

The green bond trend has been rapidly accelerated by the ever-increasing focus by governments and international organisations on tackling climate change and sustainability objectives head on. The United Nations, for example, is successfully implementing global sustainability-linked principles such as the UN Global Compact and Social Development Goals around the world.

We are confident that this trend will continue, led by the European continent. Europe now accounts for over half of all green bond issuance, which as of April 2021 surpassed a cumulative $500 billion of green issuance according to Climate Bonds Market Intelligence.

The COP26 UN Climate Change Conference summit is fast approaching, which aims to unite countries to accelerate action towards achieving the goals of both the UN Framework Convention on Climate Change and the Paris Agreement. We expect green financing to be a key part of the agenda to continue to drive and help fund the necessary transition to a low-carbon economy.

Future growth relies on maintaining the value of the green label to minimise greenwashing. Investors’ capacity to assess green credentials is limited, especially in the fast-paced bond and loan markets. We believe the thorough, extensive research and verification that independent organisations such as the Climate Bonds Initiative perform on a daily basis can help overcome this challenge. These efforts help investors and other market participants recognise the Climate Bonds Initiative green label, underpinning trust and confidence that these bonds’ use of funds will be directed to projects and assets that are in line with the Paris Climate Agreement.
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