GREEN BOND PRICING IN THE PRIMARY MARKET:

April – June 2017

Q2 2017

Report highlights

- Includes USD and EUR green bonds issued Q2 2017
- Pool of issuers continues to expand
- Issuers can access a broader investor base
- 54% of green bonds allocated to dedicated green bond investors
- Oversubscription and tight pricing are features of the bond market and extend to green bonds
- EUR Corporate credit performs particularly well in the secondary market

With support and funding from Pax World Mutual Funds, Obvion Hypotheken and Rabobank

Prepared jointly by the Climate Bonds Initiative and the International Finance Corporation

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Introduction

This is the second paper in our series examining the behavior of green bonds in the primary markets. In August 2017, we published a comprehensive assessment of green bonds issued during 2016 and the first quarter of 2017[1]. This paper covers qualifying[2] green bonds issued in the second quarter of 2017, and includes similar metrics[3] to the earlier paper, plus a few enhancements.

Report Highlights

- **USD denominated green bonds price on average 15.4bps tighter than IPT.**

  This is tighter than vanilla bonds issued during the same period. EUR denominated green bonds price on average -6.3bps tighter than IPT, average for vanilla equivalents is -9.4bps.

  See more on Page 3

- **EUR green bonds achieve slightly bigger order books (2.3 times covered) than a comparable vanilla sample (2.2 times covered).**

  USD green bonds achieve the same sized order books (2.8 times cover) as vanilla equivalents.

  See more on Page 4

- **54% of green bonds were sold to green investors.**

  This was 62% for bonds originating from Developed Markets, and 25% for bonds originating from Emerging Markets[4].

  See more on Page 5

- **All 5 EUR corporate green bonds perform well on all Metrics.**

  Spreads tighten more than baskets of comparable vanilla bonds after both 7 and 28 days, and spreads tighten more than indices after both 7 and 28 days.

  See more on Page 7

101 labelled green bonds were issued during the second quarter of 2017, with a combined face value of USD30bn. This paper covers just under half of the total amount issued (USD14bn) during the quarter, made up of 19 USD and EUR bonds. The sample includes green bond issuers from both Developed and Emerging Market countries. The 19 bonds were chosen based on parameters designed to capture the most liquid portion of the market. See the methodology discussion on page 13.

What's new?

In our last report, we included an analysis of the first green Apple bond, which was issued on the same day as 5 comparable vanilla Apple bonds, enabling an opportunity to track the relative performance. However, issuers rarely bring green and vanilla bonds on the same day. For this publication, we have therefore introduced a peer group comparison which we believe to be the best alternative.

Green bonds are compared to baskets of vanilla bonds issued during the same quarter and with the same characteristics in terms of currency, rating, and sector. The vanilla bonds are not necessarily issued on the same date as the green bonds, and are not matched by tenor or issuer.

While we understand the importance of matching by tenor, this would have further restricted an already limited basket. Some bonds in the basket have longer tenors than the green bond, and some have shorter tenors (details on pages 14 & 15). We have used equally weighted mean numbers for baskets.

Acknowledging these limitations, we see value in using this model to demonstrate what other investment opportunities were available outside of the green bond space during the same period. The summary statistics of the baskets are presented on pages 14 and 15.

New green bond issuers expand investor choice

The green bond market continues to develop rapidly and we are seeing lots of 'firsts'[5], extending the breadth of the market. An increase in the type and number of issuers offers investors with a green mandate an opportunity to diversify their risk.

Any 'first' will therefore receive a lot of investor attention, and performance will be closely scrutinized. For example, at issuer level, Intesa Sanpaolo, Regie Autonome des Transports Parisiens (RATPFP), and China Three Gorges all brought EUR green bonds for the first time in Q2.

In Q2 2017 we saw:

- First green bond from the Gulf – First Abu Dhabi Bank PJSC
- First Chilean green bond – Inversiones CMPC SA
- First Insurance green bond – QBE Insurance Group Ltd
- First Spanish SOE – Alta Velocidad
- First Indian SOE – Rural Electrification

There were also several repeat issuers including Export Development Canada, Berlin Hyp (second green Pfandbrief), Apple, and EIB. Dutch electricity provider TenneT issued 2 green bonds in Q2 2017, and now has 7 green bonds outstanding, enough to build its own green bond curve, which sits inside its vanilla curve. The fact that issuers return to the green bond market may indicate that the benefits outweigh the issuance costs.

Limitations of the data set: The data set remains too limited to draw definite conclusions and there is no potential to partition the data set on a more granular level. Our observations are based only on bonds included in the scope of this paper.

1. https://www.climatebonds.net/files/files/Greenbond_Pricing_Jan_16-March_17.pdf
2. Methodology described on page 13
3. Use of the terms metrics and methodology in this report, refer to the metrics and methodology defined in this document.
4. Developed and Emerging Markets as defined by MSCI Market Classification https://www.msci.com/market-classification
5. First time a green bond has been issued in a sector, or from a region or country.

1. Initial Price Talk: Green bonds price tighter than IPT - in line with the market

- **EUR:** final pricing average -6.3bps tighter than IPT, market average is -9.4bps
- **USD:** final pricing average -15.4bps tighter than IPT, market average is -12.5bps

Green bonds in our sample priced tighter than Initial Price Talk (IPT). Bond spreads tightening relative to IPT is a normal feature of the bookbuilding process. The difference between IPT and landing price can be influenced by a number of factors specific to each bond. These factors may include the tenor, rating, and sector of the bond as well as more micro considerations such as whether the issuer has bonds already outstanding, and what else is being issued that week.

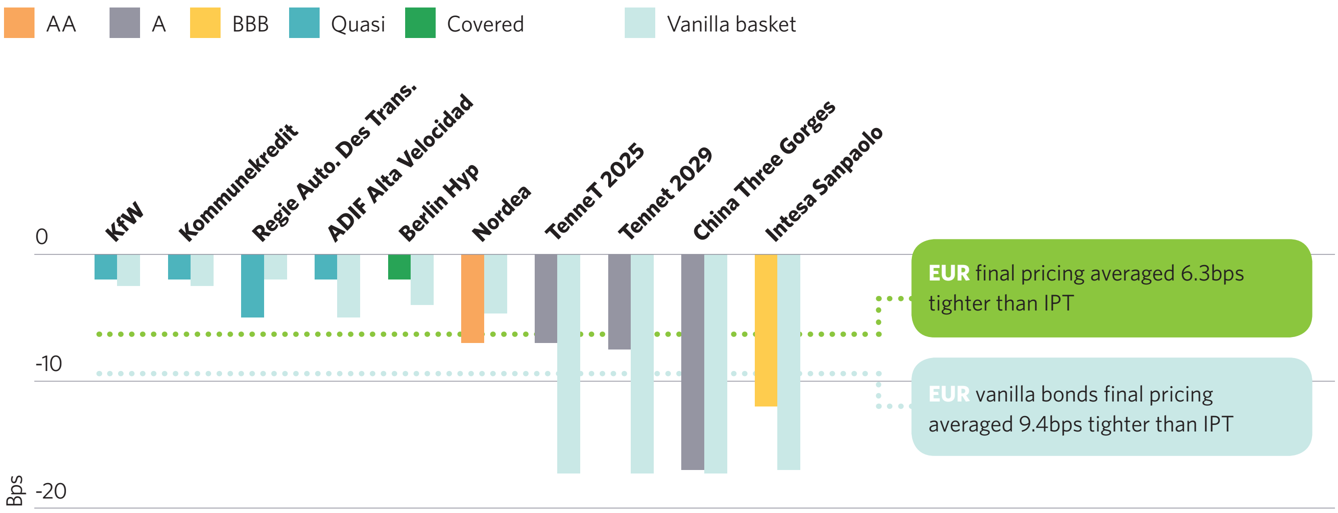
We have compared each green bond to a corresponding vanilla basket. The price movements seen for EUR green bonds are lower than the market average, while USD green bonds showed bigger price movement than the market average.

Inversiones CMPC (-37.5bps), Rural Electrification (-32.5bps), and Kaiser Foundation (-22.5 bps) exhibited the biggest differences between IPT and landing price and tightened more than their corresponding baskets.

Methodology notes: Market averages are based on baskets of bonds of the same currency, sharing similar rating and sector characteristics as the green bonds. Vanilla bonds were issued at some point in Q2 but not necessarily on the same day as the corresponding green bond. Summary statistics of baskets are on pages 14 and 15.

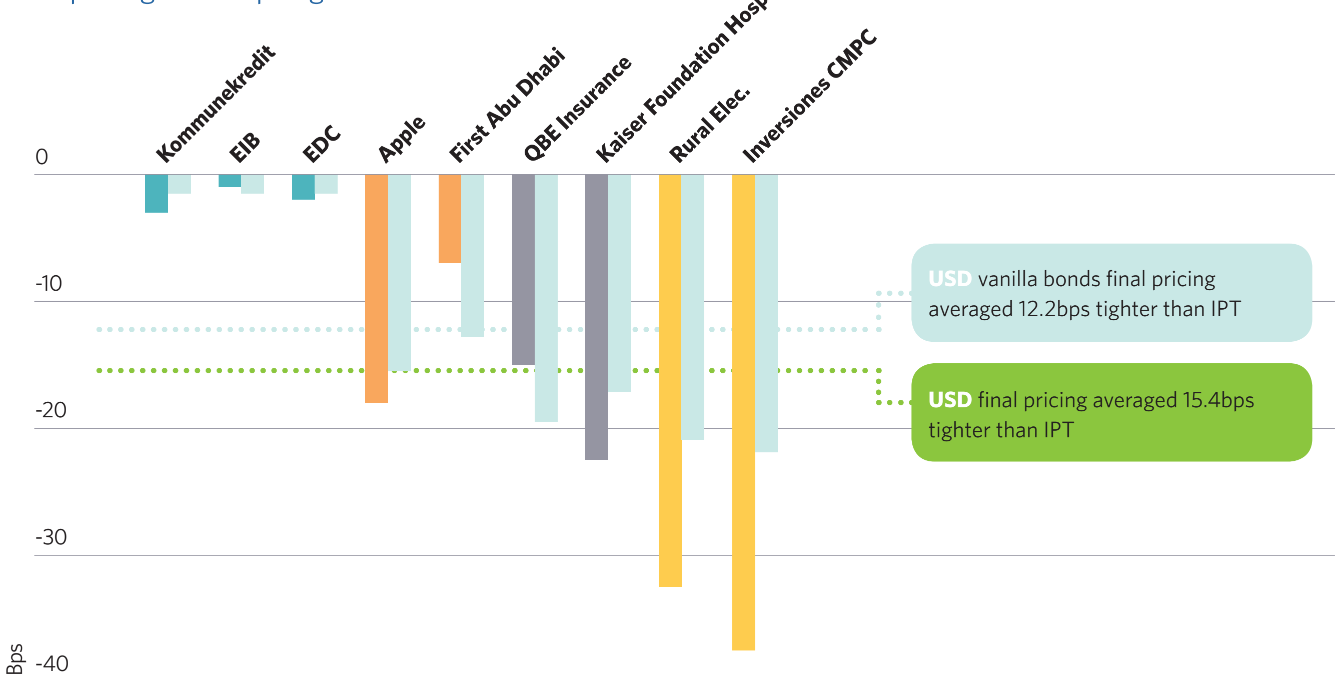
EUR green bonds price tighter than IPT

Final pricing is 6.3bps tighter than IPT



USD difference between IPT and final price is larger for green bonds

Final pricing is 15.4bps tighter than IPT



2. Order books for green bonds are oversubscribed - in line with the market

- Average oversubscription for EUR bonds = 2.3x
- Average oversubscription for USD bonds = 2.8x

Excess demand is a normal feature of the new issue market. Fixed income investors may have money to invest because of coupon income and maturing bonds. As with the IPT metric, oversubscription will depend on a combination of factors.

EUR green bonds covered their order books by an average of 2.3 times against the market average of 2.2 times. Three first-time green bond issuers, Intesa Sanpaolo (3.6 times), RATP (3.2 times), and 3 Gorges (3.1 times) had the highest book cover. Order book cover for EUR bonds in our green bond sample is summarized below:

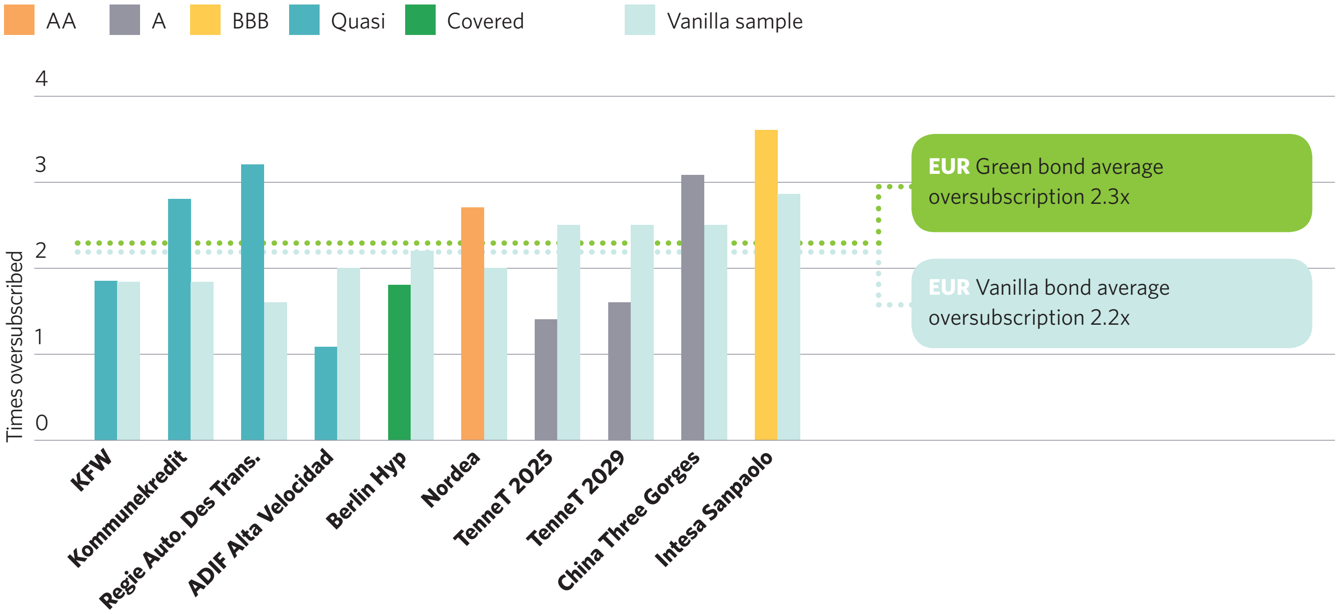
- 1-2 times - 5 bonds
- 2-3 times - 2 bonds
- 3-4 times - 3 bonds

USD green bonds were on average 2.8 times oversubscribed, identical to the market average. Pulp and paper company Inversiones CMPC brought the first Chilean green bond to market and the book was 4.8 times covered which was the highest for any green bond in our sample. Rural Electrification was 3.9 times oversubscribed, and Kaiser Hospitals managed 3.3 times. These were green bond firsts, in terms of both issuer and sector. Order book cover for USD bonds in our sample is summarised below:

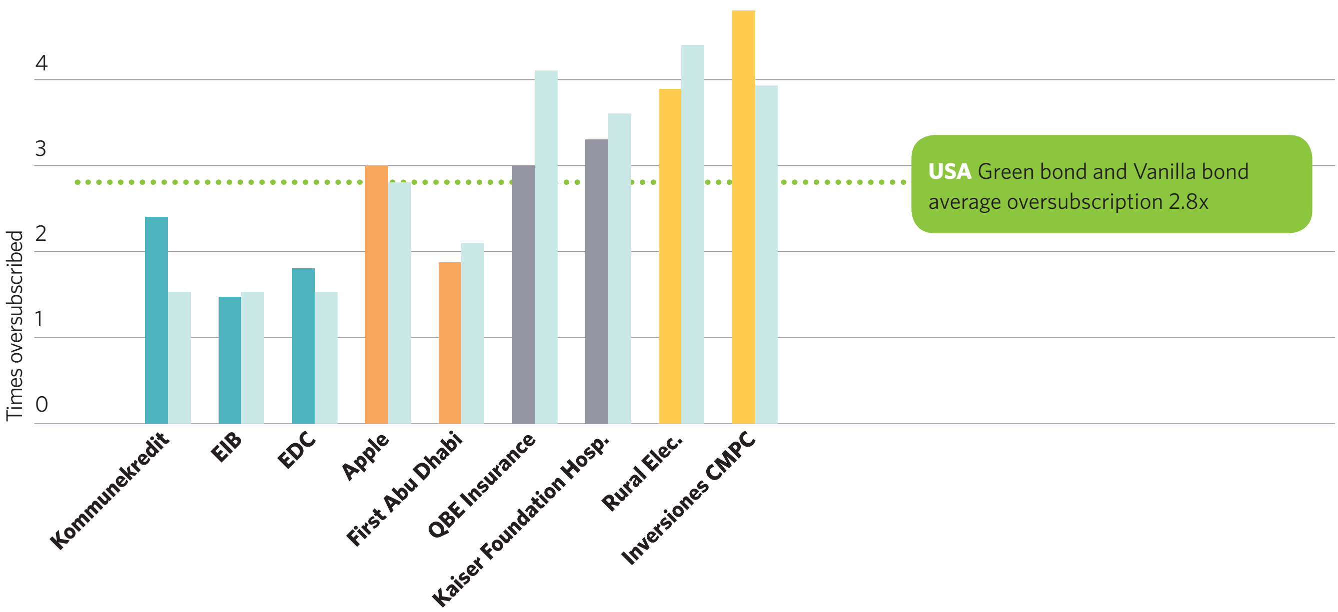
- 1-2 times - 3 bonds
- 2-3 times - 1 bonds
- 3-4 times - 4 bonds
- >=4 times - 1 bonds

Methodology notes: Market averages are based on baskets of bonds of the same currency, sharing similar rating and sector characteristics as the green bonds. Vanilla bonds were issued at some point in Q2 but not necessarily on the same day as the corresponding green bond. Summary statistics of baskets are on pages 14 and 15.

EUR green bonds are slightly more oversubscribed than the market average



USD green bonds are as oversubscribed as comparable baskets



3. Allocation: 54% of bonds were allocated to green investors

54% of bonds in our sample were allocated to those labeling themselves as socially responsible or green investors.

Treasurers repeatedly state that issuing green bonds gives them access to a broader investor base. Bookrunners say that the 'green angle' can result in tighter pricing.

We contacted 19 issuing entities directly to ask what percentage of their green bond was allocated to those labeling themselves as socially responsible or green investors (green investors). Twelve issuers responded sharing the information, the results of which are shown below. The allocations to green investors ranged from 20% (BNDES) to 82% (TenneT 2025). The total debt represented in the below chart is USD7.6bn, USD3.9bn of which was sold to green investors.

The average for Developed Market (DM) green bonds is 62%, and 25% for Emerging Market (EM). We are aware of 24 dedicated green bond funds. Most are limited to buying DM paper, which may explain the lower percentages for the three bonds in our sample domiciled in EM: BNDES (Brazil), Rural Electrification (India), and Inversiones CMPC (Chile). Despite the lack of overlap between EM and green bonds, the EM bonds in our sample were oversubscribed, indicating demand from all parts of the market.

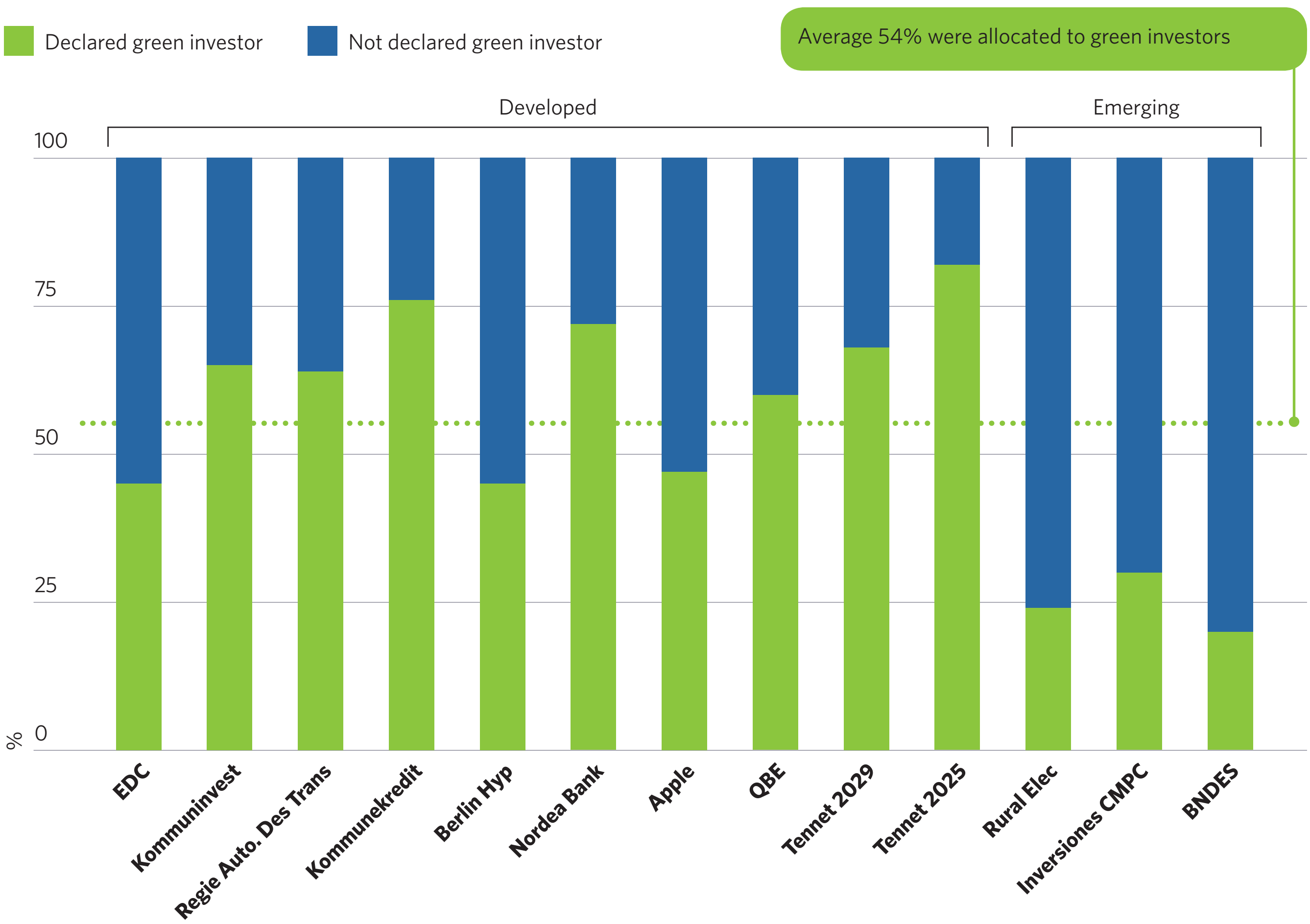
We started tracking this data in Q2 2017 so we don't have any comparable data yet. However, primary market professionals tell us that between 15-30% of an EM green bond going to green investors is normal. We expect this percentage to increase for EM green bonds. We have been advised that DM green bonds were attracting those levels of interest from green investors a couple of years ago.

Syndicate managers now generally expect around 40% of DM green bonds to be allocated to green investors. All DM bonds in our sample achieve higher percentages than this, the lowest being 45%. The percentage of deals being allocated to buyers who identify themselves as green investors is increasing. We suspect that the likely explanation for this is the robust increase in the number of green bond funds over the last couple of years. We will continue to monitor this metric for future pricing papers.

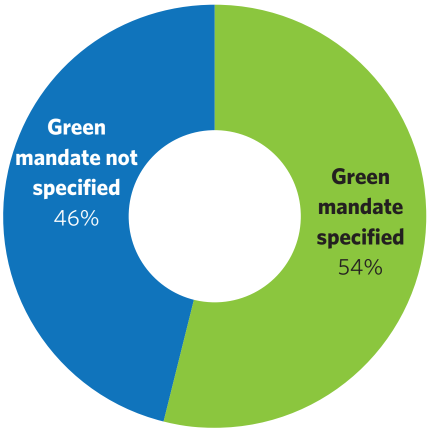
Methodology notes: This data is difficult to capture precisely because it relies on full disclosure from buyers which we cannot verify. Investment managers may have green allocations within a portfolio, but not necessarily only use the green allocation to buy the bond.

Alternatively, buyers may state they are using their green allocations in the belief that they will receive better allocations, and perhaps park the bonds elsewhere once allocated which again, we cannot verify. Separately, we note that some large investors including Amundi, AXA AM, Blackrock, Calvert, Mirova, Nikko AM and PIMCO have dedicated green bond portfolios, while others such as AP4 actively buy green bonds and integrate them into mainstream portfolios. Green investor information is provided by each bond issuer, and we have taken this data at face value.

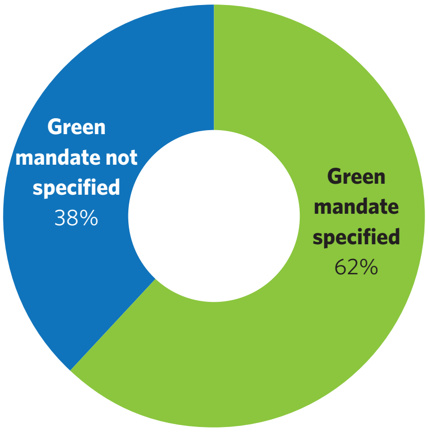
54% of green bonds were allocated to green investors



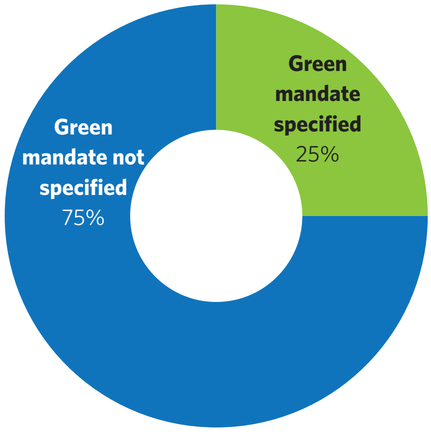
Green mandate % of green bonds in our sample



Developed Markets: 62% bought by investors with a green mandate



Emerging Markets: 25% bought by investors with a green mandate



Green bond pioneer World Bank (IBRD) issues two green bonds to meet the green investment needs of a single investor

Two bonds were issued on 5th April 2017:

- IBRD 2% 12th April 2025 USD300m
- IBRD 3 month USD Libor + 1bps 12th April 2020 USD50m

In addition to the conventional bond issues captured in the scope of this paper, we note a bond of respectable size was issued by IBRD in April 2017. The IBRD issued two customised green bonds with a combined value of USD350m. These bonds were private placements, designed with the supervision of SEB to meet the investment needs of Swedish insurance group, Folksam. That means that 100% of this deal was sold to an investor with a green mandate. These bonds took IBRD's total green bond programme above USD10bn. Simultaneously, Folksam's total exposure to green bonds climbed to SEK15bn (USD1.85bn), or 4% of the total portfolio. Having surpassed their original green investment goal of SEK12bn (USD1.5bn), Folksam set a new goal of owning SEK25bn (USD3.1bn) of green bonds by the end of 2018.

Jens Henriksson, Folksam Group President and CEO said: "Our engagement in green bonds benefit our customers directly, as their money contributes to environment- and climate-friendly projects, while they generate safe returns. Our investments in green bonds show how we can add real value and live according to Folksam's vision."[6]

Arunma Oteh, World Bank Vice President and Treasurer, said: "We are delighted that this transaction has enabled us to reach an important milestone—USD10bn in bonds issued through our green bond program. We are excited about the future, as we continue to establish close partnerships with new investors and connect further the capital markets with solutions to address climate change, health, infrastructure and other development goals."[7]

Green STORM 2017 3 month Euribor + 17 bps May 2022.

Our report sponsor, Obvion Hypotheken, issued its second green residential mortgage-backed security in May 2017, raising EUR550m.

The bond was announced on May 15th, and book building began on the 17th with IPT of 3-month Euribor (3mE) +20 bps area. The next day price guidance was set at 3mE +18 bps area, with indications of interest having reached EUR1bn. In the morning of Friday May 19th orders topped EUR1.4bn and books were closed. Final terms were set later that day, establishing a size of EUR550m and a record low post financial crisis spread of 3mE +17 bps. The strong oversubscription and high quality green order book ensured full allocation to green investors only.

Green STORM 2017 performed well in the immediate secondary market and on May 26th, the spread had tightened to 3mE +13 bps.

How important are green mandates within the green bond market?

Green mandates have been essential in driving demand for green bonds and growing a market. Further, because of the limited supply of product, green mandated investors may, in some instances, help to drive slightly tighter pricing.

Green bonds are the same as vanilla bonds in every way except that the use of proceeds is defined as green - they are no different from vanilla bonds with the same seniority ranking from the same issuer. For this reason, they are as attractive to regular investors as they are to green investors.

This broad appeal is a crucial feature which has been instrumental in growing the market. Fixed income investors may own green bonds without even knowing it, which adds to the breadth of demand for the product.

From a wider climate change perspective, this is critical. To achieve the estimated USD1tn per year required to meet climate targets, green bonds need to be a mainstream investment vehicle which all types of investors can access.

6. https://media.folksam.se/en/2017/09/13/folksam-group-in-new-acquisition-of-green-bonds-from-the-world-bank-group/
7. http://treasury.worldbank.org/cmd/htm/World-Bank-Green-Bonds-Reach-USD-10-Billion-in-Funding-Raised-for-Climate-Finance.html

4. Performance against comparison basket: Green bond spreads tighten in the immediate secondary market

Bond prices generally increase on the 'break' which is when a bond starts trading in the secondary market. If bonds are issued early in the month this can give investment managers an opportunity to chalk up some 'off benchmark' performance before bonds enter indices at month end.

Our research has shown that in terms of tightening on the break, green bonds behave no differently from vanilla bonds. 75% of our sample had tighter spreads both 7 and 28 days after announcement.

We have compared these spread changes to those of our vanilla baskets. Our vanilla baskets comprise bonds that share the same characteristics as the green bonds in our sample in terms of currency, sector, and credit rating, and were issued during the same 3-month observation period. We have not restricted on the basis of tenor providing bonds were issued with a minimum term of three years. Adding this limitation would have resulted in too few bonds. Average tenors of baskets are published on pages 14 and 15. We want to illustrate how a manager could have invested their money over the same period given bonds that were available to buy. The 7 and 28 day periods are not necessarily overlapping, and are calculated for each bond individually.

40% of green bonds in our sample had larger price improvements than their baskets 7 days after announcement, and 35% had larger price improvements after 28 days. We note that the 5 European corporate bonds issued in Q2: Nordea, TenneT (2025 and 2029), Intesa Sanpaolo, and 3 Gorges, all tightened materially 7 and 28 days post their announcement dates. When compared to the baskets, all except Nordea tightened more 7 days after announcement, and after 28 days, only TenneT 2029 had not tightened by more than its basket.

Methodology notes: Baskets include bonds that were issued between 1st April – 30th June 2017 and fit the parameters that we have used for green bonds on page 13, except that the use of proceeds is not green. We are aware that bonds can behave differently according to which part of the month they are issued in, and there are also geo-political events which occur over the course of a three-month period which can influence bond pricing. We emphasise that it is not always possible to find bonds sharing precise characteristics issued on the same day. These baskets are a proxy for how else the money could have been invested within the 3-month observation period. The number of bonds in each basket depends on what was issued over the quarter and ranges in number from 3 to 18 bonds. Summary statistics of baskets are on pages 14 and 15.

7 day spread data was available for 16 bonds in our sample. 28 day spread data was available for 18 bonds in our sample.

7 calendar days includes 5 data observations, 28 calendar days includes 20.

EUR green bonds - Spread changes compared with baskets of vanilla bonds

Ticker	Spread change 1 week	Spread change 1 week basket	Greater or less than basket?	Spread change 1 month	Spread change 1 month basket	Greater or less than basket?
3 Gorges	-14.21	-1.26	✓	-19.66	-7.83	✓
TenneT 2025	-2.04	-1.26	✓	-7.89	-7.83	✓
TenneT 2029	-2.08	-1.26	✓	-5.36	-7.83	✗
Nordea Bank	-0.67	-3.29	✗	-10.56	-4.85	✓
Intesa SanPaolo	-11.29	-6.01	✓	-31.08	-11.12	✓
Berlin Hyp				1.8	0.30	✗
KFW	1.48	-0.15	✗	-0.94	-2.24	✗
Kommuninvest	2.05	-0.15	✗	2.06	-2.24	✗
Regie Auto. Des Trans	-1.55	-2.19	✗	-1.19	-3.87	✗

Source: Thomson Reuters

USD green bonds - Spread changes compared with baskets of vanilla bonds

Ticker	Spread change 1 week	Spread change 1 week basket	Greater or less than basket?	Spread change 1 month	Spread change 1 month basket	Greater or less than basket?
First Abu Dhabi	0.22	-0.79	✗	6.94	-6.80	✗
EDC	-0.25	-0.09	✓	-0.55	-3.04	✗
Kommunekredit				-0.47	-3.04	✗
EIB	-9.30	-0.09	✓	-6.90	-3.04	✓
QBE Insurance	-0.22	-5.89	✗	1.82	-11.02	✗
Kaiser Foundation Hosp.	-3.00	-3.04	✗	-0.10	-4.87	✗
Apple	-0.90	-6.08	✗	-9.00	-6.43	✓
Inversiones CMPC	4.96	-4.82	✗	9.47	-9.90	✗
Rural Elec.	-0.51	-4.57	✗	-0.46	-14.71	✗

Source: Thomson Reuters

5. Performance against index: green bonds outperform indices in the immediate secondary market

- 7 days after announcement 66% tightened more than corresponding index
- 28 days after announcement 53% tightened more than corresponding index

Comparing bonds to corresponding indices tells us how they have performed versus 'the market,' or seasoned equivalents. Overall, 66% of green bonds in our sample had tightened more than their corresponding index 7 days after their announcement date. By currency, all the EUR denominated bonds except 1 tightened by a bigger percentage than their corresponding indices. After 28 days, 6 out of 8 bonds had tightened by a larger percentage than their indices, including all 5 of the EUR corporate bonds.

Results among the USD bonds were mixed. 7 days post announcement date, 4 out of 8 bonds had tightened by a bigger percentage than their corresponding index, and after 28 days, 3 out of 9 bonds exhibited a greater magnitude of tightening than their index. Kommins, EIB and Apple had tightened by a greater magnitude than their corresponding indices after both 7 and 28 days.

Overall then, the EUR bonds performed better than the indices, while USD bonds did not, with EUR corporate credit doing particularly well.

Methodology notes: To isolate the performance of a green bond, we would need to compare it to an index from which green bonds were excluded. Such indices are not currently available in the public domain. We have thus used standard indices.

We used standard iBoxx indices[8] partitioned by currency, asset class, credit rating, and tenor, all of which influence the performance of a bond. As a result, green bonds are compared with an index comprising bonds sharing similar characteristics. For example, EUR TenneT 2025 is matched with the iBoxx EUR Corporates A 7-10 Index.

7 day spread data was available for 15 bonds in our sample. 28 day spread data was available for 17 bonds in our sample.

7 calendar days includes 5 data observations, 28 calendar days includes 20.

EUR: 6 out of 7 of bonds tightened more than their index after 7 days

EUR: 6 out of 8 of bonds tightened more than their index after 28 days

EUR 7 days: 6 out of 7 of bonds tightened more that their corresponding index

EUR 28 days: 6 out of 8 bonds tightened more that their corresponding index

8. http://www.markit.com/product/iBoxx

USD: 4 out of 8 of bonds tightened more than their index after 7 days

USD: 3 out of 9 of bonds tightened more than their index after 28 days

USD 7 days: 4 out of 8 bonds tightened more that their corresponding index

USD 28 days: 3 out of 9 of bonds tightened more that their corresponding index

BNDES cracks the Brazilian green bond market with biggest offering to date

BNDES is the giant Brazilian development bank. Its stated mission is to foster sustainable development in the Brazilian economy, generating employment while reducing social and regional inequalities.

In early May 2017, BNDES came to the USD market for the first time since 2014 with plans to raise USD1bn to fund solar and wind projects. The BB-rated bond had a 7-year tenor, set to mature in 2024.

This was the biggest green bond to come out of Brazil, and the first international green bond from a Brazilian SME.

Initial price thoughts suggested a coupon of around 5%, and interest was strong with the order book closing at USD5bn. The bond landed with a coupon of 4.8% equivalent to a spread of UST+ 269.3 basis points.

BNDES told us that 20% of the deal was allocated to green accounts, mentioning on their website that there was interest from 370 investors[9].

One of the leads said there were

"...European accounts in the book who would not have participated in a non-green EM deal. And some asset managers placed larger than usual orders because it was a green deal".[10]

9. http://www.bndes.gov.br/SiteBNDES/bndes/bndes_en/Institucional/Press/Noticias/2017/20170509_green_bonds.html
10. http://www.globalcapital.com/article/b12vk38vlh8cy0/bndes-lays-green-grass-for-brazilian-issuers

6. The Greenium – some green bonds in our sample do not exhibit a new issue premium

- 2 bonds priced inside their own yield curve so do exhibit a greenium
- 2 bonds priced on their own yield curve so there is an absence of a new issue premium
- 6 bonds priced outside their own yield curve indicating clear new issue premium

A new issue premium is the extra yield that a buyer gets for a new bond when compared to a seasoned vanilla bond from the same issuer. The new bond sits outside a curve constructed from existing debt. An issuer bears this cost to attract new investment, and this is standard in the bond market.

Occasionally, a bond might be issued at a higher price, offering buyers a lower yield, thus sitting inside its existing curve. This is known as a new issue discount, or when present in green bonds, a greenium. This is counterintuitive because green bonds rank 'pari passu' (on equal footing) with bonds of the same rank and issuer. There is no credit enhancement to explain pricing differences and issuers of green bonds incur additional costs such as certification and third-party review.

For this exercise, our sample is a sub-set of that used for this paper, and includes 10 green bonds issued in Q2 2017. A lack of comparable bonds limits the sample.

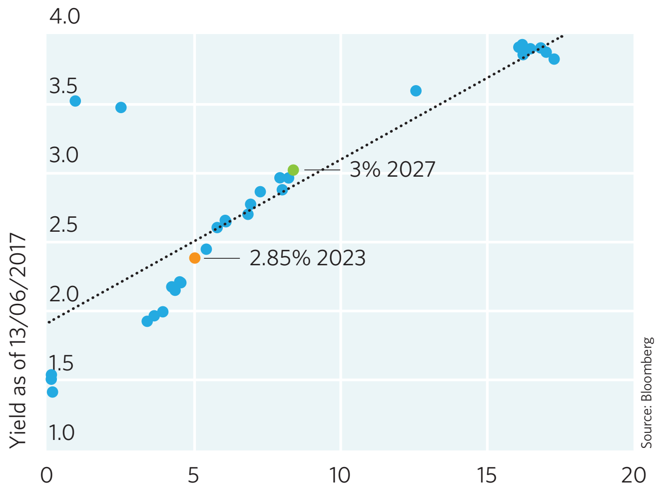
The results of this exercise show that 2 bonds did price inside their curves, thus exhibiting a greenium: Berlin Hyp, and Nordea Bank. Two bonds priced on their curves, which is the absence of a traditional new issue premium: Intesa Sanpaolo IMI and EIB. Finally, 6 bonds priced outside their curves, exhibiting new issue premium: Apple, KfW, Kommuninvest, RATPFP, TenneT 2025 and TenneT 2029.

Any of these bonds may have been funded more cheaply than they would have had the bonds not been green, and indeed, they may have been funded more cheaply than any other bond from the same issuer. We are only looking at whether green bonds priced through their existing curves and came with lower yields and higher prices relative to existing debt from the same issuer trading in the secondary market.

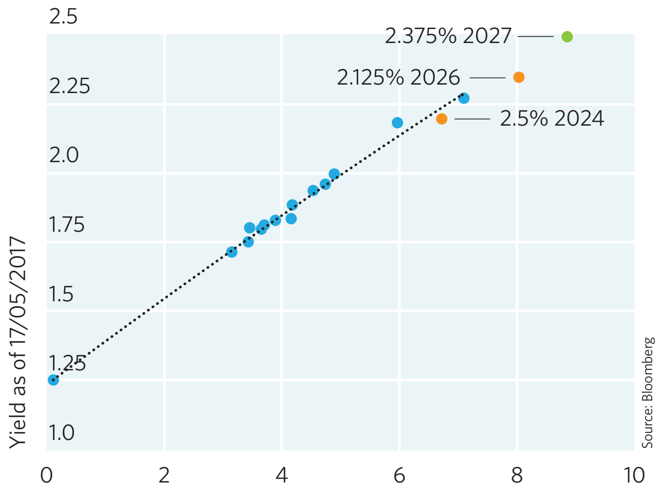
While we do not see a consistent pattern emerging, some green bonds are pricing inside their own curves and others with no discernible new issue premium. Overall, this is no different from the vanilla bond market

● New issue green bonds ● Vanilla bonds ● Seasoned green bond

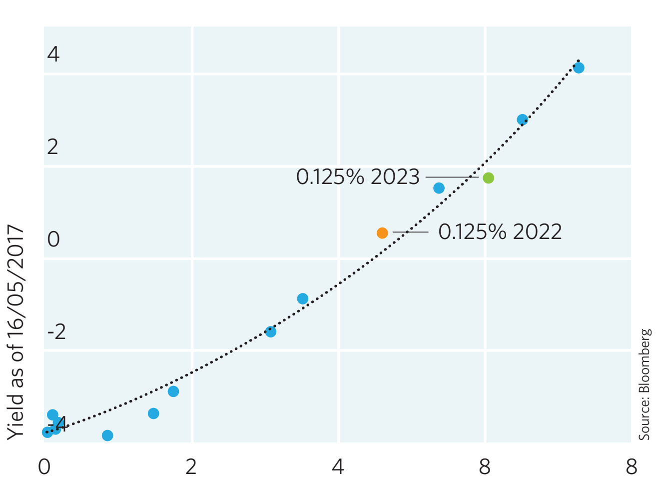
Apple (USD) exhibits a new issue premium



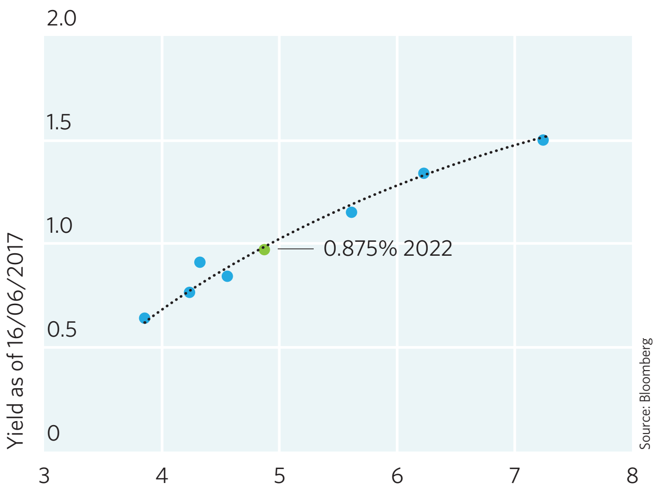
EIB (USD) exhibits a new issue premium



Berlin Hyp (EUR) exhibits a greenium



Intesa Sanpaolo (EUR) exhibits a slight greenium



where bonds will occasionally price on or through existing curves. We will continue to monitor this Metric.

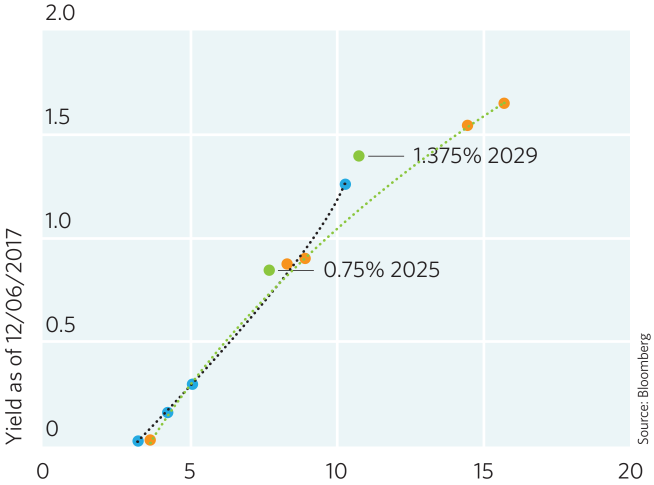
Methodology notes: We have used yield on issue date, which is where the green bond offered on issue date. For comparable bonds, we have used yield to convention mid. For all bonds, we have used modified duration to mid, and all data is taken from the announcement date of the green bond. First, we plot seasoned vanilla bonds (blue dots) and fit a 2nd order polynomial curve. Next, we overlay any seasoned green bonds (orange), finally we add our subject bond (green). Yield on issue date is not available for all bonds, and for those that did have data we have looked at bonds with a minimum of 6 comparable bonds.

- New issue green bonds
- Vanilla bonds
- Seasoned green bond

Comparable bonds are selected based on the following parameters:

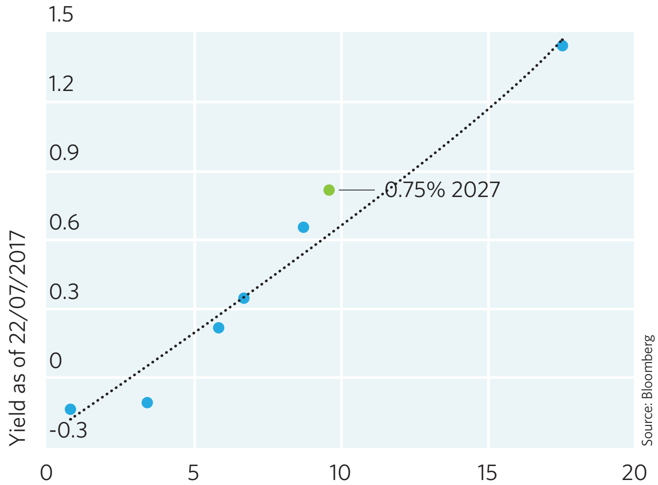
- **Currency** – same as green bond
- **Amount outstanding** > = USD200m
- **Residual maturity** > = 3 years
- **Announcement date** > = 01/01/2010
- **Seniority rank** – same as green bond
- **Bloomberg composite rating** – same as green bond
- **Zero coupons and floaters** / index linked bonds are excluded

Tennet 2025 and 2029 (EUR) exhibit new issue premiums

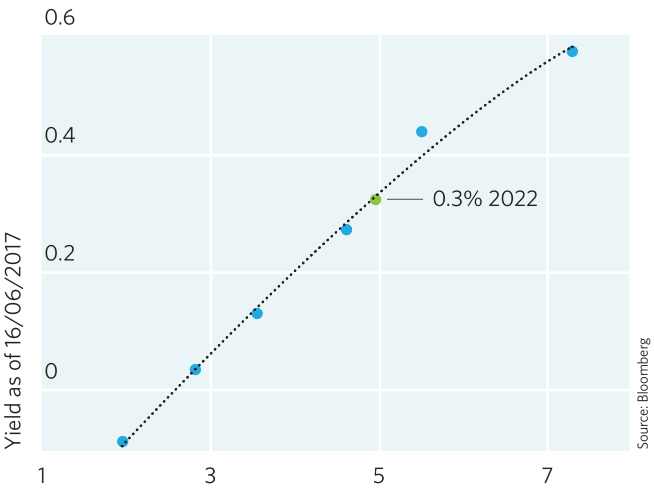


KfW (EUR) exhibits a new issue premium

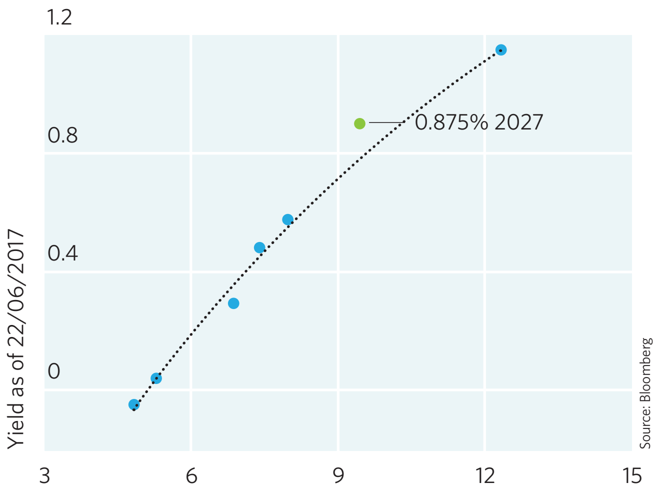
Kommuninvest (EUR) exhibits a new issue premium



NORDEA (EUR) exhibited a slight greenium



RATPFP (EUR) exhibits a issue premium



7. Treasurers welcome the benefits of a broader investor base

Green bonds attract a broader range of investors than vanilla bonds. Treasurers are overwhelmingly happy about how green bonds in our sample placed. The appeal of green bonds tends to be broader than for vanilla bonds from the same issuer because of interest from responsible investors. Investors with an explicit green mandate could offer stability in times of market volatility which treasurers ultimately like. We have included a representative selection of quotes from issuer websites and deal reviews, pertaining to bonds included in this publication. The tone is uniformly positive.

First Abu Dhabi Bank
3% March 2022, USD587m
announced 27th March 2017

Andy Cairns, NBAD's Global Head of Debt Origination & Distribution, commented:

We are honoured to be Joint Green Structuring Advisor and Joint Bookrunner on this, the first ever Green Bond from the Middle East. It illustrates that socially responsible investors are an increasingly relevant liquidity source and I am optimistic that this transaction will establish a blueprint for other Middle Eastern issuers to follow suit and issue Green Bonds and Green Sukuks.[12]

Kommuninvest
1.875% 2021, USD500m
announced 16th May 2017

Issuer's transaction comment:

With this third green bond, following shortly after the publication of our first green bonds impact report, we feel we have firmly established our green bonds framework in the market. We are again pleased with the strong demand for green bonds from Kommuninvest, and particularly happy to see such a diversified and high-quality order book, with several renowned dark green investors participating Anders Gånge, Head of Funding & Treasury.[15]

Berlin Hyp AG
0.125% October 2023, EUR500m
Pfandbrief announced 16th May 2017

Bodo Winkler, Head of Investor Relations at Berlin Hyp AG said:

...we managed to attract new investors into the deal that would not have bought had it not been for the fact that the assets being financed are green. We are very pleased with the outcome which proves this is a good path for BHH to follow.[11]

KfW
0.25% June 2025, EUR2bn announced 9th May 2017

Petra Wehlert (Head of Capital Markets) comments:

We see a growing interest from investors for liquidity in the green bond segment. We were able to issue KfW's largest green bond, fulfil investors' needs for liquidity and deliver an interesting product for green bond investors. The bond was placed without any new issue premium which reflects the strong demand for green products.[14]

Nordea
0.3% June 2022, EUR500m
announced 16th June 2017

The deal summary states:

The book included over 100 accounts, of which 72% dedicated green investors highlighting the strong diversification to the traditional senior unsecured issue investor base.[13]

RATP
0.875% May 2027, EUR500m
announced 22nd June 2017

Deal summary:

With this Debut Green Bond, RATP encountered the largest and most geographically diversified orderbook they ever had on a transaction.[16]

11. http://www.globalcapital.com/article/b13bdrx5ntlytf/berlin-hyp-finds-new-names-for-second-green-pfandbrief
12. https://www.nbad.com/en-ae/about-nbad/overview/news-room/2017/30-03-2017.html
13. https://www.nordea.com/Images/33-197335/Deal%20Review%20-%20Nordea%20Green%20Bond%20EUR500m%205-year.pdf
14. https://www.kfw.de/Bilder/Investor-Relations/KfW-Anleihen/Green-Bonds/EUR-Green-Bond-2017-2025-2.pdf
15. http://kommuninvest.se/wp-content/uploads/2017/05/Press-points-170517.pdf
16. Deal Review – RATP EUR500m 10y Inaugural Green Bond – June 2017, HSBC & RATP

Conclusion

The green bond market continues to expand, offering investors a broader choice of instruments, but the number of large corporate green bonds remains limited. More than half of the green bonds in our sample were allocated to dedicated green investors, who offer a unique form of support to the development of the market. Green bonds afford issuers the opportunity to broaden their investor base, while consolidating their commitment to investing in climate solutions. All treasurers welcome this benefit.

Green bonds are oversubscribed, and price better than expectations, which, as we wrote in our last publication, is to be expected for all types of bonds in current market conditions. Some green bonds priced inside or on their curves, but most of the bonds in our albeit limited sample did exhibit the traditional issue premium. This again does not differ from the vanilla bond market.

Performance in the immediate secondary market is mixed, but based on the metrics we have chosen, we can see that EUR Corporate green bonds issued during Q2 2017 delivered superior spread tightening relative to both vanilla bonds issued during the same period, and corresponding indices. USD green bonds did not perform comparably.

Green bonds are sometimes sold at similar levels to vanilla bonds. Sometimes they perform better, and sometimes they don't. There are signs of benefits to both issuers and buyers of green bonds relative to vanilla bonds. However, the market is still developing and more data is needed to draw more consistent conclusions.

This publication is part of an ongoing series. The next edition will monitor qualifying bonds issued in Q3 2017, July to September. As well as the metrics we have included here, we may examine other ways of comparing green bonds to a vanilla sample.

Methodology

This paper includes labelled green bonds issued during the second quarter of 2017. We have included all labelled[17] green bonds meeting the following specifications:

- Announcement date between 30/03/2017 and 30/06/2017
- Except for First Abu Dhabi Bank, issued 27th March 2017, but not picked up in our prior publication.
- Denominated in either USD or EUR
- Size >= USD300m
- Investment grade rated
- Minimum term to maturity of three years
- Consistent with Climate Bonds Taxonomy
- Amortising bonds are excluded

We have set these parameters to capture the most liquid portion of the market for which data is sufficiently robust.

All historical data is based on asset swap spreads for EUR denominated bonds, except for Regie Auto Des Trans. (RATPFP) which is spread off a Euro government curve. For USD denominated bonds, we have used a US treasury curve, except for First Abu Dhabi, EIB, EDC, and Kommuninvest which are expressed as asset swap spreads. All historical spread data is taken from EIKON Thomson Reuters.

Comparable baskets

Baskets for comparison comprise bonds meeting the above criteria with a use of proceeds which is not stated as green. To be included, adequate data must be available. Baskets are equally weighted and are organized according to:

- Currency
- Bloomberg Industry Classification Scheme Level 1
- Bloomberg composite rating

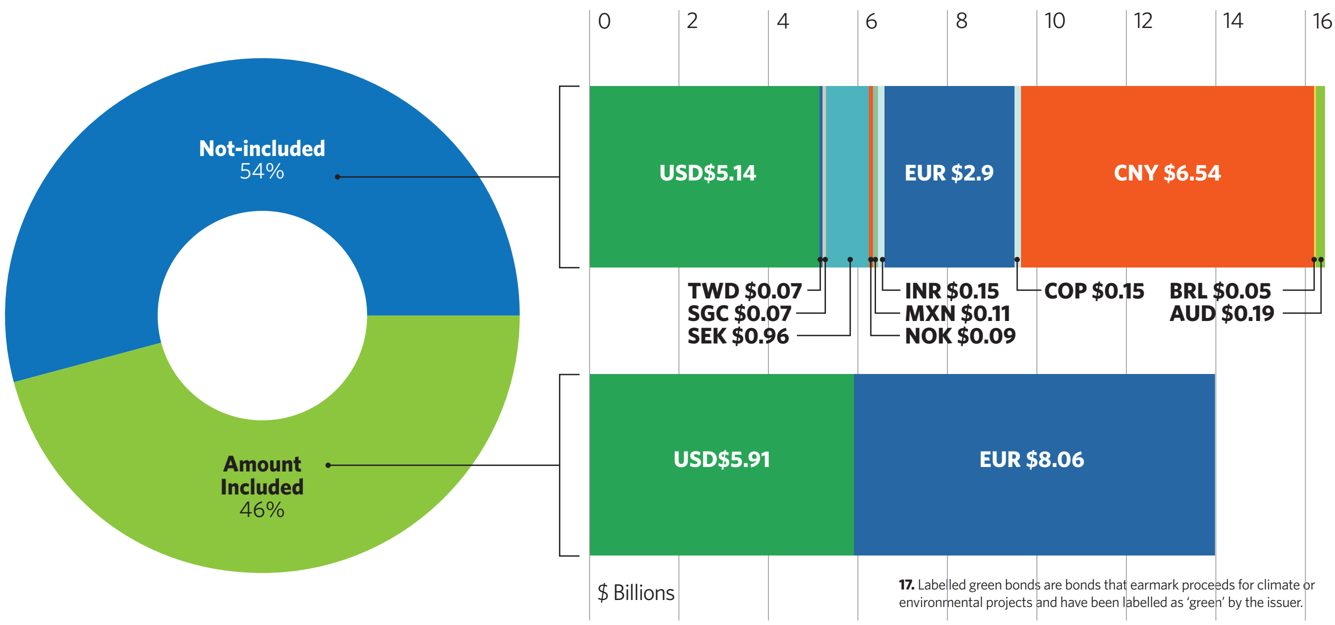
Composition of sample

EUR	Quasi	Covered	AA	A	BBB
1 to 3					
3 to 5			1		1
5 to 7	1	1		1	
7 to 10	3			1	
10+				1	

USD	Quasi	AA	A	BBB
1 to 3	1			
3 to 5	1	1	1	
5 to 7		1	1	
7 to 10	1			2
10+				

If you would like to discuss this paper in more detail please contact caroline@climatebonds.net.

Our methodology captures USD46bn of green bonds issued in Q2



17. Labelled green bonds are bonds that earmark proceeds for climate or environmental projects and have been labelled as 'green' by the issuer.

USD: Summary statistics of baskets used for comparison.

Bonds issued in Q2 2017 sharing similar characteristic to green bonds

	Number of bonds	Average Coupon (par weighted)	Maturity
First Abu Dhabi Bank 3% 30/03/2022	1	3.00%	5
AA Financials	6	2.32%	3.8
QBE Insurance Group Ltd 3% 21/10/2022	1	3.00%	5
A Financials	10	2.76%	5.375
Kaiser Foundation Hospitals 3.15% 01/05/2027	1	3.15%	10
A Healthcare	7	2.79%	9.42
Kommuninvest 1.875% 01/06/2021	1	1.88%	4
EIB 2.375% 24/05/2027	1	2.38%	10
Export Development Canada 1.625% 01/06/2020	1	1.625%	3
AAA Quasi Governments	9	1.74%	3.4
Apple 3% 20/06/2027	1	3.00%	10
AA Technology (comparable bonds all Apple, issued 11/05/2017)	4	2.69%	6.25
Rural Electrification Corp Ltd. 3.875% 07/07/2027	1	3.88%	10
BBB Financials	5	3.70%	7
Inversiones CMPC 4.375% 04/04/2027	1	4.38%	10
BBB Materials	8	3.42%	15.125

EUR: Summary statistics of baskets used for comparison.

Bonds issued in Q2 2017 sharing similar characteristic to green bonds

	Number of bonds	Average Coupon (par weighted)	Maturity
Intesa Sanpaolo 0.875% 27/06/2022	1	0.875%	5
BBB Financials	14	1.4%	8.3
Nordea Bank AB 0.3% 30/06/2022	1	0.3%	5
AA Financials	3	0.33%	5
TenneT 1.375% 26/06/2029	1	1.38%	12
TenneT 0.75% 26/06/2025	1	0.75%	8
3 Gorges Finance 1.3% 21/06/2024	1	1.3%	7
A Non-Finance (no suitable A vanilla Utility bonds issued during Q2)	5	1.12%	7.5
KFW 0.25% 30/06/2025	1	0.25%	8
Kommunekredit 0.75% 18/05/2027	1	0.75%	10
AAA Quasi Governments	9	0.42%	8
Regie Autonome des Transports Paris 0.875% 25/05/2027	1	0.88%	10
AA Quasi Governments	14	079%	11.8
Berlin Hyp 0.125% 23/10/2023	1	3.88%	10
AAA Covered bonds	18	0.59%	8

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